

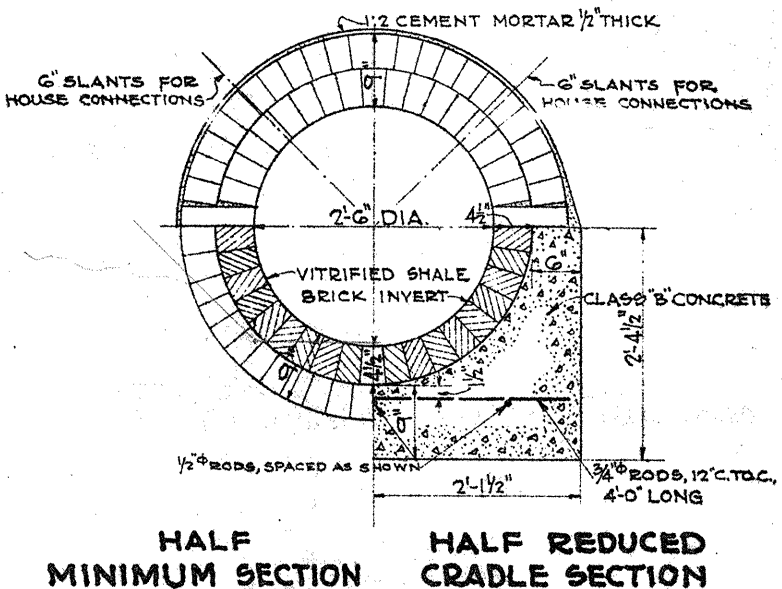
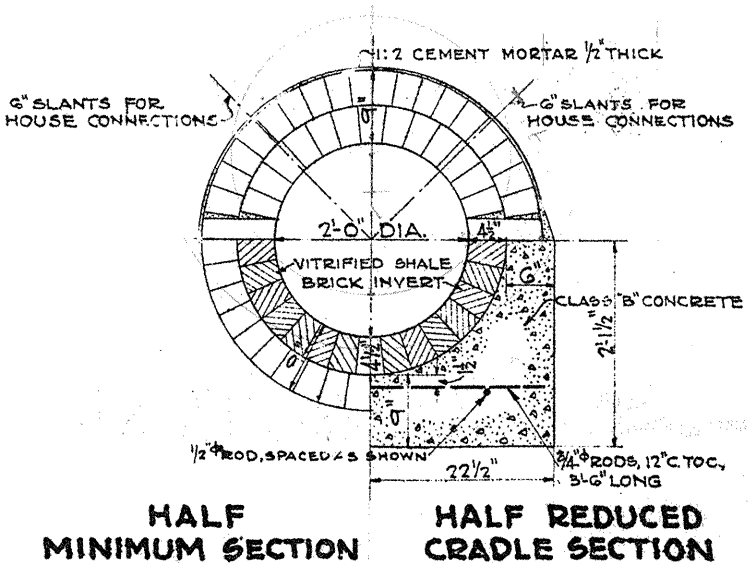
STANDARD
DETAILS
OF THE
BUREAU OF ENGINEERING
SURVEYS AND ZONING

DEPARTMENT OF PUBLIC WORKS
PHILADELPHIA
1934

CIRCULAR BRICK SEWERS

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

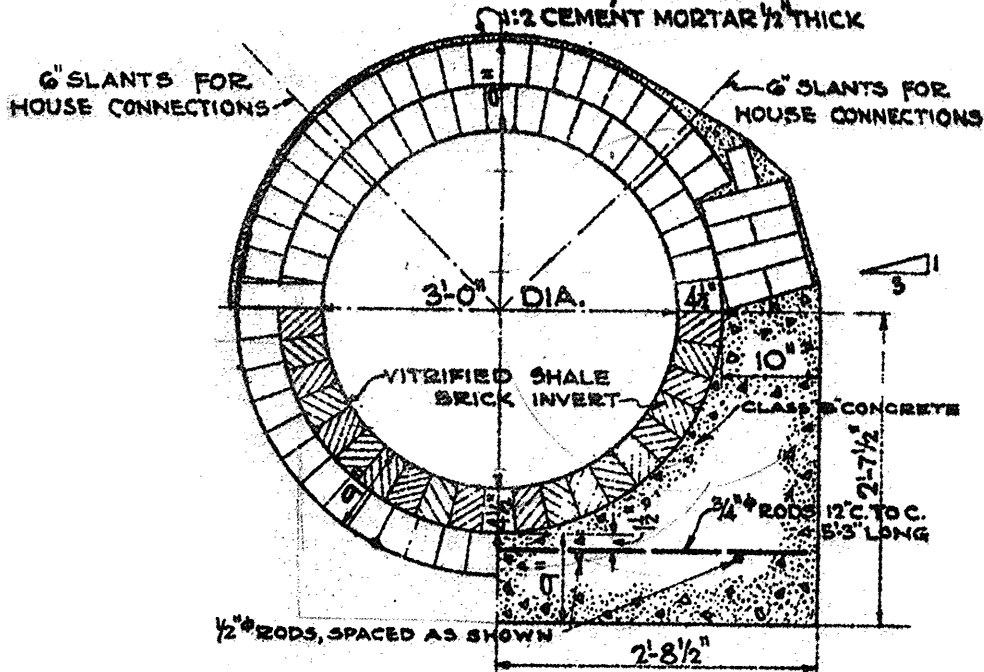
J. H. Mason
CHIEF ENGINEER



CIRCULAR BRICK SEWERS

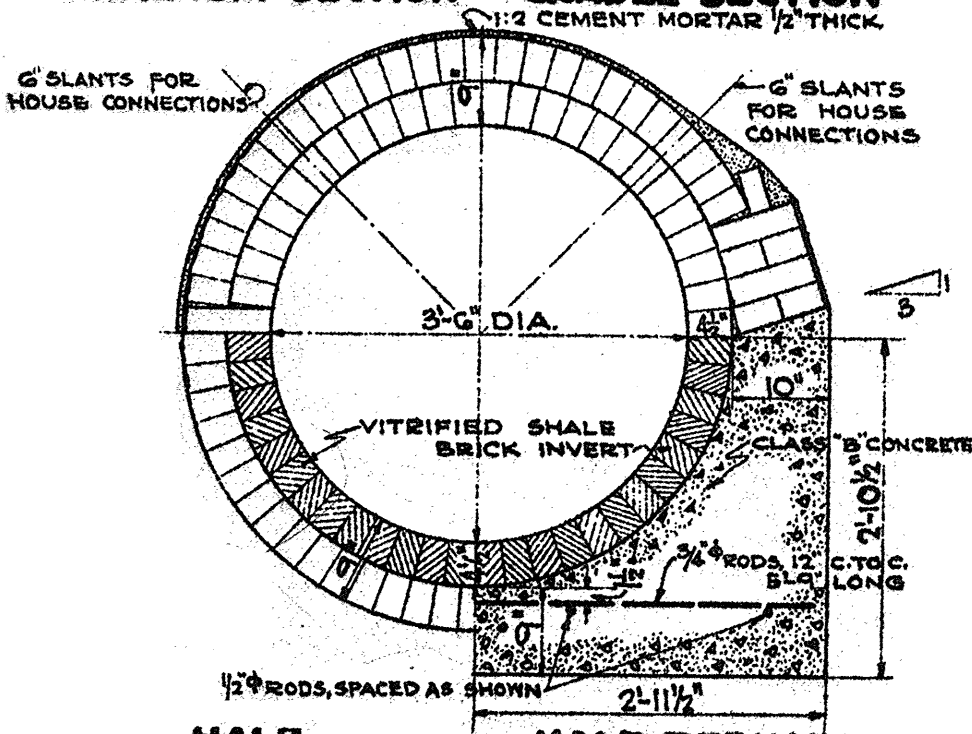
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

J. H. Mason
CHIEF ENGINEER



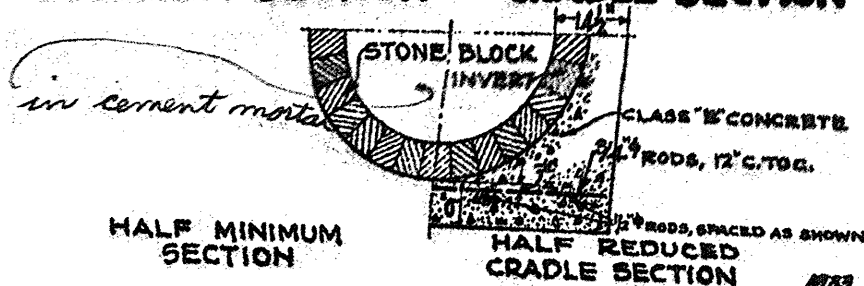
HALF MINIMUM SECTION

HALF REDUCED CRADLE SECTION



HALF MINIMUM SECTION

HALF REDUCED CRADLE SECTION



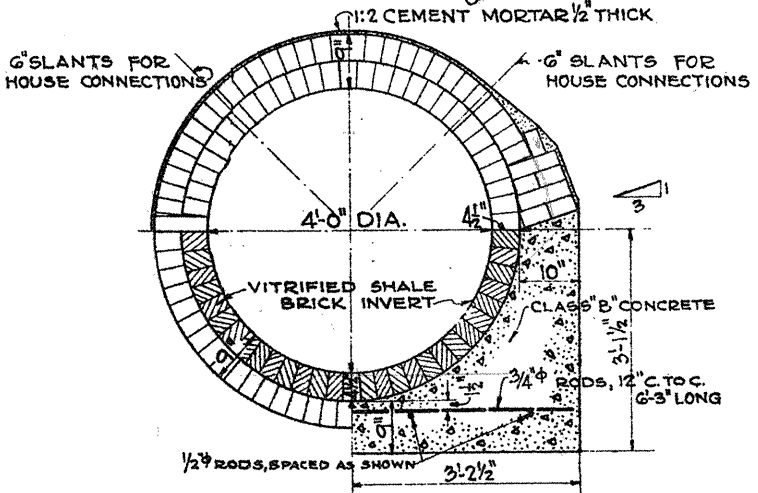
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HALF REDUCED CRADLE SECTION

CIRCULAR BRICK SEWERS

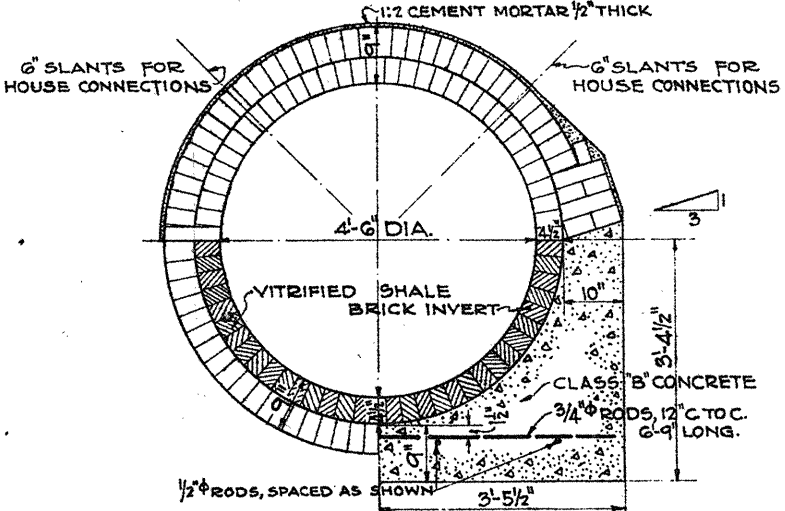
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

J. Wilson
CHIEF ENGINEER



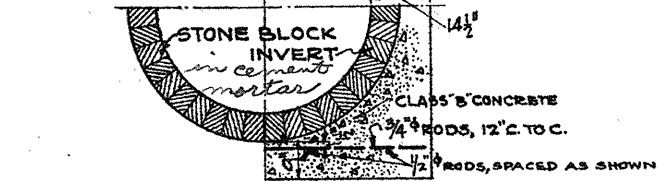
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HALF REDUCED CRADLE SECTION



HALF MINIMUM SECTION

HALF REDUCED CRADLE SECTION



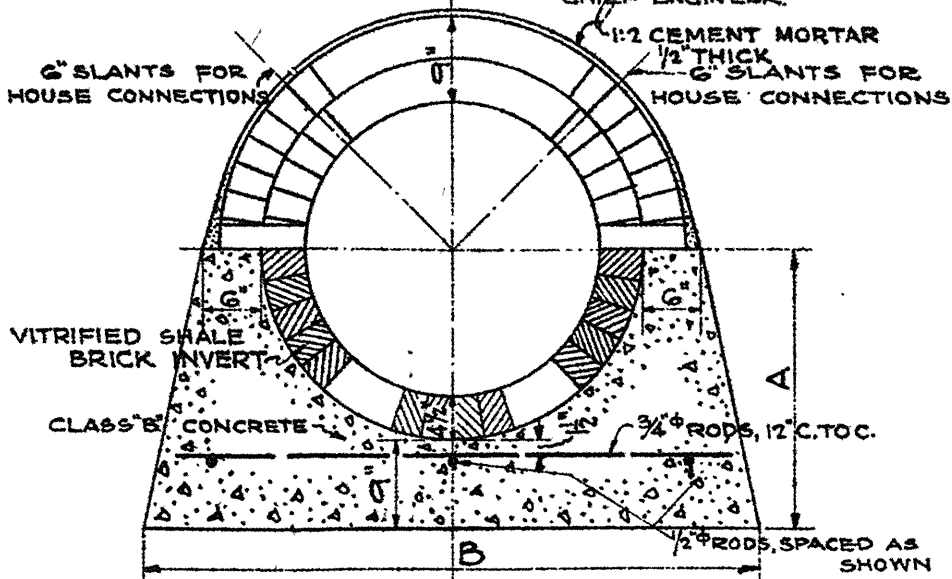
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HALF REDUCED CRADLE SECTION

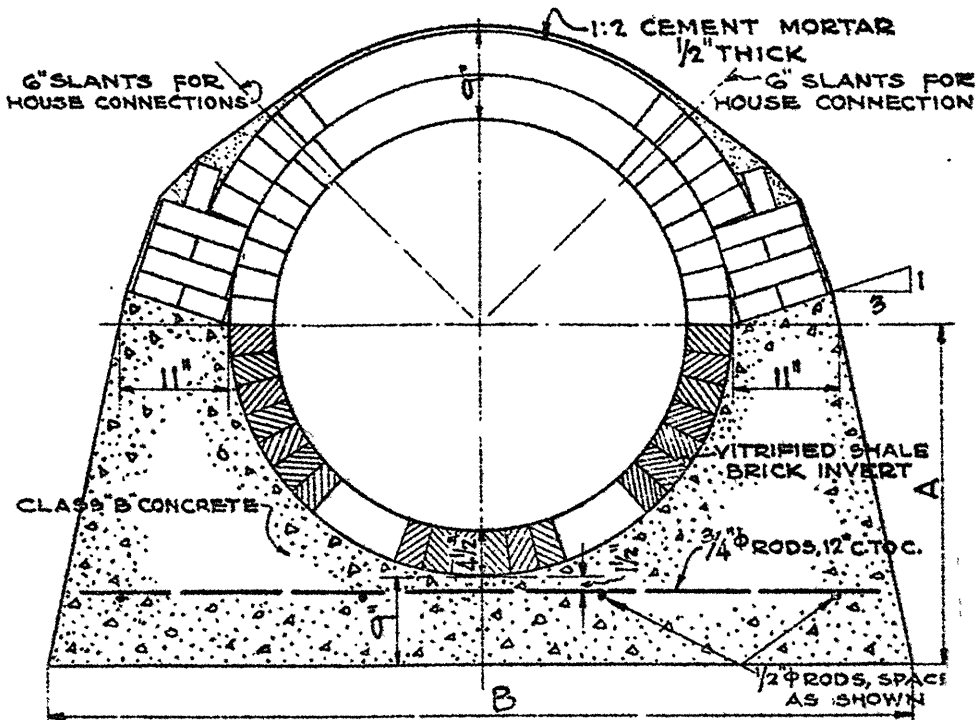
CIRCULAR BRICK SEWERS

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CHIEF ENGINEER



**SECTION IN FULL CRADLE
FOR SIZES 2'-6" DIA. AND 2'-0" DIA.**



**SECTION IN FULL CRADLE
FOR SIZES 3'-0" DIA. AND OVER**

NOTE: For sewer details not shown see Standard Sections.

