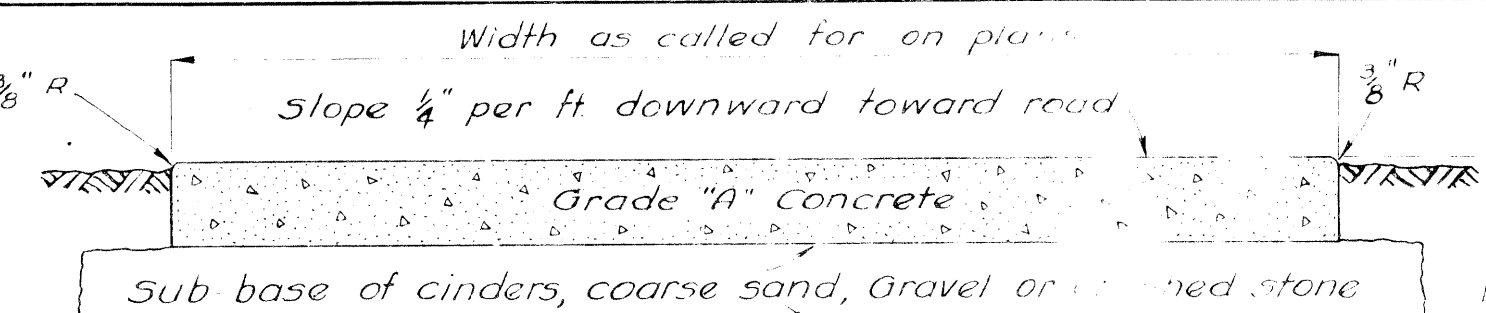


DETAIL OF TILE OUTLET HEADWALL

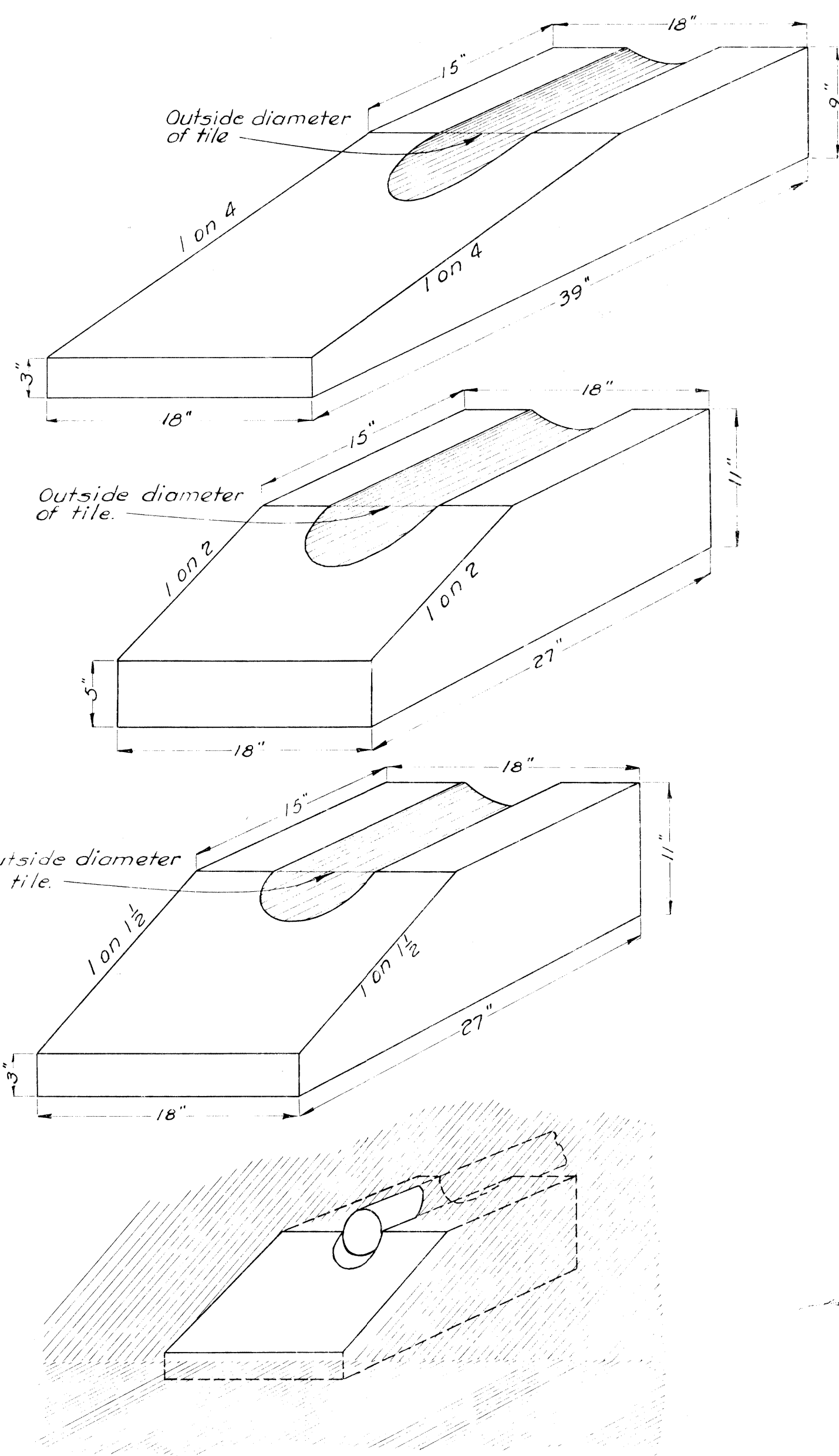
To be used where called for on plans. Where stone for Rip Rap is not available a concrete apron of Grade "A" concrete and of similar dimensions may be built under direction of the engineer at the same unit price as for grouted Rip Rap.

DIA. OF TILE	6"	8"	10"	12"	15"	18"	24"	30"	36"
A	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	2'-0"	2'-2"	2'-4"
B	1'-9"	1'-11"	2'-1"	2'-3"	2'-6"	2'-9"	3'-4"	4'-0"	4'-6"
C	1'-4"	1'-5"	1'-5"	1'-7"	1'-9"	1'-11"	2'-2"	2'-5"	2'-8"
D	9"	9"	10"	11"	11"	11"	1'-3"	1'-3"	1'-4"
E	3'-5"	4'-3"	5'-1"	5'-11"	7'-2"	8'-5"	11'-6"	14'-4"	17'-0"
F	3'-9"	4'-7"	5'-5"	6'-3"	7'-6"	8'-9"	11'-6"	14'-4"	17'-0"
G	8"	8"	8"	9"	10"	11"	12"	1'-1"	1'-2"
H	3'-5"	4'-3"	5'-1"	5'-11"	7'-2"	8'-5"	11'-6"	14'-4"	17'-0"
L	6'-0"	6'-0"	6'-0"	6'-0"	7'-0"	8'-0"	8'-0"	9'-0"	9'-0"
M	3'-0"	3'-0"	3'-0"	3'-6"	4'-0"	4'-6"	5'-6"	6'-6"	7'-6"
N	1'-0"	1'-4"	1'-8"	2'-0"	2'-6"	3'-0"	4'-0"	4'-0"	4'-6"
CU YDS. GRADE "A" CONC.	0.5	0.6	0.8	1.1	1.5	2.0	3.3	4.9	6.9
SQ YDS. GROUDED RIP RAP	2.0	2.0	2.0	3.0	3.0	4.0	5.0	6.0	8.0
NO. OF "B" BARS	3	3	4	5	7	8	11	14	17
WT. "B" BARS PER HDWL.	5	5	8	10	15	18	29	41	55
WT. "A" BARS PER HDWL.	5	6	7	8	10	11	15	19	23
TOTAL WT. OF STEEL	10	11	15	18	25	29	44	60	78



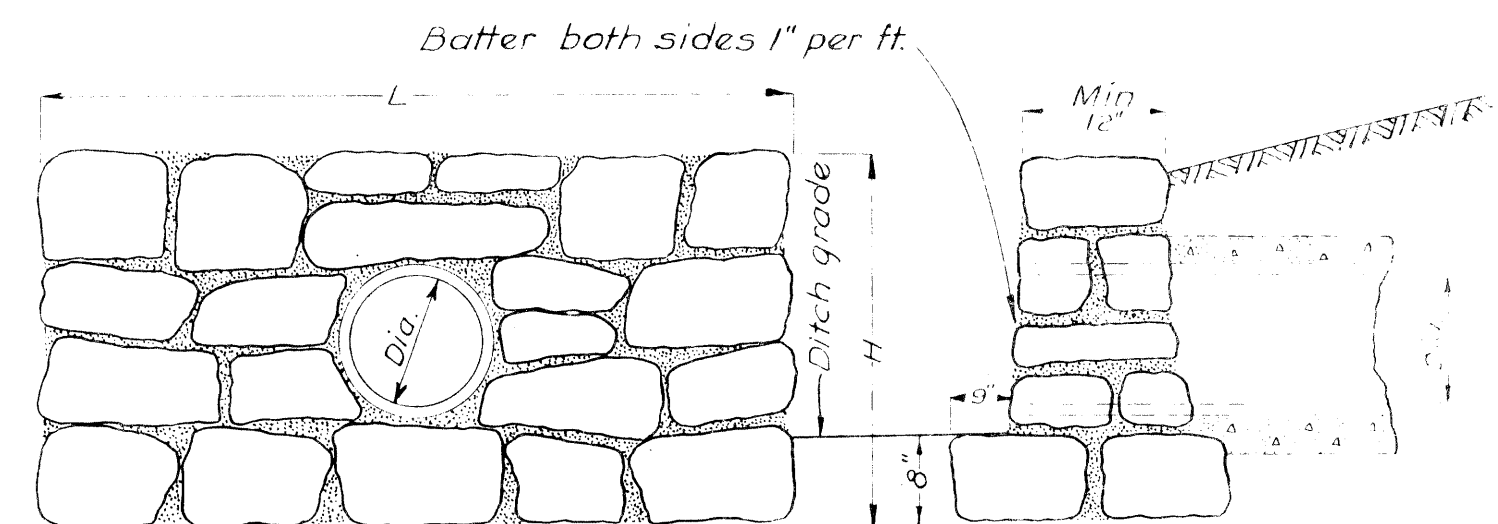
CONCRETE SIDEWALK

Thickness of sidewalk and base to be as shown unless otherwise called for on plans. Sidewalk to be laid in slabs approximately square, provided that no slab is to be of greater length than 6 ft. nor of greater area than 36 sq. ft. Expansion joint material to be placed between parallel curb and sidewalk and 2" expansion joint material to be placed between curb return and sidewalk approach.



CONCRETE TILE HEADER

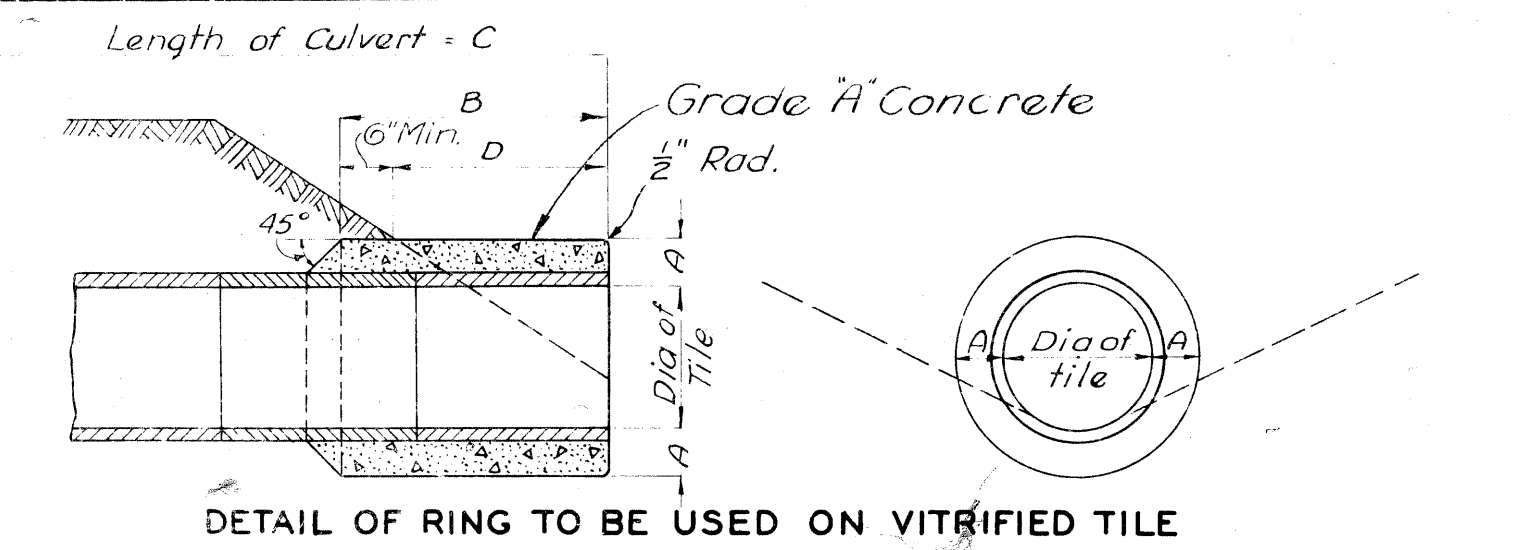
Volume of each of the above details equals approximately 0.1 cu. Yds. Grade "A" Concrete.



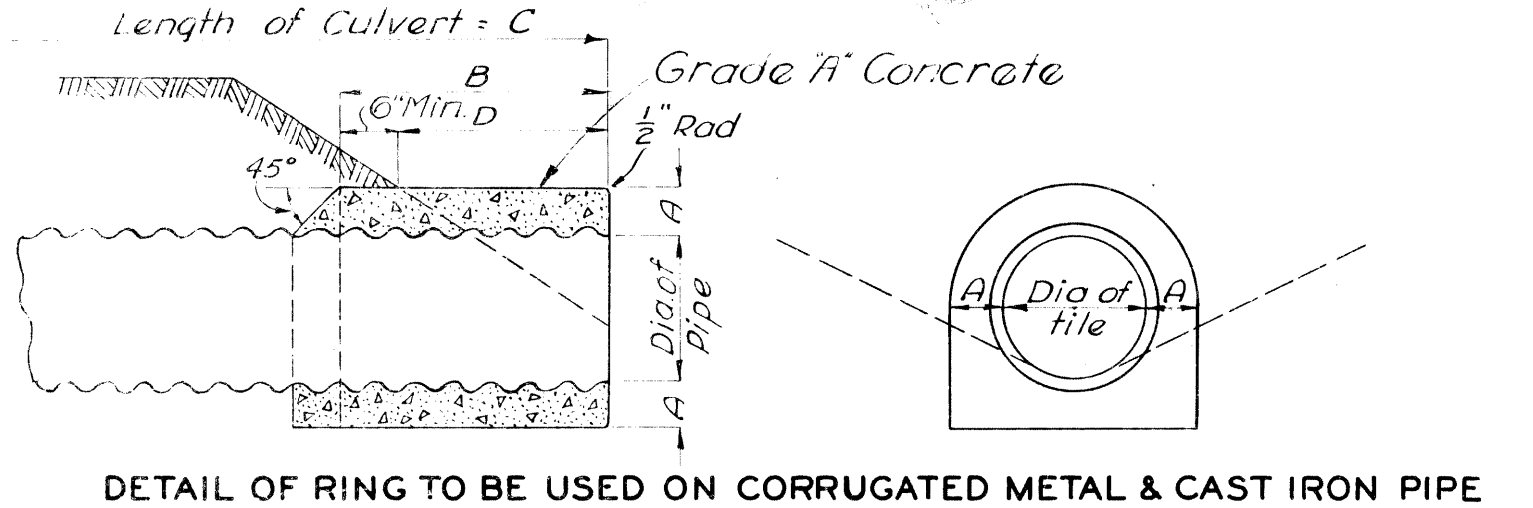
DETAIL FOR CEMENT RUBBLE MASONRY HEADWALL

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE HEADWALL

DIA.	MIN. DEPTH DITCH FOR EARTH GRADE	APPROX. H	L	CU. YDS. CEMENT RUBBLE MASONRY
10"	1'-5"	2'-6"	4'-3"	0.6
12"	1'-7"	2'-8"	4'-11"	0.7
15"	1'-10"	3'-1"	5'-8"	1.0
18"	2'-1"	3'-4"	6'-5"	1.2
24"	2'-7"	3'-10"	8'-2"	1.7
30"	3'-4"	4'-7"	10'-3"	2.6
36"	3'-10"	5'-1"	12'-0"	3.4



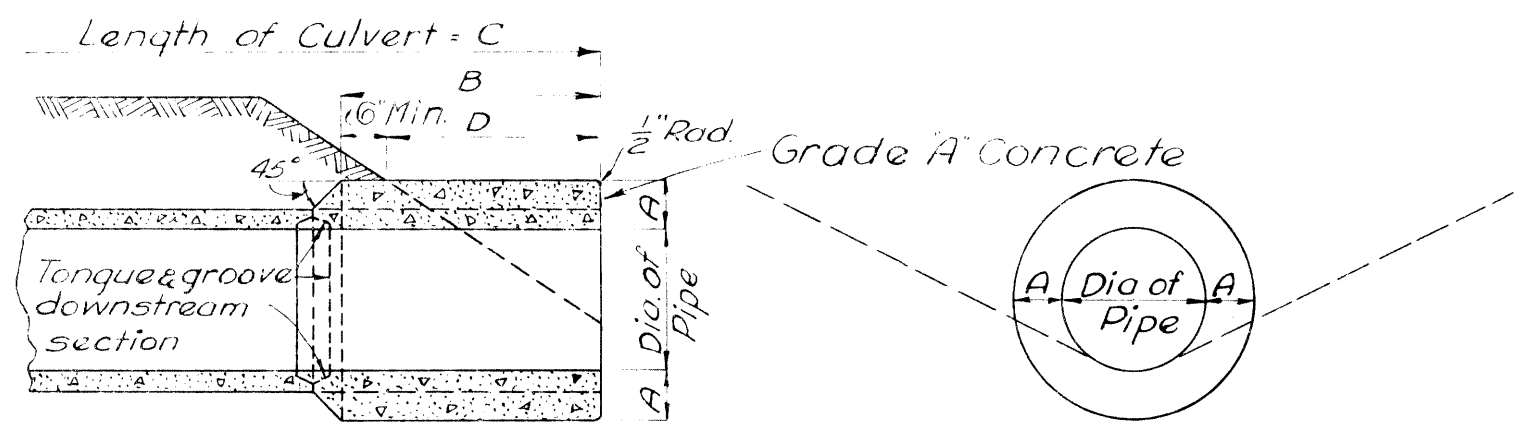
DETAIL OF RING TO BE USED ON VITRIFIED TILE



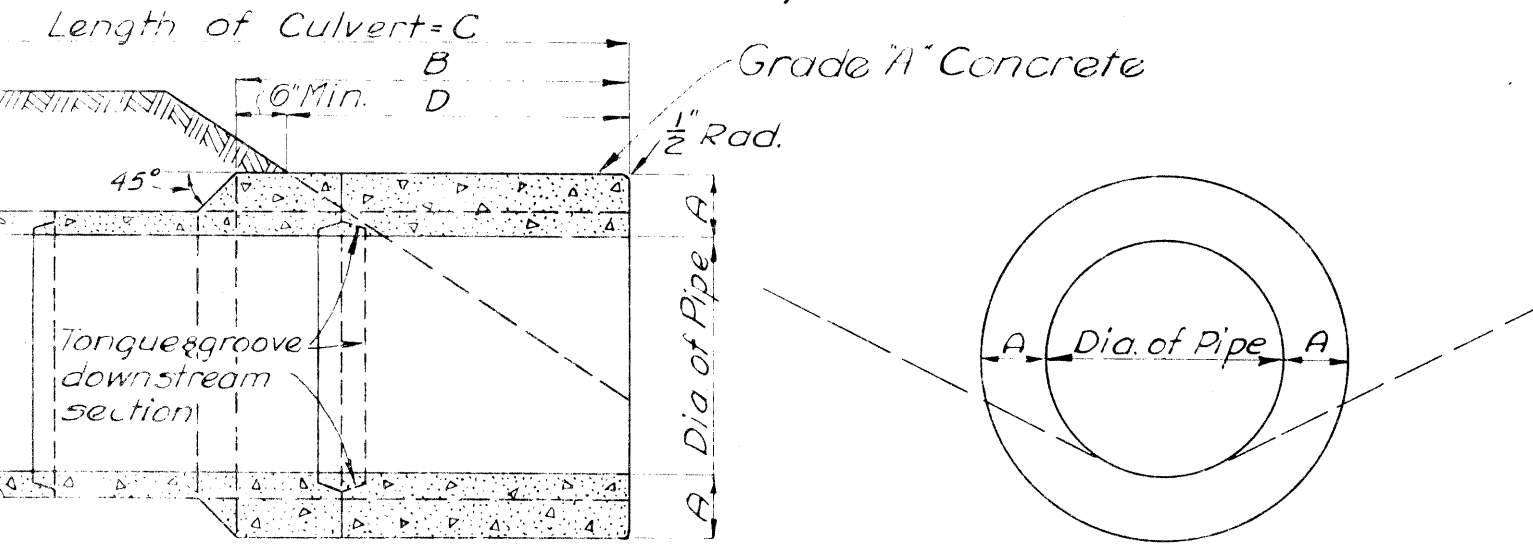
DETAIL OF RING TO BE USED ON CORRUGATED METAL & CAST IRON PIPE

TABLE OF DIMENSIONS FOR VITRIFIED TILE CORRUGATED METAL AND CAST IRON PIPE

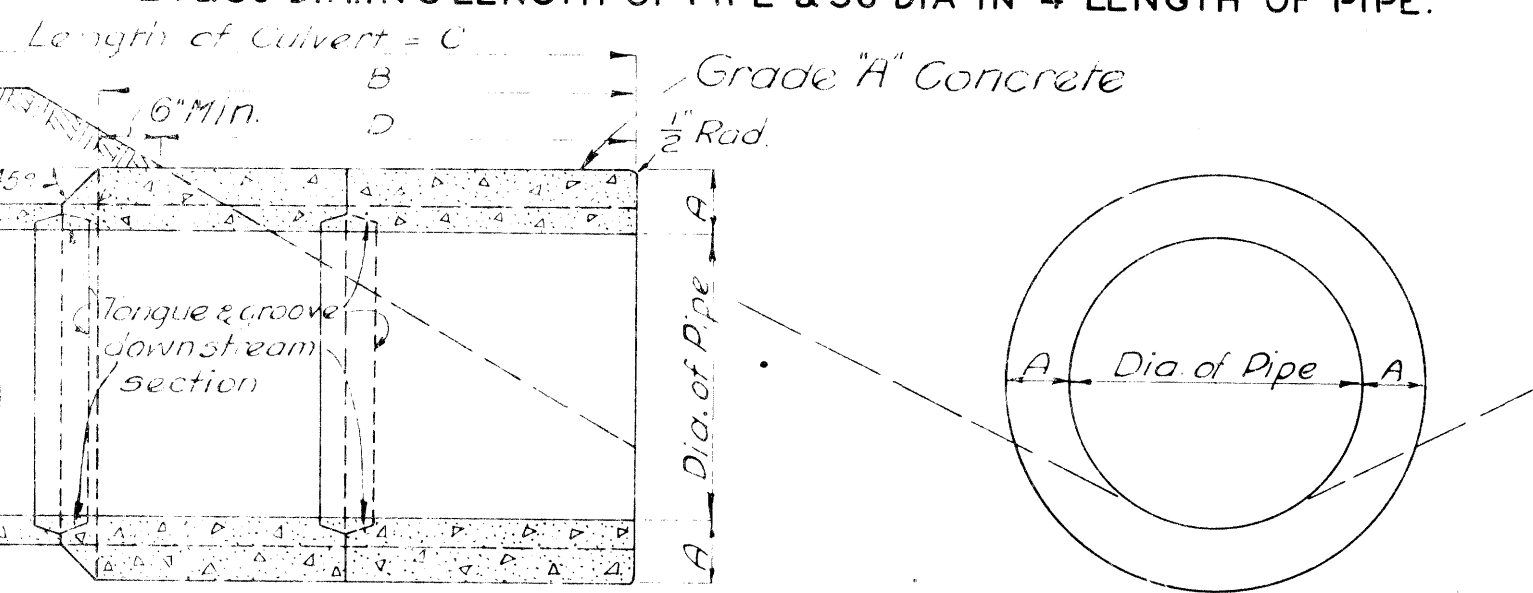
DIA. OF TILE	A	B	C	D
10"	6"	2'-7"	21'-0"	1'-6"
12"	6"	2'-7"	21'-0"	1'-8"
15"	6"	2'-6"	24'-0"	1'-10"
18"	6"	2'-8"	24'-0"	2'-2"
24"	8"	3'-6"	24'-0"	2'-9"
30"	8"	4'-6"	28'-0"	3'-6"
36"	8"	4'-8"	28'-0"	4'-2"



DETAIL OF RING TO BE USED ON REINFORCED CONCRETE PIPE 10 TO 18" DIA. IN 3' LENGTH OF PIPE; 24 & 30" DIA. IN 4' LENGTH OF PIPE



DETAIL OF RING TO BE USED ON REINFORCED CONCRETE PIPE 24 & 30" DIA. IN 3' LENGTH OF PIPE & 36" DIA. IN 4' LENGTH OF PIPE.

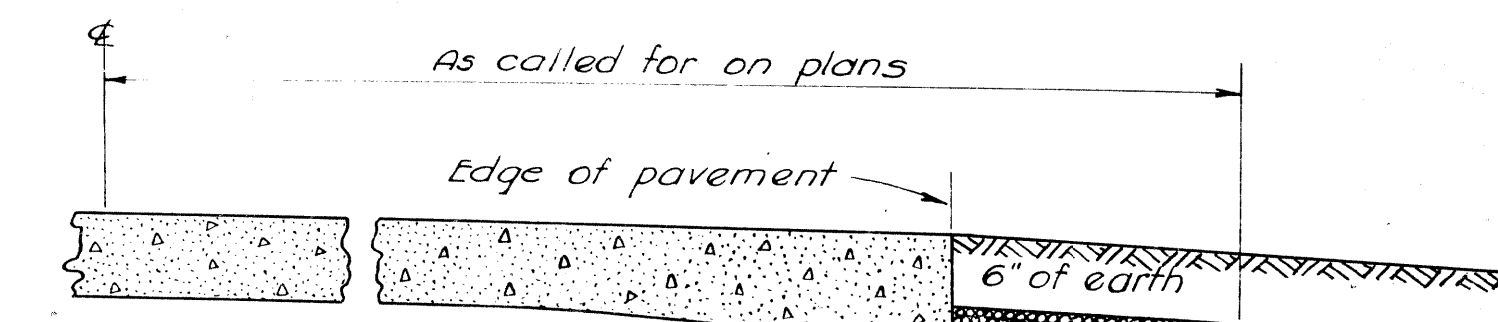


DETAIL OF RING TO BE USED ON REINFORCED CONCRETE PIPE 36" DIA. 3' LENGTH OF PIPE

TABLE OF DIMENSIONS FOR REINFORCED CONCRETE PIPE

DIA. OF PIPE	LENGTH OF SEC.	NO. OF SEC.	A	B	C	D
10"	3'	1	4 1/2"	2'-9 1/2"	21'	1'-4"
12"	3'	1	5 1/2"	2'-8 1/2"	21'	1'-7"
15"	3'	1	5 1/2"	2'-8 1/2"	24'	1'-11"
18"	3'	1	5 1/2"	2'-8 1/2"	24'	2'-2"
24"	4'	1	6"	3'-8 1/2"	24'	2'-11"
24"	3'	1 1/2	6"	4'-2 1/2"	24'	2'-1"
30"	3'	1 1/2	6 1/2"	4'-2 1/2"	27'	3'-6"
30"	4'	1	6 1/2"	3'-8 1/2"	28'	3'-2"
36"	4'	1 1/2	7"-7 1/2"	5'-8 1/2"	28'	4'-2"
36"	3'	2	7"-7 1/2"	5'-8 1/2"	30'	4'-2"

DETAIL OF CONCRETE RING



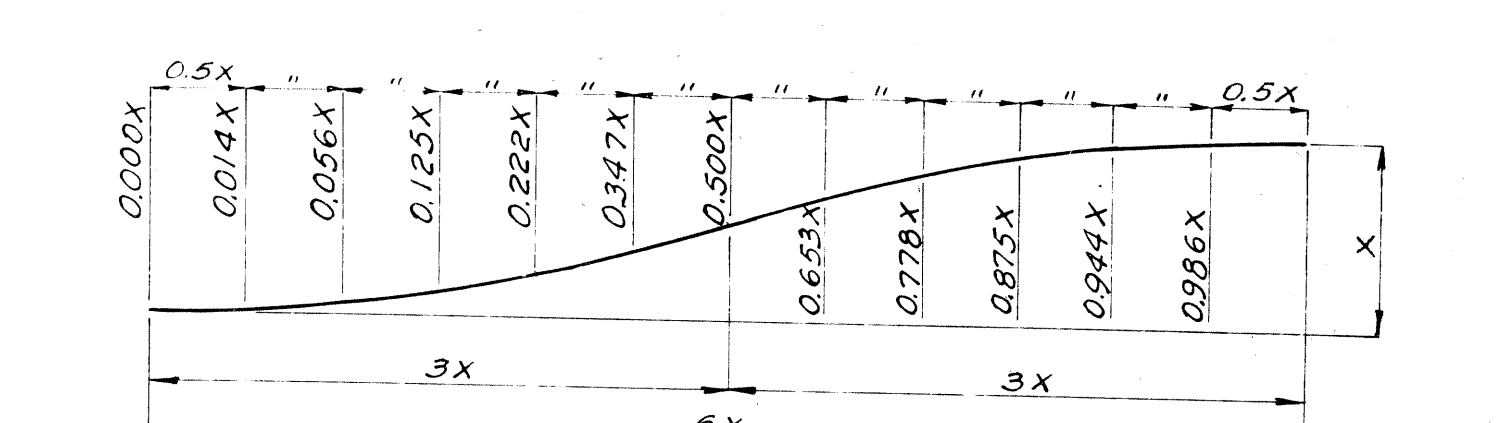
Gravel backfill to be paid for per cubic yard compacted measure as a separate item; labor for backfilling to be covered by the unit price for tile underdrain.

