MANUAL OF REGULATIONS
FOR
OFFICIAL TRAFFIC SIGNS
SIGNALS AND MARKINGS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION
1955

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DEFINITIONS

The following words and phrases, where used in this Manual, shall have the meanings respectively ascribed to them, except in those instances where the context clearly indicates a different meaning:

RELATING TO HIGHWAY

Alternate Route—A route which starts at a point where it leaves the main numbered route and connects again therewith at some distant point.

Berm—See shoulder.

Business District—The territory contiguous to a highway, when fifty (50) percent or more of the frontage thereon for a distance of three hundred (300) feet or more is occupied by buildings in use for business.

Business Route—A route which leaves the regular numbered route and passes through the business section of the city or town and rejoins the regular numbered route beyond that section.

By-Pass Route—A route which leaves the regular numbered route through a community, by-passes the community and rejoins the regular numbered route beyond the community.

Center Line—A line marking the center of a roadway on which traffic moves in both directions, or dividing the roadway between traffic moving in opposite directions.

Commercial Motor Vehicle—Any motor vehicle designed for carrying freight or merchandise: Provided, however, that a motor vehicle, originally designed for passenger transportation, to which has been added a removable box body without materially altering said motor vehicle, when owned and used by a farmer, shall not be deemed a "commercial motor vehicle" for the purpose of this act: And further provided, that any motor vehicle of the bus type, operated under contract with or owned by any school district of this Commonwealth for the transportation of school children, shall be deemed a "commercial motor vehicle."

Crosswalk—That portion of a highway ordinarily included within the prolongation of curb and property lines at intersections, or any portion of a highway clearly indicated for pedestrian crossing by lines or other markings on the surface.

Crown of Pavement—The highest part of the roadway, usually at the middle of the roadway.

Curb—A vertical or sloping member along the edge of a pavement forming part of a gutter, strengthening or protecting the pavement edge, and clearly defining the pavement edge to vehicle operators. The surface at the curb facing the general direction of the pavement is called the "face."

Curb Line—The boundary between a roadway and a sidewalk, usually marked by a fixed curb rising above the level of the roadway.

Grade—The slope in the longitudinal direction of the pavement, usually expressed in percent which is the number of units of change in elevation per 100 units of horizontal distance.

Highway—Every way or place, of whatever nature, open to the use of the public as a matter of right, for purposes of vehicular travel. The term "highway" shall not be deemed to include a roadway or driveway upon grounds owned by private persons, colleges, universities or other institutions.

Highway, Divided—A highway with separated roadways for traffic in opposite directions.

Intersection—The area embraced within the prolongation of the lateral curb line or, if none, then the lateral boundary lines of two or more highways which join one another at an angle whether or not one such highway crosses the other.

Intersection Approach—That portion of an intersection leg which is used by traffic approaching the intersection.

Island—An area within a roadway from which vehicle traffic is intended to be excluded, together with any area at the approach thereto occupied by protective deflecting or warning devices.

Local Authorities—Every county, municipal, and other local board or body, having authority to adopt local police regulations under the Constitution and laws of this Commonwealth.

Pavement—That portion of a roadway having a constructed surface to facilitate vehicular traffic.

Private Road or Driveway—Every road or drive not open to the use of the public for purposes of vehicular travel.

Ramp—An inclined section of way over which traffic passes for the primary purpose of ascending or descending so as to make connections with other ways. Also, an interconnecting roadway of a traffic interchange, or any connection between highway facilities of different levels, on which vehicles may enter or leave a designated highway.

Residence District—The territory contiguous to a highway, not comprising a business district, when the frontage on such highway for a distance of three hundred (300) feet or more is closely built up with dwellings, or by dwellings and buildings in use for business.

Roadway—That portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the berm or shoulder. In the event a highway includes two or more separate roadways the term "roadway" as used herein refers to any such roadway separately but not all such roadways collectively.

Safety Zone—The area of space officially set aside within a highway for the exclusive use of pedestrians, and which is so plainly marked or indicated by proper signs as to be plainly visible at all times while set apart as a safety zone.

Shoulder—The portion of the roadway contiguous with the travelled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Sidewalk—That portion of a street between the curb lines, or the lateral lines of a roadway, and the adjacent property lines, intended for the use of pedestrians.

Stop Intersections—A portion of a highway at the entrance to which vehicular traffic from an intersecting highway is required by law to stop before entering or crossing the same when signs are erected.

Through Highway—A highway on which preference is given to the through movement of traffic, at the expense of cross traffic, by the utilization of Stop signs and/or other control devices on intersecting streets.

Viaduct—A bridge for carrying a road over a valley, road or other way.

RELATING TO TRAFFIC

Acceleration Lane—An added area of partial or full lane width of sufficient length to enable a vehicle that has turned to increase speed to the rate at which it is convenient or safe to merge with through traffic.

Deceleration Lane—An added area of partial or full lane width of sufficient length to enable a vehicle that is to turn to slow down to the safe speed on the curve it approaches.

Motor Vehicle—Every vehicle, as herein defined, which is self-propelled, except tractors, power shovels, road rollers, agricultural machinery, and vehicles which move upon or are guided by a track, or travel through the air.

Pedestrian—Any person afoot.

Railroad Train—A steam engine, electric or other type of motor operated locomotive, with or without cars coupled thereto, operated upon rails, except street cars.

Safe Speed—The maximum speed at which vehicles may move in safety as determined by physical conditions within or adjacent to the roadway.

Traffic—Pedestrians, vehicles, and street cars, either singly or together, while using any highway for purposes of travel.

Traffic Control Devices—All signs, signals, markings, and devices placed or erected by authority of a public body or official having jurisdiction, for the purpose of regulating, warning, or guiding traffic.

Traffic Lane—A strip of roadway intended to accommodate the forward movement of a single line of vehicles.

RELATING TO SIGNS

Delineator—A light-reflecting device mounted at the side of the roadway, in series with others, to indicate the alignment of the roadway.

Directional Sign—An informational sign indicating the direction and mileage to the named destination.

Guide Sign—A sign used to direct traffic along a route or toward a destination, or to give information concerning places or points of interest.

Reflector Button—Button shaped light-reflecting devices used on traffic signs or markers for the benefit of nighttime traffic.

Regulatory Sign—A sign used to indicate the required method of traffic movement or use of the highway.

Route Marker—A guide sign showing the number of any established traffic route.

Sign—Any device, mark, marker, board, plate, or other contrivance, designed for the purpose of guiding traffic or informing of a traffic regulation.

Warning Sign—A sign used to indicate conditions that are actually or potentially hazardous to highway users.

RELATING TO MARKINGS

Center Line—See definition under section "Relating To Highway."

Lane Line—A line other than a center line separating two traffic lanes.

Stop Line (Or Limit Line)—A line behind which vehicles should stop when directed by a traffic officer, traffic control signal, stop signal, or stop sign.

Traffic Markings—All lines, patterns, words, colors, or other devices, except signs, set into the surface of, applied upon, or attached to the pavement or curbing, or to objects within or adjacent to the roadway, officially placed for the purpose of regulating, warning, or guiding traffic.

RELATING TO ISLANDS

Buffer—A structure at the approach end of a safety zone designed to deflect or stop any vehicle which collides with it.

Channelizing Island—A traffic island located to guide traffic streams along certain definite paths and to prevent the promiscuous movement of vehicles in what would otherwise be a widely extended roadway area.

Divisional Island—A traffic island, usually elongated and narrow, following the course of the roadway to separate traffic streams that flow in the same or opposite directions.

Loading Island—A pedestrian island at a regular street car, bus, or trolley bus stop especially provided for the protection of passengers.

Pedestrian Island—An island designed for the use and protection of pedestrians. Included are both loading and refuge islands.

Traffic Island—An island designed to separate or direct streams of vehicle traffic. Included are both divisional and channelizing islands.

RELATING TO SIGNALS

Alternate System—A signal system in which alternate signals, or groups of signals, give opposite indications to a given street at the same time.

Auxiliary Manual Controller—A separate and distinct manual controller attached to an automatic controller by means of which the traffic control signals may be operated by hand when the automatic timer is disconnected.

Caution Signal—A flashing Yellow signal having the same general function as a warning sign.

Clearance Interval—The time of display of the signal indication following the right-of-way interval (generally Yellow).

Color Sequence—A predetermined consecutive order of appearance of signal color indications during successive intervals within a total time cycle.

Controller—A complete electrical mechanism for controlling the operation of traffic control signals, including the timer and all necessary auxiliary apparatus mounted in a cabinet.

Detector For Traffic Actuation—A device by which vehicles, street cars, trolley buses, or pedestrians are enabled to register their presence with a traffic-actuated controller.

Fixed-Time Controller—An automatic controller for supervising the operation of traffic control signals in accordance with a predetermined fixed-time cycle and division thereof.

Fixed-Time Signal—A type of traffic control signal which directs traffic to stop and permits it to proceed in accordance with a predetermined time schedule.

Flashing Beacon—A section of a standard traffic signal head, or a similar type device, having a Yellow or Red lens in each face, which is illuminated by rapid intermittent flashes.

Flashing Feature—A relay or other device installed in a controller which when energized from a remote point or by an automatic time switch discontinues normal signal operation and causes the flashing of any predetermined combination of signal lights.

Flexible Progressive System—A signal system in which the intervals at any signal may be independently adjusted to the traffic requirements at the intersection, and in which the Go indications at separate signals may be started independently at the instant that will give the maximum efficiency.

Interval—Any one of the several divisions of the time cycle during which signal indications do not change.

Manual Operation—The operation of an automatic controller mechanism by means of a hand-operated switch.

Pedestrian Phase (Pedestrian Movement)—A traffic phase allocated exclusively to pedestrian traffic.

Rural Area—See Urban Area.

Signal Face—That part of a signal head provided for controlling traffic in a single direction.

Signal Head—An assembly containing one or more signal faces which may be designated accordingly as one-way, two-way, three-way, four-way, or multi-way.

Signal Indication—The illumination of a traffic signal lens or of a combination of several lenses at the same time.

Signal Installation—All of the equipment and materials involved in the signal control of traffic at one intersection.

Signal System—Two or more signal installations operating in coordination.

Simple Progressive System—A signal system in which the various signal faces controlling a given street give Go indications in accordance with a time schedule to permit (as nearly as possible) continuous operation of groups of vehicles along the street at a planned rate of speed, which may vary in different parts of the system.

Simultaneous System—A signal system in which all signals along a given street always give the same indication at the same time.

Stop Signal—A flashing Red signal having the same function as a Stop sign.

Synchronous Motor Controller—A controller operated by a motor that will maintain a constant speed governed by the frequency of the power supply circuit.

Time Cycle—The number of seconds required for one complete revolution of the timing dial or complete sequence of signal indications.

Traffic-Actuated Signal—A type of traffic control signal in which the intervals are varied in accordance with the demands of traffic as registered by the actuation of detectors or push buttons.

Traffic Phase (Traffic Movement)—A part of the time cycle allocated to any traffic movement receiving the right-of-way or to any combination of traffic movements receiving the right-of-way simultaneously during one or more intervals.

Traffic Signal—Any device using words or colored lights or a combination thereof, either manually or electrically controlled, by which traffic is alternately directed to stop and go.

Urban Area—A metropolitan region having a population of 5000 or more. All other places, for the purpose of Traffic Signal warrants, are regarded as rural areas.

Vehicular Phase (Vehicular Movement)—A traffic phase allocated to vehicular traffic.

INTRODUCTION

This edition of the Manual of Regulations for Official Traffic Signs, Signals and Markings revises and supersedes the Manual of Regulations published in 1943.

In accordance with Section 10 of Act 360 of the General Assembly of Pennsylvania, approved June 5, 1937, as an amendment to Article XI Section 1105 of "The Vehicle Code" (1929 P. L. 905), this Manual has been prepared by the Pennsylvania Department of Highways. It establishes standards and regulations for Signs, Signals and Markings which shall be used on all highways throughout the Commonwealth of Pennsylvania.

The contents of the Manual of Regulations is correlated with the "Manual on Uniform Traffic Control Devices," published in 1948 and adopted by the Joint Committee of the American Association of State Highway Officials, the Institute of Traffic Engineers, and the National Conference on Street and Highway Safety. The regulations in the Manual on Uniform Traffic Control Devices will govern conditions which are not covered by the Pennsylvania Manual of Regulations.

Local authorities in the Commonwealth of Pennsylvania, by the Act referred to, are directed to follow these uniform regulations for the design, location, erection, operation and maintenance of all traffic signs, signals and markings, as set forth in this Manual. No other system shall be regarded as official.

Local ordinances regulating traffic are not enforceable unless at the time and the place of the desired enforcement, official signs are in place.

This Manual applies to all traffic control devices which are erected after its publication. Official signs which were designed and erected under the provisions of the 1943 Manual, prior to the publication of this Manual, need not be removed immediately, but when they are replaced, standard signs as shown in this edition shall be used.

JOSEPH J. LAWLER
Secretary of Highways

TRAFFIC SIGNS

FUNCTION OF SIGNS

The most common device for controlling, safeguarding or expediting traffic is the traffic sign. It is also needed to convey information to the motorist regarding highway routes, directions, destinations and points of interest.

The marking of highways with standard signs is a highly important and necessary part of our vast transportation system. Signs are not needed, however, to confirm well-known or universally recognized rules of the road, such as, driving on the right, but they are essential where special regulations apply at specific places or at specific times where hazards are not self-evident.

LEGAL AUTHORITY

In accordance with Section 1105 of The Vehicle Code, the Secretary of Highways has control over designs of all signs, signals and markings on highways throughout the Commonwealth of Pennsylvania.

No other signs or signals, except those approved by the Secretary of Highways may be legally sold in the Commonwealth of Pennsylvania.

The regulations contained in this Manual apply to the use of signs, signals and markings on local roads and streets as well as on State Highways. Signs and signals which have not been approved by the Secretary of Highways, shall not be used and cannot be legally enforced.

PERMITS

No manufacturer may sell any traffic signs or other traffic device in the Commonwealth of Pennsylvania unless he has first received a permit to do so. This is in accordance with Sections 1114 (b), (c) and (d) of The Vehicle Code.

It is unlawful for any manufacturer, jobber, retailer or their agent or for any other person to sell, lease or offer for sale or hire any sign, signal or any other traffic regulatory device which does not conform to the provisions of Section 1114 of The Vehicle Code.

Any person violating any of the provisions of this section shall, upon summary conviction before a magistrate, be sentenced to pay a fine of not less than one hundred dollars ($100) or more than one thousand dollars ($1000) and costs of prosecution, and, in default of the payment thereof, shall undergo imprisonment of not more than thirty (30) days.

Any person or manufacturer desiring approval of any traffic sign, signal or any other traffic regulatory device shall submit one or more full size sample of each type sign or device upon which approval is desired, to the Pennsylvania Department of Highways, Materials Testing Laboratory,

1118 State Street, Harrisburg, Pennsylvania. Signs shall be identical in **Size, Shape, Color** and **Message** with the official signs.

Such devices will also be subject to any road tests or other tests as the Secretary of Highways may deem necessary to determine that each type of device, and their component parts, conform to the requirements as adopted by the Secretary of Highways. The Secretary of Highways is authorized to refuse approval of any device certified as complying with the specifications and requirements which the Secretary of Highways determines will be, in actual use, unsafe or impracticable or would fail to comply with the provisions of this Act, or such requirements as may be adopted by the Secretary of Highways.

Any municipality desiring to manufacture traffic signs in its own sign shop is permitted to do so, provided that the signs comply with the standards described herein. A sample sign of each type manufactured shall be submitted to the Department of Highways Materials Testing Laboratory, 1118 State Street, Harrisburg, Pennsylvania, for approval, and permits will be issued for all signs meeting the requirements.

A letter requesting such approval and/or test of any traffic sign, signal or any other traffic regulatory device, shall be sent to the Secretary of Highways, Harrisburg, Pennsylvania.

The cost of inspecting and testing a sign varies in accordance with the size and type of sign, and is to be paid for by the applicant. However, there is no charge for these permits issued to municipalities.

All sample signs will be retained by the Department of Highways.

A permit number will be issued for each type of sign approved, and the manufacturer shall stamp **Permit No.** ..... on the back face of each sign sold.

STANDARDIZATION OF DESIGN

New problems resulting from increasing volumes of traffic, higher traffic speeds on modern highways with complex intersections and interchanges present an increased need for standardization and uniformity in shape, color design, dimension, symbols, wording, lettering, reflectorization and illumination of all traffic control devices.

Signs erected on any highway in this Commonwealth shall conform to the standard designs set forth in this Manual. The designs follow the nationally recognized and recommended standards for traffic control devices. It is mandatory that each traffic sign installation will be recognized and instantly understood at a glance not only by Pennsylvania motorists, but by motorists from other states as well.

REFLECTORIZATION AND ILLUMINATION

Signs may be reflectorized by several methods, the most common of which are listed as follows: reflector buttons, reflective sheeting, reflective paint, and reflective units.

Reflector buttons are individual reflecting devices set into a painted message or symbol of suitable size and spacing to form an outline of the message or symbol.

Reflective sheeting consists of a thin layer of plastic usually mounted on a flexible backing. The plastic contains minute closely-spaced glass spheres or beads. Each bead acts as an independent lens or reflector button, but in mass effect the beads give the sheeting the appearance of a uniformly brilliant area.

Reflective paint contains small glass beads which are partially embedded in a painted background. Beads are applied while the background paint is wet. They are closely spaced and in mass effect develop a reflectorized background or message.

Reflective units are flat rigid plastic elements into which small "lenses" or "mirrors" have been molded to produce reflectivity of incident light. These units vary in size and can be placed in a similar manner as reflector buttons in a painted message or symbol. They can also be fabricated into complete or individual letters which can be mounted on the face of the sign.

In the first three methods of reflectorization the glass buttons or spheres are colorless. Colors are produced by appropriate pigments contained in the paint or binder.

The required characteristic of each type of reflectorization is that it shall be retrodirective, that is, it must have the ability to reflect an incident light beam back to its source with very little divergence. Thus, when headlamp beams are reflected back to the eyes of the driver, the signs appear to light up.

It is desirable that all signs be reflectorized except those which have only daytime significance. Reflectorization, however, is required on those signs as specified on standard blueprints or as listed in the Specification Chart on page 165.

In addition to reflectorization, artificial illumination can be used to improve nighttime legibility of signs. Several approved methods of illumination are listed as follows:

1. Lights mounted (within an enclosure) behind a translucent sign face. The face of the sign is illuminated while the message or symbol is opaque.

2. Lights attached to the sign (or mounted independently) illuminating the face of a nonreflectorized sign.

3. Neon tubing outlining the sign message or symbol.

UNIFORM APPLICATION

This Manual contains important criteria for the application and use of all types of signs and is in accordance with the best recognized methods of traffic control.

There is a wide range in application of signs and, therefore, proper signing of highways will depend on experience, good judgment, sound engineering principles established by actual studies by the authority responsible for the erection and maintenance of signs. Identical conditions should always be marked with the same type of sign wherever those particular conditions occur.

Each sign shall be erected for one definite purpose only.

It is recognized that conditions in urban and rural areas will be different because of physical conditions, volumes of traffic, speed, etc., but similar conditions in either area should be treated generally in the same manner. In some instances signs may have to be relocated or rearranged where practical, however, the Manual sets forth separate specifications for urban and rural areas.

Signs erected temporarily because of highway conditions, shall be removed immediately when such condition ceases to exist.

ERECTION

Normally, signs should be erected individually on separate posts except where one sign supplements another or where route markers or directional signs must be grouped. Under no circumstances shall any type sign be placed on the same post with a Stop Sign or Speed Regulation sign.

Signs shall be placed on the right side of the road except in cases of unusual physical conditions where for visibility or emphasis it may be necessary to place them overhead, on the left side of the roadway, or in channelized islands in order to be more conspicuous to approaching traffic. Such exceptional signs shall be supplemented by signs placed at standard locations.

All standard size signs shall be mounted at right angles to the roadway. Large reflectorized signs (4′ x 6′ and larger) should be turned slightly away from the highway to eliminate glare, as shown in Figure 31.

Signs erected in rural areas where there is little or no parking, shall be not less than 6 feet nor more than 10 feet from the edge of the roadway.

Signs erected in business and residential areas where parking is prevalent, shall be located so that the edge of the sign, adjacent to the highway, is not less than 12 inches back from the face of the curb.

In rural areas, where there is very little parking, the height of the sign is varied. The Stop Sign must be erected so the center of the sign is 42 inches above the curb or crown of the pavement. All other signs shall be erected so the bottom of the lowest sign is not less than 30 inches above the curb or crown of the pavement, except where other requirements are specified in the Manual, dealing with individual signs or classes of signs.

In business and residence districts where parking is prevalent, all signs except the Stop Sign, should be erected so the bottom edge of the sign is not less than 7 feet above the curb or crown of the pavement. The Stop Sign shall be erected so the center of the sign is 8 feet above the curb or crown of the pavement.

Overhead signs, regardless of where they are erected, whether in rural or urban areas, shall not have less than 14½ feet clearance between the bottom of the sign and the crown of the pavement.

Proper spacing for individual signs and classes of signs is specified throughout the Manual. In some instances physical conditions will require different spacing and it will be necessary that extreme care be given to the erection and location so no sign will obscure any other sign. Two signs bearing different messages or symbols shall not be placed closer than 100 feet. In rural areas where higher speeds prevail, the spacing between traffic

signs should be greater to give good visibility. Regardless of location, it must be kept in mind that effectiveness and results obtained from signs, will greatly depend on the visibility of the sign.

MAINTENANCE

All traffic signs shall be kept in proper position, clean, and clear of vegetation, to provide full visibility and legibility at all times.

The authority responsible for erection of signs shall be responsible for the proper maintenance or replacement of signs. Constant attention should be given to signs at all times to insure proper maintenance. A scheduled inspection of all signs should be made at least twice a year and all defective signs cleaned, repaired, touched up, refurbished or replaced. Damaged, defaced, dirty or haphazardly erected signs are ineffective, lose their authority, and are a discredit to the authority responsible for them. It is essential that any damaged sign be replaced as soon as possible.

The best method for cleaning the reflectorized flat surface signs is with a damp cloth without the use of solvents or soap. The reflectorized signs with rough surface, as well as painted signs, can best be cleaned by scrubbing them with soap, water and brushes. It is important that signs be thoroughly rinsed to completely remove the cleansing agent from the reflectorized surface.

When painting signs, under no condition should the symbol or message be covered with background paint and allowed to remain in this condition for any length of time. The symbol or message shall be cleaned of excess paint with a cloth, otherwise the travelling public will be deprived of the benefit of the signs. It should be understood that the painting of any reflectorized sign surface will destroy the reflecting qualities.

It is very important that care be exercised in erecting and maintaining sign posts in a vertical position. Signs should be mounted securely to their supports to prevent them from becoming loose, causing them to tilt or lean to the extent where they will be illegible and thus create a hazard.

SPECIAL SIGNS

Where a hazardous condition has developed and accurate factual data indicates a special sign may be required, consideration will be given to signs other than those shown in this Manual. A sketch showing the pertinent characteristics of the location, together with the previous 3 year accident history, shall be submitted to the Secretary of Highways. If warranted, a sign of special design and size will then be authorized and approved detail drawings for the sign will be issued by the Secretary of Highways.

All special signs shall conform to the letter designs, shapes, colors, and other design details of standard signs of similar classification shown in this Manual.

GUIDE SIGNS

Guide Signs are essential to guide the motorist along established routes, to inform him of intersecting routes, to direct him to municipalities or villages, to identify nearby rivers, streams and historical sites and, in general, give him information in the most simple and direct method possible to help him along his way.

Guide Signs are usually classified into three major groups:

1. **Route Markers and Auxiliary Route Markers.**
2. **Directional Signs.**
3. **Information Signs.**

Unlike other type signs, Guide Signs do not lose their effectiveness by frequent use. When there is any doubt as to the advisability of any such sign, it should be erected. If both a Warning Sign and a Guide Sign are necessary, at approximately the same location, the Warning Sign should precede the Guide Sign and they should be separated by not less than 150 feet, so as not to obscure the Guide Sign.

ROUTE MARKERS AND AUXILIARY ROUTE MARKERS

GENERAL

Route Markers are important to identify numbered highway routes but to accomplish their purpose they must be supplemented by various types of Auxiliary Route Markers to indicate junctions and turns, directions, as well as Alternate and By-Pass, Business and Truck Routes. U. S. Route Markers shall be displayed only on U. S. numbered routes or the approaches thereto. Similarly, State Route Markers shall be used only on State numbered routes and their approaches.

DESIGN

All Route Markers and Auxiliary Route Markers have a white background with black letters and borders. The U. S. Route Marker, G-202, consists of a shield-shaped plate, 16″ x 16½″ in size, carrying the word "Pennsylvania," the letters "U. S." and the route number. The Pennsylvania Route Marker, G-204, consists of a Keystone-shaped plate, 16″ x 16½″, and carries the State name and the route number. Both U. S. and Pennsylvania Route Markers are available in larger sizes, 24″ x 24¾″ (G-203 and G-205 respectively). Standard size Auxiliary Markers shall be used with the small Route Markers while oversize Auxiliary Markers shall be used only with oversize Route Markers.

ASSEMBLIES

Where two or more numbered routes follow the same highway, all Route Markers and Auxiliary Route Markers used at any designated point shall be erected on one post. If both U. S. and Pennsylvania Route numbers are shown, the U. S. Route Markers should be placed at the top of the assembly or to the left in horizontal assemblies. Subject to the precedent given U. S. Routes, Route Markers should be mounted in numerical order from top to bottom or from left to right. However, where directional arrows are used in these assemblies, the direction of the arrow, in each case, shall determine the place of the Route Marker in the assembly. That is, on vertical assemblies Route Markers for routes continuing straight ahead through an intersection shall be placed at the top of the assembly; right turns next; and left turns at the bottom. On horizontal assemblies, Route Markers for routes continuing straight ahead through the intersection shall be placed at the center of the assembly; left turns to the left of the assembly and right turns to the right, etc. See Figures 1 and 2 for typical installations.

The use of vertical type assemblies shall be limited to locations where few, if any, Auxiliary Route Markers are required, such as, on confirmation assemblies. As a general rule, no more than three Route Markers (no Auxiliary Route Markers) or more than a total of four Route Markers and Auxiliary Route Markers Combined shall be used on vertical assemblies. Vertical assemblies containing more signs would present a confusing and difficult picture to the motorist. All vertical assemblies shall be mounted on standard channel bar posts.

Horizontal assemblies are more legible than vertical assemblies and shall be used at more important intersections where two or more Traffic Routes intersect. Route Marker brackets, which are used for erecting horizontal assemblies, permit any combination of Keystones, Shields and Auxiliary Markers that may be required at any given location. These brackets, as shown on Figures 4 and 5, are mounted on a single pipe post and are particularly adaptable to crowded urban intersections. Special Route Marker brackets which can be mounted on channel bar posts are available for light weight assemblies. Figure 3 shows the parts required for the typical assemblies shown in Figures 1 and 2 when Route Marker brackets are used.

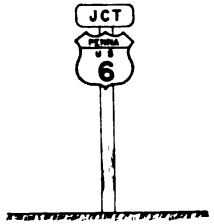
LOCATION

In locating Route Markers, particular care must be taken so they are not obscured by parked cars, posts, trees or other objects. Because of the many distracting signs and obstacles, particularly in urban areas, it is important that Route Markers be properly located at all intersections in accordance with the standards in this Manual.

In residential and business areas where parking is permitted, the bottom edge of the lowest sign in the assembly shall be at least 7 feet above the curb or crown of pavement, and the edge of the assembly adjacent to the curb shall be at least 12 inches back from the face of the curb, as shown in Figure 6. Where several routes are involved and oversize Route Markers are used in an assembly, such as shown on Figure 2, (Item number 12) the bottom edge of the lowest sign in the assembly may be reduced,

TYPICAL ROUTE MARKER ASSEMBLIES

JUNCTION ASSEMBLIES



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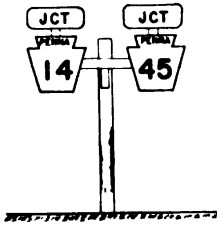

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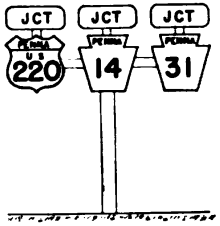

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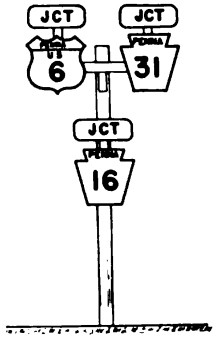
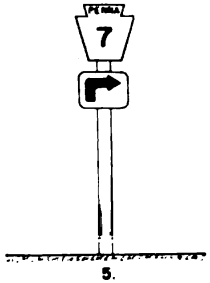


4.

ADVANCE WARNING ASSEMBLIES



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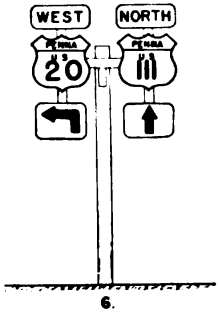

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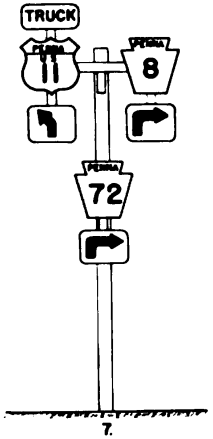

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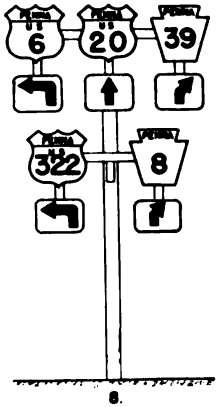


8.

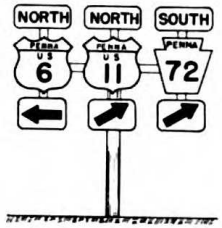
FIGURE 1.

SEE FIGURE 3 FOR MOUNTING BRACKETS PARTS LIST.

TYPICAL ROUTE MARKER ASSEMBLIES

INTERSECTION ASSEMBLIES

9.



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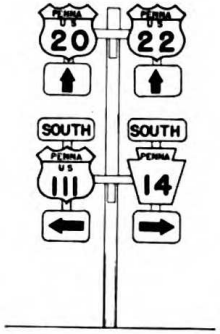

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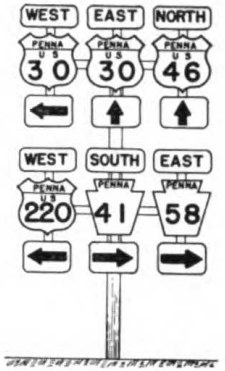
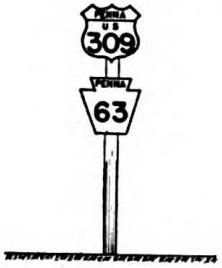
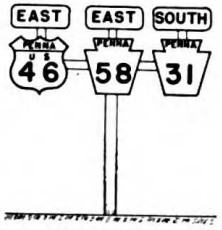


12.

CONFIRMATION ASSEMBLIES



13.



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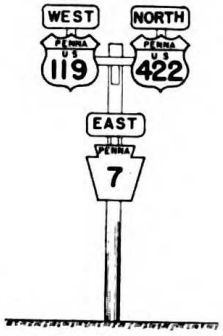

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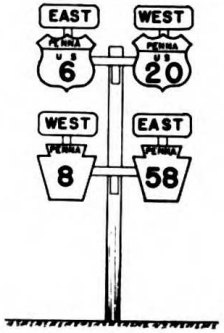


16.

SEE FIGURE 3 FOR MOUNTING BRACKETS PARTS LIST.

