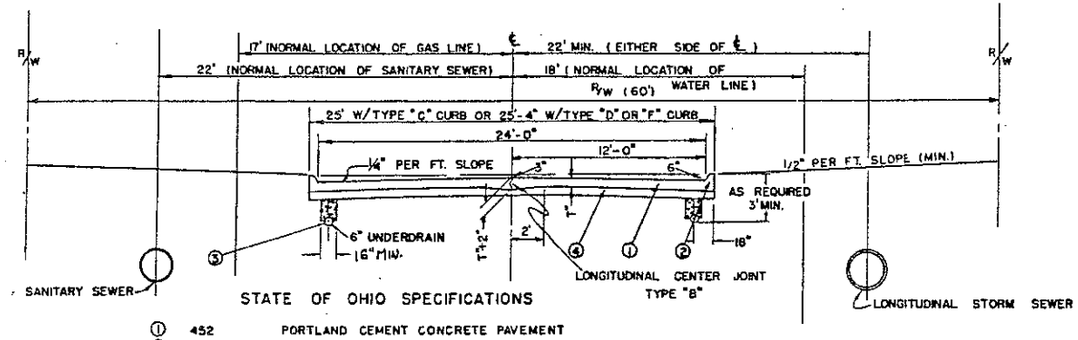
2005 WOOD COUNTY CONSTRUCTION STANDARDS

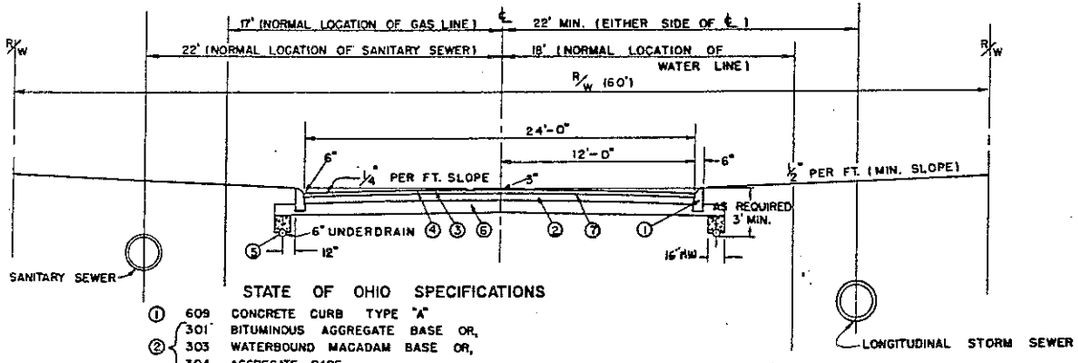
TYPICAL SECTION



STATE OF OHIO SPECIFICATIONS

① 452 PORTLAND CEMENT CONCRETE PAVEMENT
② 609 CONCRETE CURB (TYPE-)
③ 605 PIPE UNDERDRAIN 6" - IF REQUIRED 706.07 OR 706.09
④ 304, 310, 311 SUBBASE - 3" MINIMUN WITH NO STRUCTURAL NUMBER

TYPICAL SECTION

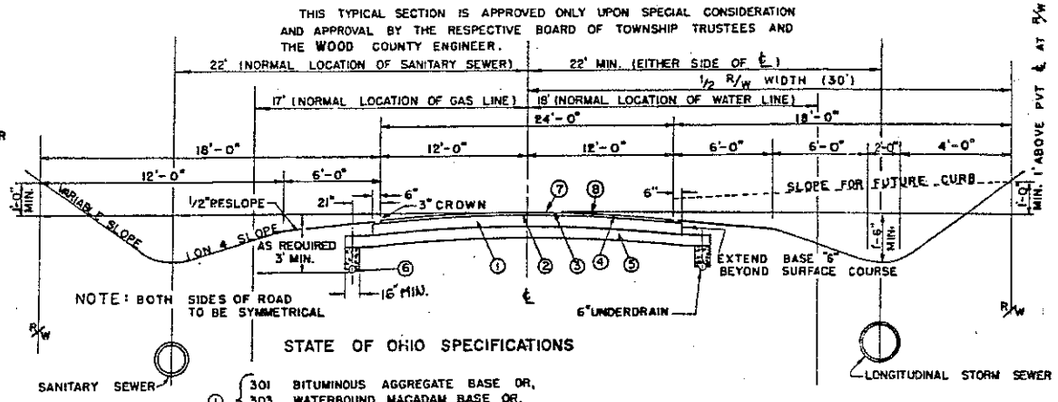


STATE OF OHIO SPECIFICATIONS

① 609 CONCRETE CURB TYPE "A"
② 301 BITUMINOUS AGGREGATE BASE OR,
303 WATERBOUND MACADAM BASE OR,
304 AGGREGATE BASE
③ 402 ASPHALT CONCRETE (LEVELING)
④ 404 ASPHALT CONCRETE (SURFACE)
⑤ 605 PIPE UNDERDRAIN 6" - IF REQUIRED 706.07 OR 706.09
⑥ 304, 310, 311 SUBBASE - 3" MINIMUN WITH NO STRUCTURAL NUMBER
⑦ 408 BITUMINOUS PRIME COAT (0.35 GAL. PER SQ. YD. OF BASE)

TYPICAL SECTION

THIS TYPICAL SECTION IS APPROVED ONLY UPON SPECIAL CONSIDERATION AND APPROVAL BY THE RESPECTIVE BOARD OF TOWNSHIP TRUSTEES AND THE WOOD COUNTY ENGINEER.



STATE OF OHIO SPECIFICATIONS

① 301 BITUMINOUS AGGREGATE BASE OR,
303 WATERBOUND MACADAM BASE OR,
304 AGGREGATE BASE
SEE ALTERNATE
② 408 BITUMINOUS PRIME COAT (0.35 GAL. PER SQ. YD. OF BASE)
③ 402 ASPHALT CONCRETE (LEVELING)
④ 404 ASPHALT CONCRETE (SURFACE)
⑤ 304, 310, 311 SUBBASE - 3" MINIMUN WITH NO STRUCTURAL NUMBER
⑥ 605 PIPE UNDERDRAIN 6" - IF REQUIRED 706.07 OR 706.09
⑦ 304 6" AGGREGATE BASE
⑧ 409 SEAL COAT WITH NO. 67 STONE

ALTERNATE: ITEM ⑦ & ⑧ MAY BE SUBSTITUTED IN PLACE OF ITEM ② ③ & ④

NOTES: DESIGN REQUIREMENTS AND PROCEDURES FOR PAVEMENT THICKNESS AND COURSES ARE LISTED ON PAGE 3.

RECOMMENDED UTILITY LOCATIONS ARE AS SHOWN ABOVE.

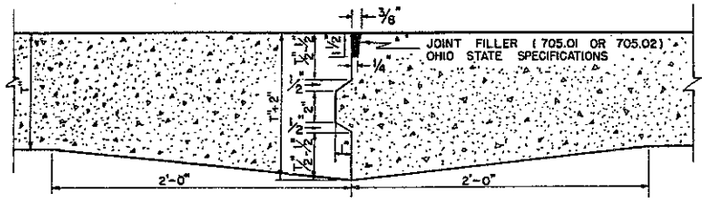
WOOD COUNTY

PAVEMENT
TYPICAL SECTIONS

CONCRETE PAVEMENT JOINTS & CURB

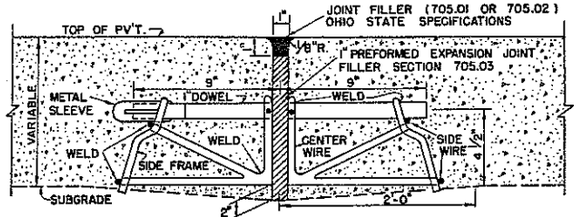
TYPE Ⓐ LONGITUDINAL CENTER JOINT

NOTE: HOOK BOLTS, AS PER OHIO STATE SPECIFICATIONS, ARE TO BE ADDED TO JOINT IF CONCRETE PAVEMENT IS WITHOUT CURB.



TYPE Ⓑ EXPANSION JOINT

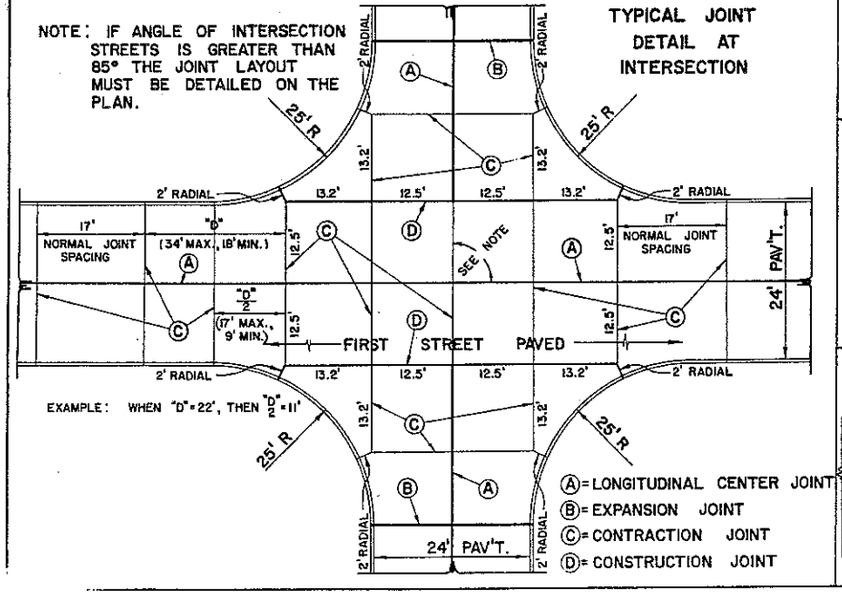
NOTE: DOWELS NOT USED FOR 6" PAVEMENT



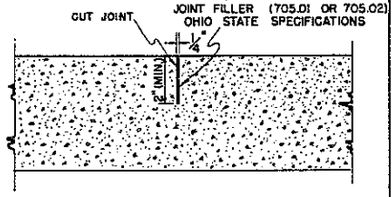
NOTE: EXPANSION JOINTS TO BE LOCATED AS SHOWN ON PLAN.

NOTE: IF ANGLE OF INTERSECTION STREETS IS GREATER THAN 85° THE JOINT LAYOUT MUST BE DETAILED ON THE PLAN.

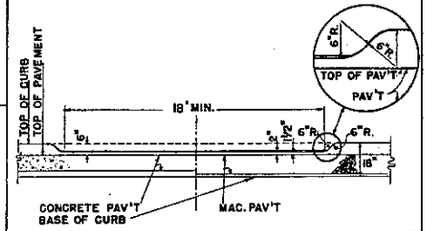
TYPICAL JOINT DETAIL AT INTERSECTION



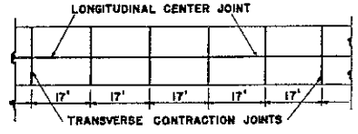
TYPE Ⓒ CONTRACTION JOINTS



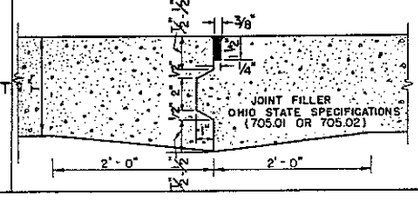
CURB CUT



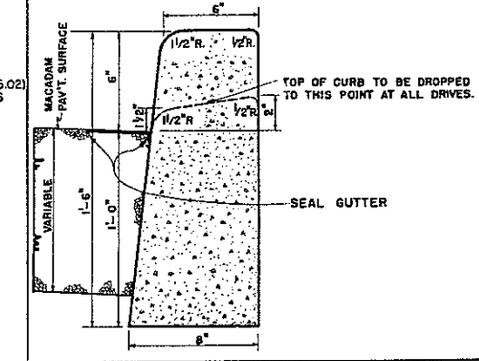
SPACING OF JOINTS



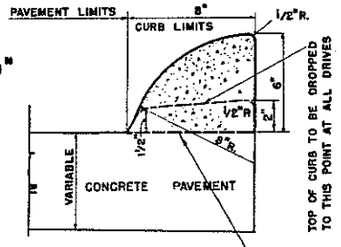
TYPE Ⓓ CONSTRUCTION JOINT



CONCRETE CURB 609 TYPE "A"

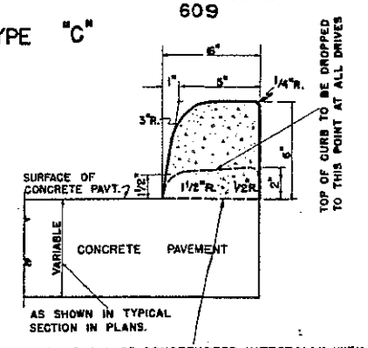


609 ROLLED CURB TYPE "D"



CURB SHALL BE CONSTRUCTED INTEGRALLY WITH CONCRETE PAVEMENT

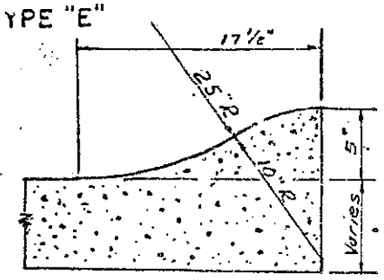
CONCRETE CURB 609 TYPE "C"



AS SHOWN IN TYPICAL SECTION IN PLANS.

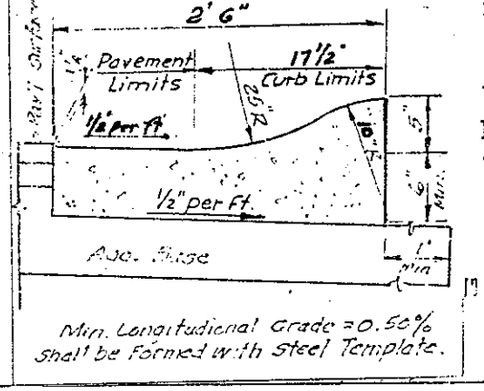
CURB SHALL BE CONSTRUCTED INTEGRALLY WITH CONCRETE PAVEMENT

MOUNTABLE TYPE INTEGRAL CURB TYPE "E"



Min. Longitudinal Grade = 0.50% shall be formed with steel Template

MOUNTABLE CURB & GUTTER TYPE "F"



Min. Longitudinal Grade = 0.50% Shall be Formed with Steel Template.

Note: When Concrete pavement is placed abutting on existing concrete pavement, expansion joint bolts will be inserted in the existing pavement, at 30" intervals along the longitudinal joint

WOOD COUNTY

CONCRETE PAVEMENT JOINTS & CONCRETE CURB 609

REQUIREMENTS AND PROCEDURES
FOR
PAVEMENT DESIGN

1. SOIL TESTS

Spacing of Borings

The spacing of borings should vary with the uniformity of the soil layers and the topography. Intervals of from 300 to 500 feet along any proposed centerline on level ground and closer spacing in the proximity of low areas near ditches will normally be satisfactory.

Depth of Borings

All borings should be made to a minimum depth of three feet below the proposed top of curb grade line.

Required Tests

Tests of each different soil layer encountered below the proposed grade line should include the following data:

1. Natural Moisture Content
2. Moisture-Density Relation
3. Mechanical Analysis
4. Liquid Limit
5. Plastic Limit — Atterberg Limits
6. Plasticity Index
7. Elevation of Water Table (should be recorded 12 to 24 hours after water is encountered during boring operations)

2. DESIGN PROCEDURE

Traffic Estimate

The minimum conditions for an average residential street structural design shall be for a 20 year design period with 400 vehicles per day including 1% at the legal limit of 18-kip single axle load. Minimum thickness: The absolute minimum allowable design of flexible pavement will be 3½" of Asphalt concrete over 8" of aggregate base.

Design Manuals

Any of the following manuals may be used as a guide for calculating the necessary structural thickness and pavement courses as described in the Construction Standards, Sheet No. 1:

1. "Thickness Design" (MS-1) (Seventh Edition) - The Asphalt Institute
2. "The Design of Concrete Pavements for City Streets" - Portland Cement Association (1963)
3. "Concrete Pavement Design" - Portland Cement Association
4. "Manual of Location and Design" - Ohio Department of Highways

Substitution Ratios for Flexible Pavements

1. 3-inches of aggregate base for 1-inch of asphaltic concrete: a substitution ratio of 3:1.
2. 4-inches of subbase for 1-inch of asphaltic concrete; a substitution ratio of 4:1.

Data to be Submitted

Design calculations shall be submitted along with proposed typical section and proposed grade line. Soil test holes shall be superimposed on proposed grade profile. Complete soil test report. Soil testing may be performed by an approved professional laboratory.

Lettering on construction plans to be a minimum height of 1/10 inch. For lower case style, the lower part shall be 1/10 inch minimum.

REQUIREMENTS AND PROCEDURES

FOR

ROADWAY DESIGN

Where pavement widths greater than those specified above are necessary, provision of same shall be discussed with the public officials having jursidiction over the planning and construction of public ways to determine whether or not public expenditures for such additional width can or should be made simultaneously with the subdivider's improvement program.

1. Vertical street profiled shall conform to the maximum and minimum grades listed below. Any deviation shall be approved by the Township Trustees concerned and the County Engineer.

Minor Highways (Arter.)	Max. Grade 4%
Collectors and Minor Streets and Alleys	Max. Grade 6%
Intersection Approaches	Max. Grade 4% (For at least 100')
Rate of Change of Grade	Max. 4' per 100'
Minimum Grade	0.4%

2. Horizontal street curves shall have the following minumum radii of center line curvature:

Major and Secondary Highways	300'
Minor High. and Collector Streets	200'
Minor Streets	100'

A minimum tangent of at least one hundred (100) feet shall be provided between reversed curbs on all minor streets; greater tangential lengths shall be required on collector and arterial streets, and throughfares.

3. Turn-arounds and intersections:

(a) The turn-around in a cul-de-sac shall be constructed with a radius not less than fifty (50) feet to the outside of the curb (or edge of street surface) and satisfactory reverse curves shall be provided. Minimum radius to right-of-way line shall be 60 feet.

(b) Where minor residential streets have a change of direction of approximately ninety (90) degrees ("L" intersection) the following shall be provided:

(aa) A centerline radius of one hundred (100) feet.

REQUIREMENTS AND PROCEDURES

FOR

ROADWAY DESIGN

(continued)

4. ALLEYS AND EASEMENTS

a. Alleys shall not be permitted in residential areas except when the Commission considers that special conditions exist which require them.

b. Alleys shall be provided in areas to be used commercially or industrially, except that the Commission may waive this requirement where other definite and assured provision is made for service assess, such as off-street loading, unloading, and parking consistent with and adequate for the uses proposed.

c. The minimum width of an alley shall be twenty (20) feet and it shall be dedicated to the public.

d. Alley intersections and sharp changes in alignment shall be avoided.

e. Dead-end alleys shall be avoided, or if unavoidable, adequate turn-around facilities shall be provided as determined by the Commission.

f. Easements for utilities shall be provided whenever required in order to permit construction of utility lines: all easement locations shall be approved by the utility company concerned - - telephone, electric, gas etc.

g. Where utilities are located outside of street right-of-way lines and no alleys are provided, easements not less than seven and one-half ($7\frac{1}{2}$) feet in width shall be provided on each side of lot lines where necessary for poles, wires, conduits, storm or sanitary sewers, gas and water lines. Where necessary, easement of greater width may be required by the Commission.

h. No water course shall be altered in such a way as to change the amount or direction of flow and no fill, building or structure shall be placed in natural water courses unless provision is made for the flow of water in a manner satisfactory to the County Engineer.

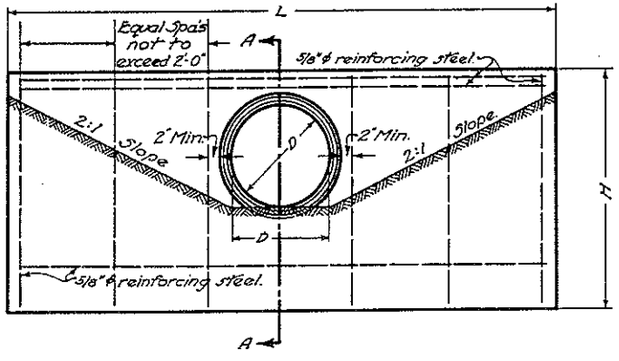
5. STORM DRAINAGE

a. Preferred runoff pattern - Design of streets and grading thereof, shall be such that runoff from roofs, driveways, and other impervious surfaces will be towards the street, will be collected in ditches and/or gutters along the street in short runs (three hundred (300) feet to four hundred (400) feet and will then be diverted from the surface into storm sewers or natural water courses. Streets shall be located away from water courses unless storm sewers are to be installed.

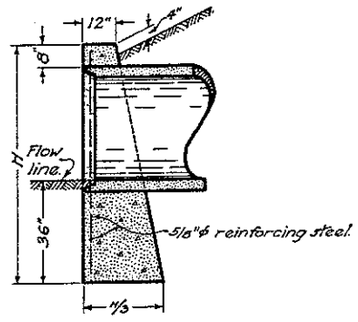
b. Drainage - The subdivider shall guard against the creation or continuation of swampy areas or stagnant pools. The Planning Commission may require fill and/or channel improvements in order to forestall such problems.

c. Any ditch traversing or abutting shall be cleaned to cleanout elevation with side slopes at minimum 2/1 slope.