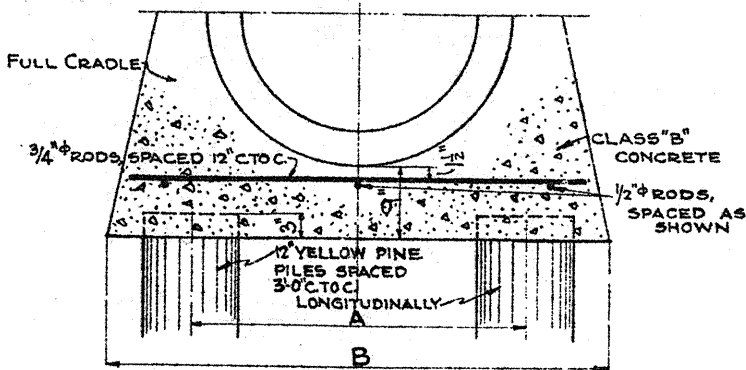
SIZE	A	B	ROD LENGTH
2'-0" DIA.	2'-1 1/2"	4'-7"	4'-0"
2'-6" "	2'-4 1/2"	5'-3"	4'-9"
3'-0" "	2'-7 1/2"	6'-10"	6'-3"
3'-6" "	2'-10 1/2"	7'-4"	6'-9"
4'-0" "	3'-1 1/2"	7'-10"	7'-3"
4'-6" "	3'-4 1/2"	8'-2"	7'-9"

(4)

CIRCULAR BRICK SEWERS

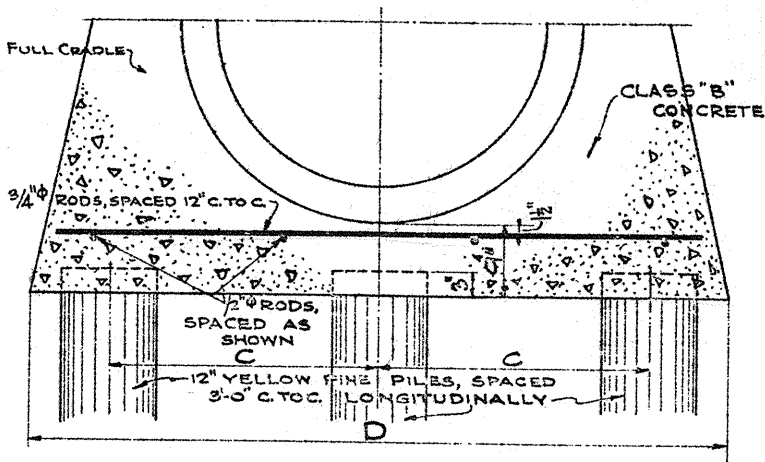
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

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SECTION ON PILES

FOR SIZES 2'-6" DIA. AND 2'-0" DIA.



SECTION ON PILES

FOR SIZES 3'-0" DIA. AND OVER

NOTE: For sewer details not shown see Standard Sections.

SIZE	A	B	C	D	ROD LENGTH
2'-0" DIA.	2'-10"	4'-7"			4'-0"
2'-6" "	3'-6"	5'-3"			4'-9"
3'-0" "			2'-7"	6'-10"	6'-3"
3'-6" "			2'-10"	7'-4"	6'-9"
4'-0" "			3'-2"	7'-10"	7'-5"
4'-6" "			3'-3"	8'-2"	7'-9"

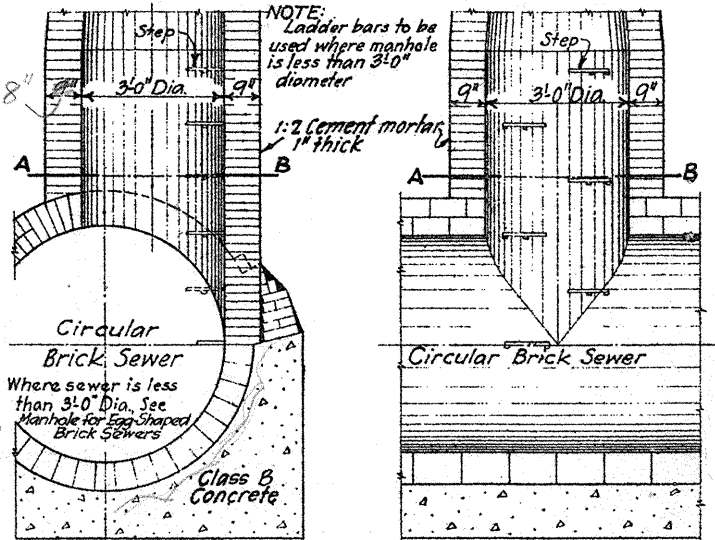
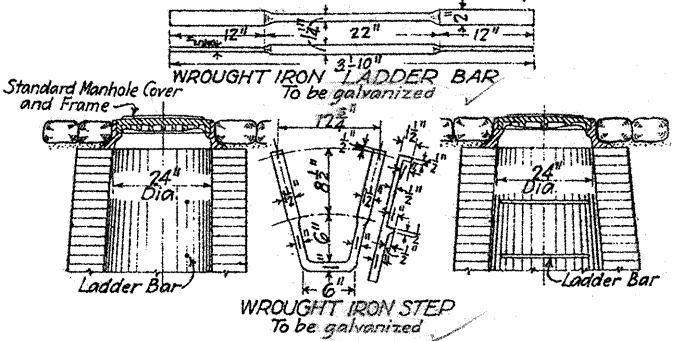
STANDARD MANHOLE

FOR CIRCULAR SEWERS 3'-0" DIA. AND OVER

DEPARTMENT OF PUBLIC WORKS
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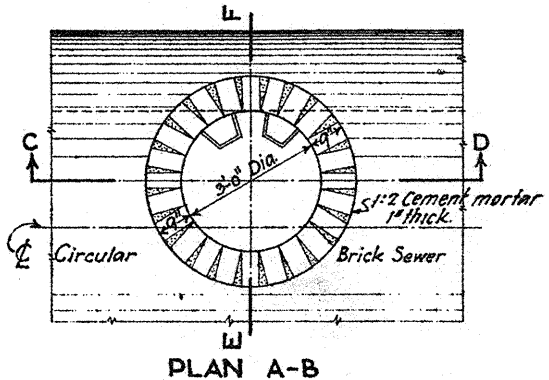
Note: for circular sewers under 3'-0" dia., use the type of manhole for Egg-Shaped Brick Sewers. Steps under top not more than 10" apart.



SECTION E-F

SECTION C-D

NOTE: In hard rock, the foundation may be reduced in accordance with the Standard Specifications.

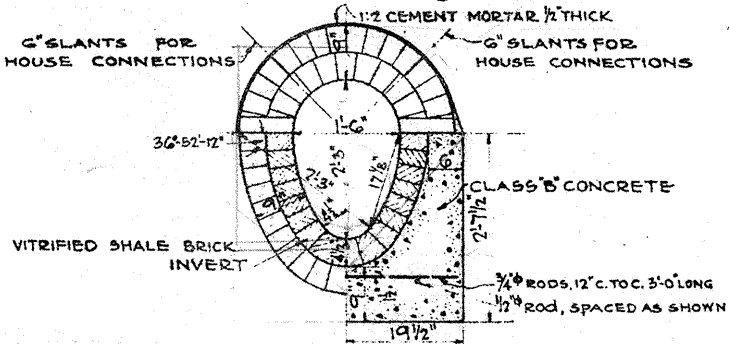


6

EGG-SHAPED BRICK SEWERS

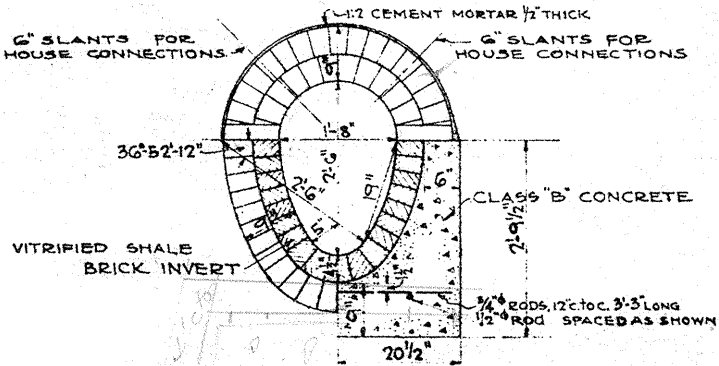
DEPARTMENT OF PUBLIC WORKS
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J. H. Johnson
CHIEF ENGINEER



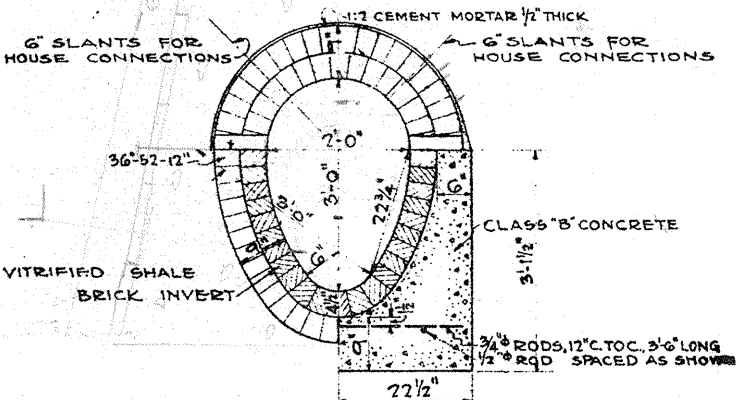
HALF MINIMUM SECTION

HALF REDUCED CRADLE SECTION



HALF MINIMUM SECTION

HALF REDUCED CRADLE SECTION



HALF MINIMUM SECTION

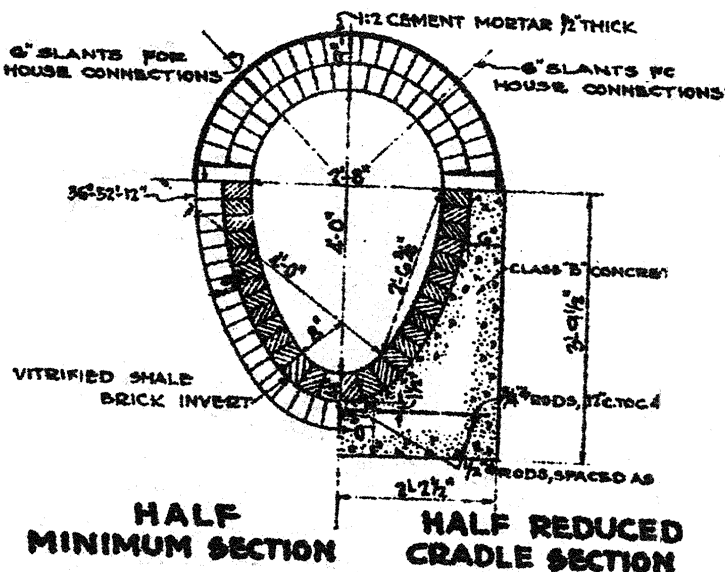
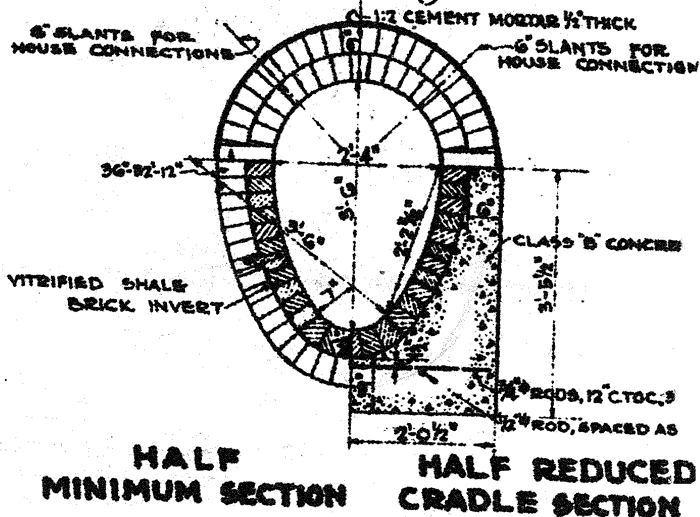
HALF REDUCED CRADLE SECTION

①

EGG-SHAPED BRICK SEWERS

DEPARTMENT OF PUBLIC WORKS
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PHILADELPHIA