FIGURE 2

ROUTE MARKER POST AND BRACKET ASSEMBLY CHART

ROUTE MARKER ASSEMBLY NO.		1		2		3		4		5		6		7		8	
ROUTE MARKER SIZE		16"	24"	16"	24"	16"	24"	16"	24"	16"	24"	16"	24"	16"	24"	16"	24"
TYPE POST		C	C	C[a]	P	P	P	P	P	C	C	P	P	P	P	P	P
SIZE POST		—	—	—	3"	3"	3"	3"	3"	—	—	3"	3"	3"	3"	3"	3"
LENGTH	R	6'-6"	7'-6"	11'-6"	8'	8'	8'	8'	11'	6'-6"	11'-6"	8'	8'	11'	11'	11'	11'
	U	11'-6"	12'-6"	11'	11'	11'	11'	13'	16'	11'-6"	12'-6"	11'	13'	13'	16'	16'	16'
BRACE		—	—	—	—	7021	7026	—	—	—	—	—	—	—	—	7021	7026
BRACKET		—	—	7033	7027	7023	7028	7022	7027	—	—	7022	7027	7022	7027	7022 7023	7027 7028
EXTENSION BAR		—	—	7020	7025	7020	7025	7020	7025	—	—	7019	7024	7019 7020	7024 7025	7020	7025

ROUTE MARKER ASSEMBLY NO.		9		10		11		12		13		14		15		16	
ROUTE MARKER SIZE		16"	24"	16"	24"	16"	24"	16"	24"	16"	24"	16"	24"	16"	24"	16"	24"
TYPE POST		C[a]	P	P	P	P	P	P	P	C	C	P	P	P	P	P	P
SIZE POST		—	3"	3"	3"	3"	3"	3"	3"	—	—	3"	3"	3"	3"	3"	3"
LENGTH	R	7'-6"	8'	8'	8'	11'	13'	11'	13'	7'-6"	11'-6"	8'	8'	8'	11'	8'	11'
	U	11'	13'	11'	13'	16'	16'	16'	16'	12'-6"	12'-6"	11'	11'	13'	16'	13'	16'
BRACE		—	—	7021	7026	—	—	7021	7026	—	—	7021	7026	—	—	—	—
BRACKET		7033[b]	7027	7023	7028	7022	7027	7023	7028	—	—	7023	7028	7022	7027	7022	7027
EXTENSION BAR		7020	7025	7019	7024	7019 7020	7024 7025	7019	7024	—	—	7020	7025	7020	7025	7020	7025

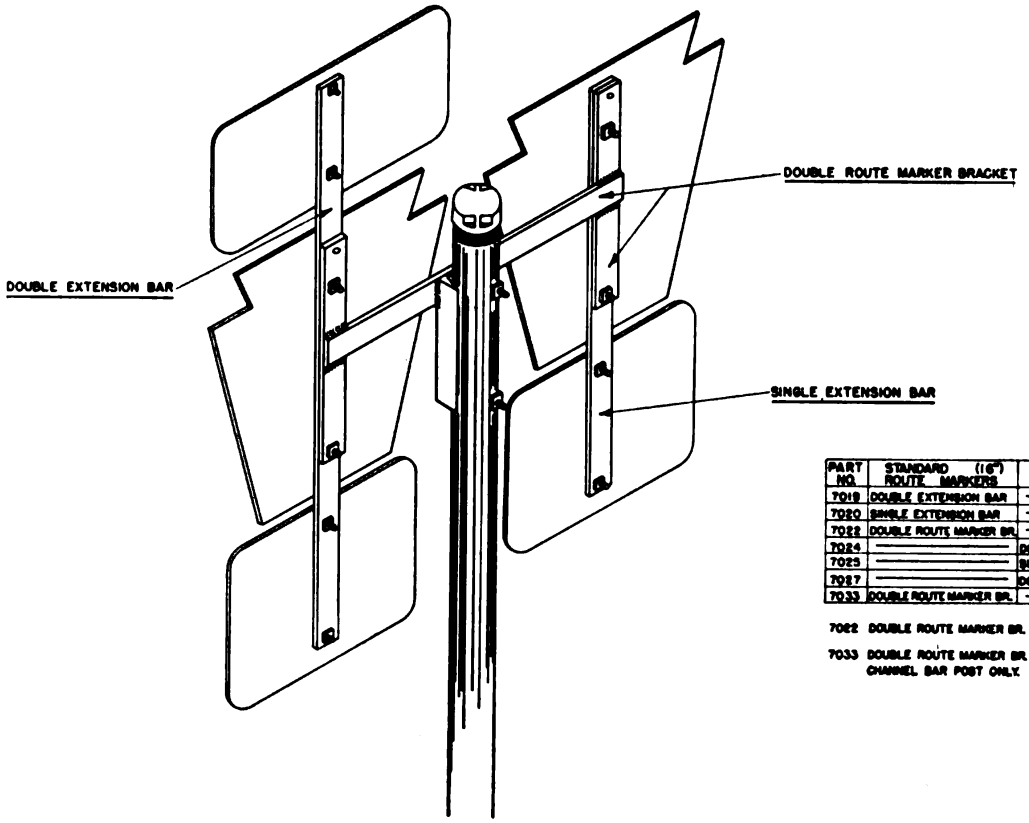
LEGEND

R-- RURAL AREAS
U-- URBAN AREAS
C-- CHANNEL BAR POST
P-- PIPE POST
a-- USE PIPE POST FOR URBAN AREAS
b-- USE BRACKET 7022 FOR PIPE POST

FIGURE 3

NOTE: ABOVE CHART SHOWS POST, BRACKETS AND EXTENSION BARS REQUIRED FOR CORRESPONDING ROUTE MARKER ASSEMBLIES SHOWN ON FIGURES 1 & 2

DOUBLE ROUTE MARKER BRACKET ASSEMBLY



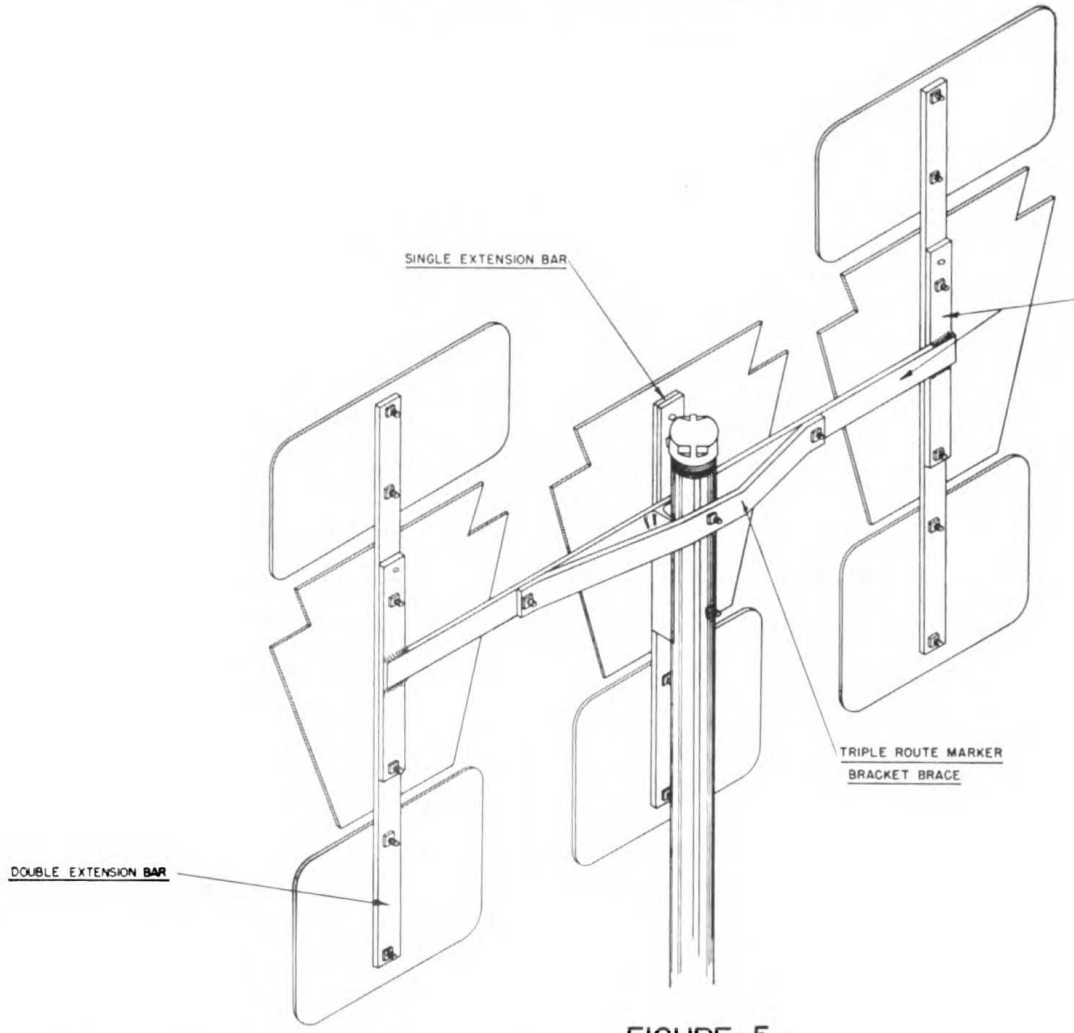
PART NO.	STANDARD (16") ROUTE MARKERS	OVERSIZE (24") ROUTE MARKERS
7019	DOUBLE EXTENSION BAR	———
7020	SINGLE EXTENSION BAR	———
7022	DOUBLE ROUTE MARKER BR.	———
7024	———	DOUBLE EXTENSION BAR
7025	———	SINGLE EXTENSION BAR
7027	———	DOUBLE ROUTE MARKER BR.
7033	DOUBLE ROUTE MARKER BR.	———

7022 DOUBLE ROUTE MARKER BR. FOR USE WITH PIPE POST ONLY.

7033 DOUBLE ROUTE MARKER BR. FOR USE WITH CHANNEL BAR POST ONLY.

FIGURE 4

TRIPLE ROUTE MARKER BRACKET ASSEMBLY



PART NO.	STANDARD (16") ROUTE MARKERS	OVERSIZE (24") ROUTE MARKERS
7019	DOUBLE EXTENSION BAR	
7020	SINGLE EXTENSION BAR	
7023	TRIPLE ROUTE MARKER BR.	
7024		DOUBLE EXTENSION BAR
7025		SINGLE EXTENSION BAR
7028		TRIPLE ROUTE MARKER BR.
7021	TRIPLE RT. MKR. BR. BRACE (STD)	
7026		TRIPLE RT. MKR. BR. BRACE

FIGURE 5

HEIGHT & LATERAL LOCATION OF ROUTE MARKERS (URBAN AREAS)

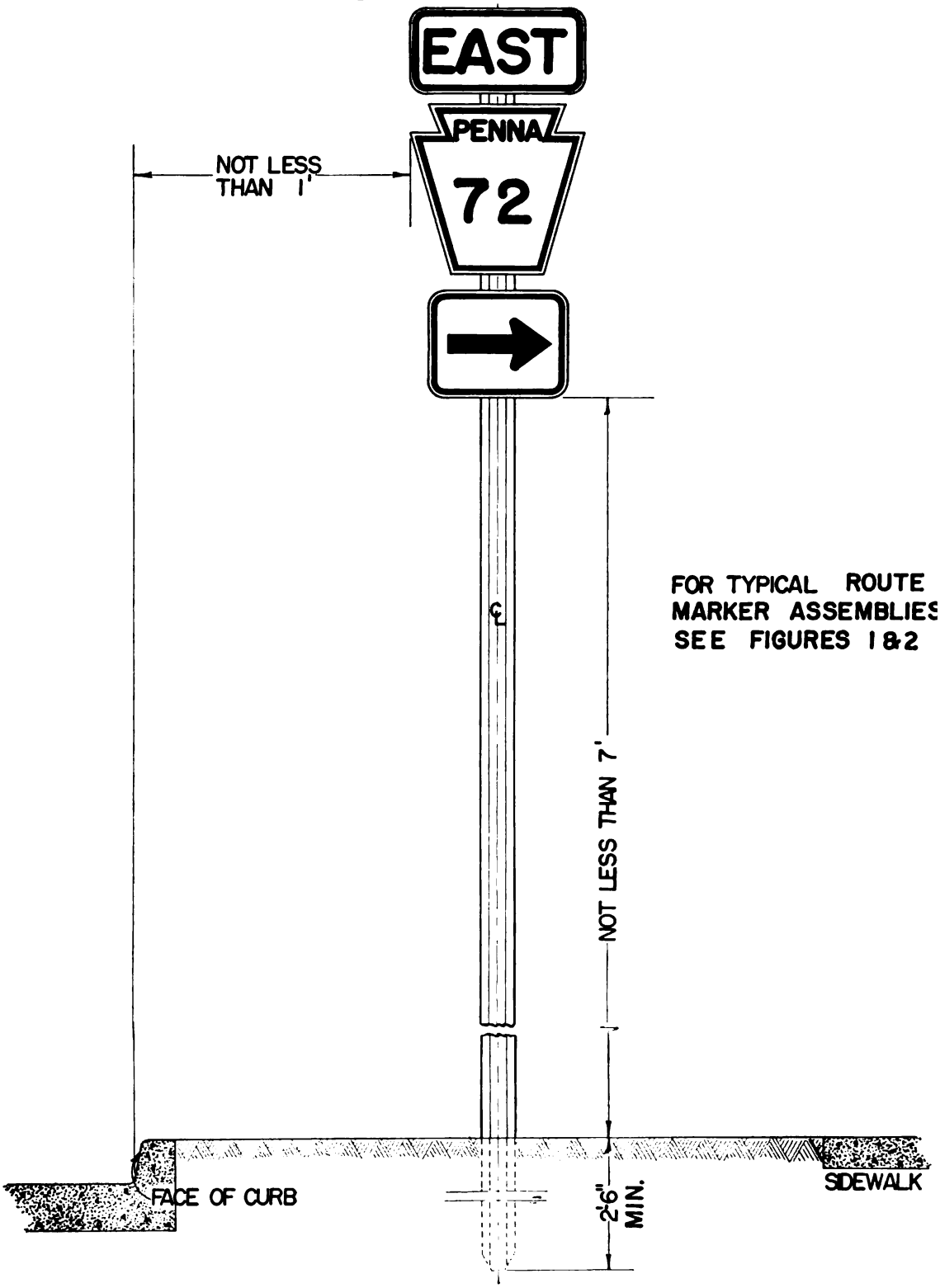


FIGURE 6

HEIGHT & LATERAL LOCATION OF ROUTE MARKERS (RURAL AREAS)

FOR TYPICAL ROUTE MARKERS ASSEMBLIES SEE FIGURES 1 & 2.

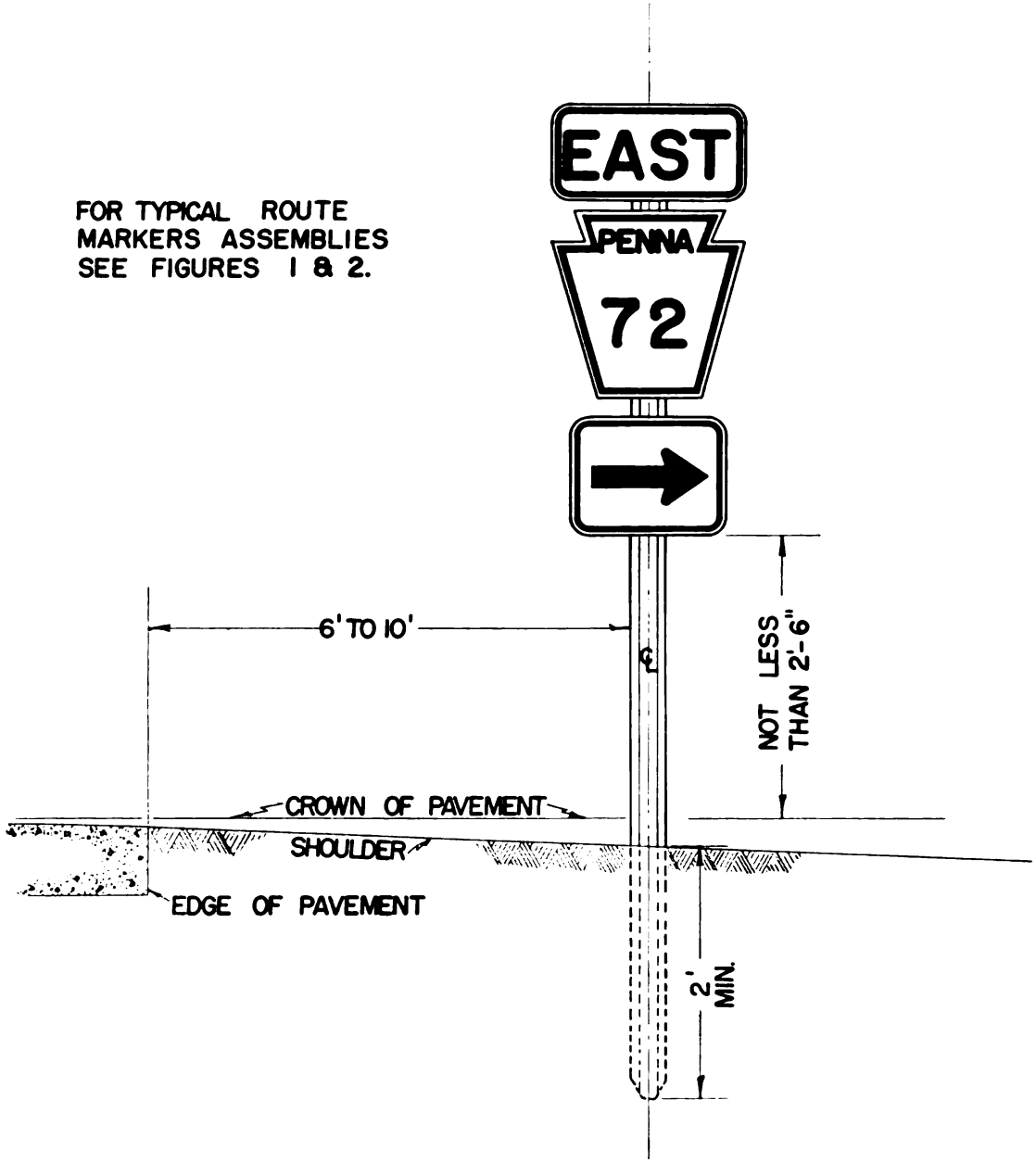


FIGURE 7

if sight distance is not effected, to 36 inches above the ground. However, this practice shall be confined to locations where the assembly parallels the curb line.

In rural and residential areas where parking is not permitted, the lowermost part of the assembly shall be at least 30 inches above the crown of the pavement and the center of the assembly shall be 6 feet to 10 feet to the right of the pavement edge, as shown on Figure 7. However, where a horizontal assembly is used, it may be necessary to locate the post as much as 15 feet to the right of the pavement edge. The type of Route Marker assembly and its respective location, depends upon whether major or minor routes are intersecting and whether the intersection is located in rural or urban areas. Figures 8 to 13, inclusive, show typical Route Markings at various types of intersections.

TYPES OF ROUTE MARKER ASSEMBLIES

In general, the first assembly the motorist will encounter when approaching an intersection will be the Junction Assembly. If the route changes direction at the intersection, the second assembly will be an Advance Warning Assembly in which a bent arrow Auxiliary Route Marker (e.g. G-212) is used to indicate the route turns just ahead. If the route continues straight through the intersection an Advance Warning Assembly is not required.

The third assembly, the Intersection Assembly, showing appropriate directional arrows will be located within the intersection in the far right corner. If the intersection is channelized or if other conditions so warrant, a duplicate assembly may be located in the near right corner. The fourth, and last assembly will be the Confirmation Assembly, which will be located just beyond the intersection. On Figures 8 through 13, the distances shown beneath each assembly are the distances between that assembly and the intersection in question. In rural areas Route Markers are located 1½ miles to 2 miles apart between intersections. In urban and residential areas they shall be located in every other block.

DETAILS OF SIGNS

U. S. ROUTE MARKER

G-202 and G-203

16″ x 16½″
24″ x 24¾″

The standard size Route Marker, G-202 (16″ x 16½″) shall be erected only on designated U. S. Routes and the approaches thereto. On highways carrying only one numbered route, route markers may be erected as shown on Figures 6 and 7. Where two or more numbered routes have been established, or at junctions of numbered routes, Route Markers shall be erected as shown on Figures 1 and 2 and in accordance with the general specifications for the erection of Route Marker Assemblies. For locations of Route Markers at intersections, refer to Figures 8 to 13 inclusive.

The oversize Route Marker, G-203 (24″ x 24¾″) shall be used only at locations where special emphasis is needed, such as at intersections where the routes turn, or where alignment of the posted route causes confusion to the motorist. It shall be erected in accordance with the specifications listed for the standard size Route Marker, G-202.

PENNSYLVANIA ROUTE MARKER

G-204 and G-205

16″ x 16½″
24″ x 24¾

The standard size Route Marker, G-204 (16″ x 16½″) shall be erected only on established Pennsylvania Routes and the approaches thereto. On highways carrying only one numbered route, the Route Markers shall be erected as shown in Figures 6 and 7. Where two or more numbered routes have been established, or at junctions of numbered routes, Route Markers shall be erected as shown on Figures 1 and 2 in accordance with the general specifications for the erection of route markers. For locations of Route Markers at intersections, refer to Figures 8 to 13, inclusive.

The oversize Route Marker, G-205 (24″ x 24¾″) shall be used only at locations where special emphasis is needed, such as at intersections where routes turn, or where alignment of the posted route causes confusion to the motorist. It shall be erected in accordance with the specifications as listed for the standard size Route Marker, G-204.

RIGHT AND LEFT TURN MARKER

G-206 and G-207

10″ x 13″
15″ x 19½″

The standard size Turn Marker, G-206 (10″ x 13″) shall be mounted directly below the Route Marker in the Intersection Assembly to confirm the junction of a numbered route and to indicate the direction of the intersecting route. It shall not be used on the Junction Assembly with the Junction Marker, G-249, except at Minor Route intersections as shown in Figure 8 where the Route Marker directional assemblies are used within the intersection. Where two or more numbered routes are established, one Turn Marker shall be used for each route. When the intersected route begins at the intersection, a Right or Left Arrow Marker, G-210 shall be used.

The oversize Turn Marker, G-207 (15″ x 19½″) shall be used only with oversize Route Markers and as specified for the standard size Turn Marker, G-206.

STRAIGHT AHEAD ARROW MARKER

G-208 and G-209

10" x 13"
15" x 19½"

The standard size Arrow Marker, G-208 (10" x 13") shall be mounted below the Route Marker to indicate that the route continues straight ahead. It is used on the Intersection Assembly, located within the intersection as well as the Advance Warning Assembly, as shown in Figure 10. If, however, all numbered routes continue straight through the intersection without changing direction, then the Advance Warning Assembly is not required.

The oversize Arrow Marker, G-209 (15" x 19½") shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-208.

RIGHT OR LEFT ARROW MARKER

G-210 and G-211

10" x 13"
15" x 19½"

The standard size Arrow Marker, G-210 (10" x 13") shall be mounted directly below the Route Marker to indicate the direction of the intersected route or the direction the route turns at the intersection, where the turn exceeds 60 degrees. This Arrow Marker shall be used only on Intersection Assemblies located within the intersection. See Figures 9 to 13, inclusive. If the turn is less than 60 degrees, then Arrow Markers, G-216 or G-218, shall be used.

The oversize Arrow Marker, G-211 (15" x 19½") shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-210.

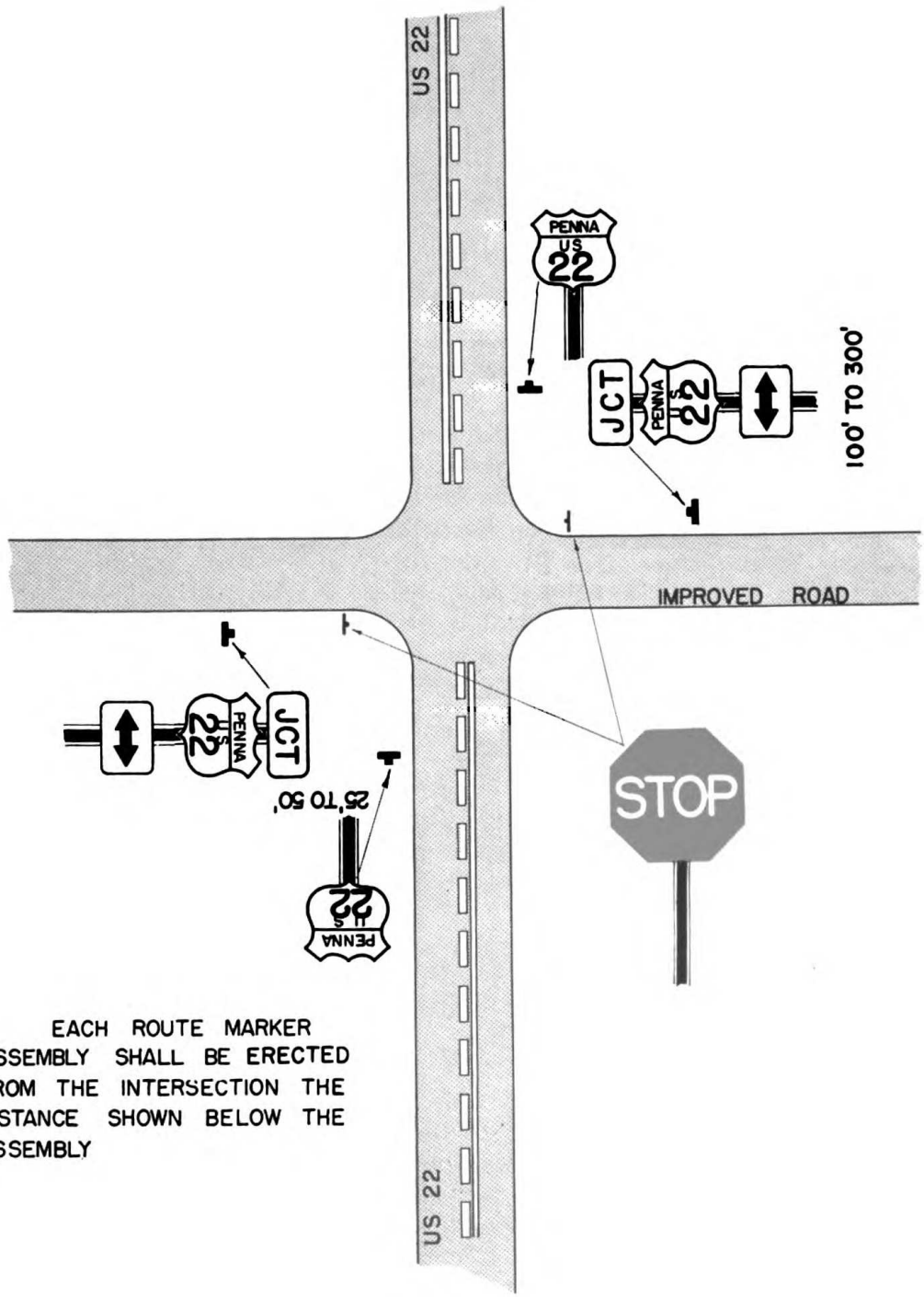
ADVANCE ROUTE RIGHT ARROW MARKER

G-212 and G-213

10" x 13"
15" x 19½"

The standard size Arrow Marker, G-212 (10" x 13") shall be mounted directly below the Route Marker to indicate the Route turns to the right just ahead, where the turn is greater than 60 degrees. This Arrow Marker shall be used only on Advance Warning Assemblies and if several numbered routes turn at the intersection, separate Arrow Markers shall be used for each route. If one or more routes continue straight through the intersection, the Arrow Marker, G-208, should be used in the Advance Warning Assembly under the appropriate Route Marker. For all turns less than 60 degrees, use the standard size Arrow Marker, G-224.

LOCATION OF ROUTE MARKERS AT INTERSECTIONS
MAJOR-MINOR ROUTES (RURAL & URBAN AREAS)



EACH ROUTE MARKER ASSEMBLY SHALL BE ERECTED FROM THE INTERSECTION THE DISTANCE SHOWN BELOW THE ASSEMBLY

FIGURE 8

LOCATION OF ROUTE MARKERS AT INTERSECTIONS MAJOR ROUTES — (URBAN AREAS)

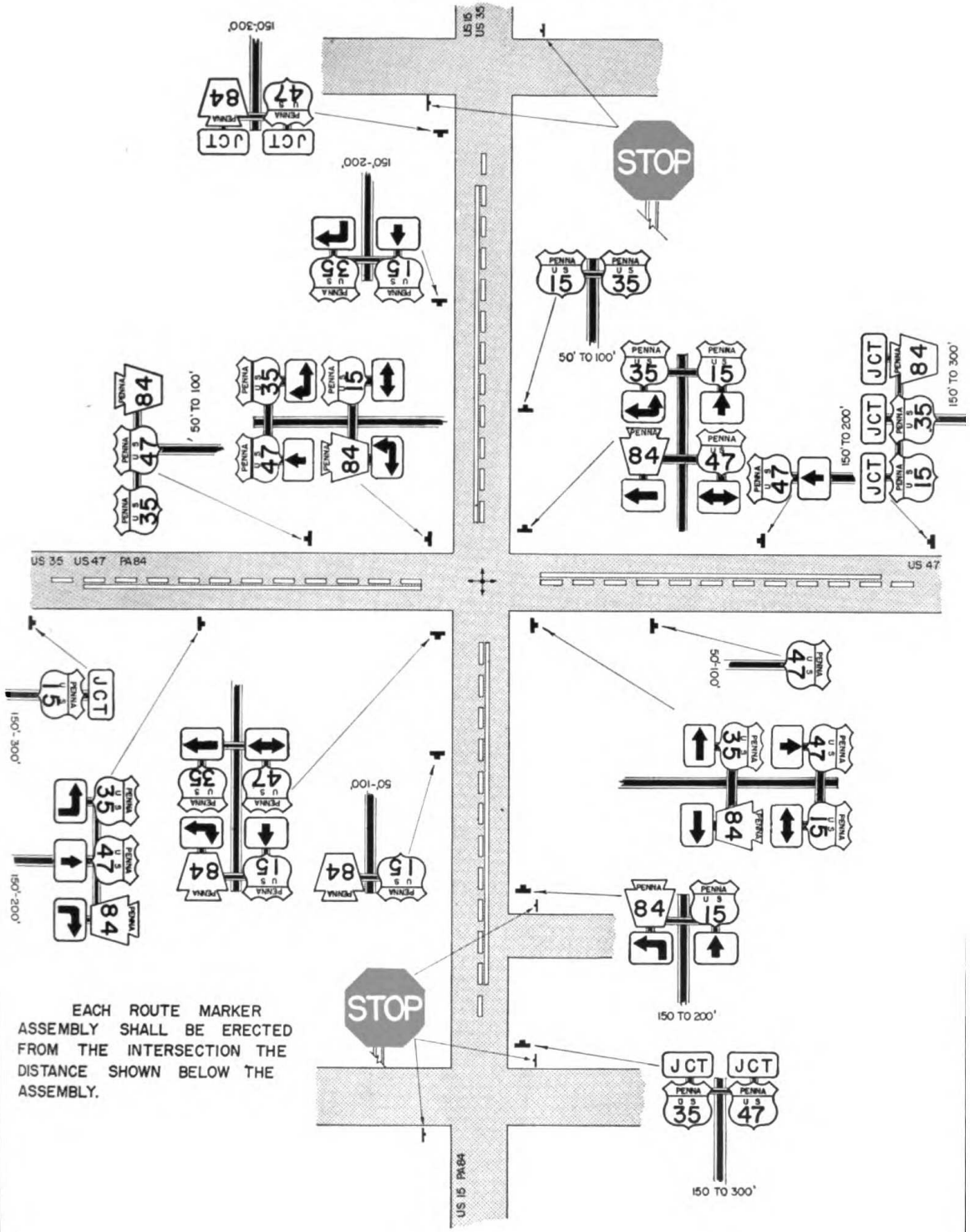


FIGURE 9

LOCATION OF ROUTE MARKERS AT INTERSECTIONS

MAJOR ROUTES —(RURAL AREAS)

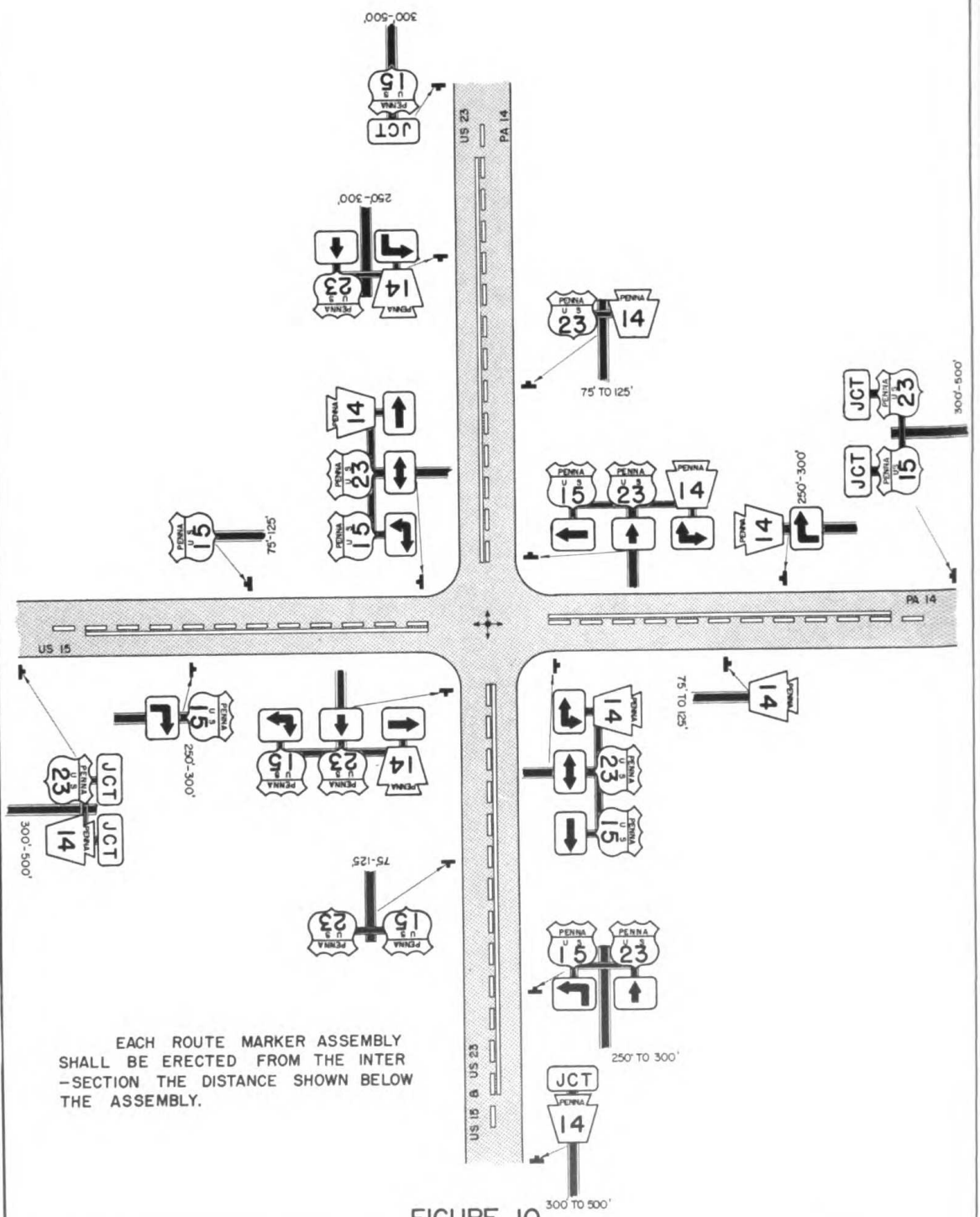


FIGURE 10

LOCATION OF ROUTE MARKERS AT INTERSECTIONS

TYPICAL "T" INTERSECTION (RURAL AREAS)

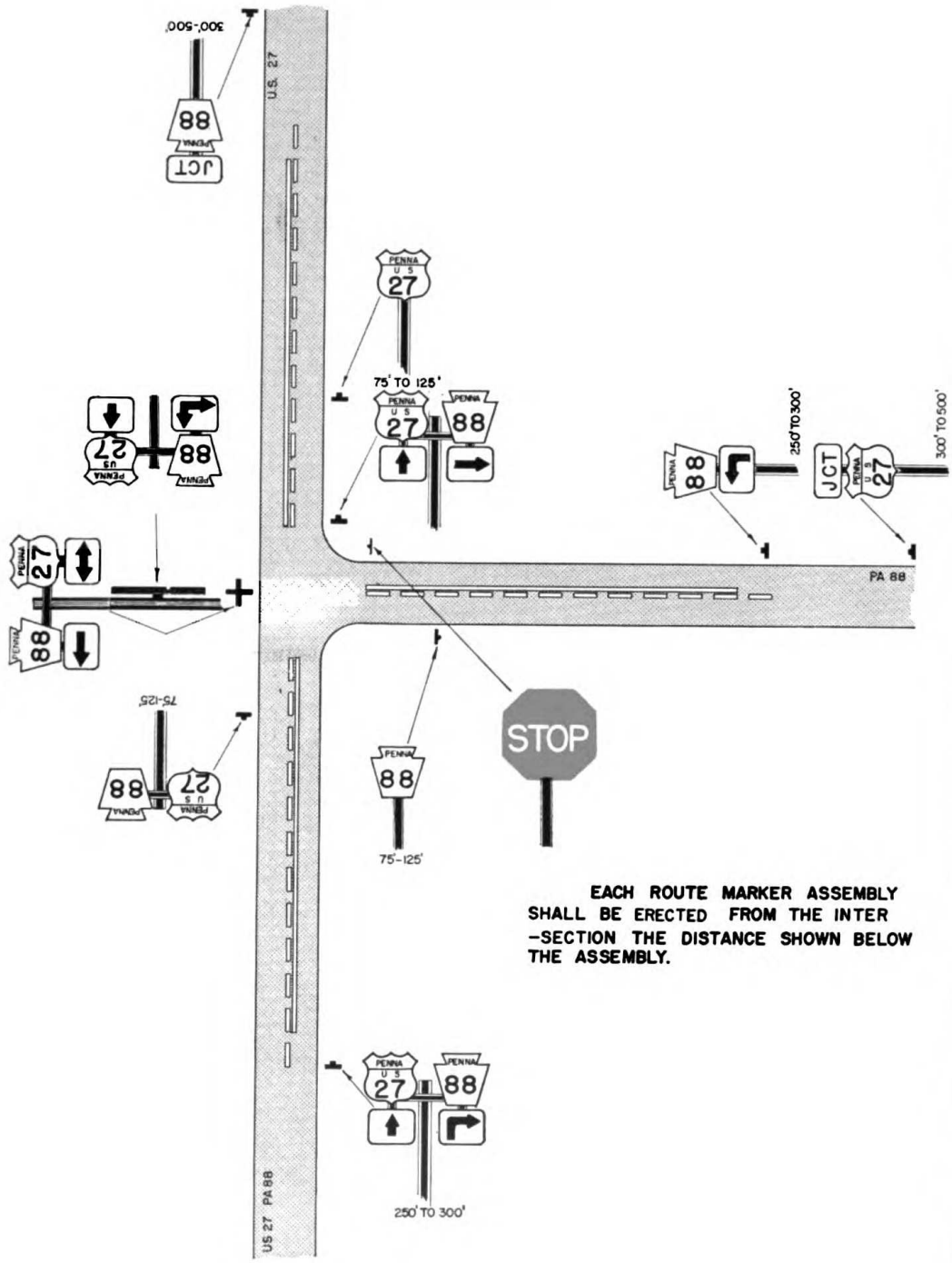


FIGURE II

LOCATION OF ROUTE MARKERS AT INTERSECTIONS

TYPICAL "Y" INTERSECTION (RURAL AREAS)