Gravel to be such that 100% will pass a 3/8" ring and at least 60% will be retained on an 8 mesh sieve and contain not more than 4% of clay or silt.

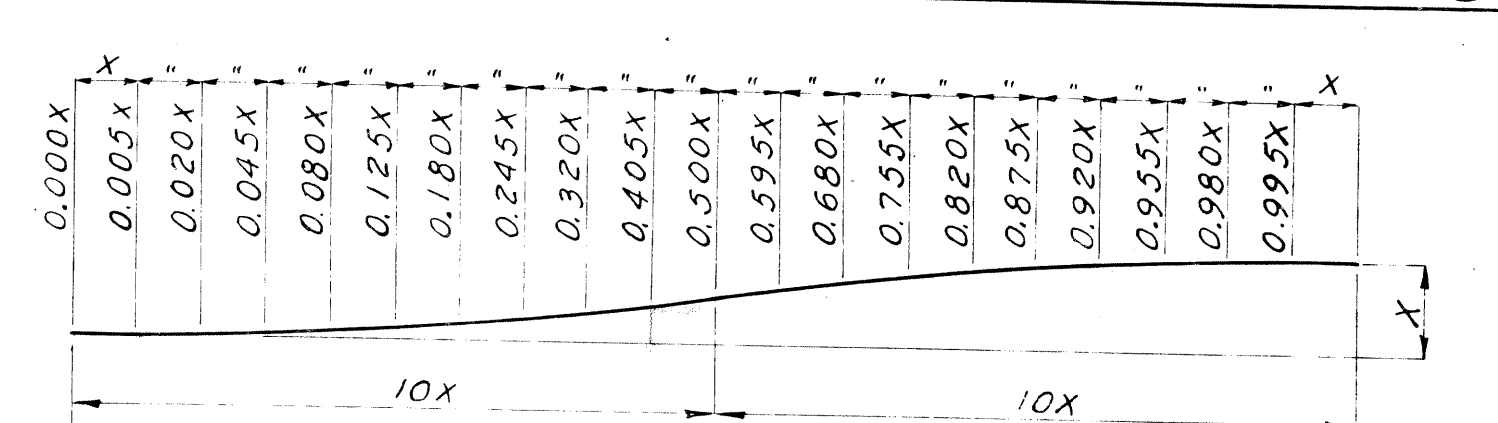
Tile to be covered with a 3" layer of loose grass, hay or straw, before backfill is placed, as a part of tile installation.

Elevation as called for on road plans.

TILE EDGE DRAIN



6 X REVERSE CURVE

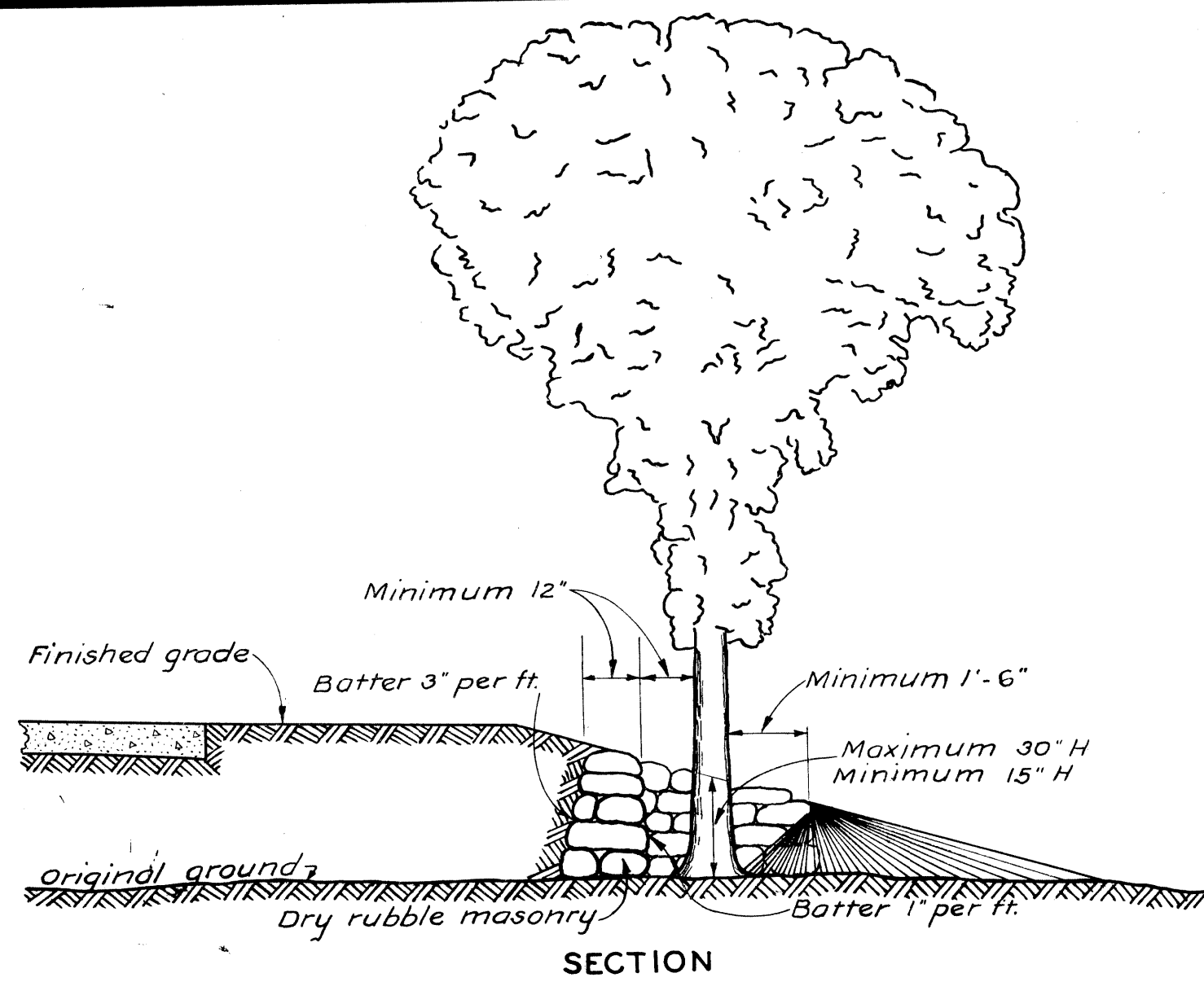


20 X REVERSE CURVE

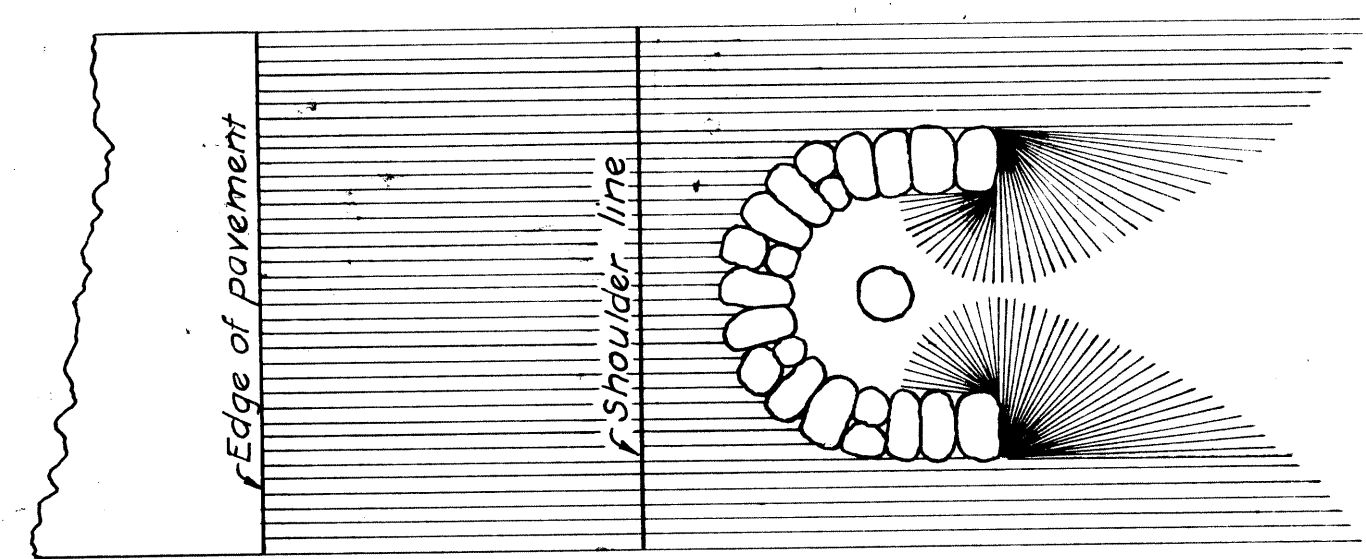
MICHIGAN STATE HIGHWAY DEPARTMENT STANDARD PLAN FOR SPECIAL HEADWALLS, EDGE DRAIN, SIDEWALK AND REVERSE CURVES

CHECKED *L. N. Pressley* 10/24/31 CHIEF DRAFTSMAN RECOMMENDED FOR APPROVAL *C. P. Kelley* 10/24/31 ENGINEER OF DESIGN
 CORRECT *C. P. Kelley* 10/24/31 APPROVED CHIEF ENGINEER

DRAWN BY *L. H. N. C. S. M.* CHECKED BY *C. A. W.* TRACED BY *E. P.*
 Approved B.P.R. Aug. 15, 1933

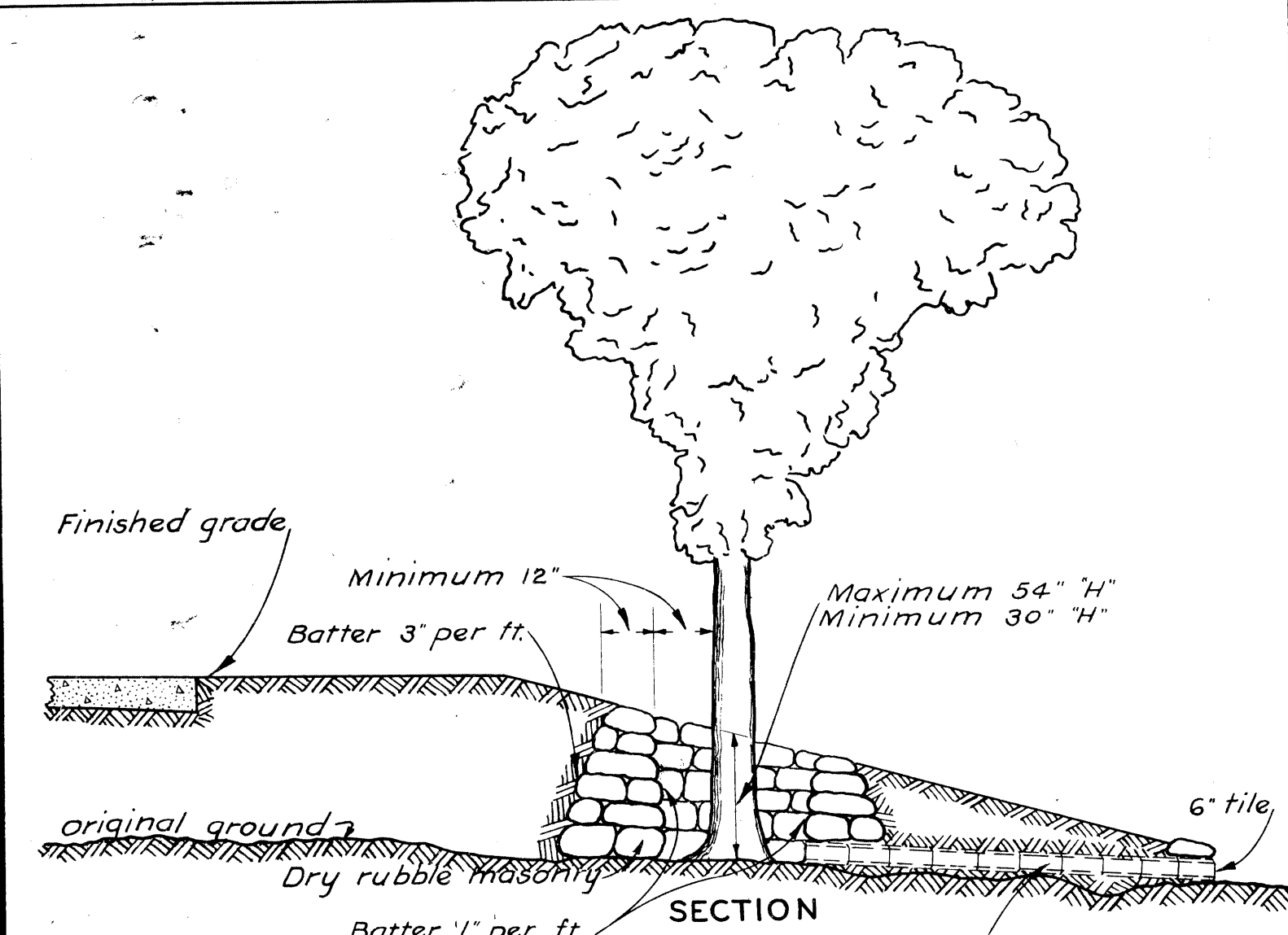


SECTION



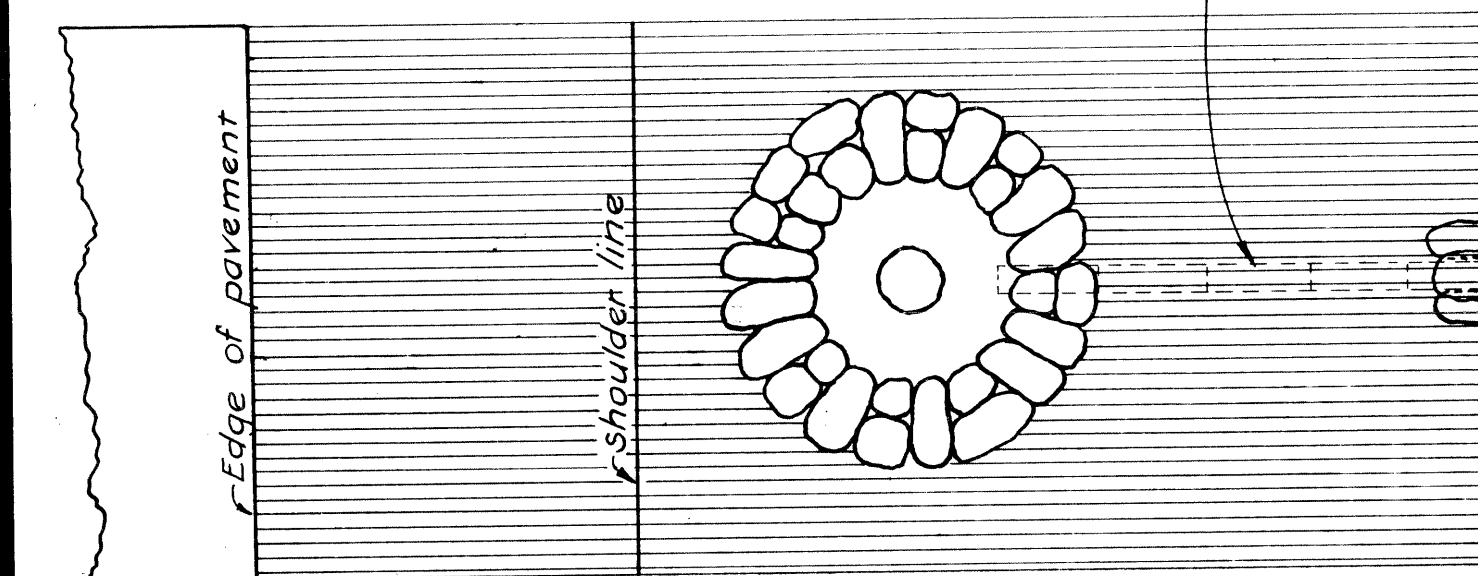
HALF TREE WELL

See Detail No. 3 for Quantities



SECTION

Tile to be used except in case of porous soil.



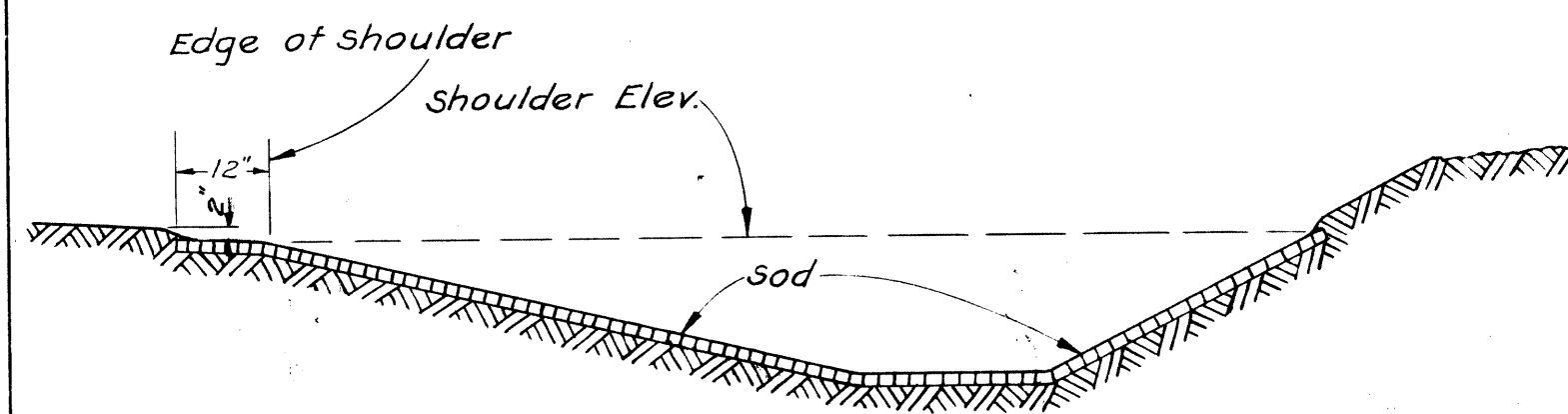
FULL TREE WELL

See Detail No. 3 for quantities

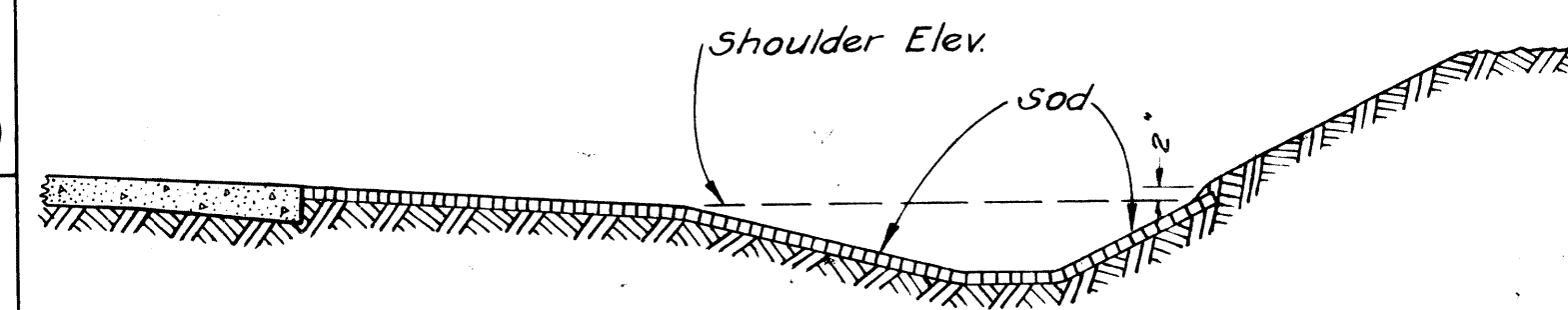
TABLE OF QUANTITIES FOR TREE WELLS

SIZE OF TREES	CU. YDS. DRY RUBBLE MASONRY PER FT. HEIGHT 'H'			
	FULL WELLS	HALF WELLS		
		1 on 4	1 on 2	
8" to 12"	0.50 H	0.25 x H + .08	.21	
12" - 16"	0.50 H	0.25 x H + .08	.21	
16" - 20"	0.55 H	0.28 x H + .09	.23	
20" - 24"	0.60 H	0.30 x H + .10	.25	
24" - 30"	0.65 H	0.33 x H + .11	.27	
30" - 36"	0.70 H	0.35 x H + .11	.29	
36" - 42"	0.75 H	0.38 x H + .12	.31	
42" - 48"	0.80 H	0.40 x H + .13	.34	
48" - 54"	0.85 H	0.43 x H + .14	.37	
54" - 60"	0.90 H	0.46 x H + .15	.40	

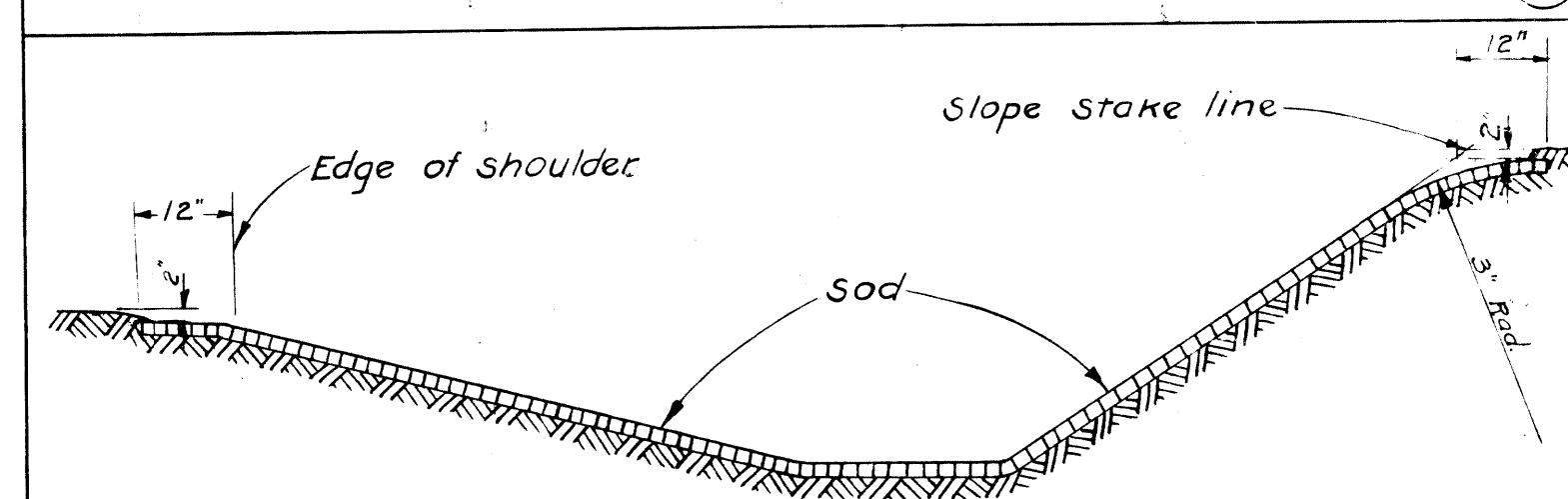
Note: Where H is greater than 15' and less than 30' use Half Wells, where H is greater than 30' and less than 54' use Full Wells.



