MANUAL AND SPECIFICATIONS

FOR THE

MANUFACTURE DISPLAY AND ERECTION OF U. S. STANDARD ROAD MARKERS AND SIGNS

FIRST EDITION
JANUARY, 1927

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FOR THE

Manufacture, Display, and Erection of . . . . .

U. S. STANDARD ROAD MARKERS AND SIGNS

FIRST EDITION

Adopted by the
American Association of State Highway Officials

JANUARY, 1927

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and
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DESIGN OF MARKERS AND SIGNS.

STANDARD DESIGNS.

The System of Standardized Signs and Markers as adopted by the American Association of State Highway Officials at Detroit, November 1925, is described herein. These signs are developed in a set of working drawings prepared by the Bureau of Public Roads, and adopted by the Association of State Highway Officials.

This set of designs is based on definite principles calculated to produce uniformity of significance in the signs themselves, and make familiarity with them easy to acquire on the part of the most casual driver.

These principles are a set of shapes each having its own significance; a set of color combinations each having its own significance; a few obvious symbols; and uniformity of erection and application as described in this Manual.

Shape

The octagonal sign is used to indicate "Stop", where for any reason such action is necessary.

The diamond shaped signs, commonly called "Slow" signs, are used to indicate any condition inherent in the road itself requiring slow speed and caution on the part of the driver.

The circular sign is used as an advance warning at railroad grade crossings only.

The square shaped signs, commonly called "Caution" signs, are used to indicate any condition requiring caution that is not inherent in the road itself, but which is due to contiguous or adjacent conditions which often are also intermittent.

Rectangular shaped signs of various dimensions are used to carry directions, information and restrictions of use or benefit to the driver.

The arrow shaped direction sign may be substituted for the rectangular direction sign.

Route Markers, to carry the designations assigned to various routes, are of various distinctive designs. For the United States Highways the standard outline of the official shield of the United States is used. On State roads that are not U. S. Highways the several States use other appropriate devices, such as the Covered Wagon in Nebraska, the conventional Sunflower in Kansas, the Indian Head in North Dakota, the North Star in Minnesota, the Triangle in Wisconsin, the Keystone in Pennsylvania, etc. Several States including Arkansas, Illinois, Indiana, Ohio and South Dakota, use the State outline as a distinctive marker.

Color

All signs of a precautionary character, including the circular railroad sign, the octagonal stop sign, the diamond slow signs, and the square caution signs have black designs on a yellow background.

All direction, information and restriction signs are black on a white background, except that the Rest Station Sign is white on a green background.

Route Markers have black copy on white background. (A few of the States are exceptions to this.)

Symbols

The symbols used on the various signs are those for railroad grade crossings, both for single and multiple tracks, for left and right curves and turns; for reversed curves and turns; the arrow on the directional sign and the arrow which accompanies the route marker.

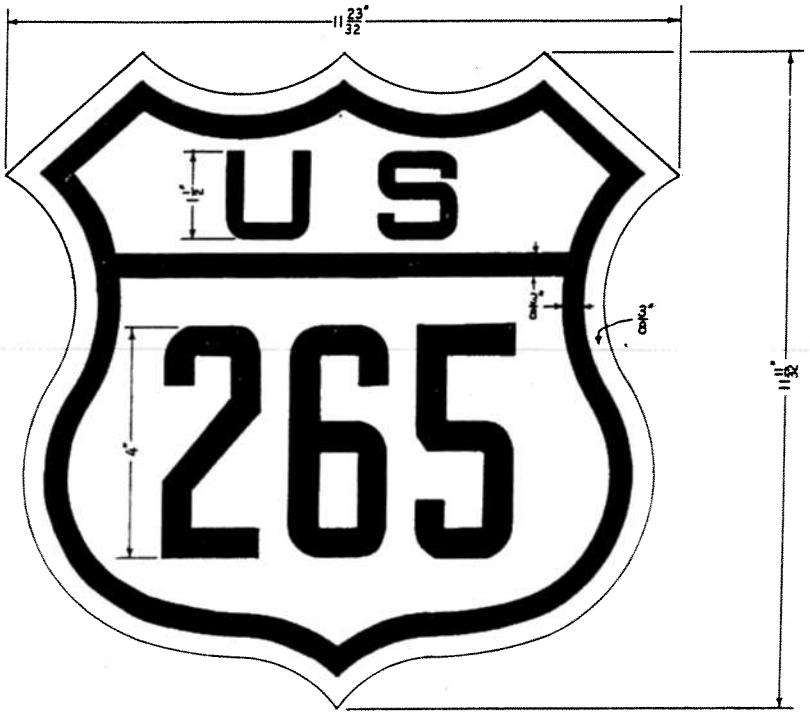
NEW DESIGNS.

If a State desires a sign for general or special use that is not included in the list of Standard signs, request for such a sign should be made to the Bureau of Public Roads and a standard design will be made up in

PLATE I

U. S STANDARD ROUTE MARKER

M-3 FOR GENERAL USE



M-23 FOR CITY USE

cooperation with the State requesting it. The design will thereafter be included in the list, and any other State wishing a sign for the same purpose will find it provided among the Standards.

DESCRIPTION OF MARKERS AND SIGNS.

MARKER SERIES.

U. S. Route Marker

The Standard Route Marker, M-3, Plate I, which is a shield bearing the name of the State, the number of the route and the letters "U.S.", shall be used in marking the United States Highways only. The background color of the shield is white and the design black.

Working Drawing M-1 shows full size the dimensions of the finished Marker, M-3. This is not a design for a blanking die or casting pattern as allowances are not provided for draw in embossing nor for shrinkage of castings.

The Drawing M-3 shows the Standard Route Marker designed for a road number of two digits. The design details must be altered as required for numbers consisting of one or three digits, and inset shown on Drawing M-17 shows the arrangement for a three-digit number. A single digit will, of course, be centered. A few numbered routes have distinguishing letters such as N (North), S (South), E (East), and W (West) following the number, and inset drawing M-18 shows the necessary arrangement in such case.

A series of insets, Drawings M-5 to M-16, inclusive, show the size and spacing of the State names for use in the general Route Marker Design M-3.

City Markers

The color scheme is the same as for the Route Marker. City Markers, M-23, Plate I, are to be of the same outline as the Standard Marker, but with reduced dimensions and with the name of the State omitted. This marker is for use when a smaller sign is desired in lieu of the Standard Marker in congested districts of cities or towns.

Working drawing Design M-22 shows full size the dimensions of this special City Marker, and inset drawing M-25 shows design for a two digit number.

Stencils

Where it is not feasible to erect Standard Markers, routes may be indicated by stenciling the design of the City Marker on telephone, power, trolley and light poles, and on curbs, traffic posts, etc. Stencils may also be used to supplement the Standard Route Marker on culvert headwalls, backs of directional signs,. end posts of bridges, etc. For such use a stencil design based on the City Marker is furnished in working drawing M-24.

U. S. Directional Letters

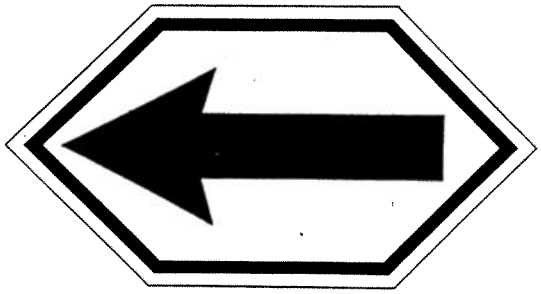
The small shield M-4 L and M-4 R, Plate II, bearing the letter "R" or "L" is for use immediately below the Route Marker where required to indicate that the United States Highway deviates to the right or left at the next intersection.

Working drawing (M-2) shows full size dimensions of the finished sign for Directional Letters (M-4). It is similar to the shield (M-1) used for the Route Marker (M-3), with the dimensions reduced.

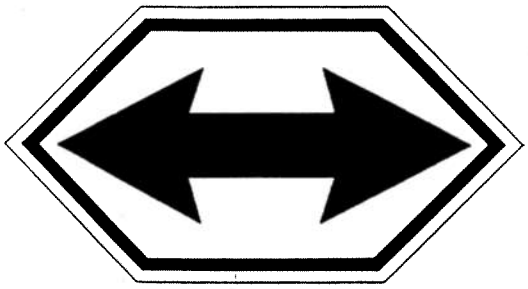
This sign (M-4) has the same color scheme as the Route Marker (M-3). It is to be used where a road forks or branches, and where the relative conditions of improvement are such as to leave the traveler in doubt as to the course of the route. The direction taken by the route should be indicated by "R" for right and "L" for left. This sign should never be omitted when another designated United States Highway or State Road is involved in the intersection. It should not be used, however, merely to indicate a curve in alignment when the traveler has no option as to the course of the route. For marking such a condition a right or left Curve Sign (C-3) or Turn Sign (C-6) should be used.

PLATE II

M-4



M-19



M-19A

D-4

Confirmatory Arrow

The Confirmatory Arrow M-19 A, Plate II, is to be mounted immediately below the Route Marker, M-3, to confirm an indicated deviation or branching of the route. It is for use immediately at the point where the deviation of the route occurs, rather than in advance of the branching. Directional Letters, M-4 are for general use in advance of a deviation in route.

However, where its use will cause no confusion, this Arrow, M-19 - may be used instead of the Directional Letters, M-4, below the Route Marker M-3, in advance of a deviation or branching of a route.

A Double Arrow, M-19A Plate II, is also provided for use where a route goes in both directions.

The color scheme of this sign is the same as for the Route Marker, M-3.

Junction Signs

The Junction Sign, D-4, Plate II, is for use in advance of points where two or more routes meet or cross.

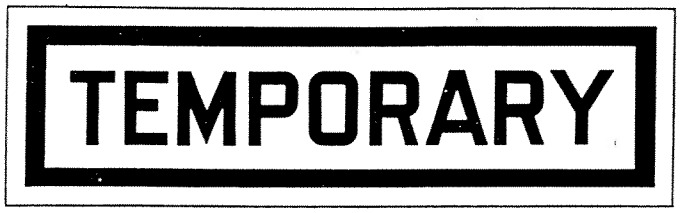
It does not carry the number of the route on which it is erected, but only the number or numbers of those routes which are intersected. It should be used when one route comes into another and does or does not follow along with it. This is primarily a directional sign and not a caution sign and its color scheme is the same as for Route Marker M-3.

The standard design D-4 shows a combination involving two routes, one United States Highway and one State Road, in addition to the route on which the sign is to be erected. The design is to be altered to provide for a single route or even a third route to fit the requirements of each particular case. It is not necessary, and will not be possible in some cases, to use the State emblem with a State road number.

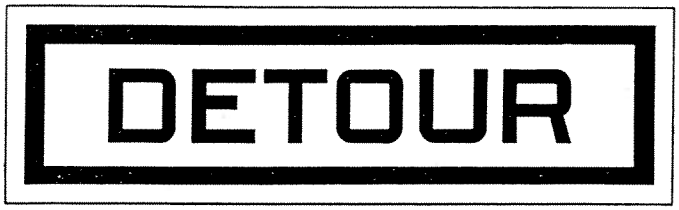
Detour Markers

Two general forms of Detour Markers are provided, either of which may be used.

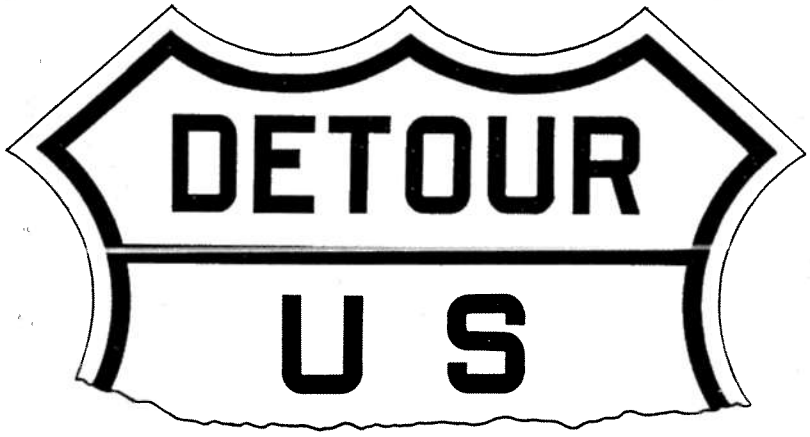
PLATE III
MARKER SERIES



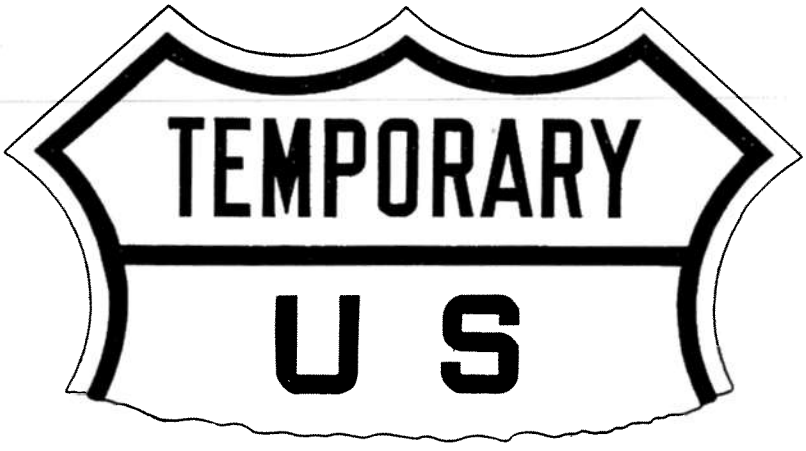
M-26



M-26



M-27



M-27

NOTE: This space is for insertion of description of State signs and markers. Printed or typewritten pages may be posted in as necessary to make the Manual complete with respect to State signs.

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ERECTION AND DISPLAY OF MARKERS AND SIGNS.

Markers

General

The Standard Markers are to be erected for the purpose of directing traffic over a specific route and should be so located as to be conspicuously visible day and night. They should be set facing and on the right hand side of approaching traffic, and care should be taken to avoid placing them on the inside of curves, in sags in the profile and behind objects which obstruct the view. They should be so located that they will be seen at all times by passing drivers with the minimum of effort.

Type of Supports

Markers should be mounted preferably on standardized posts. No particular type of posts is presented in this Manual because the conditions to be met at present are considered too indeterminate to permit of advantageous general standards for all States. Each State should select its own satisfactory design and so far as possible adhere to it for reasons of uniformity and economy. It is to be noted that the bolt holes in all signs are so far as possible punched on a multiple of six inches and if therefore holes in posts are punched or bored on six inch centers, the posts will take any standard sign without drilling in the field. Punching of posts on two inch centers will give still greater flexibility and accommodate any standard design or combination of designs. States should select designs for posts in conformity with this detail. Current practice is about evenly divided between metal and wooden posts, and in some cases concrete is used.

Leather or fibre washers should be used against the face and back of all metal signs, so that metal will not come against metal.

Where signs are described as being set at right angles to traffic, the angle should not be exact, but in order to avoid a glare reflected back to the driver, the sign should be turned away from the road so that at the center line of the surface, the plane

of the sign will intersect the center line about two feet in advance of the perpendicular to the sign post. Plate IV shows this relation.

Height of Markers

Under ordinary conditions the center of the marker should be placed approximately three and one-half feet above the crown of the pavement, or traveled way. On ascending or descending grades this height may be varied so that the rays from headlights may properly illuminate the Marker. On city and town streets where the Standard Marker is used and where street lights furnish adequate illumination, Markers should be placed with the lower edge not less than seven feet above the gutter grade in order to clear parked cars.

Lateral Distance

Markers should not be erected less than five, nor more than seven feet from the edge of surfacing on improved roads, except that where a raised curb exists they may be set as close as three feet to the edge of curb. On unimproved roads, including graded earth, and on narrow roads which may or may not be improved, it is difficult to establish a rule and the general principles of keeping them conspicuous, at right angles to the traffic, and sufficiently removed from the traveled way to be reasonably safe from damage should be observed. For a typical improved cross section the location layout is indicated in Plate IV-A and IV-B.