HEADWALLS



ELEVATION



SECTION A-A

STANDARD HW-1 HEADWALL

NOTES

HW-1 HEADWALL where required will be provided for nonskewed culverts having a diameter or rise of 36 inches or less.

CONCRETE shall be Class "C".

REINFORCING STEEL BARS shall be 5/8 inch round.

DIMENSIONS AND QUANTITIES are shown for circular sections only. It will be necessary to determine dimensions for the HW-1 headwall required for reinforced elliptical concrete pipe in accordance with the equations listed on this drawing.

Chamfer all exposed corners ¾ of an inch.

FOUNDATION. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot, it will be necessary to increase the width of the base.

DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	H	L	CONCRETE CU. YDS.	REINFORCING STEEL LBS.
15"	5'-2"	7'-0"	1.7	41
18"	5'-5'	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

L CIRCULAR SECTIONS = 5D + 4t
L ELLIPTICAL = 4R + 4t + S
H CIRCULAR SECTIONS = D + t + 44"
H ELLIPTICAL = R + t + 44"

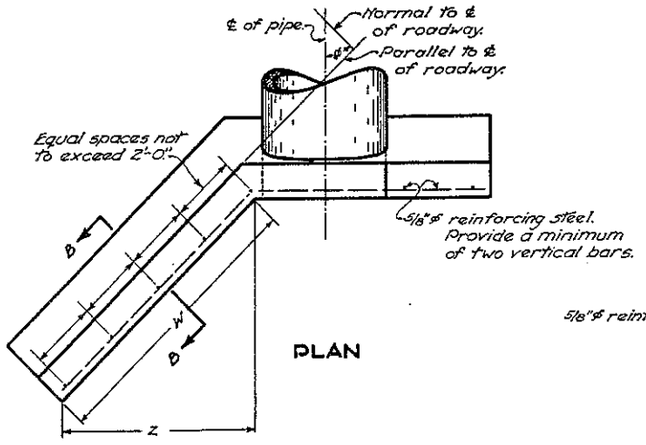
D = DIAMETER OF PIPE
R = RISE OF PIPE
S = SPAN OF PIPE
t = THICKNESS OF BARREL
L = LENGTH OF HEADWALL
H = HEIGHT OF HEADWALL

602
CONCRETE MASONRY

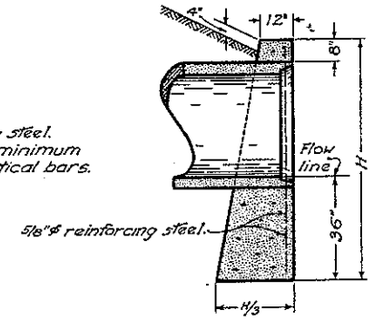
WOOD COUNTY

HW-1
STANDARD
HEADWALL

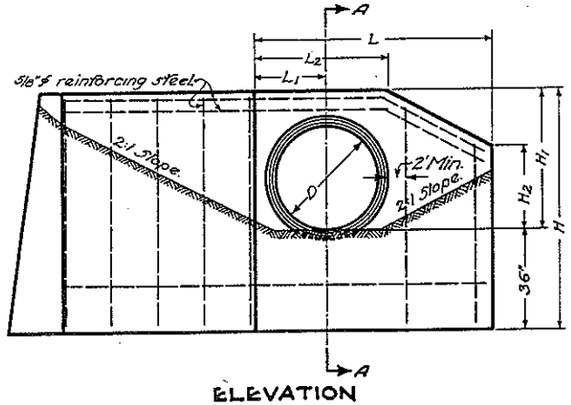
HEADWALLS



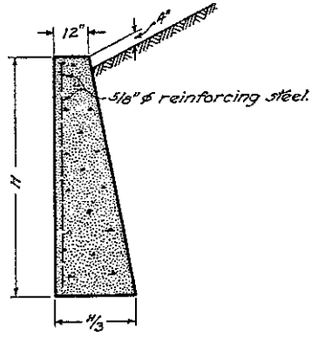
PLAN



SECTION A-A



ELEVATION



SECTION B-B

NOTES

HW-2 HEADWALL where required will be provided for skewed culverts having a diameter or rise of 36 inches or less.

CONCRETE shall be Class "C."

REINFORCING STEEL BARS shall be 5/8 inch round.

DIMENSIONS AND QUANTITIES are shown for circular sections only. When used with reinforced elliptical concrete pipe it will be necessary to determine such dimensions and quantities which shall generally conform with those listed for the nearest size circular pipe. The dimensions established by vertical diameter shall apply to rise and the dimensions established by horizontal diameter shall apply to span.

Chamfer all exposed corners 3/4 of an inch.

FOUNDATION. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot it will be necessary to increase the width of the footing.

	ϕ=15°											ϕ=30°										
	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC. C.Y.	STEEL LBS.	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC. C.Y.	STEEL LBS.
SLOPE 2:1	15"	2'-11"	0'-11"	1'-7"	2'-9"	2'-8"	5'-2"	2'-2"	1'-5"	1.4	41	15"	2'-11"	0'-11"	1'-7"	3'-1"	2'-8"	5'-2"	2'-2"	1'-5"	1.6	42
	18"	3'-7"	1'-1"	1'-10"	3'-4"	3'-2"	5'-5"	2'-5"	1'-7"	1.8	46	18"	3'-7"	1'-1"	1'-10"	3'-8"	3'-2"	5'-5"	2'-5"	1'-7"	2.0	48
	21"	4'-1"	1'-3"	2'-2"	3'-10"	3'-8"	5'-8"	2'-8"	1'-8"	2.2	50	21"	4'-1"	1'-3"	2'-2"	4'-3"	3'-8"	5'-8"	2'-8"	1'-8"	2.4	52
	24"	4'-9"	1'-5"	2'-6"	4'-4"	4'-2"	5'-11"	2'-11"	1'-10"	2.7	61	24"	4'-9"	1'-5"	2'-6"	4'-10"	4'-2"	5'-11"	2'-11"	1'-10"	3.0	63
	30"	5'-11"	1'-7"	2'-10"	5'-4"	5'-2"	6'-5"	3'-5"	2'-2"	3.8	76	30"	5'-11"	1'-7"	2'-10"	6'-0"	5'-2"	6'-5"	3'-5"	2'-2"	4.2	78
	36"	7'-0"	1'-10"	3'-4"	6'-7"	6'-4"	7'-0"	4'-0"	2'-6"	5.4	87	36"	7'-0"	1'-10"	3'-4"	7'-4"	6'-4"	7'-0"	4'-0"	2'-6"	5.8	97
SLOPE 4:1	15"	4'-1"	0'-11"	1'-7"	3'-3"	3'-2"	5'-2"	2'-2"	1'-10"	1.9	47	15"	3'-9"	0'-11"	1'-7"	3'-8"	3'-2"	5'-2"	2'-2"	1'-7"	1.9	47
	18"	4'-10"	1'-1"	1'-10"	3'-10"	3'-8"	5'-5"	2'-5"	2'-0"	2.4	57	18"	4'-6"	1'-1"	1'-10"	4'-3"	3'-8"	5'-5"	2'-5"	1'-10"	2.4	57
	21"	5'-8"	1'-3"	2'-2"	4'-4"	4'-2"	5'-8"	2'-8"	2'-3"	2.9	63	21"	5'-2"	1'-3"	2'-2"	4'-10"	4'-2"	5'-8"	2'-8"	2'-0"	3.0	68
	24"	6'-5"	1'-5"	2'-6"	4'-10"	4'-8"	5'-11"	2'-11"	2'-6"	3.5	74	24"	5'-11"	1'-5"	2'-6"	5'-5"	4'-8"	5'-11"	2'-11"	2'-2"	3.6	74
	30"	7'-9"	1'-7"	2'-10"	5'-10"	5'-8"	6'-5"	3'-5"	3'-0"	4.8	92	30"	7'-2"	1'-7"	2'-10"	6'-7"	5'-8"	6'-5"	3'-5"	2'-8"	4.9	92
	36"	9'-3"	1'-10"	3'-4"	7'-1"	6'-10"	7'-0"	4'-0"	3'-5"	6.6	112	36"	8'-6"	1'-10"	3'-4"	7'-11"	6'-10"	7'-0"	4'-0"	3'-0"	6.7	111

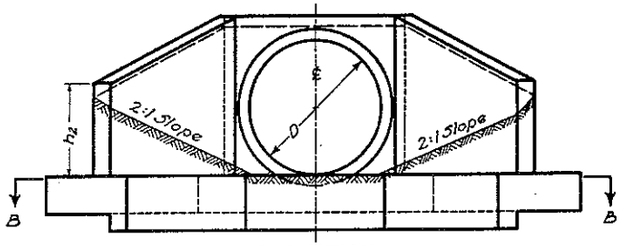
	ϕ=45°											ϕ=60°										
	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC. C.Y.	STEEL LBS.	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC. C.Y.	STEEL LBS.
SLOPE 2:1	15"	2'-11"	0'-11"	1'-7"	3'-9"	2'-8"	5'-2"	2'-2"	1'-5"	1.8	44	15"	2'-11"	0'-11"	1'-7"	5'-4"	2'-8"	5'-2"	2'-2"	1'-5"	2.3	54
	18"	3'-7"	1'-1"	1'-10"	4'-6"	3'-2"	5'-5"	2'-5"	1'-7"	2.3	56	18"	3'-7"	1'-1"	1'-10"	6'-4"	3'-2"	5'-5"	2'-5"	1'-7"	2.9	61
	21"	4'-1"	1'-3"	2'-2"	5'-2"	3'-8"	5'-8"	2'-8"	1'-8"	2.8	61	21"	4'-1"	1'-3"	2'-2"	7'-4"	3'-8"	5'-8"	2'-8"	1'-8"	3.5	73
	24"	4'-9"	1'-5"	2'-6"	5'-11"	4'-2"	5'-11"	2'-11"	1'-10"	3.4	67	24"	4'-9"	1'-5"	2'-6"	8'-4"	4'-2"	5'-11"	2'-11"	1'-10"	4.3	80
	30"	5'-11"	1'-7"	2'-10"	7'-4"	5'-2"	6'-5"	3'-5"	2'-2"	4.8	90	30"	5'-11"	1'-7"	2'-10"	10'-4"	5'-2"	6'-5"	3'-5"	2'-2"	6.0	105
	36"	7'-0"	1'-10"	3'-4"	8'-11"	6'-4"	7'-0"	4'-0"	2'-6"	6.6	110	36"	7'-0"	1'-10"	3'-4"	12'-8"	6'-4"	7'-0"	4'-0"	2'-6"	8.3	128
SLOPE 4:1	15"	3'-7"	0'-11"	1'-7"	4'-6"	3'-2"	5'-2"	2'-2"	1'-5"	2.1	50	15"	3'-4"	0'-11"	1'-7"	6'-4"	3'-2"	5'-2"	2'-2"	1'-4"	2.6	59
	18"	4'-2"	1'-1"	1'-10"	5'-2"	3'-8"	5'-5"	2'-5"	1'-7"	2.6	60	18"	3'-11"	1'-1"	1'-10"	7'-4"	3'-8"	5'-5"	2'-5"	1'-5"	3.3	70
	21"	4'-10"	1'-3"	2'-2"	5'-11"	4'-2"	5'-8"	2'-8"	1'-11"	3.8	83	21"	4'-7"	1'-3"	2'-2"	8'-4"	4'-2"	5'-8"	2'-8"	1'-7"	4.0	77
	24"	5'-6"	1'-5"	2'-6"	6'-7"	4'-8"	5'-11"	2'-11"	2'-1"	5.3	95	24"	5'-2"	1'-5"	2'-6"	9'-4"	4'-8"	5'-11"	2'-11"	1'-9"	4.7	95
	30"	6'-8"	1'-7"	2'-10"	8'-0"	5'-8"	6'-5"	3'-5"	2'-4"	7.3	116	30"	6'-3"	1'-7"	2'-10"	11'-4"	5'-8"	6'-5"	3'-5"	2'-1"	6.5	116
	36"	7'-11"	1'-10"	3'-4"	9'-8"	6'-10"	7'-0"	4'-0"	2'-7"	9.3	116	36"	7'-5"	1'-10"	3'-4"	15'-8"	6'-10"	7'-0"	4'-0"	2'-4"	8.9	139

602
CONCRETE MASONRY

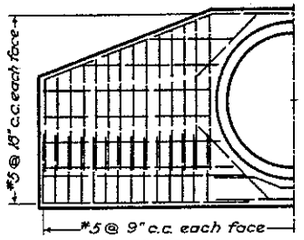
WOOD COUNTY

HW-2
STANDARD
HEADWALL

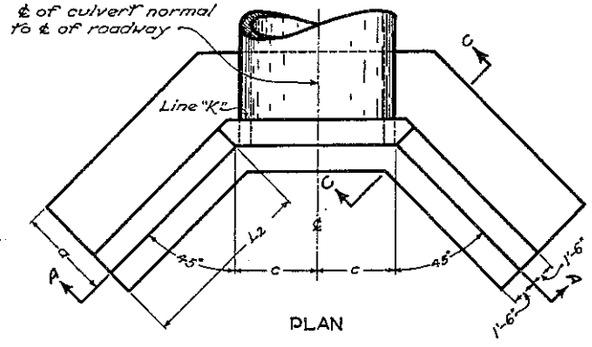
HEADWALLS



ELEVATION

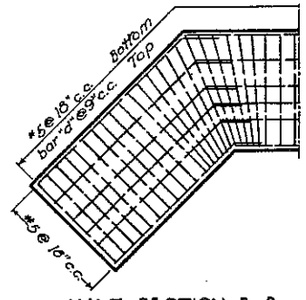


HALF-SECTION A-A

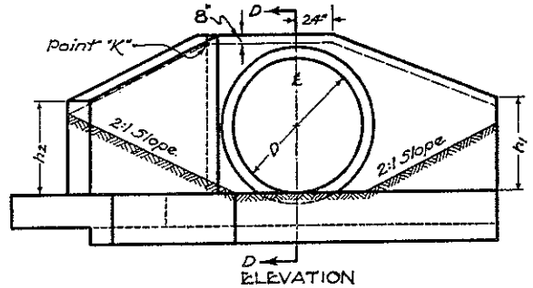


PLAN

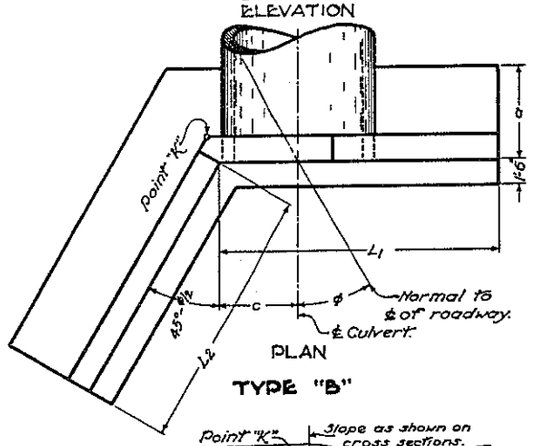
TYPE "A"



HALF-SECTION B-B

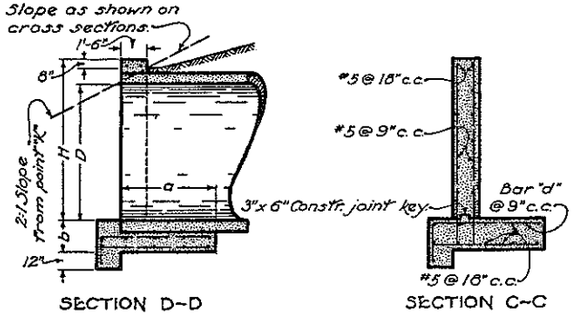


ELEVATION



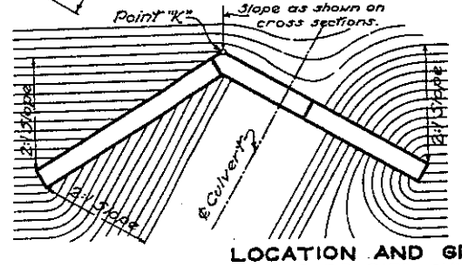
PLAN

TYPE "B"



SECTION D-D

SECTION C-C



LOCATION AND GRADING PLAN
FOR SKEWED PIPE CULVERT — TYPE B

NOTES

HW3 HEADWALL where required will be provided for skewed and non-skewed culverts having a diameter or rise of 42 to 84 inches inclusive. Type "A" is used when the skew angle (ϕ) is 10 degrees or less and Type "B" when the skew angle is 11 degrees and over.

CONCRETE shall be Class "C."

REINFORCING STEEL BARS shall be ⅝ inch round.

DIMENSIONS AND QUANTITIES are shown for circular sections only. When used with reinforced elliptical concrete pipe it will be necessary to determine such dimensions and quantities which shall generally conform with those listed for the nearest size circular pipe. The dimensions established by vertical diameter shall apply to rise and the dimensions established by horizontal diameter shall apply to span.

Chamfer all exposed corners ¾ of an inch.

FOUNDATION. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot it will be necessary to increase the width of the footing.

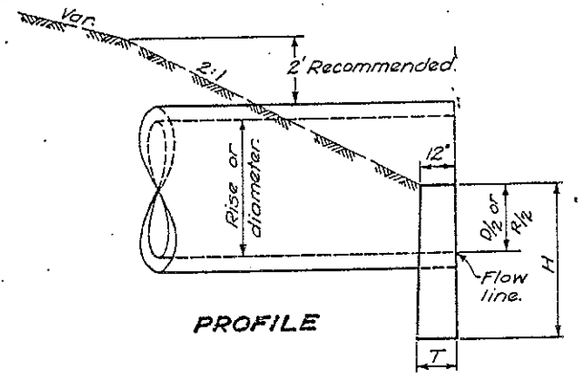
HEADWALL location to be determined by the intersection of the embankment slope of the back of the headwall at point "K". The slopes adjacent to the headwall shall be 2:1.

						ϕ=0°				ϕ=15°						ϕ=30°						ϕ=45°						
PIPE DIAM. D	H	a	b	c	BAR d	L_2	h_2	CY. CONC. RCP.	STEEL LBS.	L_1	L_2	h_1	h_2	CY. CONC. RCP.	STEEL LBS.	L_1	L_2	h_1	h_2	CY. CONC. RCP.	STEEL LBS.	L_1	L_2	h_1	h_2	CY. CONC. RCP.	STEEL LBS.	PIPE DIAM. D
42"	4'-1 1"	3'-3"	1'-6"	2'-6"	#5	3'-7"	3'-1"	6.7	598	8'-9"	4'-6"	3'-8"	3'-2"	7.1	619	7'-10"	5'-9"	3'-2"	3'-3"	7.3	633	7'-10"	7'-9"	3'-2"	3'-3"	8.5	718	42"
48"	5'-5"	3'-6"	1'-6"	2'-9"	#5	4'-4"	3'-4"	8.2	793	10'-0"	5'-4"	4'-1"	3'-5"	8.7	776	8'-9"	6'-10"	3'-5"	3'-6"	8.8	801	8'-9"	9'-2"	3'-5"	3'-7"	10.3	925	48"
54"	5'-1 1"	3'-9"	1'-6"	3'-0"	#5	5'-2"	3'-8"	10.0	1,069	11'-4"	6'-3"	4'-6"	3'-8"	10.5	1,026	9'-8"	7'-11"	3'-8"	3'-9"	10.5	1,024	9'-8"	10'-7"	3'-8"	3'-10"	12.2	1,188	54"
60"	6'-6"	4'-0"	1'-6"	3'-3"	#5	5'-1 1"	3'-1 1"	11.8	1,149	12'-7"	7'-2"	4'-10"	4'-0"	12.4	1,174	10'-7"	9'-0"	3'-10"	4'-1"	12.3	1,157	10'-7"	12'-0"	3'-10"	4'-1"	14.3	1,354	60"
72"	7'-7"	4'-6"	1'-7"	3'-9"	#7	7'-5"	4'-5"	16.2	1,783	15'-1"	8'-1 1"	5'-7"	4'-6"	17.1	1,811	12'-5"	11'-2"	4'-3"	4'-7"	16.6	1,788	12'-5"	14'-10"	4'-3"	4'-8"	19.6	2,076	72"
84"	8'-8"	5'-0"	1'-10"	4'-3"	#8	9'-0"	5'-0"	22.8	2,595	17'-7"	10'-9"	6'-4"	5'-1"	23.9	2,596	14'-7"	13'-4"	4'-10"	5'-2"	23.3	2,511	14'-3"	17'-8"	4'-8"	5'-2"	27.0	2,990	84"