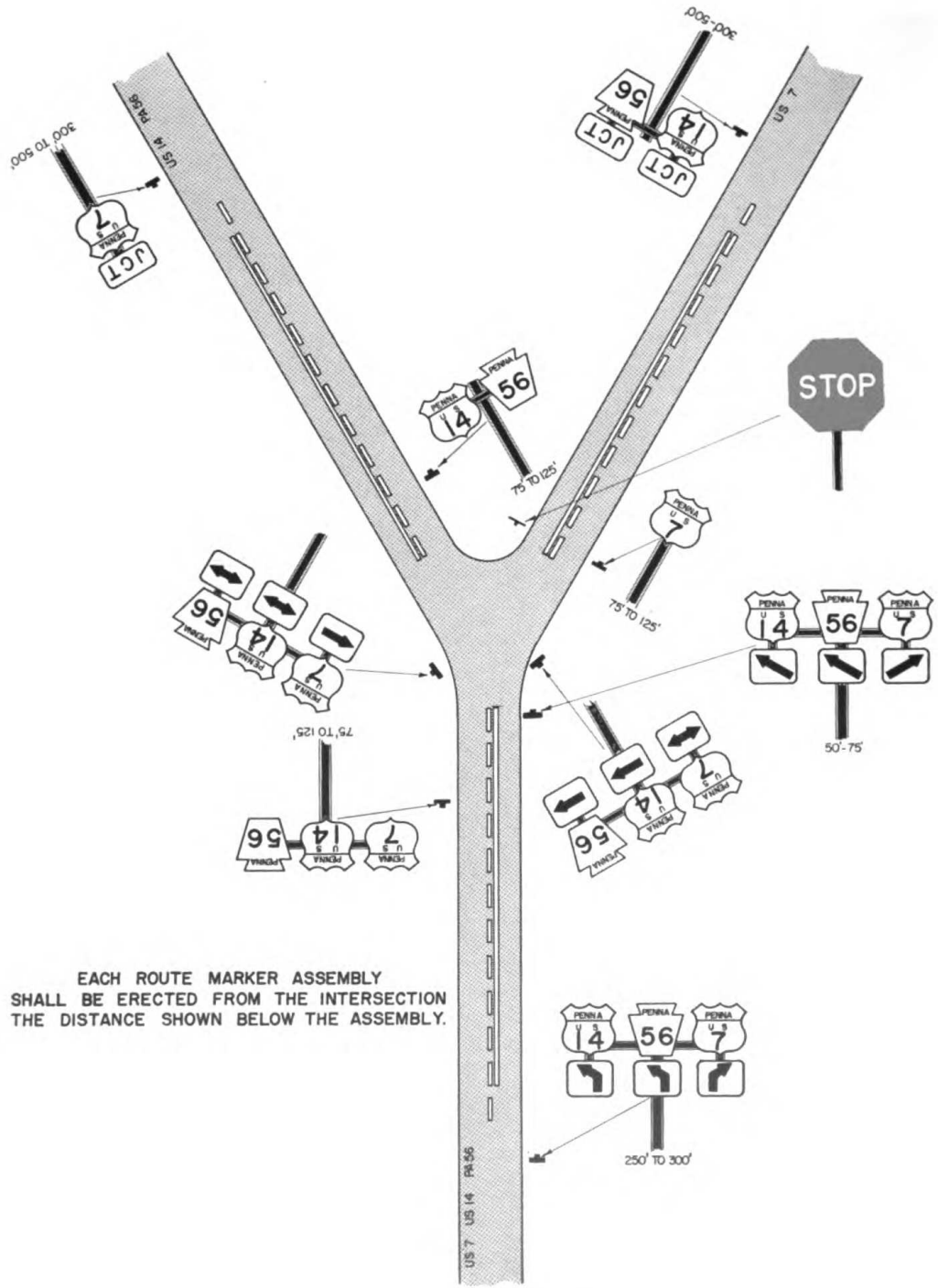


FIGURE 12

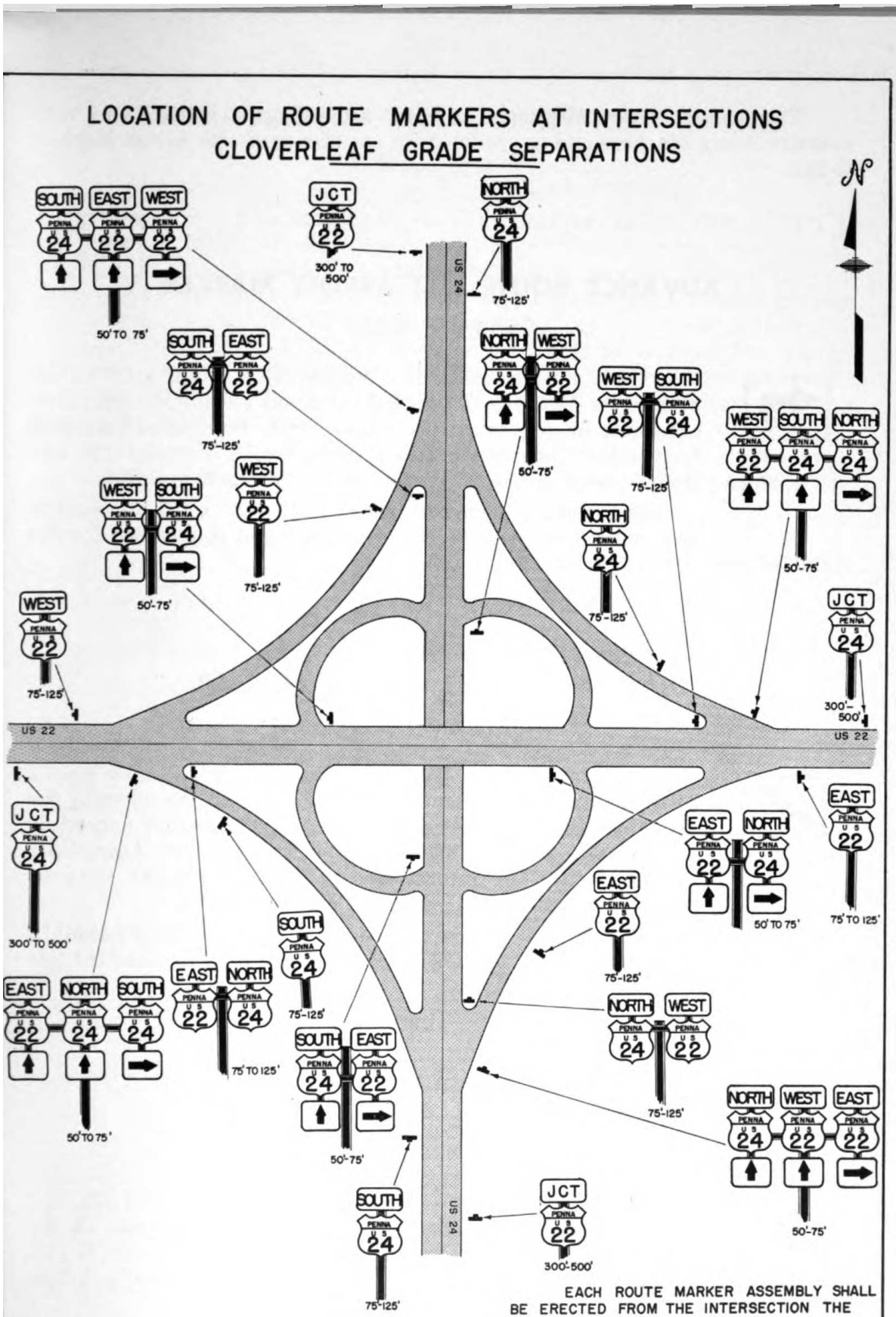


FIGURE 13

The oversize Arrow Marker, G-213 (15″ x 19½″) shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-212.

ADVANCE ROUTE LEFT ARROW MARKER

G-214 and G-215

10″ x 13″
15″ x 19½″

The standard size Arrow Marker, G-214 (10″ x 13″) shall be used on Advance Warning Assemblies to indicate left turns exceeding 60 degrees, in accordance with the method described for the standard size Arrow Marker, G-212. For all turns less than 60 degrees use standard size Arrow Marker, G-226.

The oversize Arrow Marker, G-215 (15″ x 19½″) shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-214.

DIAGONAL RIGHT ARROW MARKER

G-216 and G-217

10″ x 13″
15″ x 19½″

The standard size Arrow Marker, G-216 (10″ x 13″) shall be mounted directly below the Route Marker to indicate the direction the route turns where the turn does not exceed 60 degrees. It shall be used only on Intersection Assemblies located within the intersection. For turns greater than 60 degrees, use standard size Arrow Marker, G-210.

The oversize Arrow Marker, G-217 (15″ x 19½″) shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-216.

DIAGONAL LEFT ARROW MARKER

G-218 and G-219

10″ x 13″
15″ x 19½″

The standard size Arrow Marker, G-218 (10″ x 13″) shall be used to indicate left turns less than 60 degrees, in the manner described for the standard size Arrow Marker, G-216. For all turns greater than 60 degrees, use standard size Arrow Marker, G-210.

The oversize Arrow Marker, G-219 (15″ x 19½″) shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-218.

STRAIGHT AND DIAGONAL RIGHT TURN MARKER

G-220 and G-221

10" x 13"
15" x 19½"

The standard size Turn Marker, G-220 (10" x 13") is mounted below the Route Marker to confirm the junction of a route where the intersecting route may be followed by continuing straight ahead through the intersection or by turning diagonally right, where the turn does not exceed 60 degrees. This Turn Marker shall be used only on Intersection Assemblies located within the intersection as a confirmation to the Junction Marker. If the turn exceeds 60 degrees, then a standard size Turn Marker, G-251 shall be used.

The oversize Turn Marker, G-221 (15" x 19½") shall be used only with oversize Route Markers and as specified for the standard size Turn Marker, G-220.

STRAIGHT AND DIAGONAL LEFT TURN MARKER

G-222 and G-223

10" x 13"
15" x 19½"

The standard size Turn Marker, G-222 (10" x 13") shall be used as specified for the standard size Turn Marker, G-220, when the joining route turns diagonally to the left. However, if the diagonal left turn is greater than 60 degrees, a standard size Turn Marker, G-253, shall be used.

The oversize Turn Marker, G-223 (15" x 19½") shall be used only with oversize Route Markers and as specified for the standard size Turn Marker, G-222.

ADVANCE ROUTE DIAGONAL RIGHT ARROW MARKER

G-224 and G-225

10" x 13"
15" x 19½"

The standard size Arrow Marker, G-224 (10" x 13") shall be mounted below the Route Marker to indicate the direction in which the route turns just ahead where the turn does not exceed 60 degrees. This Arrow Marker is used only on Advance Warning Assemblies. Where the turn is greater than 60 degrees, the standard size Arrow Marker, G-212 shall be used.

The oversize Arrow Marker, G-225 (15" x 19½") shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-224.

ADVANCE ROUTE DIAGONAL LEFT ARROW MARKER

G-226 and G-227

10" x 13"
15" x 19½"

The standard size Arrow Marker, G-226 (10" x 13") shall be used only on Advance Warning Assemblies to mark diagonal left turns less than 60 degrees, in the manner specified for the standard size Arrow Marker, G-224. For all turns greater than 60 degrees, use standard Arrow Marker, G-214.

The oversize Arrow Marker, G-227 (15" x 19½") shall be used only with oversize Route Markers and as specified for the standard size Arrow Marker, G-226.

CARDINAL MARKERS

G-229 to G-236

8" x 16½"
12" x 24¾"

8" x 16½"
12" x 24¾"

8" x 16½"
12" x 24¾"

8" x 16½"
12" x 24¾"

All standard size Directional or Cardinal Markers—**North, South, East** and **West,** shall be mounted directly above the Route Markers. Cardinal Markers shall be used where motorists, when transferring from one route to another, might become confused as to the correct direction in which to proceed. Where two or more numbered routes travel in the same direction, separate Cardinal Markers shall be used for each route. At some locations, such as cloverleaf grade separations, it may be necessary to use two Route Markers for each numbered route on a single assembly—one for each direction of travel, with separate Cardinal Markers mounted above each Route Marker. See Figure 13.

Cardinal Markers shall be used only on Advance Warning, Intersection and Confirmation type assemblies.

The types and sizes of Standard Cardinal Markers are as follows:

G-229—NORTH Direction Marker	**(8" x 16½")**
G-230—Oversize NORTH Direction Marker	**(12" x 24¾")**
G-231—SOUTH Direction Marker	**(8" x 16½")**
G-232—Oversize SOUTH Direction Marker	**(12" x 24¾")**
G-233—EAST Direction Marker	**(8" x 16½")**
G-234—Oversize EAST Direction Marker	**(12" x 24¾")**
G-235—WEST Direction Marker	**(8" x 16½")**
G-236—Oversize WEST Direction Marker	**(12" x 24¾")**

The oversize Cardinal Markers shall be used only with oversize Route Markers.

ALTERNATE ROUTE MARKER

G-237 and G-238

8" x 16½"
12" x 24¾"

The standard size Alternate Marker, G-237, (8" x 16½") shall be mounted above the Route Marker to designate an established alternate route between two points on a numbered route. This marker shall be erected above all Route Markers along the alternate route in accordance with the specifications for the erection of Route Markers.

The oversize Alternate Marker, G-238 (12" x 24¾") shall be used only with oversize Route Markers and as specified for standard size Alternate Marker, G-237.

BY-PASS ROUTE MARKER

G-241 and G-242

8" x 16½"
12" x 24¾"

The standard size By-Pass Marker, G-241 (8" x 16½") shall be mounted directly above the Route Marker to designate a route which leaves the regular numbered route through a community, by-passes the community, and rejoins the regular numbered route beyond the community. It shall be erected above all Route Markers along the established By-Pass.

The oversize By-Pass Marker, G-242 (12" x 24¾") shall be used only in conjunction with oversize Route Markers and as specified for the standard size By-Pass Marker, G-241.

BUSINESS ROUTE MARKER

G-245 and G-246

8" x 16½"
12" x 24¾"

The standard size Business Marker, G-245 (8" x 16½") shall be mounted directly above the standard Route Marker to designate an auxiliary route which leaves the regular numbered route and passes through the business section of a city and rejoins the regular numbered route beyond that section. This marker shall be mounted above all Route Markers erected along the established Business Route.

The oversize Business Marker, G-246 (12" x 24¾") shall be used only in conjunction with oversize Route Markers and as specified for the standard size Business Marker, G-245.

TRUCK ROUTE MARKER

G-247 and G-248

8" x 16½"
12" x 24¾"

The standard size Truck Marker, G-247 (8" x 16½") shall be mounted above the standard Route Marker to designate an auxiliary route, for trucks, which leaves the regular numbered route usually in urban areas and then rejoins the regular route. It shall be mounted above all Route Markers erected along the established Truck Route.

The oversize Truck Marker, G-248 (12" x 24¾") shall be used only in conjunction with oversize Route Markers and as specified for the standard size Truck Marker, G-247.

JUNCTION MARKER

G-249 and G-250

8" x 16½"
12" x 24¾"

The standard size Junction Marker, G-249 (8" x 16½") shall be mounted directly above the Route Marker and is used as the name implies, only on Junction Assemblies to indicate the intersection with the numbered route just ahead. If two or more numbered routes are being intersected, then separate Junction Markers shall be used for each numbered route, as shown in Figures 8 through 13.

The oversize Junction Marker, G-250 (12" x 24¾") shall be used only in conjunction with oversize Route Markers and as specified for the standard size Junction Marker, G-249.

STRAIGHT AND RIGHT TURN MARKER

G-251 and G-252

10" x 13"
15" x 19½"

The standard size Turn Marker, G-251 (10" x 13") shall be mounted directly below the Route Marker to indicate that the intersected route may be followed by either continuing straight through the intersection or by making a right turn which exceeds 60 degrees. It shall be used only on Intersection Assemblies located within the intersection as a confirmation to the Junction Marker. For turns less than 60 degrees, use the standard Arrow Marker, G-220.

The oversize Turn Marker, G-252 (15" x 19½") shall be used only in conjunction with oversize Route Markers and as specified for the standard size Turn Marker, G-251.

STRAIGHT AND LEFT TURN MARKER

G-253 and G-254

10" x 13"
15" x 19½"

The standard size Turn Marker, G-253 (10" x 13") shall be used as specified for the standard size Turn Marker, G-251, where the intersected route may be followed by continuing straight ahead or by turning to the left. If the left turn is less than 60 degrees, use standard Arrow Marker, G-222.

The oversize Turn Marker, G-254 (15" x 19½") shall be used only in conjunction with oversize Route Markers and as specified for the standard size Turn Marker, G-253.

DIRECTIONAL SIGNS

Standard Directional Signs are classified as:

1. **Destination Signs.**
2. **Confirmation Signs.**

Destination Signs are used where required at intersections of highways to show the next important community or point of interest along the highway. These signs display the name, the mileage, and an arrow indicating the direction of the community. Because they are used to supplement route markings, only one Destination Sign is used for each direction of travel. However, when two numbered routes following the same highway through an intersection separate at a distant point beyond the intersection, then two signs are used directing traffic to destinations located on each of the numbered routes.

Destination Signs are available in three standard sizes: 7" x 45"; 9" x 56" and 11" x 72", each carrying a single name with letter heights of 4 inches, 5 inches and 6 inches, respectively. The larger signs are used at the more important intersections.

Confirmation Signs are erected just beyond intersections of major routes and at municipal limits, facing traffic leaving these areas. They display the names and mileages of the next two communities which lie ahead, thus reassuring the motorist that he is travelling in the desired direction. The size of the standard Confirmation Sign is 20" x 50" and the height of the letters and numerals is 5 inches for each name and mileage.

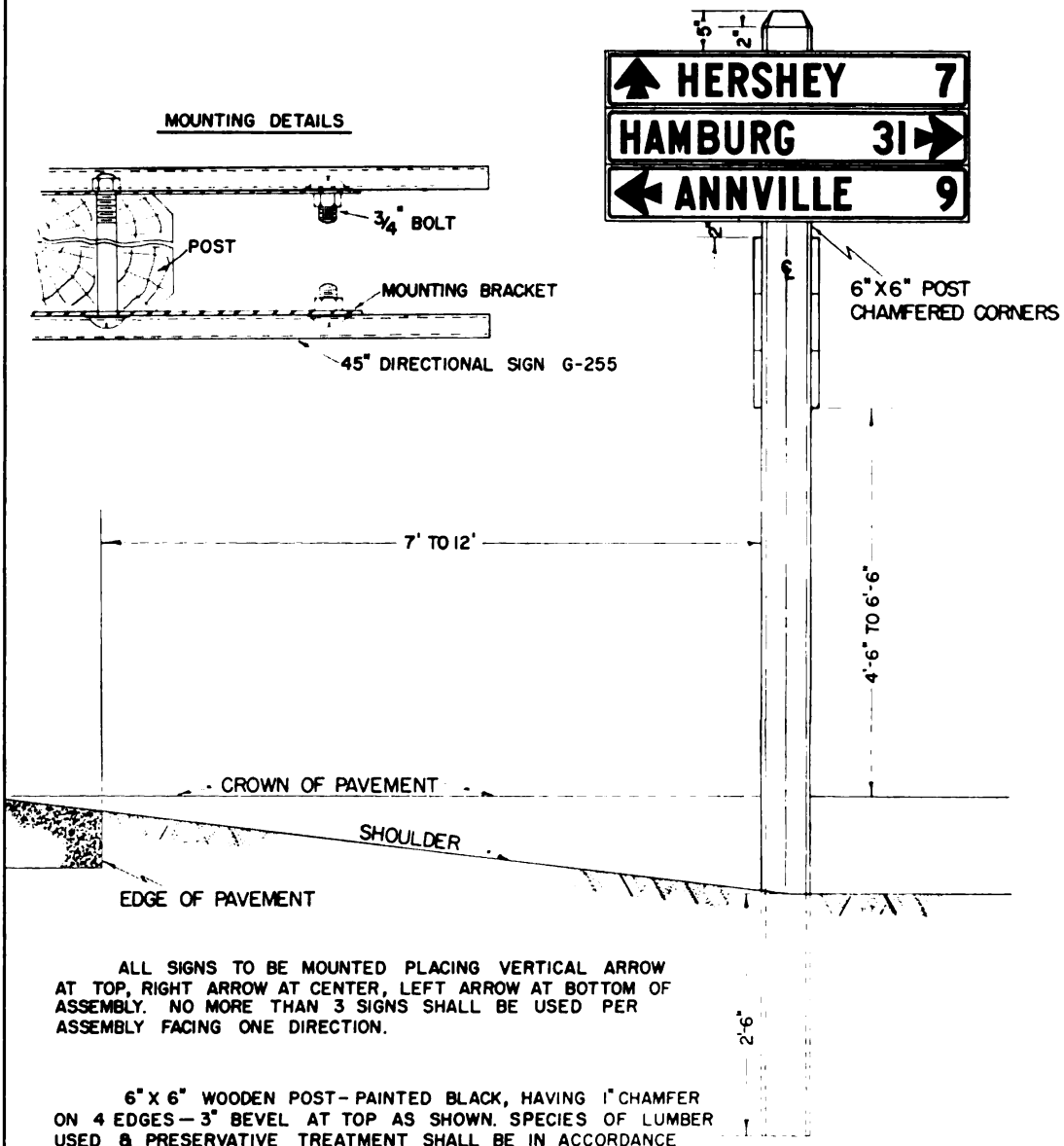
45" DESTINATION SIGN

G-255

7" x 45"

This sign shall be used at intersections of minor importance or at intersections where approach speeds are low. It shall be mounted on a single wooden post using a mounting bracket, as shown in Figure 14. In both rural and urban areas the post shall be located 7 feet to 12 feet back from the pavement edge

ERECTION DETAILS OF 45" DESTINATION SIGNS



ALL SIGNS TO BE MOUNTED PLACING VERTICAL ARROW AT TOP, RIGHT ARROW AT CENTER, LEFT ARROW AT BOTTOM OF ASSEMBLY. NO MORE THAN 3 SIGNS SHALL BE USED PER ASSEMBLY FACING ONE DIRECTION.

6" X 6" WOODEN POST - PAINTED BLACK, HAVING 1" CHAMFER ON 4 EDGES — 3" BEVEL AT TOP AS SHOWN. SPECIES OF LUMBER USED & PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH P.D.H. SPECIFICATIONS.

FIGURE 14

and the lowest sign in the assembly shall be 4½ feet to 6½ feet above the curb or crown of pavement. If required, signs may be erected on all four sides of the post making an assembly of four panels, but the number in any one panel must be limited to three signs. The sign showing the destination straight ahead shall be erected at the top of the assembly; destination to the right, next; and destination to the left, at the bottom of the assembly.

RURAL AND URBAN AREAS

At intersections of minor routes all signs shall be erected on a single post in the corner of the intersection most easily seen by motorists approaching from all directions. See Figure 17.

At intersections of major routes with minor routes signs shall be erected on separate posts located in diagonally opposite corners of the intersection as shown in Figure 18, so that the installations will be in the near right corners for traffic approaching the intersection on the main route. Signs will be located in the far right corner for traffic approaching on the minor route. However, if the width of the major route is greater than 40 feet, the signs facing the minor route should be moved from the far right corners to the near left corners to provide better visibility for traffic approaching on the minor route.

Only two signs shall be used in each panel facing the major route showing the destinations to the right and to the left, but not straight ahead. Signs with vertical arrows should not be used unless the physical conditions are likely to confuse the motorist such as change in alignment of the major route or change in the pavement color, etc.

56" DESTINATION SIGN

G-256

9" x 56"

This sign shall be used at intersections of major importance and at intersections where the approach speeds are high requiring advance warning. It shall be mounted on two 6" x 6" wooden posts as shown in Figure 15. In urban areas the post adjacent to the highway shall not be less than 2 feet back from the curb or pavement edge, while the bottom edge of the lowest sign shall not be less than 7 feet above the curb or crown of pavement. In rural areas these distances shall be 6 feet and 4 feet respectively. An assembly shall consist of not more than three signs. The sign with the vertical arrow shall be mounted at the top; the right arrow next, and the left arrow at the bottom of the assembly.

In urban areas at intersections of major routes signs shall be located at the far right corners as shown in Figure 19. Separate installations shall be made for each throat entering the intersection. If left turn lanes have been established, or if other physical conditions require it, signs may be placed in the near right corner. At intersections of two-lane highways, the 45" Destination Sign, G-255, may be used in accordance with the above.

In rural areas at signalized intersections signs shall be located 100 feet to 150 feet in advance of the intersection as shown in Figure 20. If left or right turn lanes have been constructed on any approach, the installation shall be made 100 feet to 150 feet in advance of that lane. Confirmation Signs, G-258, may be erected 300 feet beyond the intersection, if required.

In rural areas at nonsignalized intersections signs along the major route shall be located 100 feet to 150 feet in advance of the intersection. Along the minor route, signs shall be located in the far right corner of the intersection beyond the Stop Sign, as shown in Figure 21. If the width of the major route exceeds 40 feet, or if the intersection has been channelized, the signs facing the minor route may be located in the near right corner for better visibility. 72″ Destination Signs, G-257, shall be used on the major route, while 56″ Destination Signs, G-256, shall be used on the minor route.

72″ DESTINATION SIGN

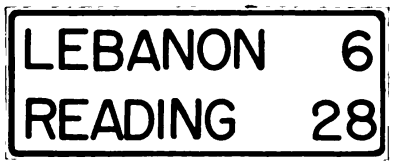
G-257

11″ x 72″

This sign shall be used at intersections of major importance where approach speeds are high and in general where 56″ Destination Signs, G-256, are inadequate because of size. It shall be used in all cloverleaf grade separations as shown in Figure 22. Each installation shall be located 100 feet to 150 feet in advance of each ramp. Confirmation Signs, G-258, shall be located 300 feet beyond the cloverleaf on each route as shown. The 72″ Destination Sign, G-257, shall be erected in accordance with specifications set forth for the 56″ Destination Sign, G-256.

50″ CONFIRMATION SIGN

G-258



20″ x 50″

This sign shall give the names and mileages of the next two communities or important points of interest which lie ahead. It shall be erected 300 feet beyond the intersection of major routes or just beyond municipal limits facing traffic leaving the intersection or the community. It shall be used to reassure the motorist that he has made the proper turn at the intersection through which he has just passed and that he is travelling in the correct direction. This sign shall be erected on two 6″ x 6″ wooden posts as shown in Figure 23. In urban areas, the post adjacent to the highway shall be not less than 2 feet back from the curb or pavement edge, while the bottom edge of the sign shall be not less than 7 feet above the curb or crown of pavement. In rural areas this distance shall be 6 feet and 4 feet, respectively. Only one sign shall be used at each installation as shown in Figures 20 and 22.

INFORMATION SIGNS

Informational Guide Signs are used to mark municipalities, villages, rivers and historical sites. They consist of many designs and sizes. However, in all cases the background of this type sign is blue and the border and message are gold.

Town Name Signs are reflectorized, while other historical markers are nonreflectorized.

TOWN NAME SIGN

G-259

20" x 50"

This sign is used along highways to mark entrances to cities, boroughs and villages. It shall be erected at the corporate, or village, limit on two 6" x 6" wooden posts as shown in Figure 23. If the built up area does not extend to the corporate line at the point where it crosses the highway, then the sign shall be placed inside the incorporated area, 300 feet in advance of the edge of the built up section. In urban areas the post adjacent to the highway shall be not less than 2 feet back from the curb or pavement edge, while the bottom edge of the sign shall be not less than 7 feet above the curb or crown of pavement. In rural areas this distance shall be 6 feet and 4 feet, respectively.

RIVER NAME SIGN

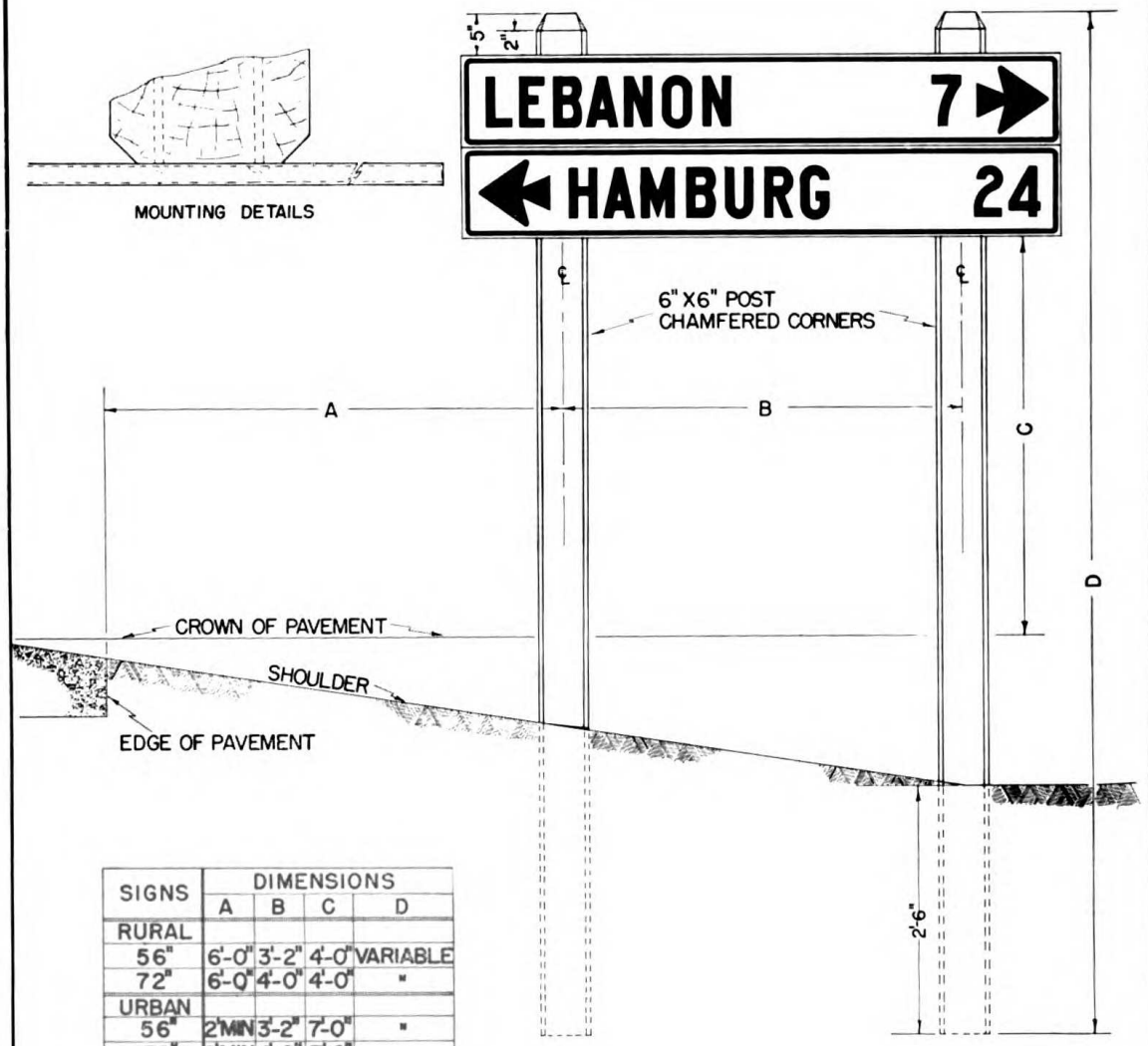
G-260

20" x 50"

This sign is used along highways to mark rivers, or streams, which are spanned by structures 100 feet or longer. It may also be used at bridges of smaller spans when the river or stream is of historical or geographical importance.

This sign shall be erected at each end of the bridge superstructure on two 6" x 6" wooden posts as shown in Figure 23. In urban areas the post adjacent to the highway shall be not less than 2 feet back from the curb or pavement edge, while the bottom edge of the sign shall be not less than 7 feet above the curb or crown of pavement. In rural areas this distance shall be 6 feet and 4 feet, respectively.

ERECTION DETAILS OF
56" & 72" DESTINATION SIGNS



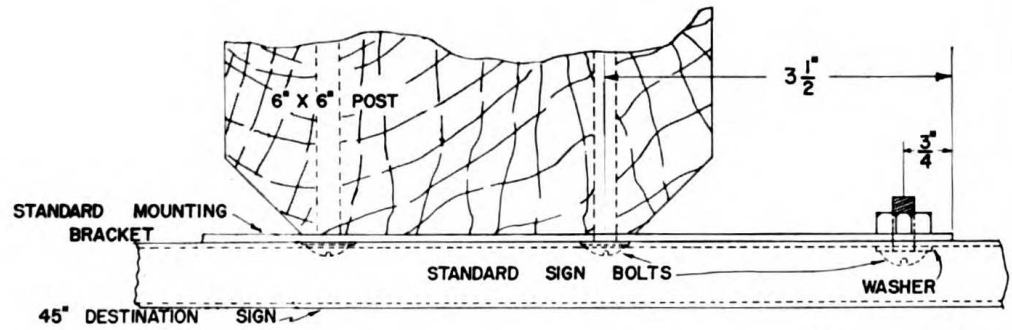
SIGNS	DIMENSIONS			
	A	B	C	D
RURAL				
56"	6'-0"	3'-2"	4'-0"	VARIABLE
72"	6'-0"	4'-0"	4'-0"	"
URBAN				
56"	2'MIN	3'-2"	7'-0"	"
72"	2'MIN	4'-0"	7'-0"	"

6" X6" WOODEN POSTS – PAINTED BLACK, 1" CHAMFER ON 4 EDGES – 3" BEVEL AT TOP AS SHOWN. SPECIES OF LUMBER USED AND PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH P.D.H. SPECIFICATIONS.

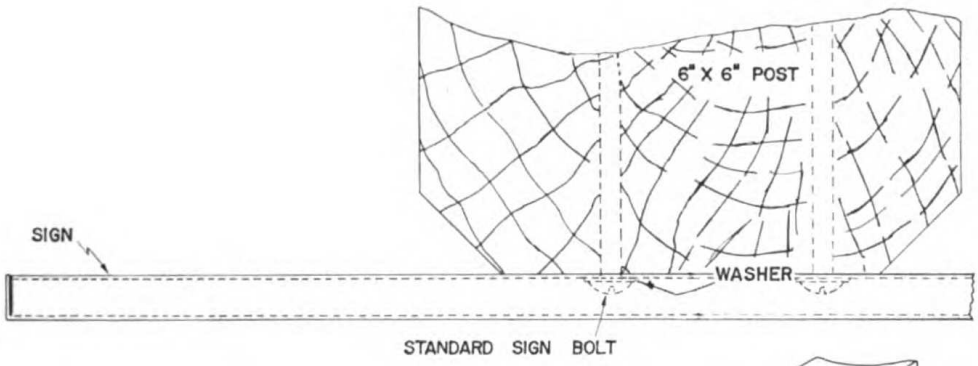
ALL SIGNS TO BE MOUNTED PLACING VERTICAL ARROW AT TOP, RIGHT ARROW AT CENTER & LEFT ARROW AT BOTTOM OF ASSEMBLY. NO MORE THAN THREE SIGNS SHALL BE USED PER INSTALLATION.

FIGURE 15

MOUNTING DETAILS FOR ROLLED EDGE DIRECTIONAL SIGNS



DETAIL OF MOUNTING BRACKET FOR 45" SIGNS.



DETAIL OF MOUNTINGS FOR
50", 56" AND 72" SIGNS.

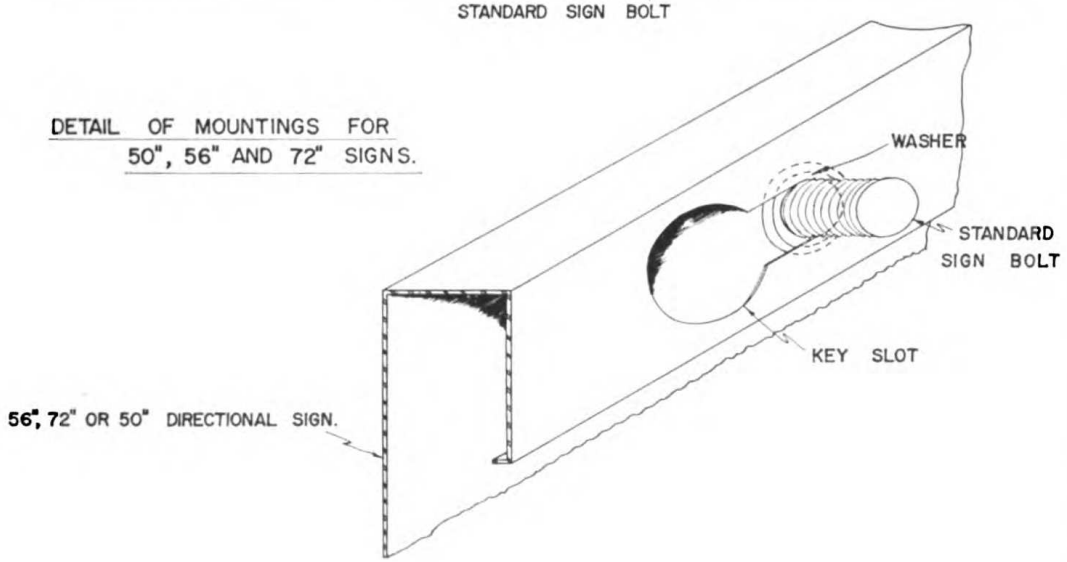


FIGURE 16

LOCATION OF DIRECTIONAL SIGNS AT INTERSECTIONS MINOR ROUTES (RURAL & URBAN AREAS.)