Location

At important cross roads and side roads, Markers should be set from 50 to 125 feet beyond or around the intersection in order to "pull" traffic past the intersection, or to further confirm a turn. The distance beyond the intersection will be determined principally by the design of the intersection itself, and the marker should be placed far enough from the side road to be safe from damage by traffic coming in from such road.

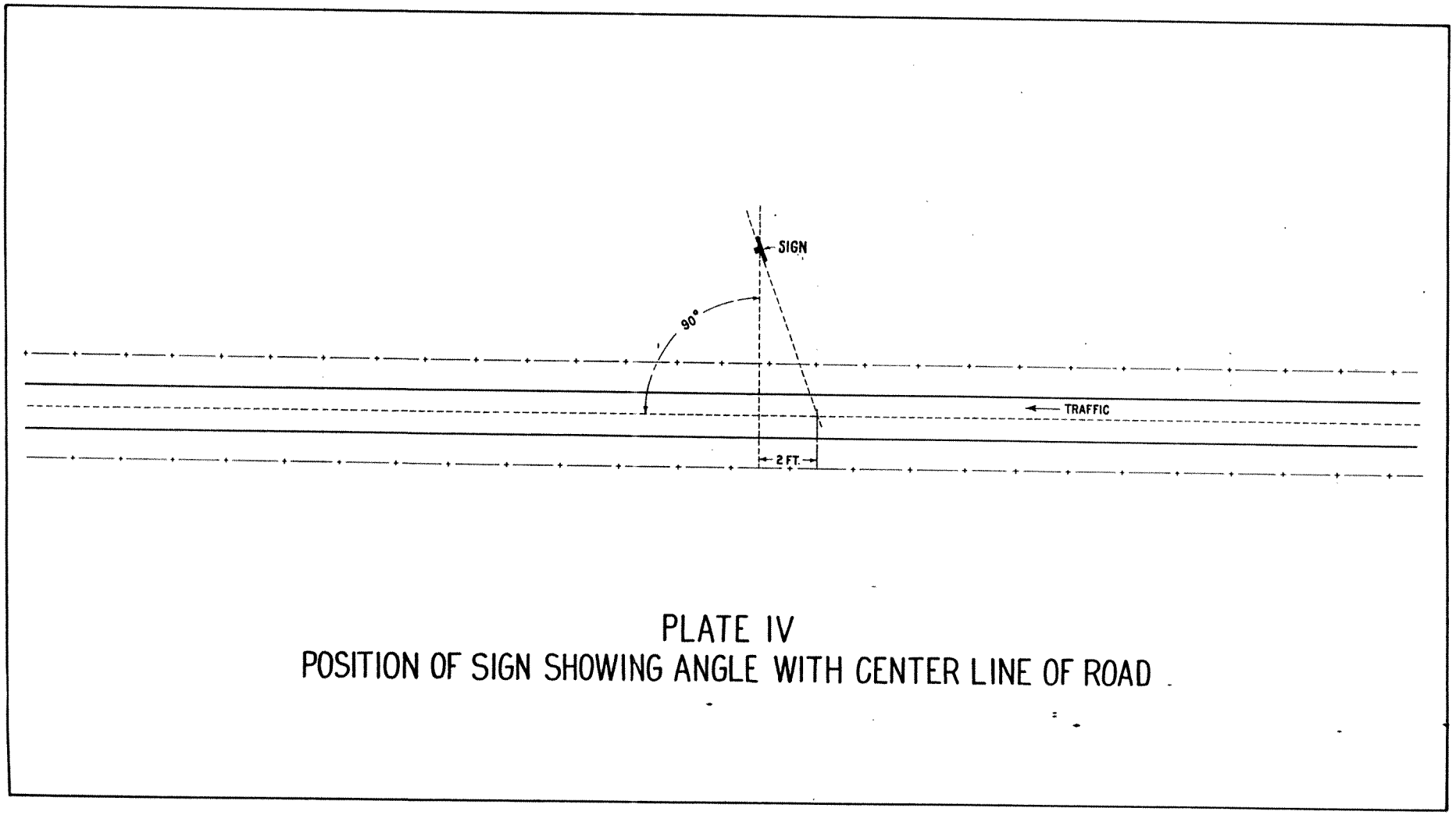


PLATE IV

POSITION OF SIGN SHOWING ANGLE WITH CENTER LINE OF ROAD

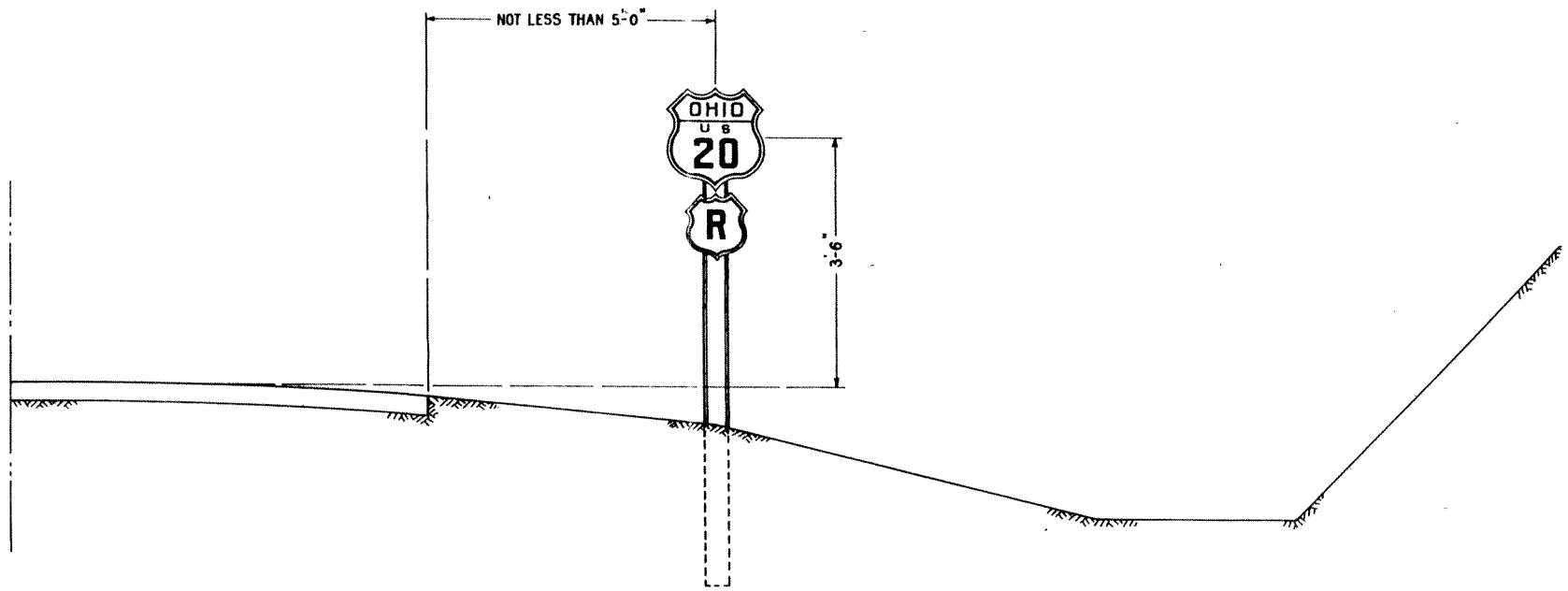


PLATE IV-A
HEIGHT AND LATERAL LOCATION OF MARKERS

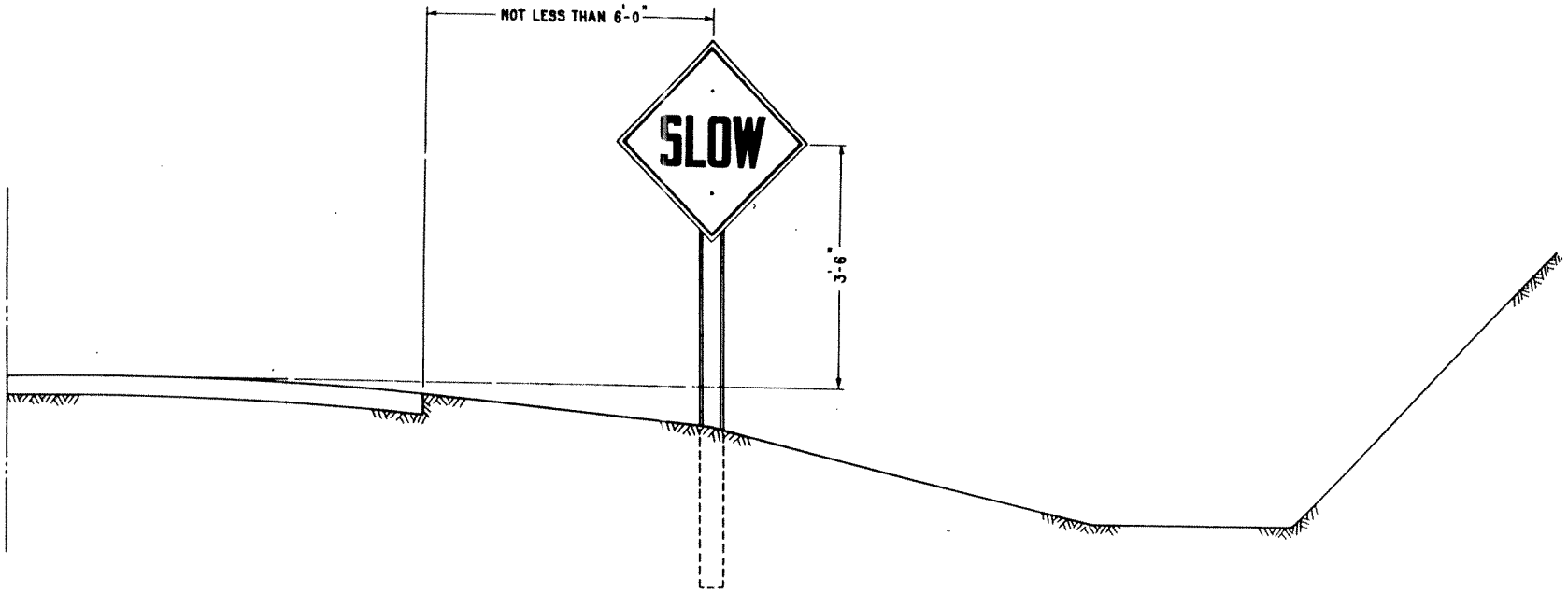


PLATE IV-B
HEIGHT AND LATERAL LOCATION OF SIGNS

At intersections or forks where the marked route turns, the Marker should be erected 200 to 300 feet in advance of the fork or turn with proper directional letter "R" or "L" immediately under the Marker. In cities it may be necessary to place the markers much closer to the intersection. Where impossible to locate Marker as specified the distance may, of course, be varied and where a Warning sign, required by the conditions of alignment, precedes a Marker the Marker should be placed, if possible, not less than 200 feet from the intersection. Through topography of the same general character the distance of Markers from turns should be maintained as nearly uniform as possible.

Markers with Confirmatory Arrows

Standard Markers with Confirmatory Arrows mounted below should be erected at the point of greatest visibility at the turn to confirm the change of direction in route and reassure the driver in case he has misread or failed to notice advance Directional Marker.

It is not possible to anticipate every case of intersection or topography but the conventional layout, Plate V, indicates the general rule and the diagrams, Plates VI to XV, show a variety of conditions that may be encountered.

Overlapping Routes

Where two or more routes follow the same road, as they may for short distances, markers for all routes should generally be erected and carried on the same support. The number by which the route is officially known in the records should be placed at the top. In order to avoid repeating the large marker, the numbers below the top one may be carried on a small rectangular substitute plaque as shown by Design M-28, Plate XVII.

Two or more Route Markers should not be carried on the same post immediately in advance of a turn when only one route turns. In such cases the

Marker for only the route which turns should be used and the proper Directional Letter should be placed under the Marker. If two or more overlapping routes turn at the same intersection, each indivudual marker should be accompanied by its own directional letters just beneath it. Where two or more Markers are mounted on the same post the height of the bottom of the lower Marker or Directional Sign should be not less than two feet above the crown of the road.

A typical case where two routes lap is shown on Plate XIV, and a more complicated case on Plate XV.

Junctions

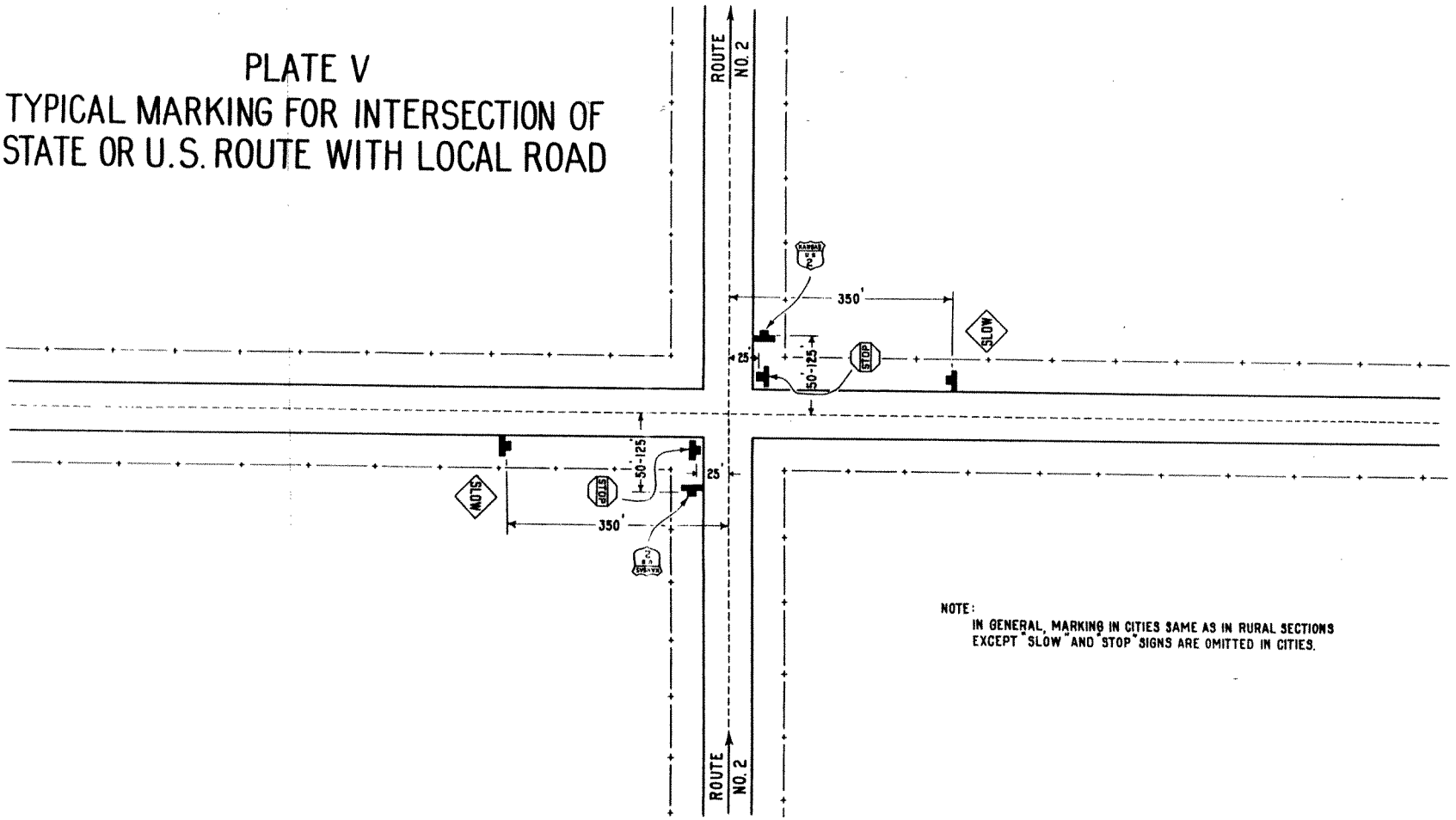
Where two or more routes meet or cross, the Standard Junction Sign D-4, Plate II, should be used to give information in advance. This is not a warning sign but a marker or information sign as its shape and color code announce. It carries the numbers of the routes intersected and not of the route on which it is erected. It should be placed about 350 feet in advance of the intersection and on the right hand side at right angles to the traffic.