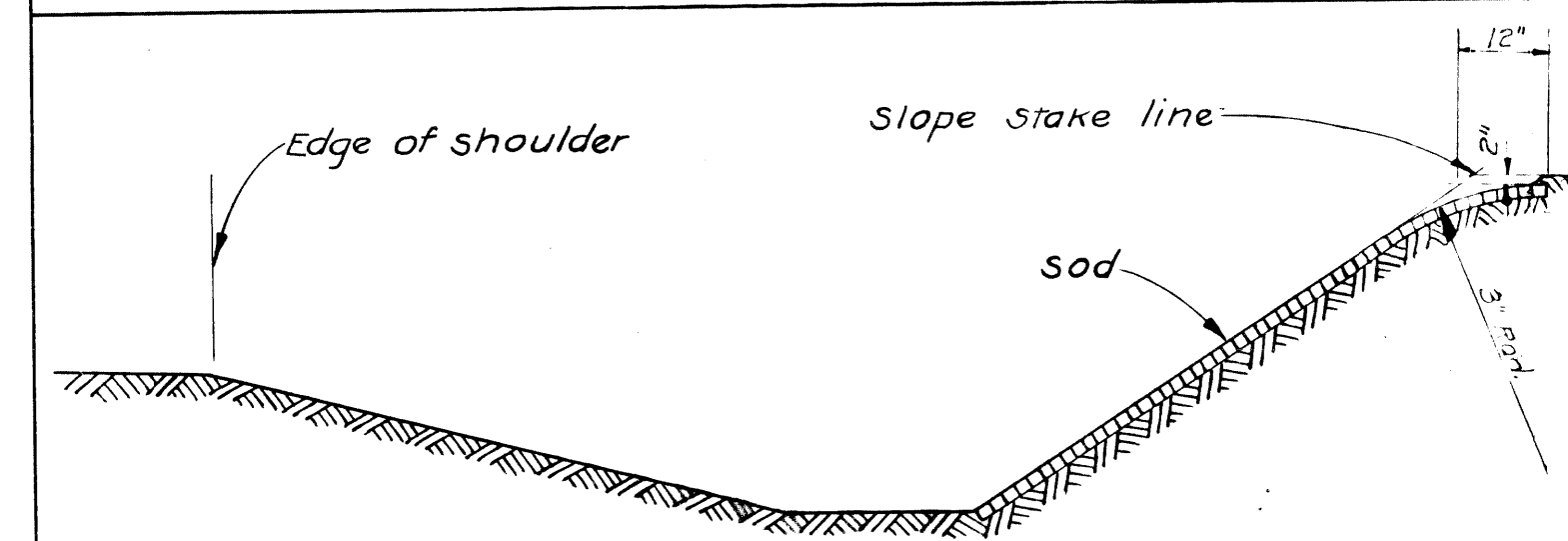
SODDED DITCH



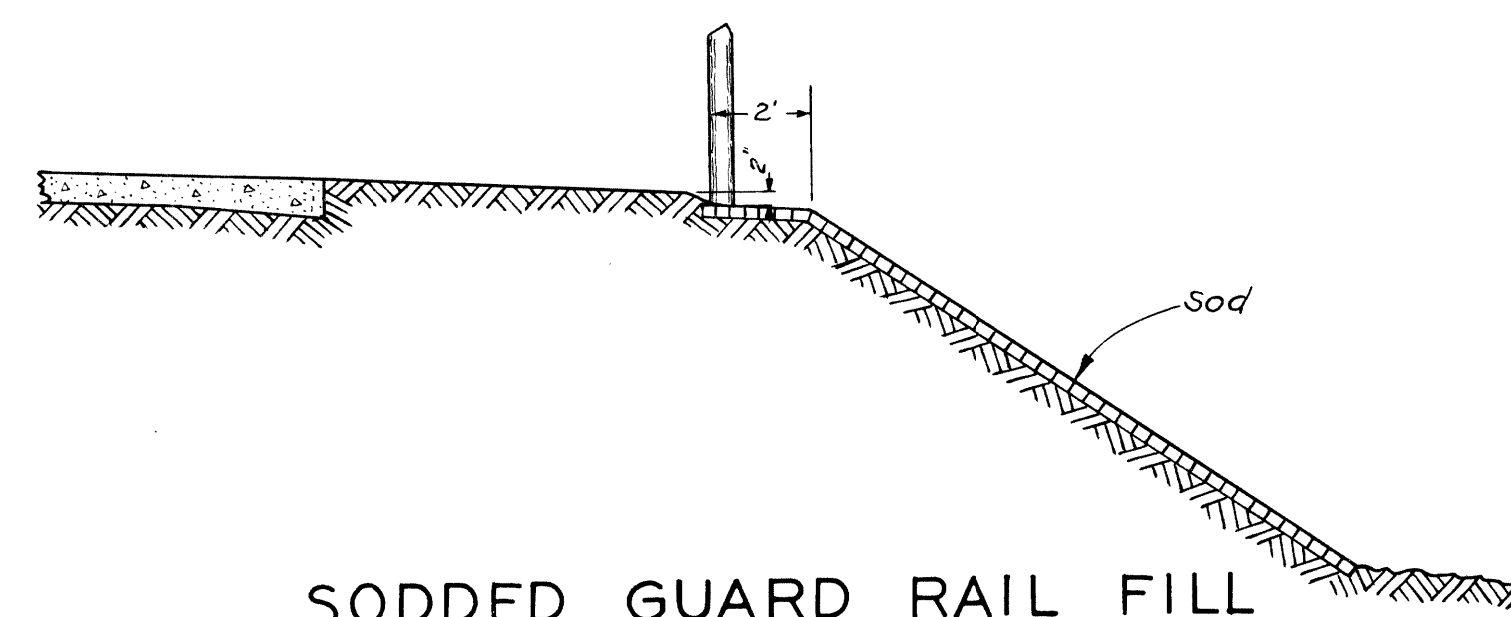
SODDED DITCH AND SHOULDER



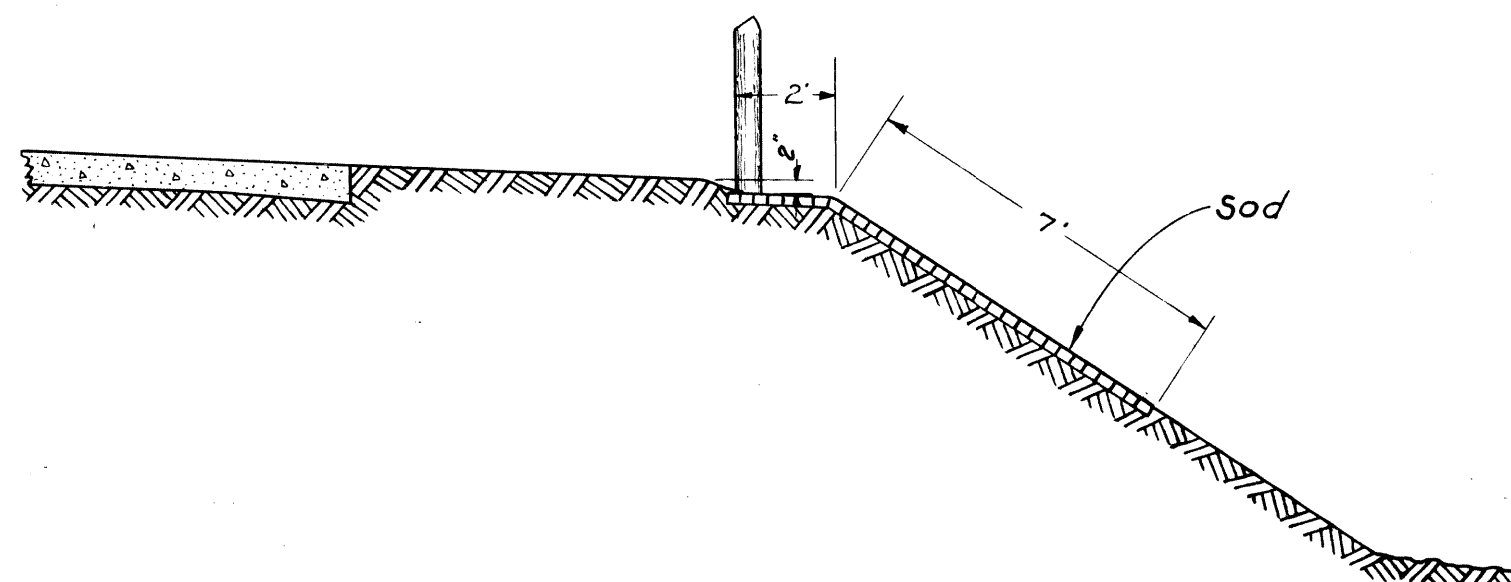
SODDED DITCH AND BACKSLOPE



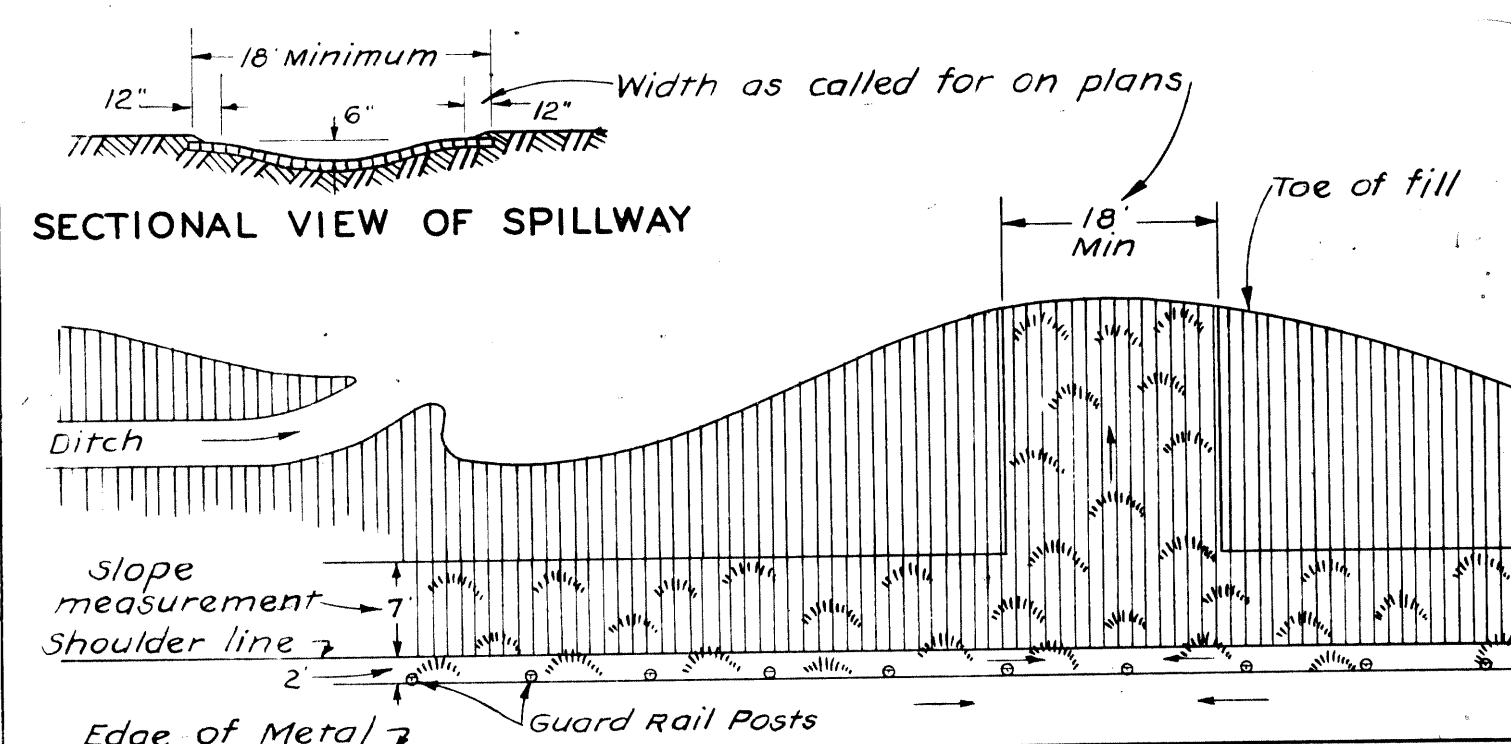
SODDED BACKSLOPE



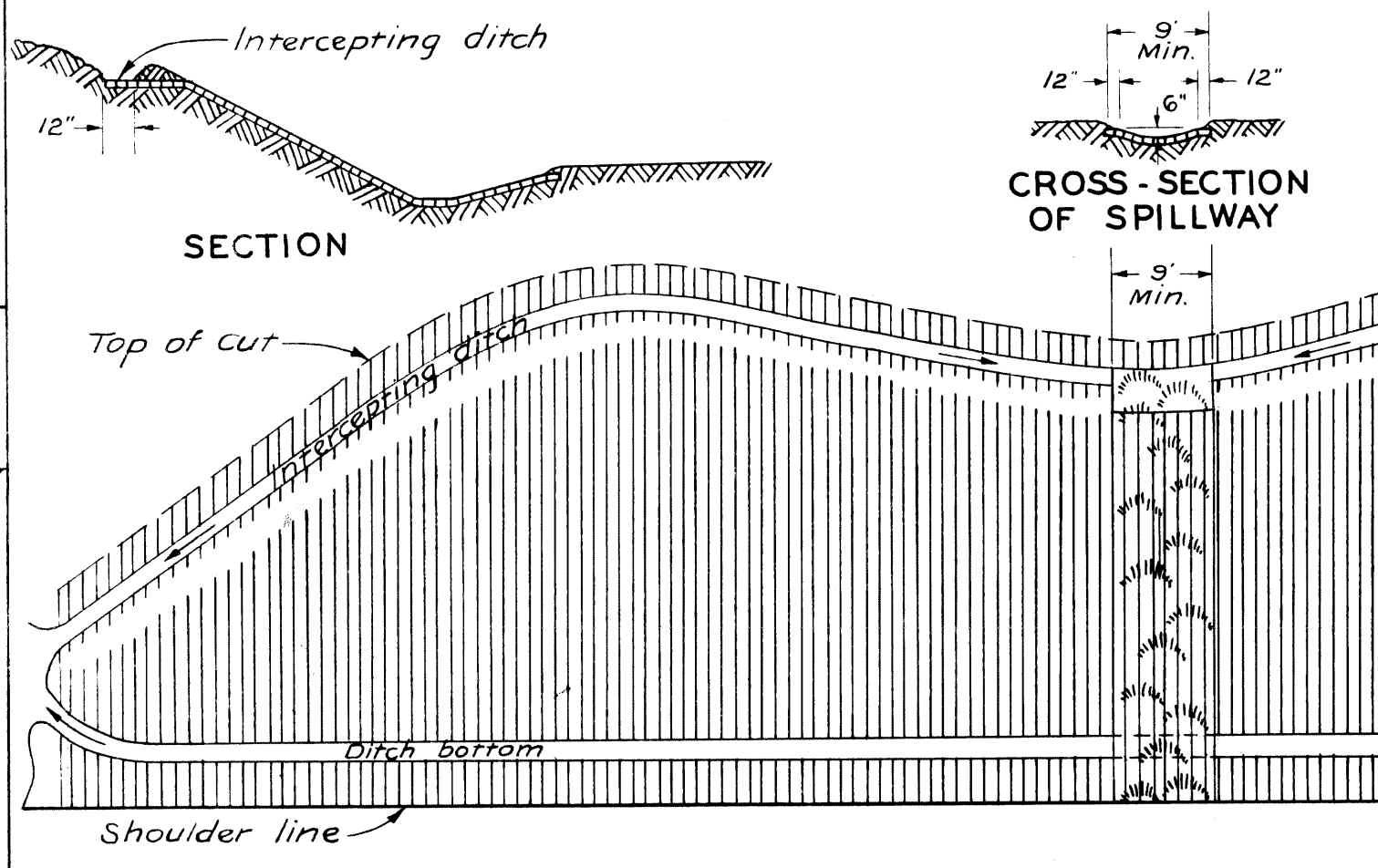
SODDED GUARD RAIL FILL FULL HEIGHT



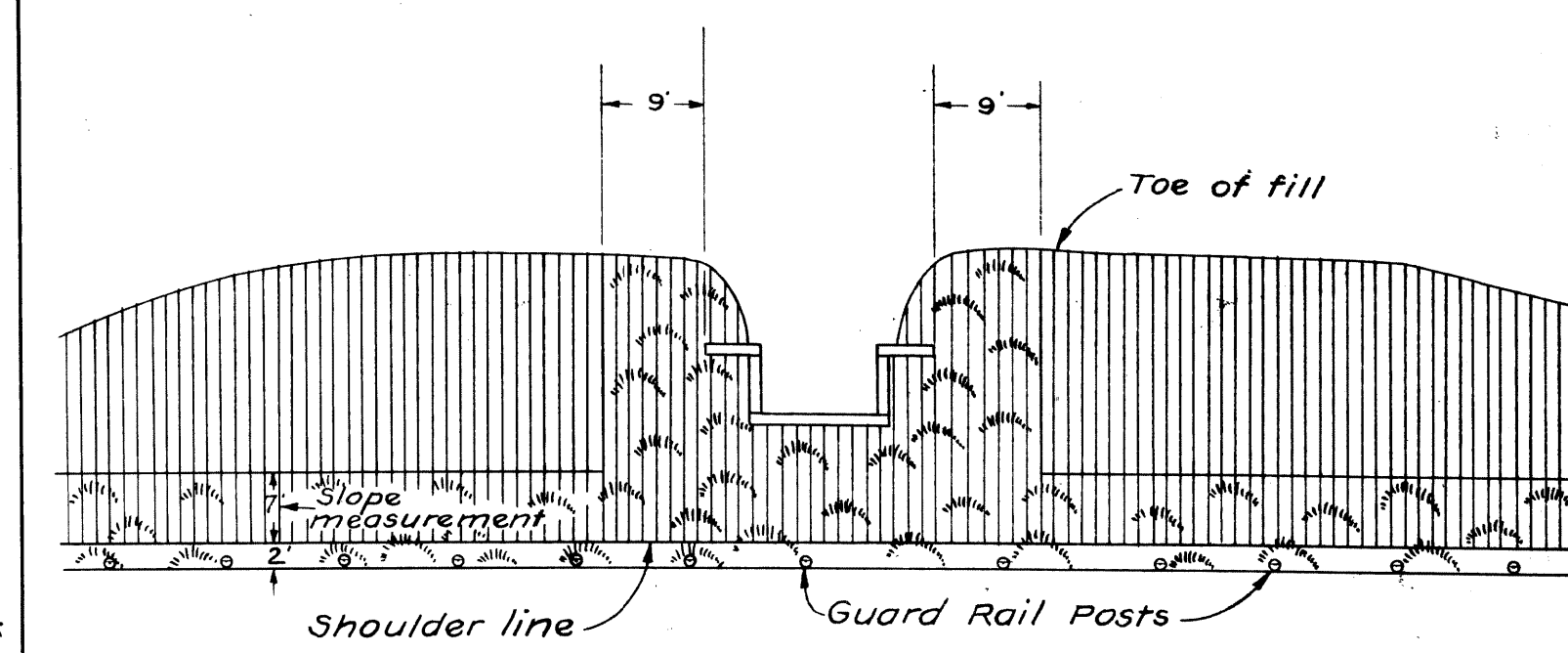
SODDED GUARD RAIL FILL 9 FT. STRIP



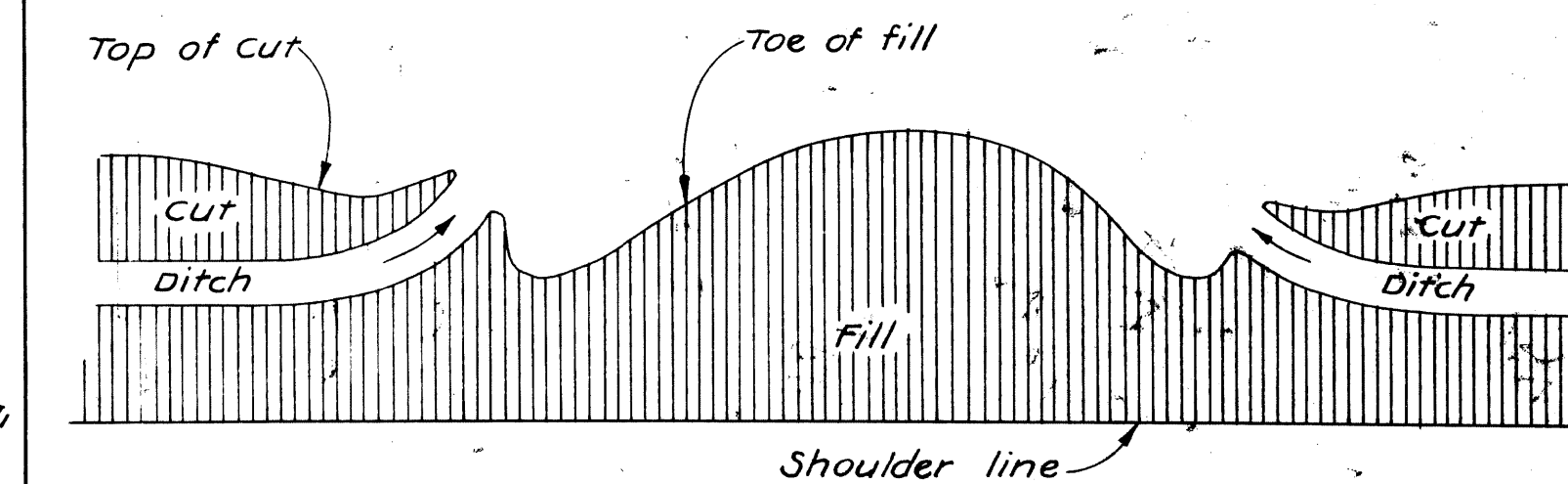
SODDED SPILLWAY ON GUARD RAIL FILL SLOPE



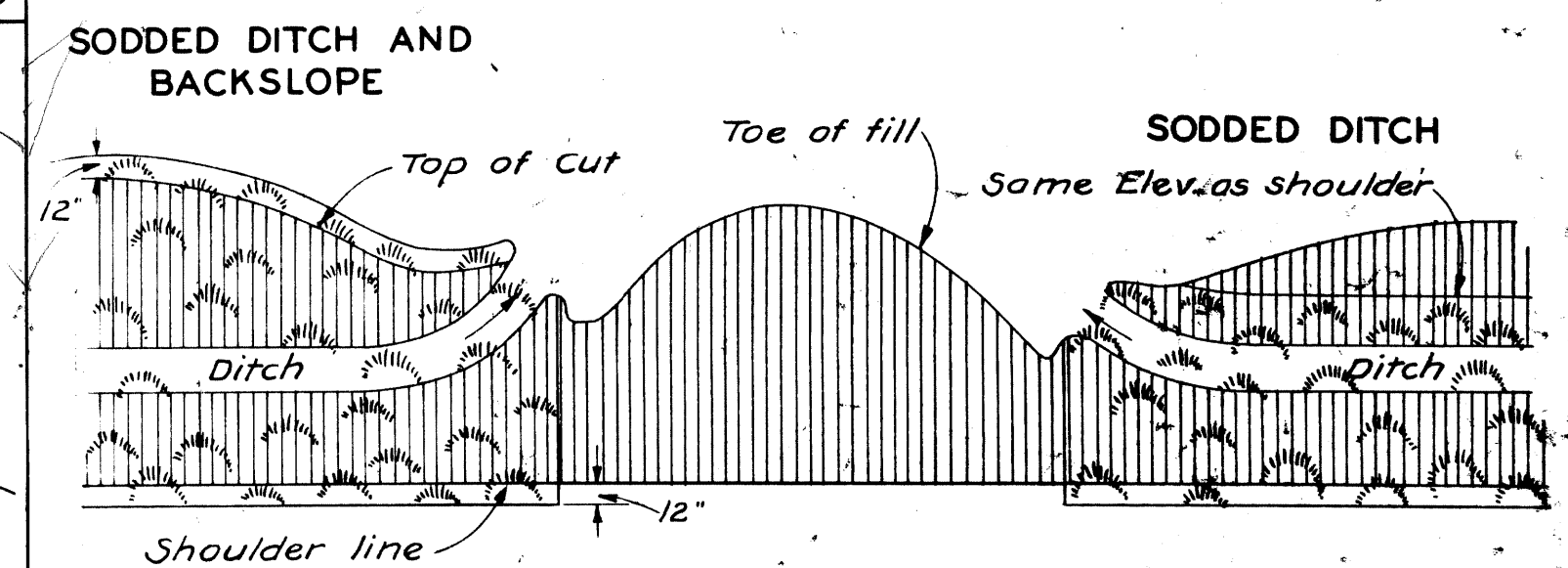
SODDED SPILLWAY ON BACKSLOPE



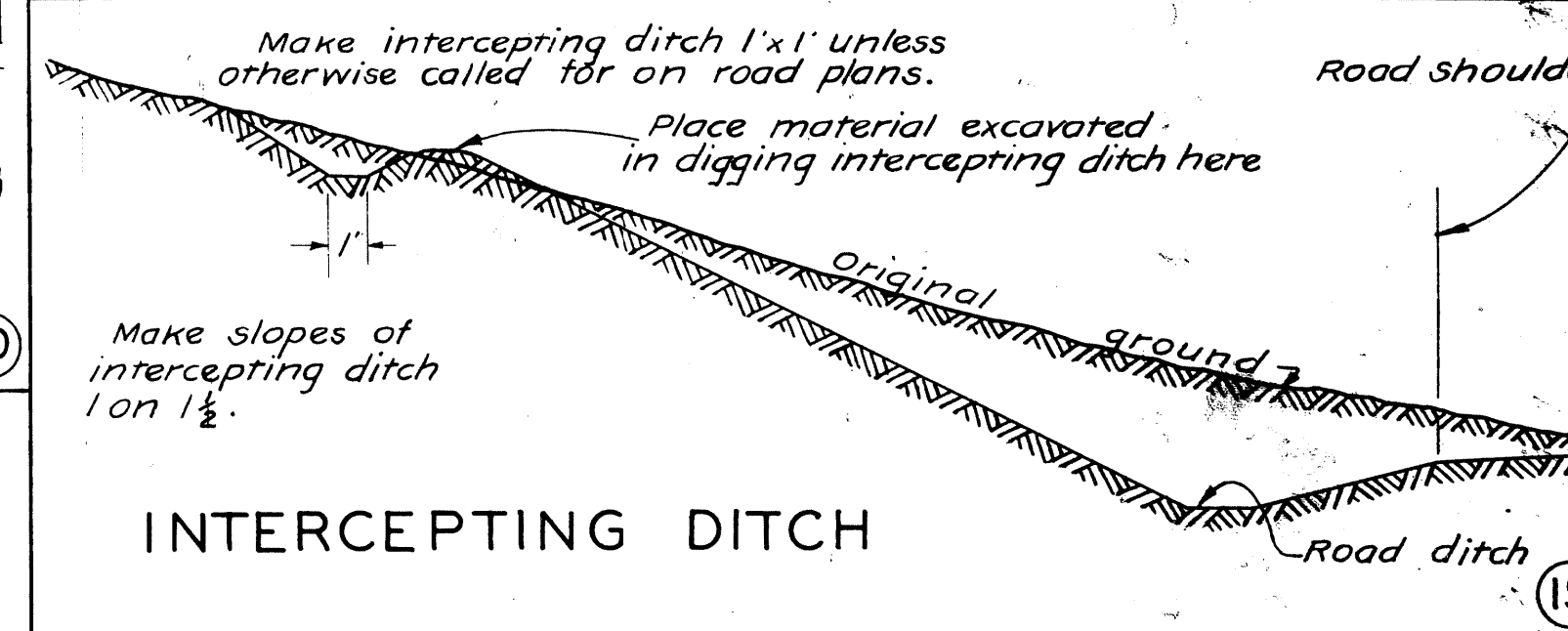
SOD AROUND CULVERT WINGS LARGE FILL



DITCH TURNOUTS



SOD AROUND DITCH TURNOUTS



INTERCEPTING DITCH

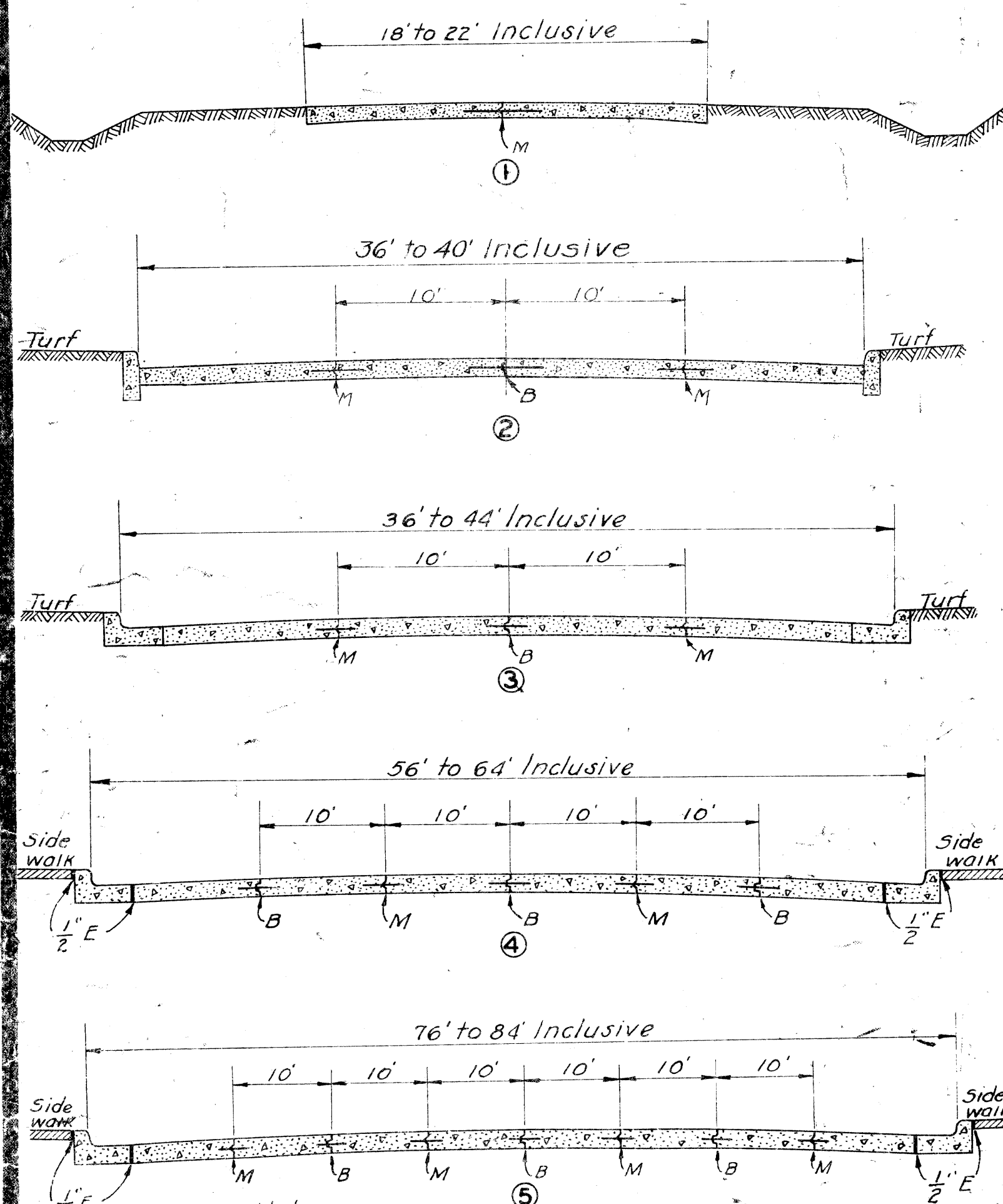
MICHIGAN STATE HIGHWAY DEPARTMENT
STANDARD PLAN FOR
TREE WELLS, SODDING AND
PROTECTIVE DITCHES