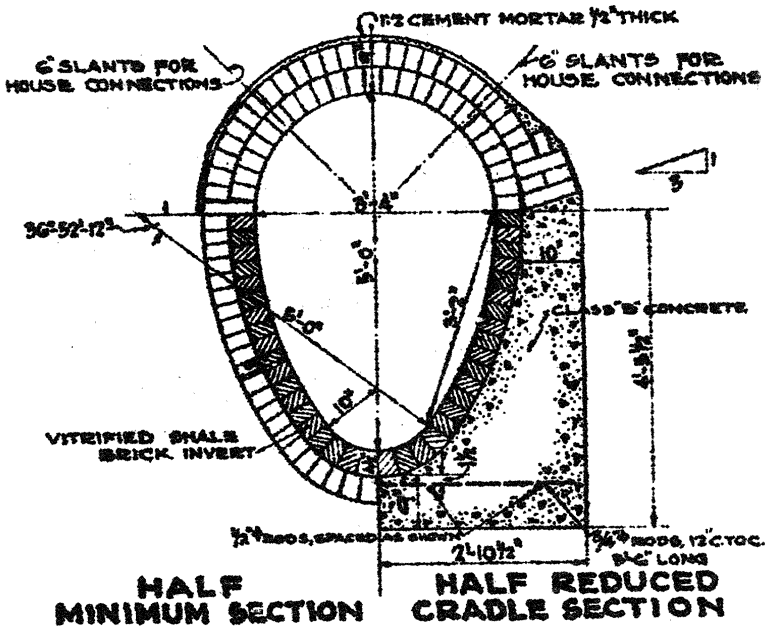
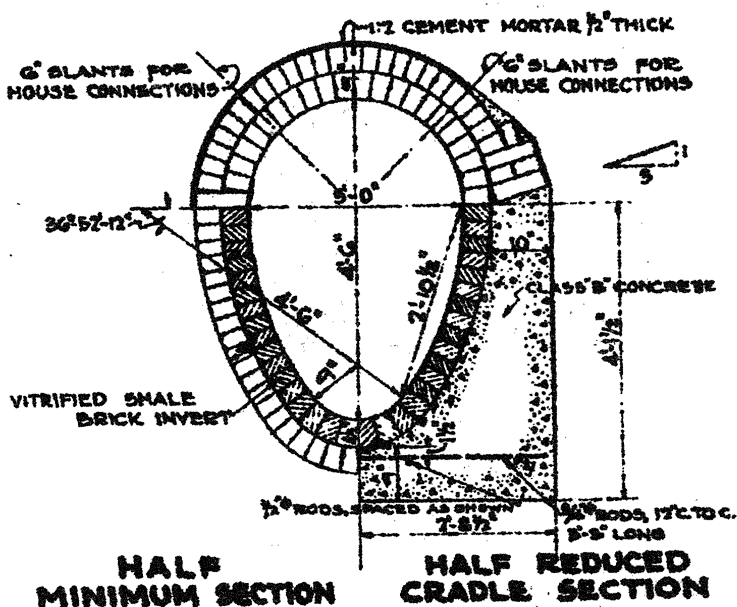
J. H. ...
CHIEF ENGINEER



EGG-SHAPED BRICK SEWERS

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

J. M. Mason
CIVIL ENGINEER

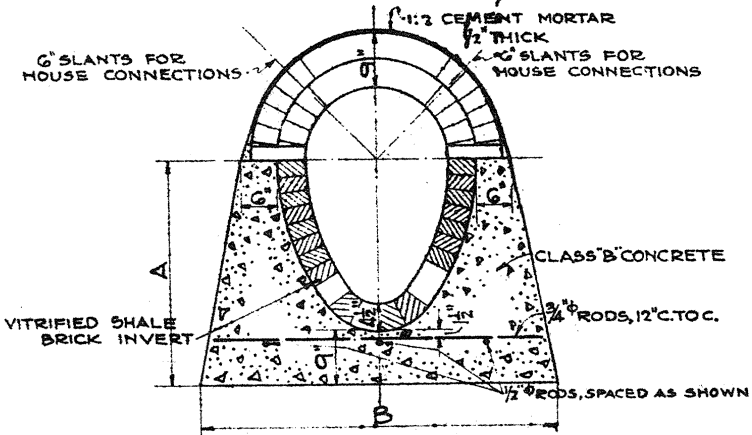


9

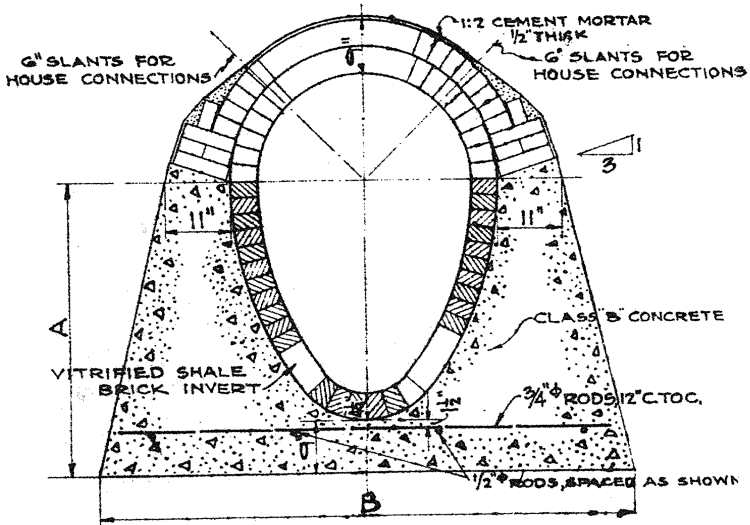
EGG-SHAPED BRICK SEWERS

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CHIEF ENGINEER



SECTION IN FULL CRADLE
FOR SIZES 4'-0" x 2'-8" AND UNDER



SECTION IN FULL CRADLE
FOR SIZES 4'-6" x 3'-0" AND 5'-0" x 3'-4"

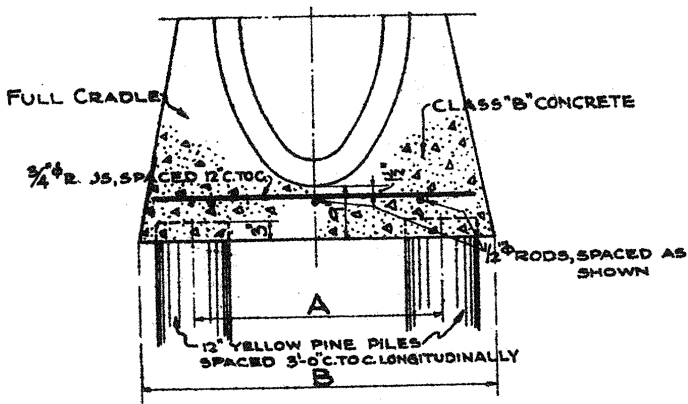
NOTE:- For sewer details not shown see Standard Sections.

SIZE	A	B	ROD LENGTH
2'-3" x 1'-6"	2'-7 1/2"	4'-3"	3'-9"
2'-6" x 1'-8"	2'-9 1/2"	4'-6"	4'-0"
3'-0" x 2'-0"	3'-1 1/2"	5'-0"	4'-6"
3'-6" x 2'-4"	3'-5 1/2"	5'-6"	5'-0"
4'-0" x 2'-8"	3'-9 1/2"	5'-11"	5'-6"
4'-6" x 3'-0"	4'-1 1/2"	7'-6"	7'-0"
5'-0" x 3'-4"	4'-5 1/2"	8'-0"	7'-6"

EGG-SHAPED BRICK SEWERS

DEPARTMENT OF PUBLIC WORKS
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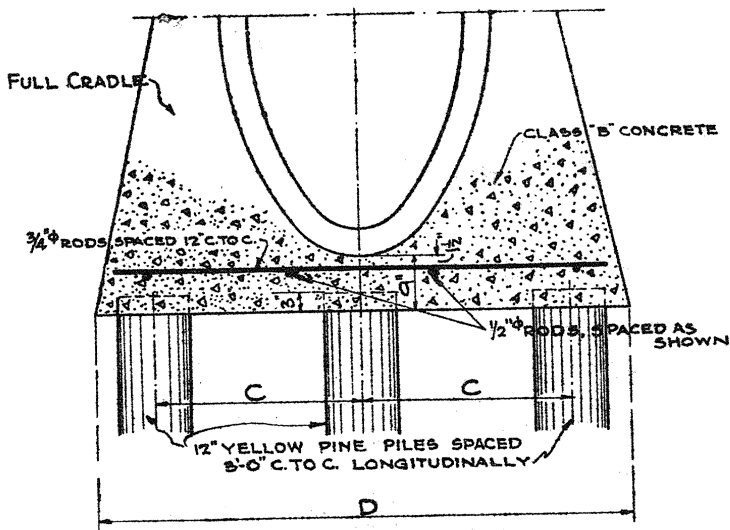
J. H. ...
CHIEF ENGINEER



SECTION ON PILES

FOR SIZES 4'-0" X 2'-8" AND UNDER

NOTE:—For sewer details not shown see Standard Sections.



SECTION ON PILES

FOR SIZES 4'-6" X 3'-0" AND 5'-0" X 3'-4"

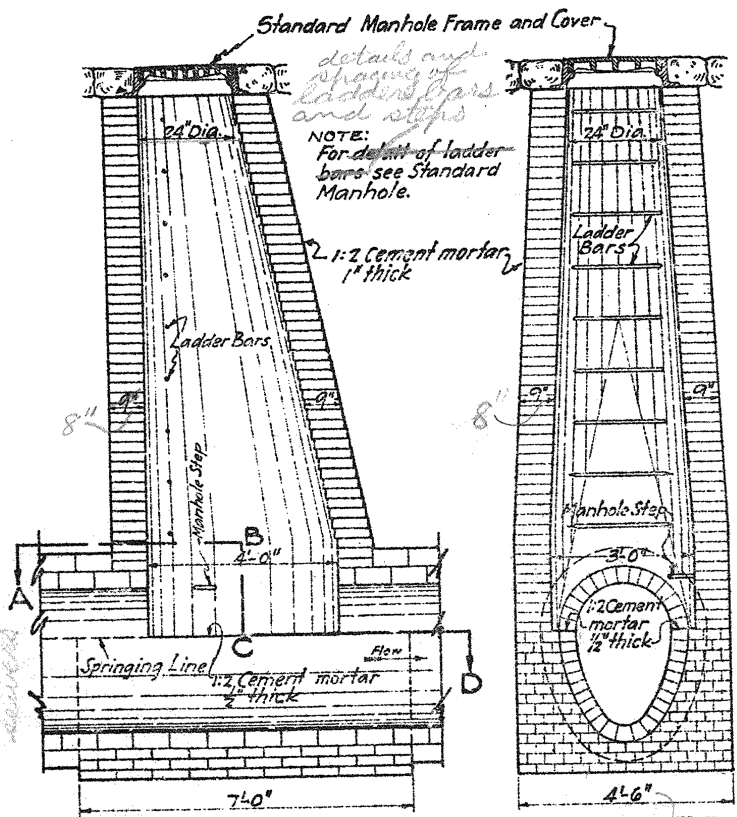
SIZE	A	B	C	D	ROD LENGTH
2'-3" X 1'-6"	7'-10"	4'-3"			3'-9"
2'-6" X 1'-8"	3'-0"	4'-6"			4'-0"
3'-0" X 2'-0"	3'-6"	5'-0"			4'-6"
3'-6" X 2'-4"	4'-0"	5'-6"			5'-0"
4'-0" X 2'-8"	4'-6"	5'-11"			5'-6"
4'-6" X 3'-0"			2'-11"	7'-6"	7'-0"
5'-0" X 3'-4"			3'-2"	8'-0"	7'-6"

MANHOLE FOR EGG-SHAPED BRICK SEWERS

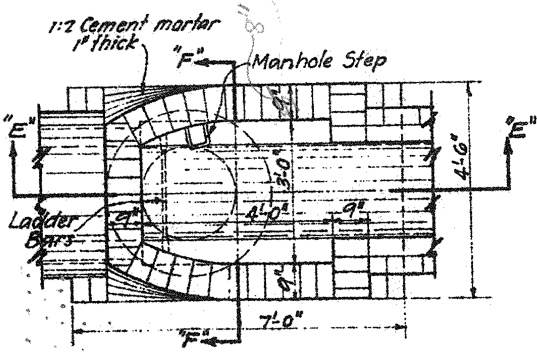
DEPARTMENT OF PUBLIC WORKS
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CHIEF ENGINEER

Note: This type of manhole is also used on 2' and 2 1/2' diameter circular brick sewers.



NOTE: In hard rock the foundation may be reduced in accordance with the Standard Specifications.



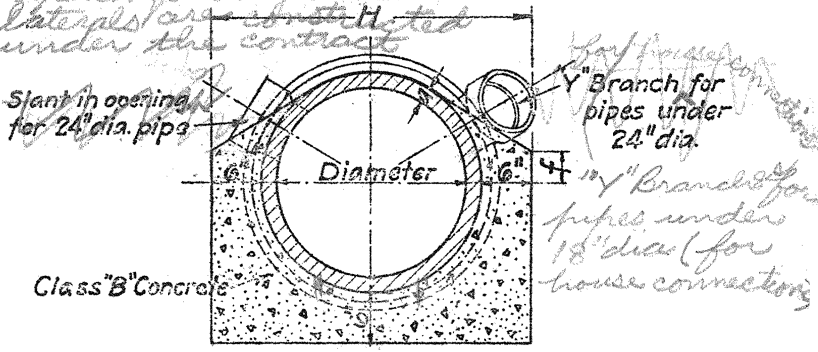
(12)

VITRIFIED PIPE SEWERS

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J. H. Mason
CHIEF ENGINEER

"Y" Branches or scored pipes for pipes 18" dia. and over (for house connections) Saddles to be mounted in openings only where laterals are constructed under the contract



SECTION ~~FOR~~ PIPES 24" DIA. AND UNDER

~~NOTE - 24" dia. pipe to be scored for openings, see detail for vitrified pipe sewers in reinforced concrete.~~

Dia.	a	f	H	DOUBLE STRENGTH
10"	7/8"	2"	2 3/4"	
12"	1"	2"	2'-2"	
15"	1 1/4"	2 1/2"	2'-5 1/2"	
18"	1 1/2"	2 1/2"	2'-9"	
20"	1 5/8"	3"	2'-11 1/2"	
24"	2"	4"	3'-4"	
30"	2 1/2"	5"	3'-11"	
36"	2 3/4"	6"	4'-5"	
27"	2 1/4"	4 1/2"	2'-7"	

omit from new table
20" out
insert 24"
a = 1 3/4"
f = 3 1/4"
H = 3'-0 1/2"

Class C Concrete

6" Pipe lateral

not necessary if a & J. M. is used in exp. & spec.