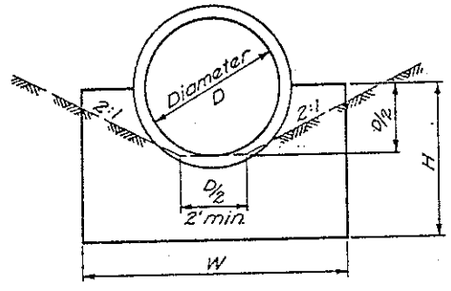
602
CONCRETE MASONRY

WOOD COUNTY

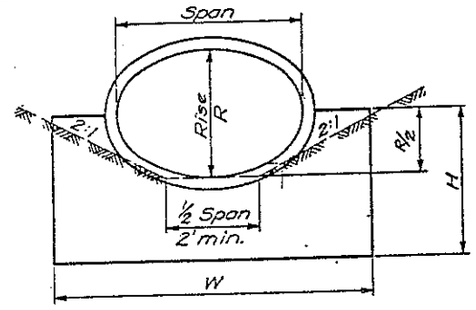
HW-3
STANDARD
HEADWALL



PROFILE



CIRCULAR



ELLIPTICAL

CONCRETE PIPE

HEADWALL FOR CONCRETE PIPE

CIRCULAR					ELLIPTICAL					
D	W	H	T	Conc. Cu. Yds.	Span	Rise	W	H	T	Conc. Cu. Yds.
12"	2'-0"	3'-0"	12"	.20						
15"	2'-6"	3'-2"	12"	.25						
18"	3'-0"	3'-3"	12"	.31	25"	14"	3'-5"	3'-2"	12"	.33
21"	3'-6"	3'-4"	12"	.37						
24"	4'-0"	3'-6"	12"	.43	30"	19"	4'-2"	3'-4"	12"	.42
27"	4'-6"	3'-8"	12"	.49	34"	22"	4'-7"	3'-5"	12"	.46
30"	5'-0"	3'-9"	12"	.56	38"	24"	5'-0"	3'-6"	12"	.50
33"	5'-6"	3'-10"	12"	.62	42"	27"	5'-5"	3'-7"	12"	.55
36"	6'-0"	4'-0"	12"	.69	45"	29"	5'-10"	3'-8"	12"	.59
39"	6'-6"	4'-2"	12"	.77	49"	32"	6'-6"	3'-10"	12"	.67
42"	7'-0"	4'-3"	12"	.84	53"	34"	7'-2"	4'-0"	14"	.82
48"	8'-0"	4'-6"	14"	1.09	60"	38"	8'-5"	4'-2"	14"	1.01
54"	9'-3"	4'-9"	14"	1.32	68"	43"	9'-8"	4'-4"	16"	1.32
60"	10'-6"	5'-6"	16"	1.93	76"	48"	11'-0"	5'-0"	16"	1.79
66"	11'-9"	5'-9"	18"	2.42	85"	53"	12'-4"	5'-2"	18"	2.23
72"	13'-0"	6'-0"	18"	2.77	91"	58"	13'-7"	5'-5"	18"	2.53
78"	14'-3"	6'-3"	20"	3.37	98"	63"	14'-10"	5'-7"	20"	3.07
84"	15'-6"	6'-6"	22"	4.05	106"	68"	16'-2"	5'-10"	20"	3.42
90"	16'-9"	6'-9"	22"	4.51	113"	72"	17'-6"	6'-0"	22"	4.05
96"	18'-0"	7'-0"	24"	5.31						
102"	19'-3"	7'-3"	26"	6.20						
108"	20'-6"	7'-6"	26"	6.78						
114"	21'-9"	7'-9"	28"	7.81						
120"	23'-0"	8'-0"	30"	8.93						

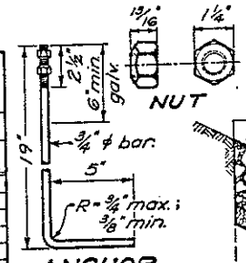
HEADWALL FOR CORRUGATED METAL PIPE

CIRCULAR					PIPE ARCH					
D	W	H	T	Conc. Cu. Yds.	Span	Rise	W	H	T	Conc. Cu. Yds.
12"	2'-0"	3'-0"	12"	.21						
15"	2'-6"	3'-2"	12"	.27	18"	11"	3'-0"	3'-0"	12"	.31
18"	3'-0"	3'-3"	12"	.33	22"	13"	3'-6"	3'-0"	12"	.37
21"	3'-6"	3'-4"	12"	.39	25"	16"	4'-0"	3'-2"	12"	.43
24"	4'-0"	3'-6"	12"	.46	29"	18"	4'-6"	3'-3"	12"	.48
27"	4'-6"	3'-8"	12"	.53						
30"	5'-0"	3'-9"	12"	.60	36"	22"	5'-6"	3'-5"	12"	.61
33"	5'-6"	3'-10"	12"	.68						
36"	6'-0"	4'-0"	12"	.76	43"	27"	6'-6"	3'-7"	12"	.74
39"	6'-6"	4'-2"	12"	.84						
42"	7'-0"	4'-3"	12"	.92	50"	31"	7'-8"	3'-9"	12"	.90
48"	8'-0"	4'-6"	12"	1.10	58"	36"	9'-0"	4'-0"	12"	1.09
54"	9'-3"	4'-9"	12"	1.33	65"	40"	10'-0"	4'-2"	12"	1.25
60"	10'-6"	5'-6"	12"	1.78	72"	44"	11'-0"	4'-4"	12"	1.43
66"	11'-9"	5'-9"	12"	2.06	73"	55"	13'-0"	4'-9"	12"	1.84
72"	13'-0"	6'-0"	12"	2.37	87"	63"	15'-6"	5'-2"	14"	2.56
78"	14'-3"	6'-3"	14"	2.94	103"	71"	18'-6"	5'-6"	16"	3.50
84"	15'-6"	6'-6"	14"	3.30	114"	77"	20'-0"	5'-9"	18"	4.18
90"	16'-9"	6'-9"	16"	4.00						
96"	18'-0"	7'-0"	16"	4.40						
102"	19'-3"	7'-3"	18"	5.28						
108"	20'-6"	7'-6"	20"	6.21						
114"	21'-9"	7'-9"	22"	7.25						
120"	23'-0"	8'-0"	24"	8.38						

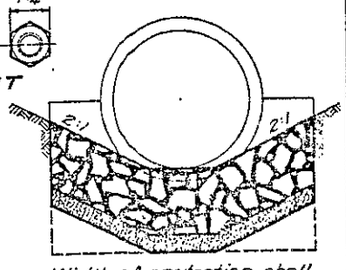
NOTES

CONCRETE for headwalls shall be Class C.

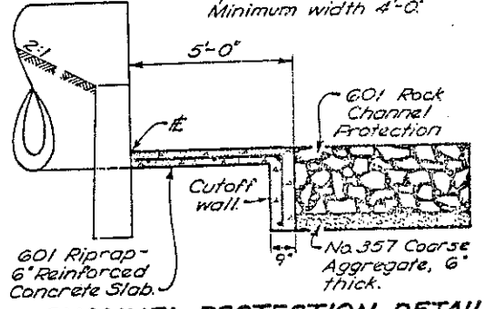
ANCHOR BOLTS (as detailed) for anchoring upstream end of metal pipes shall meet ASTM A307. The top 6" min of bolt shall be galvanized according to ASTM A153. Nuts (as detailed) shall meet ASTM A325 and A153. Cost of anchors shall be included in the unit price bid per linear foot of 603 Conduit. Unless otherwise specified, anchor bolts shall be used only on pipes with span or rise greater than 24 inches.



ANCHOR BOLT

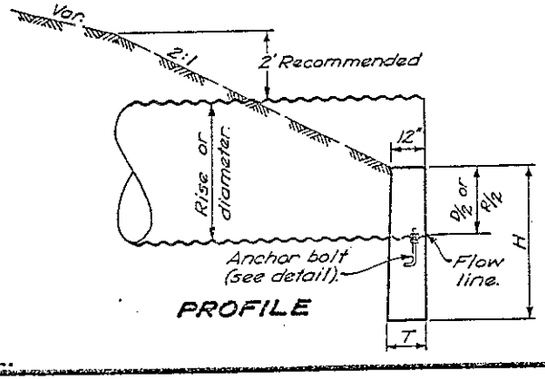


Width of protection shall equal width of headwall. Minimum width 4'-0"

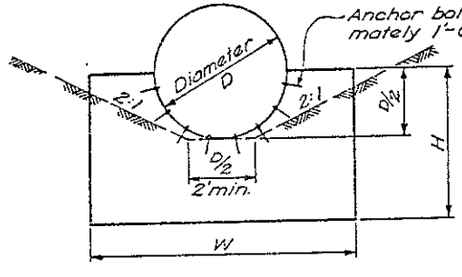


CHANNEL PROTECTION DETAIL

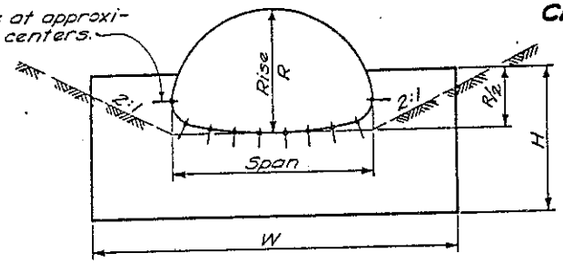
Cutoff wall depth (2'-6" min.) is variable to match required thickness of rock.



PROFILE



CIRCULAR



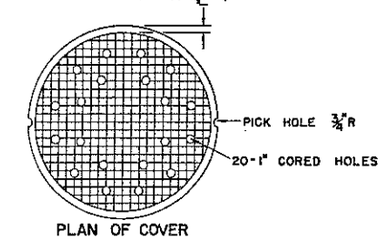
PIPE ARCH

CORRUGATED METAL PIPE

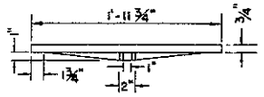
602
CONCRETE MASONRY
WOOD COUNTY
STANDARD ENDWALL

L-1 MANHOLE FRAME & COVER

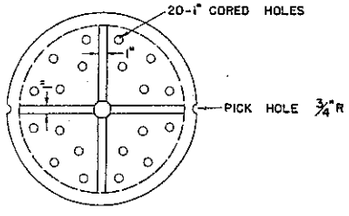
ALLOY NO. 58, NEENAH R-1786 OR EQUAL
MINIMUM WEIGHT 275 LBS.
FRAME & COVER



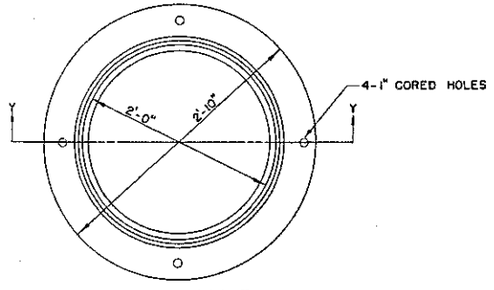
PLAN OF COVER



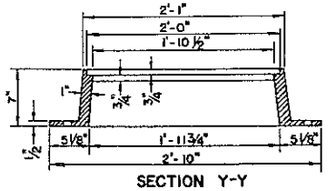
EDGE OF COVER



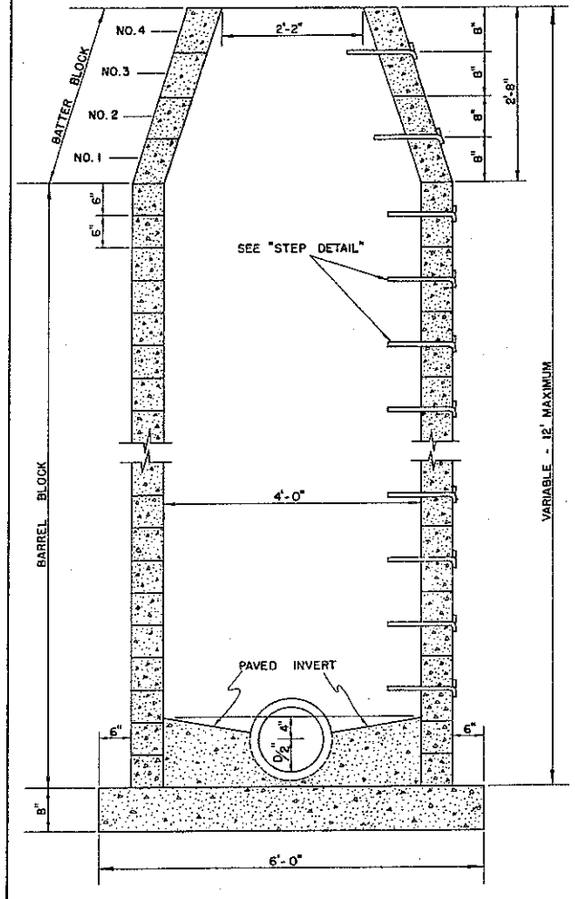
BOTTOM OF COVER



PLAN OF FRAME



SECTION Y-Y

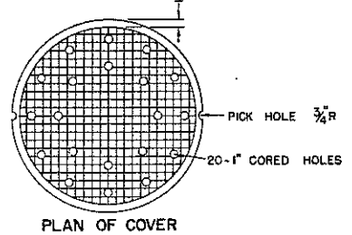


TYPE H-1 & L-1 MANHOLE

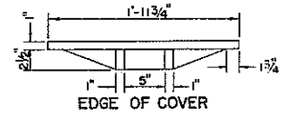
NOTE:
CONCRETE REQUIRED FOR 6' DIA. x 8" THICK BASE = 0.698 CUBIC YARD. OTHER CONCRETE QUANTITIES ARE VARIABLE.

H-1 MANHOLE FRAME & COVER

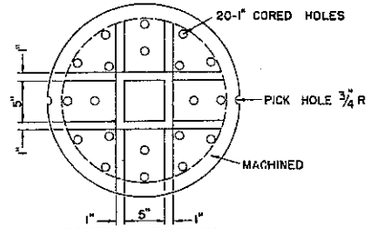
ALLOY NO. 1 HEAVY, NEENAH R-1785 OR EQUAL
MINIMUM WEIGHT 475 LBS.
FRAME & COVER



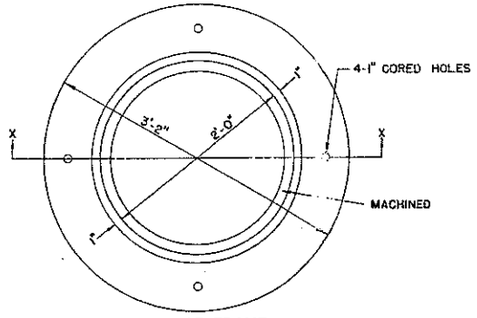
PLAN OF COVER



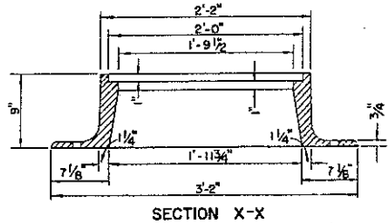
EDGE OF COVER



BOTTOM OF COVER



PLAN OF FRAME



SECTION X-X

SPECIFICATIONS

ALL BEARING SURFACES OF CASTINGS LOCATED WITHIN THE PAVEMENT AREA SHALL BE MACHINED.

NOTES:

WHEN MANHOLE IS LOCATED WITHIN THE PAVEMENT AREA, THE BACKFILL MATERIAL SHALL BE GRANULAR AND IT SHALL BE TAMPED IN PLACE AND THEN INUNDATED. GRANULAR MATERIAL IS CONSTRUED TO MEAN SAND, SCREENINGS, GRAVEL OR SIMILAR SUITABLE MATERIAL AND IS TO BE APPROVED BY THE ENGINEER.

WHEN MANHOLE IS LOCATED OUTSIDE OF THE PAVEMENT AREA, EARTH BACKFILL MAY BE USED.

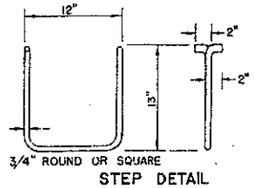
CAUTION SHALL BE EXERCISED IN SETTING THE MANHOLE FRAME ON A FRESH MORTAR BED TO INSURE UNIFORM SUPPORT FOR THE FRAME.

MATERIAL REQUIREMENTS

CONCRETE BLOCK REQUIRED
NO. 1 BATTER BLOCK = 10
NO. 2 " " = 9
NO. 3 " " = 8
NO. 4 " " = 8
BARREL BLOCK = 12 PER COURSE

MORTAR REQUIRED
2 CU. FT. CEMENT PER 100 BLOCK
4 CU. FT. SAND

CONCRETE BASE AND INVERT TO BE CONSTRUCTED OF CLASS "C" CONCRETE.



STEP DETAIL

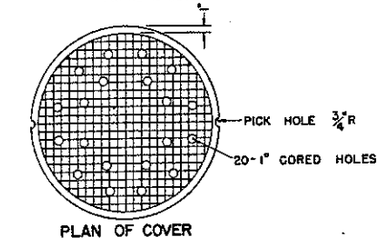
STEPS SHALL MEET THE REQUIREMENTS OF 604-OHIO STATE DEPARTMENT OF HIGHWAYS CONSTRUCTION & MATERIALS SPECIFICATIONS.

WOOD COUNTY

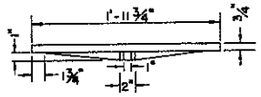
TYPE H-1 & L-1
CONCRETE BLOCK
MANHOLE
604

L-2 MANHOLE FRAME & COVER

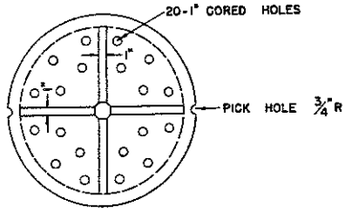
ALLOY NO. 53, NEENAH R-1786 OR EQUAL
MINIMUM WEIGHT 275 LBS.
FRAME & COVER



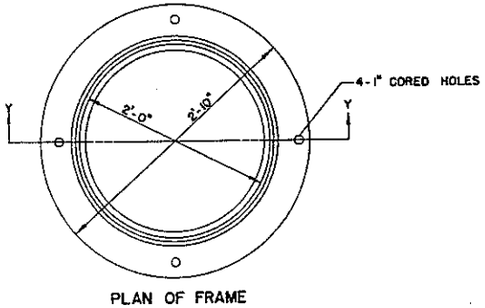
PLAN OF COVER



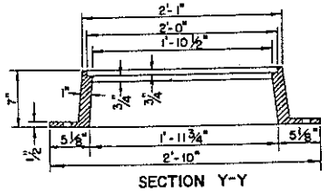
EDGE OF COVER



BOTTOM OF COVER

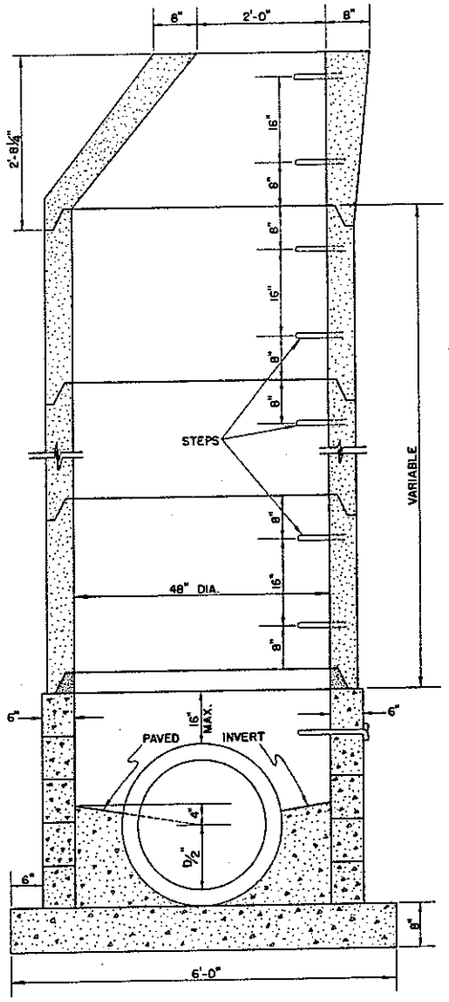


PLAN OF FRAME



SECTION Y-Y

NOTE:
DOME SECTION CAN BE EITHER CONCENTRIC TYPE OR STRAIGHT SIDE TYPE.

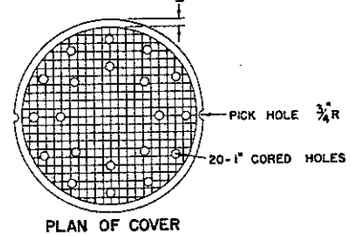


TYPE H-2 & L-2 MANHOLE

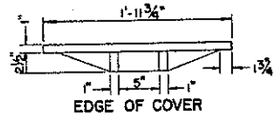
NOTE:
CONCRETE REQUIRED FOR 6' DIA. x 8" THICK BASE = 0.698 CUBIC YARD.
OTHER CONCRETE QUANTITIES ARE VARIABLE.

H-2 MANHOLE FRAME & COVER

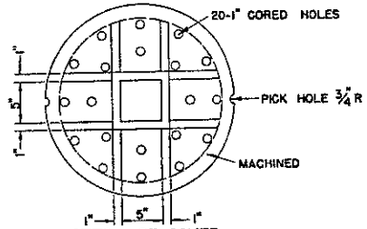
ALLOY NO.1 HEAVY, NEENAH R-1785 OR EQUAL
MINIMUM WEIGHT 475 LBS.
FRAME & COVER



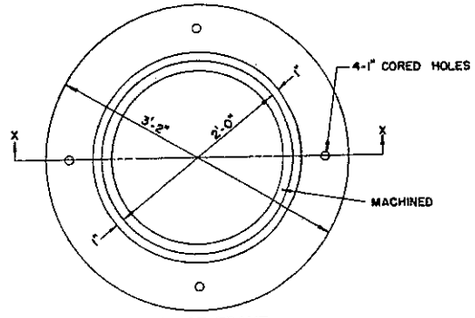
PLAN OF COVER



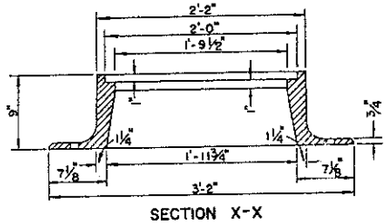
EDGE OF COVER



BOTTOM OF COVER



PLAN OF FRAME



SECTION X-X

SPECIFICATIONS

ALL BEARING SURFACES OF CASTINGS LOCATED WITHIN THE PAVEMENT AREA SHALL BE MACHINED.