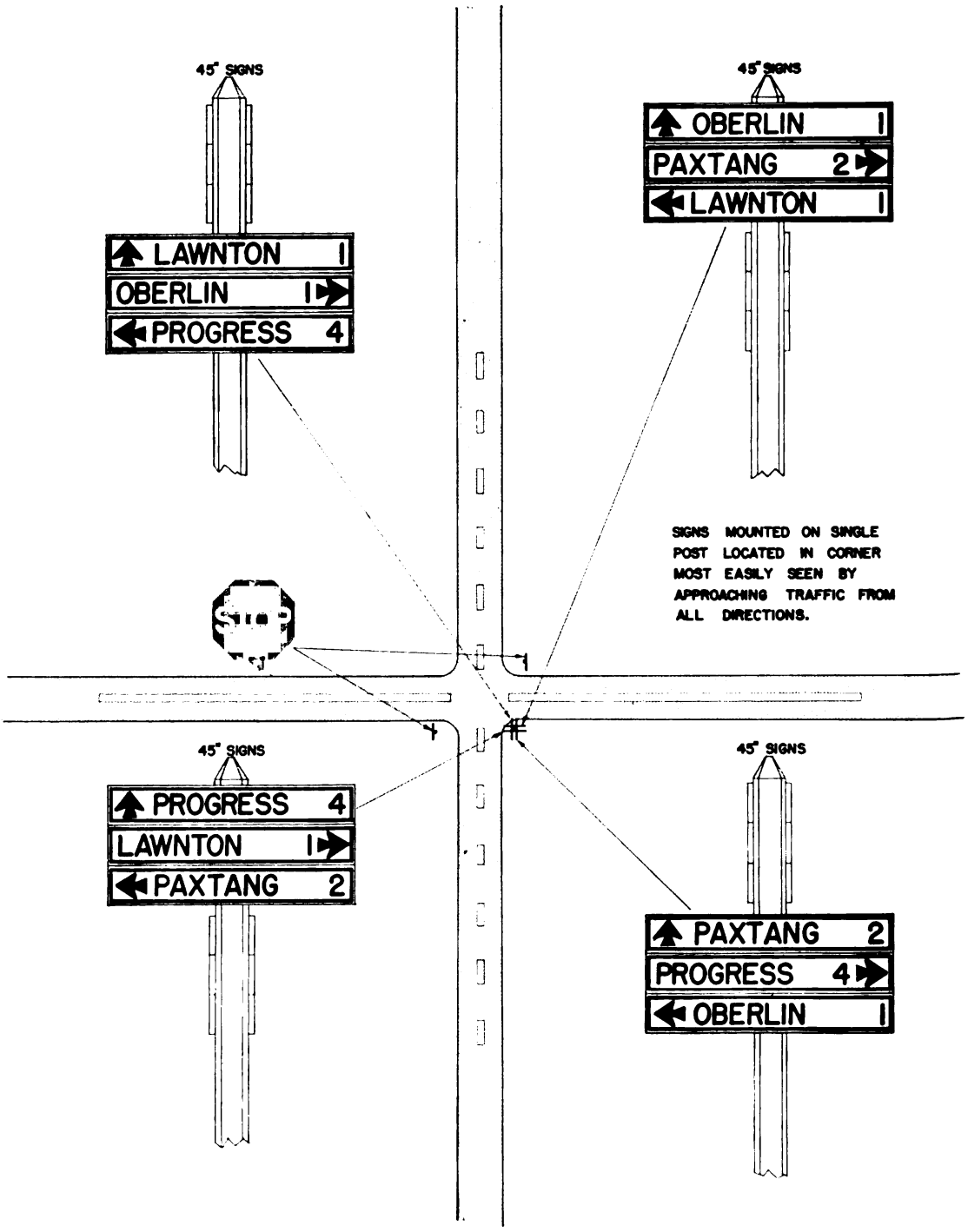


FIGURE 17

LOCATION OF DIRECTIONAL SIGNS AT INTERSECTIONS
MAJOR & MINOR ROUTES
(RURAL & URBAN AREAS)

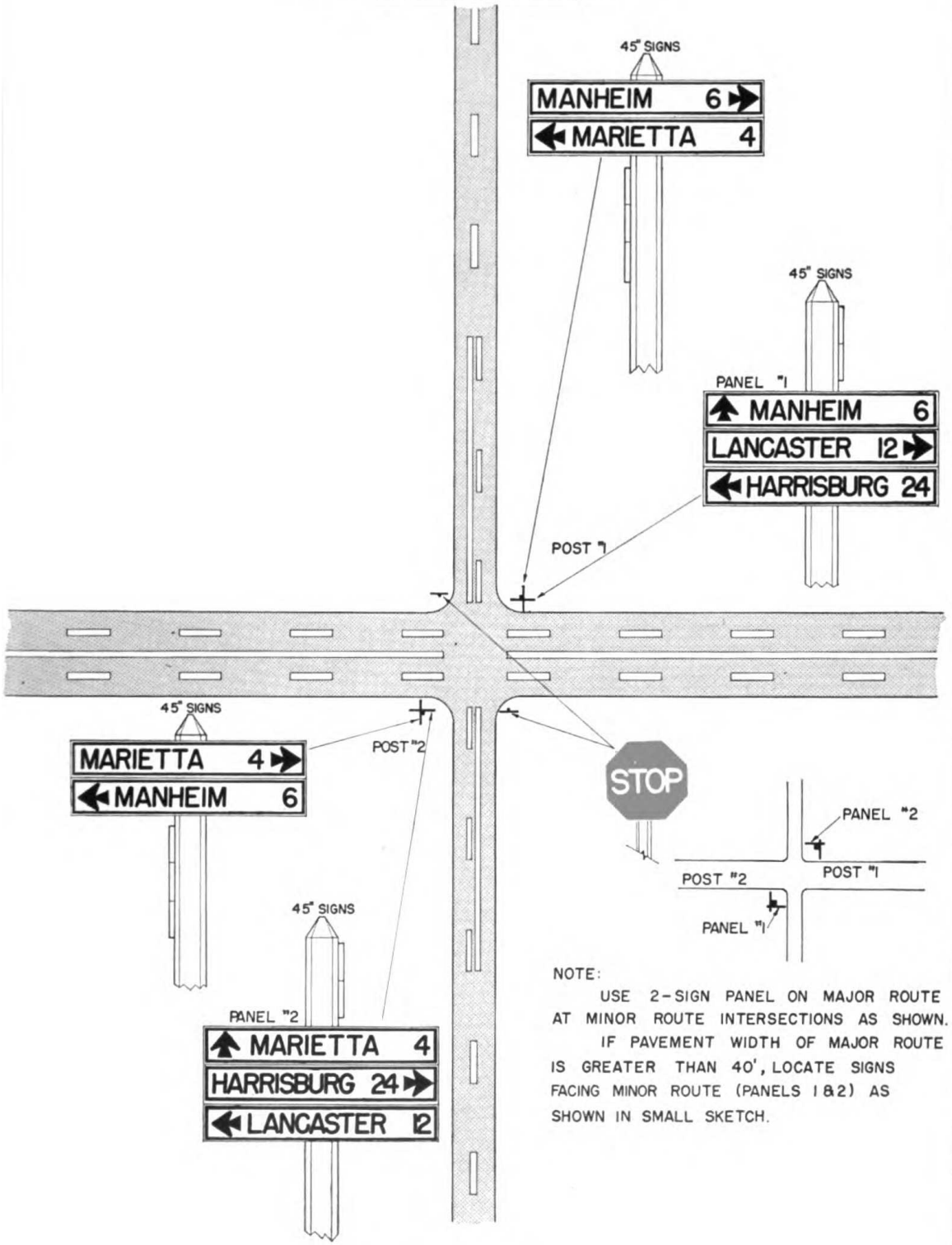
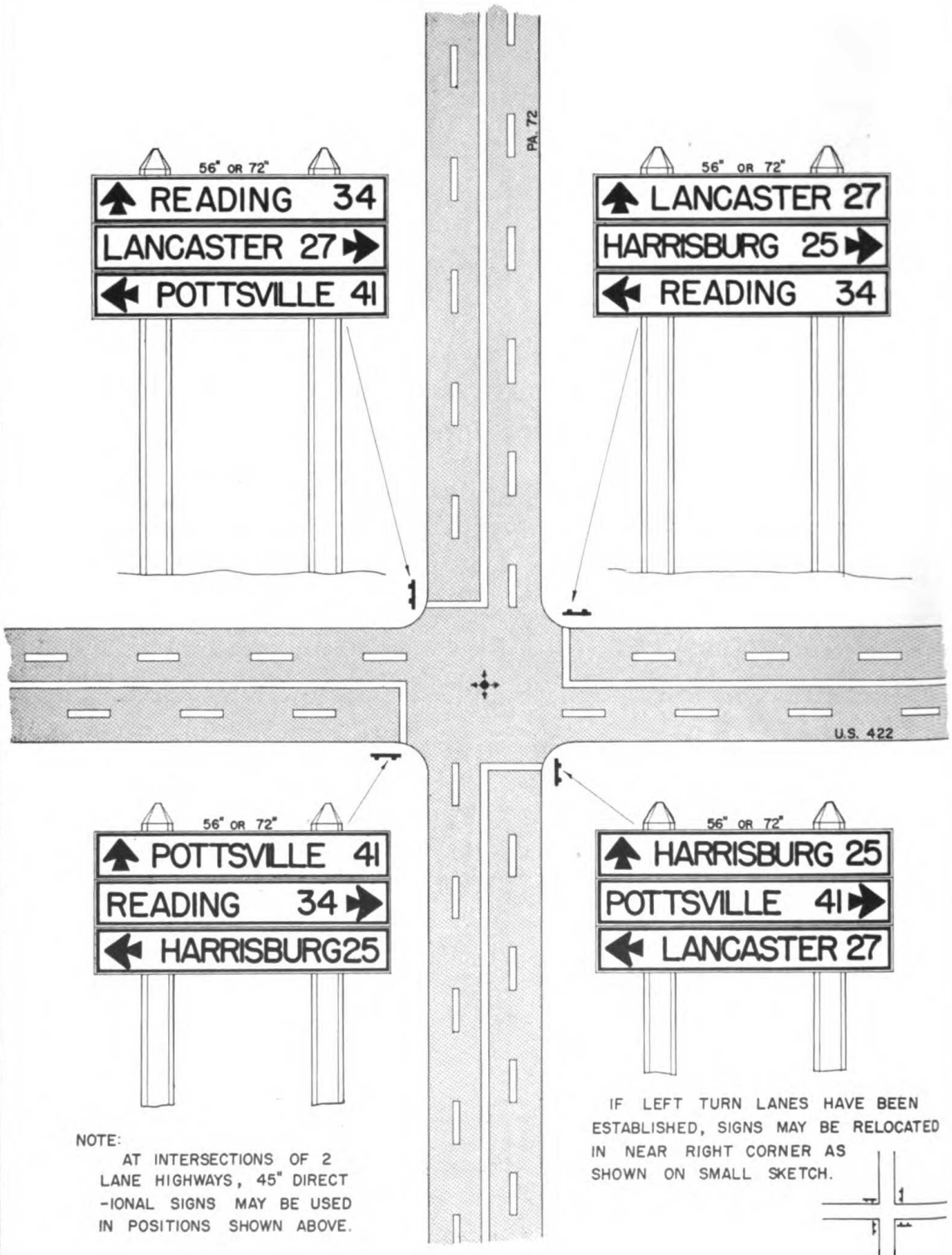


FIGURE 18

LOCATION OF DIRECTIONAL SIGNS AT INTERSECTIONS
MAJOR ROUTES – (URBAN AREAS)



NOTE:
AT INTERSECTIONS OF 2 LANE HIGHWAYS, 45" DIRECT-IONAL SIGNS MAY BE USED IN POSITIONS SHOWN ABOVE.

IF LEFT TURN LANES HAVE BEEN ESTABLISHED, SIGNS MAY BE RELOCATED IN NEAR RIGHT CORNER AS SHOWN ON SMALL SKETCH.

ESTABLISHED LEFT TURN LANES

FIGURE 19

LOCATION OF DIRECTIONAL SIGNS AT INTERSECTIONS MAJOR ROUTES (SIGNALIZED – RURAL AREAS)

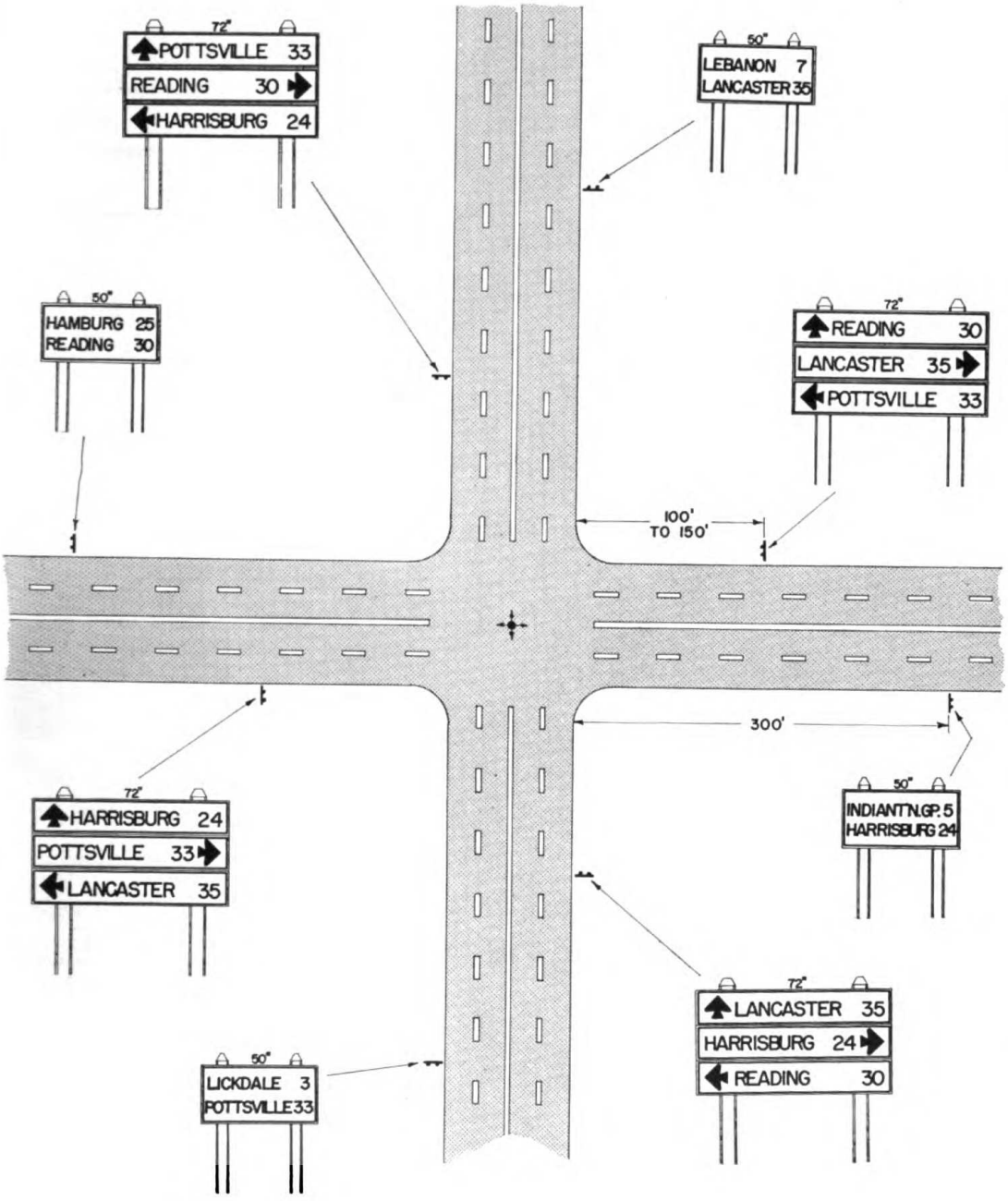


FIGURE 20

LOCATION OF DIRECTIONAL SIGNS AT INTERSECTIONS MAJOR ROUTES (NON-SIGNALIZED – RURAL AREAS)

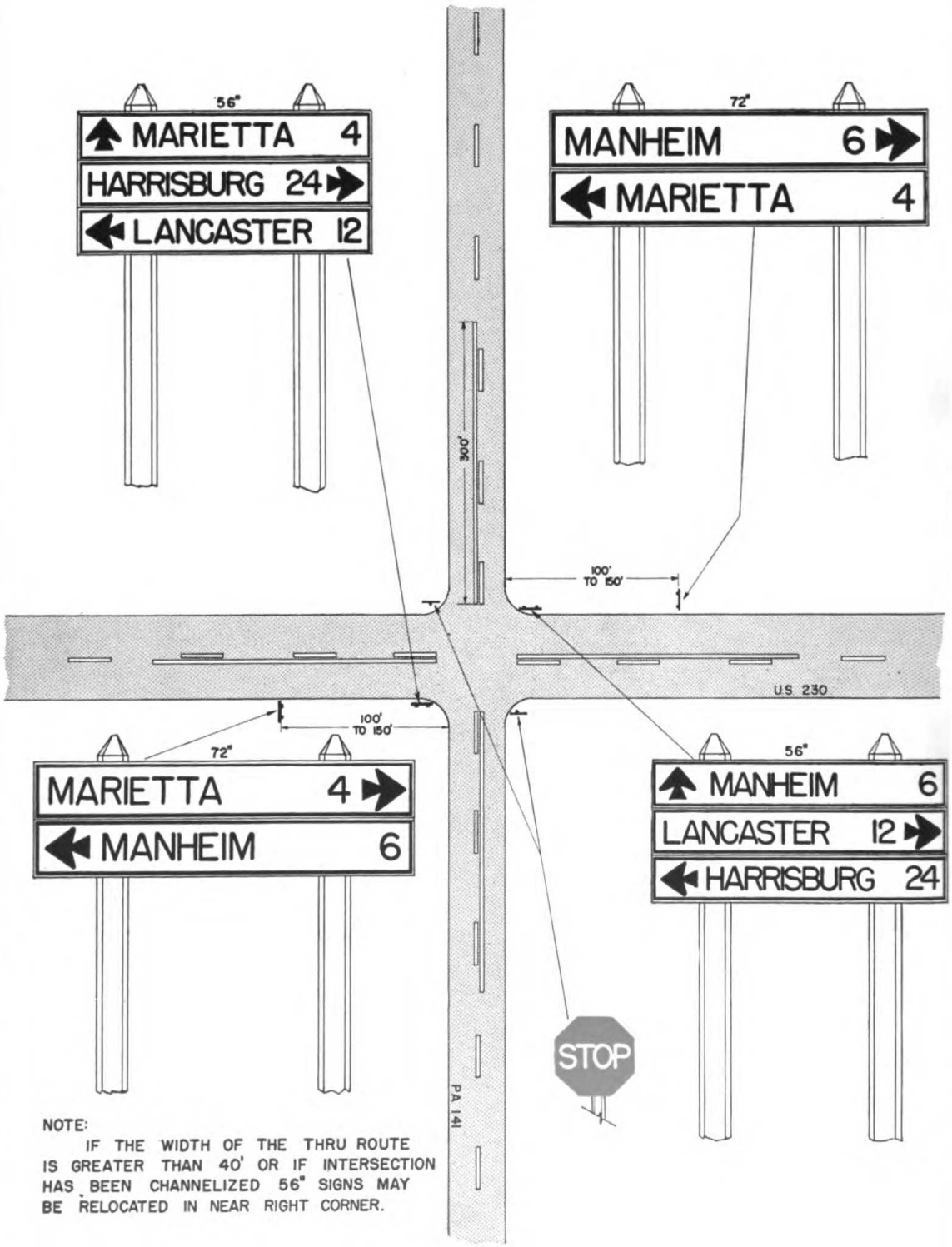


FIGURE 21

LOCATION OF DIRECTIONAL SIGNS AT INTERSECTIONS
CLOVERLEAF GRADE SEPARATIONS

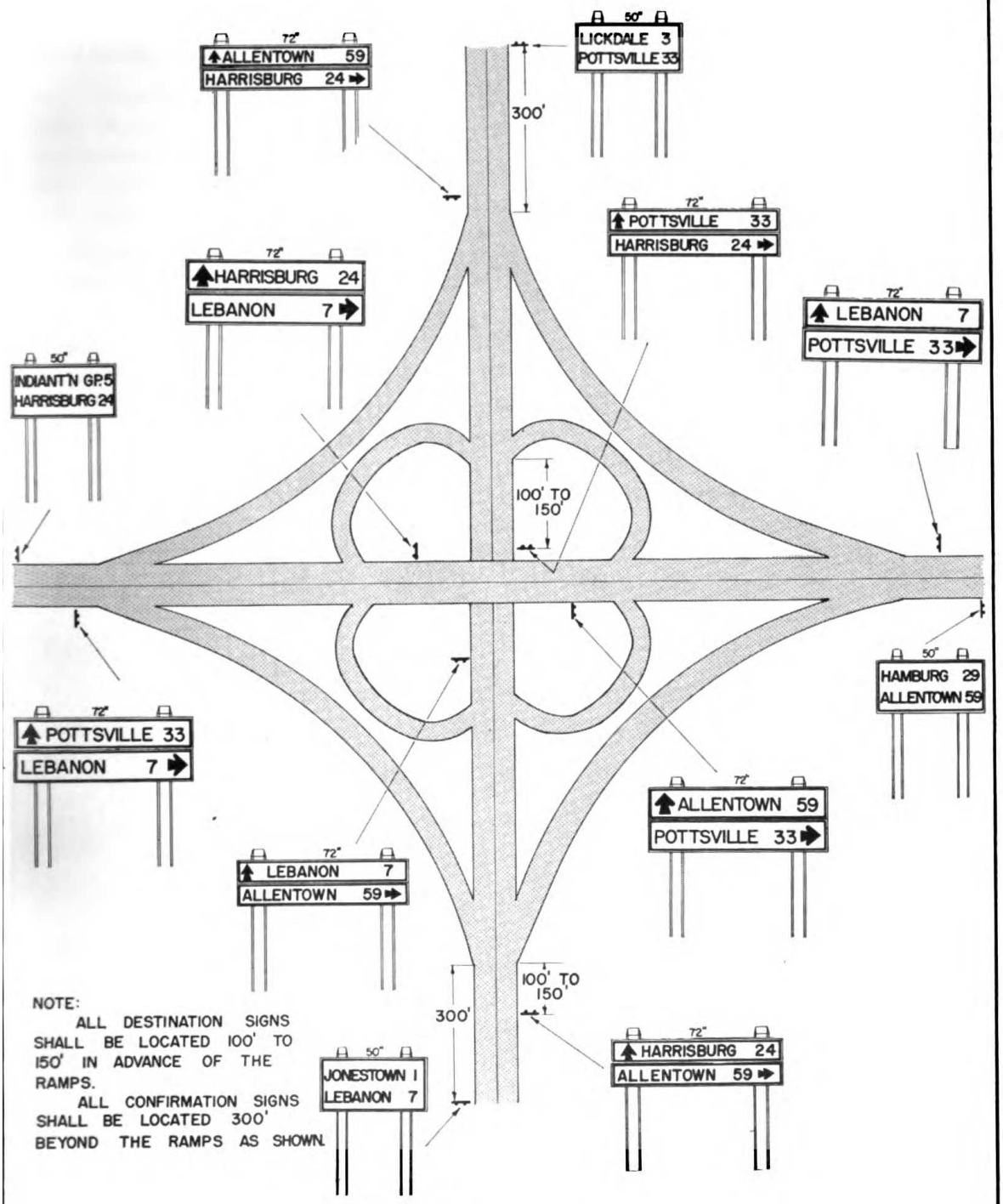
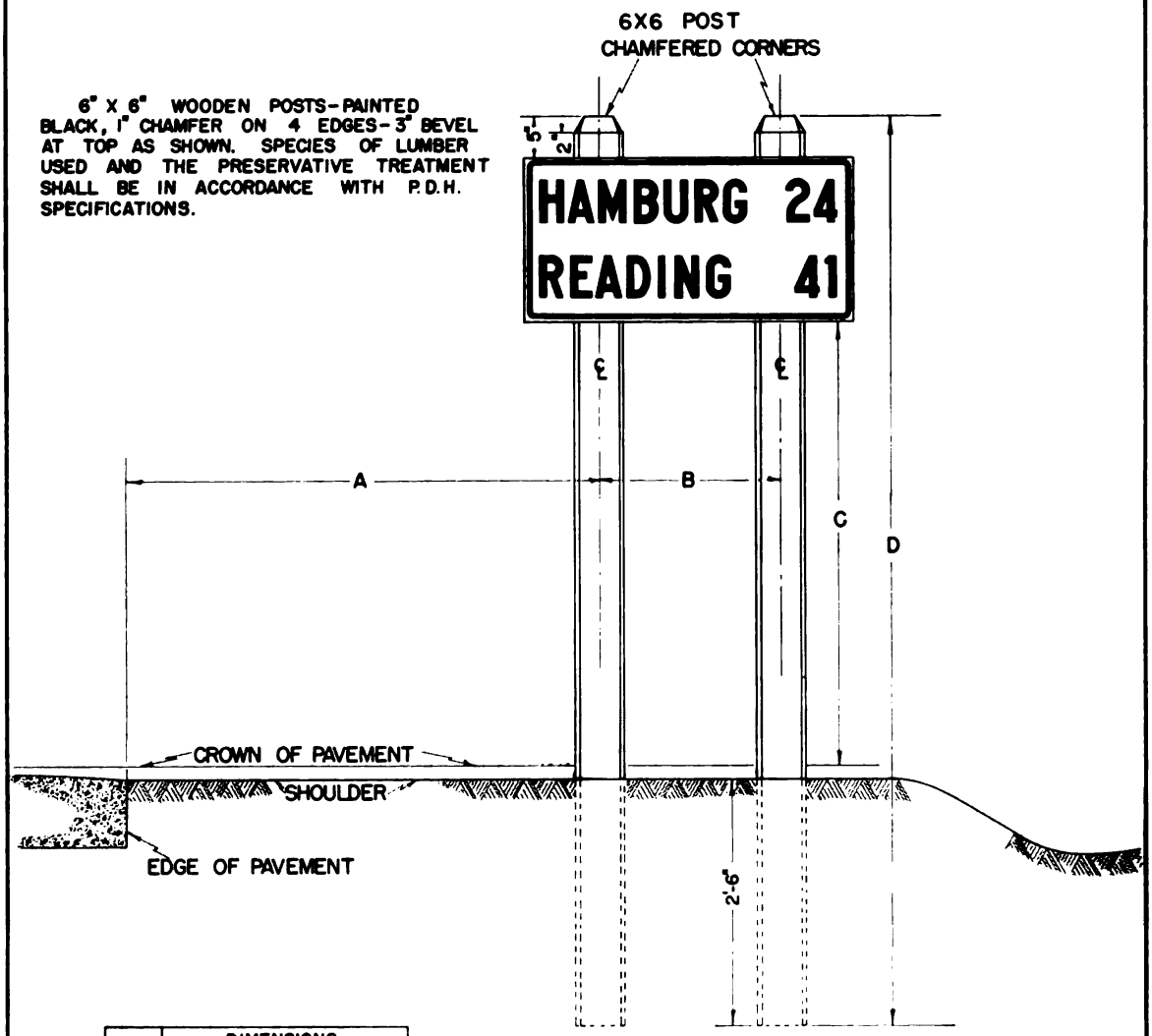


FIGURE 22

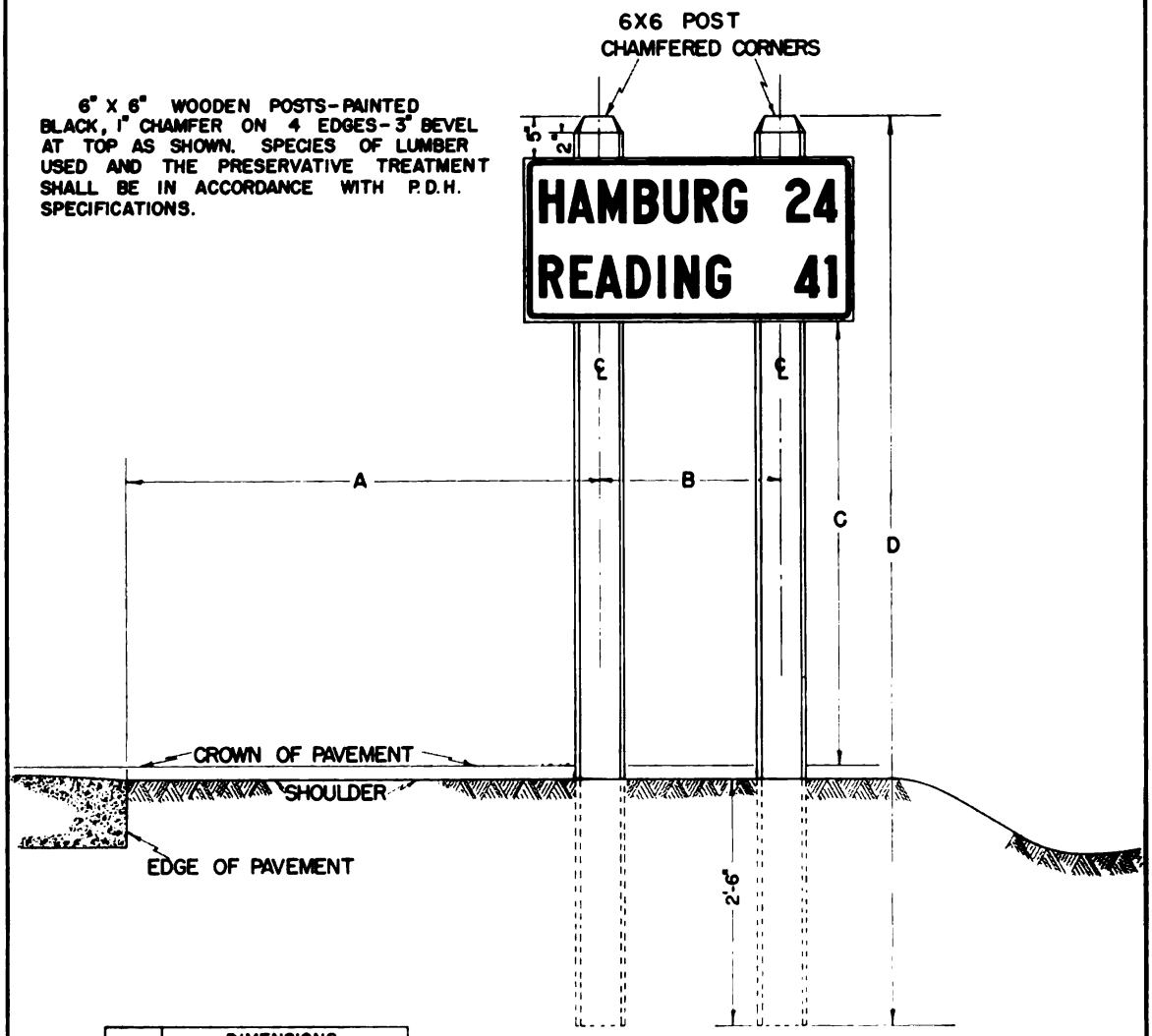
ERECTION DETAILS FOR 50" CONFIRMATION SIGNS



SIGN	DIMENSIONS			
	A	B	C	D
RURAL 50"	6'-0"	2'-8"	4'-0"	VARIABLE
URBAN 50"	2'MIN	2'-8"	7'-0"	VARIABLE

FIGURE 23

ERECTION DETAILS FOR 50" CONFIRMATION SIGNS



SIGN	DIMENSIONS			
	A	B	C	D
RURAL 50"	6'-0"	2'-8"	4'-0"	VARIABLE
URBAN 50"	2'MIN	2'-8"	7'-0"	VARIABLE

FIGURE 23

REGULATORY SIGNS

GENERAL USE

Regulatory Signs shall be used to inform highway users of certain laws and regulations enacted to promote safety, convenience and protection for motorists using the highways, the violation of which would constitute a summary offense.

They are essential to indicate legal requirements which have been officially established or designated by state or local authorities and which would, otherwise, not be apparent regarding the movement and parking of vehicles.

Regulatory Signs include such signs as: Stop, Speed Limit, Parking, One Way, etc.

Only such signs as are listed in this Manual, or designs thereof, issued by the Secretary of Highways, after publication of this Manual, are official signs and are permitted on highways except as provided by Section 1107 of the Vehicle Code. While this Manual might not provide for all conditions, it is imperative that these signs be used in the uniform manner as specified herein. This uniformity will greatly facilitate driving in urban and rural areas because similar signs will always notify the motorist of the same law or regulation.

DESIGN

With few exceptions, Regulatory Signs are rectangular in shape with the longer dimension usually vertical. Common sizes are: 12″ x 18″; 18″ x 24″ and 24″ x 30″.

These signs have white backgrounds with red, green or black lettering and borders. Red on white shall be used for signs which prohibit parking; green on white shall be used on signs which permit parking for certain periods only; black on white shall be used for all other Regulatory Signs.

An exception to these design and color standards, however, is the Stop Sign. Because of its importance, the Stop Sign is distinguished from other Regulatory Signs by its octagonal shape. It shall have a white message and border on a red background and shall be available in two standard sizes: 24″ x 24″ and 30″ x 30″. The 24 inch sign shall be used in urban areas while the 30 inch sign shall be used in rural areas.

LOCATION

All Regulatory Signs shall be erected in accordance with the specifications in this Manual. It is important that they are conspicuously located so motorists can be governed accordingly. However, regardless of how effectively these signs are placed the desired traffic control will not be obtained unless they are vigorously enforced by the local authorities.

In rural and residential areas where parking is not permitted, Regulatory Signs shall be erected 6 feet to 10 feet off the edge of the pavement. The bottom edge of the sign shall be not less than 30 inches above the crown of the pavement. The Stop Sign, however, shall be mounted so that the center of the sign is 42 inches above the crown of the pavement. See Figure 24.

In business and residential areas where parking is permitted, Regulatory Signs shall be erected not less than 12 inches back from the curb face. The bottom edge of the sign shall not be less than 7 feet above the curb or crown of the pavement. The Stop Sign, however, shall be mounted so the center of the sign is 8 feet above the curb or crown of the pavement. See Figure 25.

Regulatory Signs are located at, or near, the point where the traffic regulation begins. Along certain sections of highways, parking is prohibited at all times by law, such as at intersections, fire hydrants, etc. See Parking Signs, R-251 to R-281, for more detailed information.

At locations where parking is prohibited for an entire block, signs shall be spaced approximately 100 feet apart. At locations where parking is restricted or prohibited for a portion of a block, signs shall be placed at both ends of the restriction with signs placed intermittently approximately 100 feet apart. If parking is prohibited at all times, curbs may be painted yellow to supplement the signs.

Refer to Figure 26 for locations of Stop Signs at various types of intersections.

DETAILS OF SIGNS

STOP

R-201 and R-202

24" x 24"
30" x 30"

This sign is erected at intersections of streets and highways to designate right-of-way preference and to permit traffic to pass through the intersection on at least one of the streets or highways at all times, unless traffic is controlled by traffic signals or officers. Stop Signs are generally erected on the intersecting streets or highways that carry the lower vehicular volumes. Care must be exercised as to the location, height and visibility so that when erected it will fulfill the purpose for which it is intended.

The Stop Sign shall be erected only when one or more of the following warrants have been met:

1. **At all intersections with highways which have been officially designated as Through Highways by the Secretary of Highways, or**
2. **At intersections where the view of the intersection is so restricted that the critical or safe approach speed is 10 miles per hour or less, or**
3. **At intersections where 3 to 5 right angle collisions have occurred within one year, or**
4. **At intersections where the peak hour traffic volume on the main highway exceeds 50 vehicles; or where the total peak hour volume on both highways exceeds 75 vehicles.**

A Stop Sign shall not be erected at an intersection which is controlled by a traffic signal or a flashing signal.

In residential and business districts, 24″ x 24″ Stop Signs, R-201, are used. In these areas where parking may often obscure the Stop Sign, the sign shall be erected so that the center of the sign will be 8 feet above the curb or crown of the pavement.

It shall be placed so the edge of the sign adjacent to the curb will not be less than 12 inches back from the face of the curb, or between the curb and sidewalk or between ditch line and sidewalk. See Figure 25. At intersections where there are marked or unmarked crosswalks, the Stop Sign shall be erected 4 feet in advance of the crosswalk facing approaching traffic as shown in Figure 26.