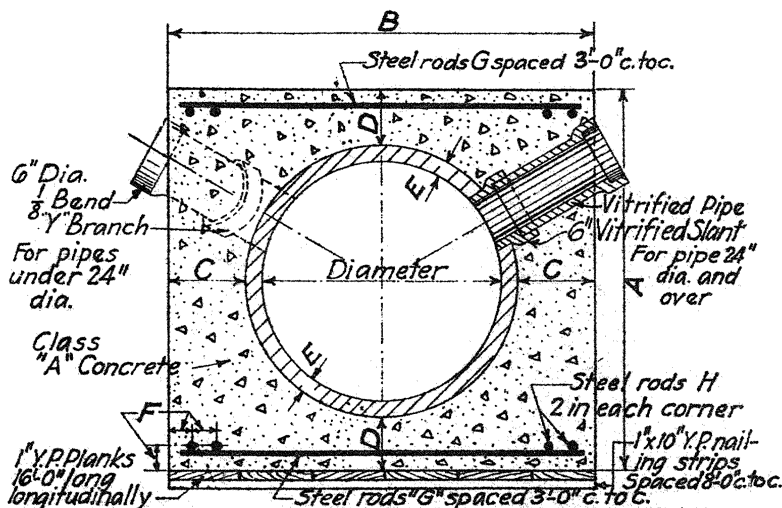
LATERALS IN CONCRETE

13

VITRIFIED PIPE SEWERS IN REINFORCED CONCRETE

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J. N. Wilson
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Dia.	A	B	C	D	E	F	G		H	Single Strength
							Dia. Rod	Length	Dia. Rod	
15"	2'-6"	2'-9"	7 ⁷ / ₈ "	6 ³ / ₈ "	1 ¹ / ₈ "	2"	5 ⁵ / ₈ "	2'-6"	5 ⁵ / ₈ "	
18"	2'-9"	3'-0"	7 ³ / ₄ "	6 ¹ / ₄ "	1 ¹ / ₄ "	2 ¹ / ₂ "	5 ⁵ / ₈ "	2'-9"	5 ⁵ / ₈ "	
20"	3'-0"	3'-3"	8 ¹ / ₈ "	6 ⁵ / ₈ "	1 ³ / ₈ "	2 ¹ / ₂ "	5 ⁵ / ₈ "	3'-0"	5 ⁵ / ₈ "	
24"	3'-5"	3'-9"	8 ⁷ / ₈ "	6 ⁷ / ₈ "	1 ⁵ / ₈ "	2 ¹ / ₂ "	5 ⁵ / ₈ "	3'-6"	5 ⁵ / ₈ "	
30"	4'-0"	4'-6"	9 ⁷ / ₈ "	6 ⁷ / ₈ "	2 ¹ / ₈ "	3"	5 ⁵ / ₈ "	4'-3"	5 ⁵ / ₈ "	
36"	4'-9"	5'-3"	11"	8"	2 ¹ / ₂ "	3"	3 ³ / ₄ "	5'-0"	3 ³ / ₄ "	
42"	5'-6"	6'-0"	12 ³ / ₈ "	9 ¹ / ₈ "	2 ⁷ / ₈ "	4"	3 ³ / ₄ "	5'-9"	3 ³ / ₄ "	

NOTES:— Pipes 24" dia. and over shall have each length scored for breaking out an opening for 6" lateral connection slant on each side of section. Openings or Y Branches shall be spaced not more than 7¹/₂ feet apart on each side of sewer, and also to accommodate all existing buildings.

A 6" diameter slant for insertion in the scored opening shall be provided for each lateral connection, and such slant shall not project within the inner surface of the sewer.

Length of 6" diameter vitrified pipe shall be placed in each slant to extend beyond the concrete casing.

Concrete monolithic sections, moulded in place, shall be provided for sewer spur connections.

Standard Y's shall be provided for inlet connections.

Manholes shall be standard pipe manholes.

All reinforced concrete shall be deposited between forms.

All vitrified pipe for sewers in reinforced concrete shall be single strength. (Not a S. T. M. Standard)

All unused vitrified pipes for house connections shall be closed with approved vitrified covers cemented in place.

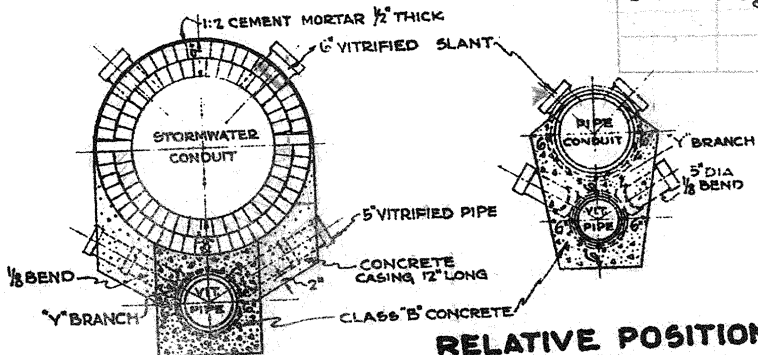
14

GENERAL SECTIONS FOR SEPARATE SYSTEM

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA.

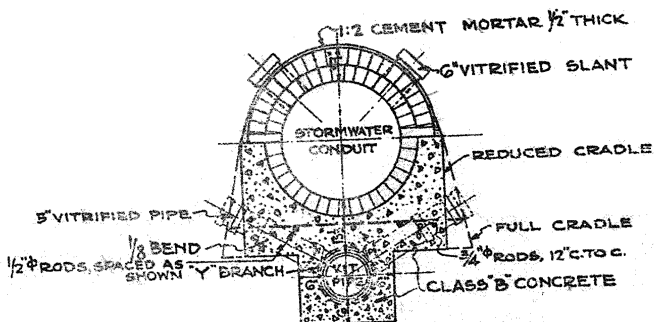
CHIEF ENGINEER

Pipes	Inv. to Inv.
10" 4/8"	1-6 7/8" 1.53
10" 4/20"	1-6 2/8" 1.54
10" 4/24"	1-6 7/8" 1.57

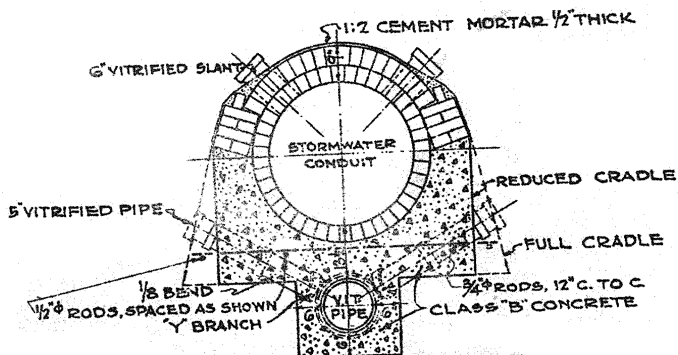


MINIMUM SECTION

RELATIVE POSITION OF PIPE SEWERS



SECTION IN CRADLE FOR SEWERS UNDER 3'-0" DIAMETER



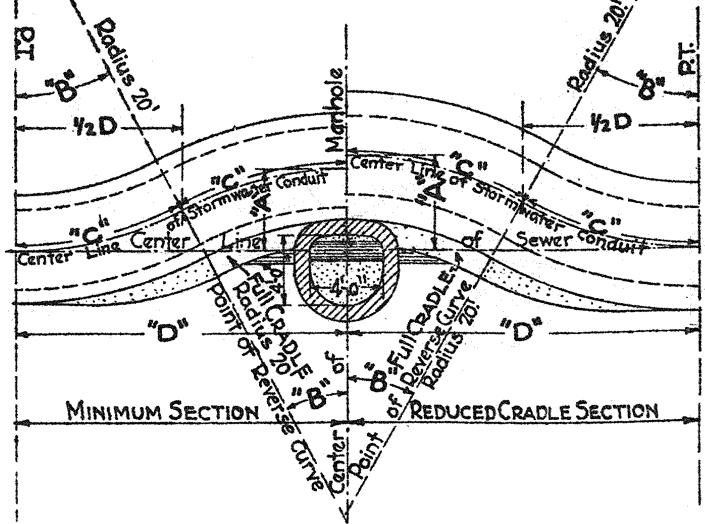
SECTION IN CRADLE FOR SEWERS OVER 2'-6" DIAMETER

NOTE: The cross sections of the Separate System must conform in all respects to the General Details of Brick and Pipe Sewers.

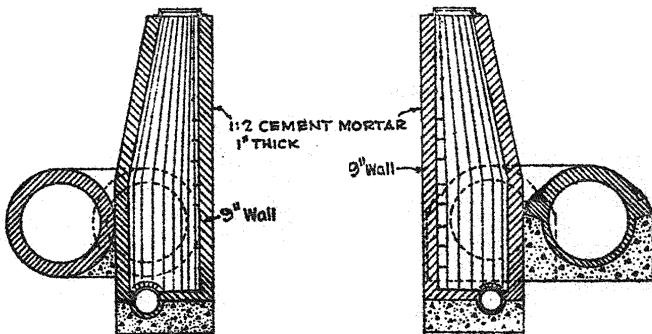
STANDARD TURNOUTS FOR SEPARATE SYSTEM

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J. H. ...
CHIEF ENGINEER



MINIMUM SECTION					REDUCED CRADLE SECTION				
Distance from M.H. to P.T. "D"	Length of Arc "C"	Central Angle "B"	Offset C. to C. "A"	Size of Stormwater Conduit	Offset C. to C. "A"	Central Angle "B"	Length of Arc "C"	Distance from M.H. to P.T. "D"	
16'-1"	8'-3 1/4"	25°-42'-19"	3'-4 1/2"	2'-0"	3'-9"	25°-0'-28"	8'-8 3/8"	16'-10 7/8"	
16'-7 5/8"	8'-7"	24°-36'-51"	3'-7 1/2"	2'-6"	4'-0"	25°-50'-51"	9'-0 1/2"	17'-5 1/4"	
17'-2 7/8"	8'-10 1/2"	25°-25'-41"	3'-10 1/2"	3'-0"	4'-6"	27°-26'-21"	9'-7"	18'-5 1/4"	
17'-8 1/4"	9'-2"	26°-14'-53"	4'-1 1/2"	3'-6"	4'-9"	28°-12'-23"	9'-10"	18'-11 3/8"	
18'-2 1/4"	9'-5 3/4"	27°-02'-53"	4'-4 1/2"	4'-0"	5'-0"	28°-57'-18"	10'-1 1/4"	19'-4 3/8"	
18'-8"	9'-8 1/2"	27°-49'-31"	4'-7 1/2"	4'-6"	5'-3"	29°-41'-16"	10'-4 3/8"	19'-9 3/8"	



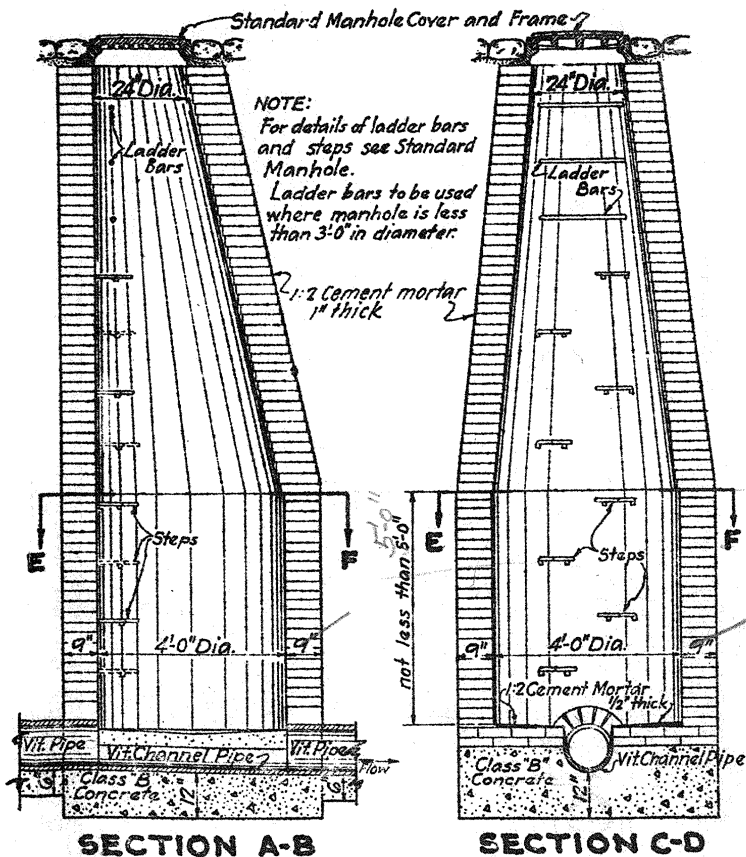
SECTION THROUGH MANHOLE
Minimum Section Reduced Cradle Section

14

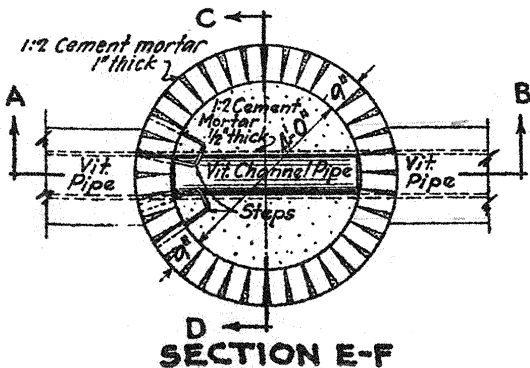
PIPE MANHOLE

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

W. Wilson
CHIEF ENGINEER



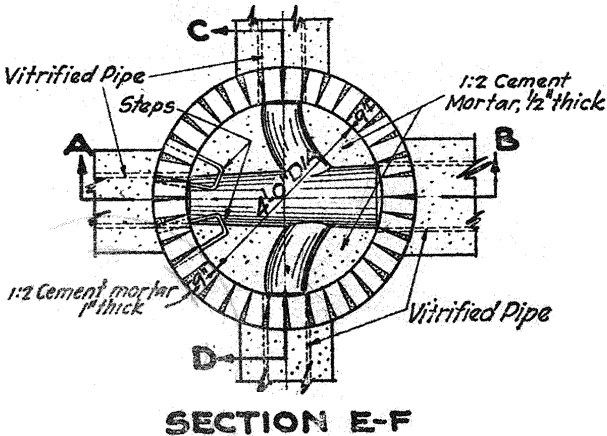
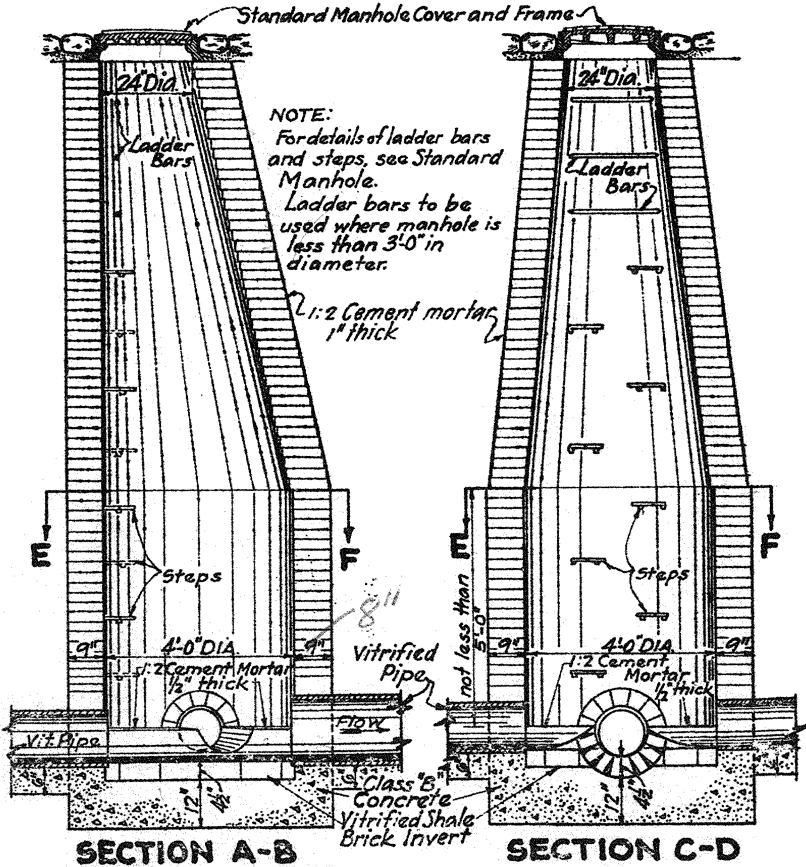
NOTE: Vitrified Channel Pipe in pipe manholes shall be double strength.