NOTES:

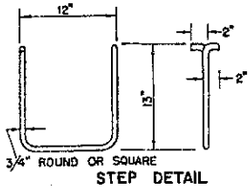
WHEN MANHOLE IS LOCATED WITHIN THE PAVEMENT AREA, THE BACKFILL MATERIAL SHALL BE GRANULAR AND IT SHALL BE TAMPED IN PLACE AND THEN INUNDATED. GRANULAR MATERIAL IS CONSTRUED TO MEAN SAND, SCREENINGS, GRAVEL OR SIMILAR SUITABLE MATERIAL AND IS TO BE APPROVED BY THE ENGINEER.

WHEN MANHOLE IS LOCATED OUTSIDE OF THE PAVEMENT AREA, EARTH BACKFILL MAY BE USED.

CAUTION SHALL BE EXERCISED IN SETTING THE MANHOLE FRAME ON A FRESH MORTAR BED TO INSURE UNIFORM SUPPORT FOR THE FRAME.

PRECAST REINFORCED CONCRETE RISER RINGS AND DOMES SHALL COMPLY WITH THE REQUIREMENTS OF 706.02, EXCEPT FOR MINIMUM DESIGNS AND MARKING. MINIMUM WALL THICKNESS SHALL BE 5 INCHES AND CIRCULAR REINFORCEMENT SHALL BE 0.18 SQ. IN. PER FOOT MINIMUM. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 4,000 POUNDS PER SQUARE INCH. 1 1/4" HOLES FOR HANDLING MAY BE CAST IN DOMES AND RINGS.

CONCRETE BASE AND INVERT TO BE CONSTRUCTED OF CLASS "C" CONCRETE.



STEP DETAIL

STEPS SHALL MEET THE REQUIREMENTS OF 604-OHIO STATE DEPARTMENT OF HIGHWAYS CONSTRUCTION & MATERIALS SPECIFICATIONS.

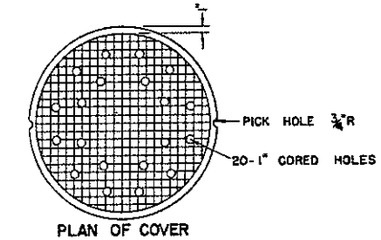
WOOD COUNTY

TYPE H-2 & L-2 PRECAST MANHOLE

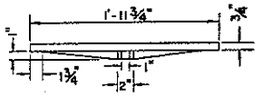
604

L-3 MANHOLE FRAME & COVER

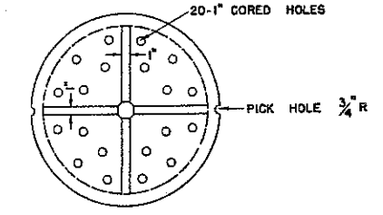
ALLOY NO. 58, NEENAH R-1786 OR EQUAL
MINIMUM WEIGHT 275 LBS.
FRAME & COVER



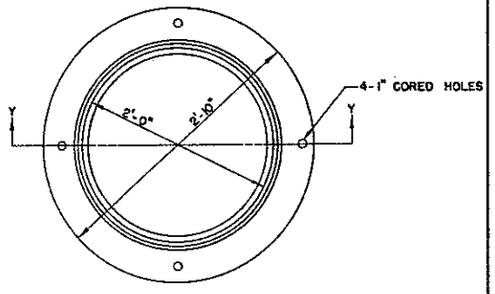
PLAN OF COVER



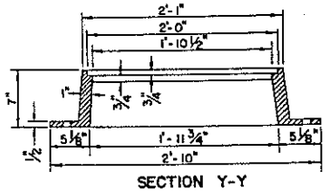
EDGE OF COVER



BOTTOM OF COVER

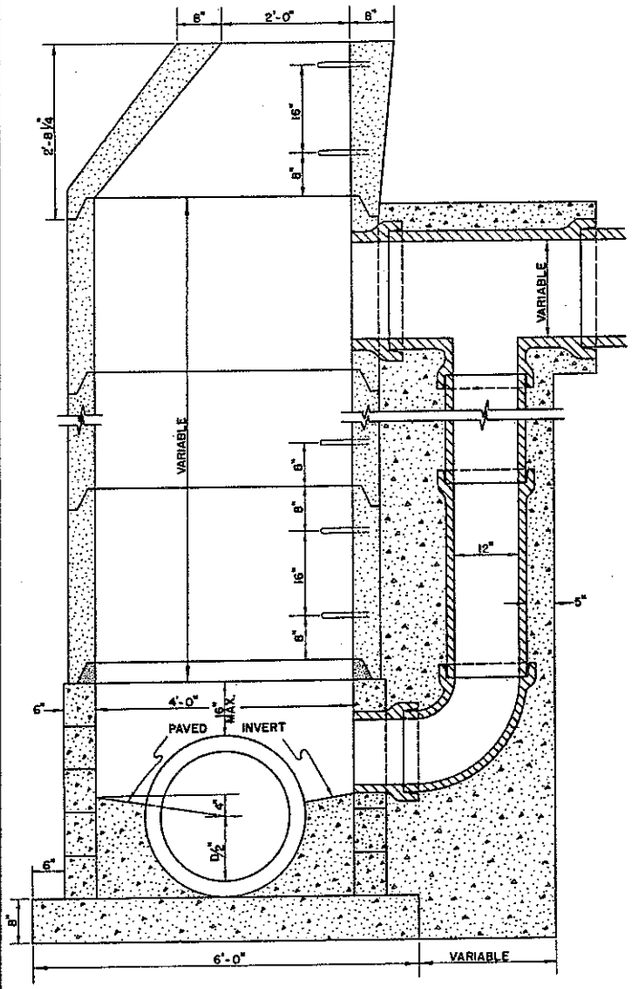


PLAN OF FRAME



SECTION Y-Y

NOTE:
DOME SECTION CAN BE EITHER CONCENTRIC TYPE OR STRAIGHT SIDE TYPE.

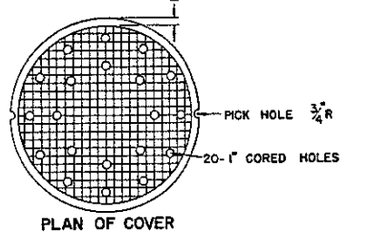


TYPE H-3 & L-3 MANHOLE

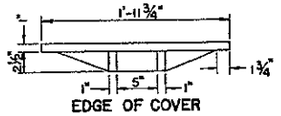
NOTE:
CONCRETE REQUIRED FOR 6' DIA. x 8" THICK BASE = 0.698 CUBIC YARD. OTHER CONCRETE QUANTITIES ARE VARIABLE.

H-3 MANHOLE FRAME & COVER

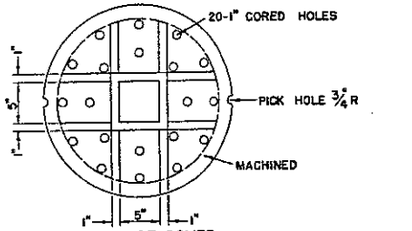
ALLOY NO.1 HEAVY, NEENAH R-1785 OR EQUAL
MINIMUM WEIGHT 475 LBS.
FRAME & COVER



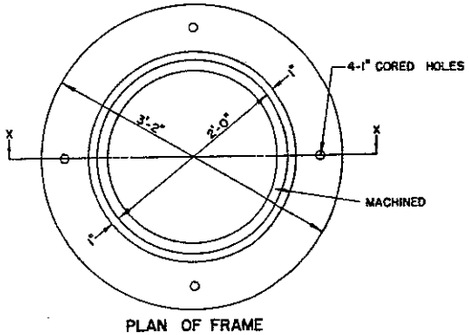
PLAN OF COVER



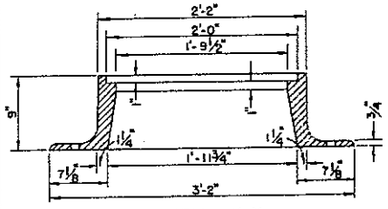
EDGE OF COVER



BOTTOM OF COVER



PLAN OF FRAME



SECTION X-X

SPECIFICATIONS

ALL BEARING SURFACES OF CASTINGS LOCATED WITHIN THE PAVEMENT AREA SHALL BE MACHINED.

NOTES:

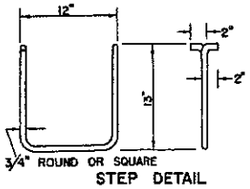
WHEN MANHOLE IS LOCATED WITHIN THE PAVEMENT AREA, THE BACKFILL MATERIAL SHALL BE GRANULAR AND IT SHALL BE TAMPED IN PLACE AND THEN INUNDATED. GRANULAR MATERIAL IS CONSTRUED TO MEAN SAND, SCREENINGS, GRAVEL OR SIMILAR SUITABLE MATERIAL AND IS TO BE APPROVED BY THE ENGINEER.

WHEN MANHOLE IS LOCATED OUTSIDE OF THE PAVEMENT AREA, EARTH BACKFILL MAY BE USED.

CAUTION SHALL BE EXERCISED IN SETTING THE MANHOLE FRAME ON A FRESH MORTAR BED TO INSURE UNIFORM SUPPORT FOR THE FRAME.

PRECAST REINFORCED CONCRETE RISER RINGS AND DOMES SHALL COMPLY WITH THE REQUIREMENTS OF 706.02, EXCEPT FOR MINIMUM DESIGNS AND MARKING. MINIMUM WALL THICKNESS SHALL BE 5 INCHES AND CIRCULAR REINFORCEMENT SHALL BE 0.18 SQ. IN. PER FOOT MINIMUM. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 4,000 POUNDS PER SQUARE INCH. 1 1/2" HOLES FOR HANDLING MAY BE CAST IN DOMES AND RINGS.

CONCRETE BASE AND INVERT TO BE CONSTRUCTED OF CLASS "C" CONCRETE.



STEP DETAIL

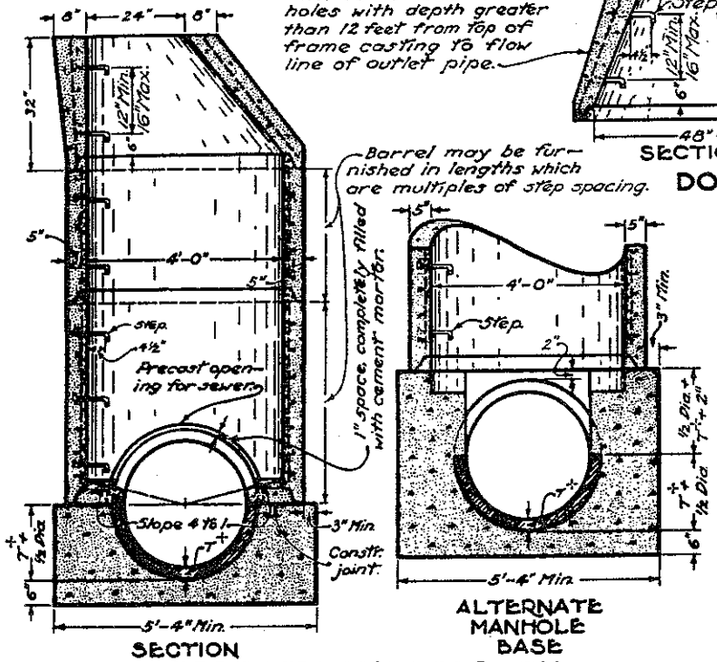
STEPS SHALL MEET THE REQUIREMENTS OF 604-OHIO STATE DEPARTMENT OF HIGHWAYS CONSTRUCTION & MATERIALS SPECIFICATIONS.

WOOD COUNTY

TYPE H-3 & L-3 PRECAST DROP MANHOLE

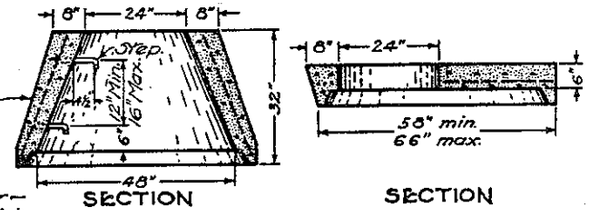
604

TYPE H-4 & L-4 MANHOLE



SECTION

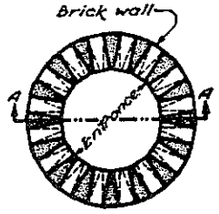
PRECAST MANHOLE ON SEWERS 42" AND UNDER



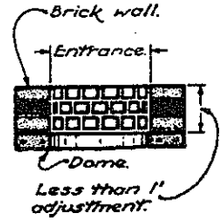
Not to be used on manholes with depth greater than 12 feet from top of frame casting to flow line of outlet pipe.

SECTION

DOME ALTERNATES

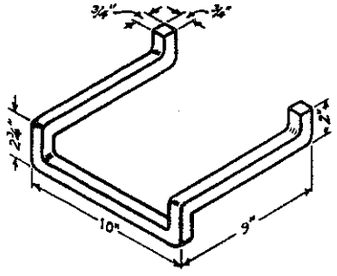


PLAN



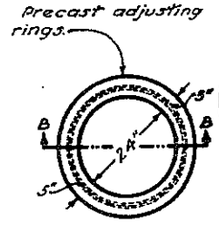
SEC. A-A

ALTERNATE MANHOLE BASE

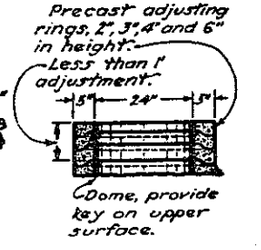


STEP DETAIL

T+ Represents thickness of concrete pipe.

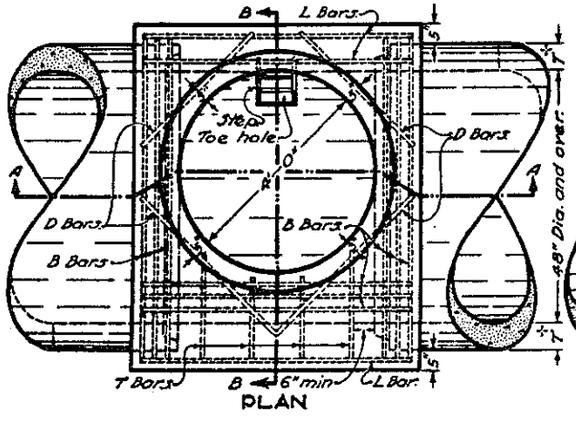


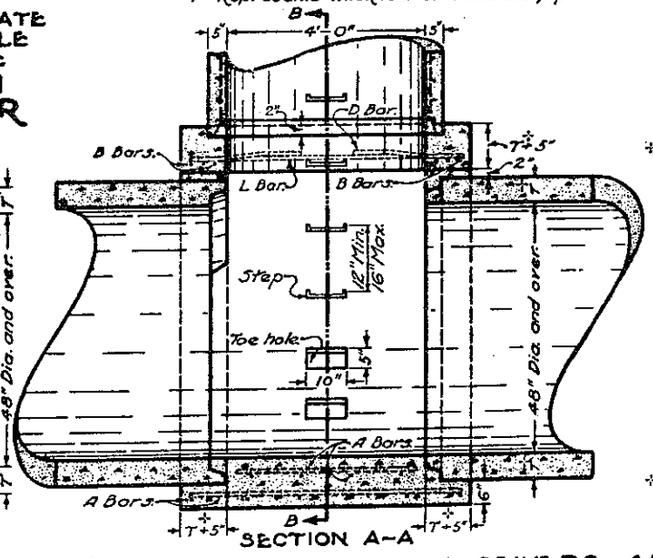
PLAN



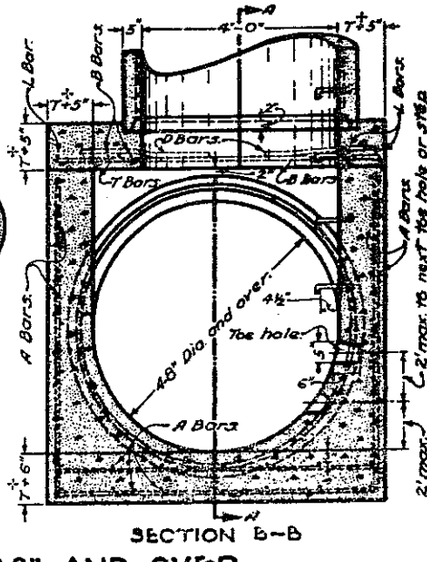
SEC. B-B

ALTERNATE METHODS OF ADJUSTING TO GRADE





SECTION A-A



SECTION B-B

CONNECTION BOX FOR PRECAST MANHOLES ON SEWERS 48" AND OVER

NOTES

Openings for the inlet and outlet sewer pipe shall be cast in the precast ring unless the manhole base is built to an elevation two inches above the top of the outlet pipe.

Openings for pipes 18" diameter or less entering the manhole above the spring line of the outlet sewer may be cut in the field provided the portion of the pipe (15" or 18" diam.) inside the manhole is cut to fit the circumference of the manhole. Pipes over 18" diameter entering the manhole above the spring line of the outlet sewer shall be connected to the manhole by a Tee connection precast with the barrel of the manhole.

All joints at pipe openings in the manhole shall be throughly caked with cement mortar or other suitable material to prevent infiltration of earth into the manhole.

MATERIALS—Concrete for the manhole base and connection box shall be Class "C".

Precast reinforced concrete riser rings and domes shall comply with the requirements of 706.02 except for Minimum Designs and Marking. Minimum wall thickness shall be 5 inches and circular reinforcement shall be 0.18 sq. in. per foot minimum. Concrete shall have a minimum strength of 4,000 pounds per square inch. 1¾" holes for handling may be cast in domes and rings. The following shall be clearly stenciled or impressed on each riser ring—

a. M H
b. The date of manufacture
c. The name or trade-mark of the manufacturer and location of the plant.

STEPS shall meet the requirements of 604.

Castings shall be as specified on Standard Drawing for H-2 and L-2 Manhole.

CONNECTION BOXES for sewers 48 inches and over in diameter shall be reinforced as shown and as specified below—

A bars shall be spaced at 12" centers in both directions.

B bars shall be spaced at 3" centers in both directions.

A, B and L bar sizes—
- ½" ϕ for 48" to 60" sewers.
- ⅝" ϕ for 66" to 78" sewers.
- ⅞" ϕ for 84" to 96" sewers.

T bars shall be ⅝" ϕ spaced at 12" centers.

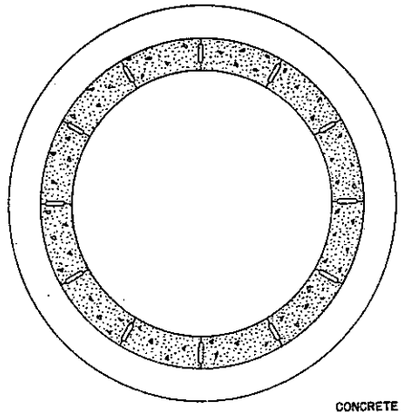
D bars shall be ½" ϕ.

Reinforcing steel shall have 2 inch clearance except where otherwise specified.

ADJUSTING RINGS, precast, shall be reinforced with one ¼" 3 gage wire or equivalent.