CHECKED *L. N. Dressley* 7-13-30 CHIEF DRAFTSMAN
CORRECT *R. P. Kelley* 7-15-30 ENGINEER OF PLANS
RECOMMENDED FOR APPROVAL *C. F. Barber* 7-17-30 ENGINEER OF DESIGN
APPROVED *C. E. Jeter* 7-17-30 CHIEF ENGINEER

DRAWN BY *L. H. N.* CHECKED BY _____ TRACED BY *IB*

Approved: Bureau of Public Roads, Oct. 8, 1930

CONCRETE PAVEMENT LONGITUDINAL EXPANSION AND CONSTRUCTION JOINTS



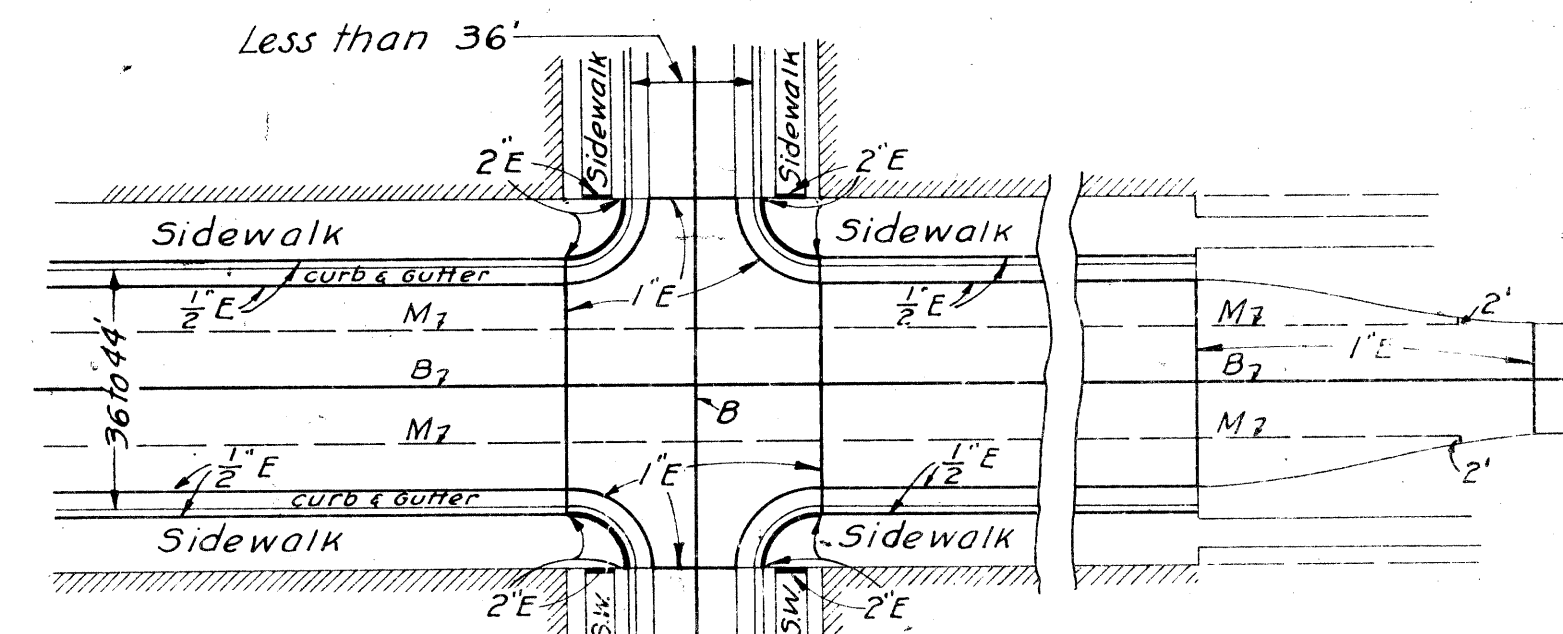
Note:-
"E" = Expansion Joint
"M" = Metal Construction Joint-Detail #4
"B" = Bulkhead Construction Joint-Detail #5

Place one-half inch expansion joints around all man hole covers and other structures in the pavement.
Place one-half inch expansion joints between back of curb and abutting parallel sidewalks or other structures.
Place two inch expansion joints between back of curb and sidewalk approaches.
Place one inch expansion joints thru curb or curb and gutter opposite all transverse expansion joints called for in pavement.
In sections 2 and 3 place one-half inch expansion joint between edge of pavement and gutter along business frontage in all cases and where curb is backed by parallel sidewalk or other structures.

CONCRETE PAVEMENT TRANSVERSE EXPANSION AND CONSTRUCTION JOINTS

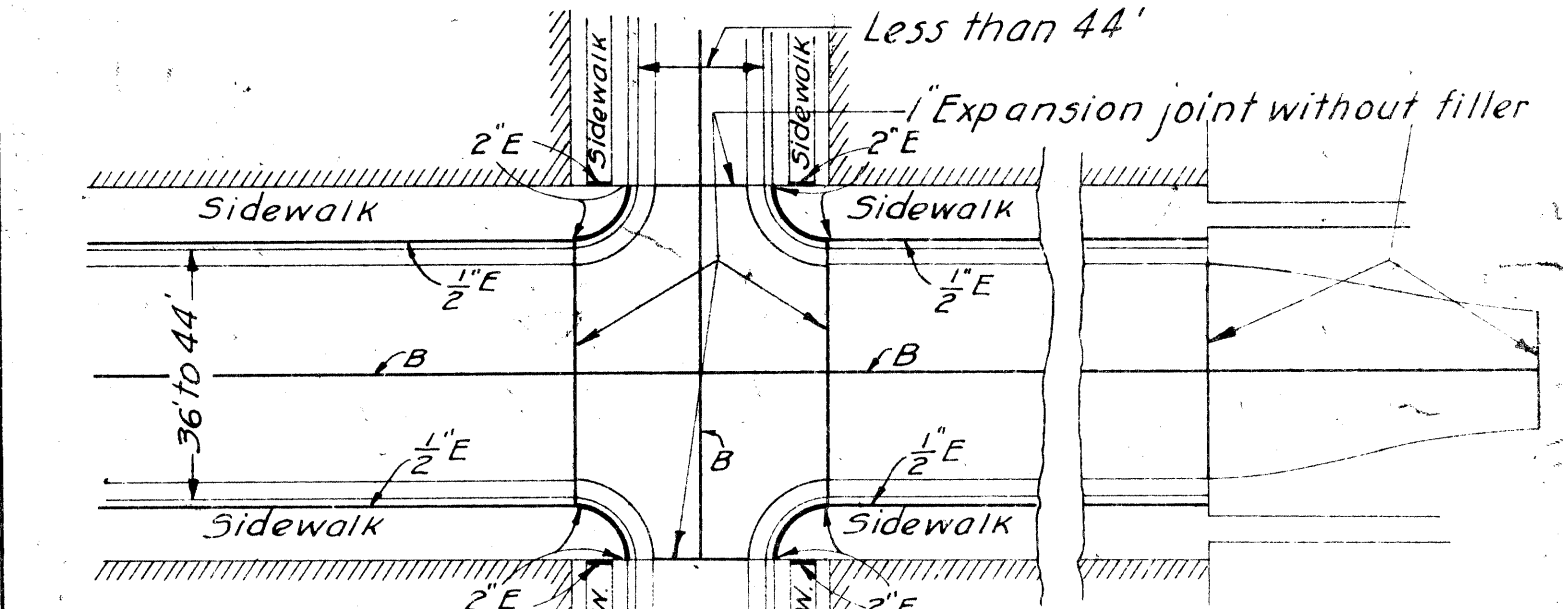
Place one inch transverse expansion joint with filler at intervals of 100 feet throughout the length of the pavement and at the ends of culverts and bridges where their floors serve as part of the pavement. Joints to be edged to $\frac{3}{8}$ " Radius.
Transverse butt joints shall be made where mixer is stopped for more than $\frac{1}{2}$ hour.

CONCRETE PAVEMENT



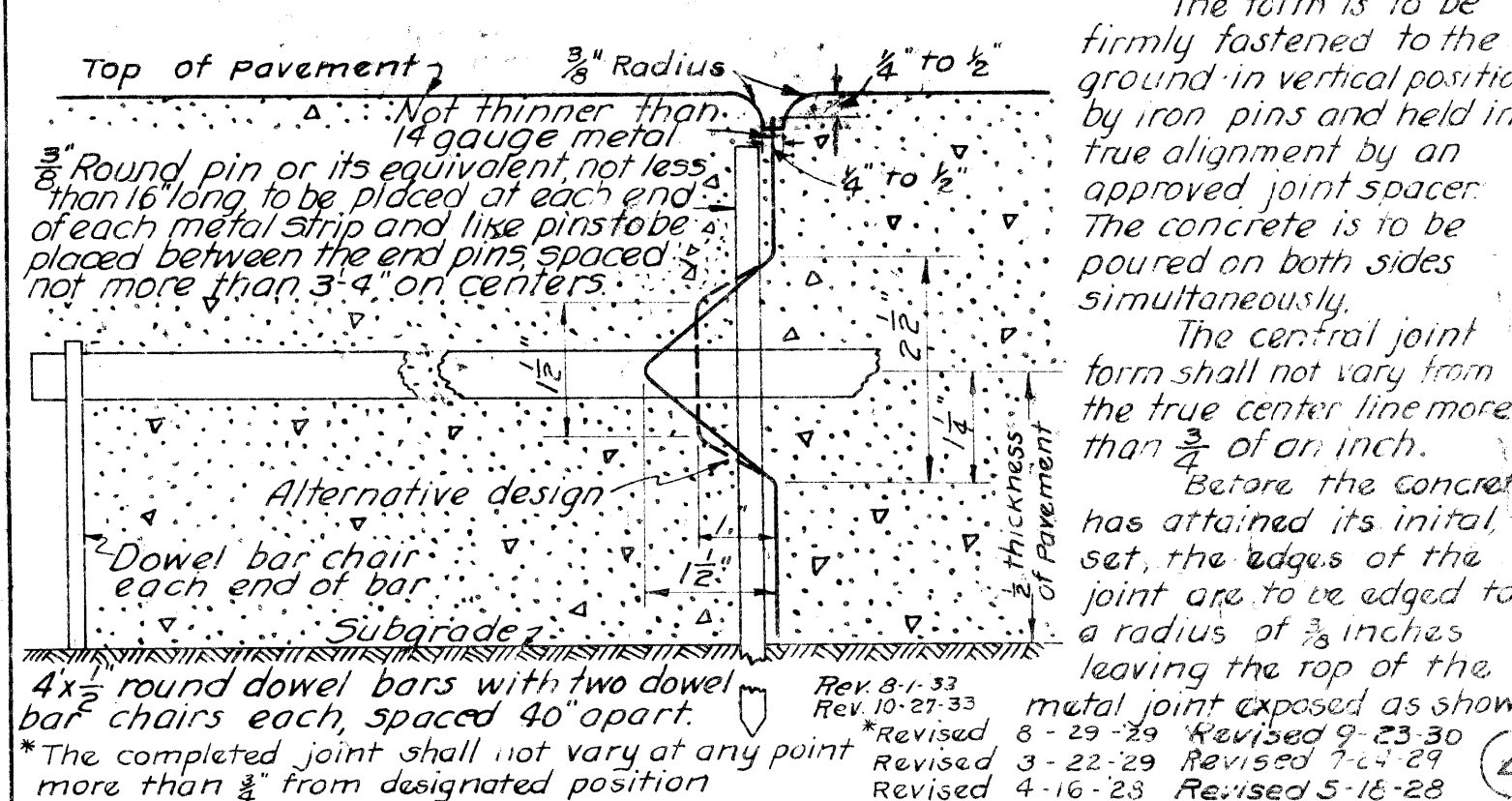
Place expansion and construction joints all catch basins, manholes and other structures in the pavement.
Note:-
"E" = Expansion joint
"M" = Metal Construction Joint-Detail #4
"B" = Bulkhead Construction Joint-Detail #5

CONCRETE BASE COURSE

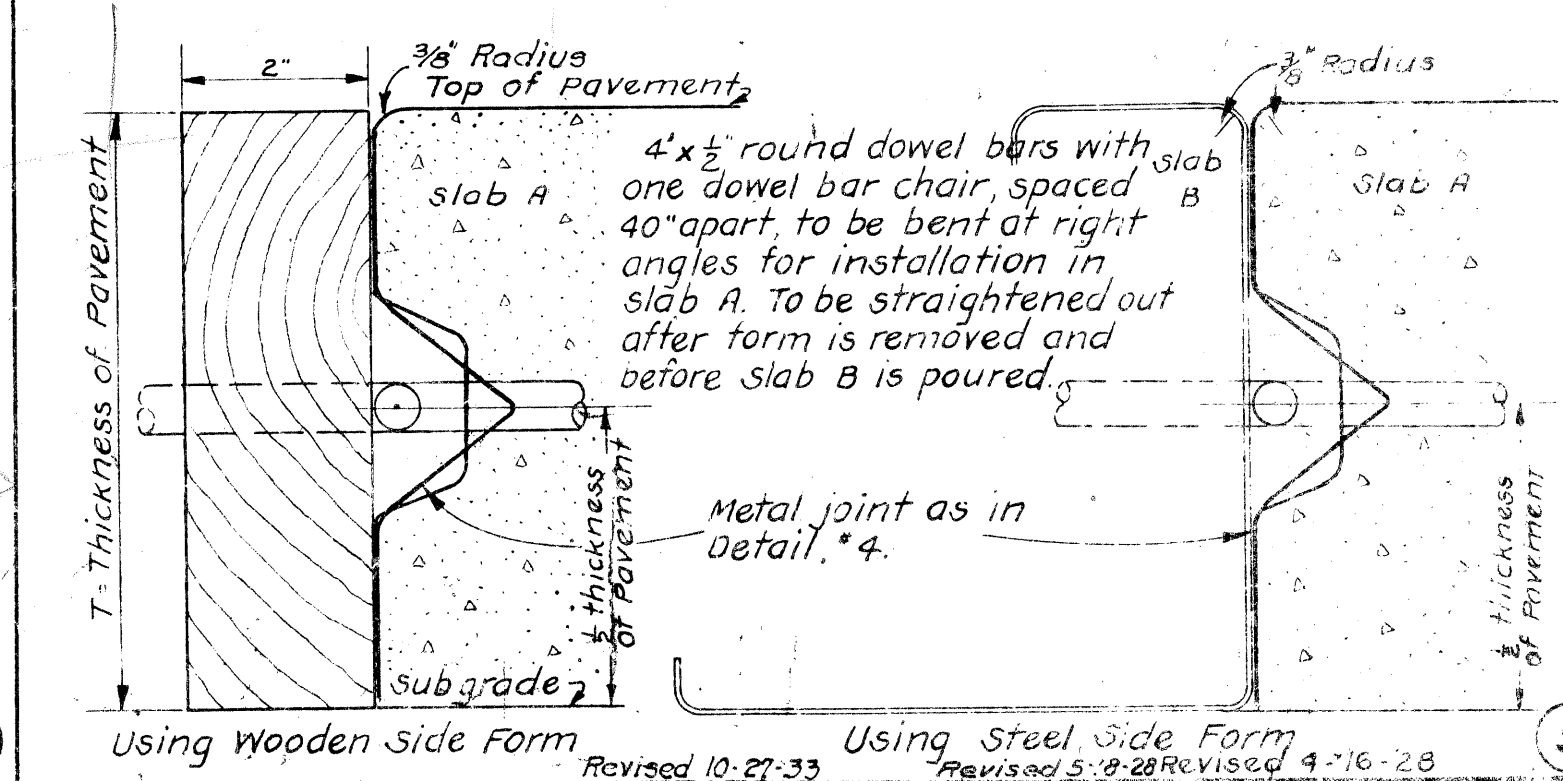


Place expansion and construction joints all catch basins, manholes and other structures in the pavement.
Note:-
"E" = Expansion joint
"M" = Metal Construction Joint-Detail #4
"B" = Bulkhead Construction Joint-Detail #5

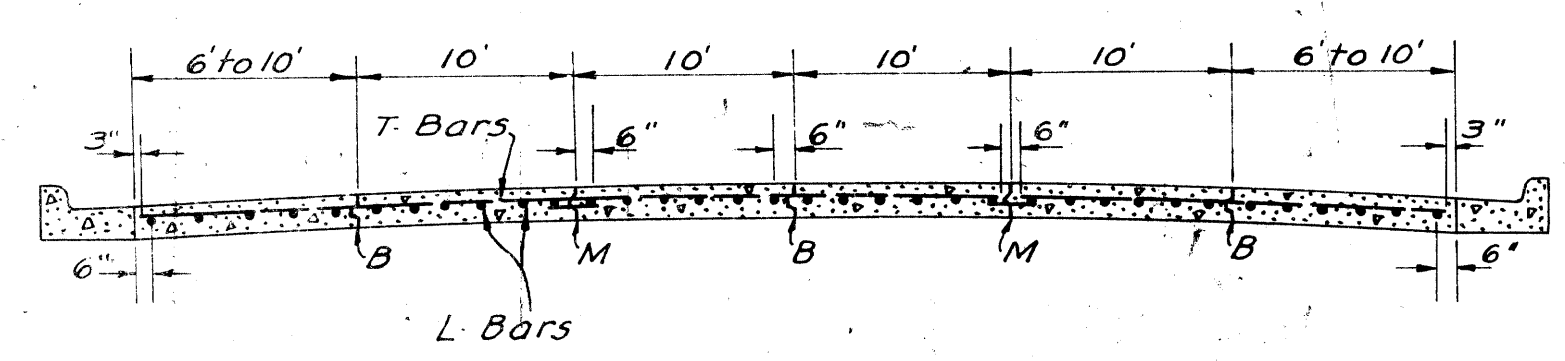
METAL CONSTRUCTION JOINT FOR CONCRETE PAVEMENT



BULKHEAD CONSTRUCTION JOINT DETAIL OF FORM



CONCRETE PAVEMENT BAR MAT REINFORCED PAVEMENT WITH CURB AND GUTTER



L Bars to be $\frac{1}{2}$ " plain round unpeeled, ends to be placed flush with expansion joints.
T Bars to be $\frac{1}{2}$ " plain round unpeeled and securely wired together at all bar intersections.
Between expansion joints to be even and the ends of bars lapped 18". Laps to be not less than 25' apart. Two feet of lapped end of one bar to be greased.

Slab width	L Bars Number	L Bars Spacing	T Bars Length	T Bars Spacing
6'	4	1'-8"	5'-6"	1'-10"
7'	4	2'-0"	6'-6"	1'-6"
8'	5	1'-9"	7'-6"	1'-9"
9'	5	2'-0"	8'-6"	1'-6"
10'	5	2'-0"	8'-6"	1'-8"

Note: Reinforcement = 7.2# per sq. yd. (Approx.)

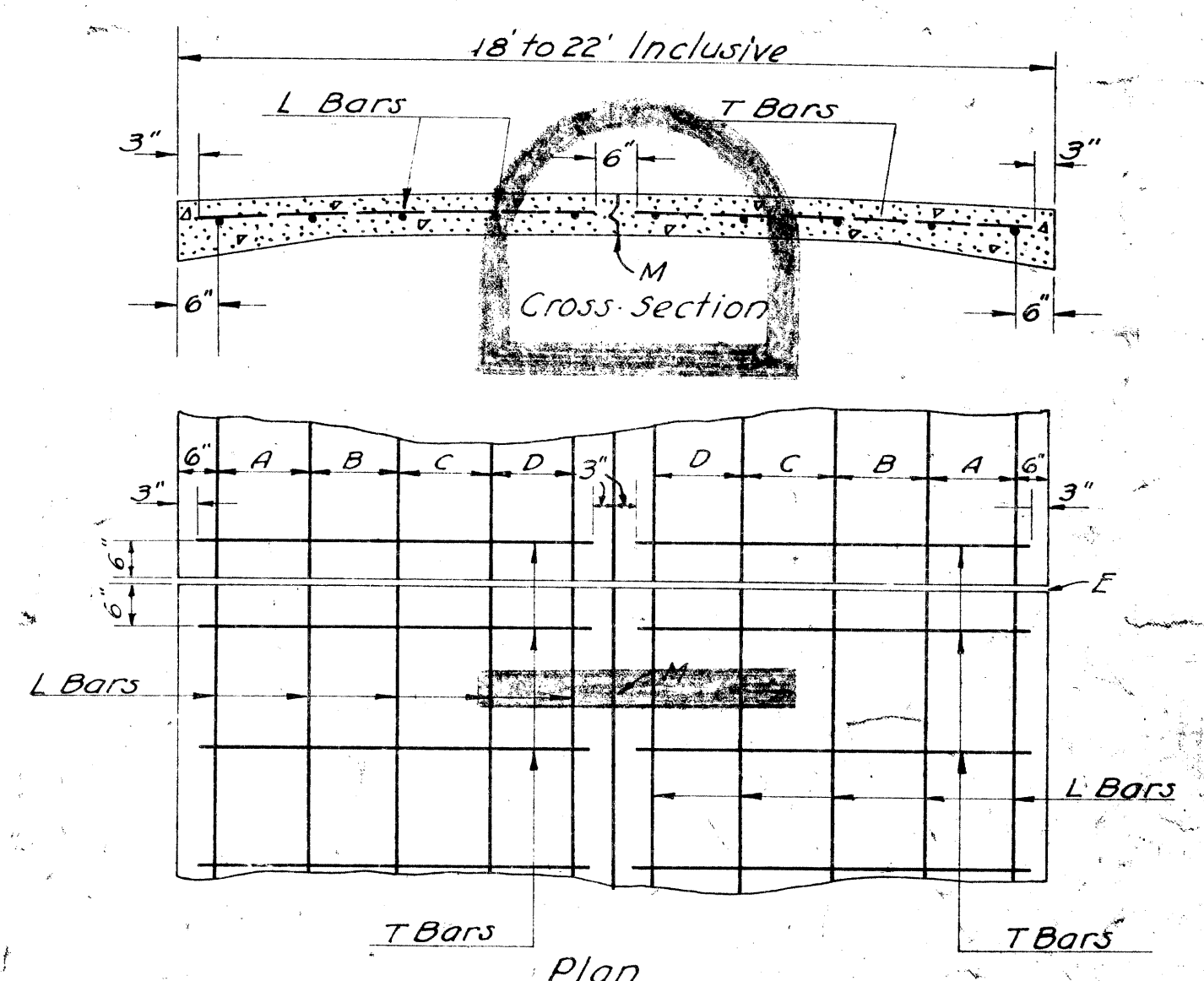
CONCRETE PAVEMENT MESH REINFORCED 5.4 LBS. PER SQUARE YARD DETAILS FOR STEEL MESH REINFORCEMENT

The steel mesh reinforcing fabric is to consist of main members spaced six inches on centers with cross-sectional area of not less than .108 sq. in. of effective steel per ft. of fabric and secondary members spaced 12 inches on centers with a cross-sectional area of not less than .054 sq. in. of effective steel per foot of fabric. Finished members shall develop a tensile strength of not less than 70,000 pounds per sq. in. of steel.
The fabric is to be placed two inches below and parallel to the top of the finished pavement and main members are to be placed parallel to the center line of pavement unless otherwise indicated.
The fabric is to extend within two inches of the edges of the slab and within two inches of expansion or construction joints. Adjacent sheets are to be lapped not less than three inches when the lap is parallel to main members and not less than twelve inches when the lap is parallel to secondary members, provided that at intervals of approximately 50 ft. in length of pavement the ends of the members placed parallel to the center line are to be butted instead of lapped.

CONCRETE PAVEMENT MESH REINFORCED 3.2 LBS. PER SQUARE YARD DETAILS FOR STEEL MESH REINFORCEMENT

The steel mesh reinforcing fabric is to consist of main members spaced six inches on centers with cross-sectional area of not less than .049 sq. in. of effective steel per ft. of fabric and secondary members spaced six inches on centers with a cross-sectional area of not less than .049 sq. in. of effective steel per foot of fabric. Finished members shall develop a tensile strength of not less than 70,000 pounds per sq. in. of steel.
The fabric is to be placed two inches below and parallel to the top of the finished pavement and main members are to be placed parallel to the center line of pavement unless otherwise directed.
The fabric is to extend within two inches of the edges of the slab and within two inches of expansion or construction joints. Adjacent sheets are to be lapped not less than three inches when the lap is parallel to main members and not less than twelve inches when the lap is parallel to secondary members, provided that at intervals of approximately 50 ft. in length of pavement the ends of the members placed parallel to the center line are to be butted instead of lapped.

CONCRETE PAVEMENT BAR MAT REINFORCED PAVEMENT WITHOUT CURB OR GUTTER



L Bars to be $\frac{1}{2}$ " plain round unpeeled. Ends to be placed flush with expansion joints.
T Bars to be $\frac{1}{2}$ " plain round unpeeled and lapped 18". Two feet of lapped end of one bar to be greased.
Top of bars to be $\frac{1}{2}$ " inches below top of pavement and securely wired together at all bar intersections.

Pavement Width	L Bar Spacing				T Bars	
	A	B	C	D	Length	Spacing
18"	14"	23"	28"	23"	8'-6"	1'-6"
20"	16"	26"	30"	26"	9'-6"	1'-5"
22"	18"	29"	36"	29"	10'-6"	1'-4"

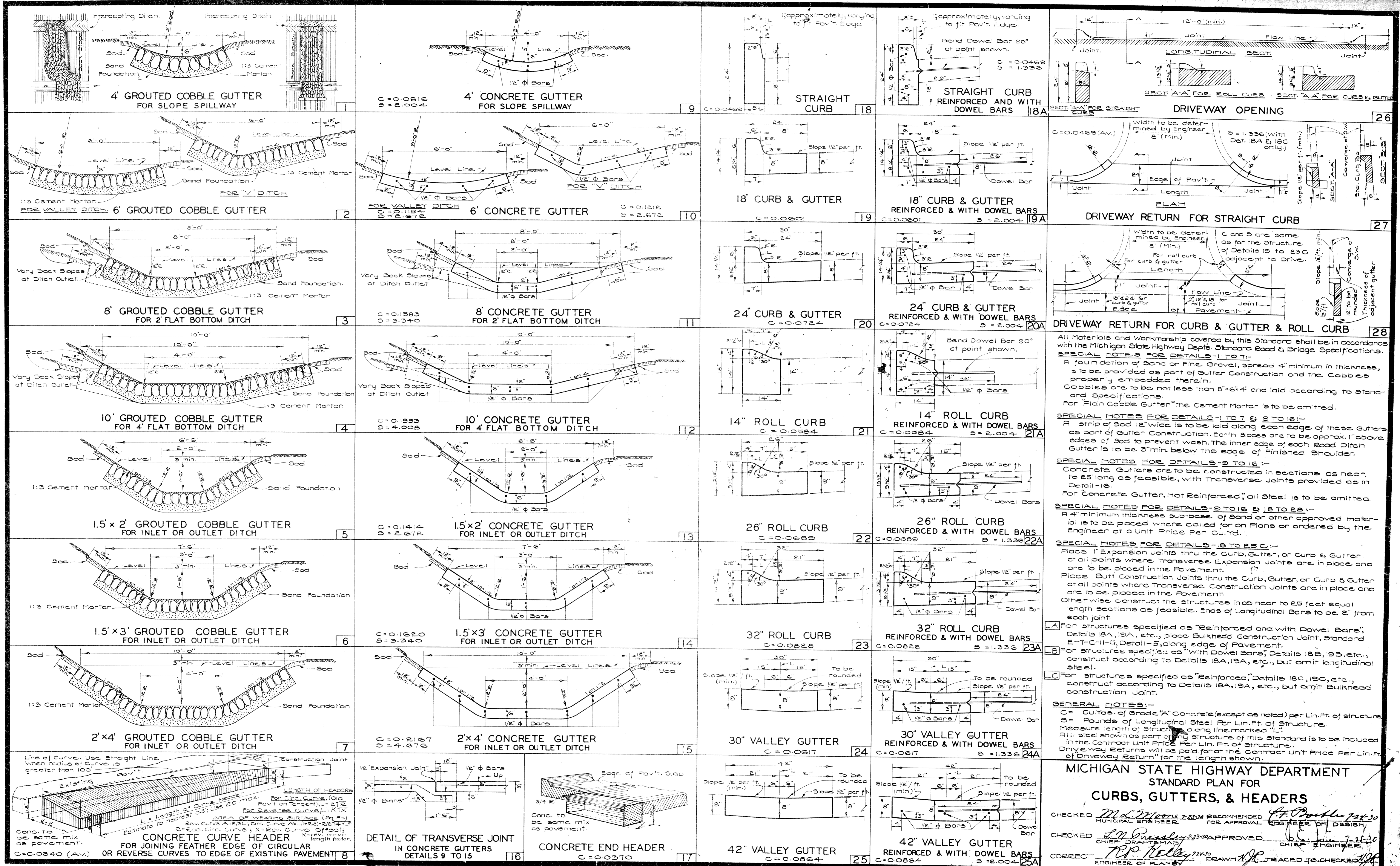
Note: Reinforcement = 7.2# per sq. yd. (Approx.)