JUNCTION MANHOLE

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

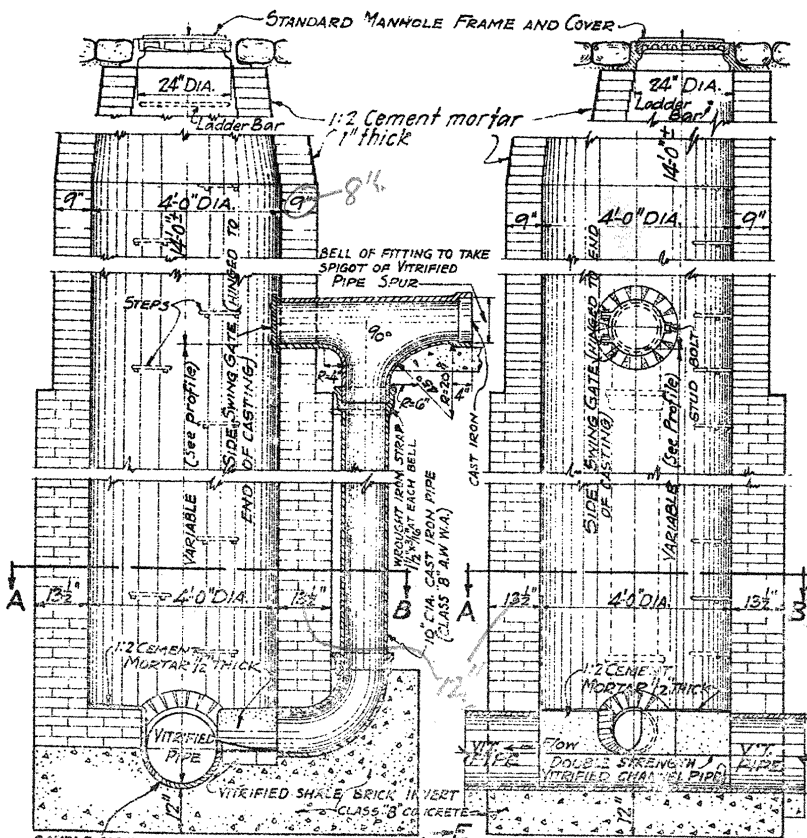
J. H. ...
CHIEF ENGINEER



PIPE SEWER DROP MANHOLE

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING AND SURVEYS
PHILADELPHIA

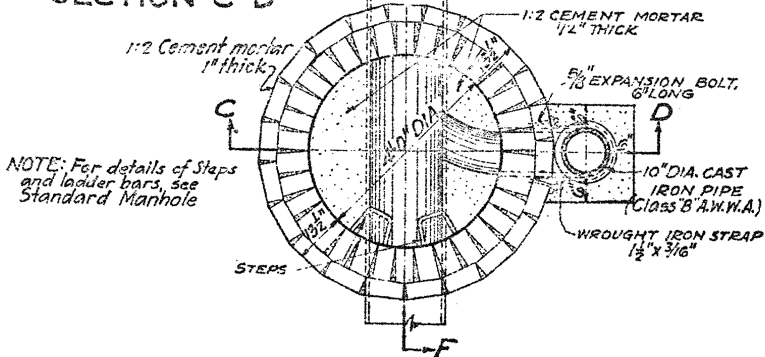
H. Wilson
CHIEF ENGINEER



DOUBLE STRENGTH VITRIFIED CHANNEL PIPE

SECTION C-D

SECTION E-F



NOTE: For details of Steps and ladder bars, see Standard Manhole

PLAN A-B

19

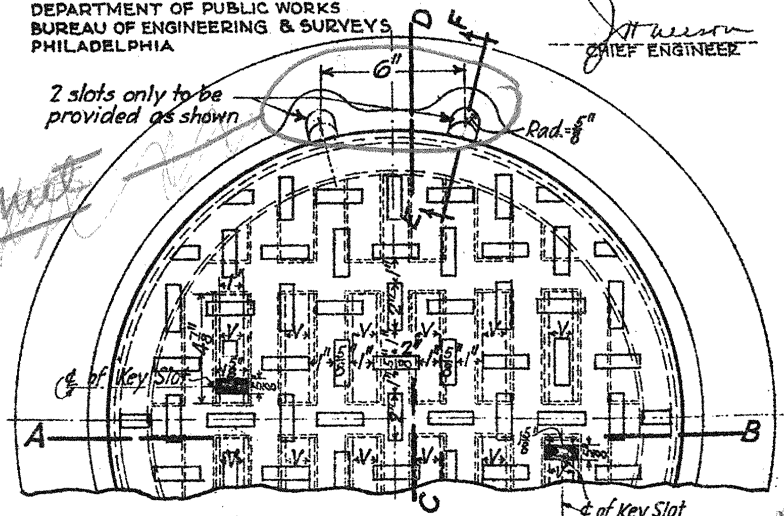
CAST IRON MANHOLE COVER AND FRAME

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

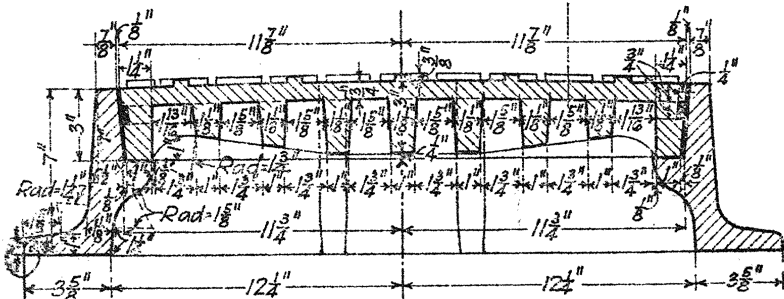
J. H. Wilson
CHIEF ENGINEER

2 slots only to be provided as shown

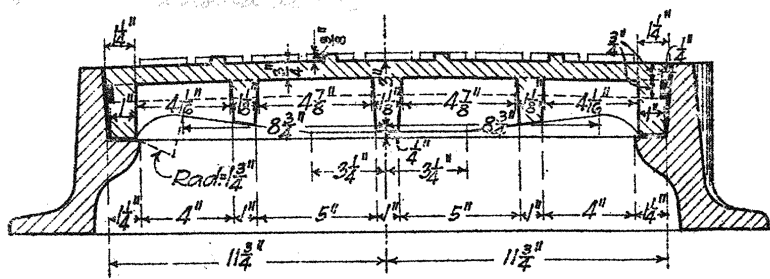
Sheet



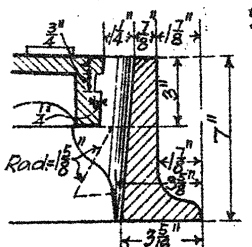
NOTE:- For Ventilating Covers, provide twelve openings as shown by dotted lines where marked "V."



SECTION A-B



SECTION C-D



SECTION E-F

WEIGHTS

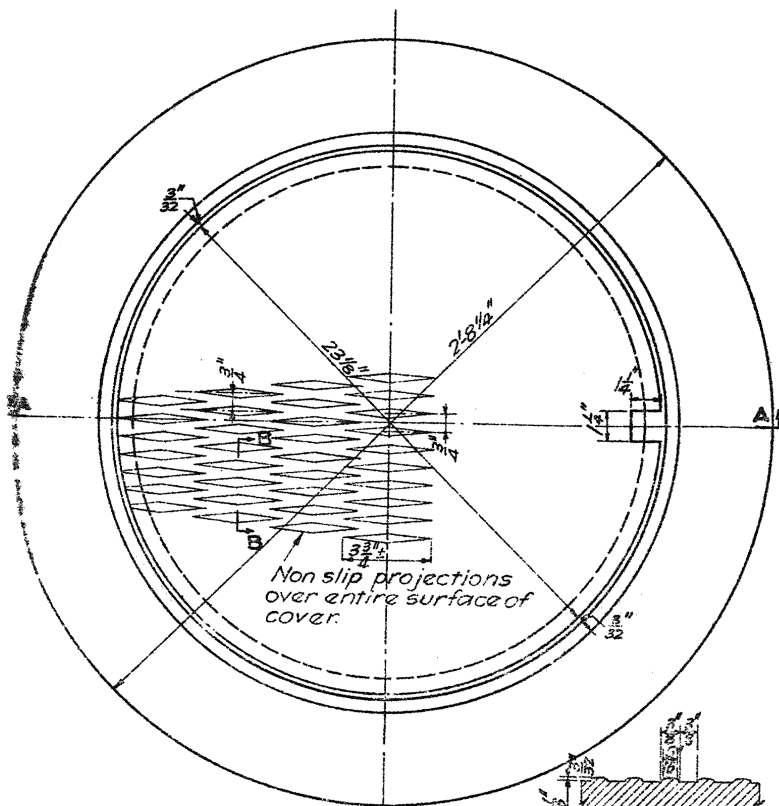
- Ventilating Cover = 200 lbs.
- Closed Cover = 215 lbs.
- Frame = 270 lbs.

20

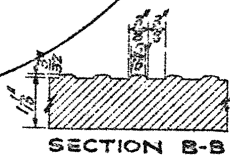
RESSED STEEL MANHOLE COVER AND FRAME 2'-0" DIAMETER

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING AND SURVEYS
PHILADELPHIA

J. H. Johnson
CHIEF ENGINEER



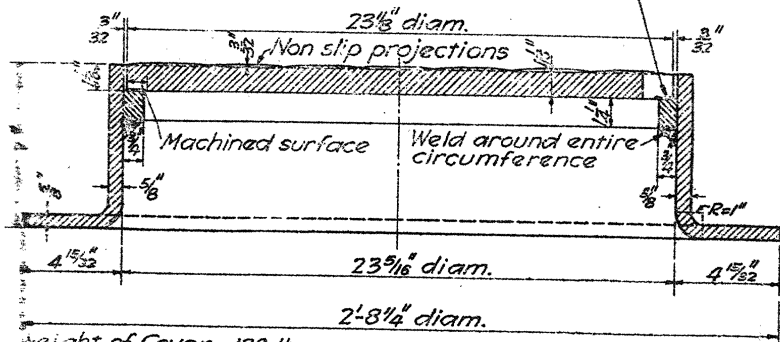
PLAN



SECTION B-B

Frame and cover to be galvanized

Bearing band with machined top surface



SECTION A-A

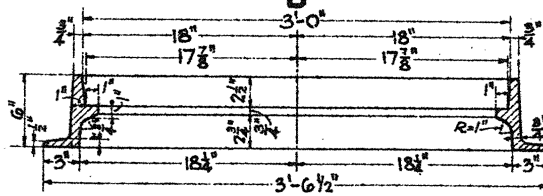
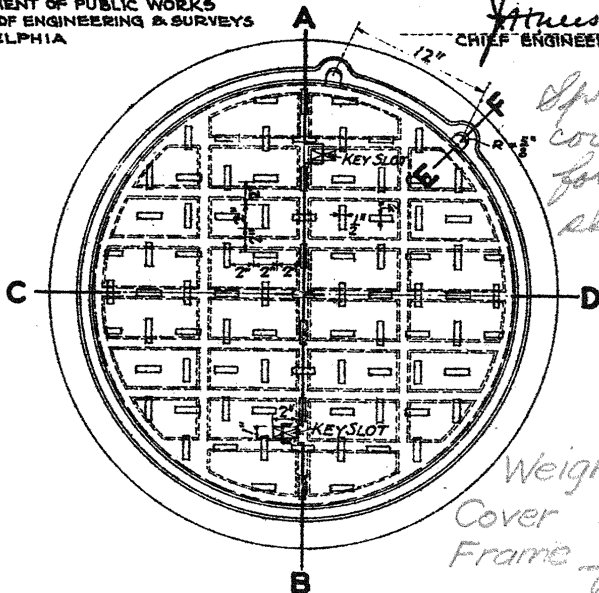
22

Weight of Cover = 128 lbs.
Weight of Frame = 170 lbs.

CAST STEEL MANHOLE COVER & FRAME 3'-0" DIAMETER.

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

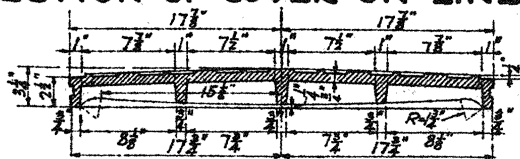
Johnson
CHIEF ENGINEER



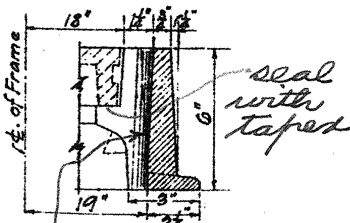
SECTION OF FRAME ON LINE C-D



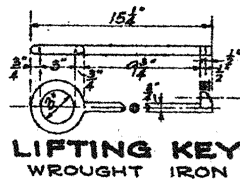
SECTION OF COVER ON LINE A-B



SECTION OF COVER ON LINE C-D



SECTION E-F



23

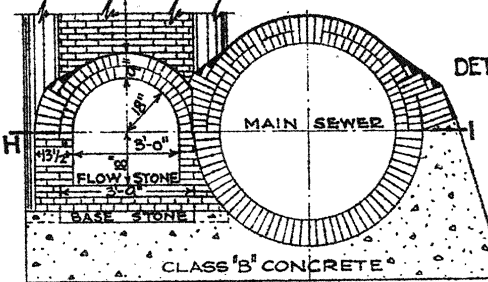
STANDARD WELLHOLE DETAILS

DEPARTMENT OF PUBLIC WORKS
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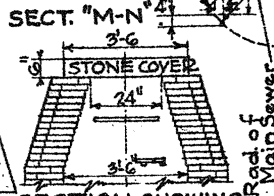
J. Neeson
CHIEF ENGINEER

SEWER DIA.	X	Y	Z	SEWER DIA.	X	Y	Z
4'-0"	4'-0 $\frac{1}{2}$ "	7'-9 $\frac{1}{2}$ "	6"	9'-6"	2'-10 $\frac{1}{2}$ "	6'-7 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
4'-6"	3'-8"	7'-5"	4 $\frac{1}{2}$ "	10'-0"	2'-9 $\frac{1}{2}$ "	6'-6 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
5'-0"	3'-5 $\frac{1}{2}$ "	7'-2 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	10'-6"	2'-9 $\frac{1}{2}$ "	6'-6 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
5'-6"	3'-3 $\frac{1}{2}$ "	7'-0"	3"	11'-0"	2'-9 $\frac{1}{2}$ "	6'-6 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
6'-0"	3'-2"	6'-11 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	11'-6"	2'-9 $\frac{1}{2}$ "	6'-6 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
6'-6"	3'-1 $\frac{1}{2}$ "	6'-10 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	12'-0"	2'-8 $\frac{1}{2}$ "	6'-5 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
7'-0"	3'-0 $\frac{1}{2}$ "	6'-9 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	12'-6"	2'-8 $\frac{1}{2}$ "	6'-5 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
7'-6"	3'-0 $\frac{1}{2}$ "	6'-9 $\frac{1}{2}$ "	2"	13'-0"	2'-8 $\frac{1}{2}$ "	6'-5 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
8'-0"	2'-11 $\frac{1}{2}$ "	6'-8 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	13'-6"	2'-8 $\frac{1}{2}$ "	6'-5 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
8'-6"	2'-11 $\frac{1}{2}$ "	6'-8 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	14'-0"	2'-8 $\frac{1}{2}$ "	6'-5 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
9'-0"	2'-10 $\frac{1}{2}$ "	6'-7 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	14'-6"	2'-8"	6'-5"	1"