WOOD COUNTY

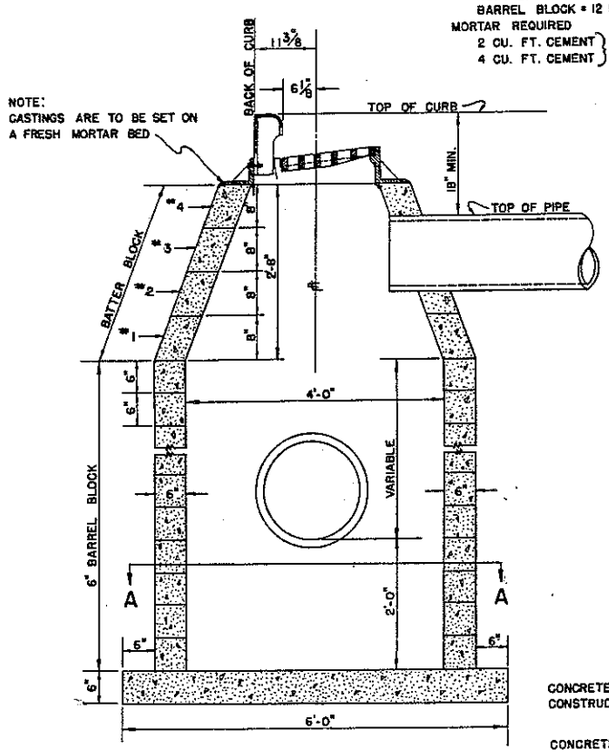
TYPE H-4 & L-4
PRECAST MANHOLE
604



SEC. A-A

CONCRETE BLOCK REQUIRED
NO. 1 BATTER BLOCK = 10
NO. 2 BATTER BLOCK = 9
NO. 3 BATTER BLOCK = 8
NO. 4 BATTER BLOCK = 8
BARREL BLOCK = 12 PER COURSE

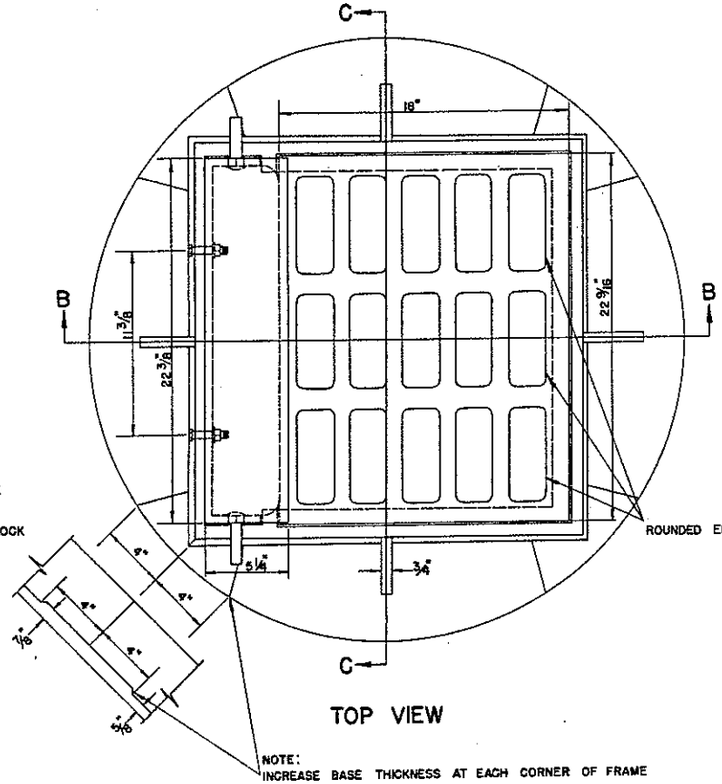
MORTAR REQUIRED
2 CU. FT. CEMENT } PER 100 BLOCK
4 CU. FT. CEMENT }



SECTIONAL ELEVATION

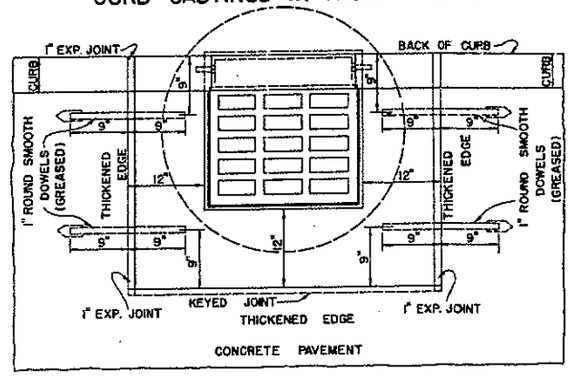
CONCRETE BASE TO BE CONSTRUCTED OF CLASS "C" CONCRETE

CONCRETE REQUIRED FOR BASE
0.524 CUBIC YARD



TOP VIEW

BOX DETAIL- TO BE USED FOR ALL CURB CASTINGS IN RIGID PAVEMENT



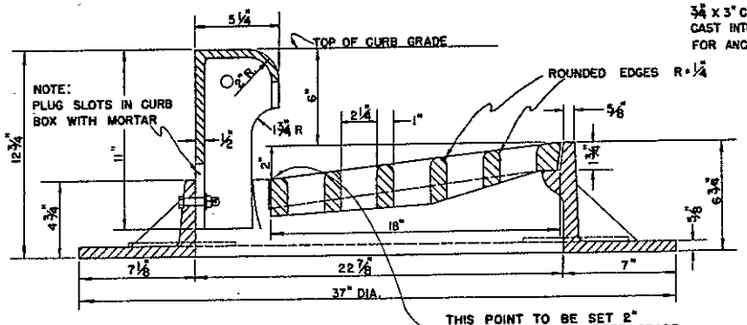
NOTES:

BACKFILL AROUND STRUCTURE SHALL BE MADE WITH GRANULAR MATERIAL. THE FILL SHALL BE THOROUGHLY TAMPED AND THEN INUNDATED BEFORE PLACING PAVEMENT. GRANULAR MATERIAL IS TO BE UNDERSTOOD TO MEAN SAND, SCREENING, GRAVEL, OR SIMILAR SUITABLE MATERIAL AND IS TO BE APPROVED BY THE ENGINEER.

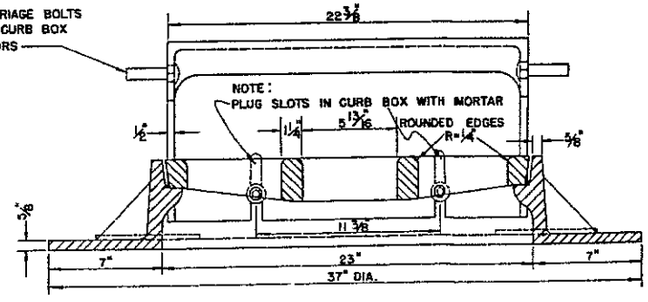
MASONRY IS TO BE CONSTRUCTED OF CONCRETE BLOCK SET IN A FULL BED OF PORTLAND CEMENT MORTAR.

CAUTION SHALL BE EXERCISED IN SETTING THE BASIN CASTING ON A FRESH MORTAR BED TO INSURE UNIFORM SUPPORT FOR THE CASTING.

"NO SUMP" DEFINITION - WHERE THE TERM "NO SUMP" IS USED, THE SUMP SHALL BE OMITTED AND THE BOTTOM OF THE STRUCTURE SHALL BE CHANNELED SIMILAR TO A MANHOLE BOTTOM.



SEC. B-B



SEC. C-C

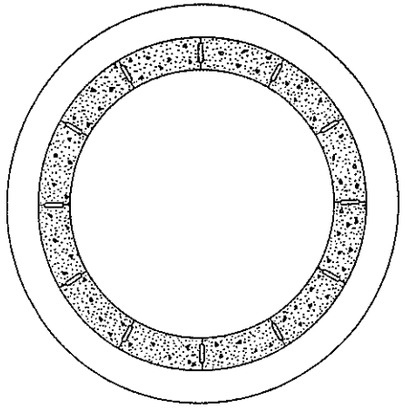
CURB INLET CASTING

NOTE:
THIS CASTING IS NOT TO BE USED WITH "TYPE E" MOUNTABLE CURB.

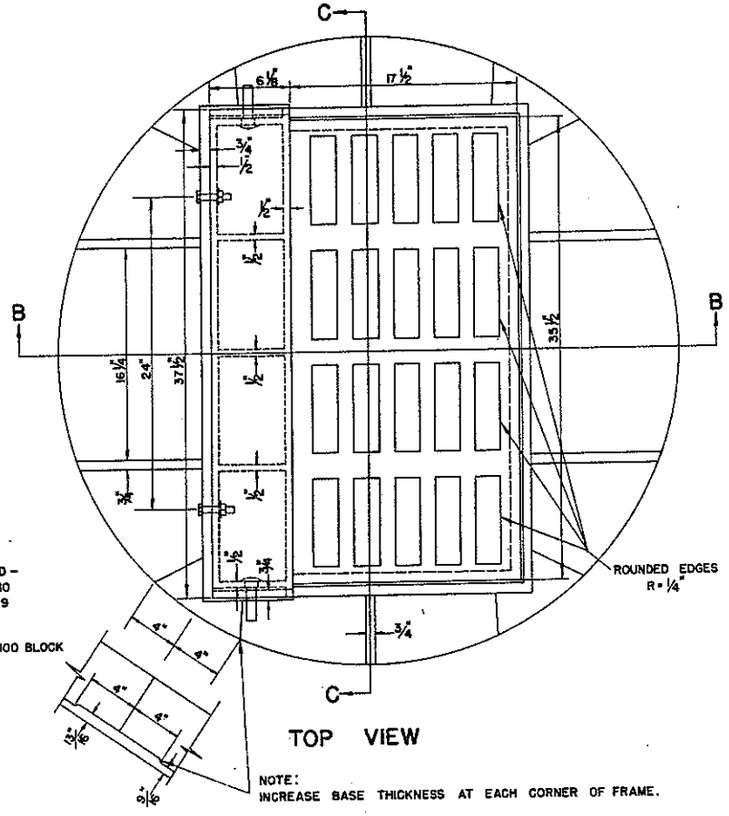
WOOD COUNTY

TYPE "A-1"
CONCRETE BLOCK
CATCH BASIN

604



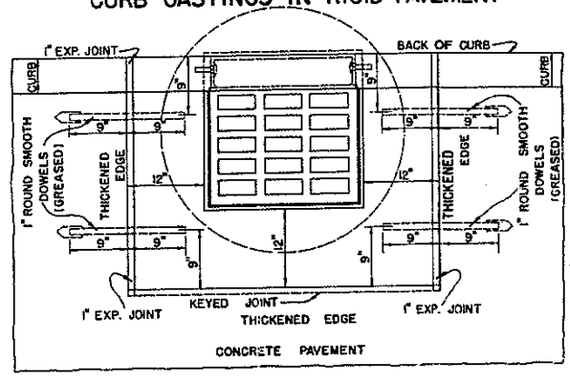
SEC. A-A



TOP VIEW

NOTE:
INCREASE BASE THICKNESS AT EACH CORNER OF FRAME.

BOX DETAIL- TO BE USED FOR ALL CURB CASTINGS IN RIGID PAVEMENT



NOTES:

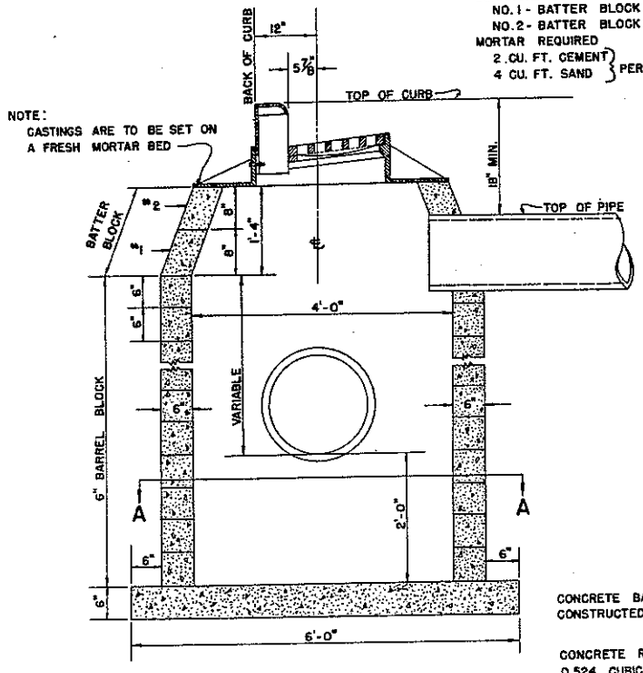
BACKFILL AROUND STRUCTURE SHALL BE MADE WITH GRANULAR MATERIAL. THE FILL SHALL BE THOROUGHLY TAMPED AND THEN INUNDATED BEFORE PLACING PAVEMENT. GRANULAR MATERIAL IS TO BE UNDERSTOOD TO MEAN SAND, SCREENING, GRAVEL, OR SIMILAR SUITABLE MATERIAL AND IS TO BE APPROVED BY THE ENGINEER.

MASONRY IS TO BE CONSTRUCTED OF CONCRETE BLOCK SET IN A FULL BED OF PORTLAND CEMENT MORTAR.

CAUTION SHALL BE EXERCISED IN SETTING THE BASIN CASTING ON A FRESH MORTAR BED TO INSURE UNIFORM SUPPORT FOR THE CASTING.

"NO SUMP" DEFINITION - WHERE THE TERM "NO SUMP" IS USED, THE SUMP SHALL BE OMITTED AND THE BOTTOM OF THE STRUCTURE SHALL BE CHANNELED SIMILAR TO A MANHOLE BOTTOM.

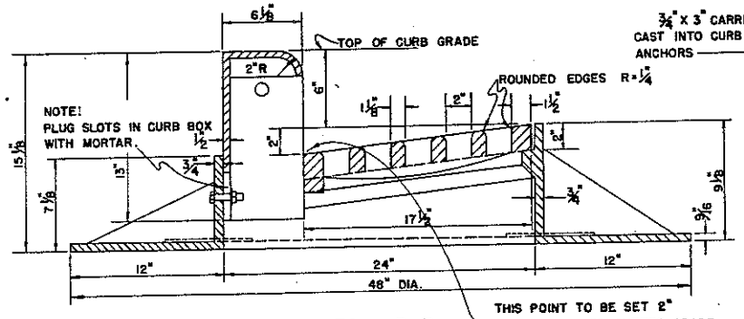
CONCRETE BLOCK REQUIRED -
NO. 1 - BATTER BLOCK = 10
NO. 2 - BATTER BLOCK = 9
MORTAR REQUIRED
2 CU. FT. CEMENT
4 CU. FT. SAND
} PER 100 BLOCK



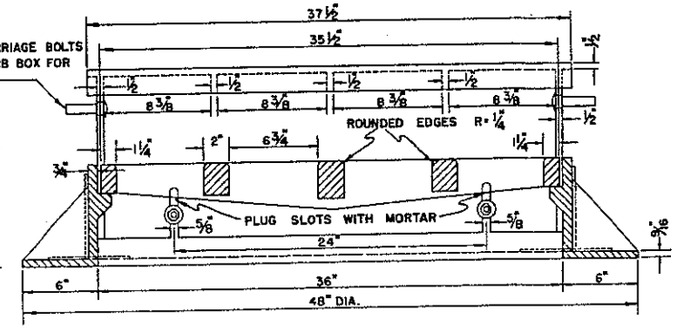
SECTIONAL ELEVATION

CONCRETE BASE TO BE CONSTRUCTED OF CLASS "C" CONCRETE

CONCRETE REQUIRED FOR BASE
0.524 CUBIC YARD



SEC. B-B



SEC. C-C

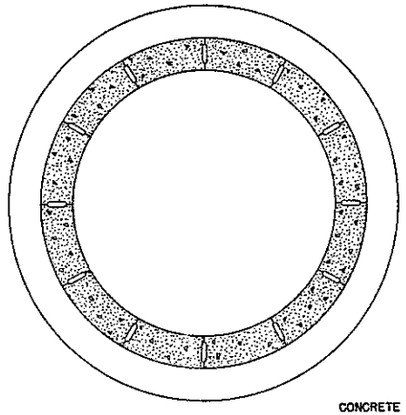
CURB INLET CASTING.

NOTE:
THIS CASTING IS NOT TO BE USED WITH "TYPE E" MOUNTABLE CURB.

WOOD COUNTY

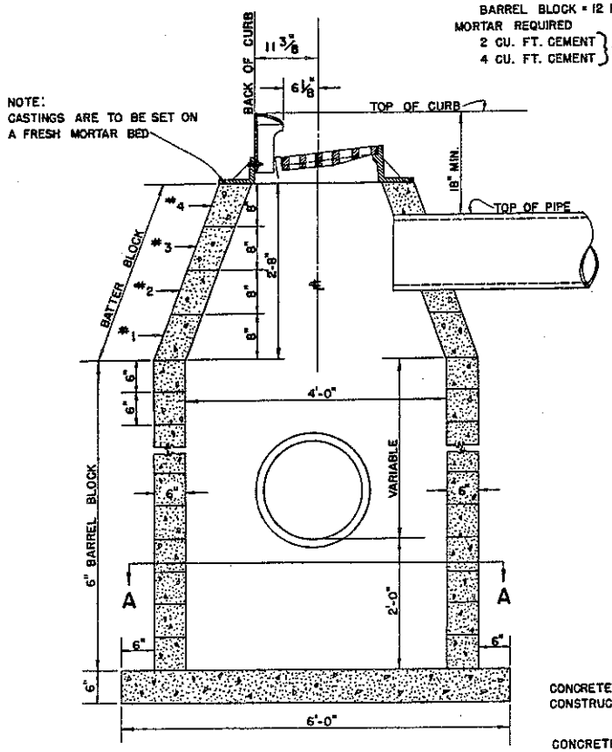
TYPE "A-2"
CONCRETE BLOCK
CATCH BASIN

604

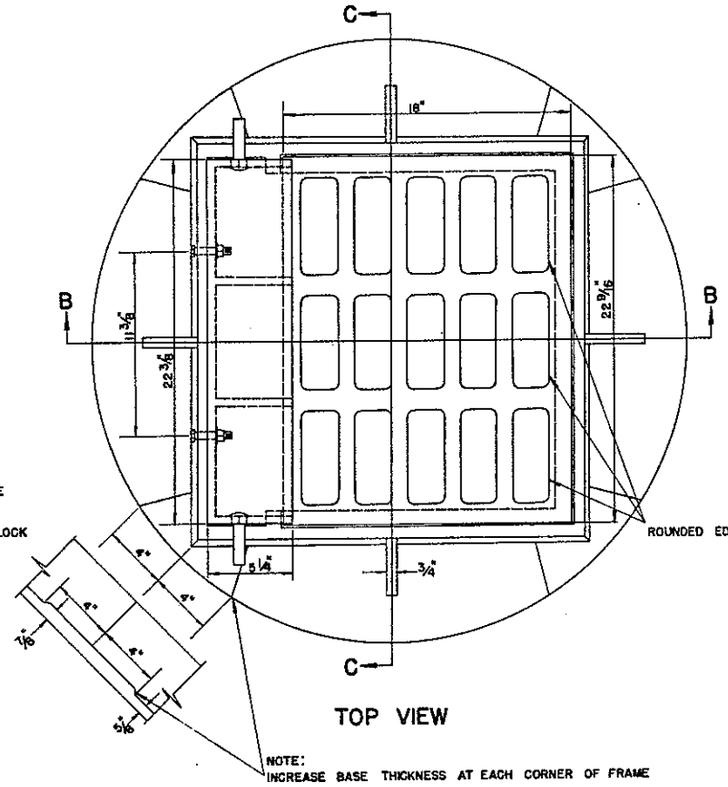


SEC. A-A

CONCRETE BLOCK REQUIRED
NO. 1 BATTER BLOCK = 10
NO. 2 BATTER BLOCK = 9
NO. 3 BATTER BLOCK = 8
NO. 4 BATTER BLOCK = 8
BARREL BLOCK = 12 PER COURSE
MORTAR REQUIRED
2 CU. FT. CEMENT } PER 100 BLOCK
4 CU. FT. CEMENT }

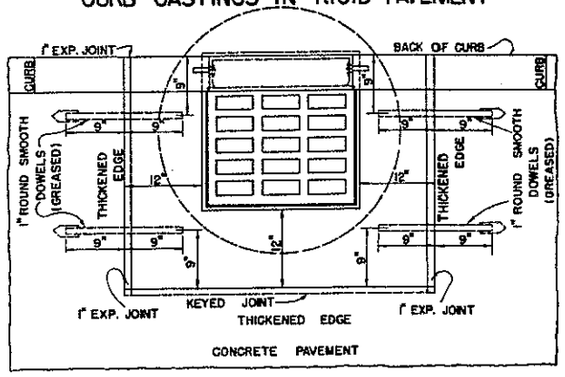


SECTIONAL ELEVATION



TOP VIEW

BOX DETAIL- TO BE USED FOR ALL CURB CASTINGS IN RIGID PAVEMENT



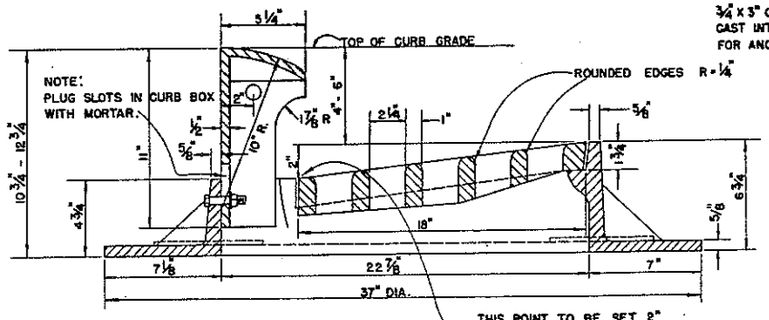
NOTES:

BACKFILL AROUND STRUCTURE SHALL BE MADE WITH GRANULAR MATERIAL. THE FILL SHALL BE THOROUGHLY TAMPED AND THEN INUNDATED BEFORE PLACING PAVEMENT. GRANULAR MATERIAL IS TO BE UNDERSTOOD TO MEAN SAND, SCREENING, GRAVEL, OR SIMILAR SUITABLE MATERIAL AND IS TO BE APPROVED BY THE ENGINEER.

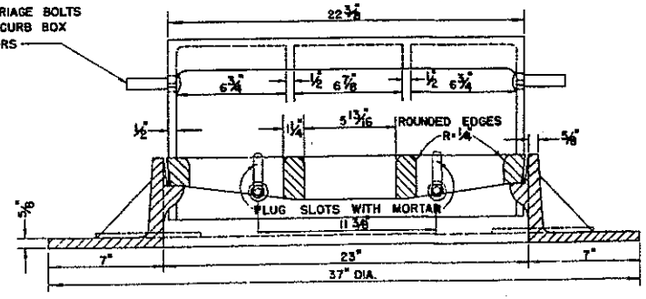
MASONRY IS TO BE CONSTRUCTED OF CONCRETE BLOCK SET IN A FULL BED OF PORTLAND CEMENT MORTAR.