CONCRETE BASE COURSE BAR MAT REINFORCED OMIT LONGITUDINAL METAL CONSTRUCTION JOINT & TIE BARS

MICHIGAN STATE HIGHWAY DEPARTMENT STANDARD PLAN FOR EXPANSION JOINTS-CONSTRUCTION JOINTS AND STEEL REINFORCEMENT IN PAVEMENT

RECOMMENDED FOR APPROVAL
CHECKED: R.P. Kelley, CHIEF DRAFTSMAN
CORRECT: J.P. Butler, ENGINEER OF DESIGN & PLANS
APPROVED: W.D. Williams, DEPUTY COMM. CHIEF ENGINEER

DRAWN BY: E.S.M.K. TRACED BY: E.P. CHECKED BY: L.K.P.



All Materials and Workmanship covered by this Standard shall be in accordance with the Michigan State Highway Dept. Standard Road & Bridge Specifications.

SPECIAL NOTES FOR DETAILS 1 TO 7:
 A foundation of Sand or Fine Gravel, spread 4" minimum in thickness, is to be provided as part of Gutter Construction and the Cobbles properly embedded therein. Cobbles are to be not less than 6"x6"x4" and laid according to Standard Specifications. For "Plain Cobble Gutter" the Cement Mortar is to be omitted.

SPECIAL NOTES FOR DETAILS 8 TO 16:
 A strip of Sod 12" wide is to be laid along each edge of these Gutters as part of Gutter Construction. Earth Slopes are to be approx. 1" above edges of Sod to prevent wash. The inner edge of each Road Ditch Gutter is to be 3" min. below the edge of Finished Shoulder.

SPECIAL NOTES FOR DETAILS 9 TO 16:
 Concrete Gutters are to be constructed in sections as near to 25' long as feasible, with Transverse Joints provided as in Detail-16.

SPECIAL NOTES FOR DETAILS 18 TO 25 C:
 For "Concrete Gutter, Not Reinforced", all Steel is to be omitted.

SPECIAL NOTES FOR DETAILS 9 TO 16 & 18 TO 25:
 A 4" minimum thickness sub-base of Sand or other approved material is to be placed where called for on Plans or ordered by the Engineer at a Unit Price Per Cu. Yd.

SPECIAL NOTES FOR DETAILS 18 TO 25 C:
 Place 1" Expansion Joints thru the Curb, Gutter, or Curb & Gutter at all points where Transverse Expansion Joints are in place and one is to be placed in the Pavement.
 Place Butt Construction joints thru the Curb, Gutter, or Curb & Gutter at all points where Transverse Construction Joints are in place and one is to be placed in the Pavement.
 Otherwise construct the structures in as near to 25 feet equal length sections as feasible. Ends of Longitudinal Bars to be 2' from each joint.

A For structures specified as "Reinforced and with Dowel Bars", Details 18A, 19A, etc., place Bulkhead Construction Joint, Standard E-T-C-11-G, Detail-5, along edge of Pavement.
B For structures specified as "With Dowel Bars", Details 18B, 19B, etc., construct according to Details 18A, 19A, etc., but omit longitudinal steel.
C For structures specified as "Reinforced", Details 18C, 19C, etc., construct according to Details 18A, 19A, etc., but omit Bulkhead construction joint.

GENERAL NOTES:
 C = Cuts of Grade "A" Concrete (except as noted) per Lin. Ft. of Structure
 S = Rounds of Longitudinal Steel Per Lin. Ft. of Structure.
 Measure length of Structure along line marked "L".
 All steel shown as part of any structure of this Standard is to be included in the Contract Unit Price Per Lin. Ft. of Structure.
 Driveway Returns will be paid for at the Contract Unit Price Per Lin. Ft. of Driveway Return for the length shown.

MICHIGAN STATE HIGHWAY DEPARTMENT
STANDARD PLAN FOR
CURBS, GUTTERS, & HEADERS

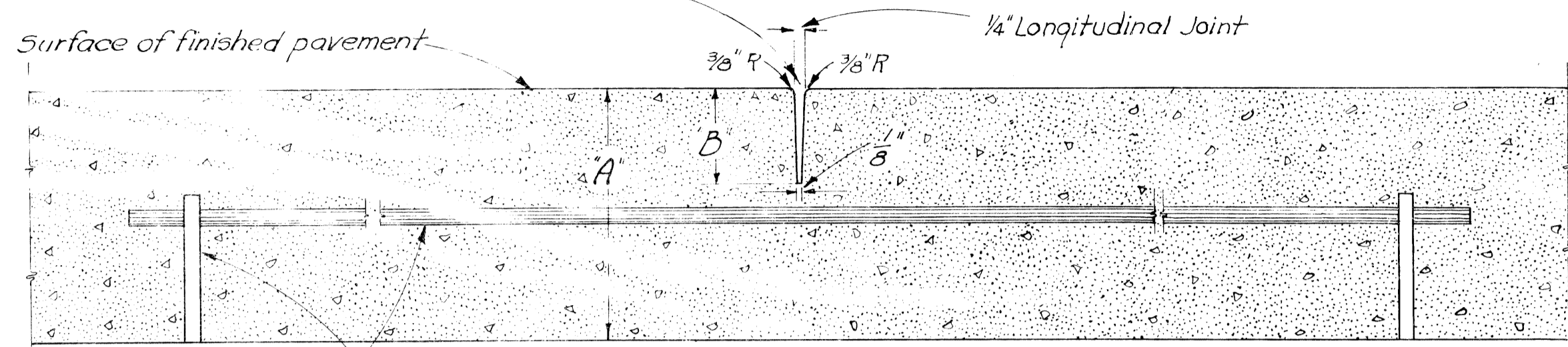
CHECKED *M. J. Moore* 7-22-34 RECOMMENDED *L. F. Powell* 7-24-30
 MUNICIPAL ENGINEER FOR APPROVAL ENGINEER OF DESIGN

CHECKED *L. M. Brasley* 7-23-34 APPROVED *C. E. Jones* 7-21-30
 CHIEF DRAFTSMAN CHIEF ENGINEER

CORRECT *R. P. Kelly* 7-24-30 DRAWN BY *J. P. Tracy* CHECKED BY *J. P. Tracy*
 ENGINEER OF PLANS

The Longitudinal Joint is to be formed immediately following the finishing machine and shall not vary from the true center-line more than 1/2 of an inch.
After the concrete has hardened sufficiently, the form is to be removed and the edges are to be rounded to a 3/8" Radius.

Groove is to be filled with Premolded Expansion Joint M-J-F-1926, Oil Asphalt Filler B-M-O-A, or Tar B-M-T.
The joint filler shall be placed or poured so as to completely fill and seal the joint without overflowing the pavement.
Where Premolded Joint Filler is installed while concrete is still soft the Edging of the concrete adjacent to the joint filler shall be omitted.

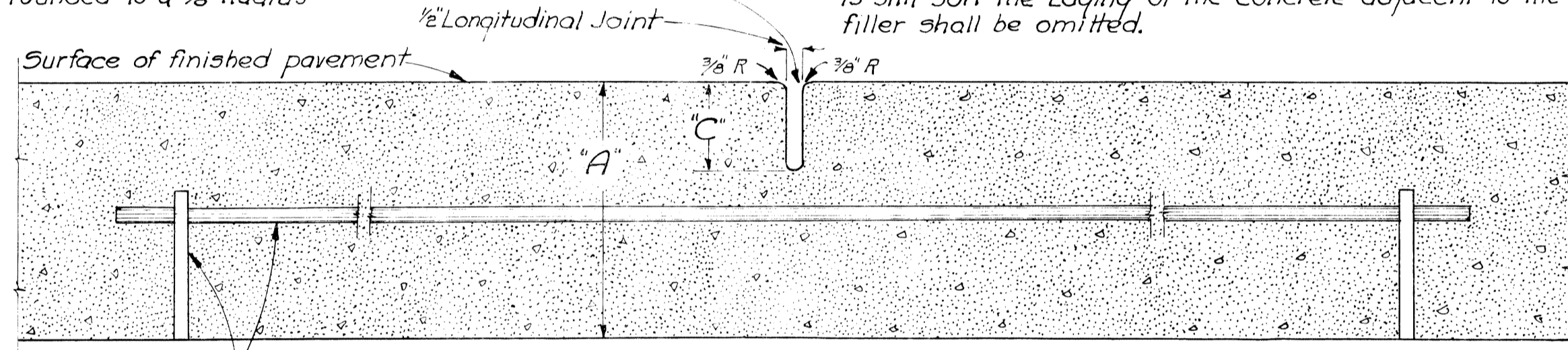


1/2" x 4" Dowel bars placed to a height of 1/2 the thickness of pavement and spaced at 40" intervals, supported by a Dowel bar Chair at each end of the bar as shown.

ALTERNATE NO. 1

The Longitudinal Joint is to be formed immediately following the finishing machine and shall not vary from the true center-line more than 1/2 of an inch.
After the concrete has hardened sufficiently, the form is to be removed and the edges are to be rounded to a 3/8" Radius.

Groove is to be filled with Premolded Expansion Joint M-J-F-1926, Oil Asphalt Filler B-M-O-A, or Tar B-M-T.
The joint filler shall be placed or poured so as to completely fill and seal the joint without overflowing the pavement.
Where Premolded Joint Filler is installed while concrete is still soft the Edging of the concrete adjacent to the joint filler shall be omitted.



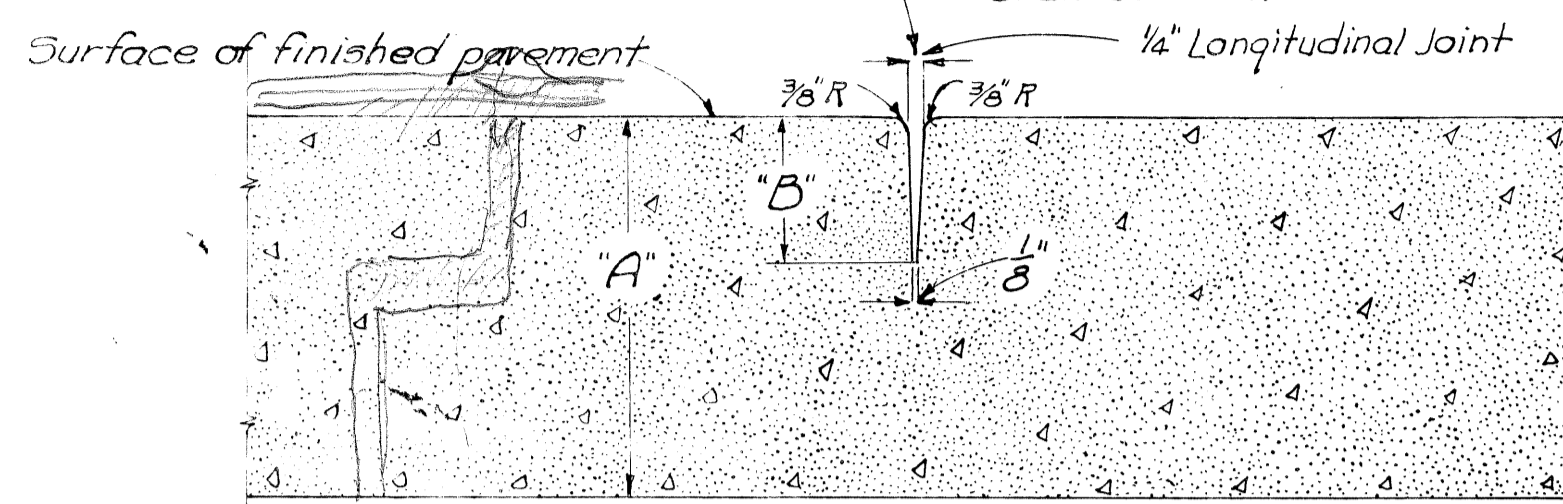
1/2" x 4" Dowel bars placed to a height of 1/2 the thickness of pavement and spaced at 40" intervals, supported by a Dowel bar Chair at each end of bar as shown.

ALTERNATE NO. 2
CONTRACTION JOINTS WITH TIE BARS

Detail No. 1

The Longitudinal Joint is to be formed immediately following the finishing machine and shall not vary from the true center line more than 1/2 of an inch.
After the concrete has hardened sufficiently, the form is to be removed and the edges are to be rounded to a 3/8" Radius.

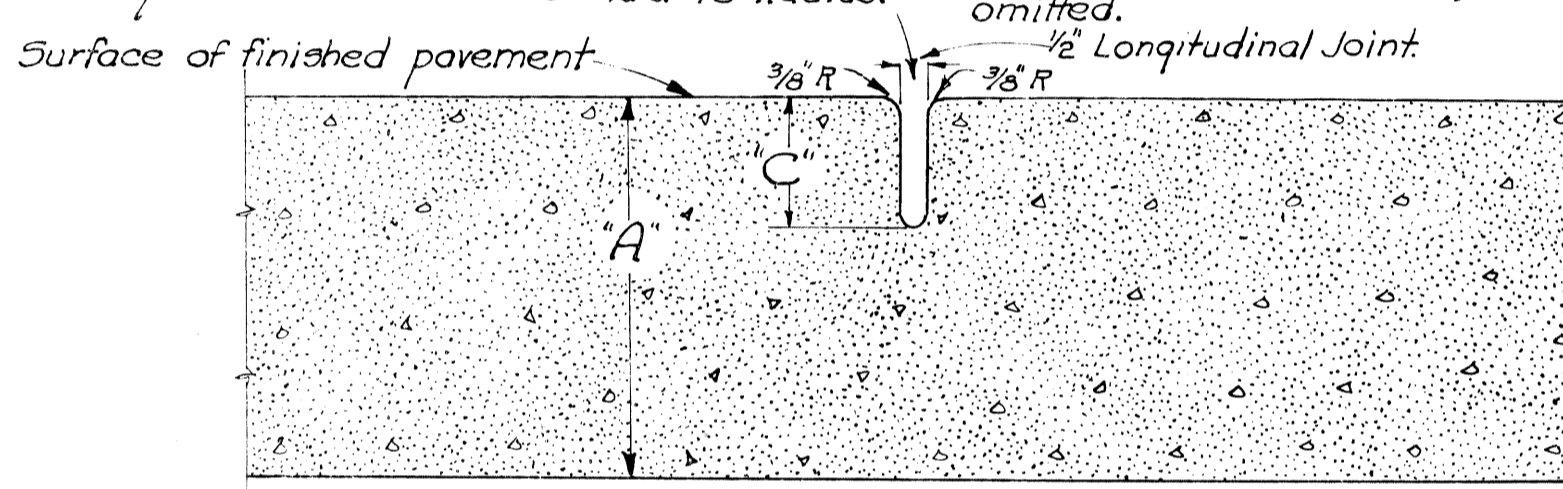
Groove is to be filled with Premolded Expansion Joint M-J-F 1926, Oil Asphalt Filler B-M-O-A, or Tar B-M-T.
The joint filler shall be placed or poured so as to completely fill and seal the joint without overflowing the pavement.
Where Premolded Joint Filler is installed while concrete is still soft the Edging of the concrete adjacent to the joint filler shall be omitted.



ALTERNATE NO. 1

The longitudinal joint is to be formed immediately following the finishing machine and shall not vary from the true center-line more than 1/2 of an inch.
After the concrete has hardened sufficiently, the form is to be removed and the edges are to be rounded to a 3/8" Radius.

Groove is to be filled with Premolded Expansion Joint M-J-F 1926, Oil Asphalt Filler B-M-O-A, or Tar B-M-T.
The joint filler shall be placed or poured so as to completely fill and seal the joint without overflowing the pavement.
Where Premolded Joint Filler is installed while concrete is still soft the Edging of the concrete adjacent to the joint filler shall be omitted.

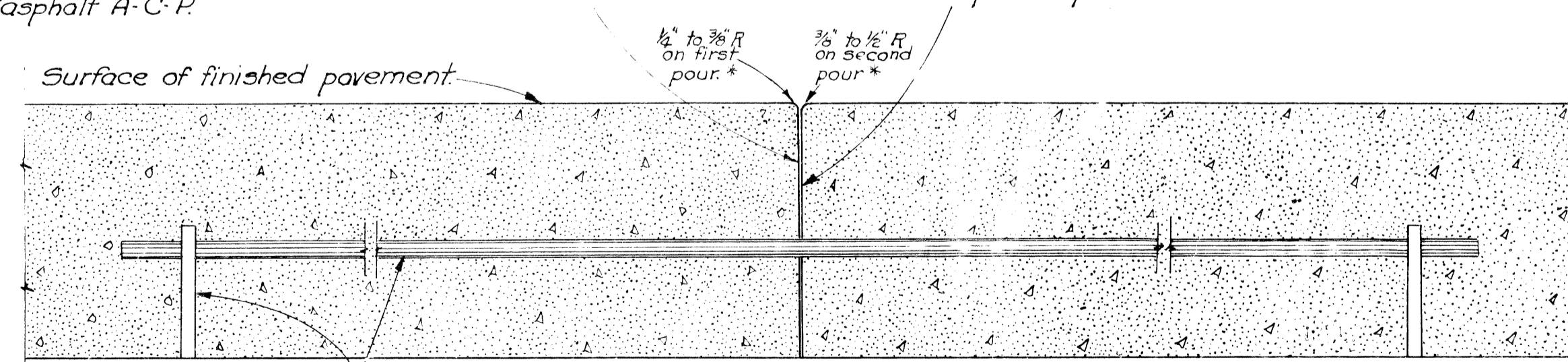


ALTERNATE NO. 2
CONTRACTION JOINTS WITHOUT TIE BARS

Detail No. 2

Faces of Bulkhead Construction Joints are to be painted with one application of Tar H-T-C or cut back asphalt A-C-P.

The completed joint shall not vary from the designated position more than 1/2 of an inch.



1/2" x 4" Dowel bars placed to a height of 1/2 the thickness of pavement and spaced at 40" intervals, supported by a Dowel bar Chair at each end of bar as shown.

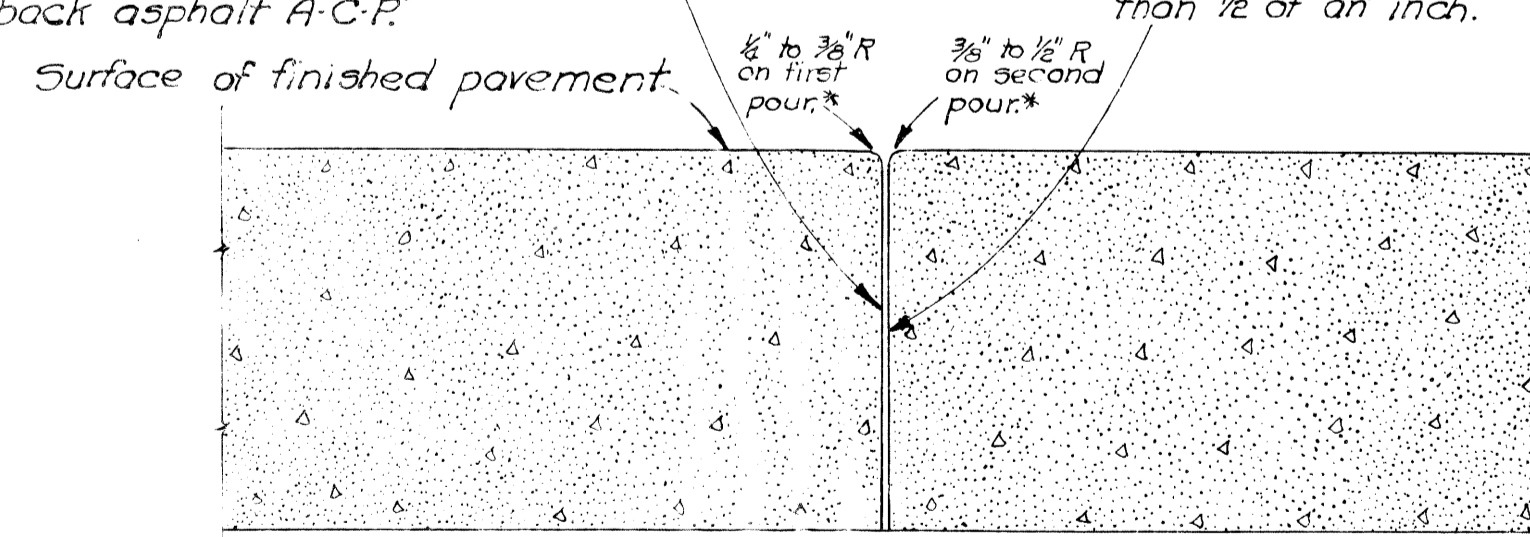
STRAIGHT BULKHEAD CONSTRUCTION JOINT WITH TIE BARS

* If 1/4" R. Edging is used on the first pour use 3/8" R. Edging on the second pour and if 3/8" R. Edging is used on the first pour use 1/2" R. Edging on second pour.

Detail No. 3

Faces of Bulkhead Construction Joints are to be painted with one application of Tar H-T-C or cut back asphalt A-C-P.

The completed joint shall not vary from the designated position more than 1/2 of an inch.



STRAIGHT BULKHEAD CONSTRUCTION JOINT WITHOUT TIE BARS

* If 1/4" R. Edging is used on the first pour use 3/8" R. Edging on the second pour and if 3/8" R. Edging is used on the first pour use 1/2" R. Edging on second pour.

Detail No. 4

TABLE FOR PAVEMENT THICKNESSES AND RESPECTIVE DEPTHS FOR ALTERNATIVE JOINTS NO. 1 & 2 DETAILS NO. 1 & 2 ONLY			
PAVEMENT THICKNESS "A"	DEPTH OF JOINT (B) ALTERNATE #1	DEPTH OF JOINT (C) ALTERNATE #2	WIDTH OF PREMOLDED MATERIAL
7"	2 3/4"	2 1/4"	2 1/2"
8"	3"	2 1/2"	2 3/4"
9"	3 1/4"	2 3/4"	3"
10"	3 1/2"	3"	3 1/4"

Note:
The materials called for on this plan shall meet the Michigan State Highway Departments 1926 Standard Road and Bridge Specifications.
Where the groove joint is filled by pouring, the pouring is to be so done as to completely fill the groove without overflowing the pavement.
Great care shall be used on grades and, where necessary, the pouring shall be done in two or more operations to prevent overflowing.
Where Premolded Expansion Joint filler is used the material shall be one fourth (1/4) inch in thickness and of a depth below the finished surface of pavement as shown in the following table and Edging along the joint material shall be omitted.

PAVEMENT THICKNESS	DEPTH OF JOINT	WIDTH OF PREMOLDED MATERIAL
7"	2 1/4"	2 1/2"
8"	2 1/2"	2 3/4"
9"	2 3/4"	3"
10"	3"	3 1/4"

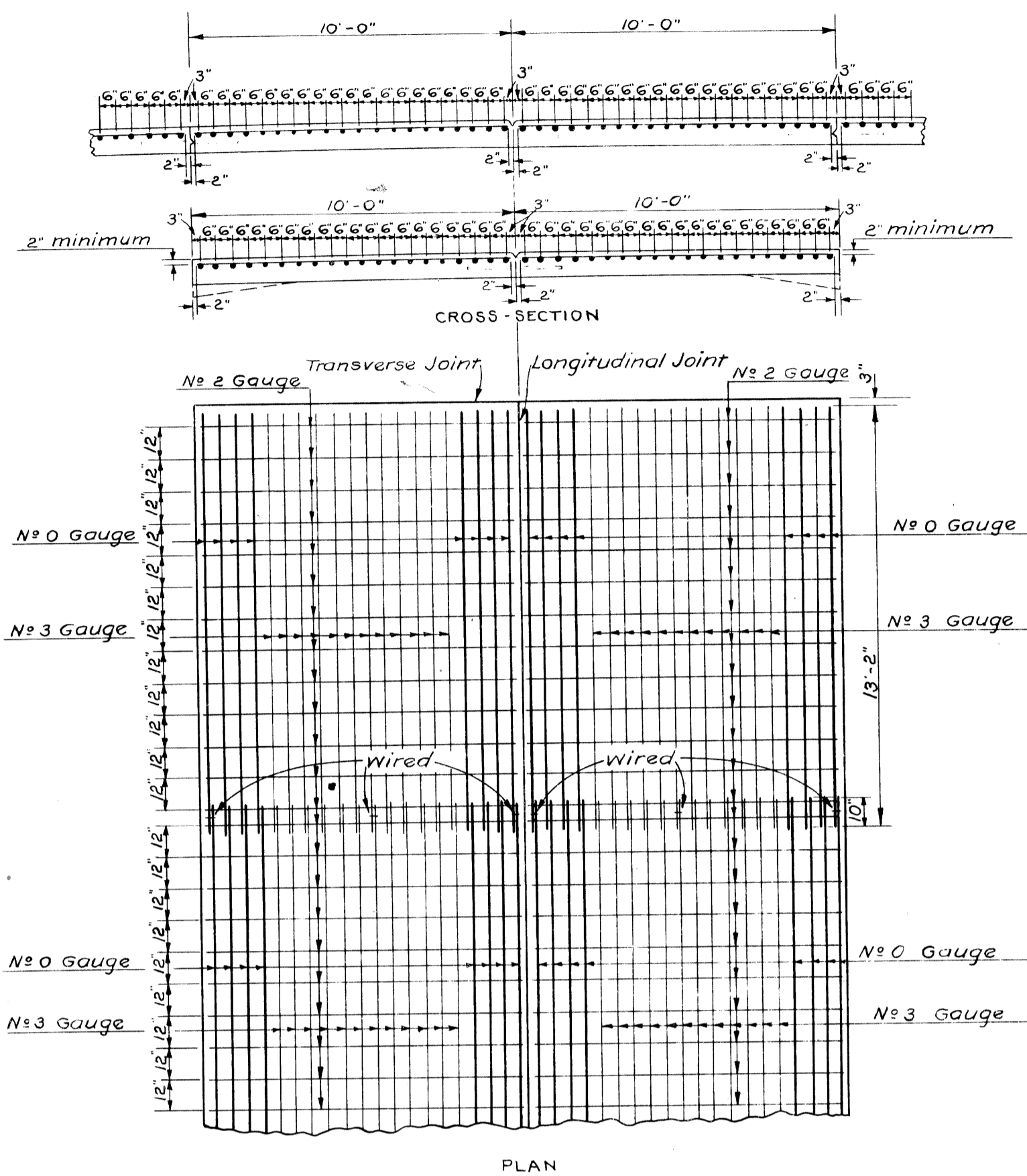
MICHIGAN STATE HIGHWAY DEPARTMENT
STANDARD PLANS FOR
CONTRACTION JOINTS AND STRAIGHT
BULKHEAD CONSTRUCTION JOINTS

CHECKED L. N. Pressley 6-10-31 FOR APPROVAL E. F. Baerlin 6-12-31
Chief Draftsman Engineer of Design

CORRECT R. P. Kelley 6-10-31 APPROVED _____
Engineer of Plans Chief Engineer

DRAWN BY Krievall TRACED BY B. Courtney CHECKED BY Pressley

STANDARD MESH REINFORCEMENT
5.4 LBS. PER SQUARE YARD
FOR CONCRETE PAVEMENT IN 10 FOOT UNITS OF WIDTH



All members shall be either cold drawn wire or hot rolled rods as follows:

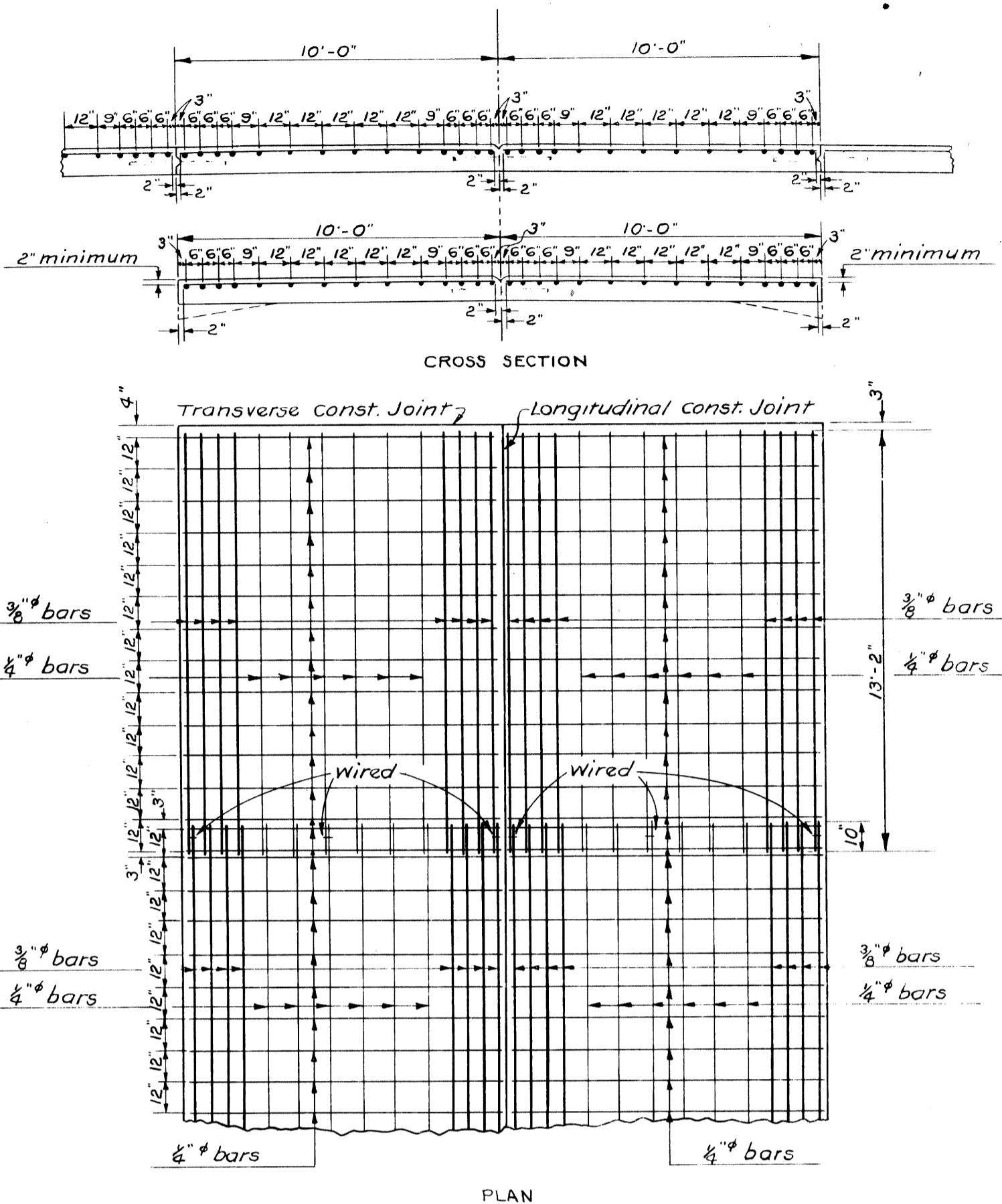
Cold drawn wire shall meet the requirements of the A.S.T.M. Standard Specifications, Designation A 82-27.