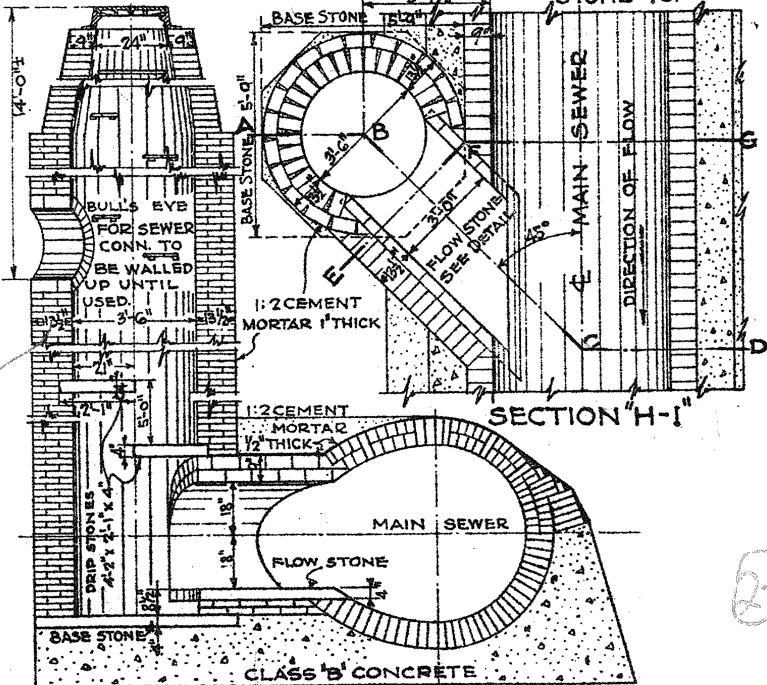
NOTE:
Drip Stones shall be 5'-0" apart, if possible, as shown.



DETAIL OF FLOW STONE



SECTION SHOWING STONE TOP

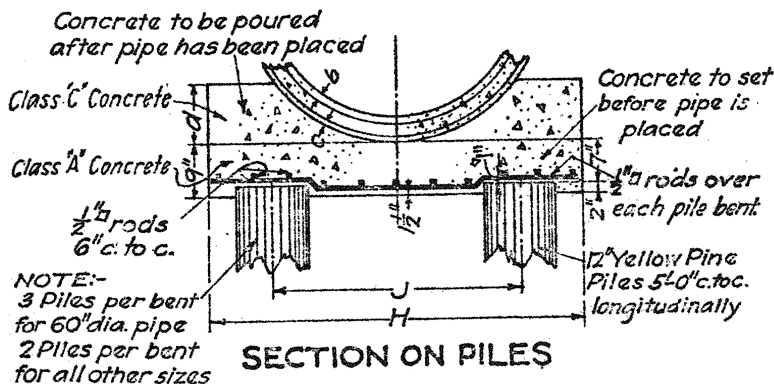
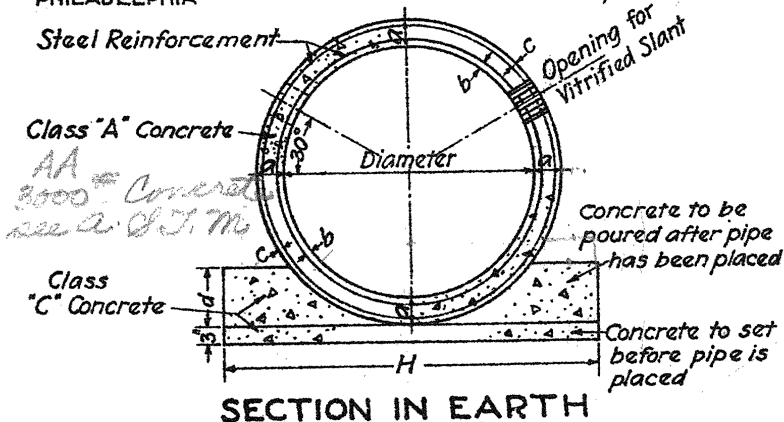


SECTION A-B-C-D

REINFORCED CONCRETE CIRCULAR PIPE SEWERS

DEPARTMENT OF PUBLIC WORKS
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PHILADELPHIA

Johnson
CHIEF ENGINEER



Dia.	a	b	c	d	H	J	Steel Reinforcement		No. Rods over each pile bent
							No. of layers	Min. weight lbs. per Sq. ft.	
24"	3"	1"		6"	$\frac{3}{8}$ " $\frac{1}{2}$ "	2L6"	1	0.34	1
30"	3 $\frac{1}{2}$ "	1"		6"	4'-0"	2L6"	1	0.41	1
36"	4"	1 $\frac{1}{4}$ "		9"	4'-7"	3L0"	1	0.63	2
42"	4 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "		10"	5'-3"	3L6"	1	0.63	3
48"	5"	1 $\frac{3}{4}$ "	1"	12"	5'-9"	4L0"	2	0.41 each layer	4
54"	5 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	1"	14"	6'-6"	4L6"	2	0.50 each layer	4
60"	6"	2"	1"	15"	7'-0"	2L9"	2	0.63 each layer	2

*3'-6" for section in earth, -4'-0" for section on piles.

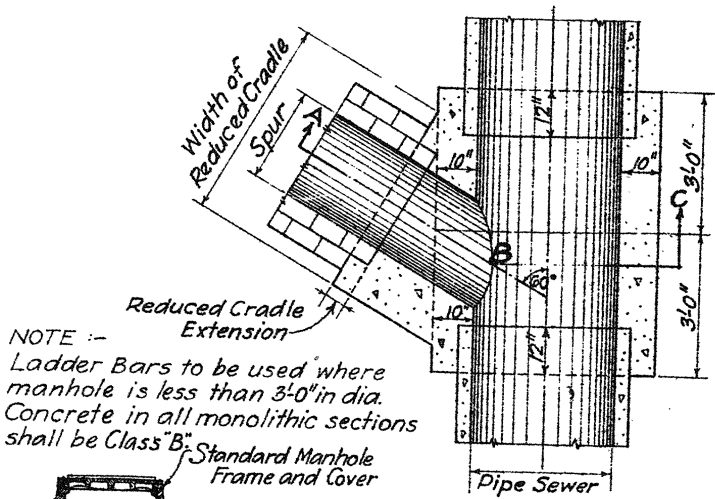
In hard rock excavation, the width of the concrete base shall be reduced to a width 3 inches greater than the outside diameter of the pipe sewer.

REINFORCED CONCRETE CIRCULAR PIPE SEWERS

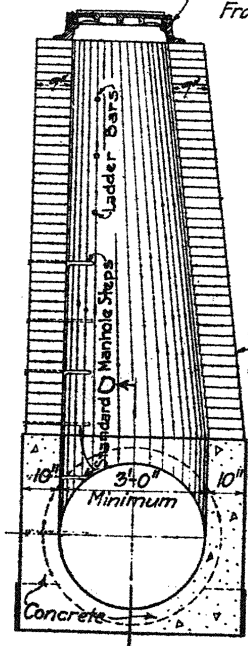
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

J. J. Johnson
CHIEF ENGINEER

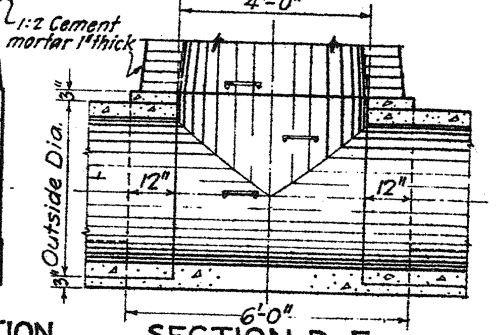
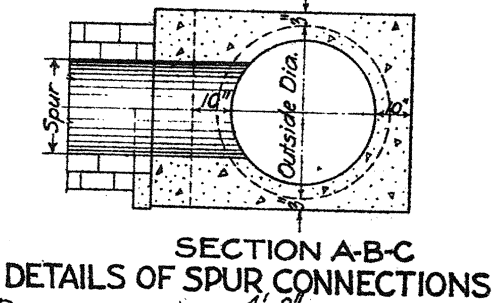
NOTE:—For details of steps and ladder bars see Standard Manhole.



NOTE:—
Ladder Bars to be used where manhole is less than 3'-0" in dia.
Concrete in all monolithic sections shall be Class "B".



ELEVATION SECTION



MANHOLE DETAILS

26

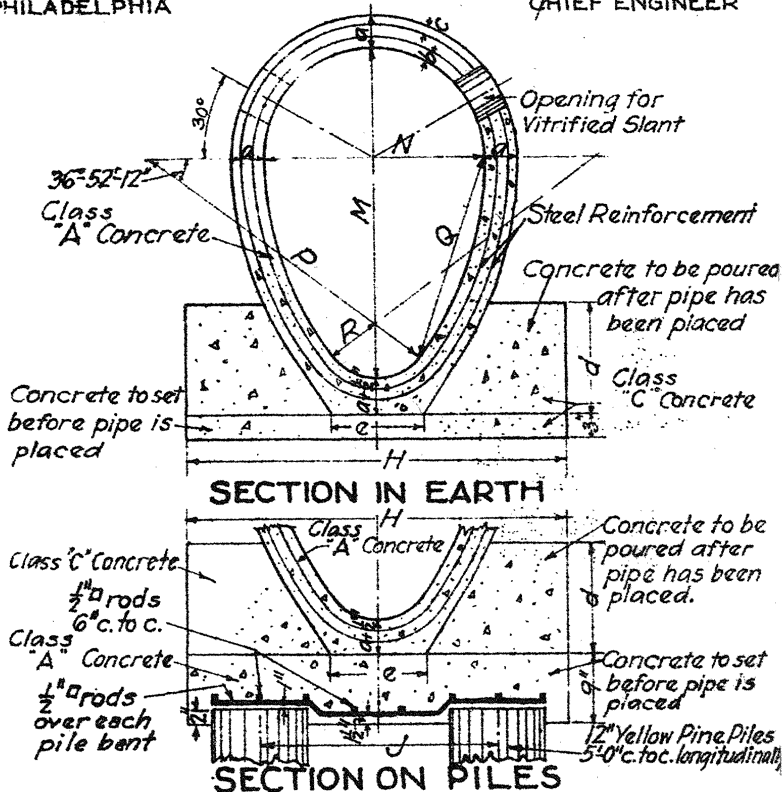
Not to be used
(not manufactured)

9-28-37

REINFORCED CONCRETE EGG-SHAPED PIPE SEWERS

DEPARTMENT OF PUBLIC WORKS
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PHILADELPHIA

J. Wilson
CHIEF ENGINEER



M	N	P	Q	R	H	J	a	b	c	d	e
27" x 18"	27"	17 1/8"	4 1/2"	3'-0 1/4"	2'-6"	3"	1"			9"	8 1/2"
30" x 20"	30"	19"	5"	3'-6 1/4"	2'-6"	3"	1"			10"	9"
36" x 24"	36"	22 3/4"	6"	4'-0"	2'-6"	3 1/2"	1 1/2"			12"	10"
42" x 28"	42"	26 3/8"	7"	4'-0"	2'-6"	4"	1 1/2"			14"	12"
48" x 32"	48"	30 3/8"	8"	4'-6"	3'-0"	4 1/2"	1 1/2"			16"	14"
54" x 36"	54"	34 3/8"	9"	5'-0"	3'-6"	5"	1 1/2"	1"		18"	16"
60" x 40"	60"	38"	10"	5'-3"	3'-6"	5 1/2"	1 1/2"	1"		20"	18"

M	N	Steel Reinforcement		No. of Rods Over each Pile Bent
		No. of Layers	Min. Weight lbs. per sq.ft.	
27" x 18"		1	0.34	1
30" x 20"		1	0.34	1
36" x 24"		1	0.41	1
42" x 28"		1	0.50	1
48" x 32"		1	0.63	2
54" x 36"		2	0.50 each layer	3
60" x 40"		2	0.50 each layer	3

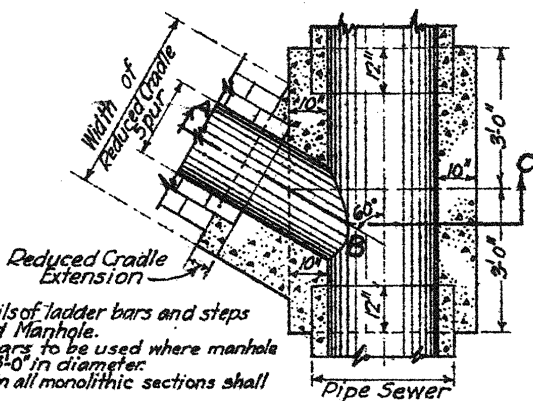
NOTE:-
* For Section in Earth.
+ For Section on Piles
In Hard Rock excavation, the width of the concrete base shall be reduced to a width 3 inches greater than the outside diameter of the pipe sewer.

20

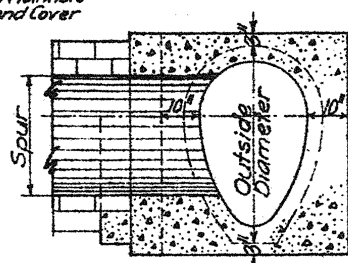
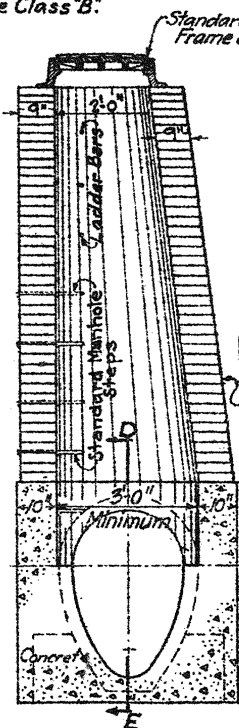
REINFORCED CONCRETE EGG-SHAPED PIPE SEWERS

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

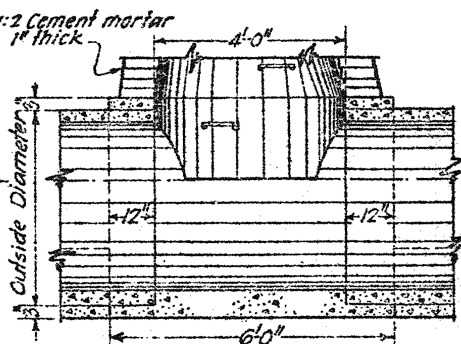
J. H. ...
CHIEF ENGINEER



NOTE:
For details of ladder bars and steps see Standard Manhole.
Ladder bars to be used where manhole is less than 3'-0" in diameter.
Concrete in all monolithic sections shall be Class B.