The use of the Junction Sign (D-4) is indicated on Plates IX, X, XII, XIV and XV.

Intervals between Markers

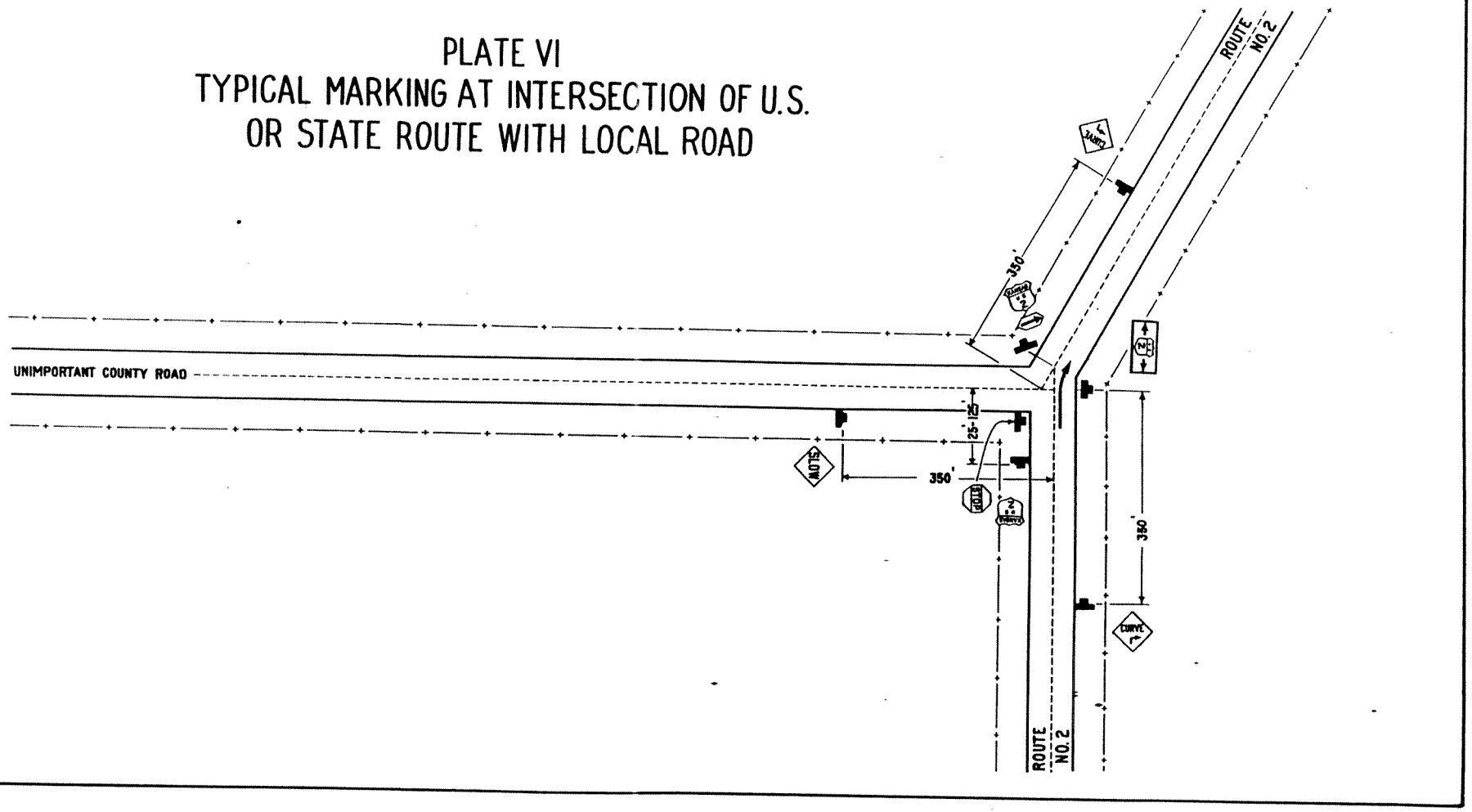
In general random Markers on tangents or elsewhere should be placed at such intervals along highways through rural sections that the maximum distance between Markers facing traffic in any one direction shall not exceed one mile. This distance is suggested for guidance only and no effort should be made to place them one mile apart, but it should be kept in mind that the best location for Markers is at road intersections both for guidance of those traveling the marked route and for the immediate information of those coming upon the marked route from side roads. Even on routes of continuous gradients and direct alignment, random markers should be introduced so that the maximum distance between them for traffic in

PLATE V
TYPICAL MARKING FOR INTERSECTION OF STATE OR U.S. ROUTE WITH LOCAL ROAD



NOTE:
IN GENERAL, MARKING IN CITIES SAME AS IN RURAL SECTIONS EXCEPT "SLOW" AND "STOP" SIGNS ARE OMITTED IN CITIES.