CAUTION SHALL BE EXERCISED IN SETTING THE BASIN CASTING ON A FRESH MORTAR BED TO INSURE UNIFORM SUPPORT FOR THE CASTING.

"NO SUMP" DEFINITION - WHERE THE TERM "NO SUMP" IS USED, THE SUMP SHALL BE OMITTED AND THE BOTTOM OF THE STRUCTURE SHALL BE CHANNELED SIMILAR TO A MANHOLE BOTTOM.



SEC. B-B



SEC. C-C

CONCRETE BASE TO BE CONSTRUCTED OF CLASS "C" CONCRETE

CONCRETE REQUIRED FOR BASE
0.524 CUBIC YARD

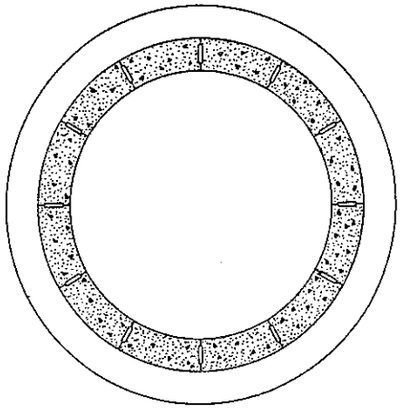
CURB INLET CASTING

NOTE:
THIS CASTING [redacted] MAY BE USED WITH THE "TYPE D" ROLLED CURB.

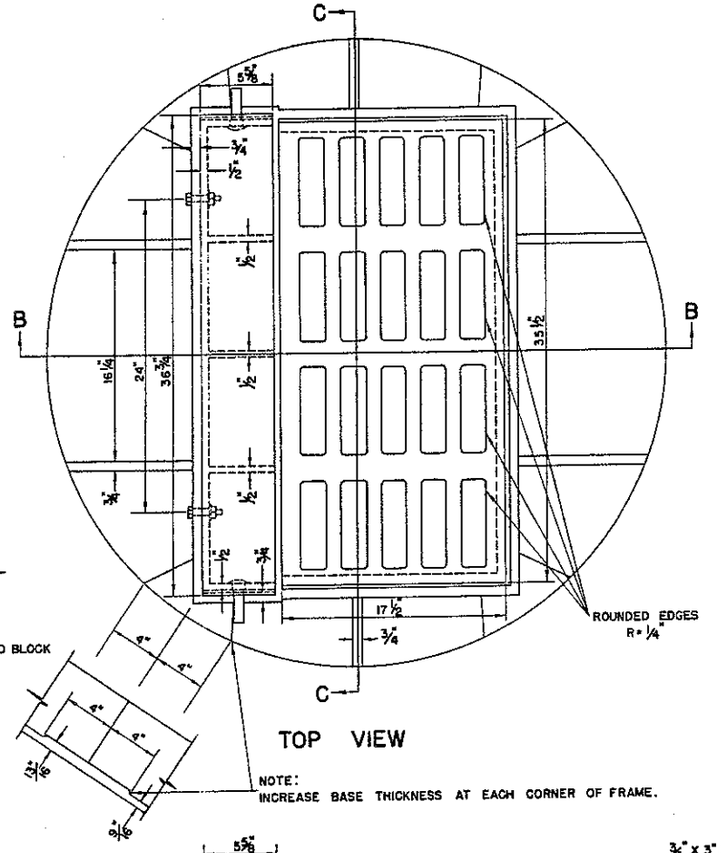
WOOD COUNTY

TYPE "A-3"
CONCRETE BLOCK
CATCH BASIN

604

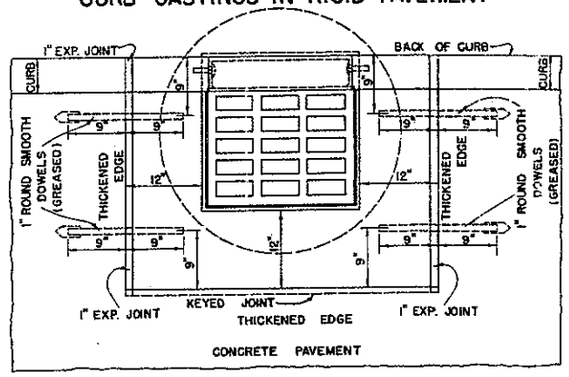


SEC. A-A

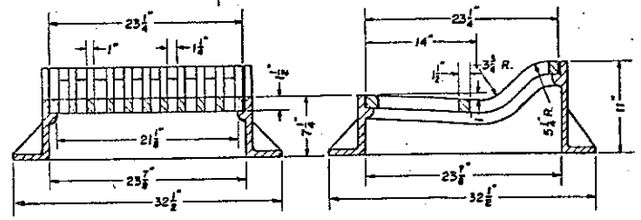


TOP VIEW

BOX DETAIL- TO BE USED FOR ALL CURB CASTINGS IN RIGID PAVEMENT

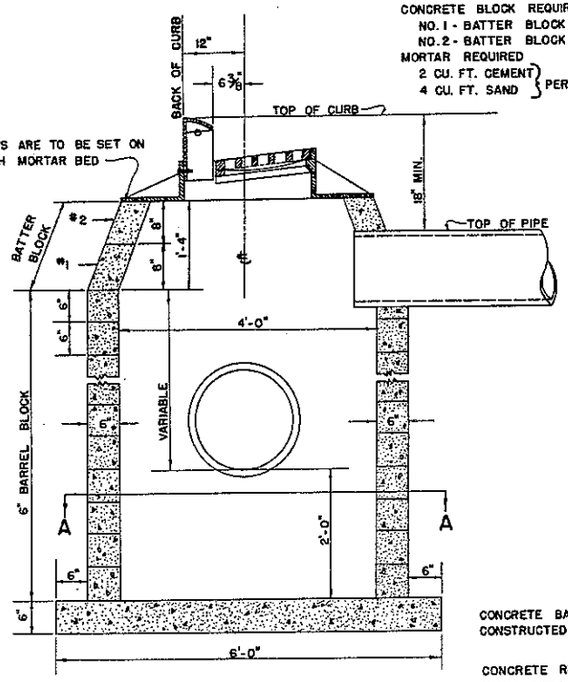


Inlet for Roll Type Curb
R-3501-N



CONCRETE BLOCK REQUIRED—
NO. 1 - BATTER BLOCK = 10
NO. 2 - BATTER BLOCK = 9
MORTAR REQUIRED
2 CU. FT. CEMENT
4 CU. FT. SAND
} PER 100 BLOCK

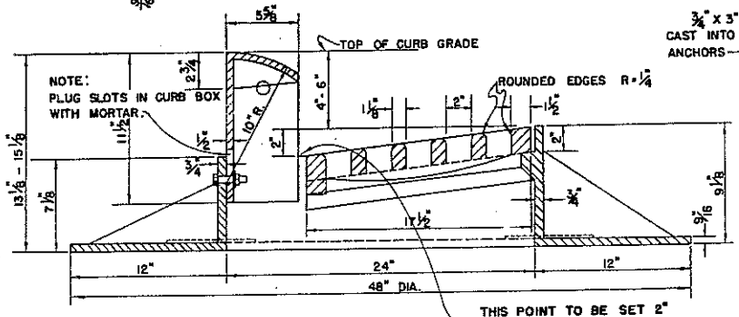
NOTE:
CASTINGS ARE TO BE SET ON A FRESH MORTAR BED



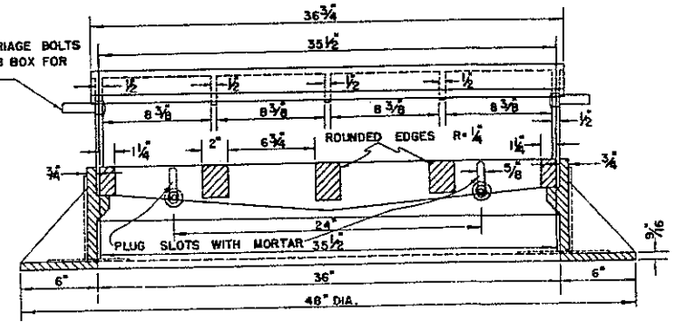
SECTIONAL ELEVATION

CONCRETE BASE TO BE CONSTRUCTED OF CLASS "C" CONCRETE

CONCRETE REQUIRED FOR BASE
0.524 CUBIC YARD



SEC. B-B



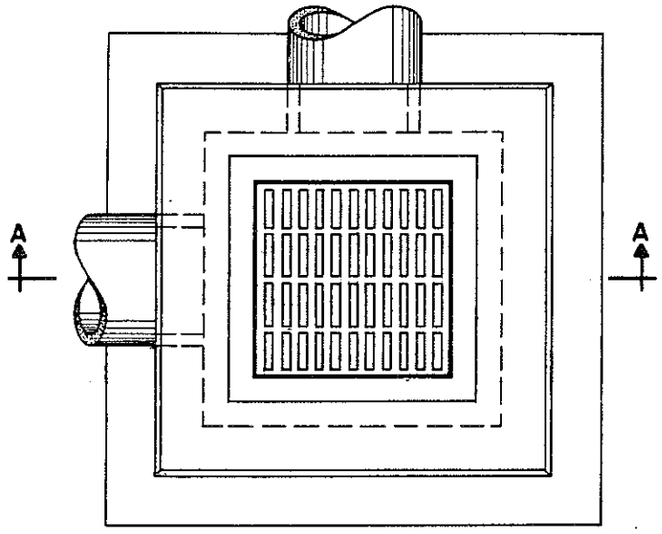
SEC. C-C

CURB INLET CASTING

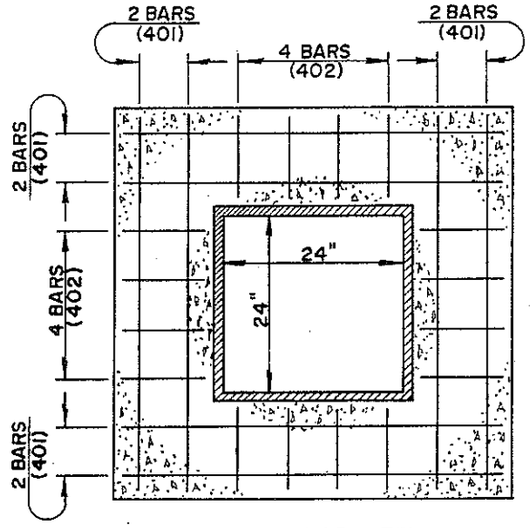
NOTE:
THIS CASTING [redacted] MAY BE USED WITH THE "TYPE D" ROLLED CURB.

WOOD COUNTY

TYPE "A-4"
CONCRETE BLOCK
CATCH BASIN
604



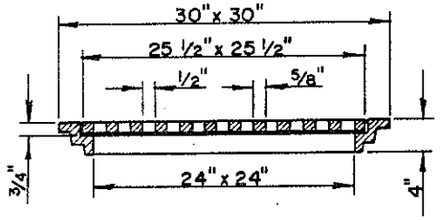
PLAN



PRECAST TOP DETAIL

REINFORCING STEEL SCHEDULE					
MARK	QUAN.	SIZE	LENGTH	WEIGHT	SHAPE
401	8	1/2" Ø	3'-10"	10.24	STRT.
402	16	1/2" Ø	8"	7.13	STRT.
			TOTAL	17.37	

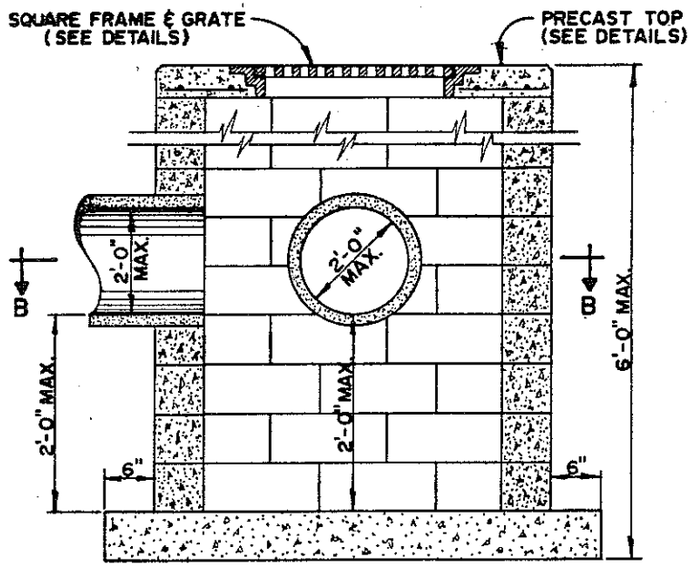
NOTE: ALL BARS SHALL BE SPACED 6" c/c



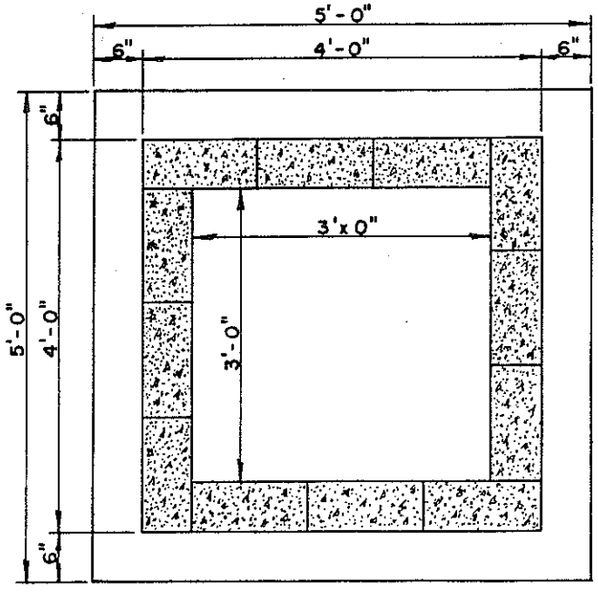
FRAME & GRATE DETAIL

DITCH INLET
NEENAH FOUNDRY CO.
R-6670-E OR EQUAL
APPROX. WEIGHT 175*

PAVEMENT AREA
R-6672-F OR EQUAL
APPROX. WEIGHT 300*



SECTION A-A



SECTION B-B

NOTES

CHAMFER all exposed corners 3/4 of an inch.

CONCRETE BASE & INVERT shall be constructed of class "C" concrete.

CATCH BASINS located within the pavement area shall be backfilled with granular material and tamped in place and then inundated.

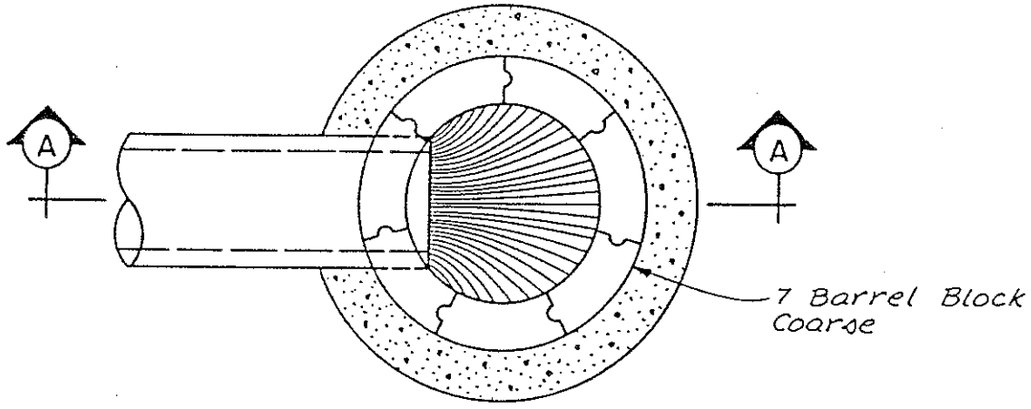
GRANULAR MATERIAL is construed to mean sand, screenings, gravel or similar suitable material and is to be approved by the Engineer.

CATCH BASINS located outside of the pavement area shall be backfilled with earth material.

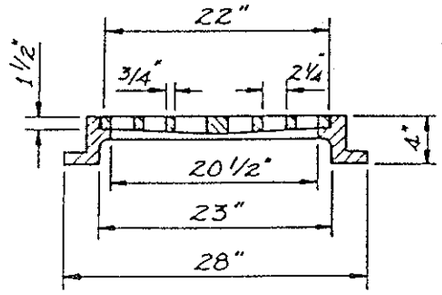
"NO SUMP" DEFINITION - where the term "NO SUMP" is used the 2' sump shall be omitted and the invert of the structure shall be channeled similar to a manhole bottom.

WOOD COUNTY
STANDARD CONSTRUCTION DRAWING

CATCH BASIN TYPE "W"

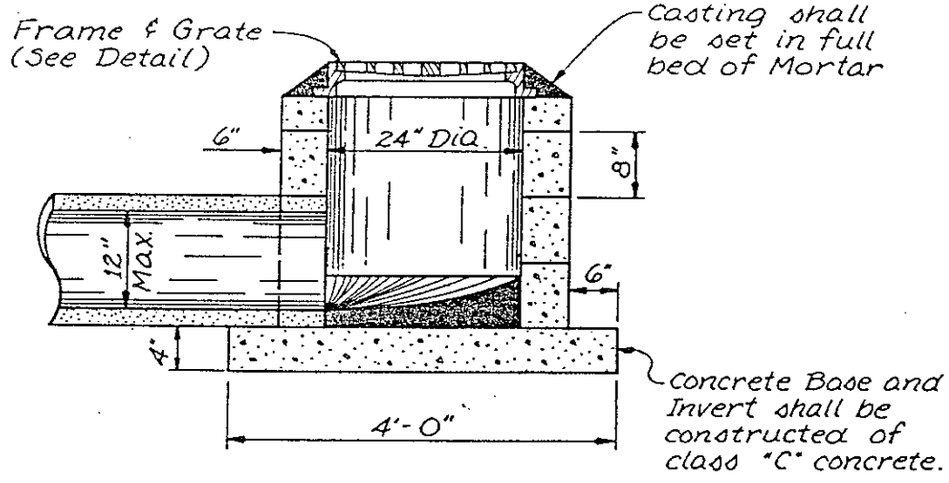


PLAN



FRAME & GRATE DETAIL

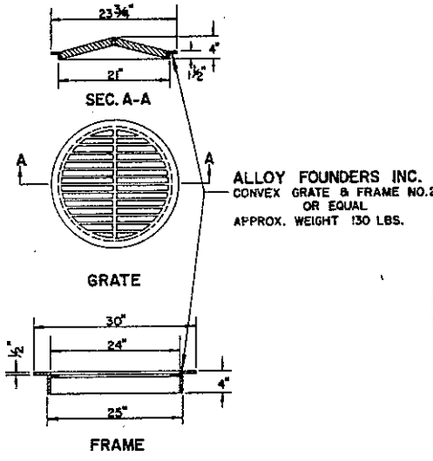
East Jordan # 1490
Neenah # 2510



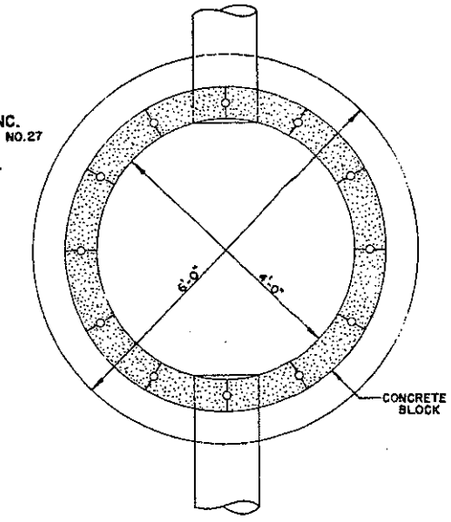
SECTION A - A

WOOD COUNTY
STANDARD CONSTRUCTION DRAWING

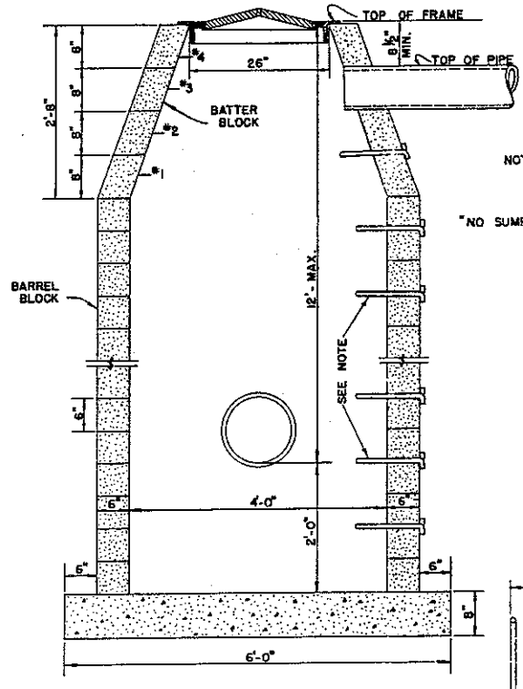
CATCH BASIN TYPE "W-2D"



ALLOY FOUNDERS INC.
CONVEX GRATE & FRAME NO.27
OR EQUAL
APPROX. WEIGHT 130 LBS.