Hot rolled rods shall meet the requirements of the A.S.T.M. Standard Specifications, Designation A 15-30 for intermediate grade steel, except that they shall also meet the cold bend test for structural grade steel of the same specification. Tensile strength tests will be made between and across welds. Ductility and cold bend tests will be made between welds. The minimum diameters of rods shall be those shown in the A.S.T.M. Standard Specification designation A 82-27, for corresponding sizes of cold drawn wire.

Computed Weights of Steel

Average weight per standard sheet..... 74.8 lbs.
Average weight in slab 10 ft. wide and 100 ft. long..... 598.5 lbs.
Approximate weight per sq. yd. of Standard Pavement..... 5.4 lbs.

STANDARD BAR MAT REINFORCEMENT
5.4 LBS. PER SQUARE YARD
FOR CONCRETE PAVEMENT IN 10 FOOT UNITS OF WIDTH



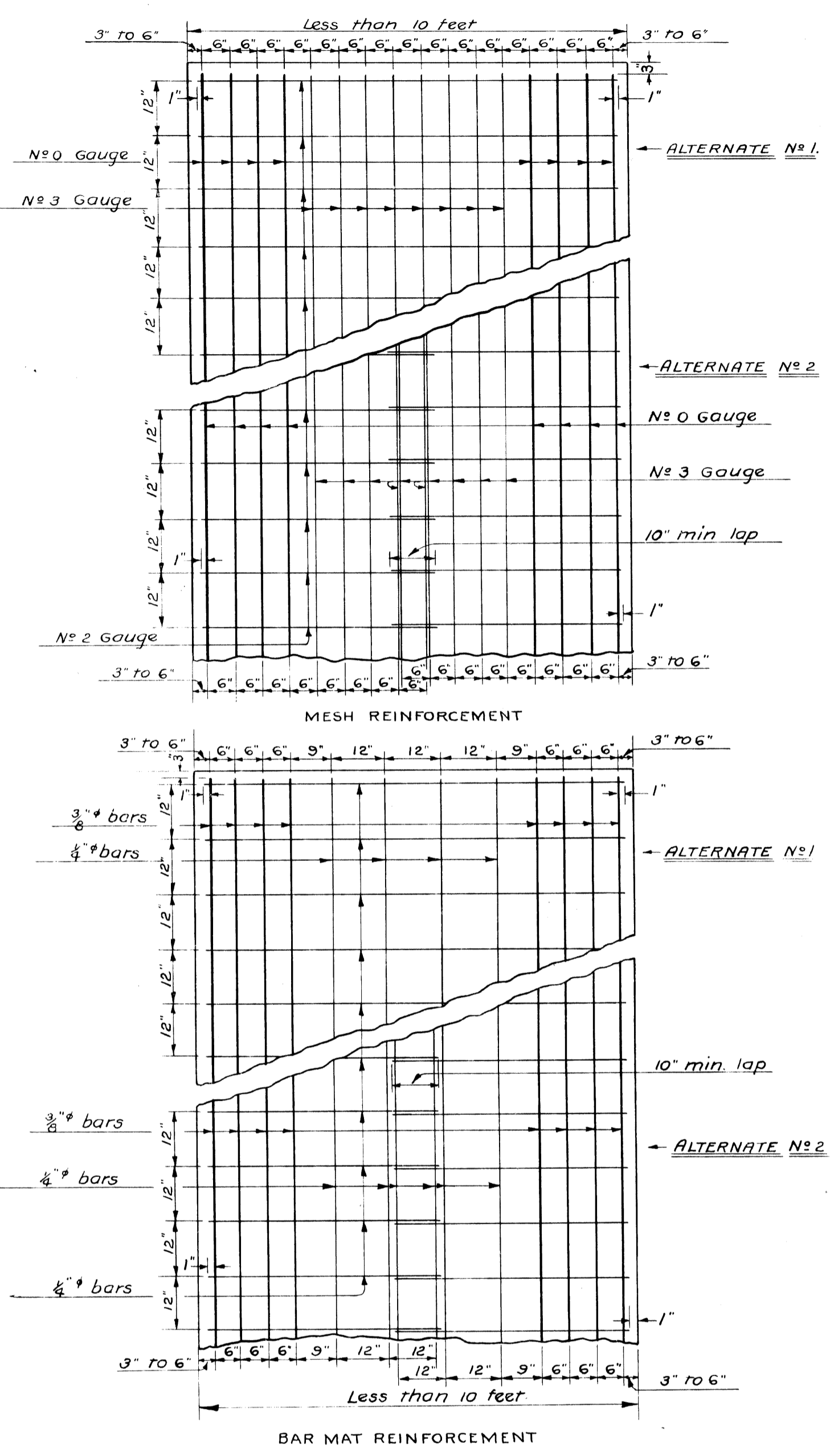
All members shall be plain round bars conforming to the requirements of the A.S.T.M. Standard Specifications, Designation A 15-30, for intermediate grade steel, except that they shall also meet the cold bend test for structural grade steel of the same specification. Tensile strength tests will be made between and across welds. Ductility and cold bend tests will be made between welds.

Computed Weights of Steel

Total weight per standard Mat..... 75.4 lbs.
Total weight in slab 10 ft. wide and 100 ft. long..... 603.2 lbs.
Approximate weight per sq. yd. of Standard Pavement..... 5.4 lbs.

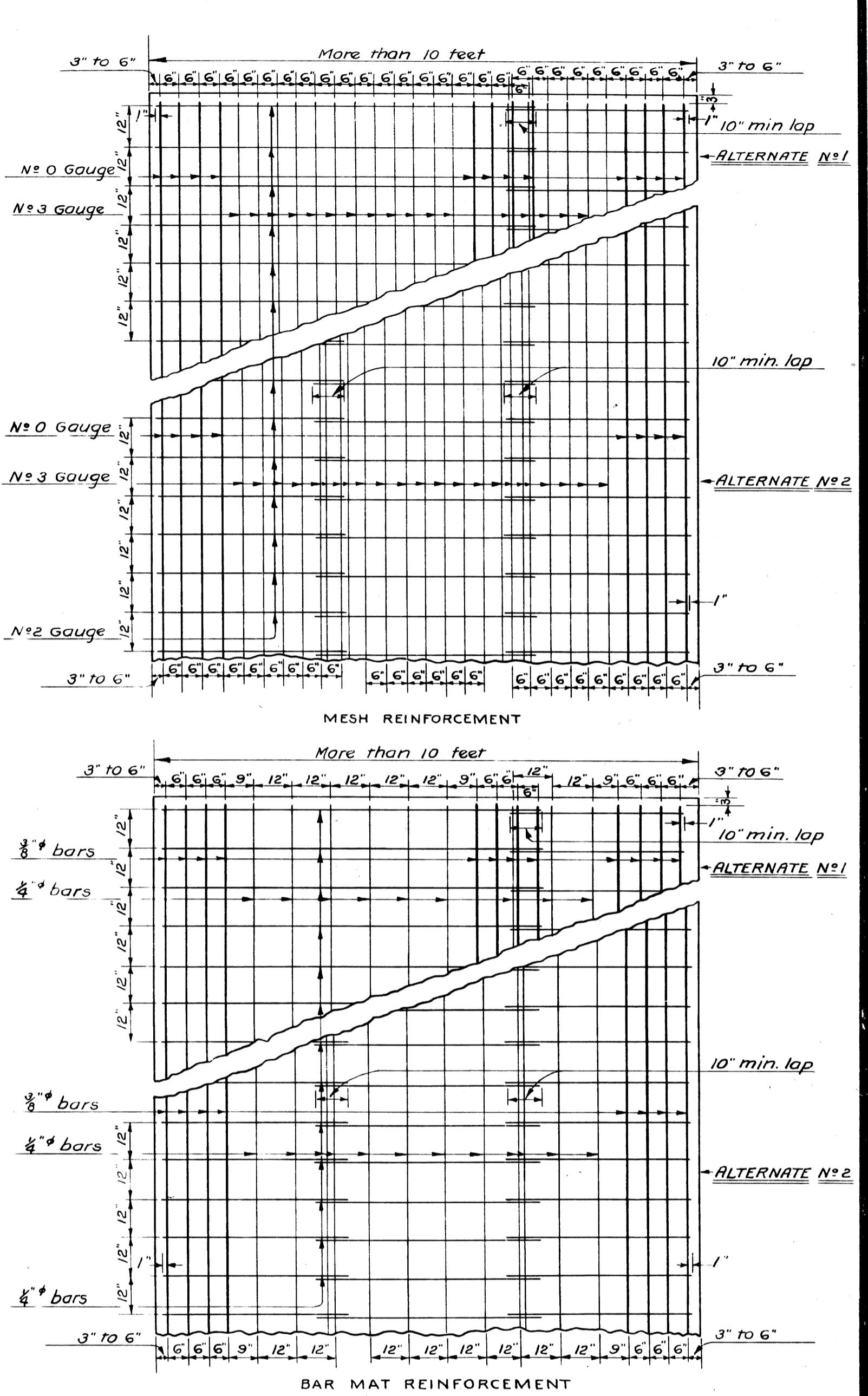
Deformed bars may be substituted for plain round bars, at the option of the contractor, provided that the cross sectional area at all points shall at least equal the cross sectional area of plain round bars.

SPECIAL DESIGN FOR REINFORCEMENT
FOR CONCRETE PAVEMENT
IN UNITS OF WIDTH LESS THAN 10 FEET



Where the unit width of pavement slab is less than 10 feet the reinforcement requirements are similar to those for ten (10) foot units of width except that the number of the lighter longitudinal members shall be reduced by fabricating special sheets or mats of the required width or by splitting and lapping standard sheets or mats.

SPECIAL DESIGN FOR REINFORCEMENT
FOR CONCRETE PAVEMENT
IN UNITS OF WIDTH GREATER THAN 10 FEET



Where the unit width of pavement slab is more than 10 feet the reinforcement requirements are similar to those for 10 foot units of width except that the reinforcement shall be widened by adding split sheets or mats to standard sheets or mats or by splitting and spreading standard sheets or mats and inserting special sheets or mats.

-NOTES-

The size and spacings of all members shall be as shown on this plan.

The different members of each sheet or mat shall be electrically welded at all points of intersection and the welds shall be of sufficient strength that they will not be broken during handling or placing.

Adjacent sheets or mats shall be lapped not less than ten (10) inches and shall be held firmly together by wire or approved clips not more than four (4) feet apart.

Sheets and mats shall be shipped and delivered to the work in flat bundles containing from ten (10) to twenty (20) sheets or mats securely fastened together. Each bundle shall have an approval tag attached thereto.

The use of cold drawn wire and hot rolled rods in the same sheet will not be permitted.

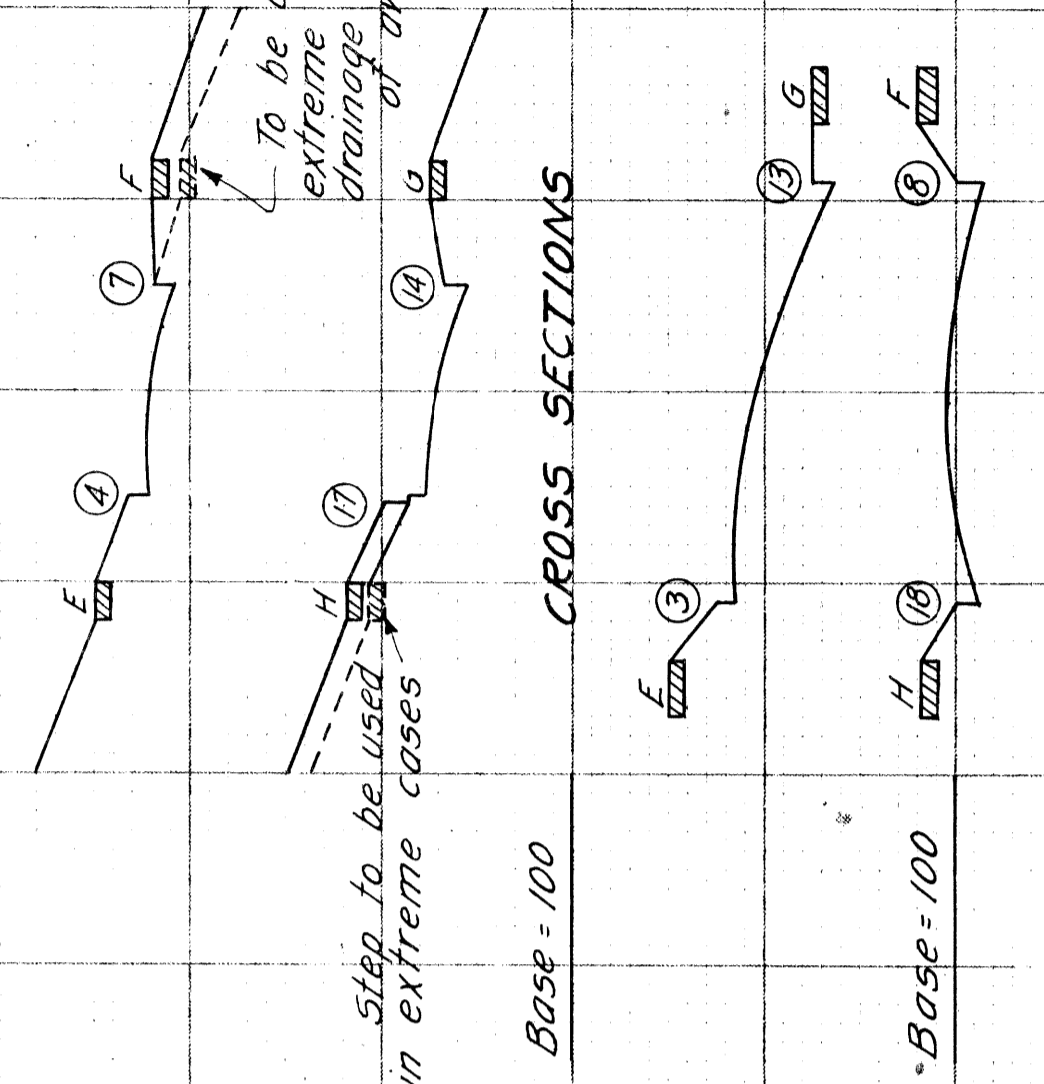
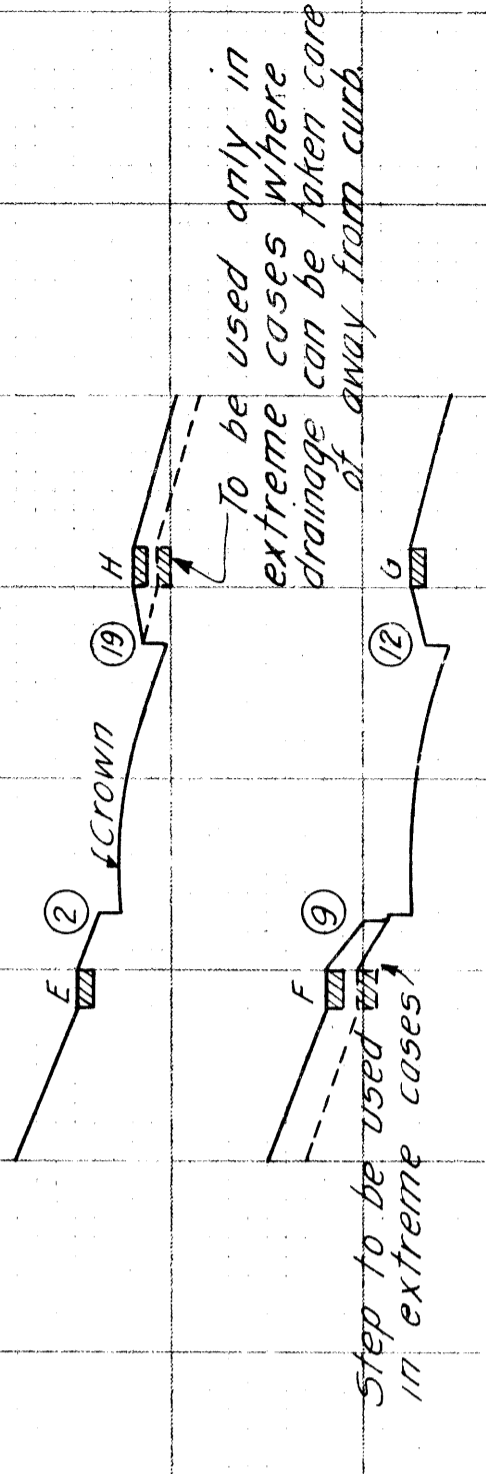
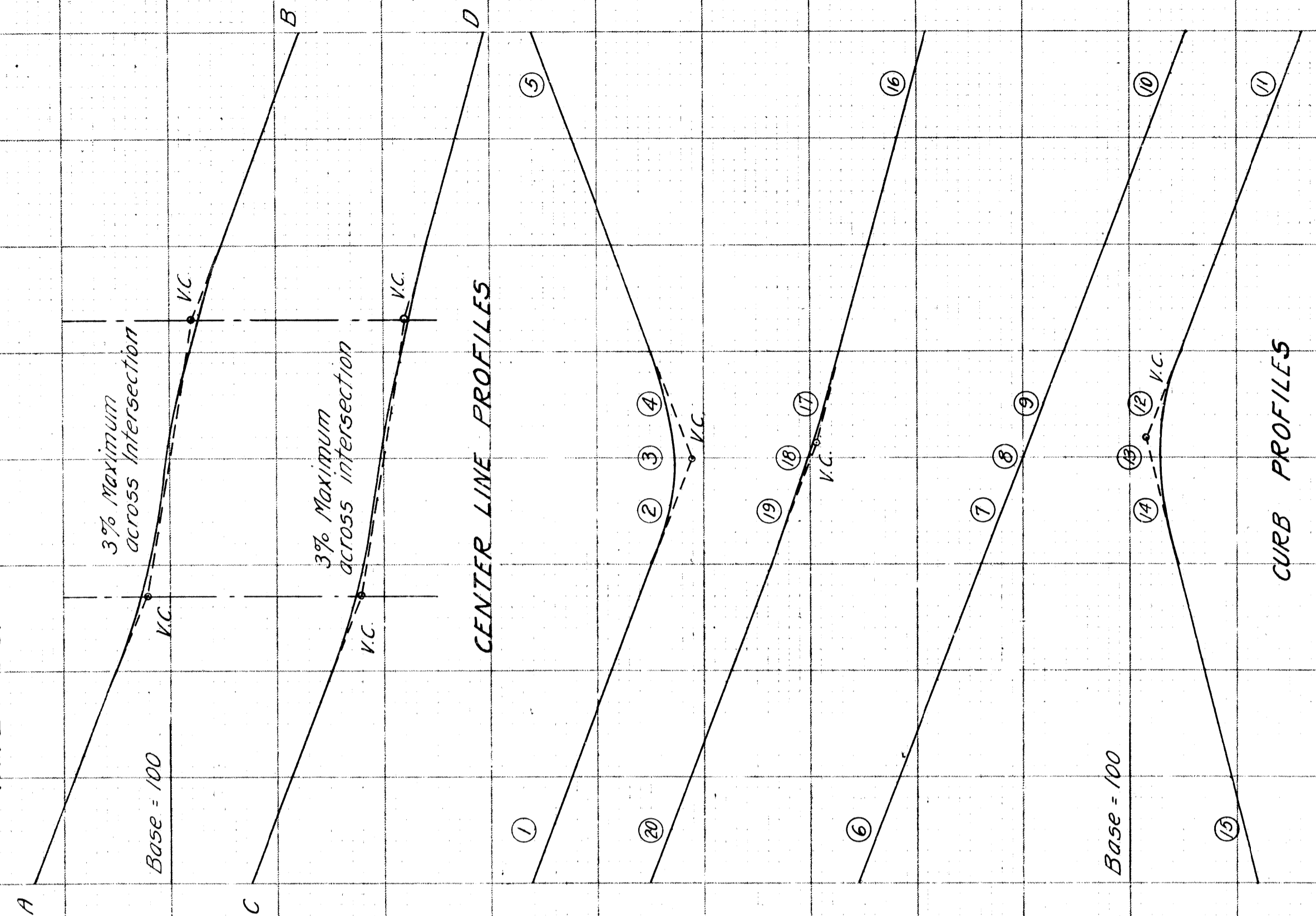
The reinforcement shall be placed not less than two (2) inches below the surface of the finished pavement but not lower than the center of the slab. It shall be held in proper position by the use of approved chairs or hangers or by pouring the concrete in two operations and levelling or striking off the initial pour at the proper elevation to form a support for the reinforcement.

The bars or dowels are classed as part of joint construction and not a part of Mesh or Bar Mat Reinforcement. Mesh or Bar Mat Reinforcement will be paid for at the contract unit price per square yard of pavement, reinforced in accordance with the details on this plan and regardless of variations in weight due to special lengths and widths of pavement slabs.

MICHIGAN STATE HIGHWAY DEPARTMENT
STANDARD PLAN FOR
STEEL REINFORCEMENT IN PAVEMENT

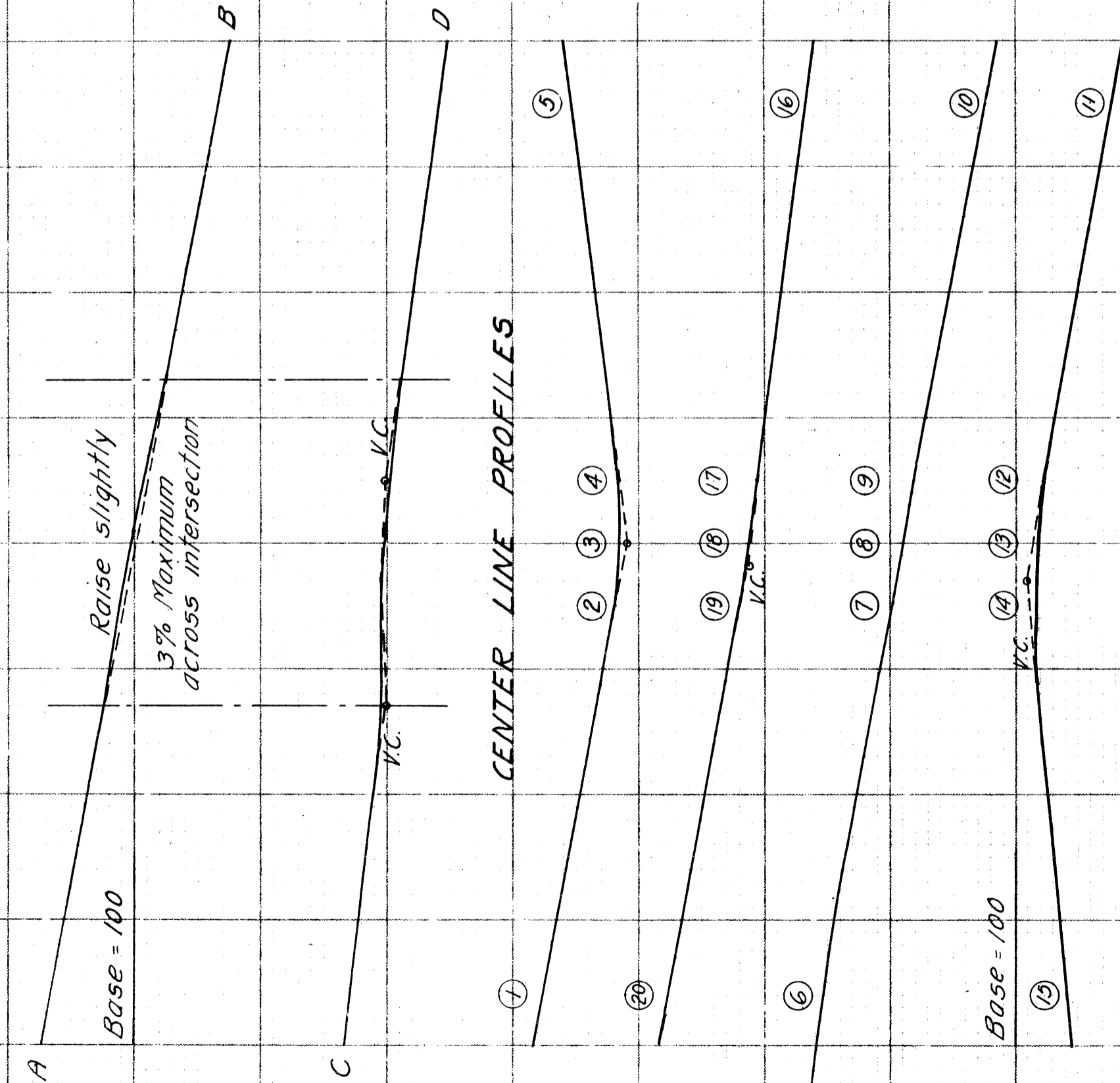
CHECKED: L. N. Pressley 5-22-31 CHIEF DRAFTSMAN
CORRECT: R. P. Kelley 5-23-31 ENGINEER OF PLANS
DRAWN BY: H. B. & C. S. M. TRACED BY: I. B.
RECOMMENDED FOR APPROVAL: F. J. Conner 5-25-31 ENGINEER OF DESIGN
APPROVED: [Signature] CHIEF ENGINEER
APPROVED BY: B. P. R. July 8, 31
CORRECTED: 8-28-31