PLATE VI
TYPICAL MARKING AT INTERSECTION OF U.S. OR STATE ROUTE WITH LOCAL ROAD



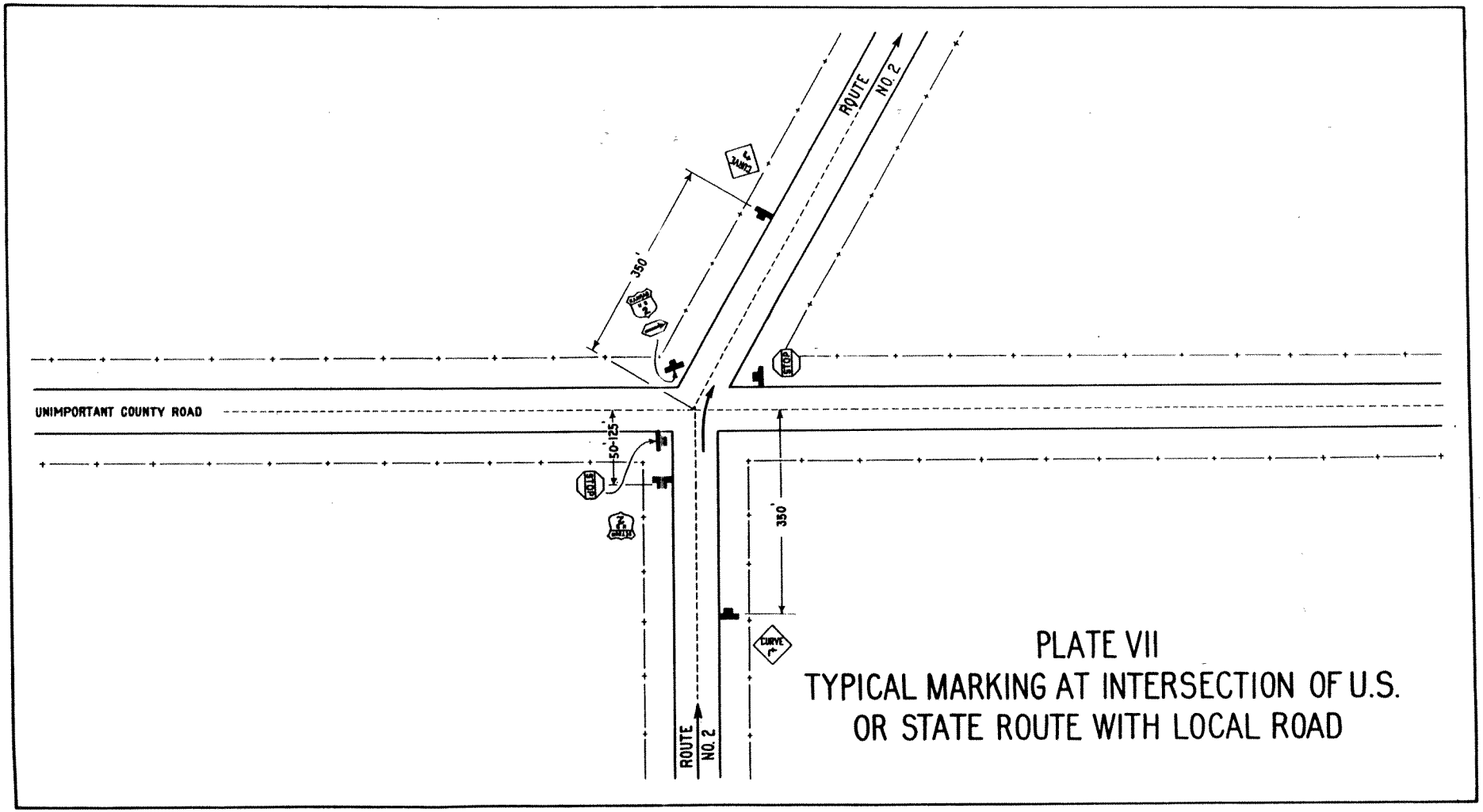


PLATE VII

TYPICAL MARKING AT INTERSECTION OF U.S. OR STATE ROUTE WITH LOCAL ROAD

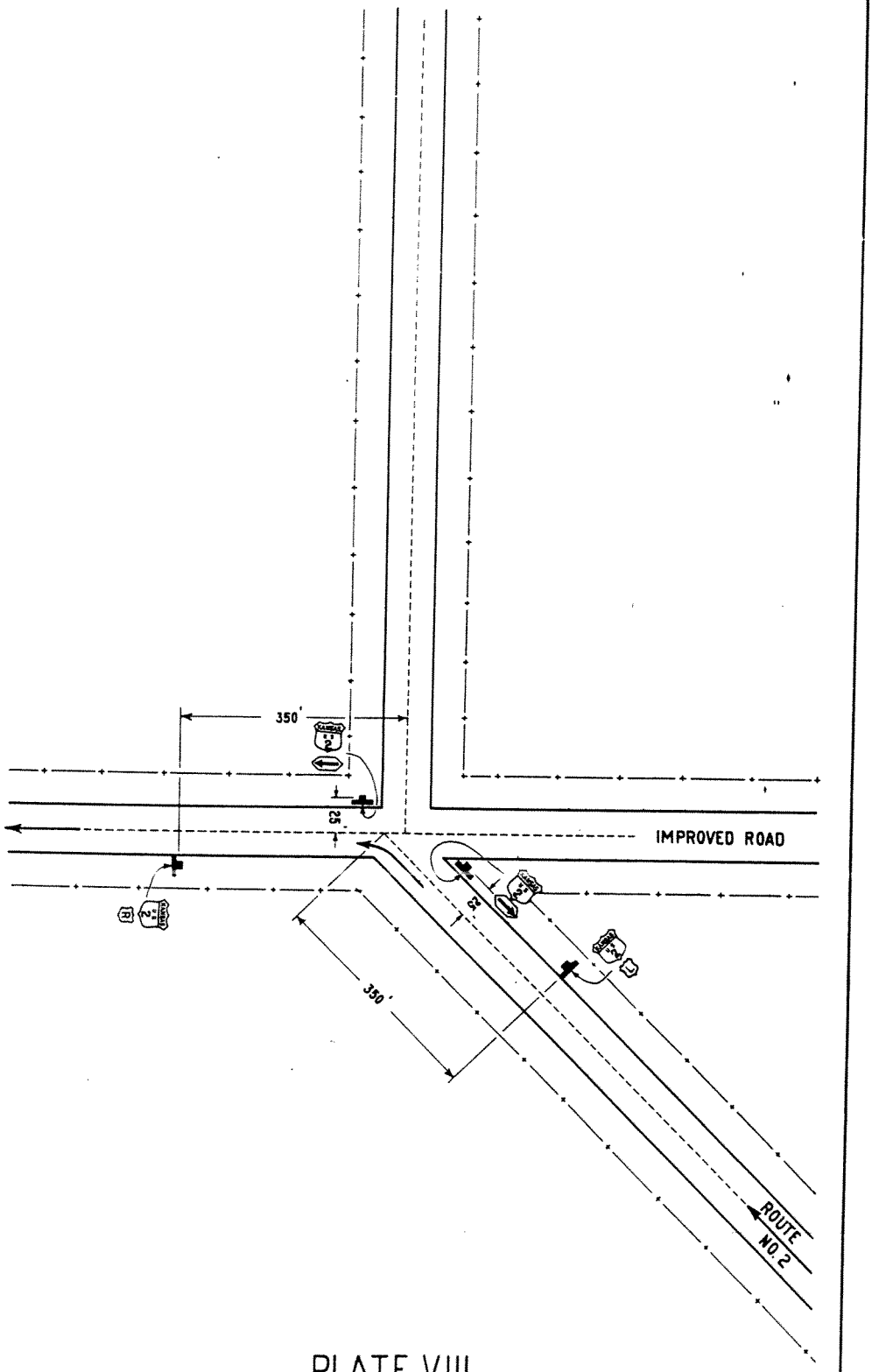


PLATE VIII
TYPICAL MARKING AT INTERSECTION OF U.S.
OR STATE ROUTE WITH LOCAL ROAD

PLATE IX
TYPICAL MARKING AT INTERSECTION OF U.S. OR STATE ROUTE WITH LOCAL ROAD SHOWING GUIDE SIGN

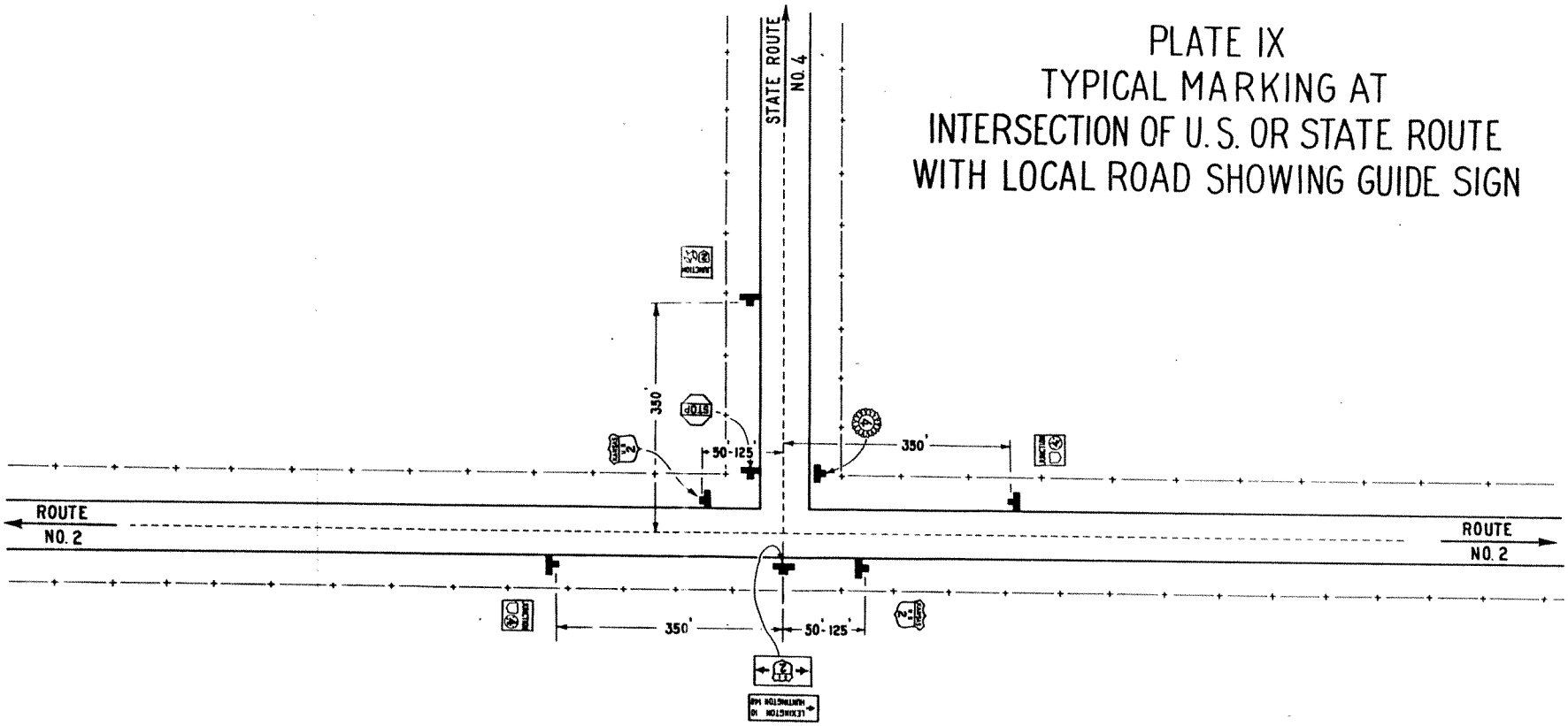
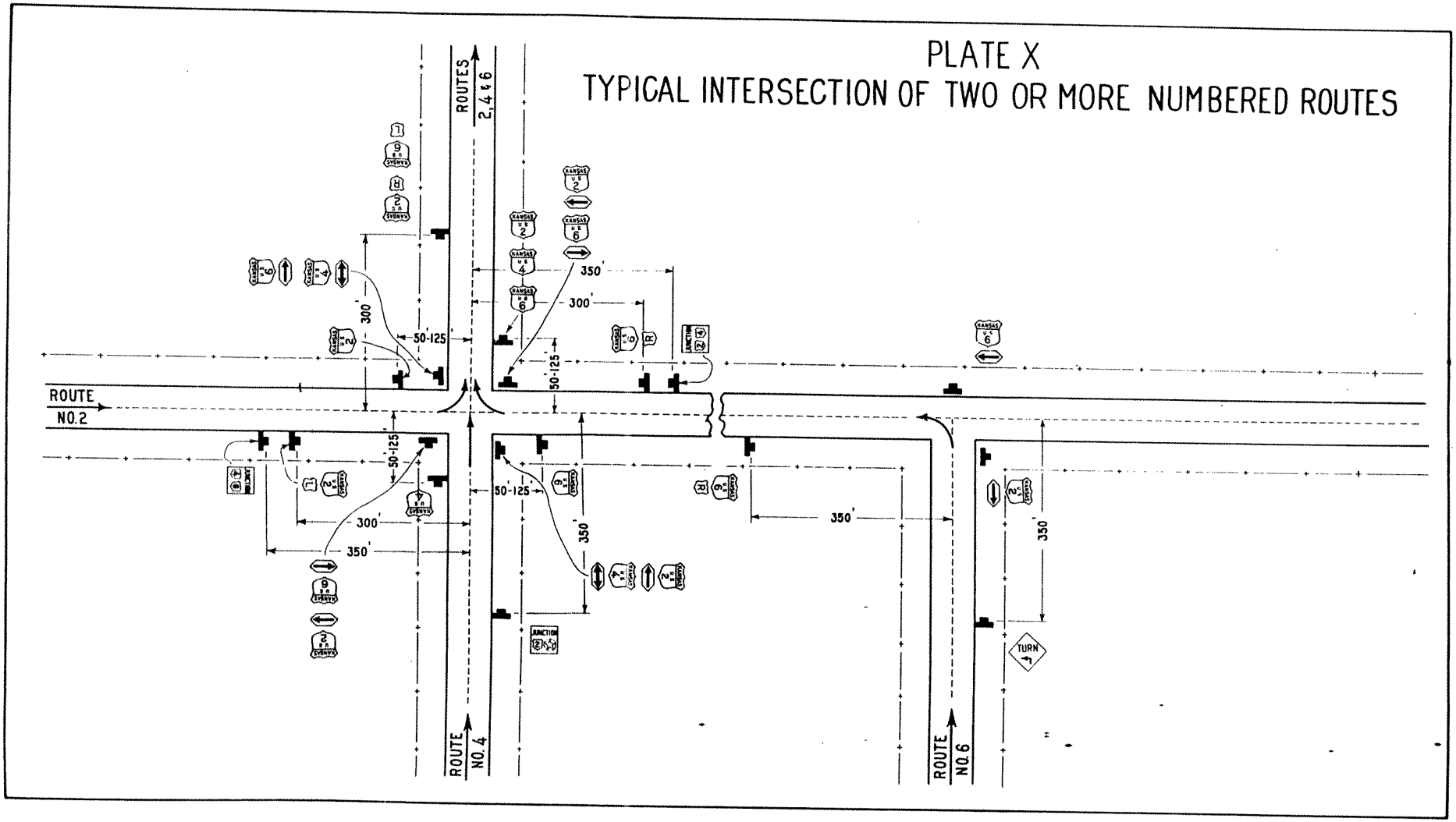


PLATE X
TYPICAL INTERSECTION OF TWO OR MORE NUMBERED ROUTES



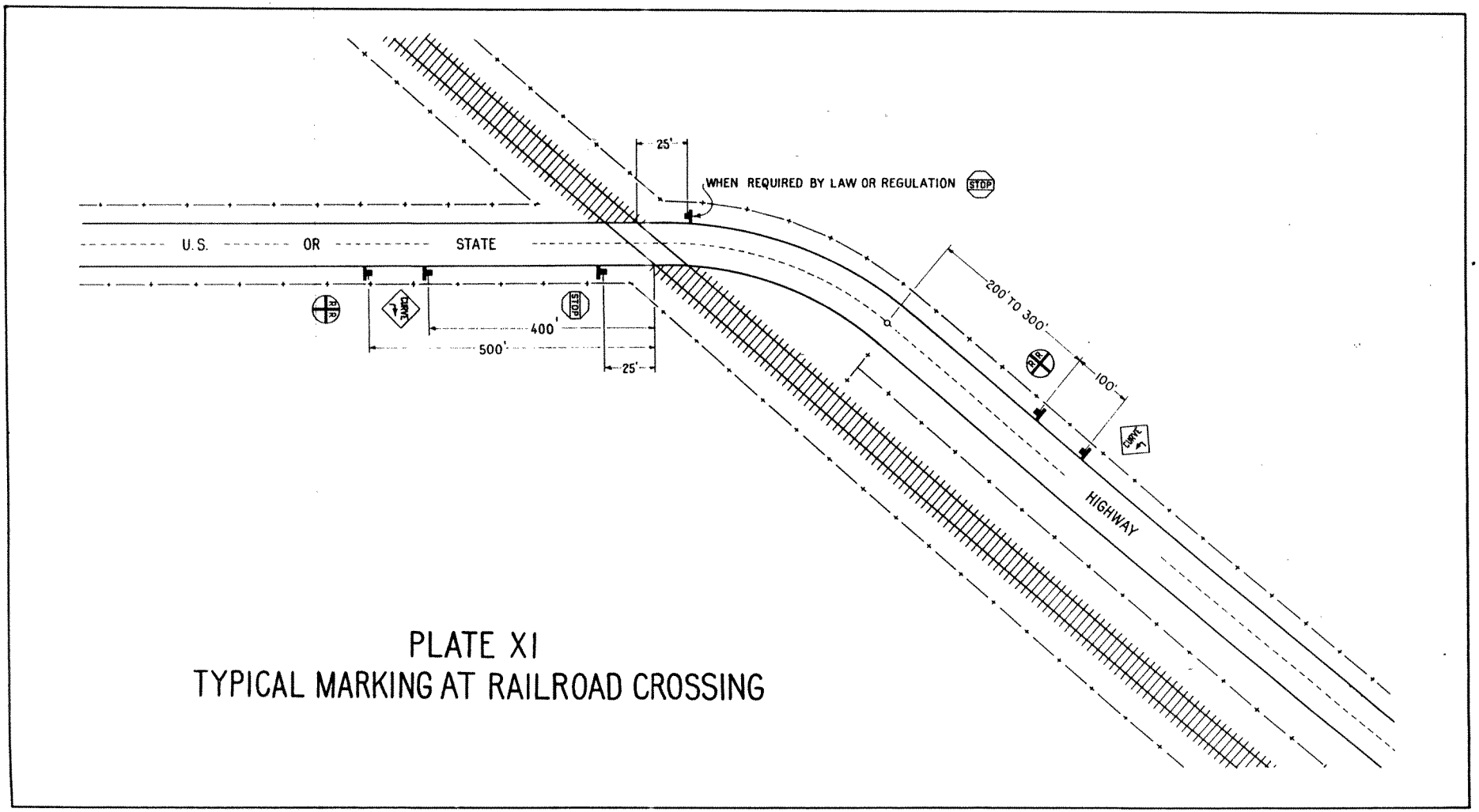
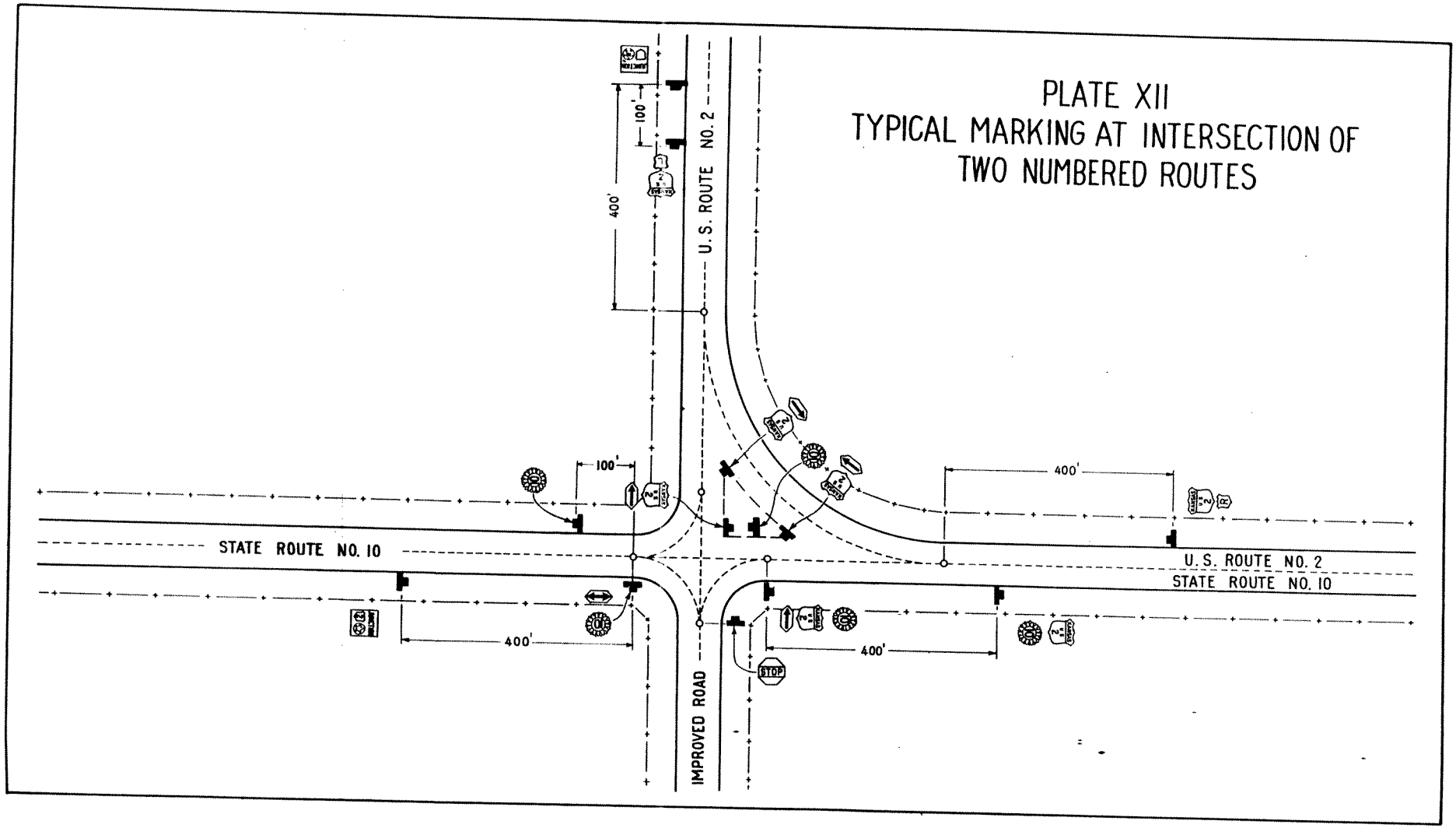