PLAN



SECTIONAL ELEVATION

NOTE: WHEN THE DEPTH OF THE STRUCTURE FROM THE TOP OF THE FRAME TO THE FLOOR IS IN EXCESS OF 4 FEET, STEPS WILL BE REQUIRED.

"NO SUMP" DEFINITION - WHERE THE TERM "NO SUMP" IS USED, THE 2' SUMP SHALL BE OMITTED AND THE BOTTOM SHALL BE CHANNELED SIMILAR TO A MANHOLE BOTTOM.

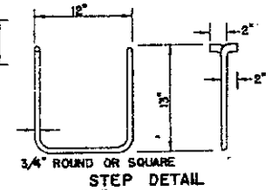
MATERIAL REQUIREMENTS

CONCRETE BLOCK REQUIRED
NO. 1 BATTER BLOCK = 10
NO. 2 " " = 9
NO. 3 " " = 8
NO. 4 " " = 6
BARREL BLOCK = 12 PER COURSE

MORTAR REQUIRED PER 100 BLOCK
2 CU. FT. CEMENT
4 CU. FT. SAND

CONCRETE BASE TO BE CONSTRUCTED OF CLASS "C" CONCRETE

CONCRETE REQUIRED FOR BASE = 0.698 CUBIC YARD.



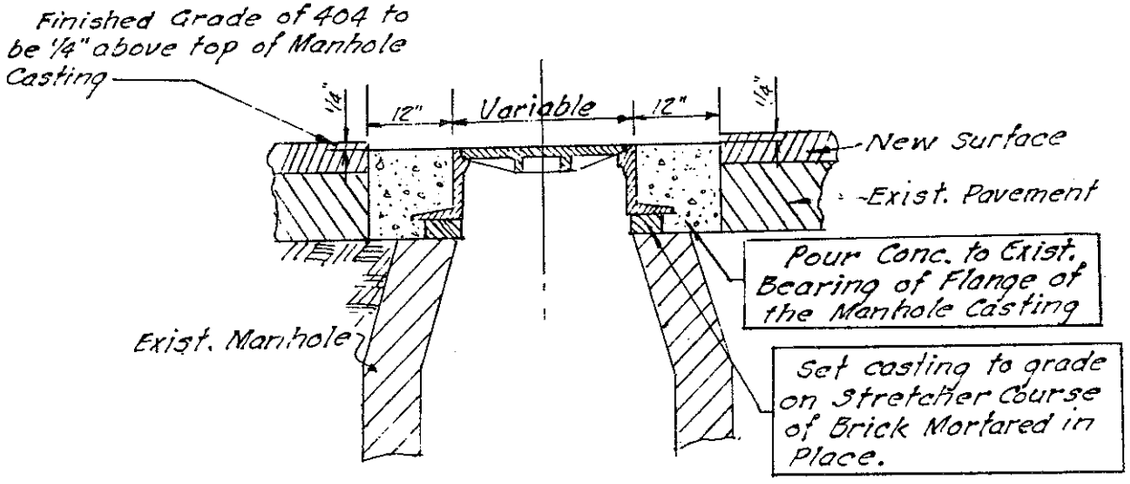
STEP DETAIL

STEPS SHALL MEET THE REQUIREMENTS OF 604-OHIO STATE DEPARTMENT OF HIGHWAYS CONSTRUCTION & MATERIALS SPECIFICATIONS.

WOOD COUNTY

TYPE "D" CATCH BASIN

604



DETAIL OF ADJUSTED CASTINGS

RESET CASTING BY THE FOLLOWING METHOD

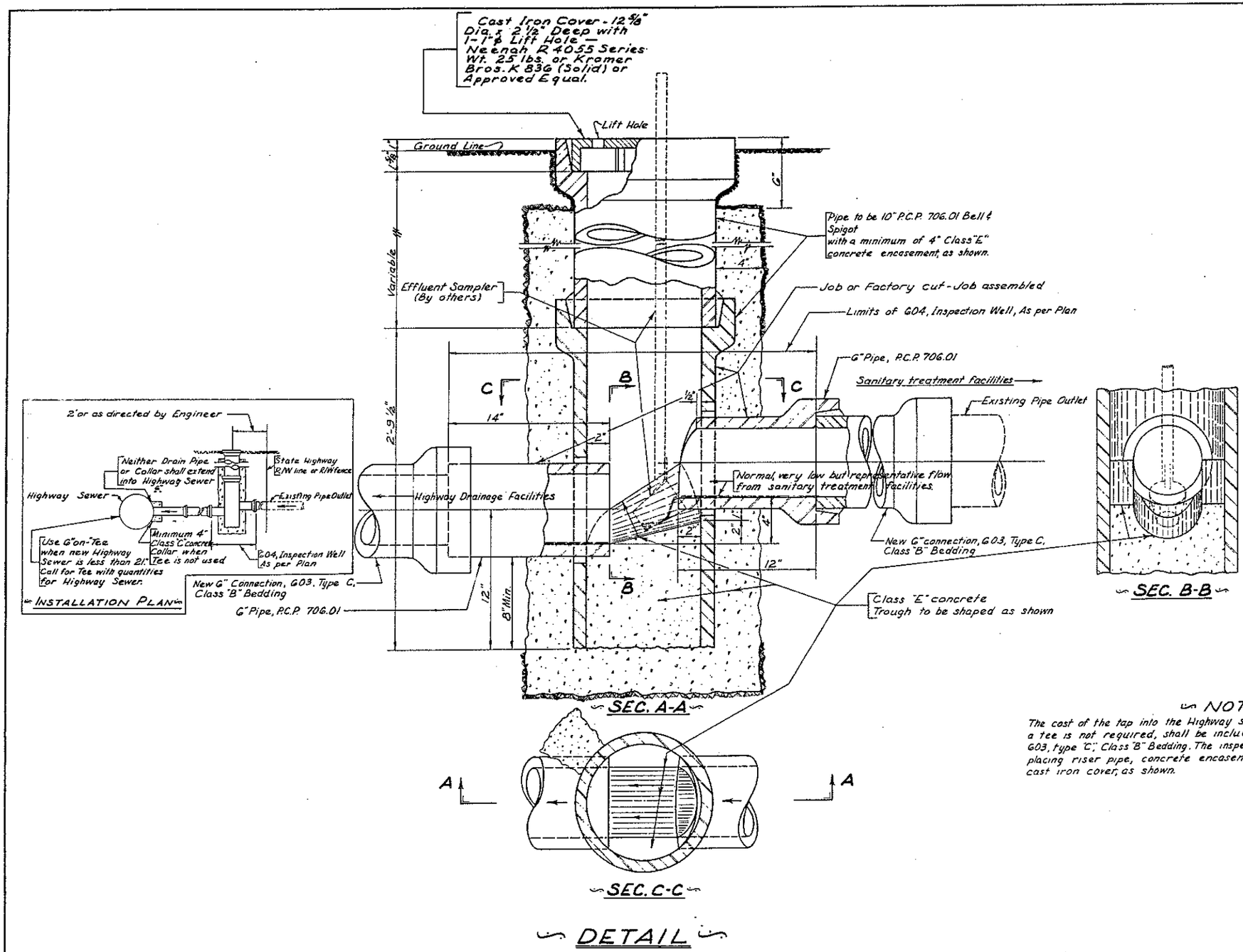
Step 1. The Asphalt Concrete, including leveling, binder and wearing courses, shall be laid continuously over the casting. Special Precautions shall be taken by the Contractor, the Engineer, and the Inspectors, for the marking & re-establishment of the locations of the castings.

STEP 2. After completely placing and compacting the Asphalt Concrete, one-half the width of the street shall be barricaded off. The new asphalt concrete surface and the old pavement shall be neatly cut away with air spades and removed in a circular area of specified diameter around each casting, down to the existing bearing of the flange of the castings as detailed.

STEP 3. The casting shall then be raised to 1/4" below the new asphalt conc. surface and set to grade. The excavated area around the casting shall then be filled and compacted to 1/4" below the new surface with high-early strength concrete as specified by the Engineer. The concrete shall be allowed to cure at least twenty-four (24) hours before this side of the street is opened to traffic.

STEP 4. After step 3 has been completed the remaining one-half the width of the street shall be completed in the same manner as outlined in Step 2 and 3 above.

WOOD COUNTY
ADJUST MANHOLE CASTINGS 604



DETAIL

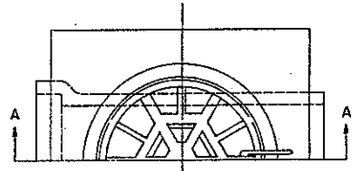
NOTE

The cost of the tap into the Highway sewer and the concrete collar, when a tee is not required, shall be included in the Unit price bid for the 6", 603, type "C", Class "B" Bedding. The inspection well shall include furnishing and placing riser pipe, concrete encasement, shaped concrete trough and cast iron cover, as shown.

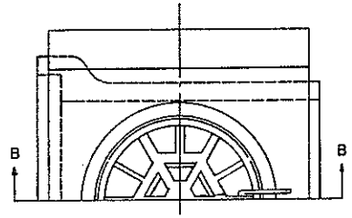
WOOD COUNTY

INSPECTION WELL

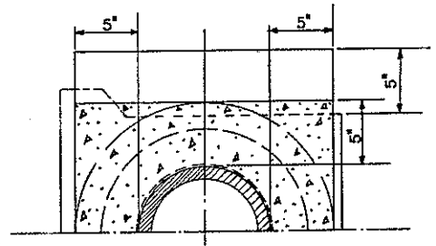
604



HALF-PLAN

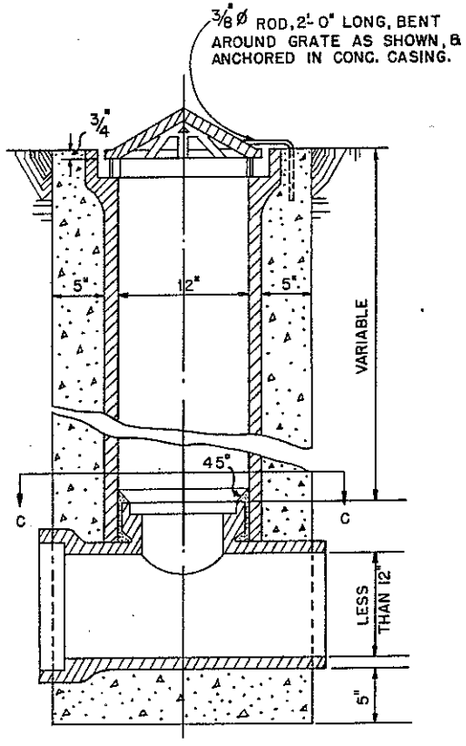


HALF-PLAN



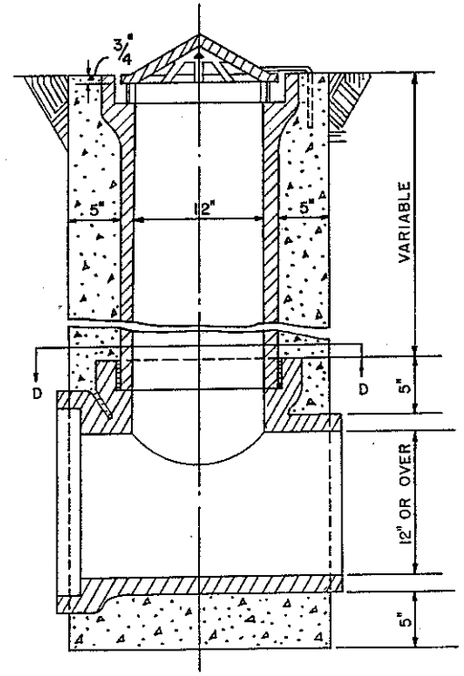
SEC. D-D

CONCRETE CASING FOR RISER MAY BE SQUARE, ROUND OR HEXAGONAL IN SHAPE.



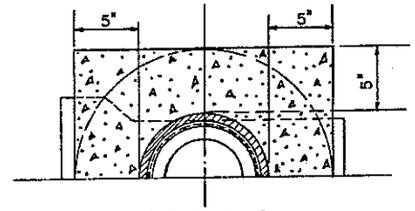
SEC.A-A

RISER PIPE IN ALL CASES SHALL BE 12" IN DIAMETER REGARDLESS OF SIZE OF CARRYING LINE.



SEC.B-B

CONCRETE TO BE CLASS "C"

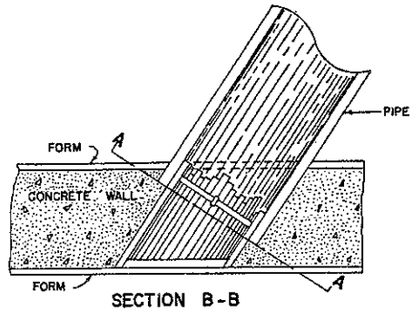


SEC. C-C

WOOD COUNTY

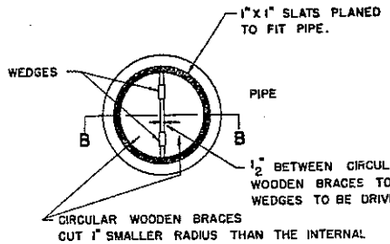
SIDE DITCH INLET

604



SECTION B-B
THROUGH WALL & PIPE

BARRELING CONCRETE WALL



SECTION A-A

LAYING PIPE

NOTES

BARRELING OUT CONCRETE WALL

WHEN NECESSARY THAT THE PIPE BE BARRELED OUT TO THE REQUIRED LENGTHS, IT SHALL BE DONE ACCORDING TO THE DETAILS SHOWN HEREON.

GRADE STAKES

GRADE STAKES SHALL BE SET AT THE FOLLOWING INTERVALS:
FOR GRADES LESS THAN 0.70% - 25 FEET
FOR GRADES OF 0.70% & OVER - 50 FEET

GRADE POLE

THE GRADE POLE SHALL BE A STRAIGHT POLE DRESSED WITH CORNERS ROUNDED, SIZE DEPENDING ON THE LENGTH BUT APPROXIMATELY 1" x 2". THE POLE SHALL BE EQUIPED WITH A METAL BRACKET ON THE BOTTOM WITH A PROJECTING LENGTH OF 12" NOTCHES SHALL BE CUT ON THE POLE FOR THE DEPTH OF THE FLOW LINE BELOW THE GRADE STRING & FOR THE DEPTH OF THE TRENCH.

POSSUM

POSSUM OR SWAB IS FOR WIPING OUT ANY EXCESS MORTAR FROM THE INSIDE OF THE PIPE & SHALL BE MADE AND USED AS FOLLOWS: THE STEM IS 1"x1"x 6'-0" & MADE OF STRONG WOOD. THE BURLAP SACK SHALL BE FILLED AROUND THE STEM IN SUCH A MANNER SO THAT THE STEM WILL REMAIN PRACTICALLY CENTRAL WHEN THE SWAB IS IN THE PIPE & THE STEM IS UNSUPPORTED. THE SWAB, WHEN PULLED AHEAD, SHALL DRAG THE ENTIRE CIRCUMFERENCE OF THE PIPE SO THAT ANY MORTAR WHICH HAS ENTERED AT THE JOINTS WILL BE DRAGGED AHEAD. THE LENGTH OF THE STEM SHALL BE SUCH THAT THE SWAB WILL NOT PASS A JOINT WHERE THE BACKFILL HAS NOT BEEN TAMPED. AFTER EVERY TENTH PIPE LAYED, THE SWAB SHALL BE REMOVED & CLEANED.

CONNECTION OF EXISTING DRAINS TO NEW OR EXISTING HIGHWAY SEWERS 21" & UNDER

WHERE ANY LATERAL PIPE DRAIN INTERSECTS A HIGHWAY SEWER THAT IS 21" OR LESS, A TEE OR A WYE SHALL BE PROVIDED IN THE HIGHWAY SEWER SO THAT THE LATERAL DRAIN CAN BE CONNECTED.

CONNECTION OF EXISTING DRAINS TO NEW OR EXISTING HIGHWAY SEWERS 24" & OVER

WHERE ANY LATERAL PIPE DRAIN INTERSECTS A 24" (OR OVER) HIGHWAY SEWER AND IS OVER ⅓ OF THE DIAMETER OF THE HIGHWAY SEWER, A MANHOLE SHALL BE REQUIRED. WHEN THE DIAMETER OF ANY LATERAL PIPE DRAIN IS EITHER ⅓ OR LESS THAN THE DIAMETER OF THE HIGHWAY SEWER, THEN IT SHALL BE CONNECTED IN THE FOLLOWING MANNER.

A NEAT HOLE OF THE SAME DIAMETER AS THE INSIDE DIAMETER OF THE LATERAL EXISTING PIPE TO BE CONNECTED SHALL BE CUT INTO THE NEW SEWER PIPE, WHERE DIRECTED BY THE ENGINEER.

THE BOTTOM OF THE HOLE SHALL THEN BE ENLARGED JUST ENOUGH TO PROVIDE ADEQUATE SUPPORT FOR THE LATERAL PIPE.

THE LATERAL PIPE SHALL THEN BE NEATLY TRIMMED SO THAT NO PORTION OF IT EXTENDS INTO THE BORE OF THE NEW SEWER PIPE.

THE JOINT AT THE INTERSECTION OF THE TWO PIPES SHALL THEN BE TIGHTLY SEALED WITH A 1:2 PORTLAND CEMENT MORTAR COLLAR.

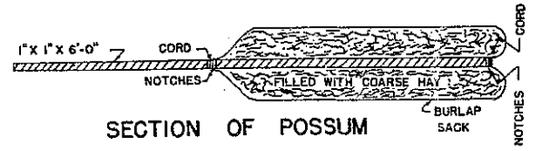
ALL OF THE ABOVE SHALL BE DONE IN A MANNER SATISFACTORY TO THE ENGINEER.

COMPENSATION FOR ALL LABOR, MATERIAL & ANY PIPE NECESSARY TO MAKE SUCH CONNECTIONS SHALL BE CONSIDERED TO BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR 603 CONDUIT.

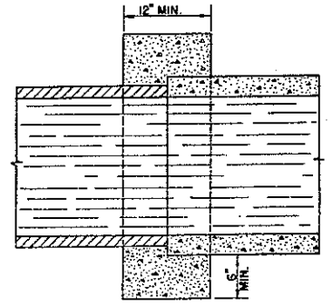
PIPE JOINTS

BELL & SPIGOT JOINT

TONGUE & GROOVE JOINT



SECTION OF POSSUM



CLASS "E" CONCRETE COLLAR, 6" MINIMUM THICKNESS, INCLUDED IN PRICE BID FOR PIPE.

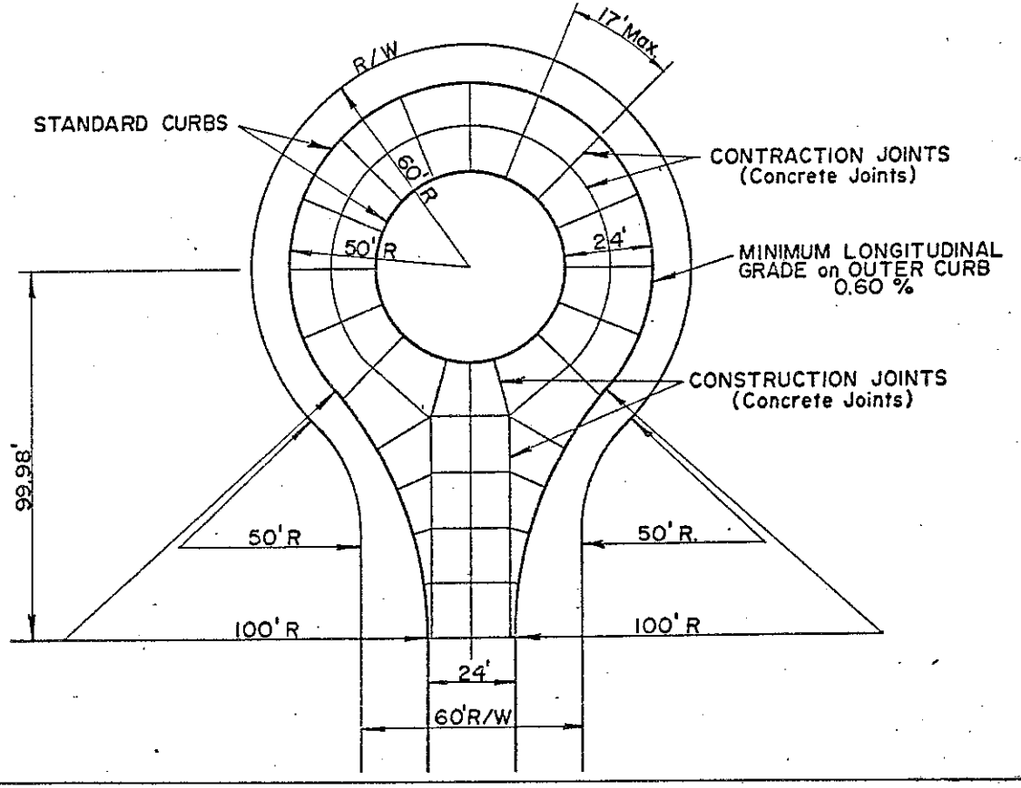
BUTT JOINT

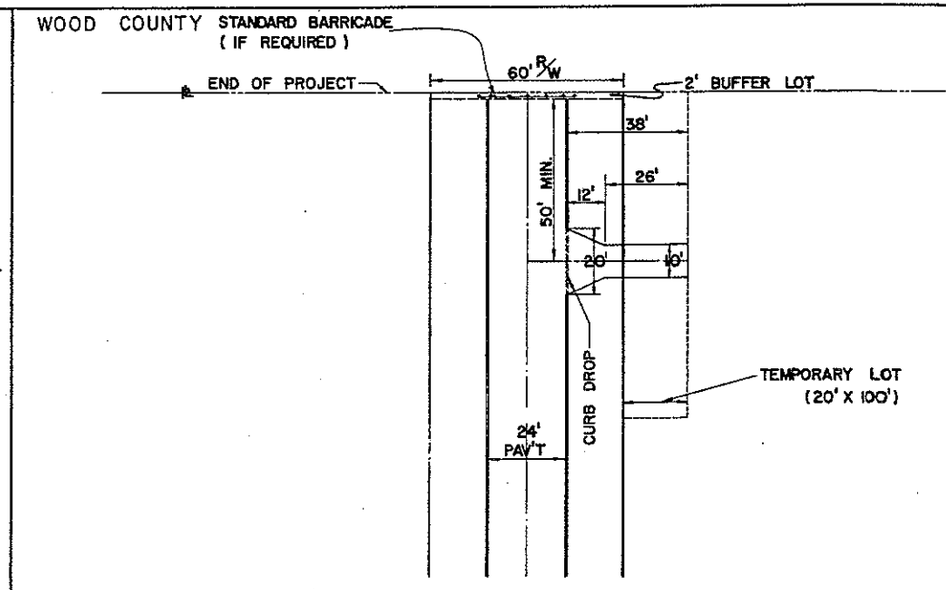
NOTE:
BUTT JOINTS ARE TO BE USED ONLY UPON PERMISSION OF THE ENGINEER.