SECTION A-B-C
DETAILS OF SPUR CONNECTIONS



ELEVATION SECTION

SECTION D-E

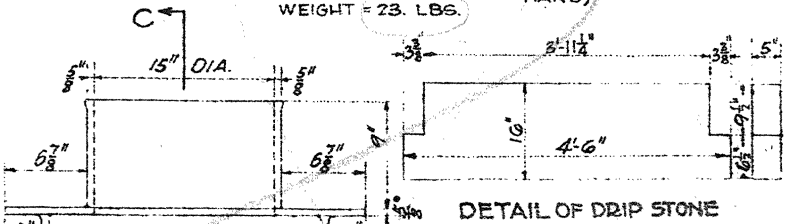
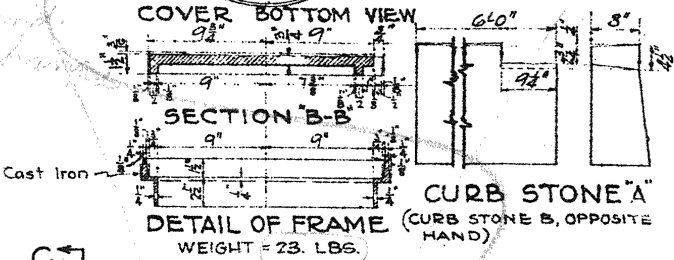
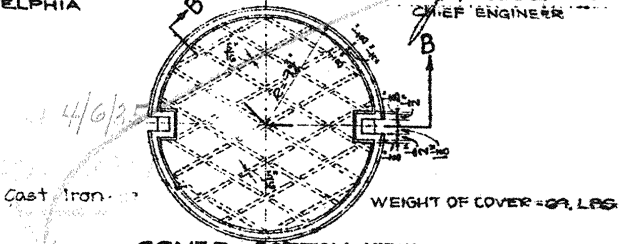
MANHOLE DETAILS

28

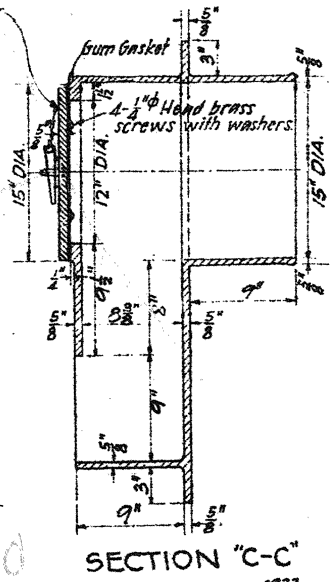
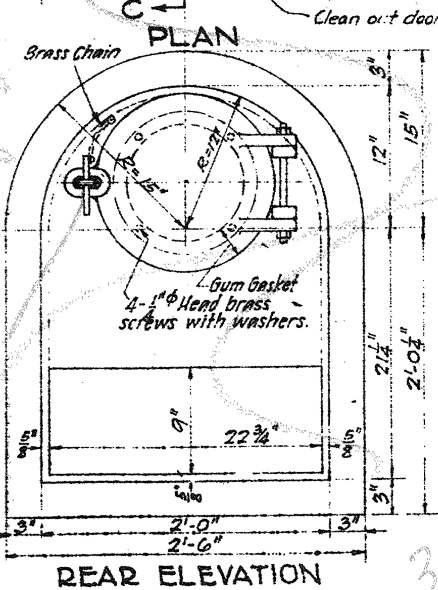
CITY INLET DETAILS

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

J. H. Nelson
CHIEF ENGINEER



DETAIL OF
CAST IRON OUTLET
WEIGHT = 465 LBS.



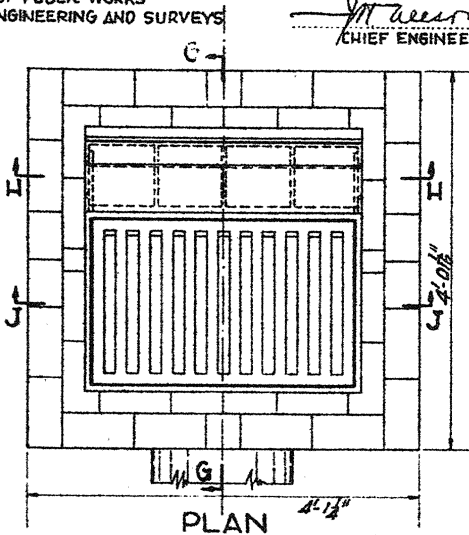
30

1933

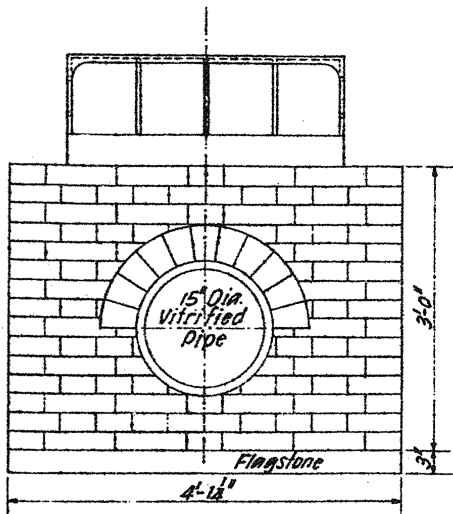
OPEN MOUTH-GRATE INLET ASSEMBLED DETAILS

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING AND SURVEYS
PHILADELPHIA

J. W. Mason
CHIEF ENGINEER



*Exp. = 2.28
Cu. Yds.*

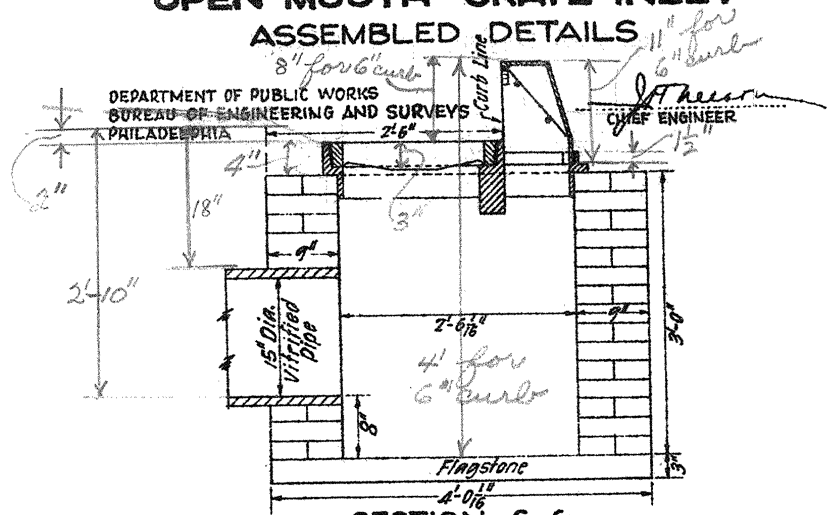


NOTE:-

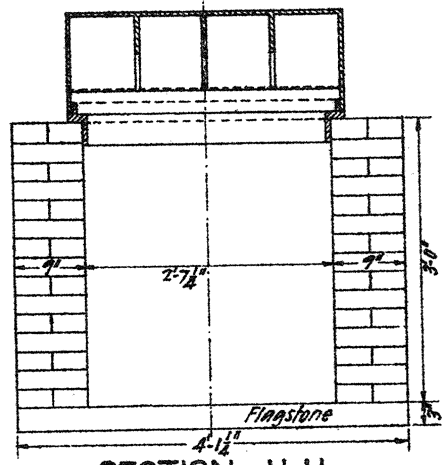
All Inlets shall be set approximately 2" below the grade of the gutter or ditch as directed by the Engineer in each case.

30

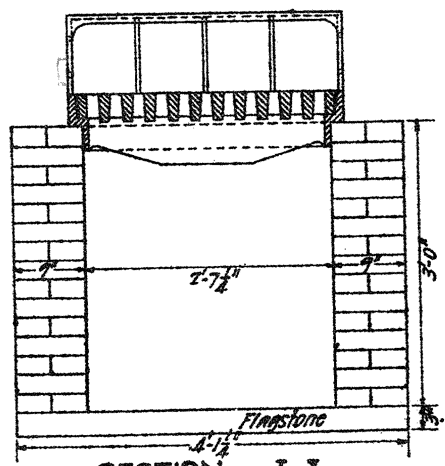
OPEN MOUTH-GRATE INLET ASSEMBLED DETAILS



SECTION G-G



SECTION H-H



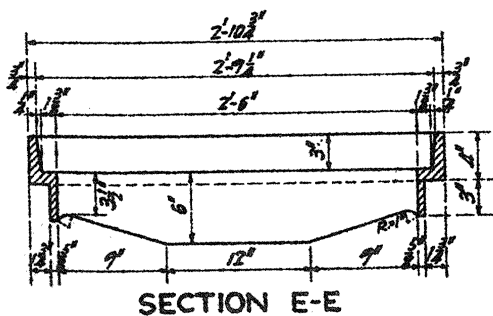
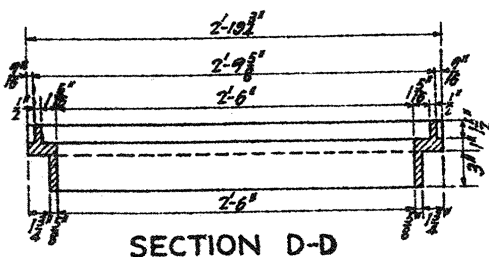
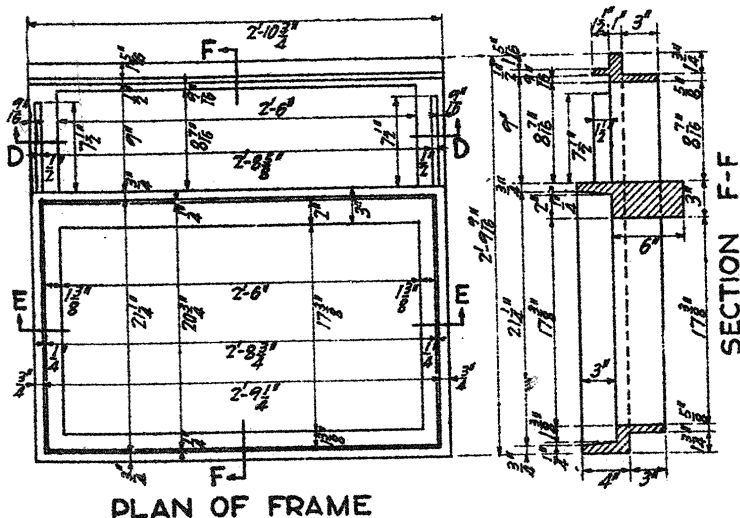
SECTION J-J

32

OPEN MOUTH-GRATE INLET FRAME DETAILS CAST IRON

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING AND SURVEYS
PHILADELPHIA

[Signature]
CHIEF ENGINEER



Estimated weight of Frame = 345 lbs.

33

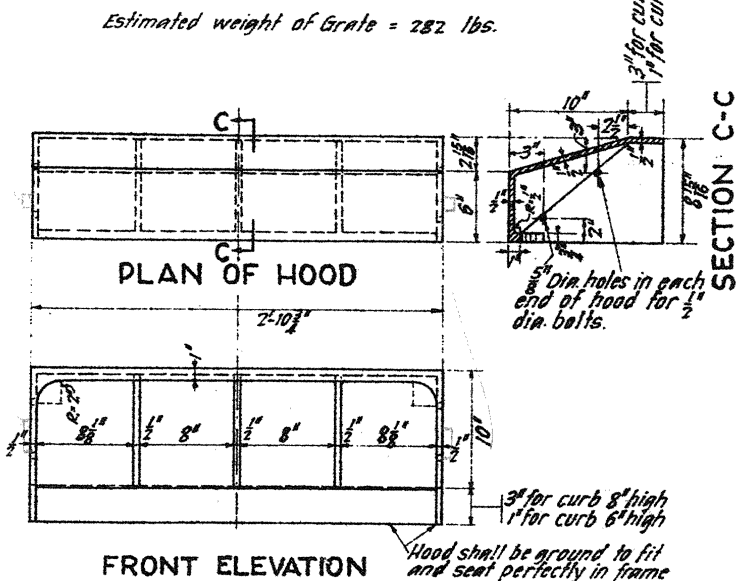
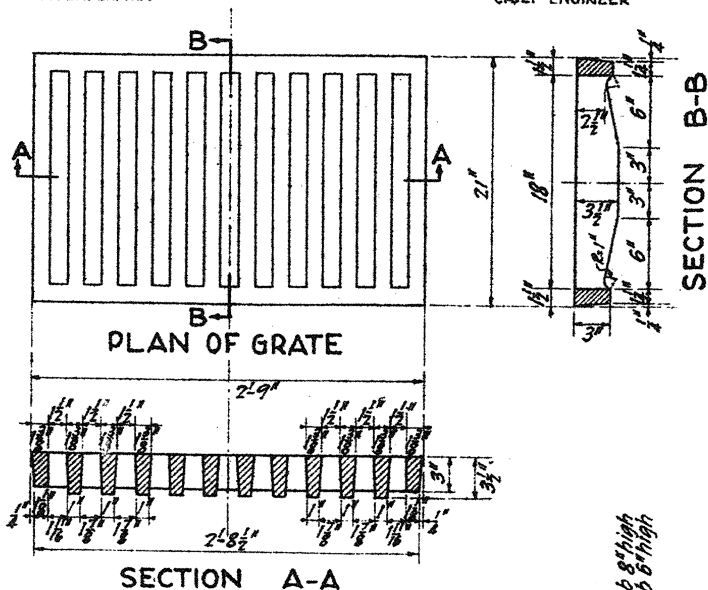
OPEN MOUTH-GRATE INLET

GRATE AND HOOD DETAILS

CAST IRON

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING AND SURVEYS
PHILADELPHIA