INTERSECTION WITH STEEP GRADES

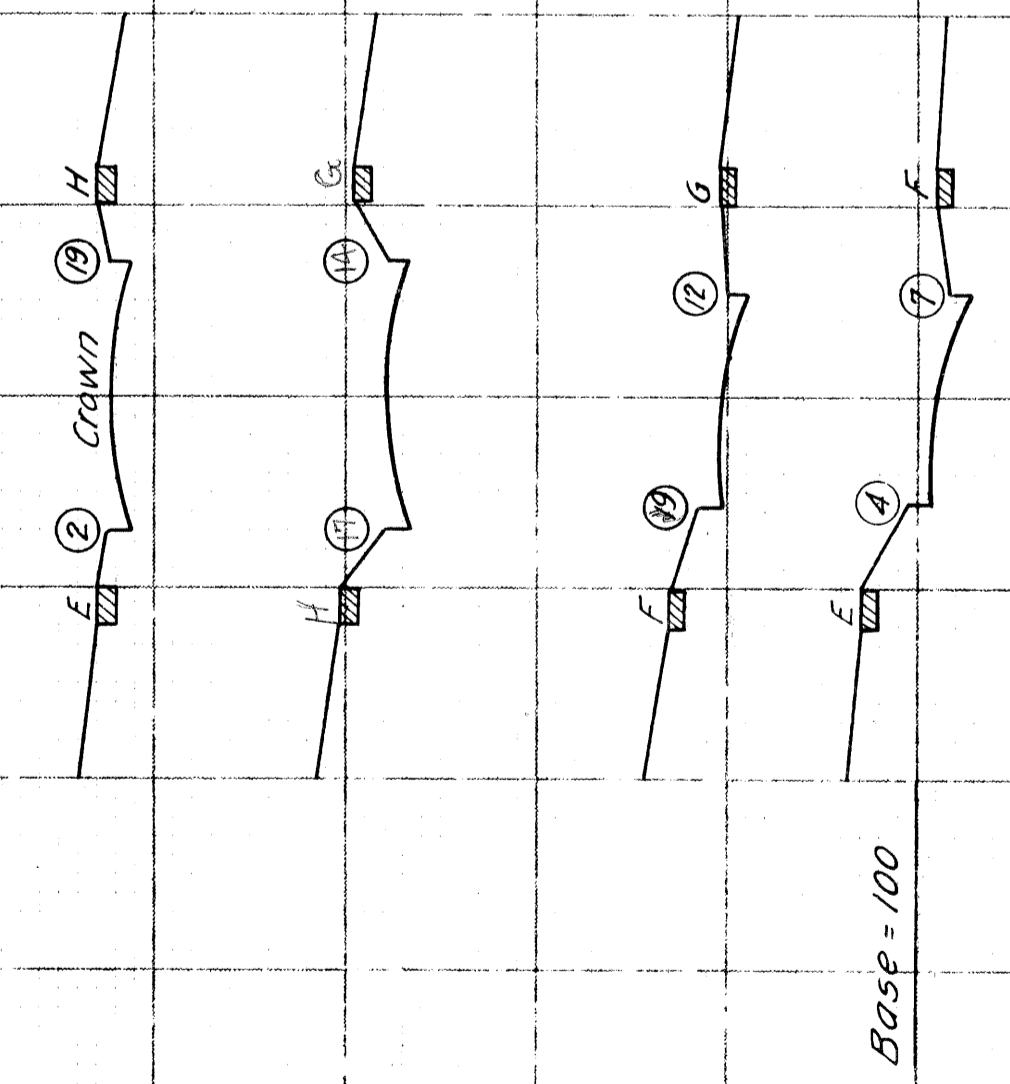


DIAGONAL SECTIONS

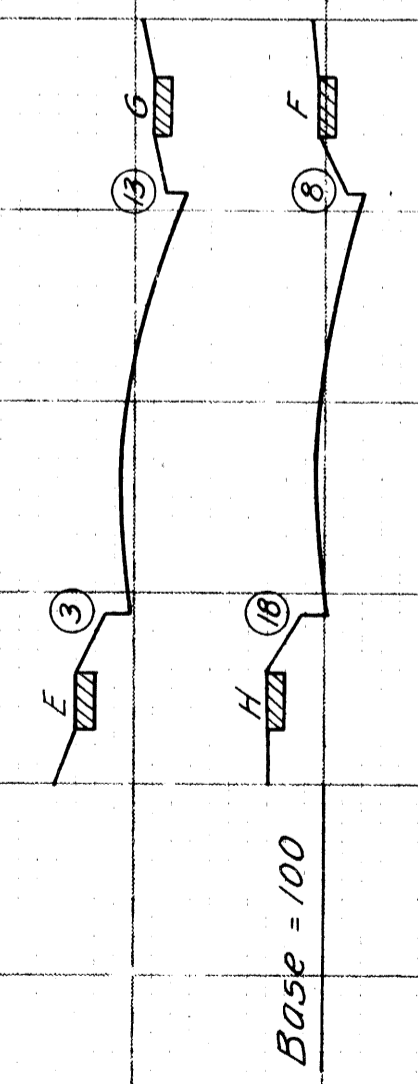
NORMAL INTERSECTION



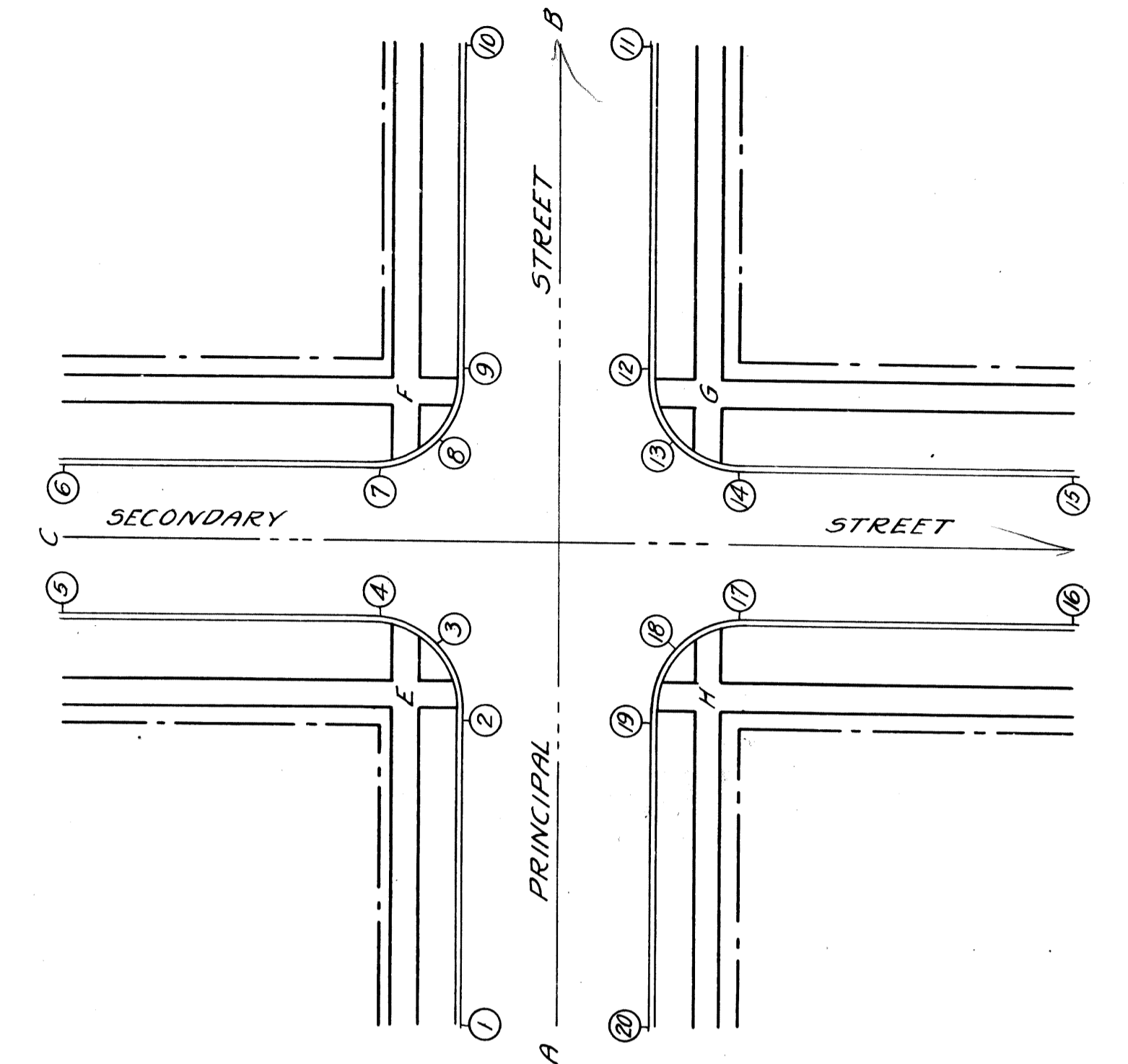
CURB PROFILES



CROSS SECTIONS



DIAGONAL SECTIONS

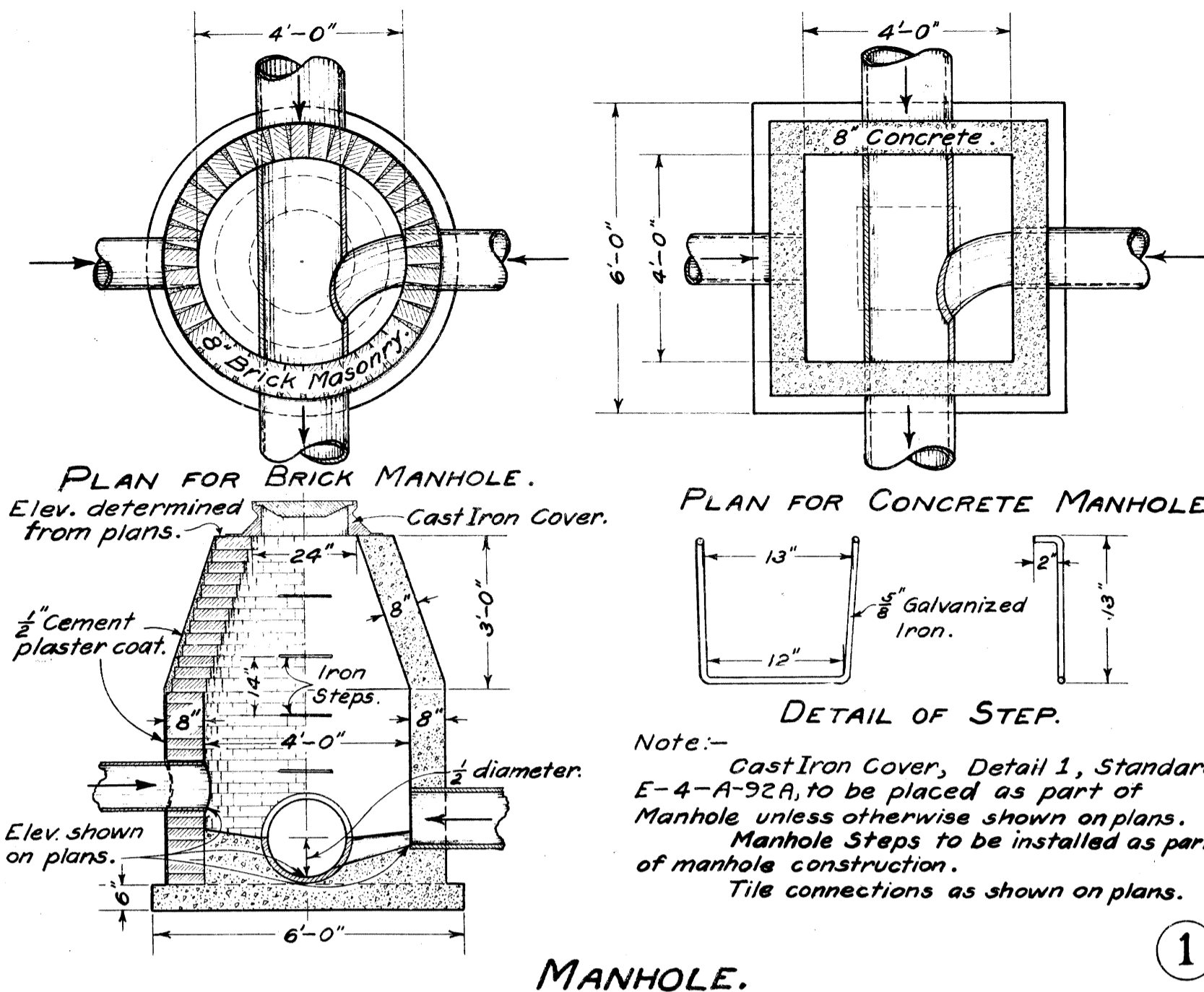


Each intersection should be studied on paper and checked on the ground.
 Center line grades should be not more than 3% across intersections. At the center of the intersection the grade should be raised slightly to avoid a flat area.
 Center line profiles, curb profiles, cross sections at the curb tangent points and diagonal sections should be pleasing in appearance, safe for traffic and so adjusted as to make the sidewalk approaches slope towards the curbs except in extreme cases.
 The grade of sidewalk approaches should not be greater than 10%.
 The examples shown on this sheet are intended to show the method of working out the intersection grades. Each intersection is a study by itself.

MICHIGAN STATE HIGHWAY DEPARTMENT
 STANDARD METHOD
 OF DETERMINING GRADE OF
 STREET INTERSECTIONS

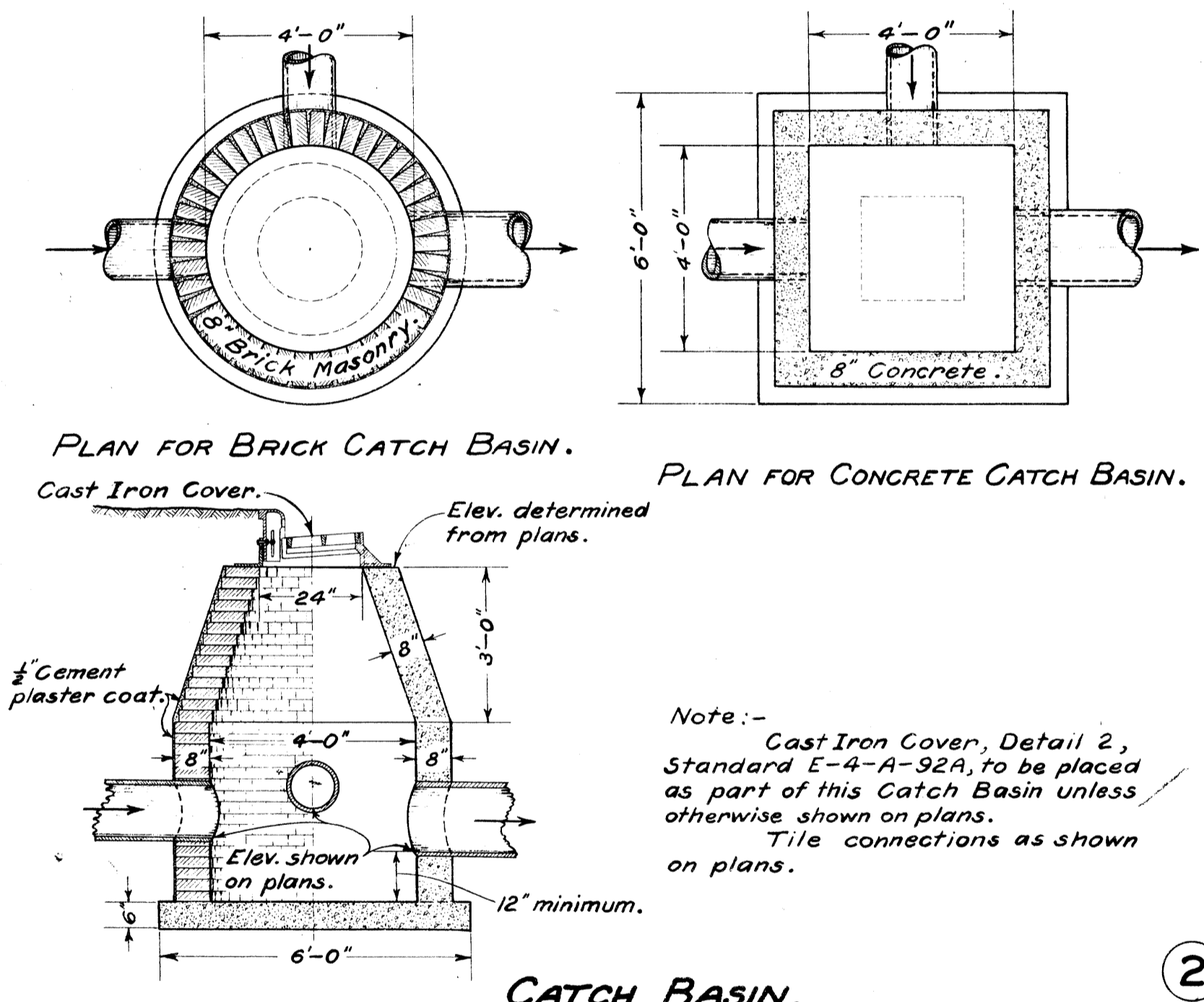
VERTICAL - 1 in. = 4 FT. HORIZONTAL - 1 in. = 25 FT.
 CORRECT R. B. Dille CHIEF DRAFTSMAN APPROVED Harry B. Brakman ENGR. OF SURVEYS & PLANS
 CORRECT M. C. Moore MUNICIPAL ENGR. APPROVED Red Sullivan DEPUTY HIGHWAY COMM.

JUNE 15, 1924
 DRAWN BY M.L.M.
 TRACED BY W.B.S.
 CHECKED BY



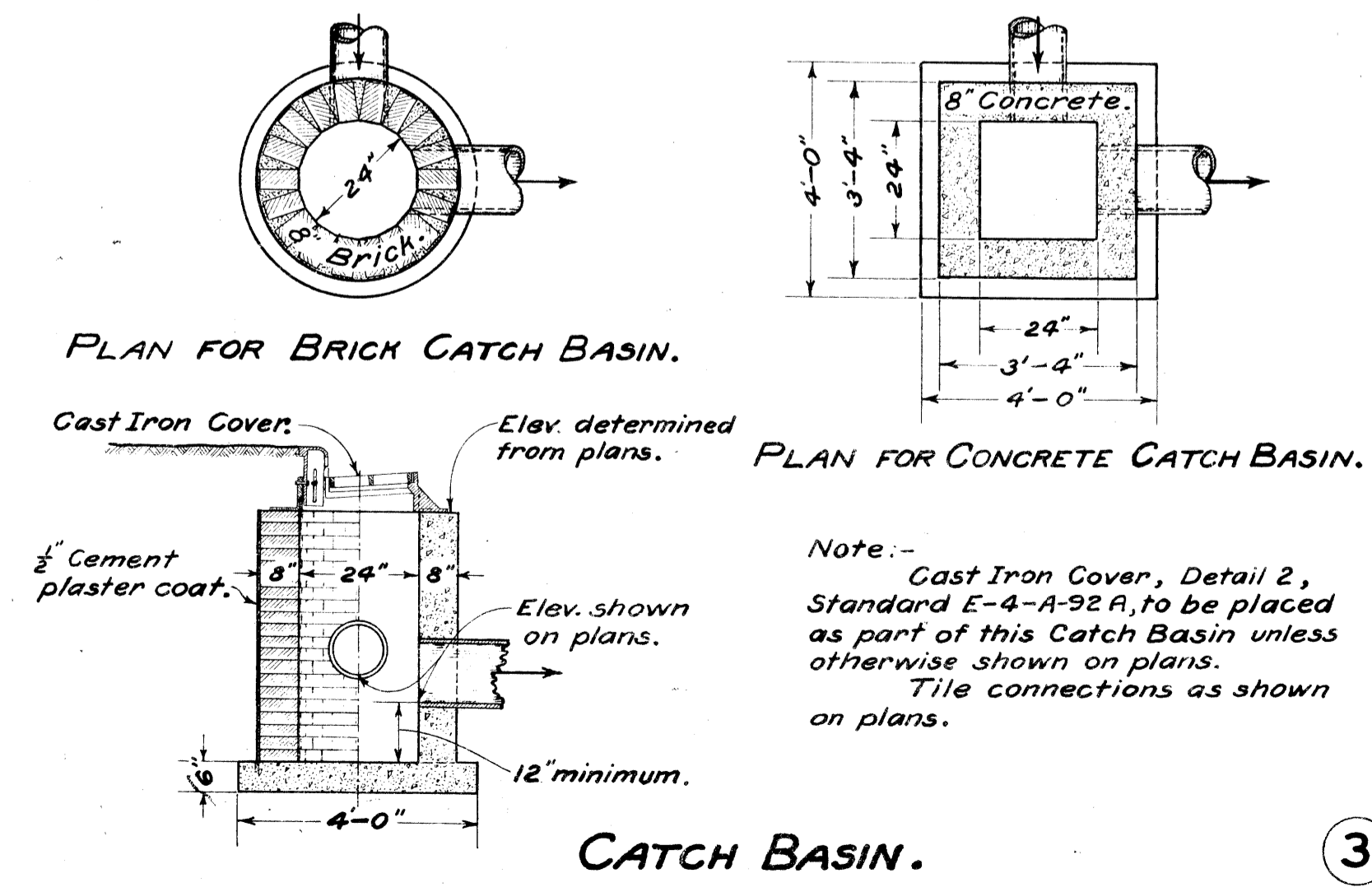
MANHOLE.

①



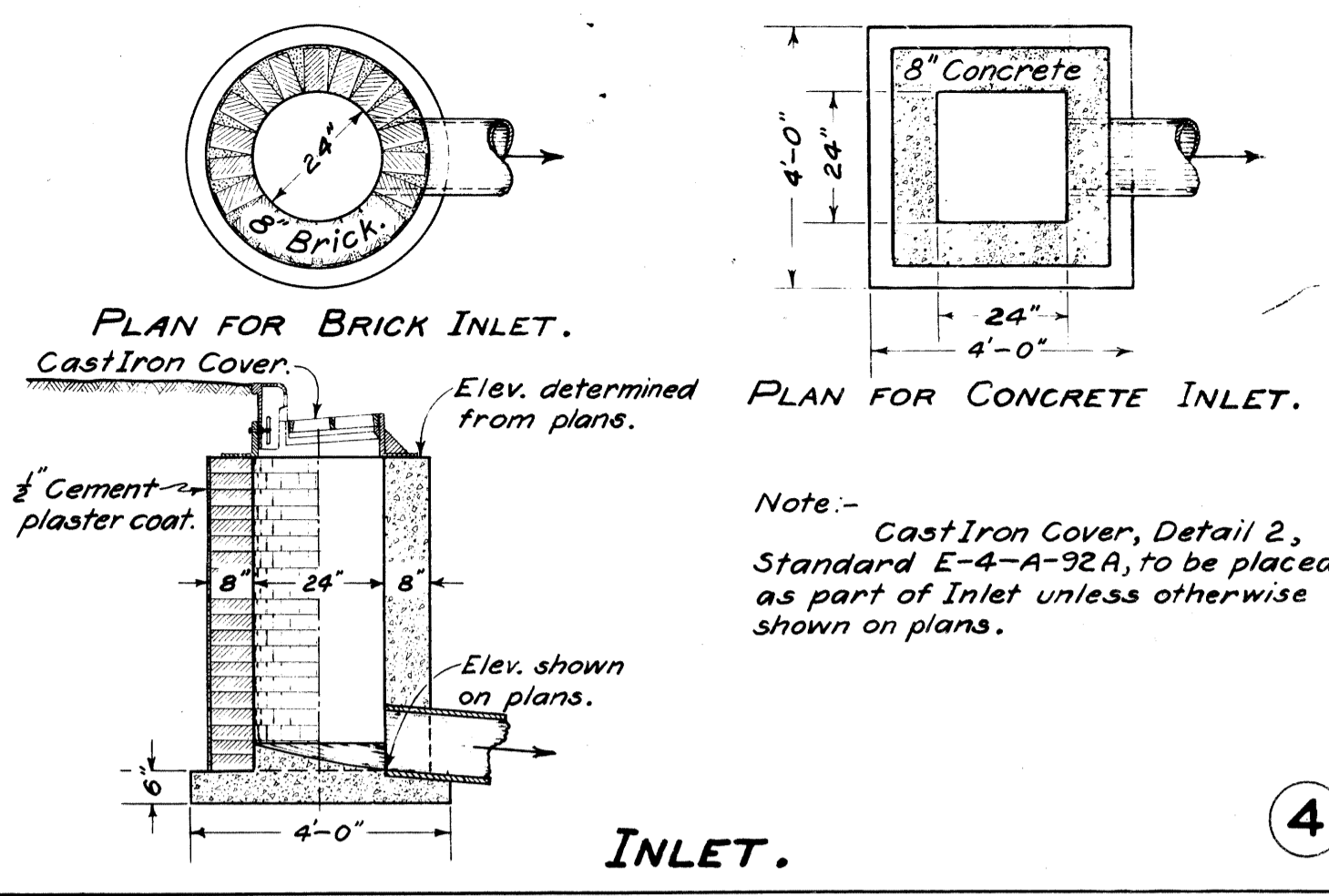
CATCH BASIN.

②



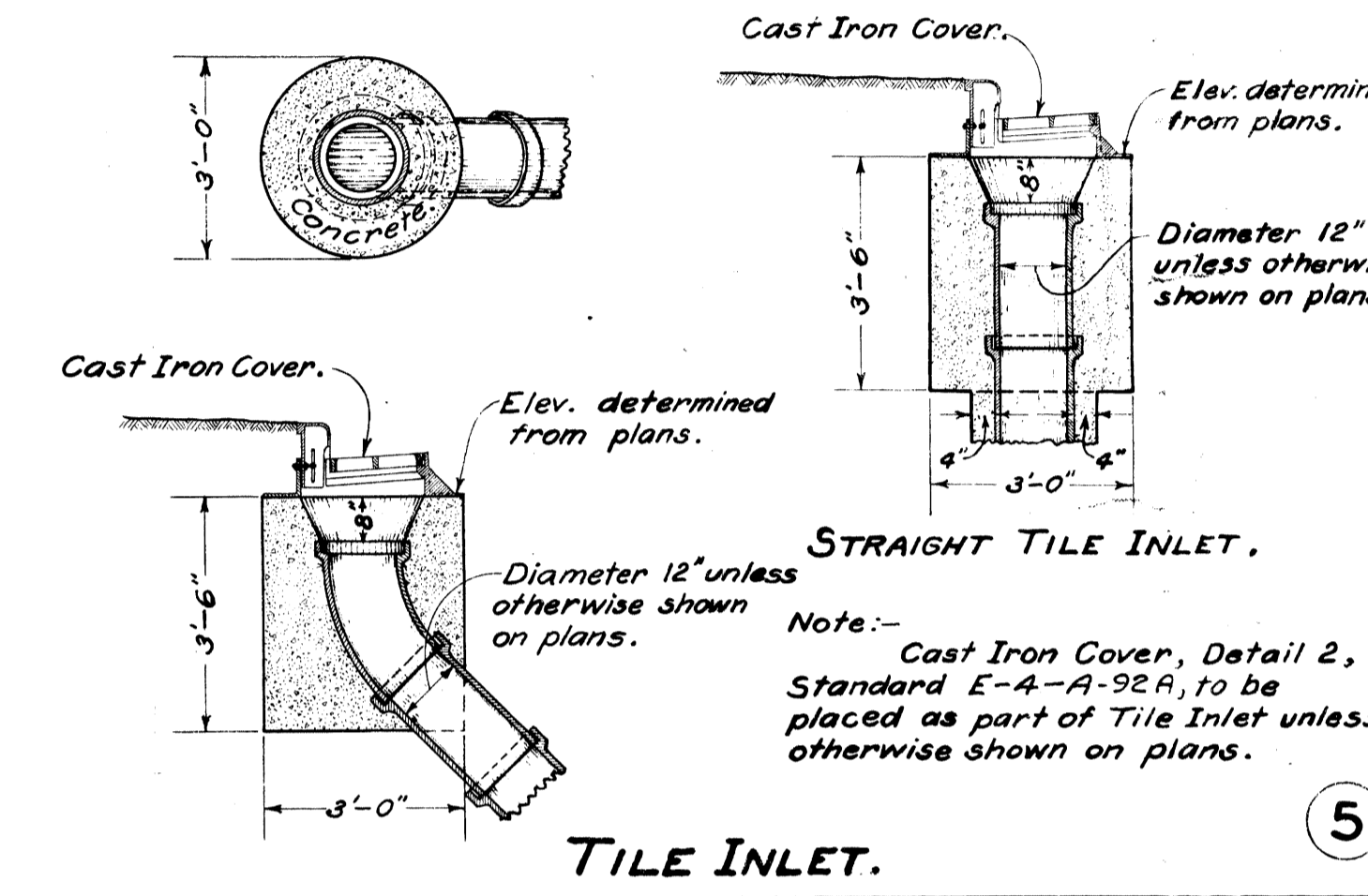
CATCH BASIN.