In rural districts, 30″ x 30″ Stop Signs, R-202, are used. This sign shall be erected not less than 6 feet, nor more than 10 feet, from the edge of the roadway on which traffic is required to stop, and in addition it shall be located not less than 6 feet, and preferably 10 feet from the edge of the intersecting roadway. The center of the sign shall be 42 inches above the crown of the roadway, as shown in Figure 24.

When possible, the Stop Sign shall be erected at the point where the vehicle is to stop. Where this is not possible, Stop Lines or Limit Lines shall be painted at the required stopping point which should be 6 feet to 10 feet in advance of the intersecting roadway. In any case the Stop Sign shall not be located more than 30 feet from the edge of the intersecting roadway.

At wide throat intersections it may be necessary to channelize the intersection. This would require a Stop Sign for right turn traffic and a second Stop Sign for straight through or left turn traffic as shown in Figure 26. If the channelizing island is formed by white lines painted on the pavement, the latter Stop Sign should be protected by guard fence posts. The word STOP may be painted on the pavement to supplement the Limit Line and Stop Sign.

On a one-way street it may be necessary to erect two Stop Signs; one on the near right corner and an auxiliary sign on the near left corner of the Stop intersection.

If the visibility of a Stop Sign at any location is restricted, the Stop Sign shall be erected as specified and a Stop Ahead Sign, W-236, placed not less than 300 feet nor more than 500 feet in advance of the Stop Sign.

No other sign of any type may be placed on the same post with a Stop Sign.

SIGNALS SET FOR (25) M.P.H.

R-203

12″ x 18″

This sign may be used to indicate the beginning of a section where the traffic signals are coordinated into a progressive system and timed for a specific speed.

It should be erected in advance of the first signal where it can easily be seen and at intervals of every other block throughout the coordinated section. It shall be erected so the bottom of sign will not be less than 7 feet above the curb or crown of the pavement.

25-MILE SPEED REGULATION

R-204 and R-205

18" x 24"
24" x 30"

This sign shall be erected only within business districts where official 25-Mile Speed Zones have been established. Such signs shall be placed through the controlled section at intervals not greater than ⅛ of a mile (660 feet). On one-way streets it may be necessary to erect speed limit signs on both sides of the street or on the left side only, depending upon parking. It shall be erected so the bottom of the sign will be 7 feet above the top of the curb or crown of the pavement, and placed so the edge of the sign adjacent to the curb will not be less than 12 inches back from the face of the curb. See Figure 25.

The oversize sign, R-205, shall be used only where standard size signs, R-204, are not adequate because of pavement width, numerous advertising signs, or other obstructions in busy downtown areas.

No sign of any other type shall be placed on the same post with a speed regulation sign.

END 25-MILE SPEED REGULATION

R-206 and R-207

18" x 24"
24" x 30"

This sign shall be erected at the end of an authorized speed zone to inform the motorist that he is leaving the controlled section. It shall be erected not further than ⅛ of a mile (660 feet) beyond the last sign in a controlled section and in accordance with methods set forth for erection of 25-Mile Speed Regulation Sign. The oversize sign, R-207, shall be used only with oversize R-205 sign.

35-MILE SPEED REGULATION

R-208 and R-209

18" x 24"
24" x 30"

This sign may be erected in business or residential districts where official 35-miles per hour speed zones have been established. Where there is little parking or where parking is prohibited, this sign shall be erected so the bottom of the sign is 30 inches above the crown of the pavement and not less than 6 feet nor more than 10 feet from the edge of the pavement. See Figure 24. In other instances, this sign shall be erected in accordance with methods set forth for the erection of the 25-Mile Speed Regulation Sign. See Figure 25.

The oversize sign, R-209, shall be used only where standard size sign, R-208, is not adequate because of pavement width, numerous advertising signs or other obstructions.

No sign of any other type shall be placed on the same post with a speed regulation sign.

REGULATORY SIGNS

HEIGHT AND LATERAL LOCATION IN RURAL AREAS

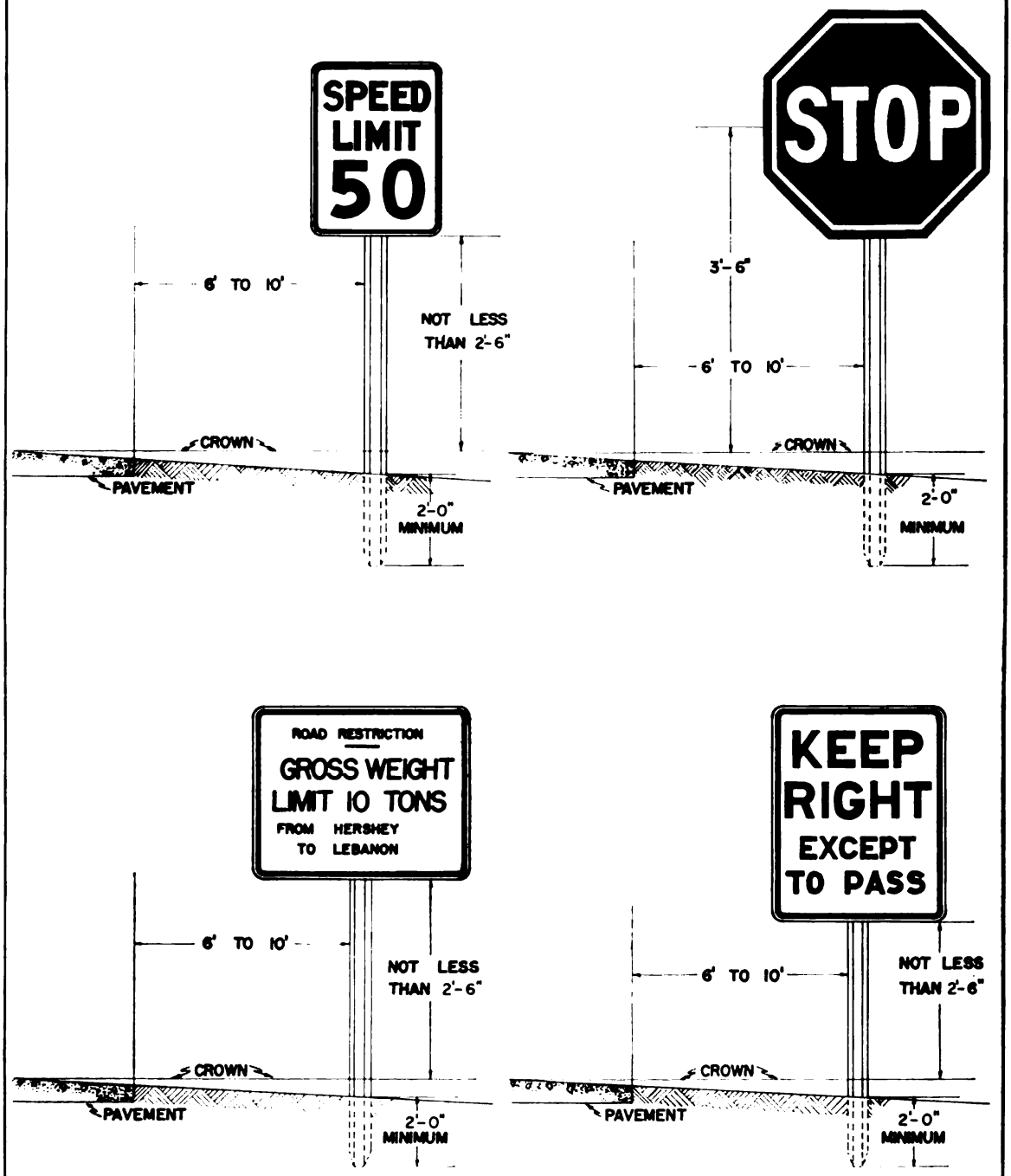
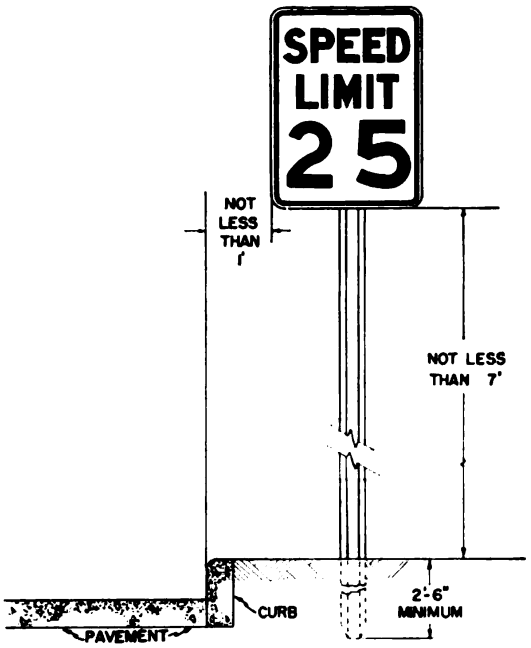
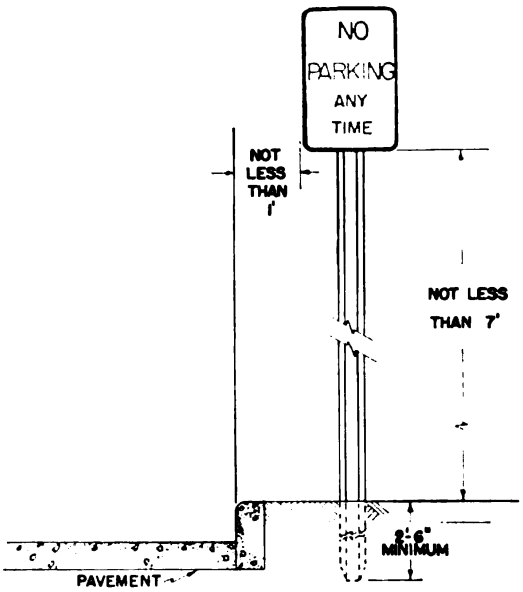
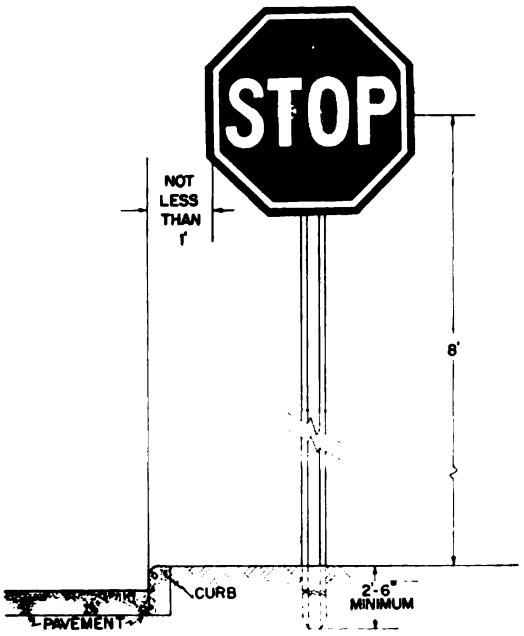


FIGURE 24

REGULATORY SIGNS
HEIGHT AND LATERAL LOCATION IN URBAN AREAS







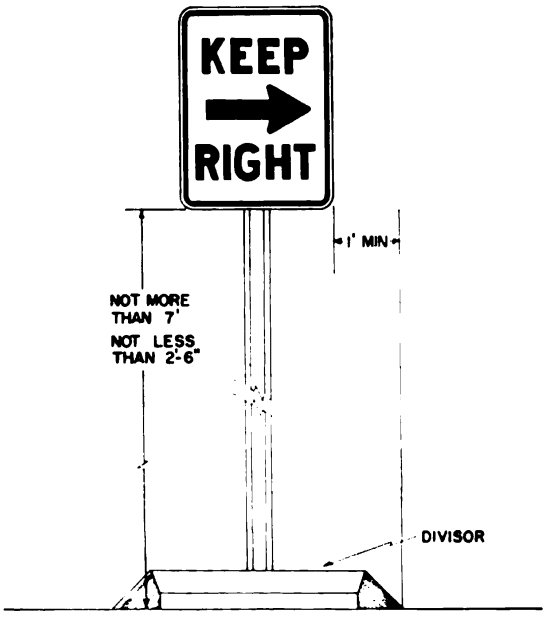
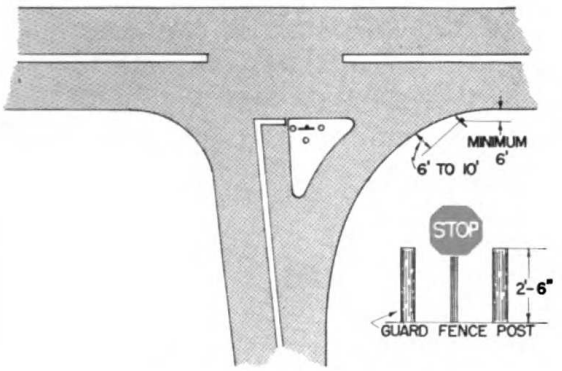
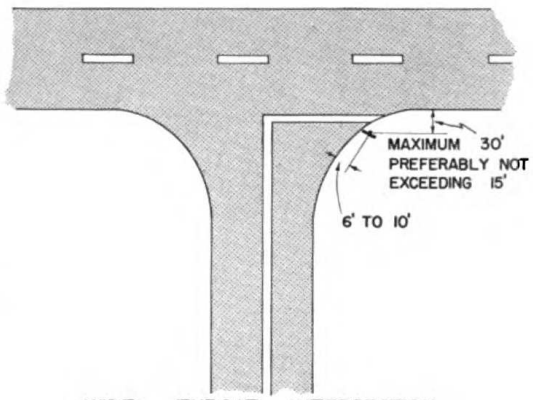


FIGURE 25

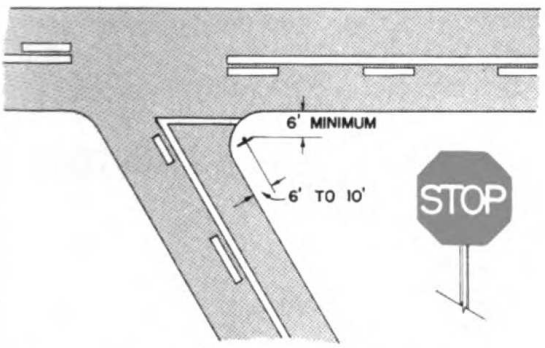
LOCATIONS OF STOP SIGNS



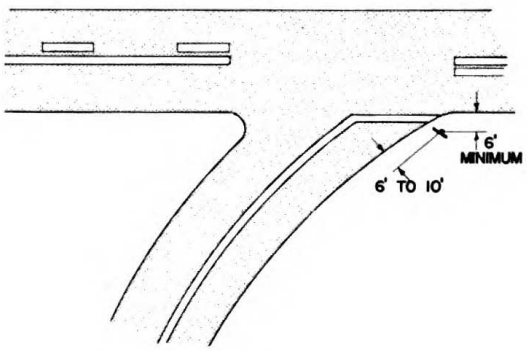
CHANNELIZED INTERSECTION



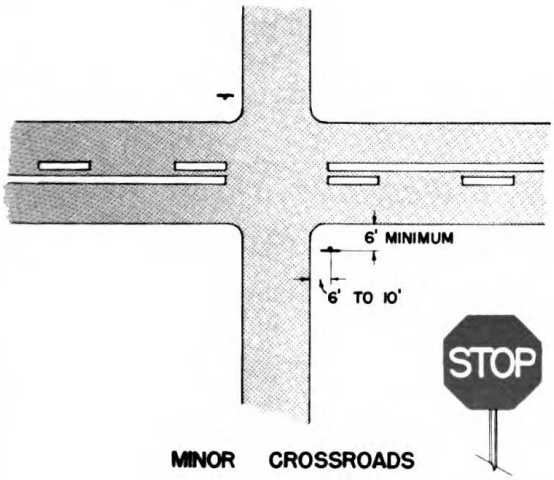
WIDE THROAT INTERSECTION



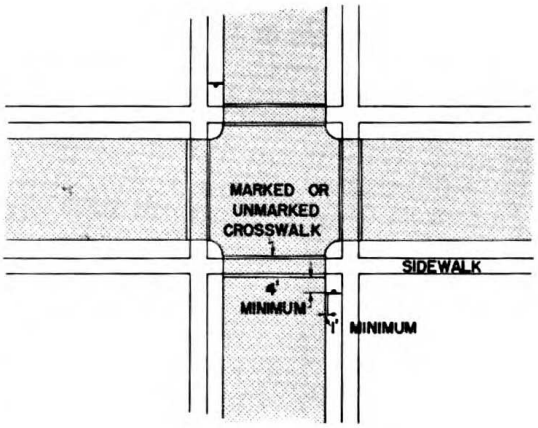
ACUTE ANGLE INTERSECTION



RIGHT TURN



MINOR CROSSROADS



URBAN INTERSECTION

FIGURE 26

END 35-MILE SPEED REGULATION

R-210 and R-211

18" x 24"
24" x 30"

This sign must be erected at the end of an authorized 35-Mile Speed Zone to inform the motorist he is leaving the controlled section. It shall be erected not further than 1/8 of a mile (660 feet) beyond the last sign in the controlled section and in accordance with the methods set forth for the erection of the 35-Mile Speed Regulation Sign.

The oversize sign, R-211, shall be used only with oversize R-209 sign.

50-MILE SPEED REGULATION

R-212 and R-213

18" x 24"
24" x 30"

This sign shall be erected only in rural areas on the right side of the highway facing approaching traffic where the 50-Miles Per Hour Speed is legal and can be safely maintained. While this type sign should be spaced at approximately 2½ mile intervals along continuous sections of rural highway, it should be located at points where speeding generally occurs. It shall be erected in accordance with the general specifications for the erection of Regulatory Signs in rural areas.

The oversize sign, R-213, shall be used only where standard size sign, R-212, is not adequate.

STATE LINE SPEED INFORMATION

R-214

This sign shall be erected on traffic routes along our State Line at various points of entry into Pennsylvania. It shall be so placed that the left edge of the sign is 6 feet to 10 feet from the pavement and the bottom edge 24 inches above the crown of the pavement. The sign shall be erected 100 feet to 500 feet from the State Line. For details of sign design, see Figure 27.

SPEED ZONE AHEAD

R-215

24" x 30"

This sign may be erected in advance of an authorized speed zone to inform the motorist he is entering an area where vehicles are restricted to a lower maximum speed. It should be erected on the right side of the highway facing approaching traffic not less than 300 feet, nor more than 500 feet, in advance of the restricted section and in accordance with the general specifications for erection of Regulatory Signs in urban areas.

TURN PROHIBITION SIGNS

R-216 — R-223

(9″ x 14″ and 18″ x 24″)

R-216

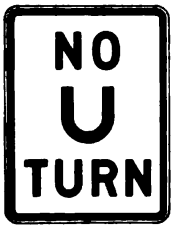
R-217

R-218

R-219

R-220

R-221



R-222

R-223

These signs may be used at intersections to indicate regulations prohibiting specific types of turns. The 18″ x 24″ sign should, generally, be erected as applicable on the near right corner or under existing corner post traffic signals. If required, supplementary signs may be erected on the far right corner or 50 feet to 100 feet in advance of the intersection. When advance signs are used, care should be taken that no alley or driveway exists between the signs and the intersection. The No Left Turn Sign, R-218, is sometimes more visible on the far left corner than in the locations mentioned above.

These signs shall be erected so the bottom edge of the sign is not less than 7 feet above the curb or crown of the pavement and the edge of the sign, adjacent to the curb, is at least 12 inches back from the face of the curb.

The 9″ x 14″ sign is used as applicable under mast arm or overhead type traffic signals. However, a Turn Prohibition Sign mounted on a signal installed directly over the roadway shall have a clearance of at least 14½ feet above the roadway.

The Turn Prohibition Sign may also be erected when necessary in advance of the ends of ramps, separate turning lanes, merging lanes, or traffic circles at their intersection with Through Highways, Parkways or Turnpikes, etc.

KEEP RIGHT (WITH ARROW)

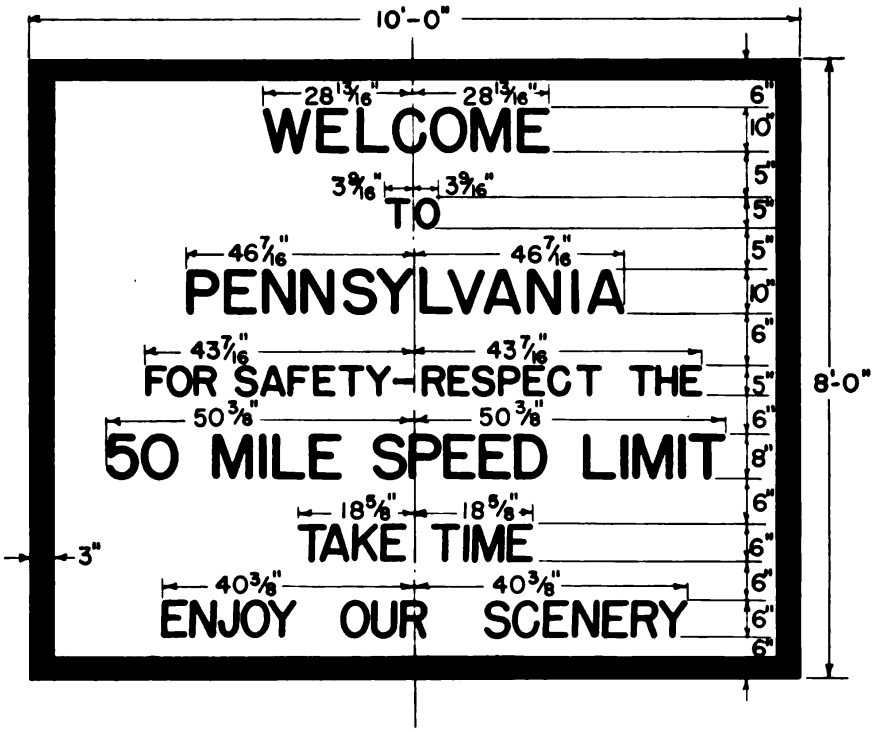
R-224

18″ x 24″

This sign shall be used within, and at the ends of, medial strips, parkways, raised safety zones, traffic islands, and at underpass piers where traffic is required to keep to the right of such obstructions.

This sign, when erected on medial strips, shall be mounted on a post approximately 12 feet back from the approach ends. At channelized intersections, pedestrian islands, or other obstructions, it shall be erected at the approach end or as close thereto as practical. In rural and urban areas it shall be erected so the bottom of the sign is 30 inches above the crown of the pavement, except where it may be obscured by traffic, it shall be erected so the bottom of the sign is 7 feet above the curb or crown of pavement. See Figure 25.

STATE LINE SPEED INFORMATION SIGN
R-214



LETTERS, NUMBERS AND BORDER SHALL BE BLACK NO 6 SEMI-GLOSS.

FACE & BACK OF SIGN SHALL BE WHITE NO. 5 FLAT.

LETTERS & DIGITS SHALL BE P.D.H. SERIES "D"

FIGURE 27

ONE WAY

R-226

12" x 36"

This sign shall be used to indicate streets on which traffic is allowed to travel in only one direction. It shall be erected on the near right and the far left corners of the intersection to face traffic entering, or crossing, the one-way street. See Figure 28.

When One Way Signs are required at a signalized intersection, they may be placed below the signal head. If the intersection is not signalized, the sign shall be erected so the bottom of the sign is 7 feet above the curb or crown of the pavement, and the edge of the sign adjacent to the curb is not less than 12 inches back from the face of the curb.

The One Way Sign shall also be placed parallel to the one-way street opposite the exit from streets, alleys and other publicly accessible places. Turn Prohibition Signs may be used, when applicable, to supplement One Way Signs.

NO PASSING

R-228

24" x 24"

This sign may be erected on two-lane and three-lane highways where sight distance is restricted and where passing is hazardous. It shall be erected only on sections of highways which have officially been designated as No Passing Zones. See Section 1112.1 of The Vehicle Code. Such signs shall be placed at intervals not greater than 1/8 of a mile (660 feet) throughout the restricted section.

When No Passing Zone Signs are erected, pavement markings shall be altered, if necessary, to supplement these signs. Where needed, No Passing Zone Ahead Signs, R-297, may be used in advance of the established zone.

END NO PASSING ZONE

R-229

20" x 24"

This sign shall be erected at the end of an officially designated No Passing Zone to inform the motorist that he is leaving the restricted section. It shall be placed not greater than 1/8 of a mile (660 feet) beyond the last sign in the restricted section.

TYPICAL LOCATIONS
ONE WAY SIGNS

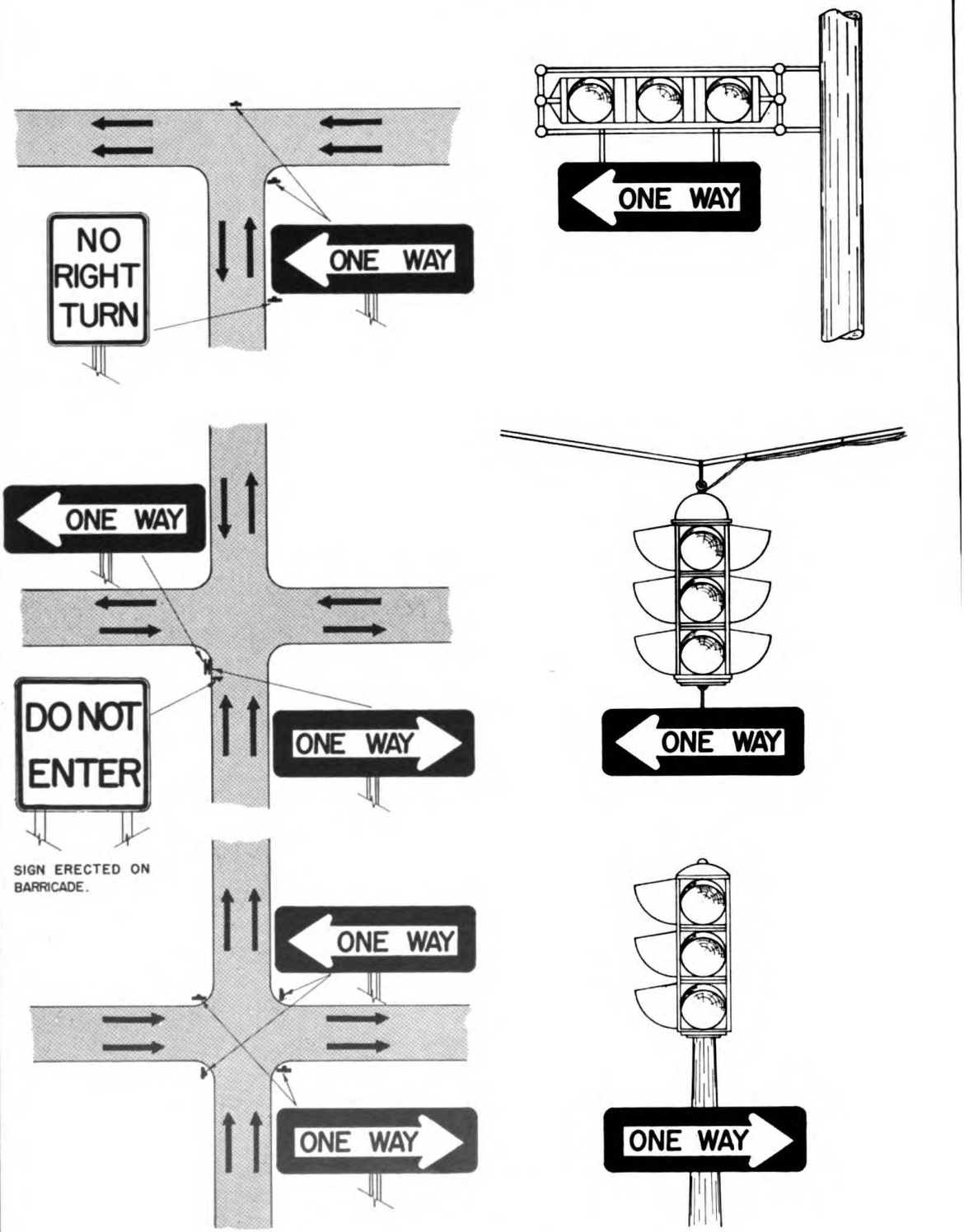
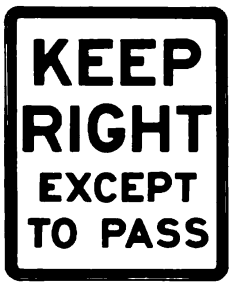


FIGURE 28

KEEP RIGHT EXCEPT TO PASS

R-230

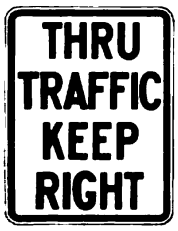


24" x 30"

This sign may be used on multiple lane highways where the motorist is required to keep in the right lane except when passing. It shall be erected 300 feet to 500 feet from the beginning of the multiple lane highway and at locations where there is a tendency, on the part of the motorist, to drive on the inside lane, or lanes, when not passing.

THRU TRAFFIC KEEP RIGHT

R-231



18" x 24"

This sign may be used on three-lane and four-lane highways in advance of channelized intersections, or in conjunction with pavement markings at intersections and other locations where it is necessary to advise through traffic to keep right to guide them to their traffic route or to avoid a left turning lane.

This sign shall be erected on the right side of the highway facing traffic, 100 feet to 300 feet in advance of the locations where it is desired to direct through traffic to the right.

KEEP RIGHT

R-232 and R-233

12" x 18"
24" x 24"

This sign may be used at locations where there are a series of vertical curves, obstructions in the roadway, channelized intersections, and three-lane and four-lane highways where motorists tend to violate the regulations which require them to stay on the right side of the highway. It shall be erected at or in advance of the location where traffic shall keep right.

WALK ON LEFT FACING TRAFFIC

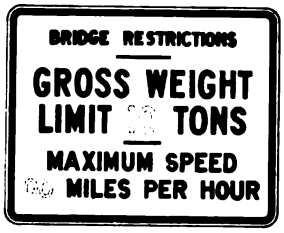
R-235

18" x 24"

This sign may be used to encourage safer pedestrian habits on highways in communities, small boroughs, etc., usually at the outskirts of built-up areas where sidewalks end and pedestrians must walk on the road shoulder. The sign should be erected so the bottom edge will be 30 inches above the crown of the pavement on the right side of the highway.

BRIDGE RESTRICTION GROSS WEIGHT MAXIMUM SPEED

R-236



24" x 30"

This sign shall be used to notify the motorist of a bridge or structure with a limited capacity of 15 tons or less. This sign shall be located on the right side of the highway in a conspicuous place 50 feet to 100 feet in advance of the bridge or other structure to which the restriction applies. If necessary, a supplementary sign may be mounted upon the structure.

CROSS ON GREEN LIGHT ONLY

R-239

12" x 18"

This sign may be used to aid pedestrians in busy urban areas, desiring to cross at signalized intersections. The sign should be located on the far side of the roadway facing pedestrians wishing to cross. The bottom edge of the sign shall be approximately 7 feet above the curb or crown of the pavement. If the sign is mounted on a post supporting a traffic signal, care should be taken to provide adequate pedestrian head clearance.

RIGHT TURN KEEP MOVING

R-241

24" x 30"

This sign may be used to supplement the traffic signal indication at signalized intersections where a special right turn green arrow has been provided to permit such movement of traffic. It may also be used at entrance ramps, merging lanes, traffic circles and channelized intersections to expedite certain movements of traffic.

This sign should be located on the far right side of the signalized intersection facing traffic with the bottom edge of the sign approximately 7 feet above the curb or crown of the pavement. If necessary, an additional sign may be erected in the same manner on the near right side of the road 25 feet to 50 feet in advance of the actual turn.

When erected in rural areas on entrance ramps, merging lanes, traffic circles and channelized intersections, the sign should be placed 50 feet to 150 feet in advance of the actual turn so the bottom edge of the sign is 30 inches above the curb or crown of the pavement.

RIGHT TURN ONLY

R-242

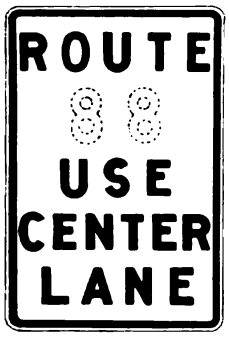
18" x 24"

This sign shall be used at intersections with one-way streets where only right turns are permitted. It shall also be used at channelized intersections where separate lanes are provided for the right turn movement. It shall not be used at intersections where traffic is permitted to move straight through in addition to making a right turn.

This sign shall be located in the near right, or far right, corner of the intersection or just in advance of established right turn lanes.

ROUTE (88) USE CENTER LANE

R-245



24" x 36"

This sign may be used on three-lane highways in advance of intersections in conjunction with pavement markings at locations where the motorist must use the center lane, to continue on, or as a guide to a traffic route. This sign shall be erected on the right side of the highway facing traffic 300 feet to 500 feet in advance of the location where it is desired that traffic move to the center lane.

THRU TRAFFIC KEEP MOVING

R-246

24" x 30"

This sign may be used at locations where channelization, turning movements, or other conditions might cause the motorist, wishing to continue through the intersection, to slow down or stop altogether. It should be used particularly at high volume-density intersections and shall be located in advance of the point where congestion would develop rapidly if traffic did not keep moving.

TURN RIGHT ON GREEN ARROW WITH CAUTION

R-247

24" x 30"

This sign may be used at signalized intersections where a special right turn green arrow has been provided to permit such movement of traffic. It may be used at intersections where there are special traffic signal control problems, and it should be located under the signal head or on the far right side of the intersection facing traffic. The bottom edge of the sign shall be 7 feet above the curb or crown of the pavement. Auxiliary signs may be erected in the same manner on the near right side, or 25 feet to 50 feet in advance of the intersection.

NO DUMPING

R-249

12" x 18"

This sign may be used to give notice that dumping rubbish on the right-of-way of a highway is prohibited. It shall be erected parallel to the highway along the shoulder at those points where rubbish is being dumped. The bottom edge of the sign shall be 30 inches above the crown of the pavement.

PENALTY FOR VANDALISM OF ROADSIDE PLANTING

R-250

12" x 18"

This sign, where warranted, may be erected in parks, or medial strips, on shoulders along the highway and at locations which have been landscaped. It should be conspicuously located, parallel to the highway. The bottom edge of the sign shall be 30 inches above the crown of the pavement.

PARKING SIGNS

R-251 to R-281

R-252
12" x 18"

Standard Parking Signs cover a wide range of regulations but in general are classified as (1) Parking Prohibition; (2) Parking Restriction.

Parking Prohibition signs are used to designate areas where parking is not permitted at any time. They are identified by a red border and lettering on a white background. See typical example, R-252.

R-273
12" x 18"

Parking Restriction signs are used to designate areas where parking is prohibited or permitted at specified times. The signs used to prohibit parking only during certain periods are identified by red border and lettering on a white background. See typical example, R-273.

R-261
12" x 18"

The signs used to permit parking only during certain periods are identified by green border and lettering on a white background. See typical example, R-261.

R-251
12" x 24"

At certain locations parking may be prohibited during certain periods but permitted during other periods. Signs for such locations are identified by both red and green borders and lettering on a white background. The upper portion of the sign (red on white) will always display the parking prohibition, while the lower portion (green on white) will display the parking restriction. See typical example, R-251.

At certain locations where parking is prohibited by The Vehicle Code, signs are not necessary. Such locations are listed as follows:

1. **Within an intersection.**
2. **Within 25 feet from the intersection of curb lines or, if none, within 15 feet of the intersection of property lines at highway intersections.**
3. **Within 15 feet of a fire hydrant.**
4. **Within 15 feet of a driveway entrance to any fire station.**
5. **Within 50 feet of the nearest rail of a railroad crossing.**
6. **On a sidewalk or crosswalk.**
7. **Within 30 feet on the approach to a traffic signal or Stop Sign.**

It is often desirable to prohibit parking farther than these designated minimum distances. When this is done, official signs shall be erected.

Because signs are not required to enforce parking within the minimum distances shown in the above seven locations, curbs may be painted yellow to identify the limits of these sections to the motorist. Curbs may also be painted yellow at locations where signs are used if parking is prohibited at all times.

The parking or standing of vehicles shall be prohibited where official signs have been erected at right angles to the roadway.

With few exceptions these signs shall be erected at each end of the section where the parking restriction is effective. To permit unrestricted visibility in business and residential areas, parking signs shall be erected at intervals of approximately 100 feet. In rural areas where visibility is not restricted, parking signs shall be erected at intervals of 150 feet to 300 feet. Parking Signs shall be erected not less than 12 inches back from the curb and the bottom edge of the sign shall not be less than 7 feet above the curb or crown of the pavement.