J. M. Mason
CHIEF ENGINEER



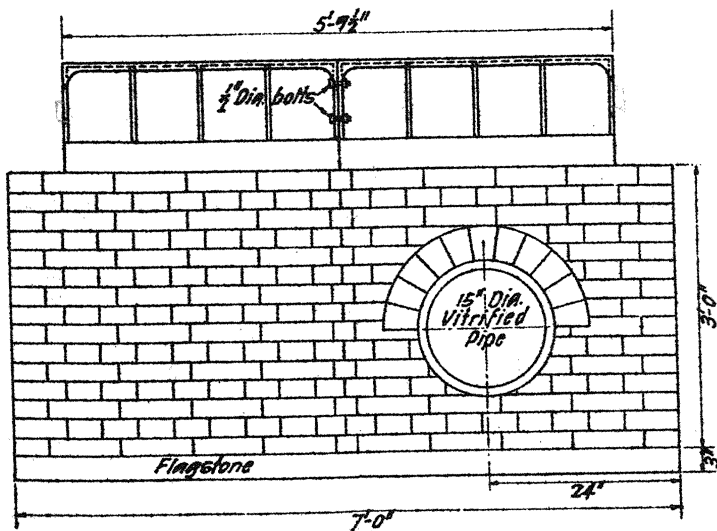
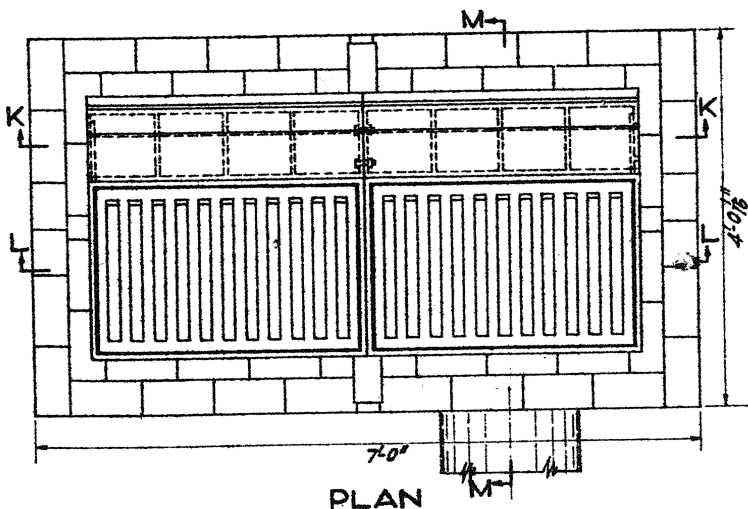
Estimated weight of Hood for curb 8" high = 124 lbs.
 " " " " " 6 " = 110 "

34

MULTIPLE OPEN MOUTH-GRATE INLET ASSEMBLED DETAILS

DEPARTMENT OF PUBLIC WORKS
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PHILADELPHIA

J. M. ...
CHIEF ENGINEER



NOTE:-

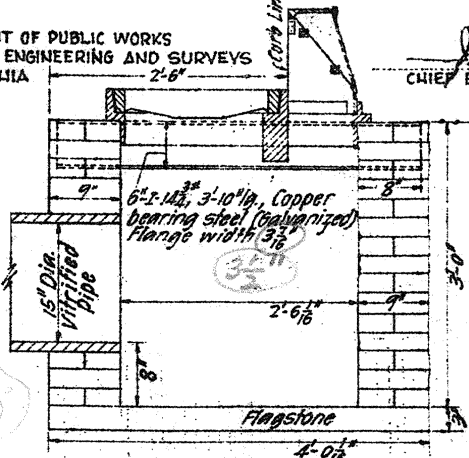
All Inlets shall be set approximately 2" below the grade of the gutter or ditch as directed by the Engineer in each case.

35

MULTIPLE OPEN MOUTH-GRATE INLET ASSEMBLED DETAILS

DEPARTMENT OF PUBLIC WORKS
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PHILADELPHIA

M. J. Mason
CHIEF ENGINEER

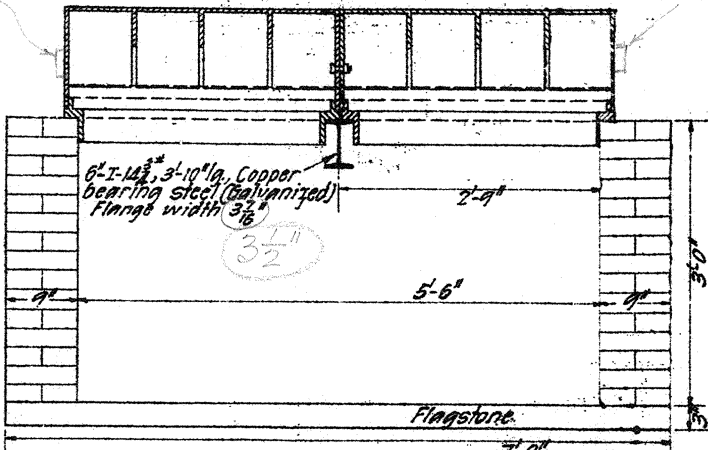


suggested by Bailey (to hold in curbs)

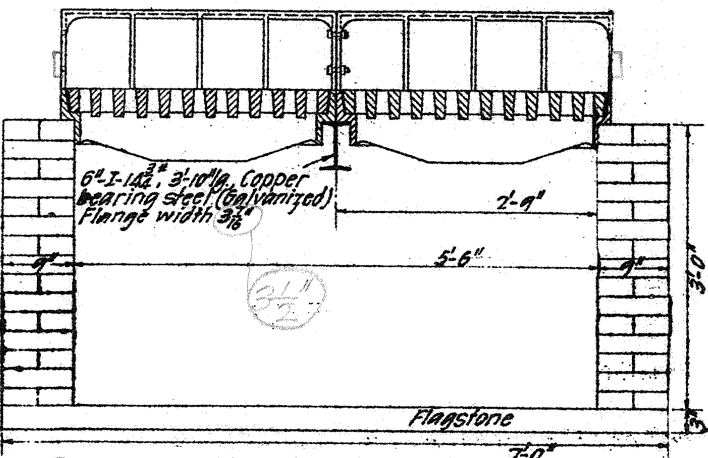
1"x1"x3"

1"x1"x3"

SECTION M-M



SECTION K-K



SECTION L-L

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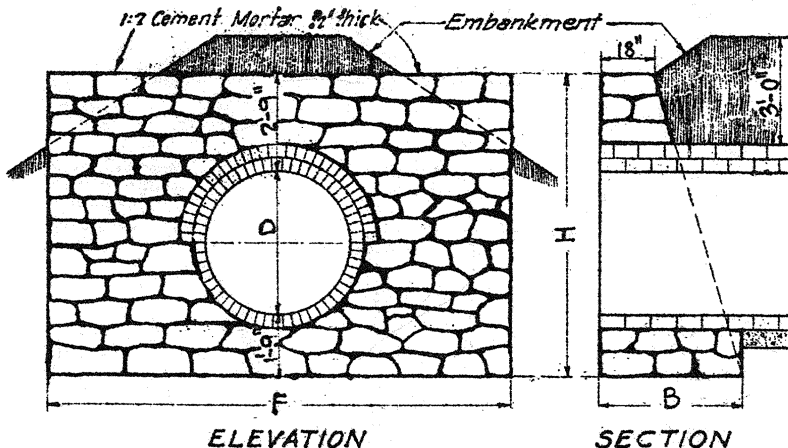
STANDARD WALLS

(INTAKE AND OUTLET)

FOR SEWERS OF FIVE FEET OR LESS DIAMETER

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING & SURVEYS
PHILADELPHIA

W. H. Mason
CHIEF ENGINEER



Foundation to extend to satisfactory bottom.
Wall to be of concrete or rubble masonry, pointed as directed.

CIRCULAR SEWERS				
D	H	B	F	Cu. Yds.
12"	5'-6"	2'-6"	6'-0"	2.26
15"	5'-9"	2'-8"	7'-0"	2.86
18"	6'-0"	2'-9"	8'-0"	3.41
2'-0"	6'-6"	3'-0"	9'-0"	3.53
2'-6"	7'-0"	3'-3"	10'-0"	4.34
3'-0"	7'-6"	3'-6"	11'-0"	5.01
3'-6"	8'-0"	3'-9"	12'-0"	6.04
4'-0"	8'-6"	4'-0"	13'-0"	7.18
4'-6"	9'-0"	4'-3"	14'-0"	8.50
5'-0"	9'-6"	4'-6"	15'-0"	8.60
EGG-SHAPED SEWERS				
D	H	B	F	Cu. Yds.
2'-3" x 1'-6"	6'-9"	3'-3"	8'-0"	3.31
2'-6" x 1'-8"	7'-0"	3'-5"	8'-6"	3.89
3'-0" x 2'-0"	7'-6"	3'-6"	9'-0"	4.18
3'-3" x 2'-2"	7'-9"	3'-7 1/2"	9'-6"	4.66
3'-6" x 2'-4"	8'-0"	3'-9"	10'-0"	5.16
4'-0" x 2'-8"	8'-6"	4'-0"	10'-6"	5.86
4'-6" x 3'-0"	9'-0"	4'-3"	11'-0"	6.20
5'-0" x 3'-4"	9'-6"	4'-6"	11'-6"	6.93

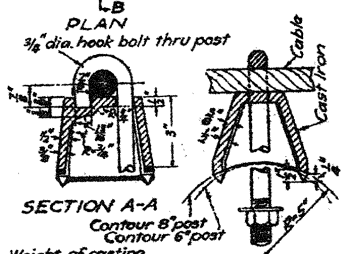
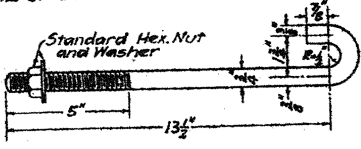
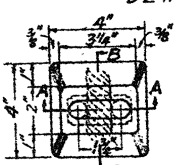
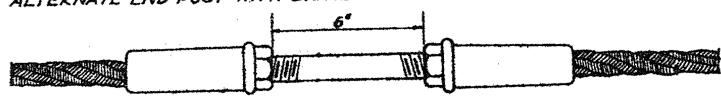
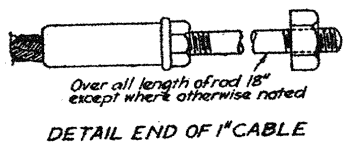
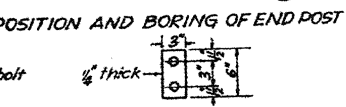
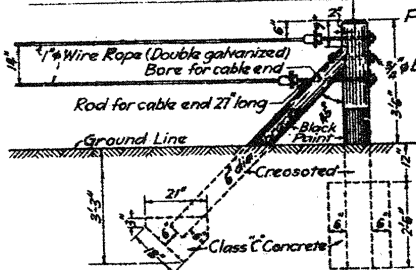
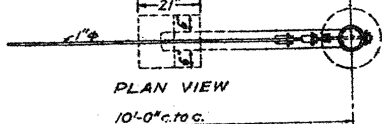
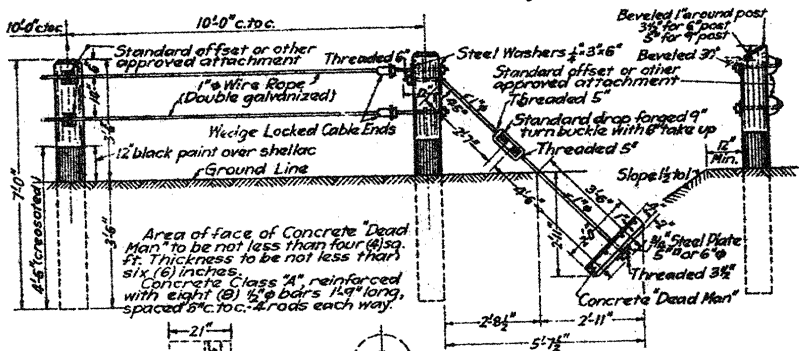
.46 H
.47 H
.46 H
.46 H
.47 H
.47 H

Calculate all these quantities; they are not correct

STANDARD WIRE ROPE GUARD FENCE

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Alcega
CHIEF ENGINEER



Weight of casting without bolt to be approximately 4 1/2 lbs.

DETAIL OF OFFSET ATTACHMENT AND HOOK BOLT

All posts to be of seasoned, straight, sound chestnut, locust or cedar at no place less than six (6) inches in diameter with bark removed, knots hewn flush with the surface, the surface shaved smooth and painted with creosote four and a half (4 1/2) feet up.

After erection, posts and castings shall be painted with three (3) coats of white lead paint.

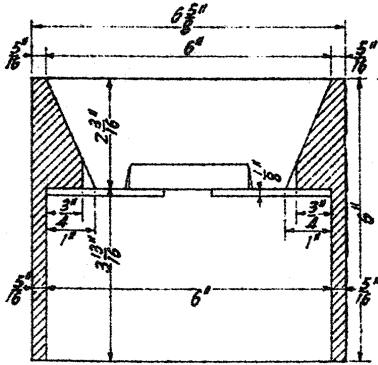
All cable ends, rods, nuts, turnbuckles and washers to be hot dip galvanized.

All rods shall conform to the specifications for plain reinforcing bars.

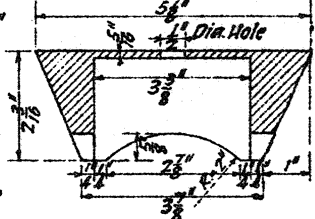
CONCRETE SURVEY MONUMENT

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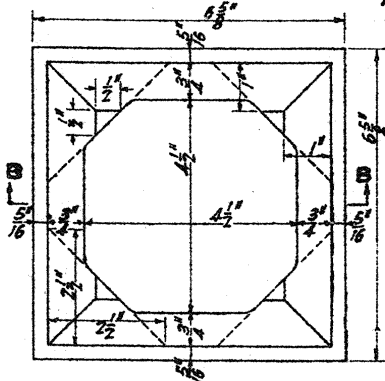
J. Nelson
CHIEF ENGINEER



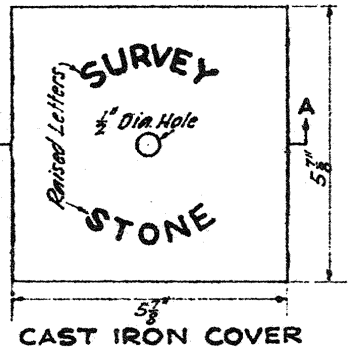
SECTION B-B



SECTION A-A

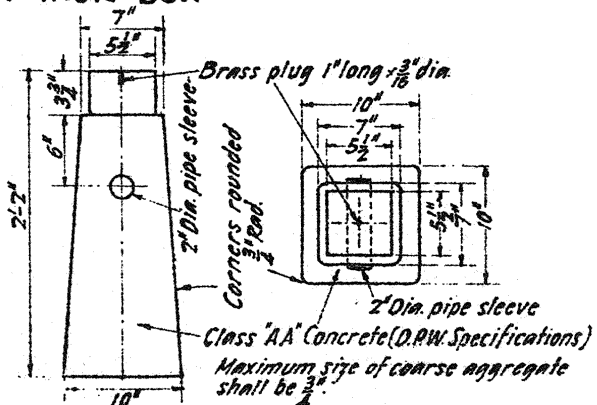


CAST IRON BOX



CAST IRON COVER

WEIGHTS
Box = 18 1/2 lbs.
Cover = 8 lbs.



CONCRETE MONUMENT