③



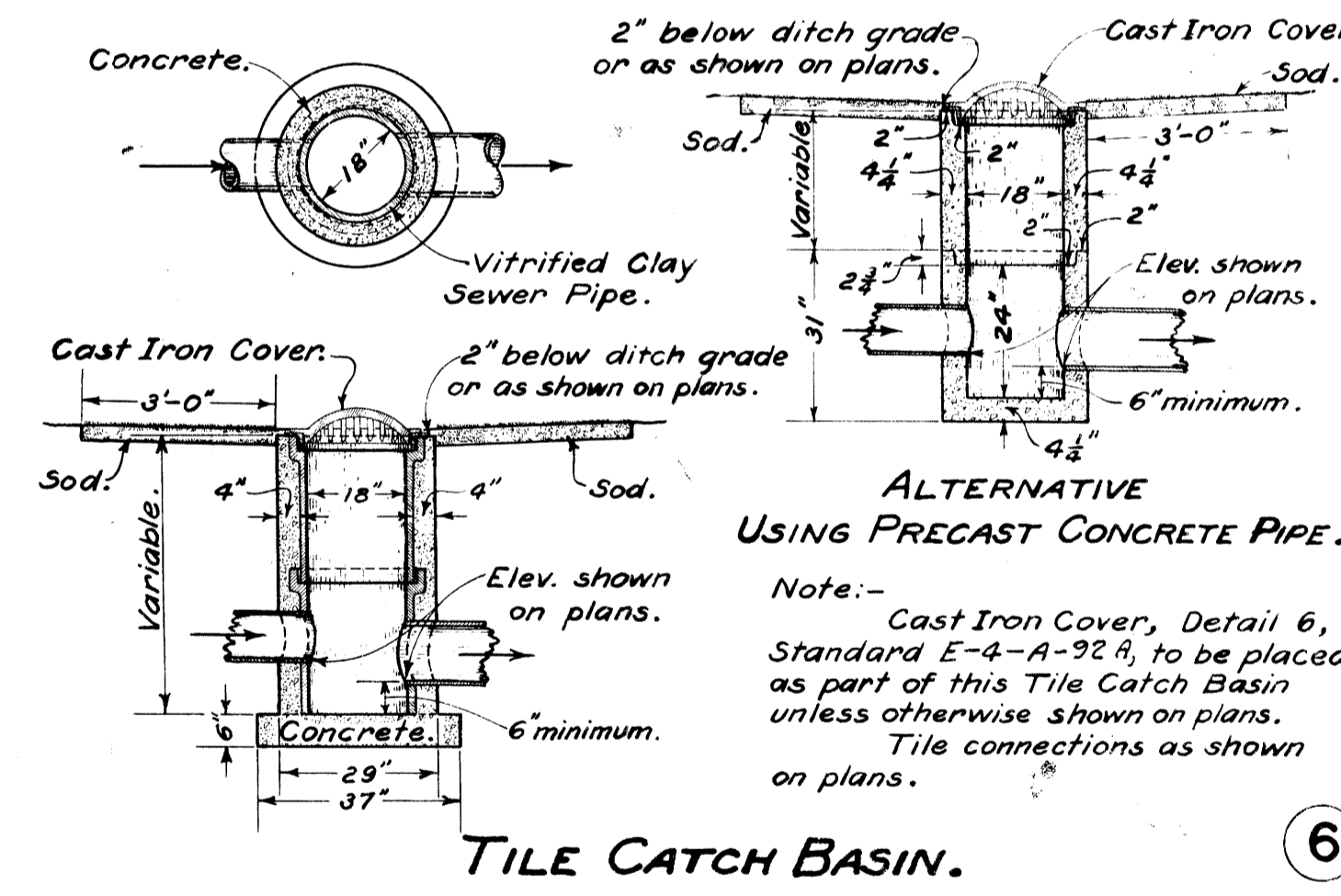
INLET.

④



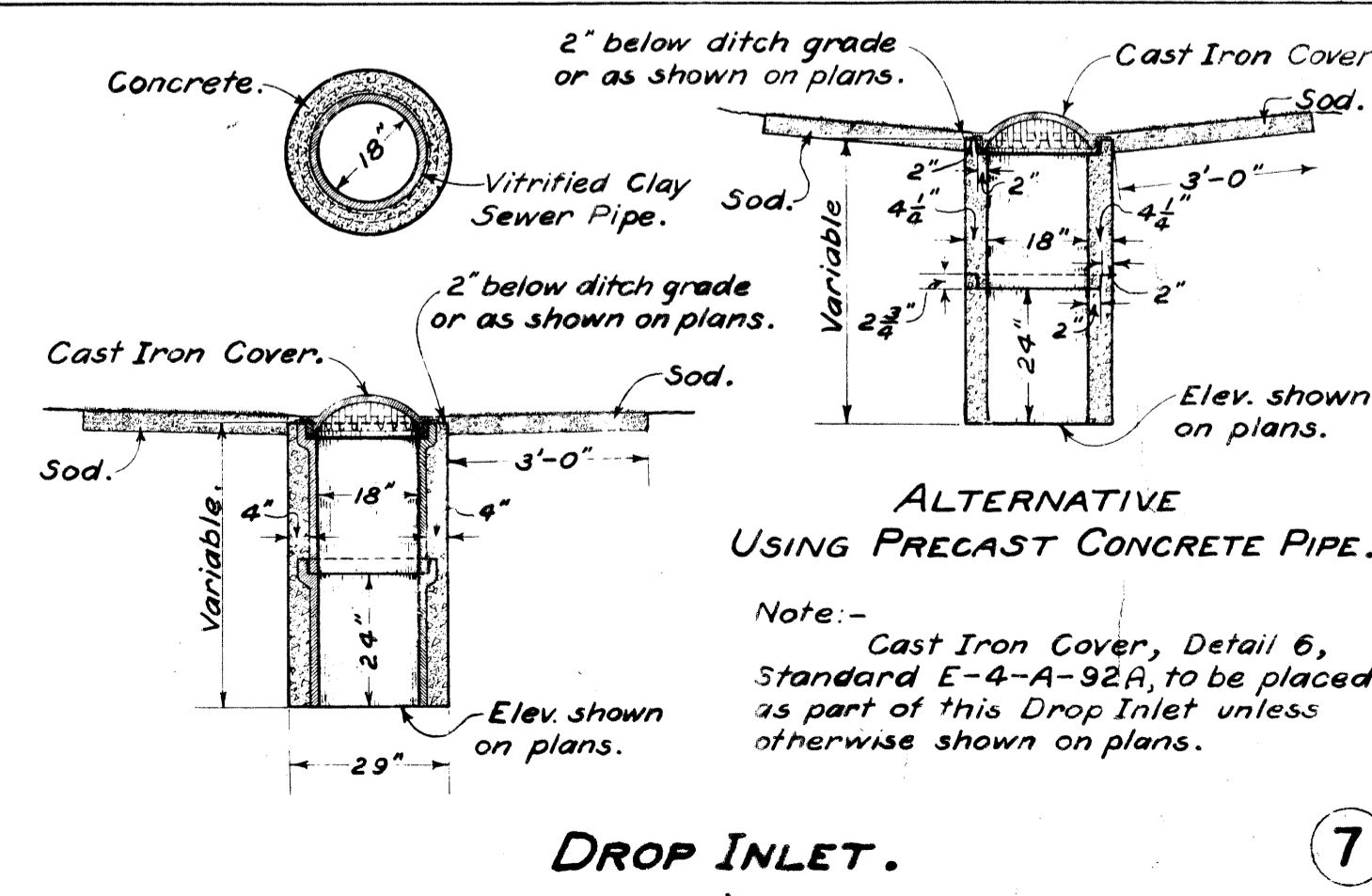
TILE INLET.

⑤



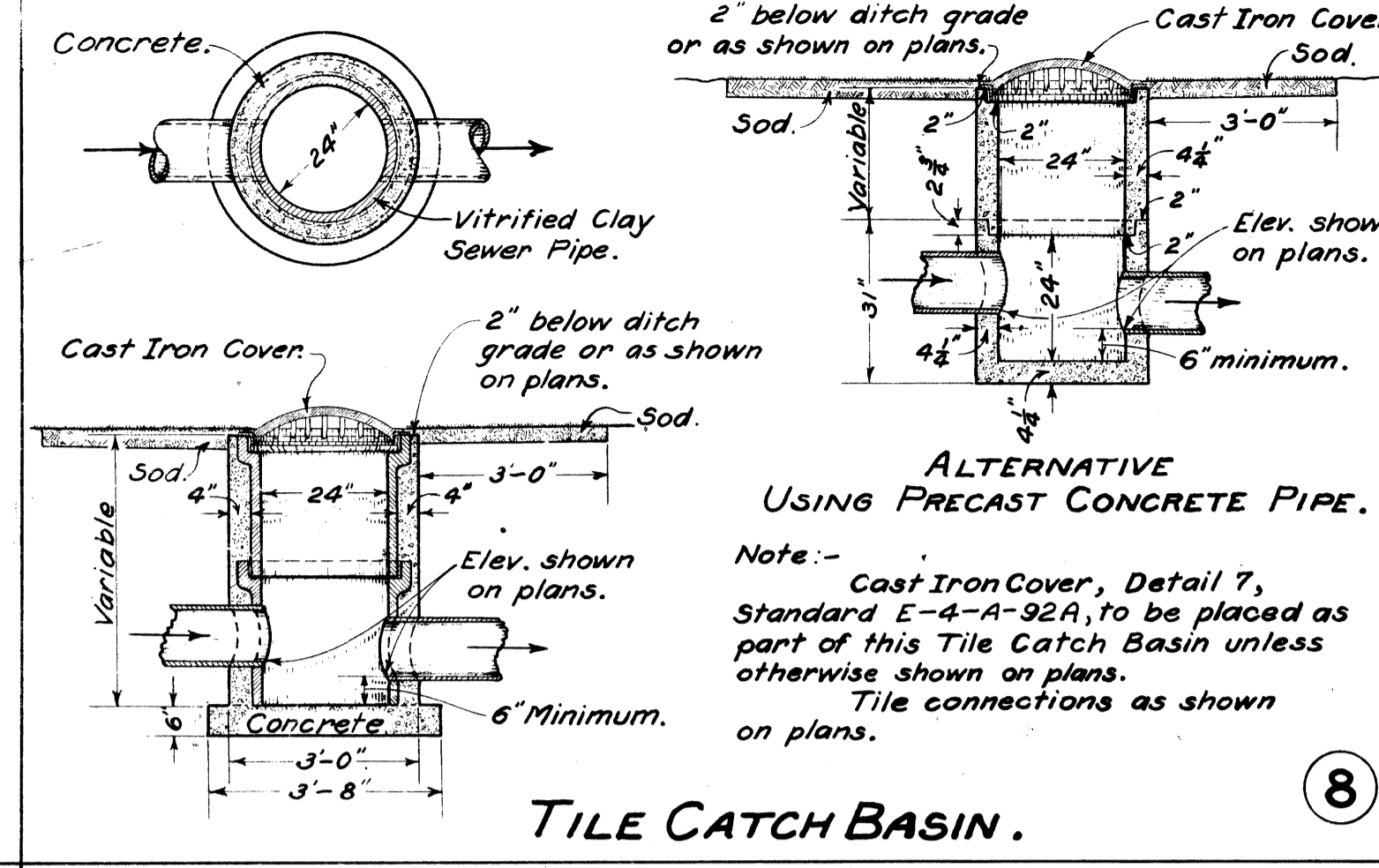
TILE CATCH BASIN.

⑥



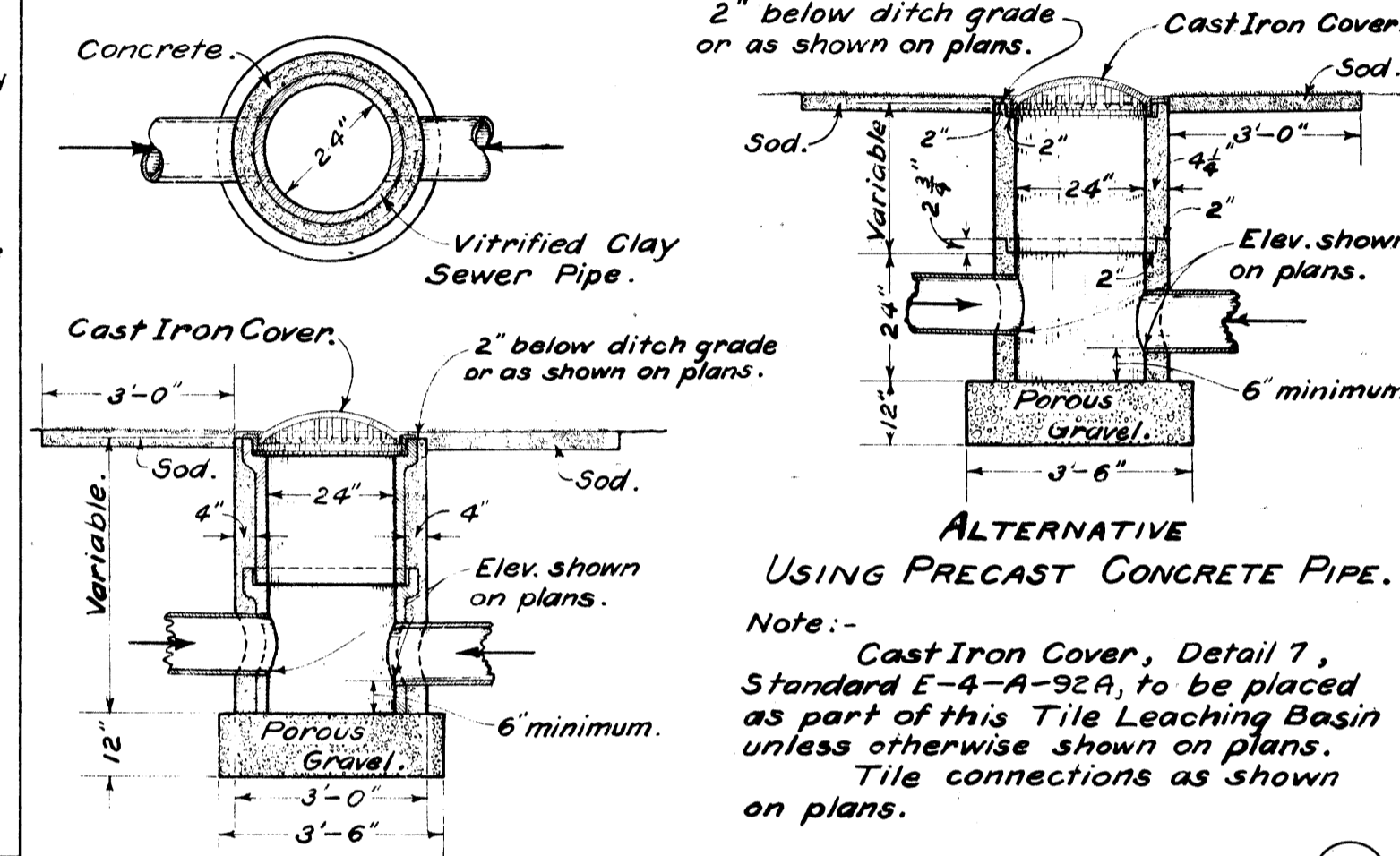
DROP INLET.

⑦



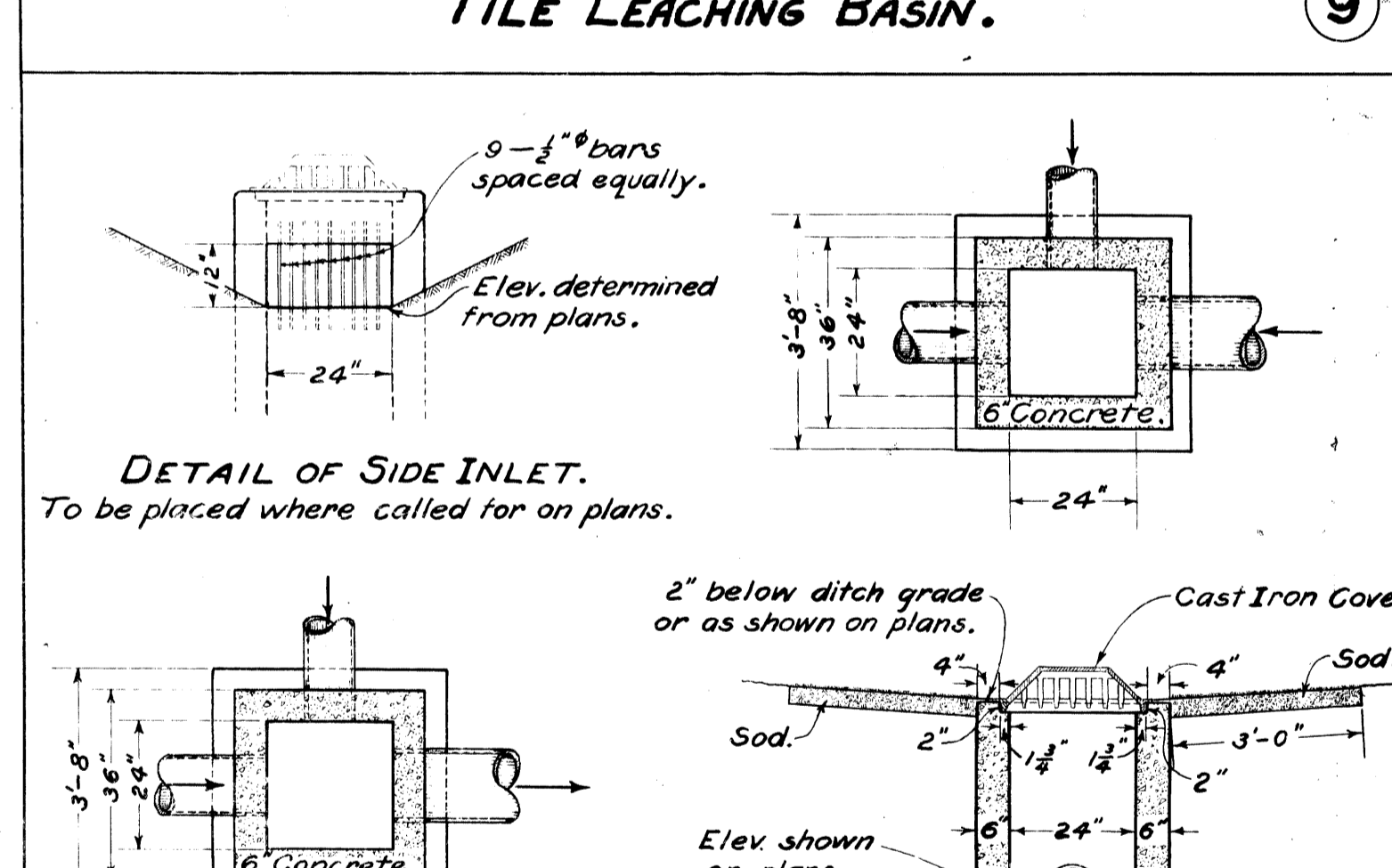
TILE CATCH BASIN.

⑧



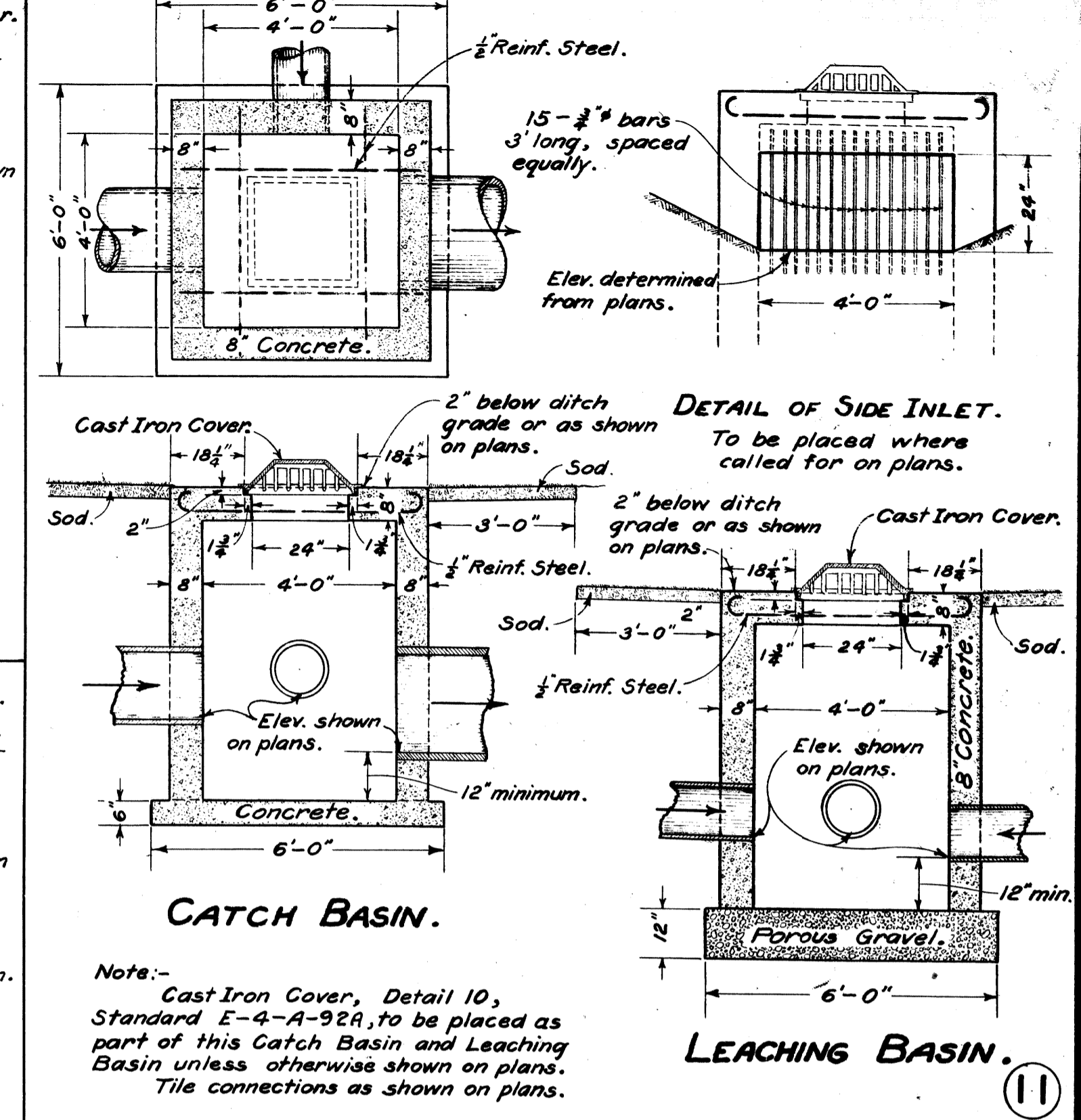
TILE LEACHING BASIN.

⑨



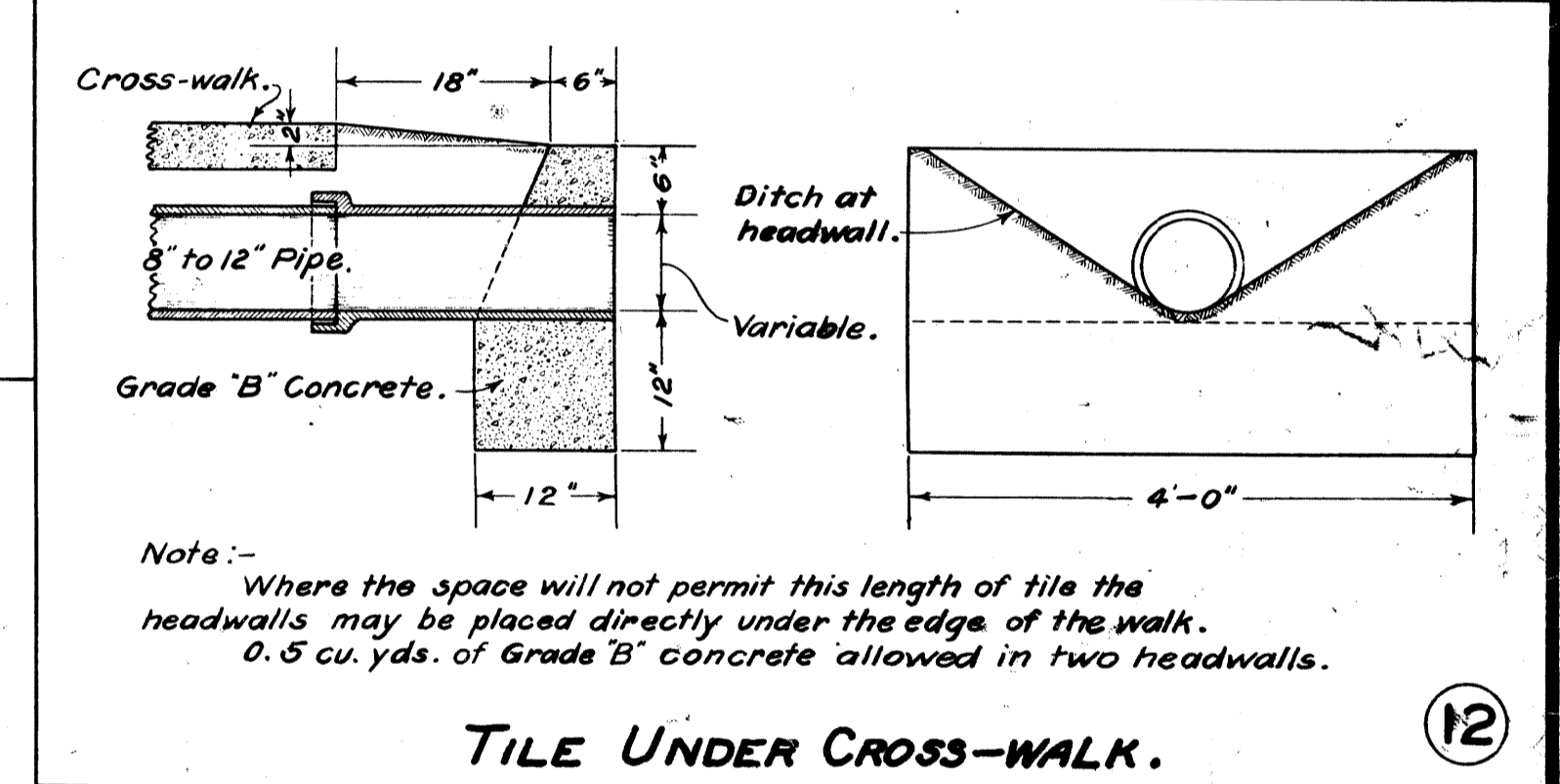
LEACHING BASIN.

⑩



CATCH BASIN.

⑪



TILE UNDER CROSS-WALK.

⑫

Details Nos 1 to 4 inclusive may be built either with a circular section of hard burned brick or with a square section of concrete. Details show each in half section.

All concrete to be Grade "A" unless otherwise shown. Materials and workmanship to be in accordance with Michigan State Highway Department 1926 Standard Road and Bridge Specifications.

All muck or other unsuitable material lying below any structure shown on this plan, is to be excavated and replaced with gravel or other firm material thoroughly compacted to proper elevation before the structure is constructed thereon.

Where alternatives using precast concrete pipe are indicated on this plan, the materials and workmanship are to meet the specifications for Reinforced Concrete Pipe except that the reinforcement may be omitted and the dimensions shown on this plan will govern.

A strip of sod 3 ft. wide is to be placed around structures, Details 6, 7, 8, 9, 10 and 11 as part of the construction of such structures.

Plaster coat called for on brick structures to be 1 to 3 mortar as called for under "Brick Masonry".

**MICHIGAN STATE HIGHWAY DEPARTMENT
STANDARD PLAN FOR
MANHOLE, CATCH BASINS AND INLETS.**

CHECKED *M.L. Mott* 12-6-29 MUNICIPAL ENGINEER. RECOMMENDED FOR APPROVAL *C. J. ...* ENGINEER OF DESIGN.

CORRECT *R.P. Kelley* 12-6-29 CHIEF DRAFTSMAN. APPROVED *C.E. ...* CHIEF ENGINEER.

DRAWN BY *C.S.* TRACED BY *C.S.*

APPROVED BY *B.P.R.* Feb. 6, 1930.