On one-way streets, supplementary parking signs may be erected on the left side of the street if required.

The following is a list of the official Parking Signs which have been approved for use along all highways. No other signs may be legally used. Letters or numerals in the message which are shown in italics can be changed to meet local requirements. The design of any other sign required which is not included below should be requested from the Secretary of Highways.

Standard	Name of Sign	Size
R-251	*2* Hour Parking Weekdays—No Parking Sundays and Holidays	12" x 24"
R-252	No Parking Any Time	12" x 18"
R-253	No Parking This Side	12" x 18"
R-254	No Parking Between Signs	12" x 18"
R-255	No Parking Here To Corner	12" x 18"
R-256	No Parking—Loading Zone	12" x 18"
R-257	No Parking *8:30* A.M. to *5:30* P.M.	12" x 18"
R-258	*30* Min. Parking *8:30* A.M. to *5:30* P.M.	12" x 18"
R-259	Parking ONE Hour	12" x 18"
R-260	TWO Hour Parking *8* A.M. to *6* P.M.—Except Sundays	12" x 18"
R-261	*2 Hrs.* Parking *9:00* A.M. to *6:00* P.M.	12" x 18"
R-262	Parking *15* Minutes	12" x 18"
R-263	No Parking School Hours	12" x 18"
R-264	3 HR. Parking *8 A.M.* to *8 P.M.*—Except Sunday	12" x 18"
R-265	*15* Min. Parking *8:00* to *9:30* A.M.—*4:30* to *6:00* P.M.	12" x 18"
R-266	No Parking *8:00* to *9:30* A.M.—*4:30* to *6:30* P.M.	12" x 18"
R-267	*1* HR. Parking *6 P.M.* to *10 P.M.—Fri.—Sat. Only*	12" x 18"
R-268	No Parking On Bridge	12" x 18"
R-269	No Parking Loading Zone *8* A.M. to *6* P.M.	12" x 18"
R-270	1 HR. Parking *8:00 A.M.* to *8:00 P.M.*—Except Sundays and Holidays	12" x 18"
R-271	No Truck Parking In This Block	12" x 18"
R-272	No Parking Taxi Stand	12" x 18"
R-273	No Parking *10 A.M.* to *2 P.M. Sunday Only*	12" x 18"
R-274	Parking *TWO* Hours	12" x 18"
R-275	*30 Min.* Parking *A.M.* to *P.M.* Except Sunday	12" x 18"
R-276	No Parking *12 Midnight Sundays* to *7 A.M. Mondays*	12" x 18"
R-277	No Parking *7:30 A.M.* to *6:00 P.M.*—Except Sundays and Holidays	12" x 18"
R-278	*1* Hour Parking *8 A.M.* to *6 P.M.*—Saturday *8 A.M.* to *9 P.M.*	12" x 18"
R-279	No Parking *2 A.M.* to *6 A.M.*—*1* Hour Parking *8 A.M.* to *6 P.M.*	12" x 24"
R-280	No Parking *9 A.M.* to *7 P.M.*—Saturday *9 A.M.* to *10 P.M.*	12" x 24"
R-281	No Parking Police Cars Only	12" x 18"
R-282	No Parking on Sidewalk	12" x 18"

ONE (TWO) WAY TRAFFIC AHEAD

R-283

24" x 30"

This sign shall be erected on the right side of the highway in a conspicuous place 50 feet to 100 feet in advance of the location where the restriction applies. If required, the message may be altered to read Two-Way Traffic Ahead.

SPECIAL NO LEFT TURN RESTRICTION

R-284

18" x 24"

This sign shall be used where left turns are prohibited only during certain hours of the day. It should be erected on the near or far right corner of the intersection where the restriction applies.

NO FISHING FROM BRIDGE

R-285

12" x 18"

This sign may be erected on each end of the bridge or immediately in advance of the end of the bridge, facing the pedestrian or motorist. It may be erected on the bridge itself, at reasonable intervals depending on the length of structure. Care shall be taken, however, so that the left edge of sign does not extend over the edge of the roadway and/or wheelguard. Where there is a crosswalk on the bridge, adequate pedestrian head-clearance shall also be provided.

TRUCK TRAFFIC USE (CENTER) LANE

R-286

24" x 36"

This sign may be used on three-lane and four-lane highways in advance of channelized intersections or in conjunction with pavement markings at intersections, steep grades, and other locations where it may be necessary for truck traffic to move to a specified lane. The sign shall be erected on the right side of the highway facing traffic, 100 feet to 300 feet in advance of the location where it is desired that truck traffic move to the specified lane.

NO PASSING ON RIGHT

R-287

24" x 30"

This sign may be used in advance, at or throughout locations where there has been or there is a tendency on the part of the motorist to pass on the right. Examples of such locations are loading zones in urban areas, grades where there are wide berms and other locations where it is hazardous for both pedestrians and motorists alike.

STOP PAY TOLL

R-288

24" x 30"

This sign should be conspicuously placed at or in advance of the entrance to a highway or bridge where it is necessary for the motorist to stop and pay a toll.

DO NOT ENTER

R-290

24" x 24"

This sign shall be erected in a conspicuous location at the end of a one-way roadway, street, or ramp, to prohibit traffic from entering. It shall be erected at the entrance to the restricted section on the right side of the roadway facing traffic entering the roadway in the wrong direction.

MAXIMUM GROSS WEIGHT (10) TONS

R-291

18" x 24"

This sign may be used as an intermediate sign within a restricted weight zone which has been designated with Road Restriction Signs, R-294, or it may be used to supplement Bridge Restriction Signs, R-236. It shall be placed, if required, on the right side of the highway facing traffic at appropriate locations along the restricted route.

PLAY STREET

R-292

18" x 24"

This sign shall be used to post any official designated highway, or section or highway as a "Play Street." The sign shall specify the hour or hours such highway or section of highway is closed to general traffic. It shall be erected at each end of such restricted section of highway not over 25 feet inside the restricted zone, and at all intersections within the zone.

KEEP OFF SEEDED

R-293

12" x 18"

This sign may be erected where warranted in parks, on median strips or shoulders along the highway, and at other locations which have been seeded. It shall be conspicuously located, usually parallel to the highway and shall be erected in accordance with the general specifications for the erection of Regulatory Signs.

TRUCKS PROHIBITED EXCEPT FOR LOCAL DELIVERIES

R-294

24" x 30"

This sign may be used to post certain highways which have been officially restricted to prohibit the operation of trucks on such highway, except for those trucks making local deliveries within the restricted area. It shall be erected at each end of the restricted section, not over 50 feet inside the restricted zone.

SCHOOL BUS STOP

R-295

12" x 18"

This sign shall be erected at officially established school bus loading zones along the highways traversed by school buses. It shall be placed only outside business and residential districts. This sign shall be erected along the highway, facing traffic, indicating the actual point where the school bus shall stop to receive or discharge school children. Where required, signs shall be erected at a given location, on both sides of the highway.

SCHOOL BUS WARNING

R-296

36" x 36"

This sign shall be erected on Traffic Routes along our State line at various points of entry into Pennsylvania to inform motorists that they are prohibited from passing school buses when they are loading or unloading school children. It shall be erected 100 feet to 500 feet from the State Line, on the right side of the highway facing approaching traffic from the adjoining State. The bottom edge of the sign shall be not less than 30 inches above the crown of the pavement and the edge of the sign not more than 10 feet from the edge of the roadway.

NO PASSING ZONE AHEAD

R-297

36" x 48"

This sign may be erected in advance of an officially designated No Passing Zone to inform motorists that they are entering the restricted section. It shall be erected on the right side of the highway facing traffic 300 feet to 500 feet in advance of the restricted section.

CENTER LANE LEFT TURN ONLY

R-298

24" x 30"

This sign shall be used on three-lane highways or in advance of channelized intersections to supplement pavement markings at intersections or other locations where it may be necessary to restrict the center lane for left turn movements. Left turn lanes should not be established, on three-lane highways, unless there is actually a heavy left turn movement. This sign shall be erected on the right side of the highway facing traffic 100 feet to 300 feet in advance of the location where traffic is required to move to the center lane.

WARNING SIGNS

GENERAL USE

Warning Signs shall be used for the purpose of warning traffic of hazardous conditions either on or adjacent to the highway. Warning Signs require caution on the part of the motorist and generally call for a reduction of speed. Adequate Warning Signs are of great assistance to the vehicle operator and are valuable in safe-guarding and expediting traffic.

Typical locations and hazards which may warrant the use of Warning Signs are as follows:

1. **Turns**
2. **Curves**
3. **Intersections**
4. **Advance Warnings of Stop Signs or Traffic Signals**
5. **Grades**
6. **Changes in pavement widths**
7. **Railroad Grade Crossings**
8. **School Zones**
9. **Other hazardous conditions**

The use of Warning Signs should be kept to a minimum as too frequent use will tend to breed disrespect for all signs. All Warning Signs must be erected in strict accordance with the regulations set forth in this Manual. This will produce uniform signing under like conditions throughout the Commonwealth. If Warning Signs other than those listed in this Manual are required, the approval of the Secretary of Highways shall be obtained before they may be used.

DESIGN

Warning signs convey their message by legend or symbol, color and shape. All signs are diamond-shape with the exception of the Railroad Advance Warning Sign which is circular; the large Arrow Sign which is rectangular and the Advisory Speed Sign which is square. The Clearance Sign, W-228, has a white background with a black message. All other Warning Signs have a yellow background with black border and symbol or message. All signs with few exceptions are reflectorized. These exceptions are signs which have only daytime significance such as: School, Park Entrance, etc.

All Warning Signs shall be 30″ x 30″ with the exception of a few signs such as: Church, School and Hospital. Where hazardous conditions warrant the use of larger Warning Signs, the appropriate sign may be enlarged to the desired size in proportion to the standard sign.

LOCATION

Since Warning Signs are placed primarily for the protection of the driver who is not acquainted with the road, it is very important that thought be given to their location and erection. Although this Manual specifies the distance at which signs shall be placed in advance of hazards, there may

be instances where physical conditions will require different distances. Trial runs should be made by day and night to determine the most effective location and erection characteristics for each installation. In cities where speeds are relatively low, Warning Signs shall be placed nearer to the point of hazard (150 feet to 300 feet) than that specified for rural highways.

In Rural and Residential Districts, where parking is restricted, Warning Signs shall be erected not less than 6 feet and not more than 10 feet from the edge of the pavement or the roadway. The center of the sign shall not be less than 42 inches above the crown of the roadway. Figure 29, shows a typical installation.

In Residential and Business Districts, where parking is frequent, Warning Signs shall be erected so the center of the sign is not less than 8 feet above the top of the curb, or crown of the pavement and the edge of the sign adjacent to the curb is not less than 12 inches back from the face of the curb. Figure 30 shows a typical installation.

All signs smaller than 4′ x 6′ shall be placed 90 degrees to the roadway. Larger signs shall be angled away from the roadway as shown in Figure 31. This position will prevent the occurrence of a glare on the sign as the motorist approaches it, but will not reduce its reflective qualities.

Warning Signs are mounted on single Channel Bar Posts. Oversize Warning Signs, that is, 4′ x 4′, or larger, shall be mounted on two or more Channel Bar or wooden posts. Figure 32, shows typical installations for Warning Signs in rural areas.

DETAILS OF SIGNS

RIGHT TURN

W-201

30″ x 30″

This sign shall be used to mark sharp curves bearing to the right having a curvature of 28 degrees or over, and to mark other curves having a curvature of 15 degrees to 27 degrees where the central angle exceeds 45 degrees. Figure 33 shows the method of measuring curvature. An alternate method of determining the use of the Turn Sign is with the Ball Bank Indicator. Any curve shall be marked with a Turn Sign when the Ball Bank Indicator (See Figure 34) shows a bank of 10 degrees or more, at speeds less than 31 miles per hour. For instructions on proper use of the Ball Bank Indicator, refer to page 249. The Turn Sign shall be erected not less than 300 feet or more than 500 feet in advance of the beginning of the turn. On extremely sharp curves, or right angle turns, it is often desirable to use Warning Arrow Sign, W-216, at the point of the turn. See Figure 35.

WARNING SIGNS
HEIGHT AND LATERAL LOCATION IN RURAL AREAS

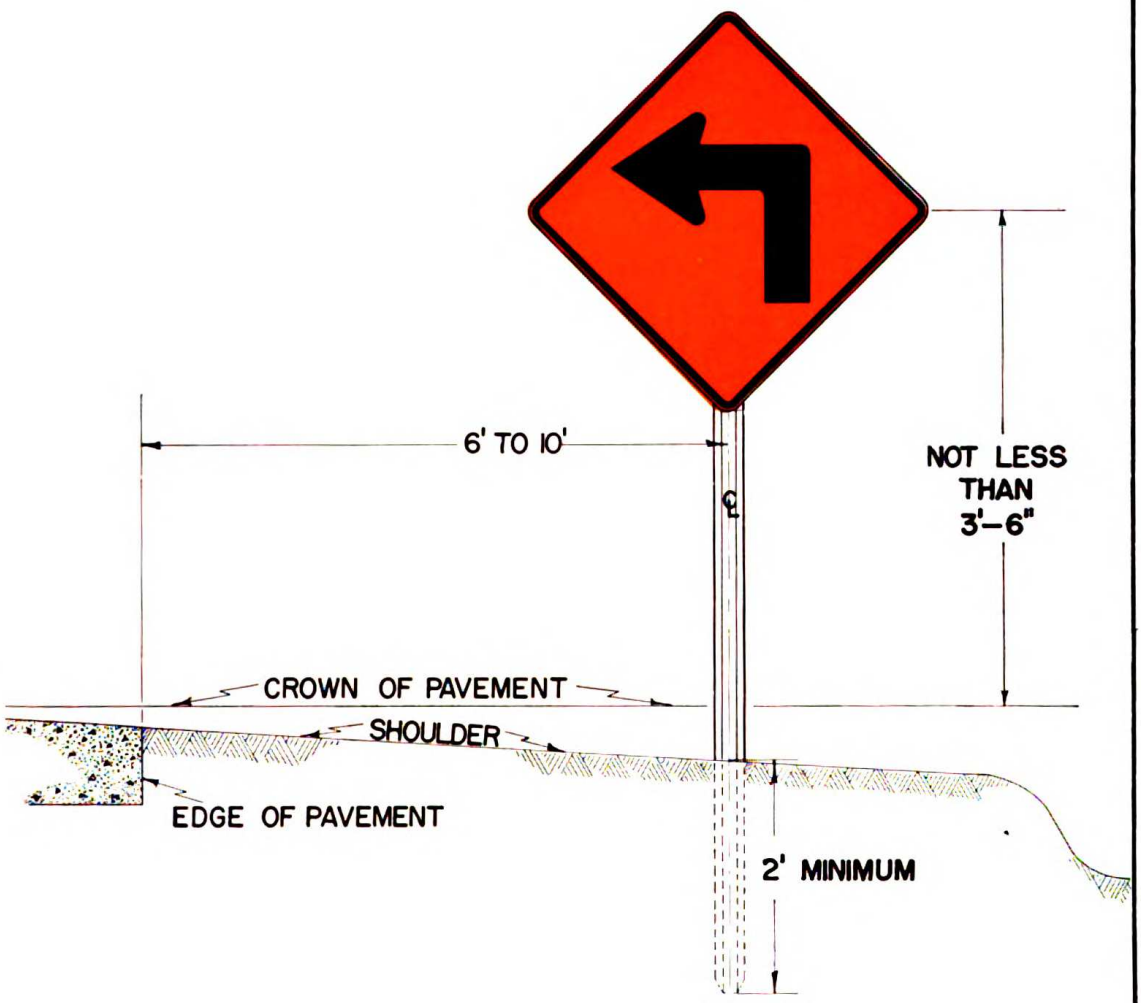


FIGURE 29

WARNING SIGNS
HEIGHT AND LATERAL LOCATION IN URBAN AREAS

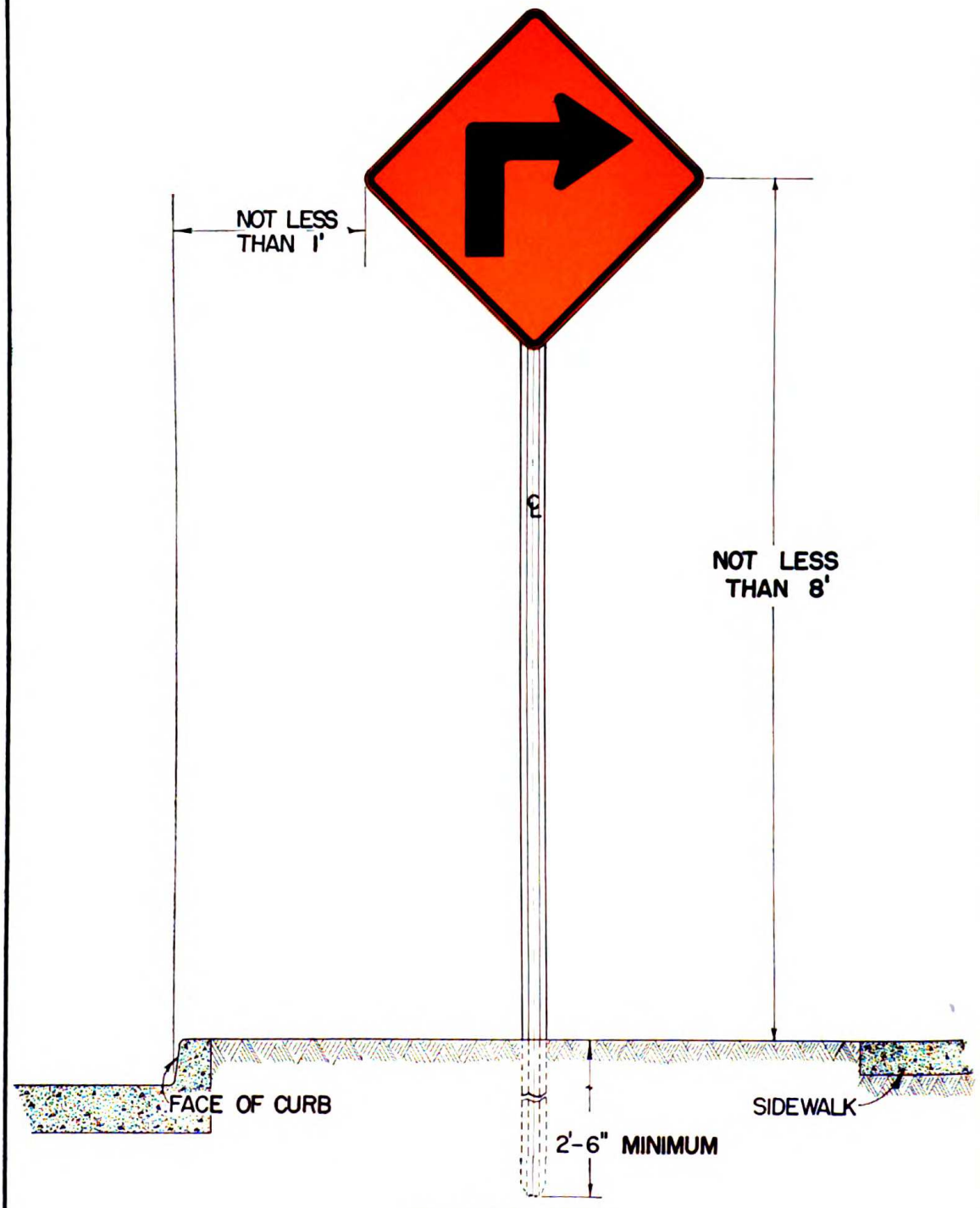


FIGURE 30

ALIGNMENT OF SIGNS WITH RESPECT TO PAVEMENT

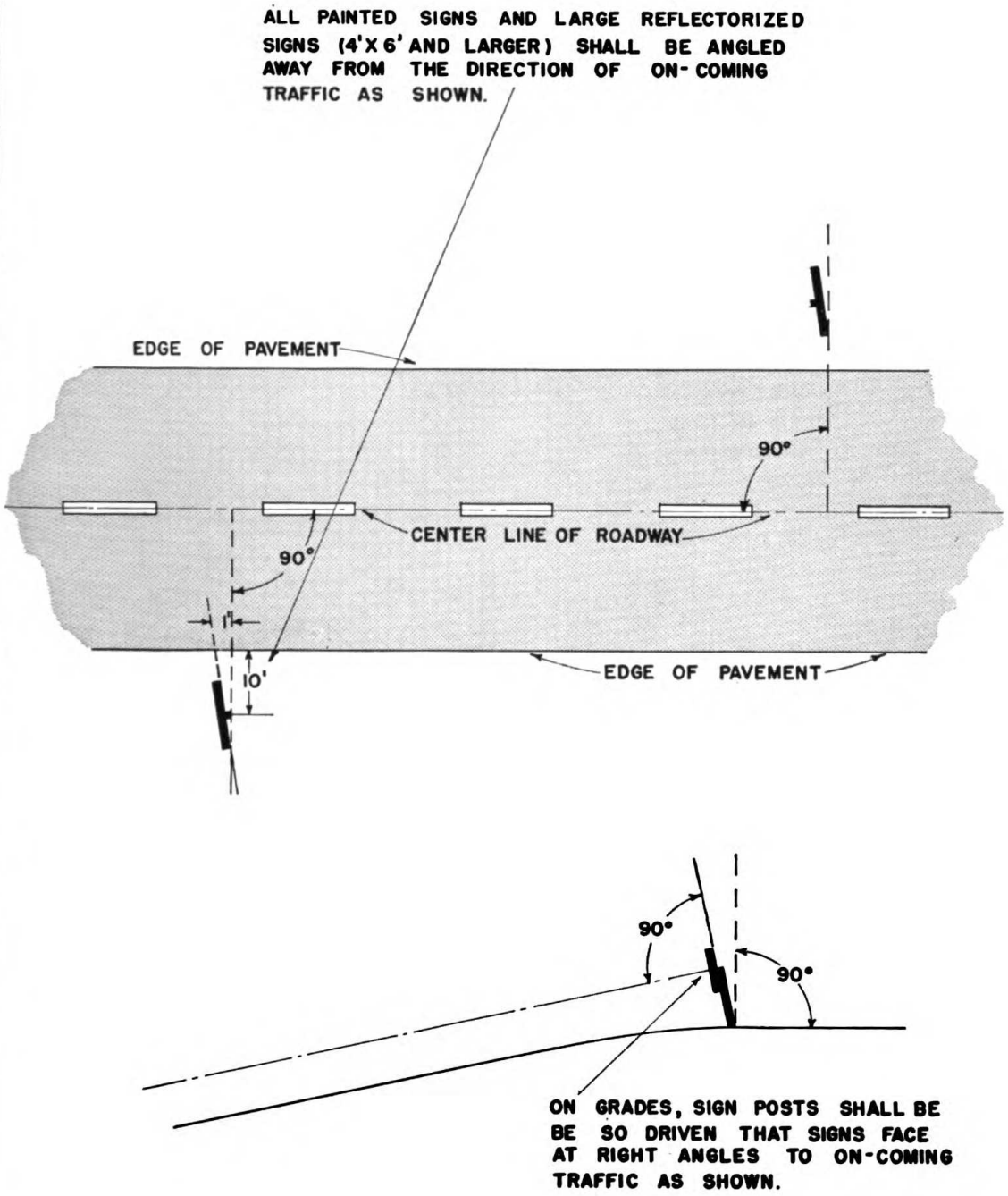


FIGURE 31

TYPICAL INSTALLATION OF WARNING SIGNS

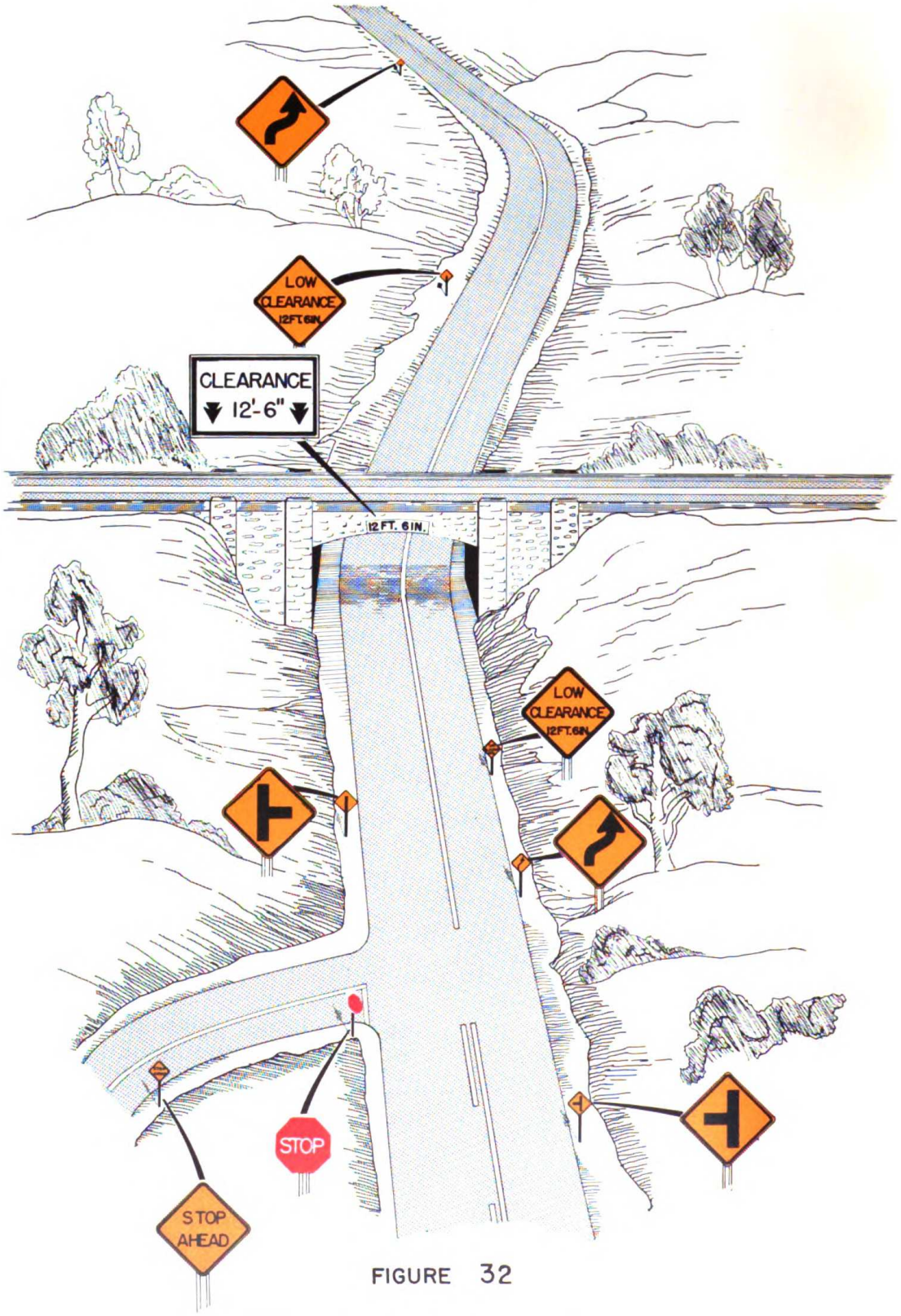


FIGURE 32

LEFT TURN

W-202

30" x 30"

This sign shall be placed on sharp curves bearing to the left in accordance with the method described for Right Turn Sign, W-201.

RIGHT CURVE

W-203

30" x 30"

This sign shall be used to mark a right-hand curve having a central angle of less than 45 degrees and a curvature of from 4 degrees to 28 degrees, and to mark all other curves having a curvature between 4 degrees and 15 degrees and a central angle greater than 45 degrees. Refer to Figure 33 for the method of measuring curvature. An alternate method of determining the use of the Right Curve Sign can be made by using the Ball Bank Indicator. It shall be erected if the Ball Bank Indicator reading is 10 degrees or more at speeds between 31 and 50 miles per hour. If the curvature exceeds the above limits, a Turn Sign, W-201 or W-202, shall be used. Curves not meeting these requirements, should not be posted with a curve sign unless other conditions warrant it. The Right Curve Sign shall be erected not less than 300 feet nor more than 500 feet in advance of the beginning of the curve. Additional protection may be provided by the use of Safe Speed Sign, W-267.

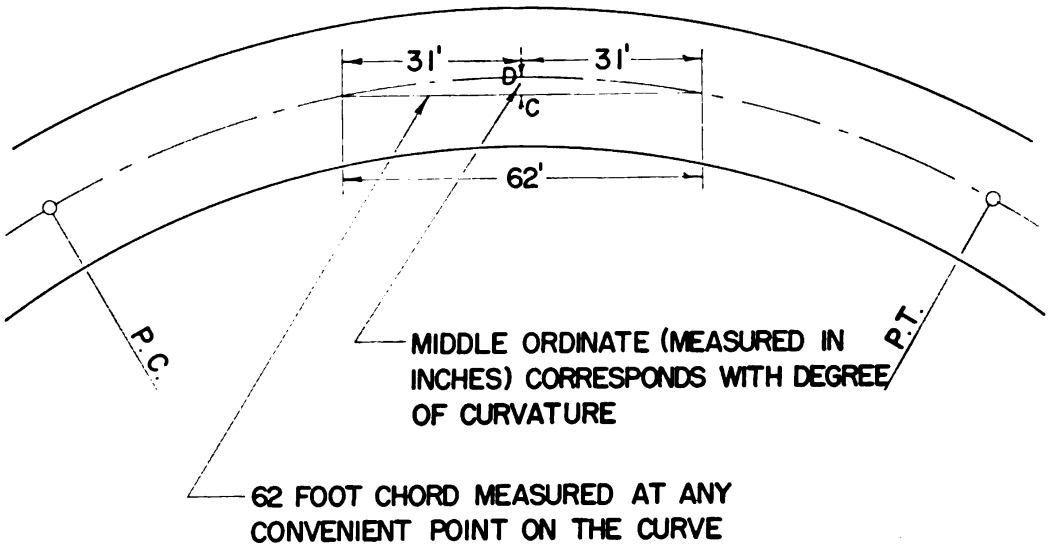
LEFT CURVE

W-204

30" x 30"

This sign shall be placed on curves bearing to the left in accordance with the method described for the Right Curve Sign, W-203.

METHOD OF DETERMINING CURVATURE



CENTRAL ANGLE MAY BE DETERMINED BY MULTIPLYING THE LENGTH OF CURVE FROM P.C. (BEGINNING OF CURVE) TO THE P.T. (END OF CURVE) BY THE DEGREE OF CURVATURE (AS FOUND ABOVE) AND DIVIDE THAT PRODUCT BY 100'

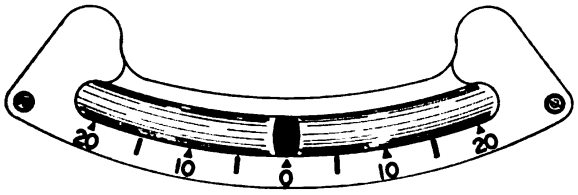
EXAMPLE

$$\text{CENTRAL ANGLE} = \frac{500' \text{ (LENGTH OF CURVE)} \times 5° \text{ (IN. AT MIDDLE ORDINATE)}}{100'} = 25°$$

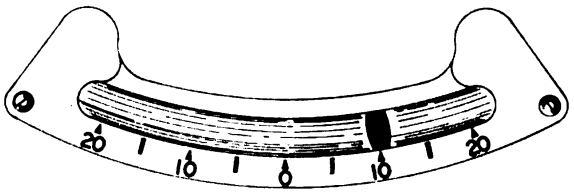
DEGREE OF CURVATURE	RADIUS OF CURVE (FEET)	CENTRAL ANGLE (°)	SIGN REQUIRED
0°-3°	2000' AND OVER	ALL	NONE
4°-14°	400' TO 1500'	ALL	CURVE
15°-27°	200' TO 400'	UNDER 45°	CURVE
15°-27°	200' TO 400'	45° & OVER	TURN
28° AND OVER	UNDER 200'	ALL	TURN

FIGURE 33

BALL BANK INDICATOR



ZERO POSITION



INDICATES 10° LEFT BANK

SPEED	BALL BANK IND. READING	SIGN
31 M.P.H. OR LESS	10° OR OVER	TURN
31 TO 50 M.P.H.	10° OR OVER	CURVE

FOR INSTRUCTIONS ON THE PROPER USE OF THE BALL BANK INDICATOR SEE APPENDIX.

FIGURE 34

RIGHT REVERSE CURVE

W-205

30" x 30"

This sign shall be used where two consecutive curves in opposite directions are separated by a tangent of less than 400 feet and where the first of these two curves bears to the right. The degree of curvature of both curves shall meet the warrants as defined under the Right Curve Sign, W-203. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the first curve. For additional protection, the Safe Speed Sign, W-267, may be used.

LEFT REVERSE CURVE

W-206

30" x 30"

This sign shall be placed in advance of consecutive curves as described above for Right Reverse Curve, W-205, where the first curve bears to the left.

RIGHT REVERSE TURN

W-207

30" x 30"

This sign shall be used where two consecutive turns in opposite directions are separated by a tangent of less than 400 feet and where the first of the two turns bears to the right. The degree of curvature of both turns shall meet the warrants as defined under the Right Turn Sign, W-201. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the first turn. For additional protection the Safe Speed Sign, W-267, may be used.

LEFT REVERSE TURN

W-208

30" x 30"

This sign shall be placed in advance of consecutive turns as described above for Right Reverse Turn, W-207, where the first turn bears to the left.

RIGHT WINDING ROAD

W-209

30" x 30"

This sign shall be used where there exists a series of five or more successive turns or curves separated by a tangent of less than 400 feet and where the first turn bears to the right. The turns or curves must meet the warrants as defined for the Right Turn Sign, W-201, and Right Curve Sign, W-203. Where there are fewer than five curves in succession, one or more of the Right Reverse Turn Sign, W-207 or the Right Reverse Curve Sign, W-205, shall be used. The Right Winding Road Sign shall be erected at the beginning of the first series of curves. In advance of this sign, not less than 300 feet nor more than 500 feet, a Turn or Curve Sign shall be erected showing the direction of the first curve to be to the right.

30" x 30"

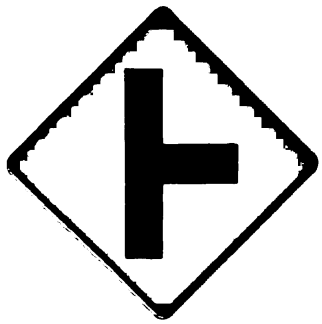
LEFT WINDING ROAD

W-210

This sign shall be placed in advance of successive turns or curves as described above for the Right Winding Road, W-209, where the first turn or curve bears to the left.

"T" AND SIDE ROAD INTERSECTION

W-211



30" x 30"

This sign shall be used on main highways to indicate either "T" or Side Road intersections. Its use should be restricted to intersections where the side road carries a fairly large volume of traffic or where unusual features exist such as: poor sight distance or obscured entrances. It should not ordinarily be used where Junction Signs or Turn Markers are present.

As a Side Road symbol, this sign shall be used in advance of only those side roads which intersect the main highways at right angles from either the right or left side. As a "T" symbol, this sign shall be used to warn traffic approaching a "T" intersection on the highway forming the stem of the "T", i.e., where traffic must turn either to the right or left. The "T" symbol sign shall not generally be

used on an approach where traffic is required to stop before entering the intersection, unless it is justified by a high accident frequency or some unusual physical condition.

This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the intersection.

CROSSROAD INTERSECTION

W-212

30" x 30"

This sign shall be used on main highways to indicate the presence of a crossroad. Its use should be restricted in accordance with the warrants set forth under the "T" and Side Road Intersection Sign, W-211. Too frequent use of the Crossroad Sign should be avoided. It shall be erected not less than 300 feet nor more than 500 feet in advance of the intersection.

"Y" INTERSECTION

W-213

30" x 30"

This sign shall be used to warn the motorist he is approaching a "Y" Intersection on the highway forming the stem of the "Y". It shall be used only when the branching roads forming the "Y" are of equal importance. It shall not be used at a "Y" Intersection which is channelized by traffic islands nor, generally, where Route Marker Junction Signs or Turn Markers are present. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the intersection.