PLATE XI

TYPICAL MARKING AT RAILROAD CROSSING

PLATE XII
TYPICAL MARKING AT INTERSECTION OF TWO NUMBERED ROUTES



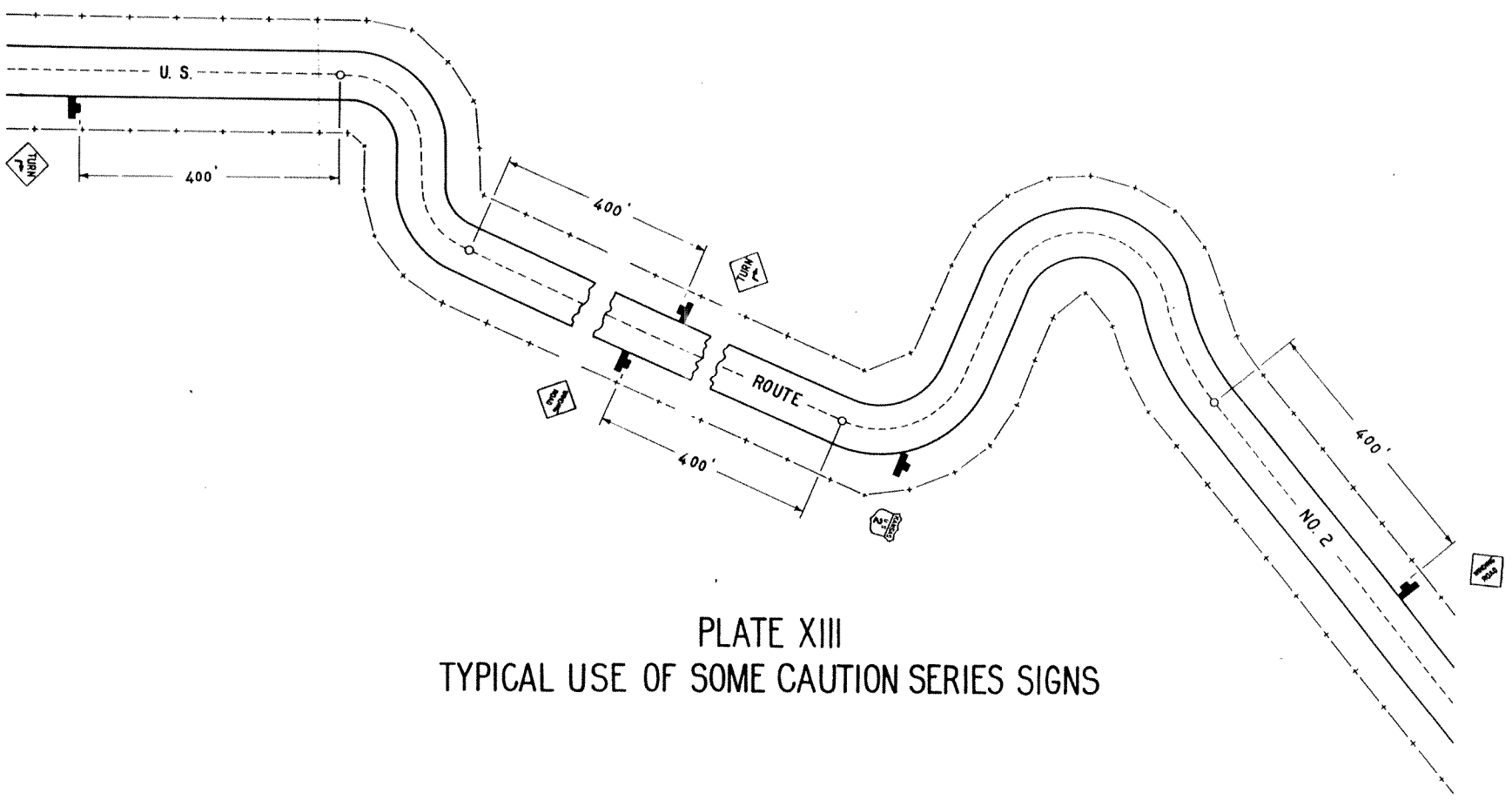


PLATE XIII

TYPICAL USE OF SOME CAUTION SERIES SIGNS

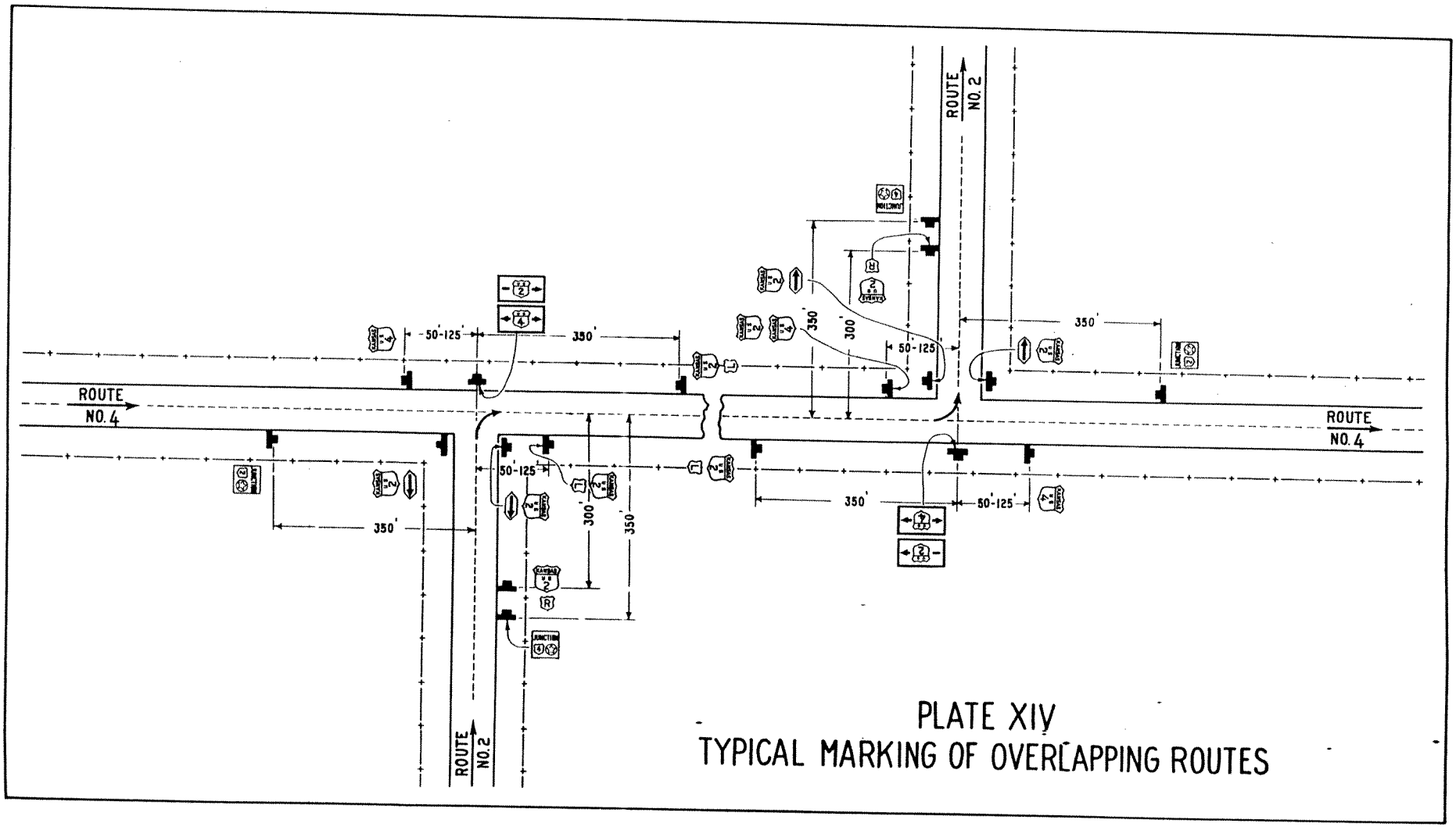
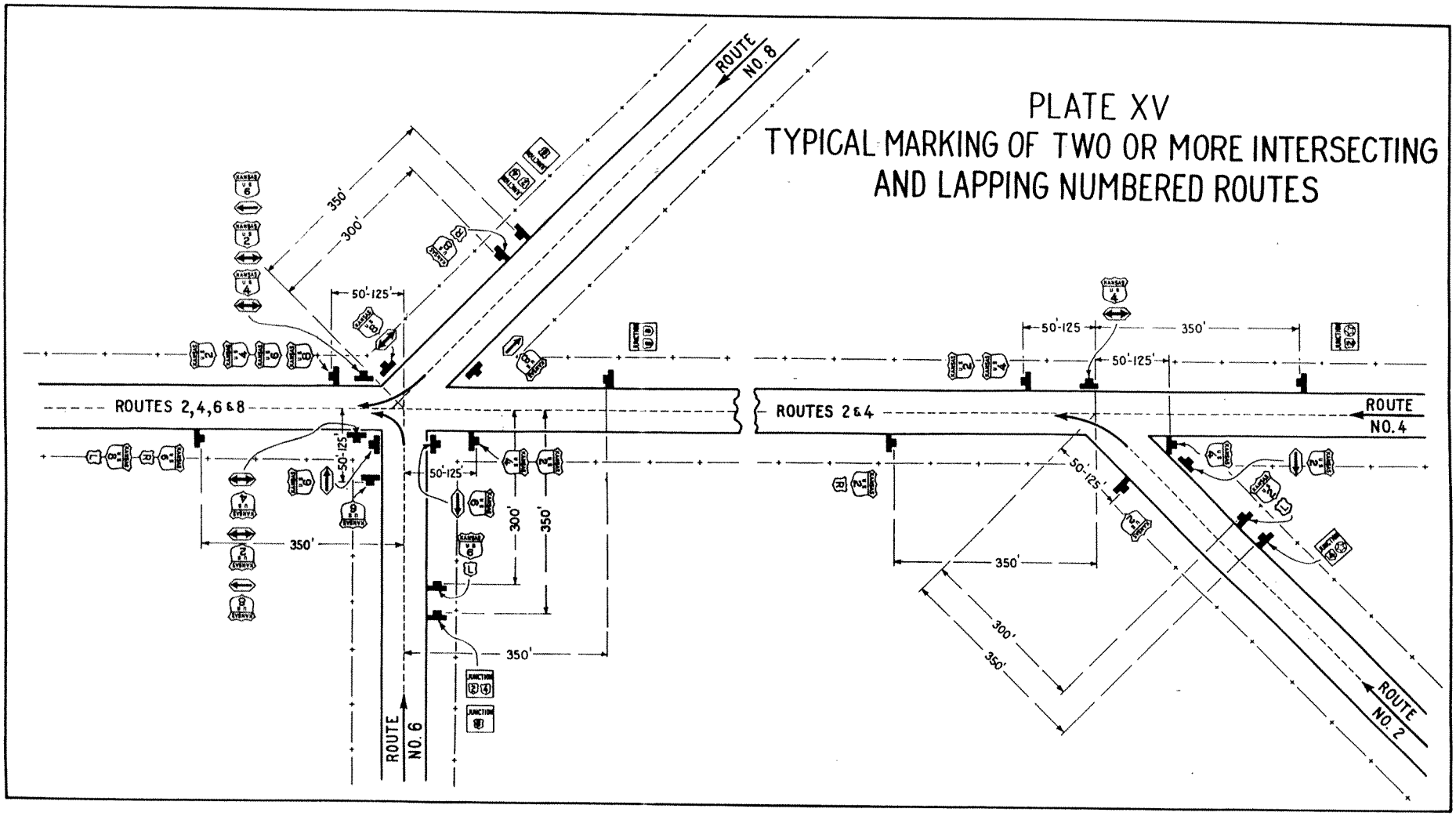


PLATE XIV
TYPICAL MARKING OF OVERLAPPING ROUTES

PLATE XV
TYPICAL MARKING OF TWO OR MORE INTERSECTING AND LAPPING NUMBERED ROUTES



any one direction will not exceed one mile. Markers need not necessarily be erected at intersections with very minor roads.

Markers in Cities

Through towns and cities Markers shall be erected or placed at relatively short intervals so that one or more will be plainly in view at all times, regardless of traffic conditions. The clear marking of routes through towns and cities is relatively much more difficult than rural marking, more care is required and more markers are needed.

Where the stencilled marker is to be used on poles, a white band 20 inches high shall first be painted around the pole at the required height from the ground. If a marker and directional letter are to be stencilled, the white band shall be 30 inches high. A two-inch black band shall be painted around the pole at both the top and lower border of the white band. The stencil shall be painted in black on the white background in such a position as to be readily seen by approaching traffic.

General Plan

The same principles should be observed in marking through towns and cities as on rural roads. Turns should be indicated sufficiently in advance to notify traffic. Any available support may be used. Positions should be selected where the markers will be illuminated by street lights and wherever they project beyond the curb, whether supported on poles or standard posts, they should be at a sufficient height to clear passing or parked vehicles. In general, the lower edge should be not less than seven feet above gutter grade. Particular care should be used in locating Markers with Directional Signs "R" or "L" in order that traffic may not be turned into the alley or street in advance of the one intended, and Confirmatory Arrows should be freely used at street corners where the route turns. Traffic guide posts, silent policemen and semaphore posts are ideal places for the display of Markers and Confirmatory Arrows.

Where no turn is involved the best position is one just beyond the street intersection on the right hand side and clearly visible to the driver as he approaches the intersection.

Special City Marking

For any given route a single fixed layout through a town or city should be adopted and marked. To direct traffic from lateral or parallel streets to the marked route the Standard Arrow Sign, D-1 S, may be used with typical legend "To Route 20". (Plate XVIII)

If, because of density of traffic, it becomes advisable to route through traffic in different directions over separate streets this can be done by the use of one-way traffic signs and directions. Such conditions will generally occur only in places large enough to have their own traffic regulations and system of street marking.

Marking Detours and Temporary Routes

Standard Detour Marking

The same principles should be used in marking a detour as in main route marking and it should be noted that on unimproved roads, often narrow and poorly defined, the chances of making a false turn are much greater than when on a clear, direct, open right of way with surfaced roadway. Accordingly, the detour signs should be freely used and placed as conspicuously as possible. A detour should be made fool proof. The Markers on detours should be used in the same manner as Standard Markers so far as position and distribution are concerned, except that it is advisable to erect markers at every intersecting road. For marking detours the Standard Marker accompanied by the word "Detour" or "Temporary" as described under "Detour Markers" on page 10, will be used.

Emergency Detour Marking

An emergency or short time "Detour Arrow," M-20, is provided for use where, through accident or other cause, a route is temporarily closed. The maintenance

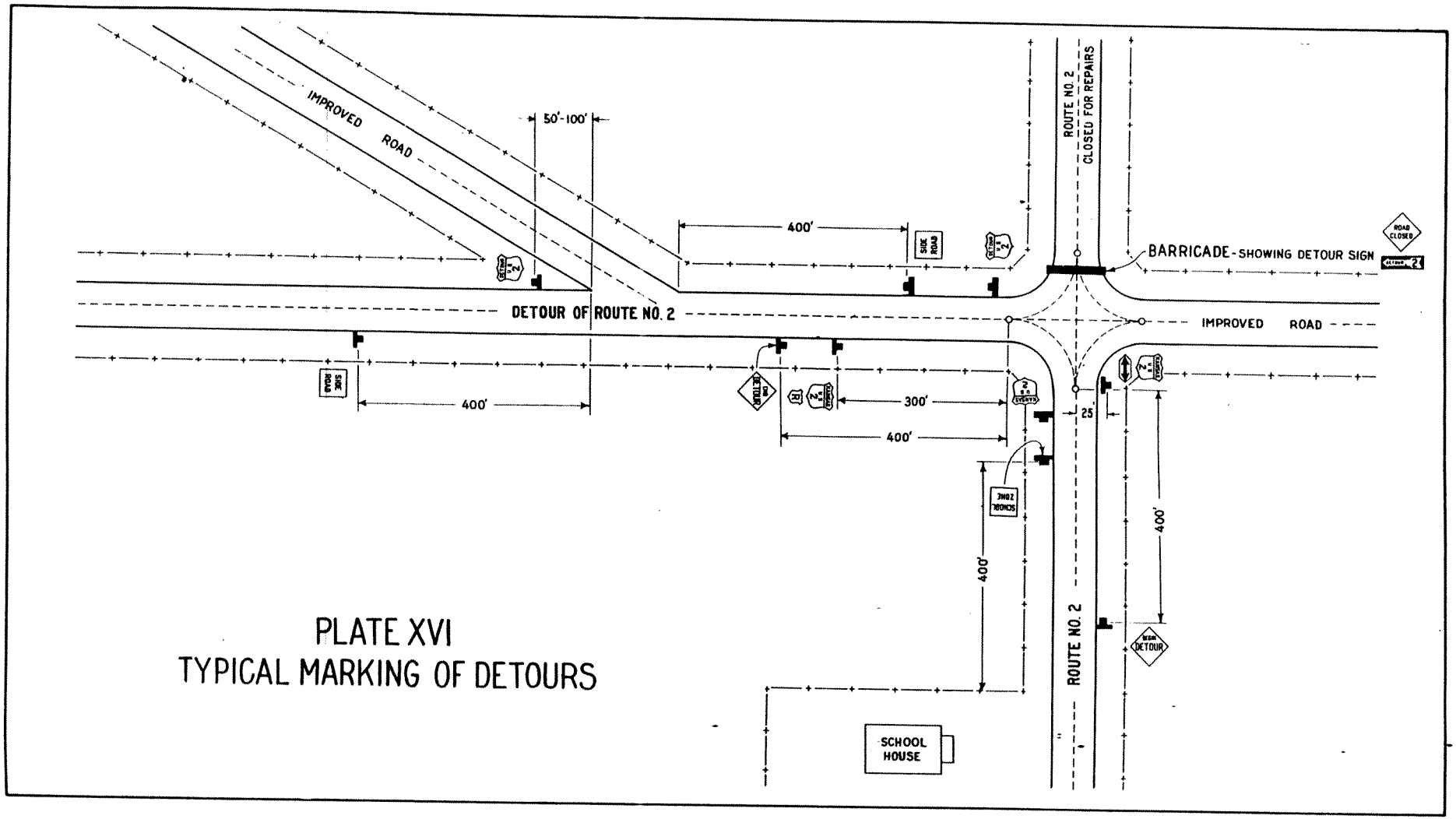
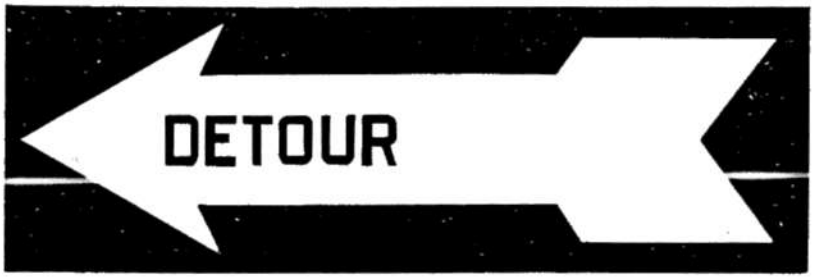