WOOD COUNTY

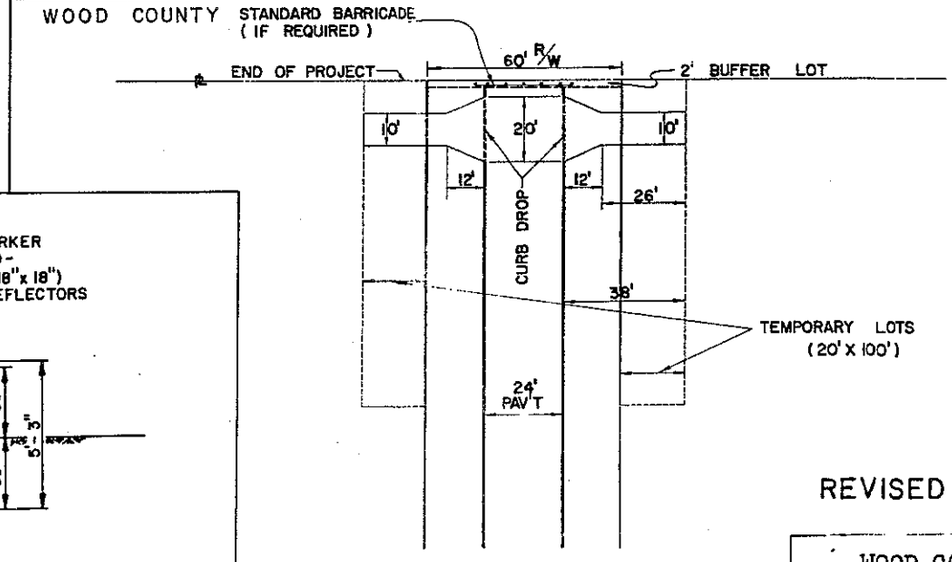
STORM SEWERS & PIPE JOINTS
603

CUL-DE-SAC

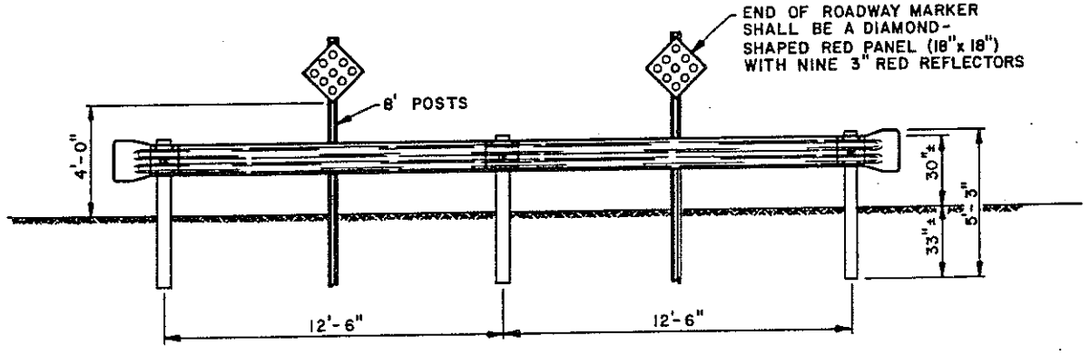




TURNAROUND
TYPE "A"



TURNAROUND
TYPE "B"



WOOD COUNTY STANDARD BARRICADE

REVISED 8/1/86

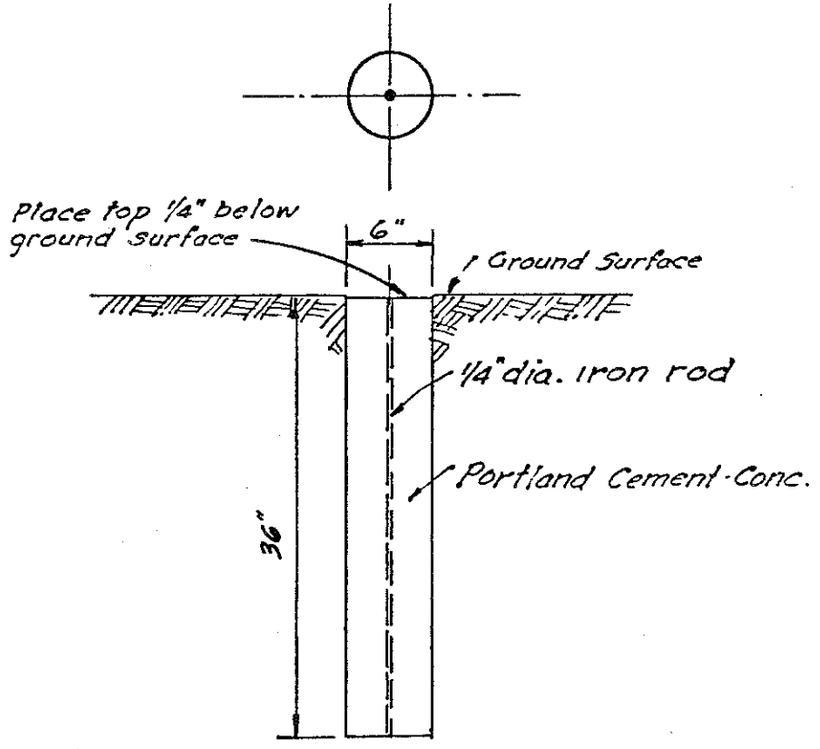
WOOD COUNTY

CUL-DE-SAC,
TURNAROUNDS
& STD. BARRICADE

MONUMENTS

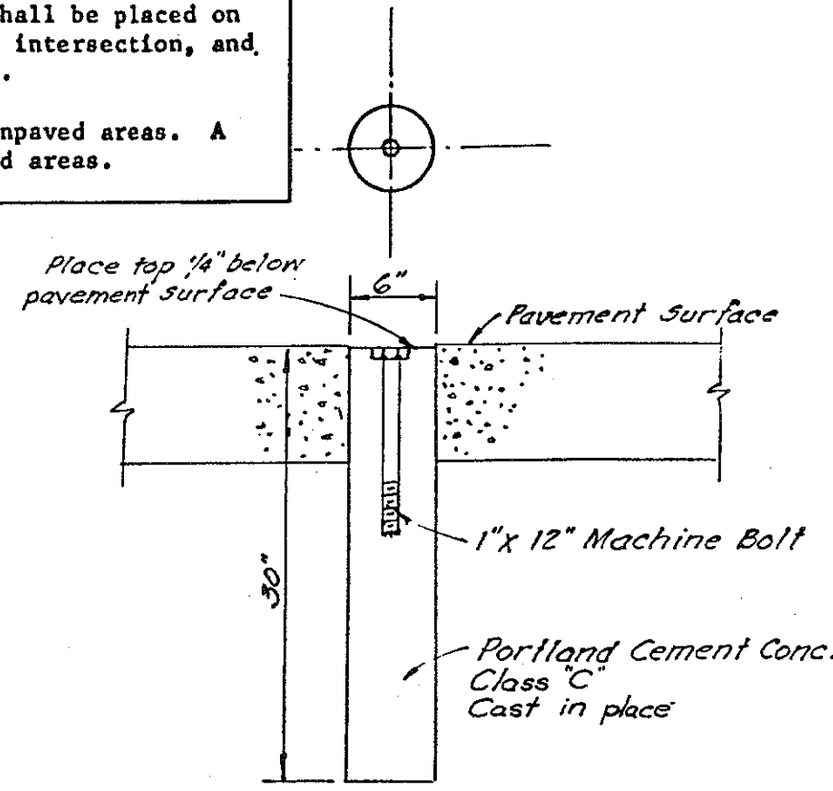
A monument shall be placed at each change in direction on the boundary of the plat, and one such monument shall be placed on the centerline of right-of-way of each street intersection, and at the beginning and end of all street curves.

A Type "A" monument shall be placed in all unpaved areas. A Type "B" monument shall be placed in all paved areas.



TYPE "A"

A cylindrical concrete marker six (6) inches in diameter and thirty (36) inches in length with a quarter (¼) inch iron rod cast at the central axis of the cylinder. Said marker shall be placed in a vertical position with its top being level with the surface of the surrounding ground.



TYPE "B"

A cylindrical concrete marker as described under Type A except that a machine type iron bolt (without nut) of one (1) inch diameter by twelve (12) inches in length shall be placed in a vertical position with the head of the bolt upward and level with the surface of the pavement. A point shall be marked on the head of the bolt to indicate the exact point referred to on the Final Plat.

WOOD COUNTY

(604) MONUMENT ASSEMBLY

REQUIREMENTS AND PROCEDURES
FOR
STORM DRAINAGE DESIGN

The design of storm sewer systems will be based upon the "Rational Method", using the Equation Q=CIA and the "Manning Formula". (A = less than 500 acres)

A. - The rainfall intensity, "i", will be taken from the appropriate curves for the Toledo, Ohio area as published in technical paper No. 25, of the U.S. Weather Bureau, "Rain intensity-Duration-Frequency Curves for selected stations in the United States, Alaska, Hawaiian Islands and Puerto Rico", Government Printing Office, 1955.

B. - A maximum of T=20 minutes shall be used as time of concentration to the first pick-up point in the system, in Residential Areas. (Preferred runoff pattern-design of streets and grading thereof, shall be such that runoff from roofs, driveways, and other impervious surfaces will be towards the street, will be collected in ditch and/or gutters along the street in short runs (three hundred (300) feet to four hundred (400) feet and will then be diverted from the surface into storm sewers or natural water courses. Streets shall be located away from watercourses unless storm sewers are to be installed.)

C. - The following runoff coefficients shall be used in residential areas:*

Average Lot Size	Runoff Coefficient "C"
5000 Sq. Ft. or less	0.50
5000 Sq. Ft. to 6999 Sq. Ft.	0.40
7000 Sq. Ft. to 10,000 Sq. Ft.	.35
Over 10,000 Sq. Ft.	.30

* Includes Right-of-way areas

Coefficients for areas other than one family residents shall be based on the following runnoff Coefficients:

Character of Surface	Runoff Coefficients
Pavement	
Asphaltic & Concrete	0.95
Roofs:	
a. Slage to metal	0.95
Lawns, sandy soil	0.25
Lawns, heavy soil	0.35

Description of Area	Runoff Coefficients
Business	
Downtown	.95
Neighborhood	.75
Residential	
Multi-units, detached	.75
Multi-units, attached	.85
Apartment	.85
Industrial	
Light	.80
Heavy	.95

The coefficients in these two tabulations are applicable for storms of 5 to 10 year frequencies, and shall be called minimum coefficients.

Storm sewers shall be designed to flow just full for the 5 year intensity-duration-frequency curve minimum pavement gutter elevations shall be at or above the hydraulic grade line for a 10 year frequency storm. Use the 10 year intensity-duration-frequency curve for determining this hydraulic grade line.

Catch basin type and spacing shall be designed using the 2 year intensity-duration-frequency curve. The maximum allowable width of sheet gutter flow from the face of the curb shall be limited to 8 feet.

An overall drainage layout plan showing the limits of the contributing runoff area, broken down into areas contributing to each drainage pick-up point, shall be submitted with the paving and drainage plans. Drainage design within the development shall be adequate to handle the entire contributing watershed area, and its existing, proposed and probable future development, and not the area under submission only. When the design makes use of existing sotrm sewer or open ditch, cross sections and profiles shall be submitted which show the existing conditions at least 500 feet downstream from the plat being considered.

If future plat extensions will utilize the same drainage system, the overall drainage plan shall be submitted with the first plat paving plans.

Complete drainage calculations must be submitted for pipe size, determinations, 10 year hydraulic gradient checks and catch basin type and spacing designs.

Storm sewers and culverts shall be designed to conform to the requirements of Item 603 - Type "A" conduits 706.02, 706.04, & 707.03. Type "B" conduits 706.01, 706.02, 706.04, & 706.08. Bedding Type "A" & "B". Type "A" or "B" only shall be used under pavement and five (5) feet outside pavement.

The use of metal pipe will not be permitted in industrial plats or in drainage systems subjected to runoff from industrial or industrial zoned areas. Metal pipe will not be used in plats, except in special situations subject to review, or in drainage systems subjected to runoff of Sanitary effuent.

Minimum cover for Type "C" & "D" conduit shall be 18 inches. Type "A" & "B" conduit shall have a minimum cover of 9 inches, measured from the top outside crown of the pipe to the finished subgrade, and shall have premium joints.

Granular material to be used for pipe bedding and backfilling shall meet the requirements of Item 310.02, or as modified by Wood County.

Culverts shall be designed as follows:

The Talbot Formula: $A = c\sqrt[4]{M^3}$ The result of this formula is based on the average rainfall of 4 inches per hour.

A = Required waterway area in Sq. Ft.
M = Area of drainage basin in acres.
C = Coefficient dependent on acreage of watershed as follows:
= 1/6 for less than 300 acres.
= 1/5 for 300 to 1000 acres.

For acres above 1000 use Sq. Mi Formula - we have attached the table to this sheet, or you can find same in State of Ohio Department of Highways Specifications for Design of Highway Structures.

Ditch enclosures in sparsely developed areas is not recommended; however each project will be considered on its individual merits.

RETENTION PONDS

To enable this office to check and approve storage ponds it will be necessary to furnish the following information.

1. Volume of temporary storage in acre-feet
2. Peak flow from design storm in CFS
3. Design storm frequency

Agricultural rate of runoff C = .045

(For watersheds of less than 250 acres)

$\frac{Vs}{Vr}$	$\frac{Qo}{Qi}$									
	0.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	1.00	0.99	0.98	0.96	0.95	0.94	0.92	0.91	0.90	0.88
0.1	0.87	0.85	0.84	0.82	0.81	0.79	0.78	0.76	0.74	0.73
0.2	0.72	0.70	0.68	0.67	0.65	0.64	0.62	0.61	0.60	0.58
0.3	0.57	0.55	0.54	0.52	0.51	0.50	0.49	0.47	0.46	0.45
0.4	0.44	0.43	0.42	0.41	0.40	0.39	0.38	0.37	0.36	0.35
0.5	0.34	0.33	0.32	0.31	0.30	0.29	0.28	0.27	0.27	0.26
0.6	0.25	0.24	0.23	0.23	0.22	0.21	0.20	0.20	0.19	0.18
0.7	0.18	0.17	0.16	0.15	0.15	0.14	0.14	0.13	0.12	0.12
0.8	0.11	0.11	0.10	0.09	0.09	0.08	0.08	0.07	0.97	0.06
0.9	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.01	0.01

Basic equation: $\frac{Vs}{Vr} = 1 - 2\left(\frac{Qo}{Qi}\right) + 1.8\left(\frac{Qo}{Qi}\right)^2 - 0.8\left(\frac{Qo}{Qi}\right)^3$

Where: Vs = Volume of temporary storage, Ac-Ft.
Vr = Volume of runoff, Ac-Ft.
Qo = Required principal spillway discharge, cfs
Qi = Peak flow from design storm, cfs

EXAMPLE:

Given: Vs = 8.0 Ac. Ft.
Vr = 12.0 Ac. Ft.
Qi = 75 c.f.s.

Find: Qo

Solution: $\frac{Vs}{Vr} = \frac{8.0}{12.0} = 0.67$

$\frac{Qo}{Qi} = 0.20$ (from table)

Qo = 0.20 x Qi
= 0.20 x 75 = 15.0 c.f.s.

See chapter 6 of this manual for pipe size.

Exhibit 11-4 Estimate of principal spillway discharge allowing for temporary storage

Requirement for County Engineer

To check and approve storage ponds.

1. Volume of temporary storage in acre feet
2. Peak flow from design storm in CFS
3. Design storm frequency

SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR

POLY VINYL CHLORIDE (PVC) CONDUIT

Wood County approves for use in Storm Sewers "Type PSM SDR-35 Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings", ASTM Designation D-3034.

If you desire to use PVC conduit for storm sewers the following note must appear on the plans submitted to the County for approval:

Note: If Type "B" or "C" conduit is specified, the contractor may use "Type PSM SDR-35 Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings", ASTM Designation D-3034 (as per Wood County specifications).

For hydraulic design calculations, using PVC conduit, an "n" factor of 0.010 shall be used.

SPECIAL PROVISIONS

POLY VINYL CHLORIDE (PVC) - CONDUIT & FITTINGS

ASTM DESIGNATION D-3034 (SDR-35)

1. MATERIAL

All PVC conduit shall conform to ASTM designation D-3034 (SDR-35). Nominal laying lengths shall be 12'-6" or as otherwise specified and in diameters of six (6) inches through twelve (12) inches.

2. JOINTS

All joints shall be of the elastomeric gasket joint type (integral bell). Minimum coupling length shall be four and one-half (4½) inches. The bell end of the joint shall be formed as an integral part of the barrel.

All field-cutting of conduit shall be done in a neat, trim manner using a hand or power saw and the cut shall be perpendicular to the longitudinal axis of the conduit. The cut end of the conduit shall be bevelled using a hand file to produce a smooth bevel of approximately fifteen (15) degrees. The conduit shall be joined as follows:

(a) Wipe inside surface of bell with a dry rag to remove any grease, sand or mud which may have accumulated in the gasket "groove" area.

(b) Insert gasket into groove in bell with the gasket slot facing the spigot end of the pipe.

(c) Check to insure gasket is square in groove and as far forward in groove as possible.

(d) Lubricate bevelled portion of spigot around complete circumference sparingly.

(e) Place spigot in bell.

(f) Push pipe into bell until line on spigot is within one-half (½) inch of bell.

The completed joint shall create a hydraulic seal.

Backfilling of the trench around the conduit, including joint areas, may be accomplished immediately upon completion of the installation.

All fitting material shall conform to ASTM Designation D-1784 Type I, Gradel, and shall be of the same quality as that of the pipe.

3. INSTALLATION

The pipe and fittings shall be installed per ASTM Designation D-2321-T, Underground Installation of Flexible Thermo-plastic Sewer Pipe.

SUPPLEMENTAL MATERIAL SPECIFICATIONS

FOR

CONTROLLED DENSITY FILL (CDF)

310.03 CONSTRUCTION METHODS (Add the following)

When CDF is used in backfilling as described in 603.08, no on site testing shall be required.

603.02 MATERIALS (Add the following)

In lieu of compacted granular material used for backfilling, per the requirements of sections 310.02 and 703.08, the contractor may use Controlled Density Fill.

CDF is a controlled density fill made of cementitous materials, consisting of Portland cement and salvaged materials.

603.08 BACKFILLING (Add the following)

All material used for backfilling shall meet the compaction requirements of 203.12 and 203.13 as determined by Standard Proctor Density, AASHTO Design T 99. CDF shall be placed in a useable fluid form and will consist of uniform vertical lifts. No special finishing shall be required, however, finished grade should be observed when topping out a vertical trench.

Where drainage around structures is required, the drainage system should be conveniently installed and backfilled with a porous material before the placement of the CDF mix.

No special protections are needed under normal construction conditions, except extremely early loading. When traffic will be maintained, the contractor shall furnish plates to bridge the trench for the first twenty-four hours, or as directed by the Engineer. After twenty-four (24) hours, or as directed by the Engineer, the contractor may install permanent or temporary paving materials.

The quality control test procedure by the manufacturer shall include: A. Test for Unit Weight, ASTM C-138; B. Test for Compressive Strength, ASTM C-39.