RIGHT SIDE ROAD INTERSECTION

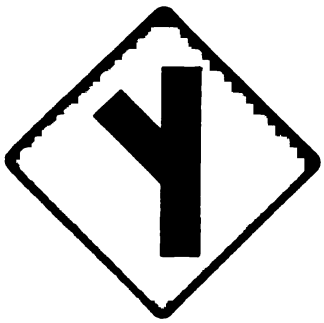
W-214

30" x 30"

This sign shall be used to warn traffic approaching an oblique angle intersection where the intersecting highway branches to the right. Its use should be restricted in accordance with the warrants set forth under the "T" and Side Road Intersection Sign, W-211. It shall be erected not less than 300 feet nor more than 500 feet in advance of the intersection.

LEFT SIDE ROAD INTERSECTION

W-215

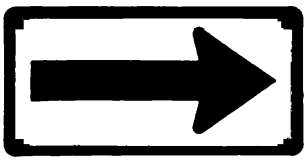


30" x 30"

This sign shall be used to warn traffic approaching an oblique angle intersection where the intersecting highway branches to the left. Its use should be restricted in accordance with the warrants set forth under the "T" and Side Road Intersection Sign, W-211. It shall be erected not less than 300 feet nor more than 500 feet in advance of the intersection.

LEFT OR RIGHT ARROW

W-216

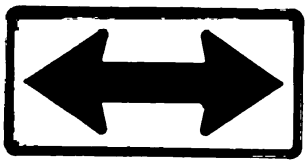


20" x 40"

This sign shall be used to give notice of a sharp change in alignment. It should be used on all curves where the curvature is 28 degrees or more and on all curves having a curvature of from 15 degrees to 27 degrees where the central angle exceeds 45 degrees. (See Figure 33 for method of measuring curvature.) It shall be erected at the point of turn on the outside of the curve. See Figure 35. However, the best location should be selected by making trial runs by day and night. This sign shall not be erected at the ends of medial strips, center piers, etc., where there is no change in the direction of travel.

JUNCTION ARROW

W-217



20" x 40"

This sign may be erected at "T" and "Y" Intersections which have proved hazardous. It shall not be used to mark the ends of medial strips, center piers, etc., where there is no change in the direction of travel. It shall be located on the far side of the intersection at right angles to the direction of travel.

TYPICAL SIGNING OF SHARP CURVES

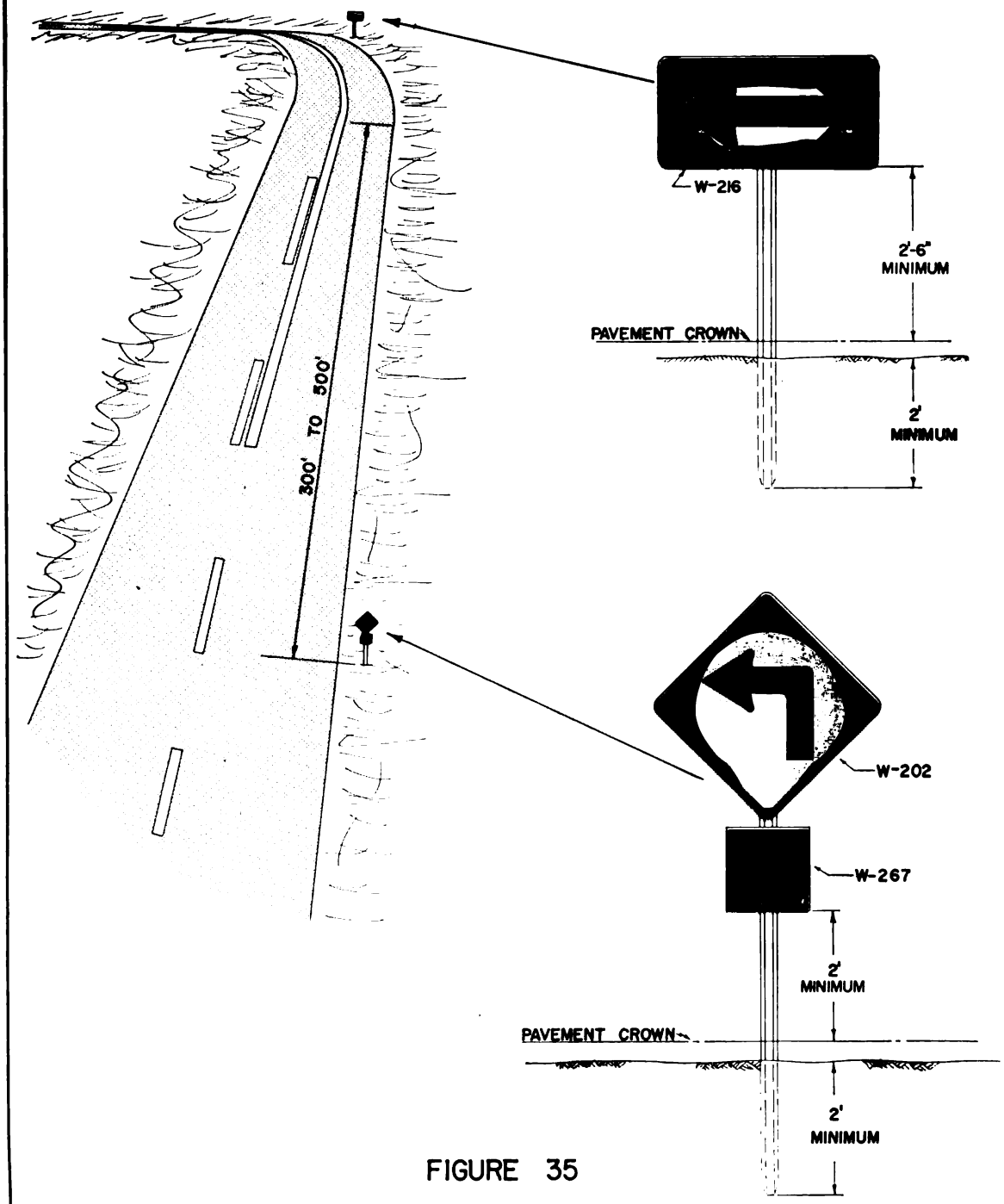
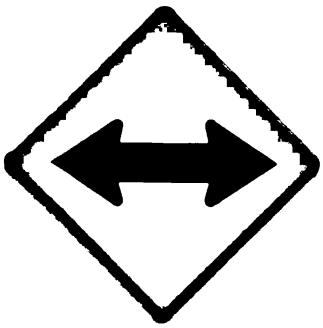


FIGURE 35

DOUBLE ARROW

W-218



30" x 30"

This sign may be used at loading and refuge islands, traffic islands, and obstructions in the roadway where traffic is permitted to pass on either side of the island or obstructions. It shall be mounted on the approach ends or just in front of the island or obstruction, or as close thereto as is practical. In some instances where an obstruction in the line of traffic is likely to be obscured by vehicles, two signs may be needed—one mounted directly above the other. The center of the upper sign should be not less than 8 feet above the crown of the roadway.

SLOW

W-219

30" x 30"

This sign shall be used only to emphasize a condition where the usual standard Warning Sign indicating the nature of the hazard has already been erected. It shall never be used except as an advance warning sign indicating a hazardous condition where unusual caution is required, such as road construction, abrupt changes in alignment, dangerous intersections, heavy pedestrian crossings, etc. It shall be erected not less than 300 feet nor more than 500 feet in advance of the warning sign which designates the actual hazard.

HILL

W-220

30" x 30"

This sign shall be used only in advance of descending grades of 6 percent or more for the lengths given in the following table, or grades of 6 percent or more where any part of the grade is on a curve sharper than 4 degrees. It shall be used under the following conditions:

On a 6-percent grade more than 2,000 feet long;
On a 7-percent grade more than 1,000 feet long;
On an 8-percent grade more than 750 feet long;
On a 9-percent grade more than 500 feet long;
On an 11-percent grade more than 400 feet long;
On a 13-percent grade more than 300 feet long;
On a 15-percent grade more than 200 feet long;
On a grade of 16 percent or more, of any length.

This sign shall be located not less than 300 feet nor more than 500 feet in

advance of the point where a reduction of speed is necessary for safety. Where more emphasis is needed, the Special Background for Warning Signs, W-245, or the Hill—Trucks Use Low Gear Sign, W-255, shall be used.

SIGNALS AHEAD

W-221

30" x 30"

This sign shall be used in advance of any signalized intersection where the prevailing approach speeds are such as to justify an advance warning. It shall also be warranted where lights, or illuminated signs at the intersection may distract the motorists' attention from the traffic signal. This sign shall be erected not less than 200 feet nor more than 500 feet in advance of the intersection.

RAILROAD ADVANCE WARNING

W-222

30" Diameter

This sign shall be placed in advance of all used railroad crossings even if these crossings are protected by signals, gates or flagmen, except in business districts of large cities where the crossings are fully protected and the physical conditions prevent an effective display of the sign. In rural districts this sign shall be erected not less than 300 feet nor more than 500 feet in advance of the crossing. In urban districts, where speeds are relatively low, the sign shall be placed not less than 100 feet in advance of the crossing.

NARROW ROAD

W-223

30" x 30"

This sign shall be used on two-lane highways where the pavement width is reduced abruptly to such a width that two cars cannot safely pass without a reduction of speed. It shall not be used on highways carrying low volumes of traffic even though the pavement is only 16 feet to 18 feet in width. However, the sign shall be used on all highways when pavement widths are less than 16 feet. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the beginning of the narrow road.

UNDERPASS

W-224

30" x 30"

This sign shall be used to warn the motorist of all overhead structures where the minimum clearance is greater than 13 feet. If the clearance is less than 13 feet, then the Low Clearance Sign, W-253, shall be used. The Underpass Sign, shall be erected not less than 300 feet nor more than 500 feet in advance of the overhead structure.

ONE LANE BRIDGE

W-225

30" x 30"

This sign shall be used to mark all bridges having a clear roadway width of less than 16 feet. It may also be used on bridges having roadway widths of less than 18 feet where Commercial Vehicles constitute a high proportion of traffic or where alignment approaching the structure is poor. Additional protection may be provided by painting parapets with diagonal white stripes as shown on standard for Portal and Headwall Markings, Figure 65. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the structure.

NARROW BRIDGE

W-226

30" x 30"

This sign shall be used to indicate a bridge having a clear roadway width of 16 feet to 18 feet, inclusive, or any bridge having a roadway clearance less than the width of the approaching pavement. For additional protection the parapets may be painted with diagonal white stripes as shown on standard for Portal and Headwall Markings, Figure 65. This sign shall be located not less than 300 feet nor more than 500 feet in advance of the structure.

SCHOOL

W-227

24" x 24"

This sign shall be erected only at locations where school buildings or grounds are adjacent to the highway and where passing traffic creates a hazard to school children. It shall be erected not less than 300 feet nor more than 500 feet in advance of the school grounds, or crossings, used by the pupils. See Figure 56.

CLEARANCE

W-228

20" x 40"

This sign shall be used to indicate the exact amount of clearance at low bridges, underpasses, and other overhead structures where the clearance is less than 13 feet. The actual clearance shall be shown on the sign to the nearest inch. This sign shall be mounted overhead, directly above the roadway on the structure, as shown on Figures 62 and 64. This sign shall be used in conjunction with the Low Clearance Sign, W- 253.

36" x 36"

DIVIDED HIGHWAY AHEAD

W-231

This sign shall be used on the approaches to a section of highway where the opposing flow of traffic is separated by a divider. It shall be located not less than 300 feet nor more than 500 feet in advance of the dividing island. See Figure 61.

36" x 36"

DIVIDED HIGHWAY ENDS

W-230

This sign shall be used at the end of a section of divided highway as a warning of two-way traffic ahead. It shall be located not less than 300 feet nor more than 500 feet in advance of the end of the divider.

30" x 30"

PAVEMENT ENDS

W-232

This sign shall be used where a roadway surface changes from a hard surfaced pavement to an unimproved surface or earth road. It shall be erected not less than 300 feet nor more than 500 feet in advance of the end of the hard surfaced pavement.

PAVEMENT NARROWS

W-233

30" x 30"

This sign shall be used to give advance notice of a reduction in the number of lanes of pavement as from three-lane to two-lane, etc. On divided highways, where the width of the divider will permit, two such signs may be erected facing approaching traffic, one on the right side and the other on the divider. These signs shall be erected not less than 300 feet nor more than 500 feet in advance of the point where the reduction in width begins. See Figures 49 and 50.

STOP AHEAD

W-236

30" x 30"

This sign shall be used in advance of a Stop Sign which is not visible for a sufficient distance to permit the driver to bring his vehicle to a stop at the Stop Sign. Obstruction of view, due to horizontal or vertical curves, parked vehicles, or foliage, high approach speeds, all must be considered in determining the need for the erection of this sign. In some cases it may be used for emphasis where there is poor observance of the Stop Sign. The Stop Ahead Sign shall be erected not less than 300 feet nor more than 500 feet in advance of the Stop Sign. In built-up areas it may be necessary to erect this sign less than 300 feet in advance of the Stop Sign in order to have it posted within the same block.

SLIPPERY WHEN WET

W-240

30" x 30"

This sign shall be used to warn traffic of an extraordinarily slippery condition when the pavement is wet. The use of this sign, however, should be kept to an absolute minimum and upon correction of the slippery condition the sign should be removed. It shall be erected not less than 300 feet nor more than 500 feet in advance of the slippery section. In rural areas this sign shall be erected at intervals of one mile throughout the slippery area but in urban areas this spacing shall be reduced to intervals of 500 feet to 1000 feet.

SOFT SHOULDERS

W-241

30" x 30"

This sign shall be used where soft shoulders present a hazard to vehicles. It is usually warranted on newly seeded shoulders or on highways where shoulders are dangerously soft due to weather conditions. It should be removed when the hazard no longer exists. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the soft shoulder condition and shall be erected at intervals of one mile throughout the length of the highway where the condition exists.

SLIDES

W-242

30" x 30"

This sign shall be used to warn motorists of areas where possible slides, or falling rocks, present a hazard. It shall be used only during the time in which the hazard exists. For example: during Spring when frost leaves the ground. It shall be erected not less than 300 feet nor more than 500 feet in advance of the hazardous area, and spaced at intervals of one mile throughout the dangerous area.

CROSSWALK

W-243

30" x 30"

This sign shall be used to warn motorists of pedestrian crossings where crosswalks have been painted on the pavement. It usually will not be required on secondary highways where the traffic volume is low or pedestrian crossing is infrequent. In rural areas it shall be erected not less than 300 feet nor more than 500 feet in advance of the crossing. In urban areas where speeds are less than 35 miles per hour, it shall be erected not less than 150 feet nor more than 200 feet in advance of the crossing.

TRUCK CROSSING

W-244

30" x 30"

This sign shall be used to warn motorists of hazardous crossings caused by heavy truck traffic. It is warranted particularly in built-up industrial areas where the pavement is narrow. Its use, however, should be kept to a minimum. It shall be erected not less than 300 feet nor more than 500 feet in advance of the crossing in rural areas and not less than 150 feet nor more than 300 feet in urban areas.

SPECIAL BACKGROUND FOR WARNING SIGNS

W-245

5' x 5'

This type of sign shall be used to emphasize any hazardous condition which has been marked by standard Warning Signs, such as sharp curves, steep grades, narrow bridge, etc. It shall be used only when standard Warning Signs have proved to be inadequate and where accidents and congestion occur frequently in spite of the signs. This sign shall be used in conjunction with standard Warning Signs instead of erecting special signs to provide the necessary warning for the condition which exists. It shall be erected with the stripes horizontal when used with a diamond-shaped Warning Sign. When it is used with a square sign, it shall be erected so the stripes fall in a diagonal position, sloping downward toward the center of the roadway.

"Y" INTERSECTION
Secondary Right

W-247

30" x 30"

This sign shall be used to warn motorists approaching a "Y" Intersection where the main highway bears to the left and the intersecting branch, bearing to the right, is a side road. It shall not be used if there is any channelization present nor where Route Markers, Junction Markers, or Auxiliary Turn Markers have been erected. This sign shall be erected not less than 300 feet nor more than 500 feet in advance of the intersection.

"Y" INTERSECTION
Secondary Left

W-248

30" x 30"

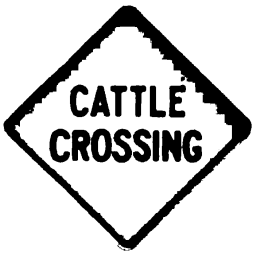
This sign shall be used to warn motorists approaching a "Y" Intersection where the main highway bears to the right and the intersecting branch bearing to the left is a side road. It shall be used as specified for the "Y" Intersection—Secondary Right Sign, W-247.

SAFETY ZONE

W-250

30" x 30"

This sign shall be used for the protection of safety zones or pedestrian islands where traffic is permitted to pass on either side of the zone or island. It shall be used to mark raised pedestrian islands as well as safety zones which have been painted on the pavement. The single arrow to the right shall be used only where traffic is permitted to pass on the right side of the zone. This sign may be used in conjunction with the Keep Right Sign, R-224, as shown on Figure 60. It shall be erected from 12 inches to 36 inches inside the beginning of the zone and 8 feet above the crown of the pavement.



24" x 24"

CATTLE CROSSING

W-251

This sign shall be erected to warn motorists of cattle crossing the highway. It shall be erected only during the time cattle are actually making the crossing and shall be located 150 feet to 300 feet in advance of the crossing.

24" x 24"

SCHOOL CROSSING

W-252

This sign shall be used to warn motorists of school children crossing highways at locations where schools are not located along the highway. It shall be erected not less than 150 feet nor more than 300 feet in advance of the school crossing.

LOW CLEARANCE

W-253

30" x 30"

This sign shall be used to indicate the exact amount of clearance at low bridges, underpasses and other overhead structures where the clearance is less than 13 feet. The actual clearance shall be shown on the sign to the nearest inch. Additional protection shall be provided by markings as shown on Figures 62, 63 and 64. This sign shall be erected in rural districts not less than 300 feet nor more than 500 feet, and in urban districts not less than 150 feet nor more than 300 feet in advance of the overhead structure. This sign shall be used in conjunction with the Clearance Sign, W-228, which is mounted overhead on the structure.

30" x 30"

PARK ENTRANCE

W-254

This sign shall be used to warn motorists of entrances to parks which are located adjacent to the highway. It shall be erected not less than 300 feet nor more than 500 feet in advance of the park entrance.

HILL — TRUCKS USE LOW GEAR

W-255

4′ x 4′

This sign shall be used under the same conditions as specified under the Hill Sign, W-220, and where safety demands that trucks descend a grade in low gear. It shall be erected not less than 300 feet nor more than 500 feet in advance of that part of the descending grade where conditions require a reduction in speed.

WATCH CHILDREN

W-256

24″ x 24″

This sign may be erected along highways where children are numerous, thus requiring caution on the part of the driver. It shall be erected not less than 300 feet nor more than 500 feet in advance of the play area.

CEMETERY ENTRANCE

W-258

24″ x 24″

This sign shall be used to warn motorists of entrances to cemeteries which are located adjacent to the highway. It shall be located not less than 300 feet nor more than 500 feet in advance of the entrance.

MERGING TRAFFIC AHEAD

W-260

36" x 36"

This sign shall be used at locations where two separate roadways merge and where traffic is not required to stop on either roadway. Signs shall be erected on the main highway facing traffic, not less than 300 feet nor more than 500 feet in advance of the point where traffic from the side road, or ramp, merges with the main highway.

TUNNEL

W-261

30" x 30"

This sign may be used at all tunnel entrances. It shall not be used at viaducts or underpasses of grade separations. It shall be erected not less than 300 feet nor more than 500 feet in advance of the approach to the tunnel.

PLAYGROUND

W-262

24" x 24"

This sign shall be used to mark playgrounds which are located adjacent to highways and shall be erected not less than 150 feet nor more than 300 feet in advance of the playground area.

CHURCH

W-263

24" x 24"

This sign shall be used to mark churches which are adjacent to the highway particularly in rural areas where speeds are high and where pedestrians, or stopping of cars, may cause a hazard to passing motorists. It shall be erected not less than 300 feet nor more than 500 feet in advance of the church.

HOSPITAL

W-264

24" x 24"

This sign shall be used to mark hospitals which are located adjacent to the highway. It shall be erected not less than 300 feet nor more than 500 feet in advance of the hospital entrance.

COUNTY HOME

W-265

24" x 24"

This sign shall be erected only at locations where the county home, or grounds, are adjacent to the highway, particularly in rural areas where speeds are high and there is a hazard to pedestrian and motorist alike. It shall be erected not less than 300 feet nor more than 500 feet in advance of the entrance to the County Home.

SAFE SPEED LIMIT FOR CURVES AND TURNS

W-267

15" x 15"

This sign may be used in conjunction with any standard Warning Sign to indicate the maximum safe speed around a curve or through any hazardous location. It shall be mounted immediately below the standard Warning Sign and on the same post as shown in Figure 35, with its lower edge not less than 24 inches above the crown of the pavement. Safe speeds, which shall be shown in multiples of 5-miles per hour, shall be determined at the time of installation of Warning Signs by the method shown in Figure 34.

NO OUTLET

W-268

30" x 30"

This sign shall be used in urban areas on highways having no outlet. It shall be erected not less than 150 feet in advance of the end of the highway, or just beyond the last intersected highway, facing traffic entering the highway which has no outlet.

PAVEMENT, OBSTRUCTION AND DELINEATOR MARKINGS

FUNCTIONS AND LIMITATIONS OF MARKINGS

Pavement Markings perform definite functions which cannot be achieved by the use of any other device.

They are used to supplement traffic signs and signals, or they may be used alone to give notice of certain regulations and warnings which otherwise could not be clearly understood. Markings are used to separate opposing streams of traffic, permit and restrict passing, divide, separate, channelize and guide traffic on multi-lane highways in business, residential and rural areas.

Markings shall be of uniform design, position and application because it is important that they be recognized and instantly understood.

Markings, however, have definite limitations. They may be entirely obliterated by snow, they have limited visibility when wet, and must be repainted frequently when subjected to heavy traffic.

LEGAL AUTHORITY

Markings on or along any street or highway shall be placed only by the public authority having jurisdiction over the area in question, and only for the purpose of regulating, warning or guiding traffic. Counties, cities, boroughs and first and second class townships, may place markings wherever it is considered necessary, but the markings shall conform with the standards of design and location as presented in this Manual.

If special markings are needed for unusual conditions not described in this section, they shall be secured from the Secretary of Highways.

MATERIALS AND COLORS

Paint is the most common material used for pavement, curb, and object marking. It can be applied quickly with hand or mechanical equipment. Qualities in paint to consider are: durability, drying time, degree of settlement when stored for limited periods, and visibility under varied conditions.

Nighttime visibility of painted lines is greatly increased if lines are reflectorized with glass beads. The beads which are partially embedded in the paint reflect light back in the direction of its source causing the markings to appear luminous under normal headlighting. Beads have no effect in daytime visibility. While the initial cost of reflectorized paint is greater than ordinary paint, the increased life of the markings particularly on heavily travelled pavements, more than compensates for the difference in cost.

Except for curb markings, all pavement markings shall be white in color regardless of the type of surface involved. Curbs may be painted yellow to indicate areas where parking is prohibited.

Metal or plastic inserts are sometimes used instead of paint particularly to mark crosswalks in busy downtown areas. Inserts shall not be less than 4 inches in diameter, if round, or of equivalent rectangular area. They should not be more than 16 inches, center to center on transverse lines, and not more than 36 inches, center to center on longitudinal lines.

TYPES OF PAVEMENT MARKINGS

The following are pavement markings illustrated in this Manual:

Center Lines
Lane Lines
No Passing Zones
Safety Zones
Pavement Width Transitions
Crosswalks
Stop and Limit Lines
Railroad Crossings
Channelizations
Clearance Lines
Turn Markings
Route Turns
Parking Limits
Pavement Lettering

Objects within the roadway or dangerously close to the edge of the roadway shall have the vertical surfaces marked with diagonal white stripes, as shown in Figures 63 and 64.

DETAILS OF PAVEMENT MARKINGS

STANDARD PAVEMENT MARKINGS

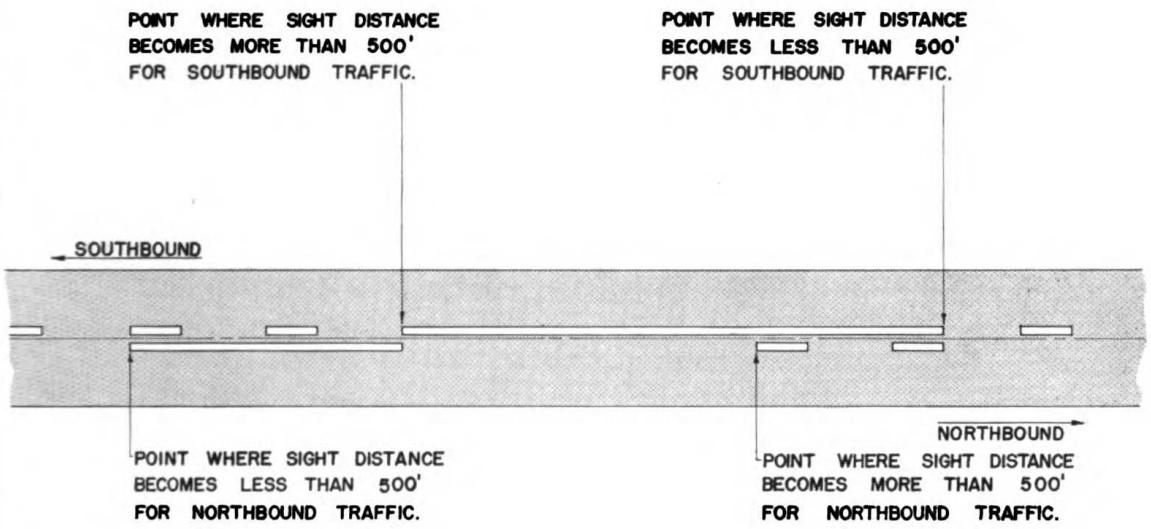
Standard pavement markings consist of broken and solid white lines, 4 inches wide, as shown in Figure 36. Broken lines, which indicate passing is permitted, consist of white dashes 15 feet long, spaced 25 feet apart. In urban areas dashes may be spaced 15 feet apart. Solid lines are continuous and indicate areas where passing is prohibited. Broken and solid lines are used either separately in single lines, or at appropriate locations they are combined to form double parallel lines 4 inches apart. Double broken or double solid lines, however, are never used.

On black top pavements, two-lane, three-lane, four-lane, or more, single and double line markings shall be so placed that pavement is divided into the required number of lanes.

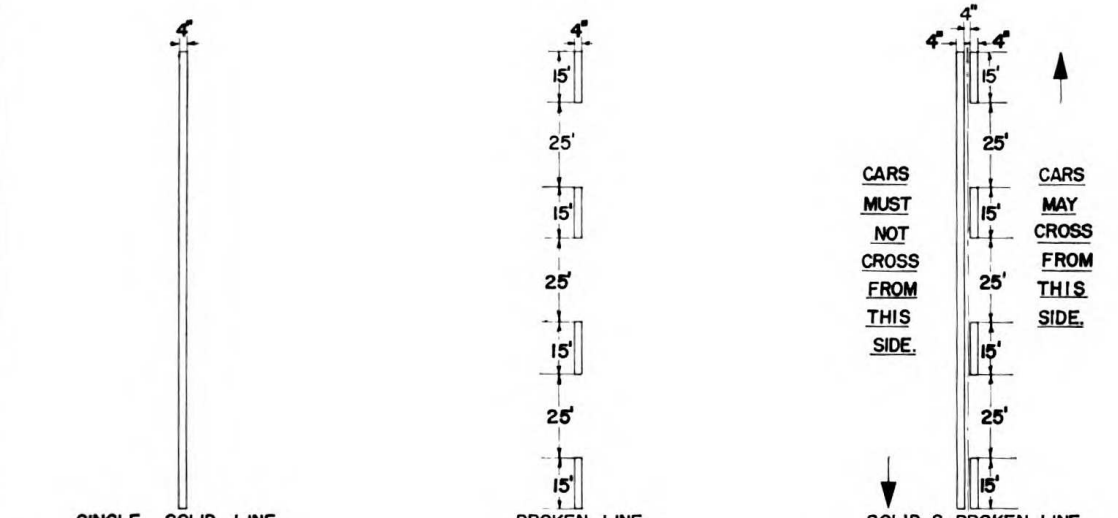
On concrete pavement where single line marking is used it shall be placed as follows: (See Figure 37). On two-lane pavements, the center line shall be offset so that the near edge of center line is 2 inches from the longitudinal joint.

On three-lane pavements the lane line shall be offset on the center lane, so that the outside edge of line is 2 inches from the longitudinal joint. On pavements of four lanes or more, the lane line shall be offset on the inner lanes so that the outside edge of line is 2 inches from the longitudinal joint.

STANDARD PAVEMENT MARKINGS



EXAMPLE OF PAVEMENT MARKING FOR VERTICAL AND HORIZONTAL CURVES ON 2-LANE PAVEMENTS.

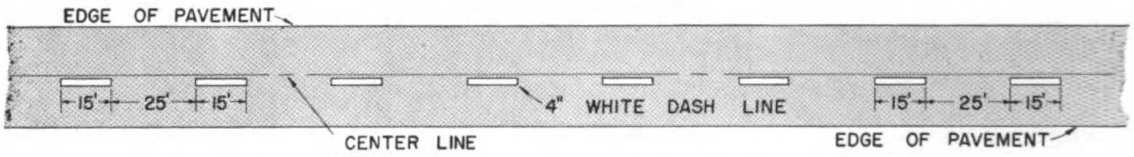


ALL MARKINGS CONSIST OF WHITE LINES, 4" WIDE.

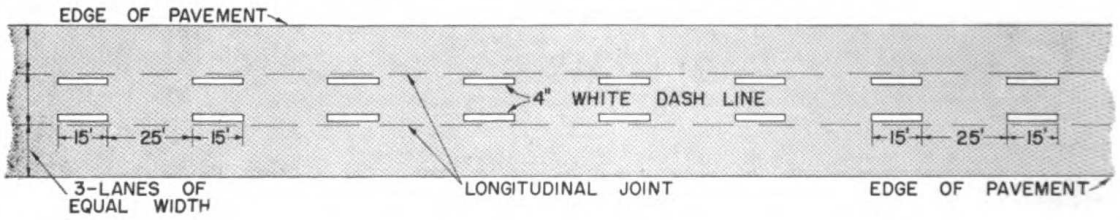
FIGURE 36

FOG LINE MARKINGS

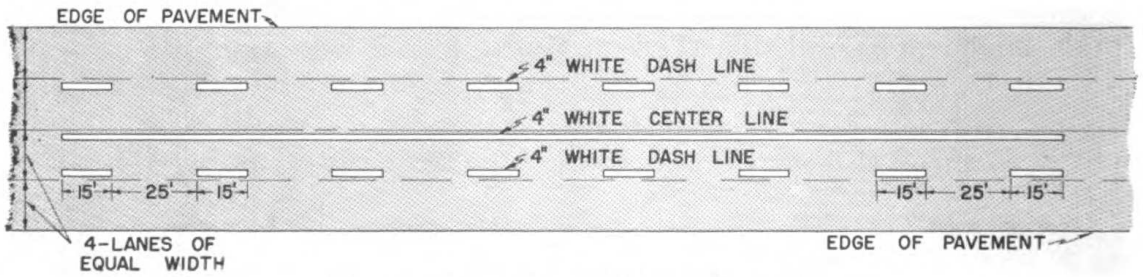
MARKING TWO-LANE PAVEMENTS



MARKING THREE-LANE PAVEMENTS



MARKING FOUR-LANE PAVEMENTS



MARKINGS SHALL BE OFFSET FROM CENTER LINE OR LONGITUDINAL JOINT AS SHOWN ON CONCRETE PAVEMENTS

FIGURE 37

On concrete pavement where solid line markings are used in conjunction with broken lines, they shall be placed so the inside edge of the lines shall be offset 2 inches each side of the longitudinal joint.

Other pavement markings such as Intersection Markings, Stop or Limit Lines, Crosswalks, School Crossings, Railroad Crossings, Pavement Arrows and Letters, Parking Areas and obstruction markings are referred to throughout this section.

MARKING VERTICAL CURVES

Typical center line markings for all vertical curves are shown on Figures 38, 39 and 40. The solid line marking begins at the point where the sight distance becomes less than 500 feet. The broken line marking begins at the point where sight distance becomes more than 500 feet.

On successive vertical curves, Figure 39, broken lines shall not be used to designate areas where passing is permitted unless the length of the broken line is 500 feet or more. If less than 500 feet, it shall be omitted. For example, if **CE** were less than **CD** (equal to 500 feet) then broken line between **C** and **E** shall not be used.

On three-lane pavements the solid line, prohibiting passing, begins at the left edge of the center lane and runs 150 feet diagonally to a point in the middle of the center lane where the sight distance becomes less than 500 feet. See Figure 40. The solid line shall be continued along the center line of the pavement until the sight distance again becomes greater than 500 feet.

On long grades, however, it may be desirable to establish No Passing Zones (marked by signs) by restricting passing down grade but permitting passing up grade. The pavement should then be appropriately marked to supplement the No Passing Signs.

MEASURING SIGHT DISTANCE ON VERTICAL CURVES

Measurement of the 500 feet sight distance is accomplished with the use of two targets attached to a line 500 feet in length, as shown in Figure 41. The peephole slot as shown in each target is the average height of the driver's eye above the roadway.

Beginning on the upgrade side of the curve, workmen **A** and **B** pull the line taut with **A** sighting through the peephole slot in his target to see **B's** target. Then both men move over the vertical curve holding the line taut and with **A** sighting at **B's** target, to the point where **B's** target just drops out of sight. There **A** places a symbol marking as shown on center line at his position (A_1) and **B** places a symbol marking as shown on center line at his position (B_1).

Then moving farther over the vertical curve to the point where **B's** target again just becomes visible, **A** places a symbol marking as shown on center line at his position (A_2) and **B** places a symbol marking as shown on center line at his position (B_2).

This method of measuring sight distances may also be used on two-lane, three-lane and four-lane highways as well as successive vertical curves.

MARKING HORIZONTAL CURVES

Typical center line markings for horizontal curves are shown on Figures 42, 43, 44, 45 and 46. The solid line begins at the point where sight distance

MARKING TWO-LANE VERTICAL CURVES

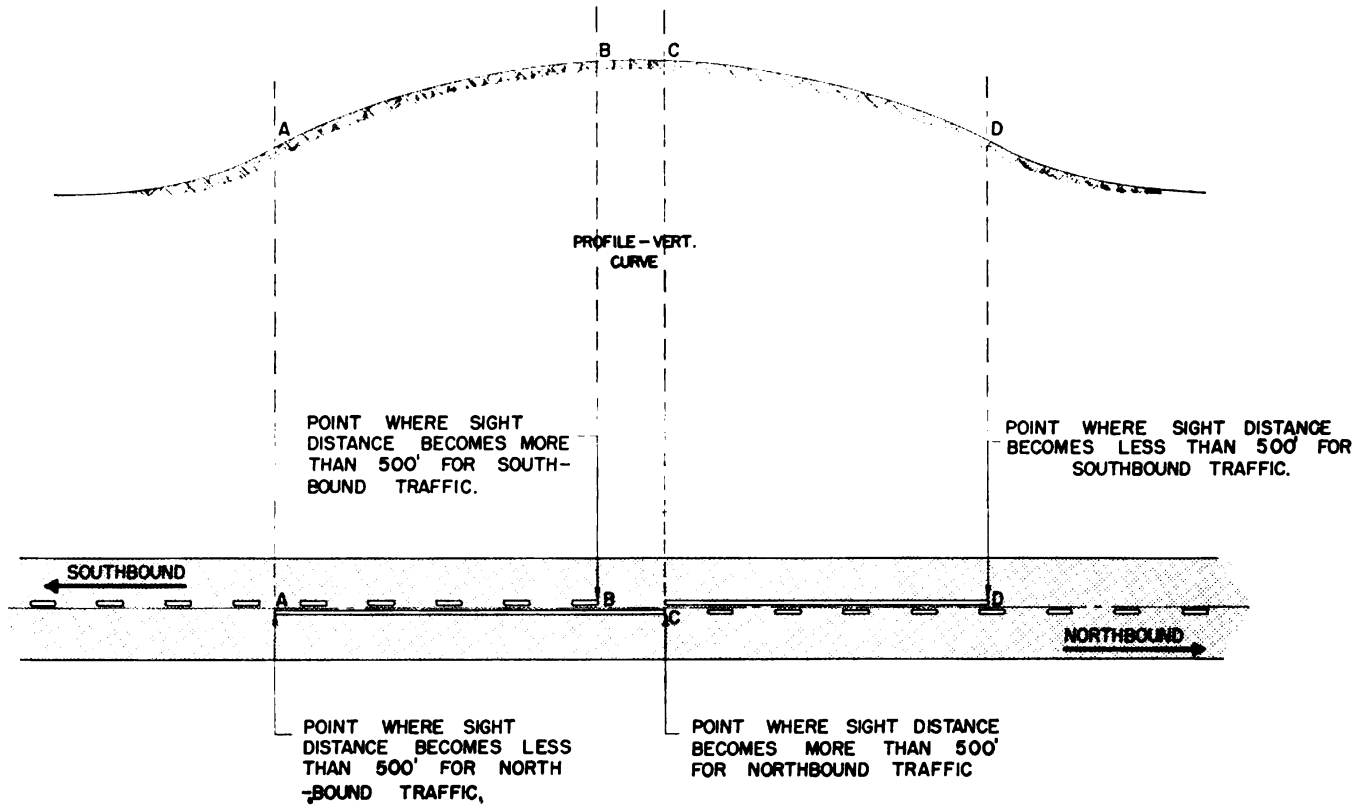


FIGURE 38

becomes less than 500 feet. The broken line marking begins at the point where the sight distance becomes more than 500 feet except on sharp curves where the degree of curvature equals 8 degrees or more. When this is the case, curves shall be marked with a single solid line between the **PC** and **PT** as shown in Figure 43, even though the sight distance is greater than 500 feet.