PLATE XVI
TYPICAL MARKING OF DETOURS

PLATE XVII
MARKER SERIES

M-20

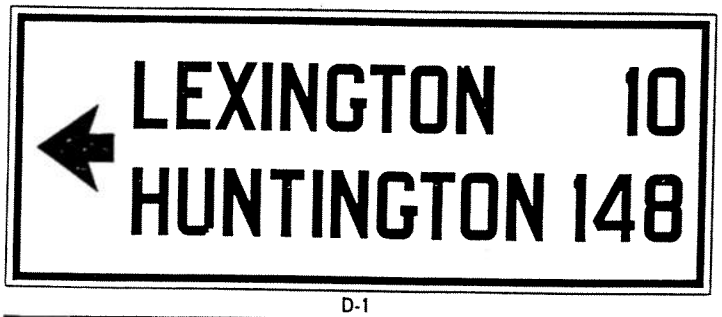


M-21

M-24

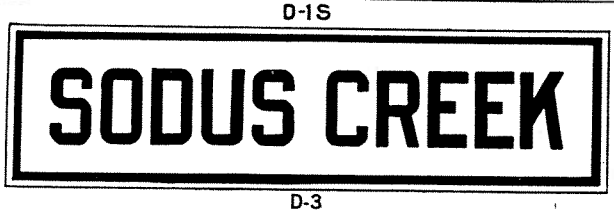
M-26

PLATE XVIII
DIRECTIONAL SERIES

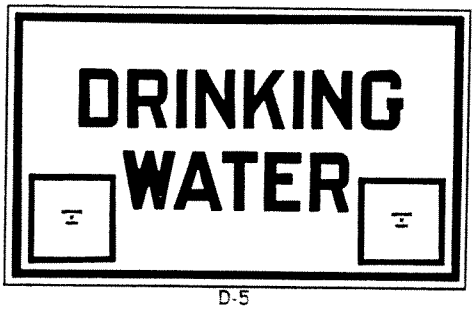


D-1

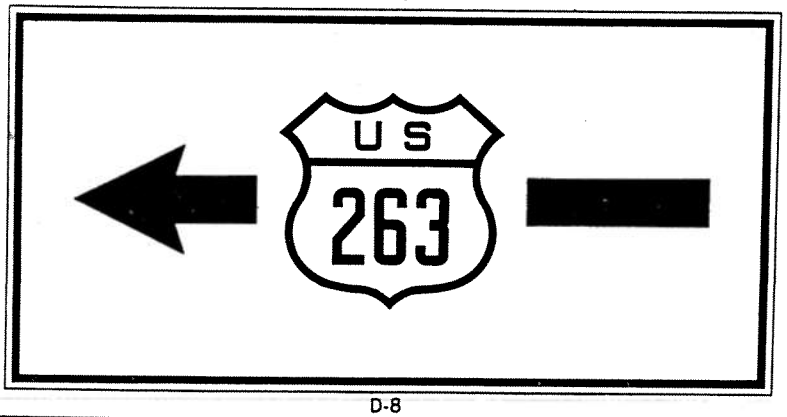
D-1S



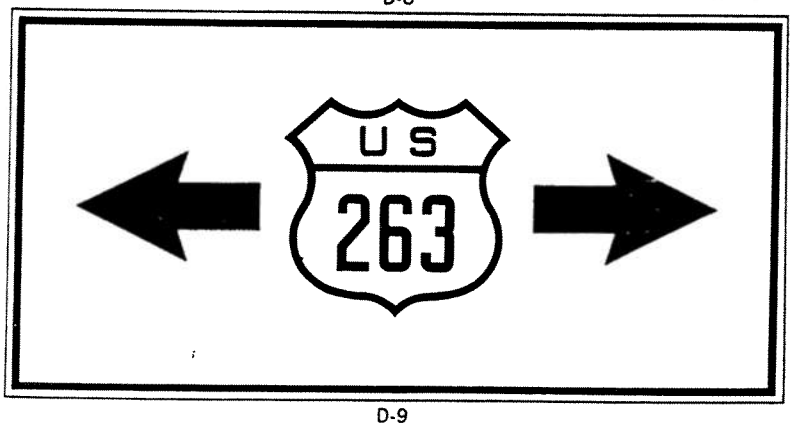
D-3



D-5



D-8

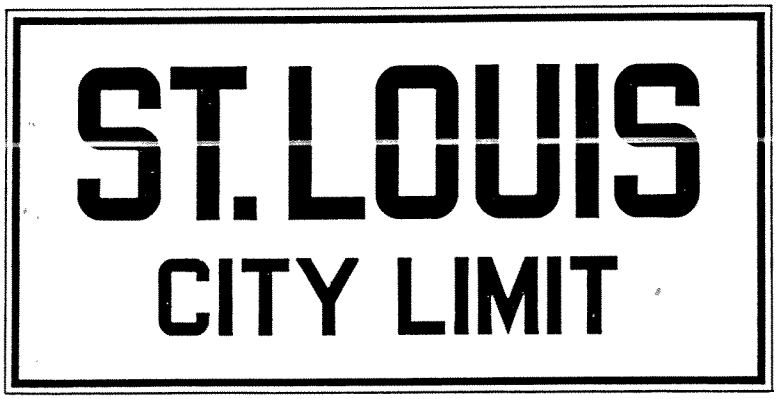


D-9

PLATE XIX
DIRECTIONAL SERIES

D-10

D-13



D-11

D-12

organization, inspectors and traveling field men should carry a supply of such arrows for instant use and they should be freely used to direct traffic when necessary. These paper markers may be tacked on a board before erection if there is no suitable place along the road on which to fasten them. As soon as the obstruction to travel is removed, care should be taken to remove all Detour Signs.

Advance Warning

A Caution Sign, C-17, Plate XXIII giving advance warning of a detour is provided. It should be remembered that traffic is entitled to the same careful direction on detours as elsewhere. Similarly, as the end of the detour, and consequently the main route, is approached the traveler should be warned by the Sign, C-18, Plate XXIII of the end of the detour.

CAUTION, SLOW AND WARNING SIGN SERIES.

General

These three series comprise a general set of Signs to cover a large variety of conditions which it is desirable to meet in the interest of safety. The color scheme for these signs is yellow background with a black design. The yellow shade is that recommended by the Sectional Committee on Color Code of the American Engineering Standards Committee, and liquid samples of the standard yellow have been placed in the hands of each State highway department. Some manufacturers have indicated their intention of producing the specified shade under the name of "Federal Yellow".

The use of these Signs should be kept to a minimum consistent with a satisfactory degree of safety, because a too frequent use of such signs tends to create a disregard for them.

Two signs for different purposes should not be placed close together. It is recommended that a minimum separating distance of 100 feet if possible be used.

Where both Warning Signs and Route Markers are necessary at approximately the same location, the Warning Sign should generally precede the Marker.

Height and Lateral Location

Height, lateral location and other details of erection of all Caution, Slow and Warning Signs are the same as described herein for route markers.

Longitudinal Location

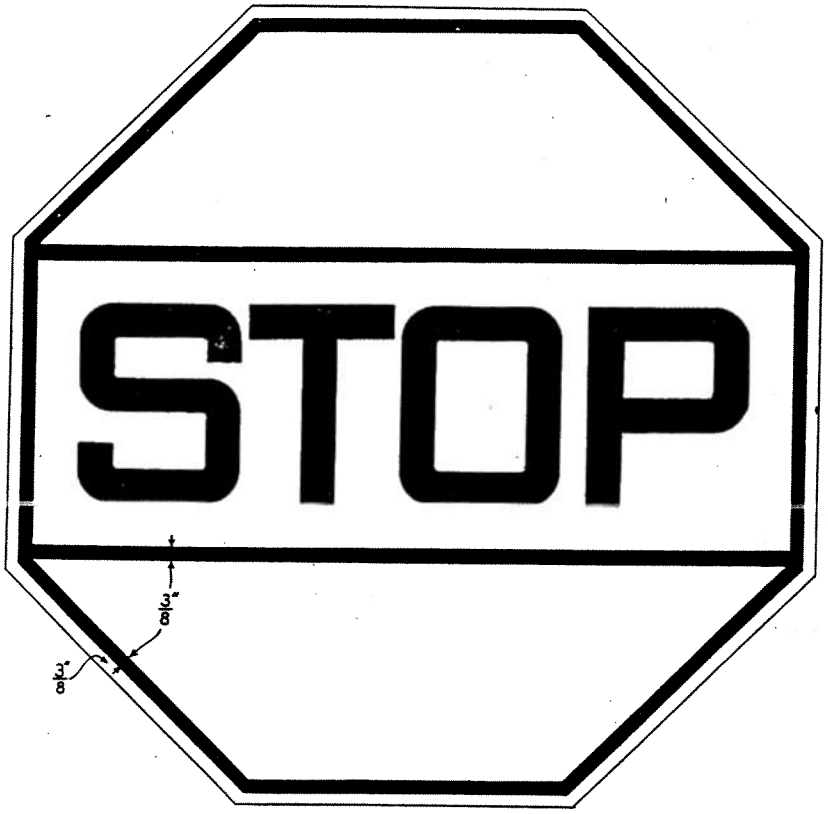
Stop Sign - W-3, Plate XX

This sign is for use at places on a highway where traffic is required to stop. Ordinarily, such points will be at railroad grade crossings, where stops may be required by law; at the intersection of two main highways; and at the junction or intersection of a cross-road with a main highway. The latter use of this sign will be the most common and will require the erection of the sign in a position to be visible and to warn traffic approaching the main route. The Stop Sign shall ordinarily be erected on the side road 25 to 50 feet from the point of potential danger, but this distance can not be fixed, and where traffic would ordinarily not be slowed down before reaching such a Stop Sign, the Slow Sign, C-5 Plate XXI, should be displayed about 350 feet in advance of it. That is to say, if a railroad crossing is located at the botton of a long, easy grade or at the end of a long, level tangent, traffic is likely to approach the point of intersection at a relatively high speed. In such location a warning to stop, W-3, only 50 feet from the point of potential danger is not adequate. The driver should be cautioned well in advance (350 feet) to slow down, by the use of the Slow Sign, C-5.

The Stop Sign should not be set back from the point of danger in an effort to save a sign, because the stop should be made at a point where the cause of danger is visible and the driver can see and understand the reason why he has been brought to rest.

PLATE XX
WARNING SERIES

HEIGHT OF LETTERS 6"



W-3

OCTAGON 24"×24" OUTSIDE

PLATE XXI
CAUTION SERIES

C-1

C-2

C-3

C-5

C-6

C-8

Where the Stop Sign is used on city streets it should be placed approximately at the point where the stop is mandatory.

Additional Copy on Stop Sign

It is intended that additional wording may be used in the upper and lower blank spaces of the Stop Sign, the wording to depend upon State legal requirements and the necessities of the case. The copy used will ordinarily be "STATE HIGHWAY", "TRUNK ROAD", "ARTERIAL HIGHWAY", "STATE LAW", "THRU HIGHWAY", "THRU TRAFFIC", etc. In general, one word should be placed in the upper space, and one word in the lower space.

Railroad: W-1 and W-2

The Railroad Grade Crossing Signs ordinarily should be erected 350 to 450 feet from the point of potential danger. Ordinarily 350 feet should be used under normal conditions. The proper distance at any place will depend upon the usual speed of traffic at that place, the character of alignment and the nature of topography. For instance, if the location requiring such a sign is on a long tangent in open country on a down grade, traffic is likely to be going at a high rate of speed, and the maximum distance could then be adopted. On the other hand, if a sign is in a built-up district, on a curve, or at such other location as will usually result in traffic moving at a moderate speed, then 300 feet, or even less may be a sufficient distance.

The Railroad Sign, Single or Multiple Track, W-1 and W-2, Plate XXVI, should be used to prewarn of the grade crossing and if a stop is required or needed the Stop Sign, W-3, should be used within 25 to 50 feet of the tracks.

Frequently railroad crossings are so situated as to involve sharp curvature and a combination of signs may be needed. A typical case is shown on Plate XI. This example includes the stop sign. If a stop is not actually required these signs may be omitted and the example remains otherwise unchanged.

Turn and Curve Sign

A Turn Sign, C-6 L and C-6 R, Plate XXI, should be used where a curve has a radius of 200 feet or less and Curve Sign C-3, Plate XXI, should be used on curves having radii between 200 and 600 feet. No Curve Sign should be used if the deflection angle is less than 15 degrees. The Double Turn Sign, C- 6 LR and C-6 RL, Plate XXI, is used in advance of two turns less than 350 feet apart.

Hill Sign

A Hill Sign, C-1, Plate XXI, should ordinarily be used only on descending grades steeper than seven per cent and longer than 200 feet, and on six per cent grades if longer than 300 feet.

A Hill Shift Gear Sign, C-2, Plate XXI, should ordinarily be used only on descending grades and under the following conditions:

On a	6	per cent	grade,	more than 2,000	ft. long,
	7	"	"	1,000	"
	8	"	"	750	"
	9	"	"	500	"
	11	"	"	400	"
	13	"	"	300	"
	15	"	"	200	""
	16	"	"	any length.	

This sign should be used where the per cent or length of grade is less than above indicated, if the grade is also on a sharp curve.

Reverse Curve Sign

The Reverse or S Curve Sign, C-3 SL and C-3 SR, Plate XXI, should be used whenever there is a reversal in alignment, and should ordinarily be confined to a single pair of curves. The symbol on this sign will indicate the direction of the first curve in the road.

PLATE XXII
CAUTION SERIES

C-9

C-10

C-11

C-12

C-13

C-14

PLATE XXIII
CAUTION SERIES

C-15

C-16

C-17

C-18

C-19

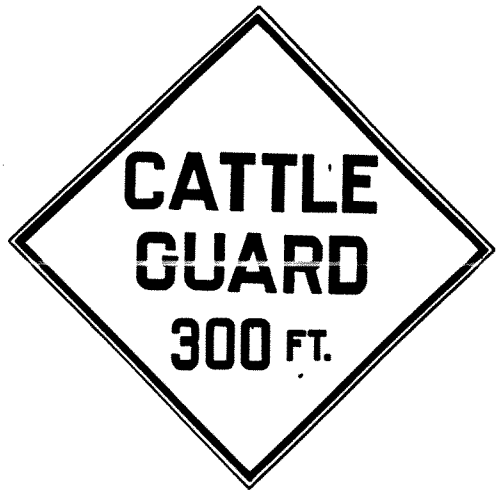
C-20

PLATE XXIV
CAUTION SERIES

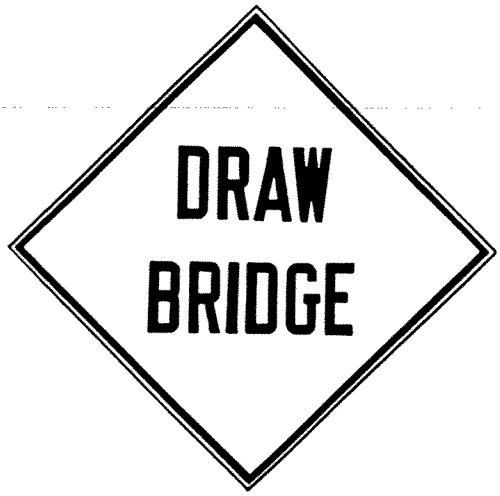
C-21

C-22

C-23



C-24



C-25

C-26

PLATE XXV
CAUTION SERIES

C-27

C-28

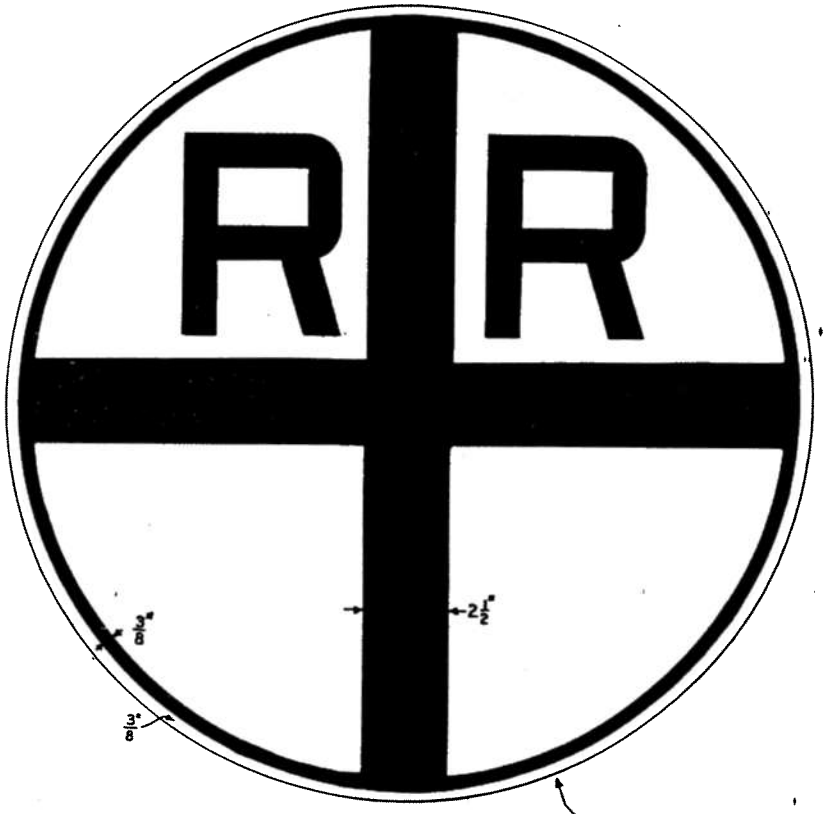
C-29

C-30

C-31

C-32

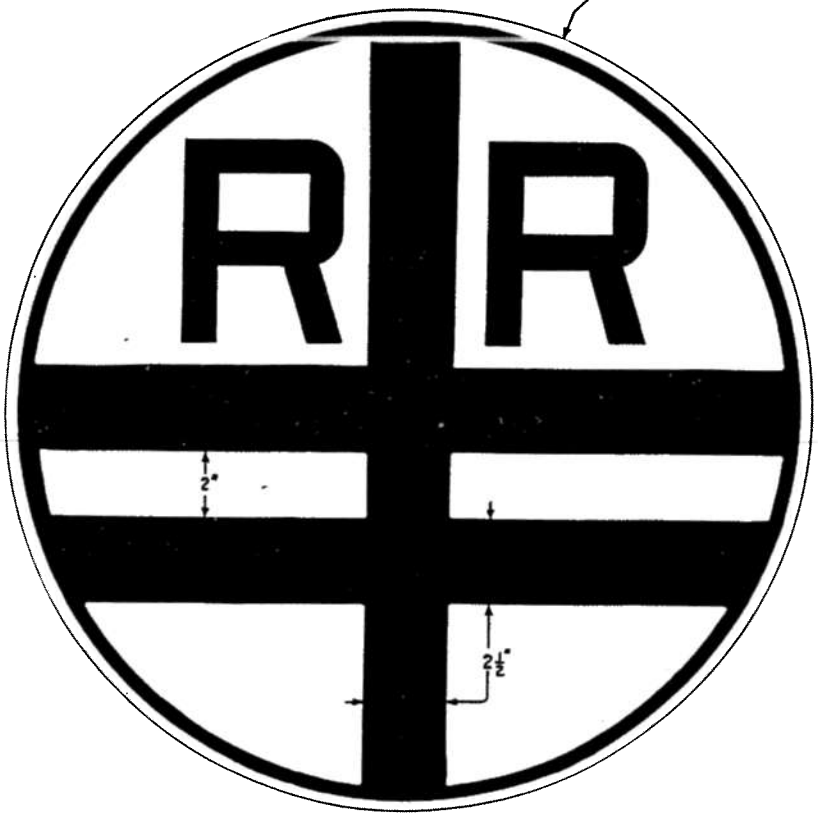
PLATE XXVI
WARNING SERIES



HEIGHT OF LETTERS 6"

W-1

24" OUTSIDE DIAMETER



W-2

Succession of Curves

Where there is a succession of curves, with or without short tangents, it is not desirable to repeat the use of the Reverse Curve Sign, and in such a case a special sign indicating the number of curves or the standard Winding Road Sign, C-21 Plate XIV, should be used.

Condition Sign

There are a number of miscellaneous condition signs in the Caution Series for uses indicated clearly by the several signs.

Loose Gravel C-13, Fresh Oil C-8, Soft Shoulders C-14, etc., Plates XXI and XXII, are to be used where characterized conditions exist, and should usually be erected on temporary supports. Narrow Bridge C-11, Narrow Road C-12, Low Bridge, etc., Plate XXII, Dip C-23, Draw Bridge C-25, Cattle Guard C-24, New Grading C-20, Pavement Ends C-19, Plates XXIII and XXIV, clearly indicate their intended use.

Narrow Bridge and Narrow Road

The Narrow Bridge, C-11 sign, and the Narrow Road sign C-12, should be used to warn traffic of its approach to a bridge or section of road where the safe speed obtainable on the wider roadway approaching the narrow bridge or narrow section of road can not be safely maintained. On moderate traffic roads a bridge or section of road with a 16-foot roadway would not be considered narrow. On heavy traffic roads with wide roadways such a bridge or section of road would be considered narrow.

Men Working

In all cases where men are working on the road the "Men Working" sign, Plate XXV, should be used for their protection.

This sign is to be used on a portable standard and placed in the center of the road. A red flag should be displayed above the sign.

Repair Zone

The Repair Zone Sign, Plate XXIV, is to be used as the standard warning sign for all repair or construction work where the road is not closed to traffic, but is in such condition that traffic should proceed with caution. This sign is to be erected on the right hand side of the road, facing traffic and 300 to 400 feet in advance of the danger zone. On wide roads it may be advisable to erect this sign in the center of road. It may be erected on a standard post set in the ground, or on a portable standard, depending on the length of time the work will last. If the work is of considerable extent, such as a long stretch of stage construction work, the warning of the Repair Zone Sign may be emphasized by a judicious use of standard "Slow" signs erected on portable standards at intervals along the section where the work is going on.

"Slow" Sign

The "Slow" Sign, Plate XXI, should be used only where for safety, careful driving at a reduced speed is necessary.

This sign may be used in conjunction with other standard signs at particularly hazardous locations. When used in conjunction with other signs it should be erected 100 feet in advance of the other sign, except when used as an advance warning for a "Stop" sign. The use of the "Slow" sign in conjunction with other signs is not recommended except for unusual cases.

A "Slow" sign may be used to warn of a hazard for which no other standard sign has been provided or for which none of the other signs seems entirely applicable.

A "Slow" sign may be used as a prewarning for a Stop sign, or to call special attention to Railroad signs in specially hazardous conditions. In special cases it may be used in addition to Cross Road or Side Road Signs.

The "Slow" sign is a warning sign only; its use as an attempt to regulate the speed of traffic entering towns is not appropriate.

School Zone, Hospital Zone, Cross Road, Etc.

The square Caution signs, using the color scheme of the Slow and Warning series, are intended for use where the need for caution arises from some condition not inherent in the road itself, but due to contiguous conditions often, but not always, of an intermittent nature. This group of signs includes the Cross Road C-15, Side Road C-16, School Zone C-10, and the Hospital Zone C-9, Plates XXII and XXIII. These may be combined when desirable.

Their use and placement follow the same general rules as for Slow and Warning signs.

DIRECTION AND INFORMATION SIGN SERIES.

General

This series of signs is intended to furnish the traveler with directional and general information, but involving nothing of a precautionary nature. The signs are generally rectangular in outline, and the color scheme is black on a white background.

City and Village Signs

Signs D-11 and D-12, Plate XIX, are for use at entrances to cities, villages or other well defined and named settlements or communities.

These signs will face incoming traffic, and the reverse of the signs may be used to carry additional information. Standard reverses are shown on D- and D- This information should show the next important place to which the route leads.

In general only one such place should be mentioned for each route involved. If erected on lapped

routes leaving a city, so far as possible each route should be indicated together with a place on that route and its distance.

Physical Feature Signs

The advantages and in some instances the necessity of marking prominent physical features contiguous to a highway are now well recognized and a design is furnished for such place names. These signs, D-2, Plate XVIII are to be used at rivers, smaller streams, lakes, prominent hills or mountains, historic spots and at any point where a place name is to be shown.

These signs should be erected at right angles to traffic and in appropriate relation to the feature marked.

Camp Sites - Potable Water

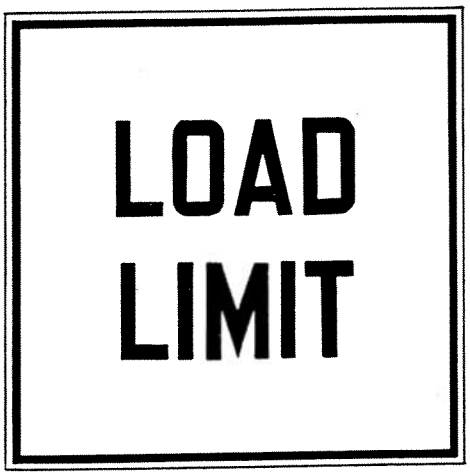
Tourist Camps are now so common, and require such a degree of control that they should be clearly designated both for the benefit of the traveler and for the protection and health of the community. Suitable design is supplied in D-10, Plate XIX, for marking and directing travel toward such camps.

Bacteriological surveys by State Boards of Health are now provided in many States, and an official designation of potable water supplies is desired. These signs should carry a certificate or stamp of the State highway department and also of the State health agency responsible for the water analysis. A design is provided in D-5, Plate XVIII for this purpose. The squares at the lower left and right corners are for aluminum or other cards of the marking agencies.

The control, authorization and erection of such signs are under direct instruction from the central office.

The placement and location of the signs should be such as to leave no doubt as to the water supply indicated.

PLATE XXVII
RESTRICTION SIGN SERIES



R-1

R-2

R-3

R-4

R-5

PLATE XXVIII - TYPICAL DESIGN FOR POSTS

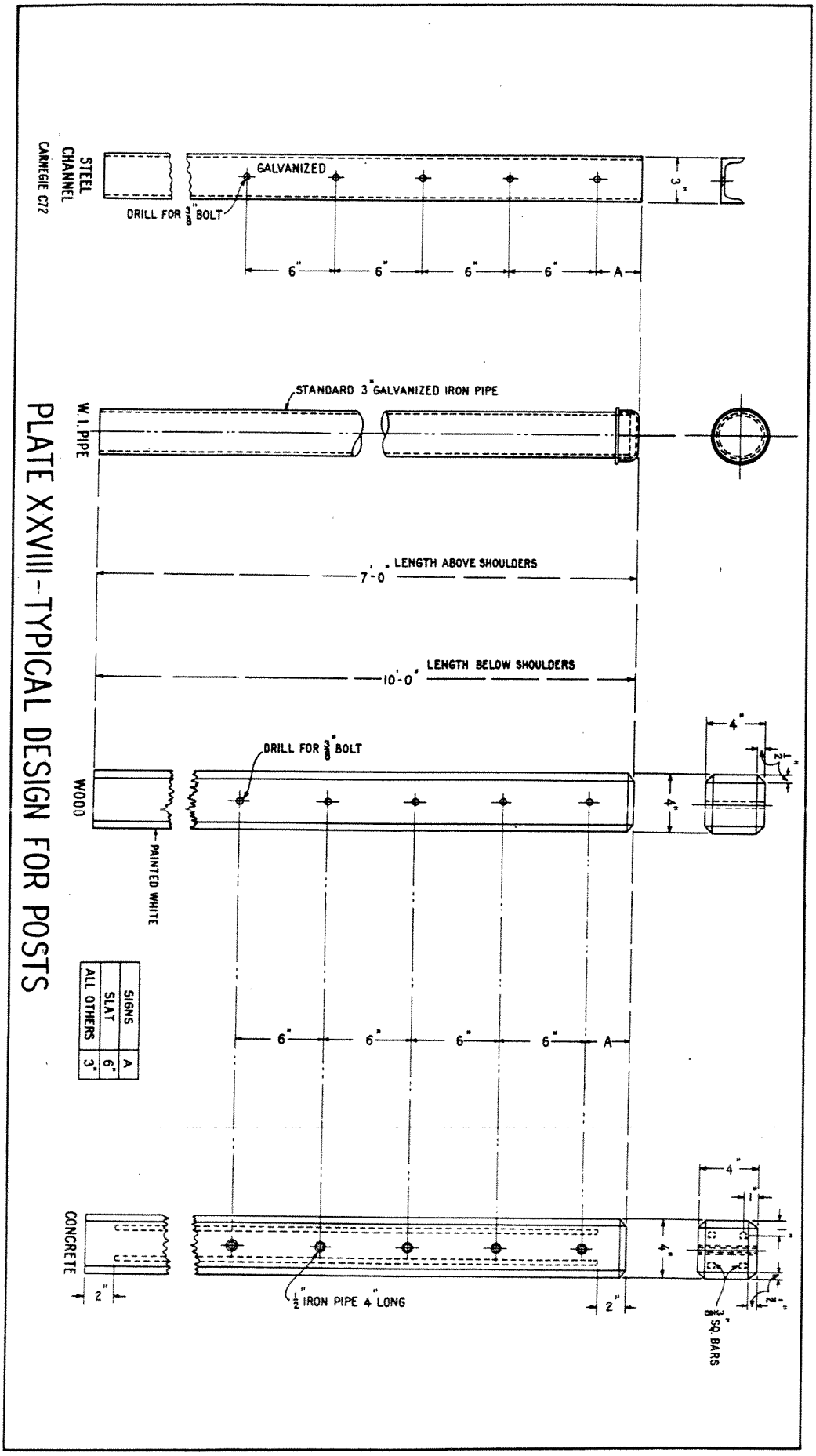
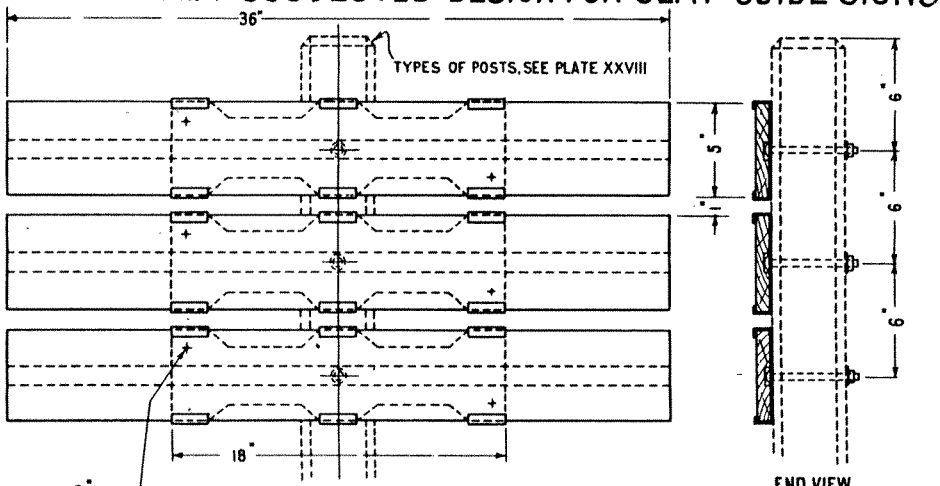
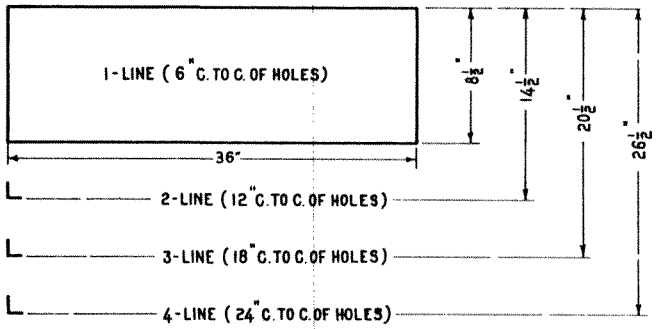


PLATE XXIX-SUGGESTED DESIGN FOR SLAT GUIDE SIGNS WITH BRACKETS FOR MOUNTING ON POSTS

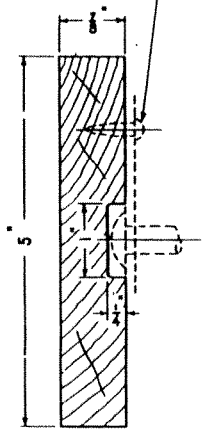


SLAT SIGN ASSEMBLY

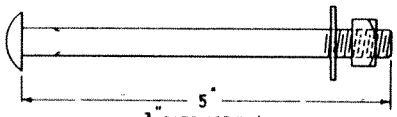
END VIEW

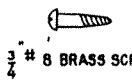


DIRECTIONAL SIGN - SCALE OF SIZES
(SLAT SIGN NOT INCLUDED)



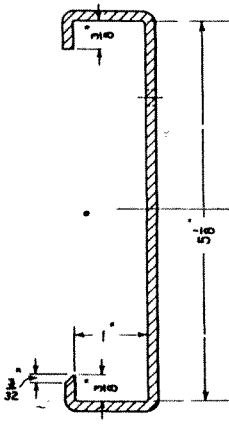
SECTION OF SLAT



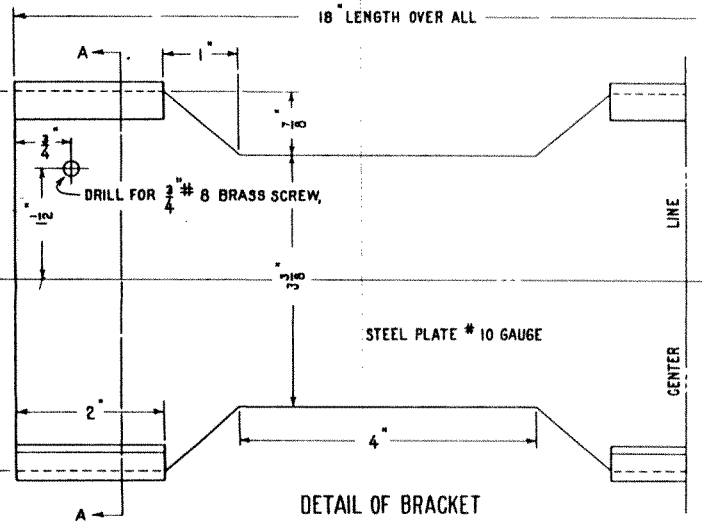


NOTES

SLATS INTERCHANGEABLE
FOR SIZES OF LETTERS AND NUMERALS, SEE SHEETS, A-98, 99, 103 AND 104.
FOR ARRANGEMENT OF LETTERS, ETC., SEE SHEET D-1.



SECTION A-A.



DETAIL OF BRACKET

Rest Station Signs

A Rest Station Sign is provided in D-7. Plate These are not for general use along the highways, but are to be supplied to garages, oil stations, merchants and others desiring them for appropriate display.

General Directional Signs

For indicating direction and distance to a place two types of signs are provided; a solid design and a slat design. Each has its own merits and either may be used at the discretion of the State highway department.

Design D-1 and D-1 S, Plate XVIII show the two designs. It is desirable to reduce the number of place names on any one sign to four so far as this may be done. This makes the design clearer to read. If additional place names are considered worthy of mention, additional signs should be placed at other points on the road.

The Drawing D-1 for a solid Directional Sign uses two place names only. On Plate XXIX of this Manual the dimensions are shown for similar signs with one, three and four lines. On the same plate, the general form of a slat sign is shown.

Location

These Directional Signs should be placed at cross roads, forks and other points where it is desirable to direct traffic. It should be remembered, however, that the numbering system goes far toward directing the traveler and the use of Directional Signs, which must be specially painted for each location, is reduced to a minimum by the general standardized system of marking.

Height

These signs should be of such height that they can be read at night with the aid of the automobile lights. Usually a 10-foot post will provide the

Design Color

(1) - Wooden signs

The design color on wooden signs shall be applied by hand or process. The design color shall dry to an even, glossy black. The finished design shall be clear cut and sharp, the lines of all letters and details true, regular and free from waviness, unevenness, furry edges or lines and from all cracking, scaling, pitting, blistering or blemishes of any kind.

(2) - Sheet metal signs

The design color on embossed metal signs shall be applied by means of rolls or other suitable device, and the equivalent at least of two wet coats shall be applied. The design color shall then be baked as required for the background color. On vitrified enamel signs the design shall be produced by the successive application of enamels necessary to produce the desired colors, fused as required above. The finished design shall be clear cut and sharp, the lines of all letters and details true, regular and free from waviness, uneveness, furry edges or lines, and from all cracking, scaling, pitting, blistering or blemishes of any kind.

(3) - Cast iron, steel and aluminum signs

The design color on cast metal signs may be applied in the manner as specified for embossed metal signs, or may be built up with brushing or spraying lacquers which will bond thoroughly with the metal surface or background coats.

PACKING AND DELIVERY.

All signs shall be packed and delivered in the finished condition required by these specifications.

BASIS OF PAYMENT.

Signs furnished under this specification will be paid for at the contract unit price per sign, suitably packed and delivered to the point or points indicated in the contract, which price shall include the furnishing of all material and the performance of all work of fabricating, finishing, packing and delivering the signs.

APPENDIX.

STANDARD ROAD SIGNS AND MARKERS.

Approved by Joint Board on Interstate Highways.
and
Adopted by Association of State Highway Officials.

Check List of Working Drawings

Marker Series

M-1 Blank for Route Marker.
M-2 Blank for Turn Marker.
M-3 Route Marker Design (2 digits) Requires also M-1, Insets M-17, M-18, A-39, A-51, A-52, A-61, and A-40.
M-4 Turn Marker Design (Right) Requires also M-2 and A-66.
M-5 State Name Insets for Wisconsin, Illinois, Missouri and Ohio. Requires also A-33, A-45.
M-6 State Name Insets for Arkansas, Iowa, Minnesota and Indiana. Requires also A-33, A-45.
M-7 State Name Insets for Alabama, Arizona, California and Colorado. Requires also A-33 A-45.
M-8 State Name Insets for Connecticut, Delaware, Florida and Georgia. Requires also A-33, A-45, and A-61.
M-9 State Name Insets for Idaho, Kansas, Kentucky and Louisiana. Requires also A-33, A-45 and A-61.
M-10 State Name Insets for Maine, Maryland, Massachusetts and Michigan. Requires also A-33 and A-45.
M-11 State Name Insets for Mississippi, Montana, Nebraska and Nevada. Requires also A-17 and A-33.
M-12 State Name Insets for New Hampshire, New Jersey, New Mexico and New York. Requires also A-17, A-33 and A-77.
M-13 State Name Insets for North Carolina, North Dakota, Oklahoma and Oregon. Requires also A-17, A-33 and A-45.
M-14 State Name Insets for Pennsylvania, Rhode Island, South Carolina and South Dakota. Requires also A-17 and A-33.

M-15 State Name Insets for Tennessee, Texas, Utah and Vermont. Requires also A-17, A-45, A-61 and A-77.

M-16 State Name Insets for Virginia, Washington, West Virginia and Wyoming. Requires also A-17, A-33 and A-45.

M-17 Three digit number inset. Requires also A-39, A-40 and A-61.

M-18 Two digit number and letter inset. Requires also A-46, A-51, A-52 and A-61.

M-19 Single Arrow.

M-19A Double Arrow.

M-20 Detour Arrow - Right. Requires also A-102

M-21 Detour Arrow - Left. Requires also M-20 and A-102.

M-22 Blank for City Marker

M-23 City Marker Design (3 digits) Requires A-20, A-48, A-97

M-24 Stencil for City Marker. Requires A-20, A-48, and A-97.

M-25 Two digit number inset (City Marker). Requires also A-48.

M-26 Detour and Temporary plates. Requires also A-97 and A-102.

M-27 Detour and Temporary Shield Marker. Requires also A-17 and A-45.

M-28 Number Plaque. Requires also A-48.

M-29 Special Shield Inset 17-1.

M-30 City Marker Inset 17-1.

Warning Series

W-1 Railroad Single Track. Requires also A-70.

W-2 Railroad - Multiple Track. Requires also A-70.

W-3 Stop. Requires also A-70 and A-71.

W-3A Stop Sign Inset. Requires also A-33.

W-3B Stop Sign Inset. Requires also A-33.

Restriction Series

R-1 Load Limit. Requires also A-37-38-39.

R-2 No Dumping. Requires also A-37-38-39

R-3 No Parking. Requires also A-37-38.

R-4 Speed Limit. Requires also A-46-91-92-100.

R-5 Tractor Sign. Requires also A-46.

Caution Series

C-1 Hill. Requires also A-73 and A-74.
C-2 Hill Shift Gear. Requires also A-69,70,78.
C-3 Curve (Right) Requires also A-41, 42, 43.
C-4 Left Curve and S Curve symbol insets. See C-3.
C-5 Slow. Requires also A-94 and A-95.
C-6 Turn. (Right) Requires also A-54 and A-55.
C-7 Left and Double Turn insets. See also C-6.
C-8 Fresh Oil. Requires also A-37, A-38, A-39.
C-9 Hospital Zone. Requires also A-21,22, & 23.
C-10 School Zone. Requires also A-37,38, and 39.
C-11 Narrow Bridge. Requires also A-47.
C-12 Narrow Road. Requires also A-47.
C-13 Loose Gravel. Requires also A-21, 22, & 23.
C-14 Soft Shoulders. Requires also A-21, 22, 23.
C-15 Cross Road. Requires also A-49, 50, and 51.
C-16 Side Road. Requires also A-49, 50 and 51.
C-17 Begin Detour. Requires also A-41, 42, 43,45, A-98 and 99.
C-18 End Detour. Requires also A-41, 42, 43, 45, A-98 and 99.
C-19 Pavement Ends. Requires also A-21, 22, 23.
C-20 New Grading. Requires also A-21, 22, and 23.
C-21 Winding Road. Requires also A-47.
C-22 Road Repairs ahead. Requires also A-37, 38, A-39 and 47.
C-23 Dip. Requires also A-64, 77, 85, and 86.
C-24 Cattle Guard. Requires also A-45, 47 and 99.
C-25 Draw Bridge. Requires also A-21, 22, and 23.
C-26 Road Closed. Requires also A-47
C-27 Tunnel. Requires also A-41, 42, and 43.
C-28 Church Zone. Requires also A-25, 26, and 27.
C-29 Men working. Requires also A-21, 22, and 33.
C-30 Low Bridge. Requires also A-47.
C-31 Slow - Dangerous dip. Requires also A-22, A-23 and 25.
C-32 Underpass. Requires also A-21, 22, and 23.

Direction and Information Series

D-1 Directional (Single Board and Slat) Requires also A-98, 99, 103, and 104.
D-2 Side Town.
D-3 Physical Feature. Requires also A-35 -36.
D-4 Junction. Requires also A-4, A-21,22, 23.
D-5 Drinking Water. Requires also A-46.
D-6 Blank for Rest Station.
D-7 Rest Station Design. Requires also A-17,18.
D-8 Night Sign (Single Arrow) Requires also M-22, 25, A-20, 48, and 97.
D-9 Night Sign (Double Arrow) Requires also M-22, 25, A-20, 48, and 97.
D-10 Tourist Camp. Requires also A-37, 38, & 39.
D-11 City Limit. Requires also A-47.
D-12 Village Limit. Requires also A-35.
D-13 Drinking Water ahead. Requires also A-35, and A-47.

Alphabet Series

A-1 2 inch Series A Letters and Digits.
A-2 3 inch Series A Letters and Digits.
A-3 4 inch Series A Letters A to Y.
A-4 4 inch Series A Letter Z and Digits 0 to 9.
A-5 5 inch Series A Letters A to I.
A-6 5 inch Series A Letters J to R.
A-7 5 inch Series A Letters S to Z and Digit 0.
A-8 5 inch Series A Digits 1 to 9.
A-9 6 inch Series A Letters A to I.
A-10 6 inch Series A Letters J to R.
A-11 6 inch Series A Letters S to Z and Digit 0.
A-12 6 inch Series A Digits 1 to 9.
A-13 8 inch Series A Letters A to I.
A-14 8 inch Series A Letters J to R.
A-15 8 inch Series A Letters S to Z and Digit 0.
A-16 8 inch Series A Digits 1 to 9.

A-17 2 inch Series B Letters and Digits.
A-18 3 inch Series B Letters and Digits.
A-19 4 inch Series B Letters A to Y.
A-20 4 inch Series B Letter Z and Digits 0 to 9.
A-21 5 inch Series B Letters A to I.
A-22 5 inch Series B Letters J to R.
A-23 5 inch Series B Letters S to Z and Digit 0.
A-24 5 inch Series B Digits 1 to 9.
A-25 6 inch Series B Letters A to I.
A-26 6 inch Series B Letters J to R.
A-27 6 inch Series B Letters S to Z and Digit 0.
A-28 6 inch Series B Digits 1 to 9.
A-29 8 inch Series B Letters A to I.
A-30 8 inch Series B Letters J to R.
A-31 8 inch Series B Letters S to Z and Digit 0.
A-32 8 inch Series B Digits 1 to 9.

A-33 2 inch Series C Letters and Digits.
A-34 3 inch Series C Letters and Digits.
A-35 4 inch Series C Letters A to Y.
A-36 4 inch Series C Letter Z and Digits 0 to 9.
A-37 5 inch Series C Letters A to I.

Alphabet Series (Con'd.)

A-38 5 inch Series C Letters J to R.
A-39 5 inch Series C Letters S to Z and Digit O.
A-40 5 inch Series C Digits 1 to 9.
A-41 6 inch Series C Letters A to I.
A-42 6 inch Series C Letters J to R.
A-43 6 inch Series C Letters S to Z and Digit O.
A-44 6 inch Series C Digits 1 to 9.

A-45 2 inch Series D Letters and Digits.
A-46 3 inch Series D Letters and Digits.
A-47 4 inch Series D Letters A to Y.
A-48 4 inch Series D Letter Z and Digits O to 9.
A-49 5 inch Series D Letters A to I.
A-50 5 inch Series D Letters J to R.
A-51 5 inch Series D Letters S to Z and Digit O.
A-52 5 inch Series D Digits 1 to 9.
A-53 6 inch Series D Letters A to I.
A-54 6 inch Series D Letters J to R.
A-55 6 inch Series D Letters S to Z and Digit O.
A-56 6 inch Series D Digits 1 to 9.
A-57 8 inch Series D Letters A to I.
A-58 8 inch Series D Letters J to R.
A-59 8 inch Series D Letters S to Z and Digit O.
A-60 8 inch Series D Digits 1 to 9.
A-61 2 inch Series E Letters and Digits.
A-62 3 inch Series E Letters and Digits.
A-63 4 inch Series E Letters A to Y.
A-64 4 inch Series E Letter Z and Digits O to 9.
A-65 5 inch Series E Letters A to I.
A-66 5 inch Series E Letters J to R.
A-67 5 inch Series E Letters S to Z and Digit O.
A-68 5 inch Series E Digits 1 to 9.
A-69 6 inch Series E Letters A to I.
A-70 6 inch Series E Letters J to R.
A-71 6 inch Series E Letters S to Z and Digit O.
A-72 6 inch Series E Digits 1 to 9.
A-73 8 inch Series E Letters A to I.
A-74 8 inch Series E Letters J to R.
A-75 8 inch Series E Letters S to Z and Digit O.
A-76 8 inch Serics E Digits 1 to 9.

Alphabet Series (Con'd.)

A-77 2 inch Series F Letters and Digits.
A-78 3 inch Series F Letters and Digits.
A-79 4 inch Series F Letters A to Y.
A-80 4 inch Series F Letter Z and Digits 0 to 9.
A-81 5 inch Series F Letters A to I.
A-82 5 inch Series F Letters J to R
A-83 5 inch Series F Letters S to Z, and Digit 0.
A-84 5 inch Series F Digits 1 to 9.
A-85 6 inch Series F Letters A to I.
A-86 6 inch Series F Letters J to R.
A-87 6 inch Series F Letters S to Z and Digit 0.
A-88 6 inch Series F Digits 1 to 9.
A-89 8 inch Series F Letters A to I.
A-90 8 inch Series F Letters J to R.
A-91 8 inch Series F Letters S to Z and Digit 0.
A-92 8 inch Series F Digits 1 to 9.

A-93 8 inch Series C Letters A to I.
A-94 8 inch Series C Letters J to R.
A-95 8 inch Series C Letters S to Z and Digit 0.
A-96 8 inch Series C Digits 1 to 9.

A-97 1-1/2 inch Series F Letters and Digits.

A-98 3-1/2 inch Series C Letters A to Y.
A-99 3-1/2 inch Series C Letter Z and Digits 0 to 9.
A-100 3-1/2 inch Series E Letters A to Y.
A-101 3-1/2 inch Siries E Letter Z and Digits 0 to 9.
A-102 1-1/2 inch Series D Letters and Digits.

A-103 3-1/2 inch Series B Letters A to Y.
A-104 3-1/2 inch Series B Letter Z and Digits 0 to 9.