The degree of curvature may be determined by stretching a line 62 feet in length between any two points on the center line of the curve (points **A** and **B** in Figure 43), and measuring length of the middle ordinate (point **C** and **D**), at center of the 62 feet line. This length measured in inches equals the degree of curvature.

Markings on successive horizontal curves shall be placed as shown in Figure 44. If distance **BC** (for northbound traffic) is less than 500 feet, then the solid line shall be continuous between points **A** and **D**. Broken lines shall not be used unless the distance where passing is permitted is 500 feet or more.

Markings on three-lane horizontal curves shall be placed as shown in Figure 45. The solid line shall begin on the left edge of the center lane 150 feet in advance of the point where the sight distance becomes less than 500 feet. The line runs diagonally across the center lane to the sighting point and continues along the center line of the pavement to the place where the sight distance becomes greater than 500 feet.

MEASURING SIGHT DISTANCES ON HORIZONTAL CURVES

The measurement of the 500 feet sight distance on horizontal curves (Figure 47) is accomplished by using the same equipment and basically the same method and code markings as are used for measuring sight distance for vertical curves (Figure 41). The sighting positions are located on the center line of the pavement.

TRANSITION LANE MARKINGS

Special pavement markings are necessary and important at points where pavement widths change either to a greater or lesser number of lanes. Standard white lines shall be used in outlining these transitions.

Typical methods of marking transition lanes are illustrated in Figures 48, 49 and 50.

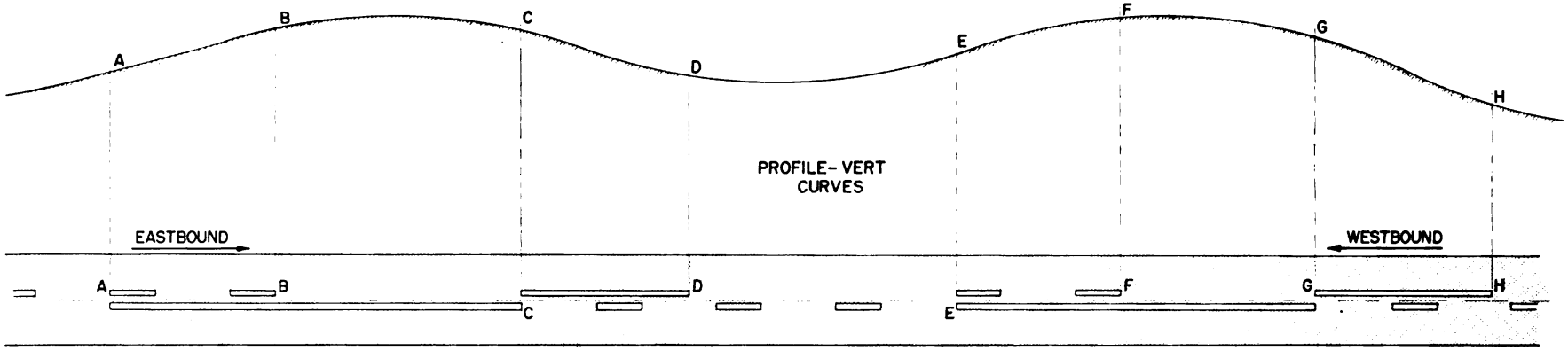
Where traffic merges into the reduced number of lanes a Pavement Narrows Sign, W-233, should be erected to warn traffic in advance of the condition.

RAILROAD GRADE CROSSINGS

Pavement markings on all two-lane pavements at railroad grade crossings shall be used as shown in Figure 51. Markings for three-lane and four-lane highways, as shown in Figure 51, shall be used only where crossings are not protected by electric signals, gates or watchmen on duty twenty-four hours daily. Where crossings are protected, 4 inch white center lines 300 feet long shall be painted on each side of the crossing in the center of the pavement as shown for two-lane pavements.

Where the distance between grade crossings and intersections on three-lane highways is less than 450 feet or on four-lane highways is less than 600 feet, a special pavement marking design should be obtained from the Secretary of Highways.

MARKING SUCCESSIVE VERTICAL CURVES

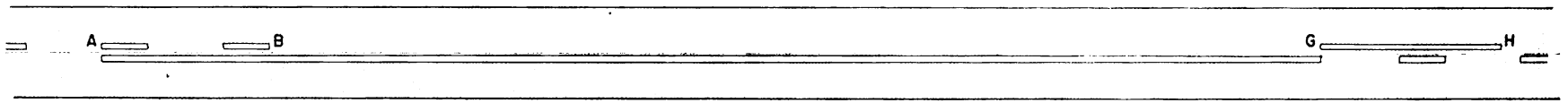


POINTS A. & E.–WHERE SIGHT DISTANCE BECOMES LESS THAN 500' FOR EAST-BOUND TRAFFIC.

POINTS C. & G.–WHERE SIGHT DISTANCE BECOMES MORE THAN 500' FOR EAST-BOUND TRAFFIC.

POINTS H. & D.–WHERE SIGHT DISTANCE BECOMES LESS THAN 500' FOR WEST-BOUND TRAFFIC.

POINTS F. & B.–WHERE SIGHT DISTANCE BECOMES MORE THAN 500' FOR WEST-BOUND TRAFFIC.



AT LOCATIONS WHERE C E (FOR EASTBOUND TRAFFIC) OR F D (FOR WESTBOUND TRAFFIC) IS LESS THAN 500', DASH LINES SHALL BE OMITTED AND A SOLID LINE ONLY SHALL BE USED BETWEEN POINTS B & G AS SHOWN ABOVE.

FIGURE 39

MARKING THREE-LANE VERTICAL CURVES

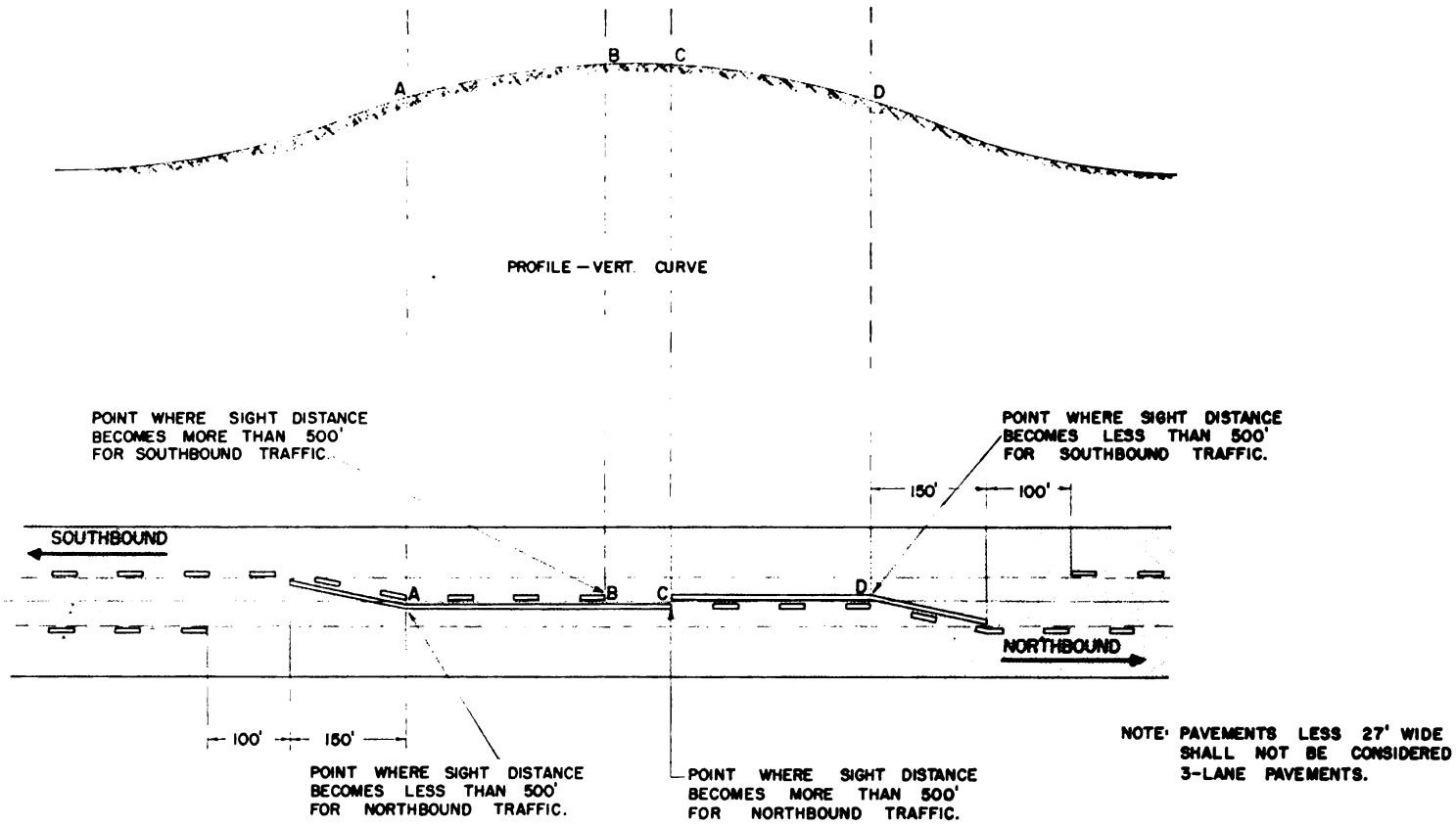
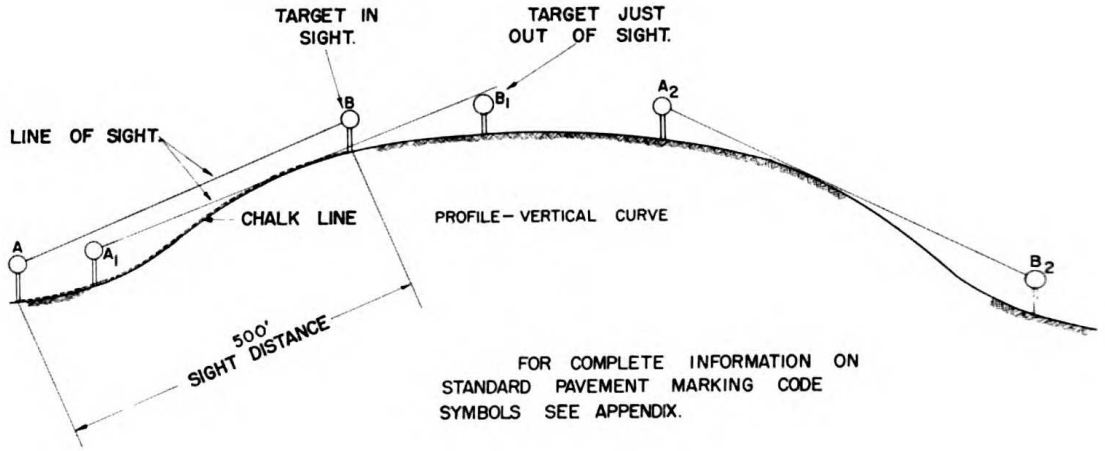
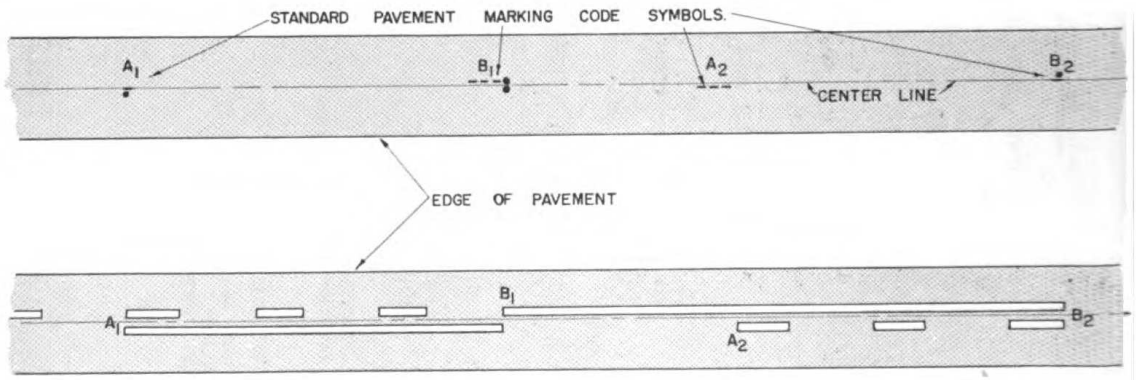


FIGURE 40

MEASURING SIGHT DISTANCES ON VERTICAL CURVES





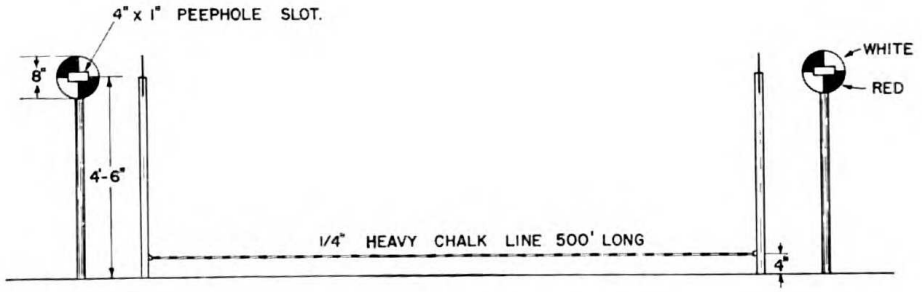


FIGURE 41

MARKING TWO-LANE HORIZONTAL CURVES (LIMITED SIGHT DISTANCE)

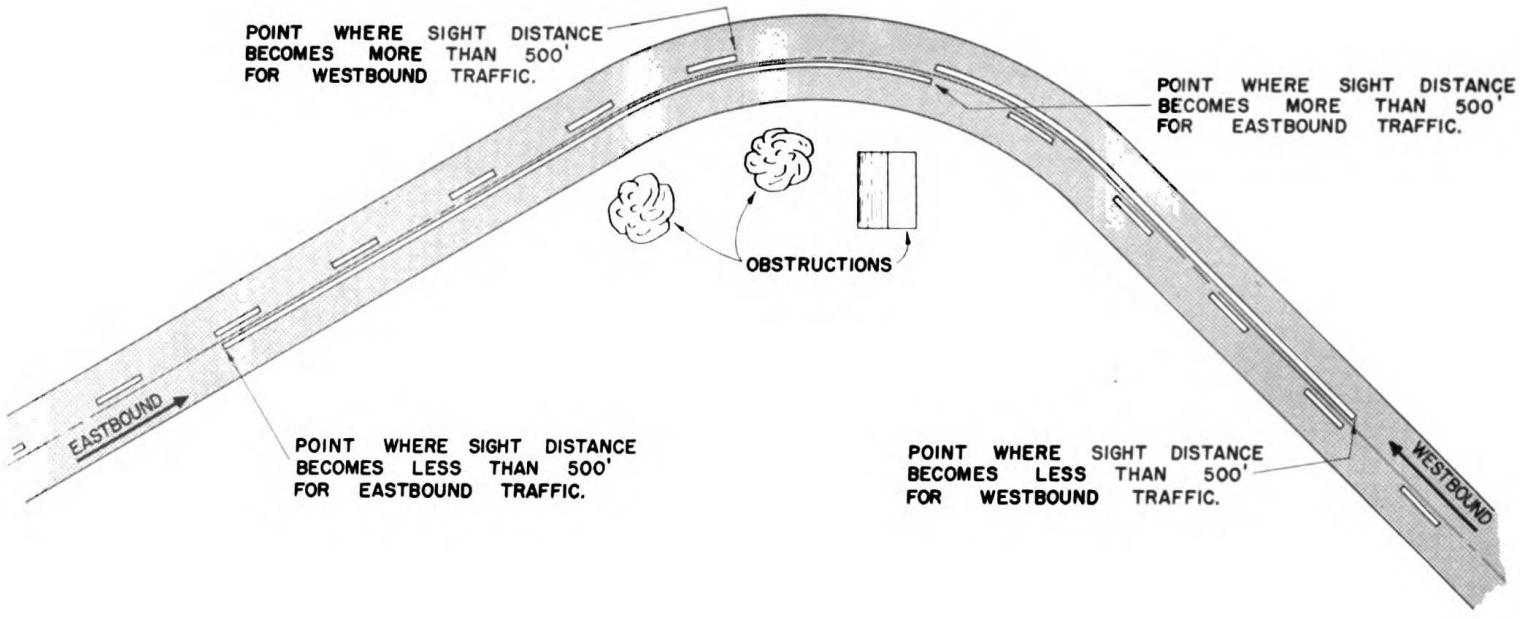
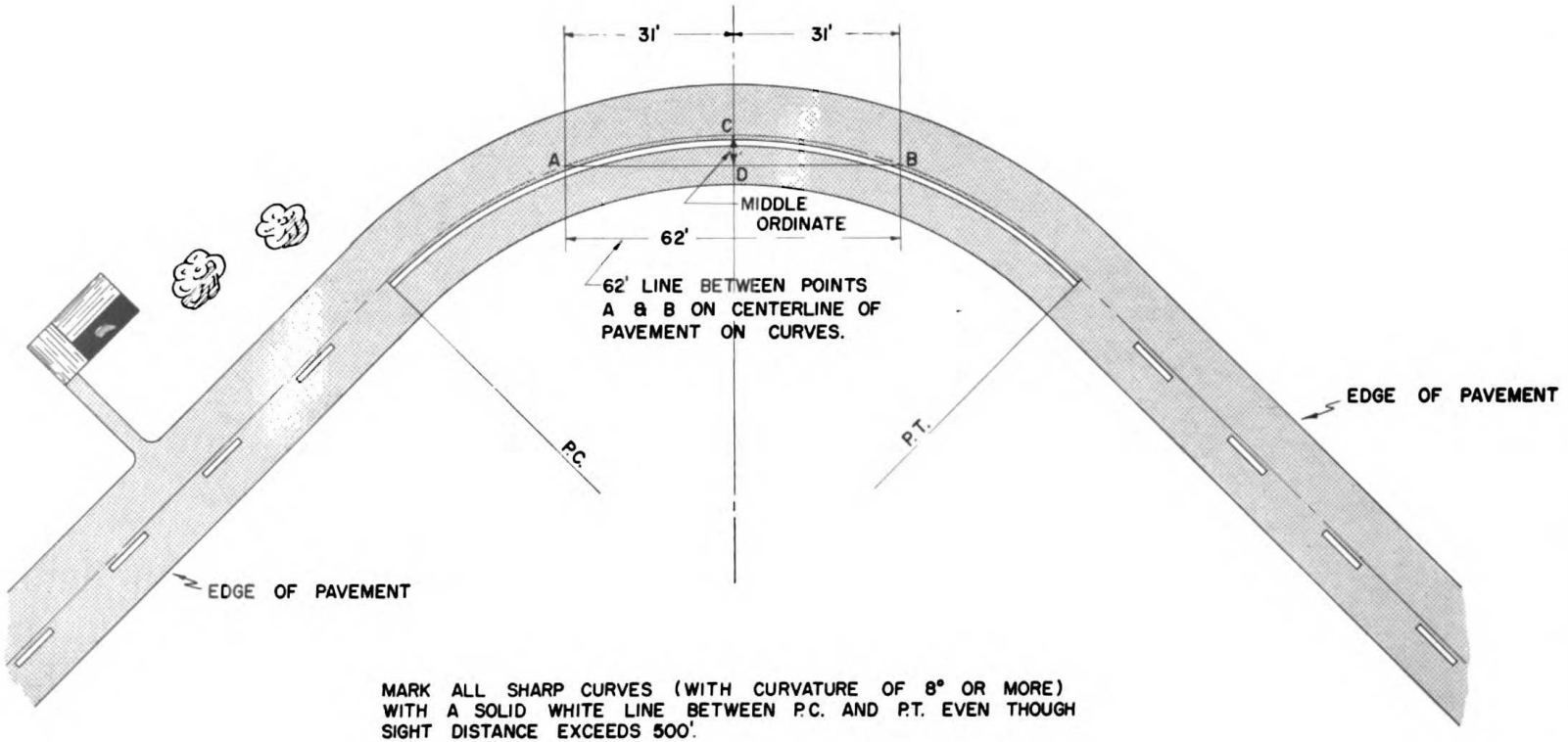


FIGURE 42

MARKING TWO-LANE HORIZONTAL CURVES (SHARP RADIUS, UNLIMITED SIGHT DISTANCE)



MARK ALL SHARP CURVES (WITH CURVATURE OF 8° OR MORE) WITH A SOLID WHITE LINE BETWEEN P.C. AND P.T. EVEN THOUGH SIGHT DISTANCE EXCEEDS 500'.

MIDDLE ORDINATE AS MEASURED ABOVE IN INCHES CORRESPONDS TO DEGREE OF CURVATURE.

FIGURE 43

MARKING SUCCESSIVE HORIZONTAL CURVES

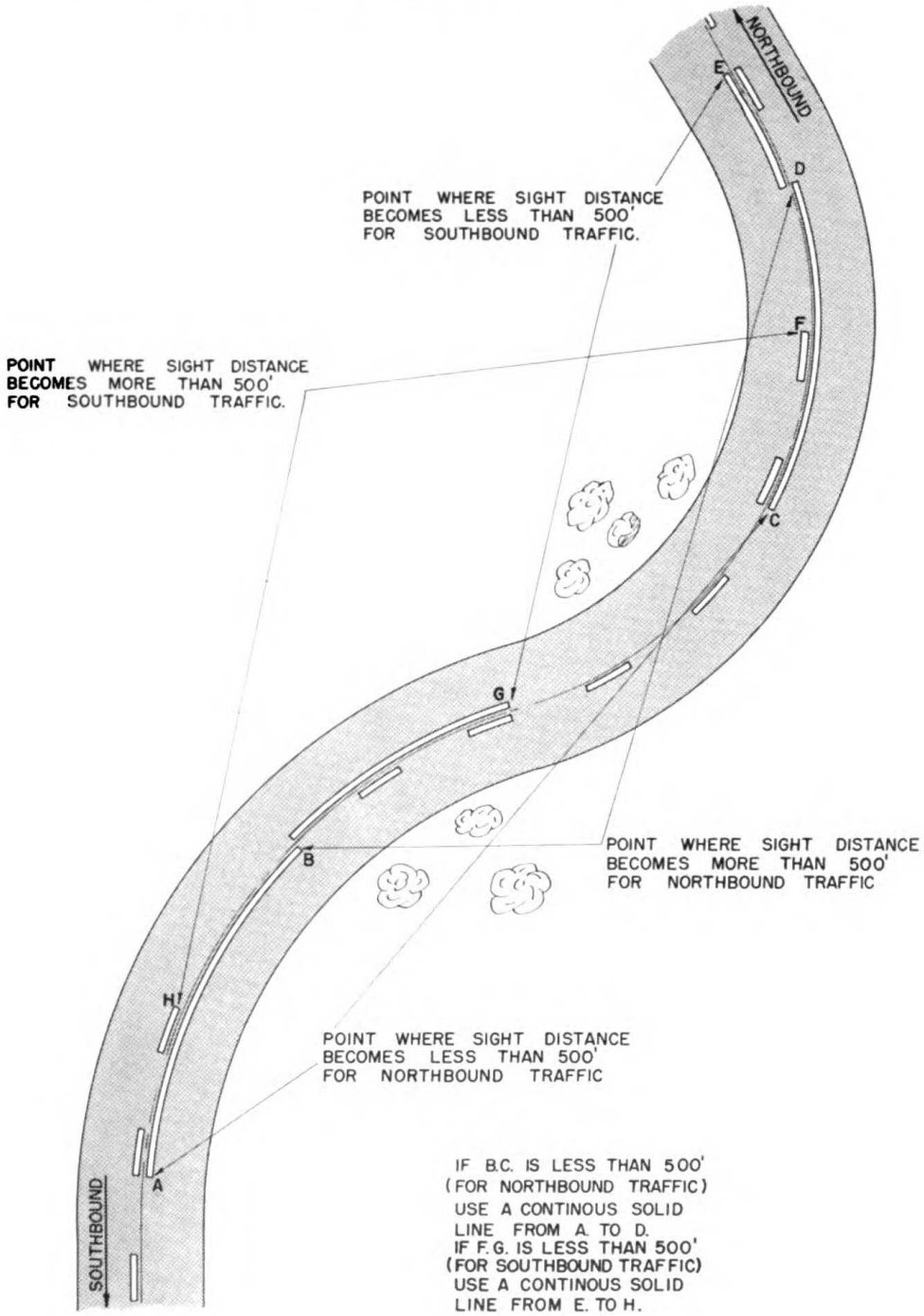


FIGURE 44

MARKING THREE LANE HORIZONTAL CURVES

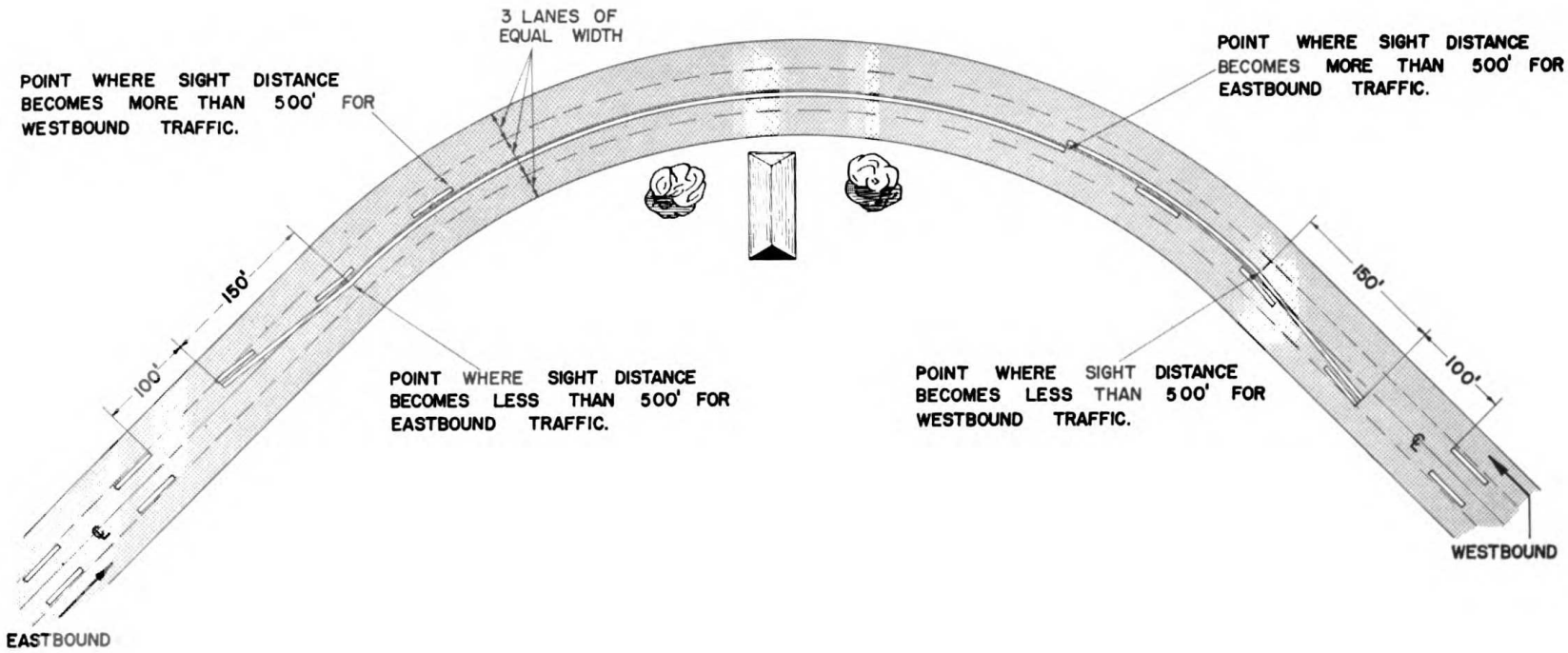
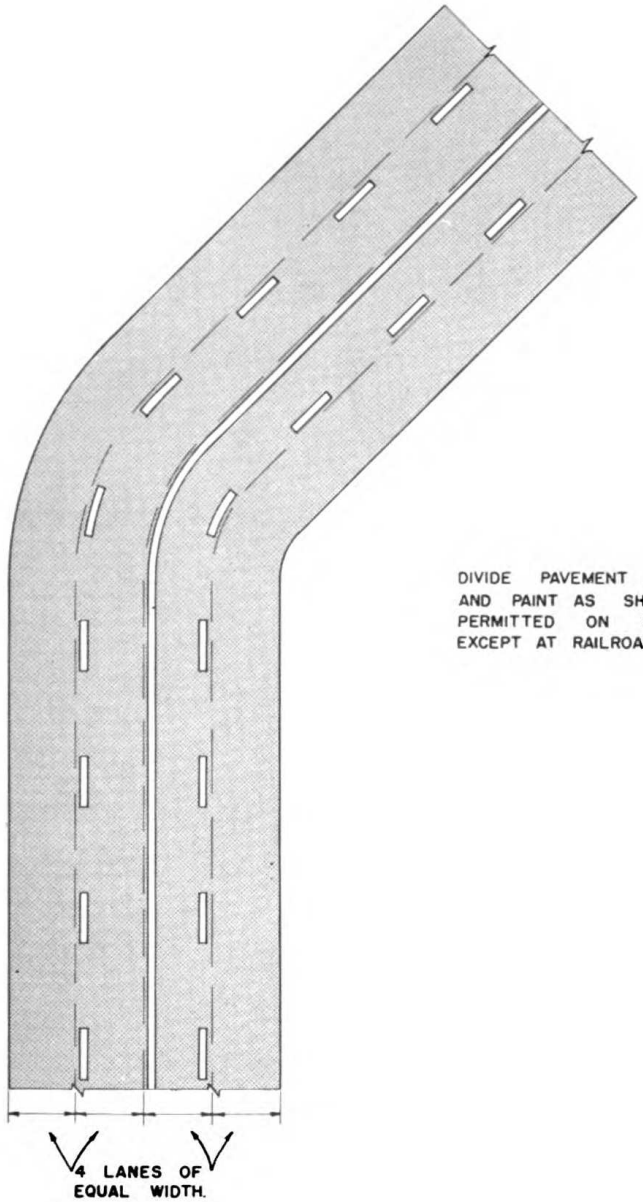


FIGURE 45

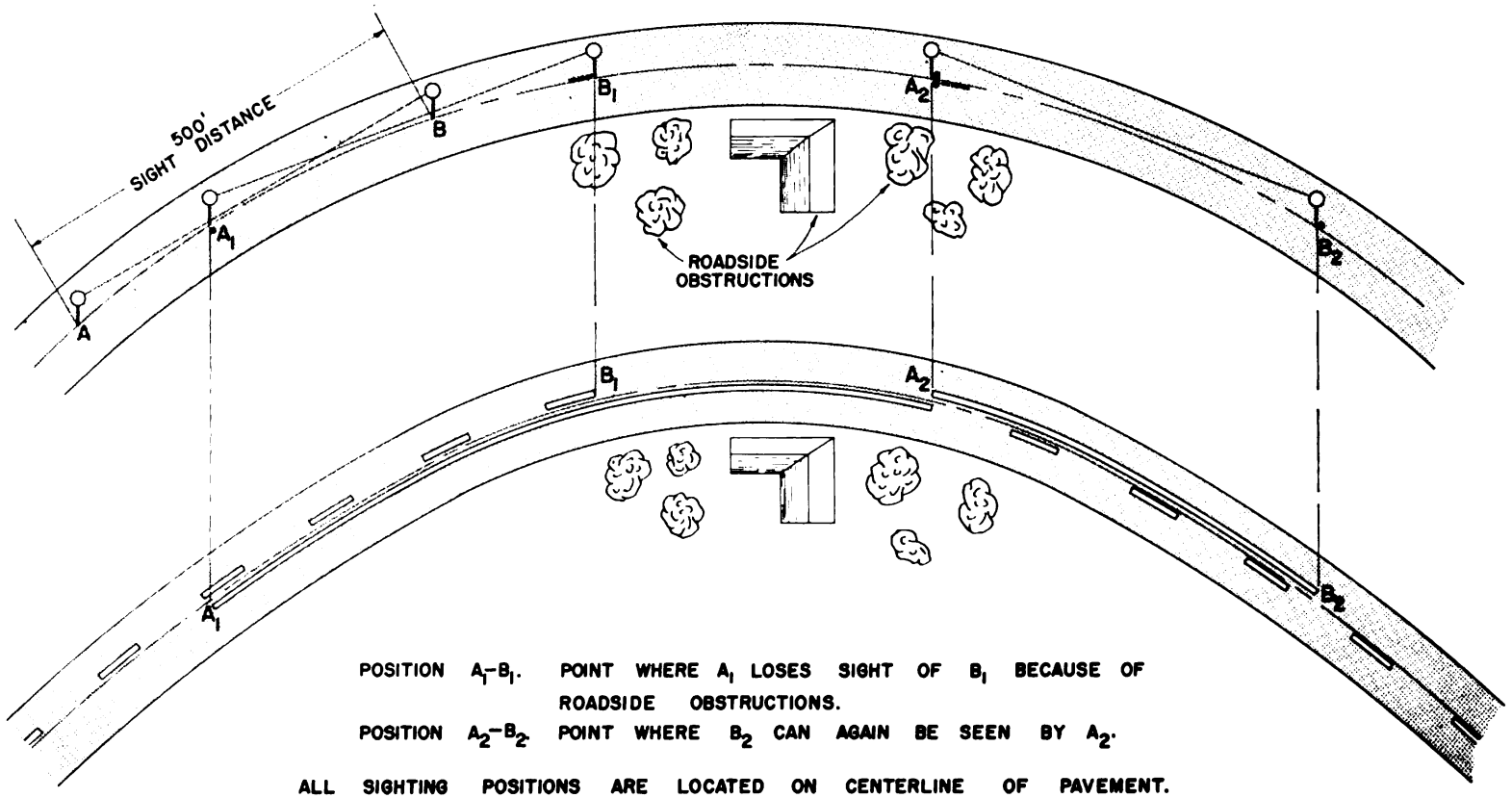
MARKING FOUR LANE PAVEMENTS



DIVIDE PAVEMENT INTO 4—LANES AND PAINT AS SHOWN. PASSING PERMITTED ON 2—LANE PORTIONS EXCEPT AT RAILROAD GRADE CROSSINGS.

FIGURE 46

MEASURING SIGHT DISTANCE ON HORIZONTAL CURVES



POSITION A_1–B_1. POINT WHERE A_1 LOSES SIGHT OF B_1 BECAUSE OF ROADSIDE OBSTRUCTIONS.

POSITION A_2–B_2. POINT WHERE B_2 CAN AGAIN BE SEEN BY A_2.

ALL SIGHTING POSITIONS ARE LOCATED ON CENTERLINE OF PAVEMENT.

FOR COMPLETE INFORMATION ON STANDARD PAVEMENT MARKING CODE SYMBOLS SEE APPENDIX.

FIGURE 47

TRANSITION LANE MARKINGS
THREE LANE TO TWO LANE

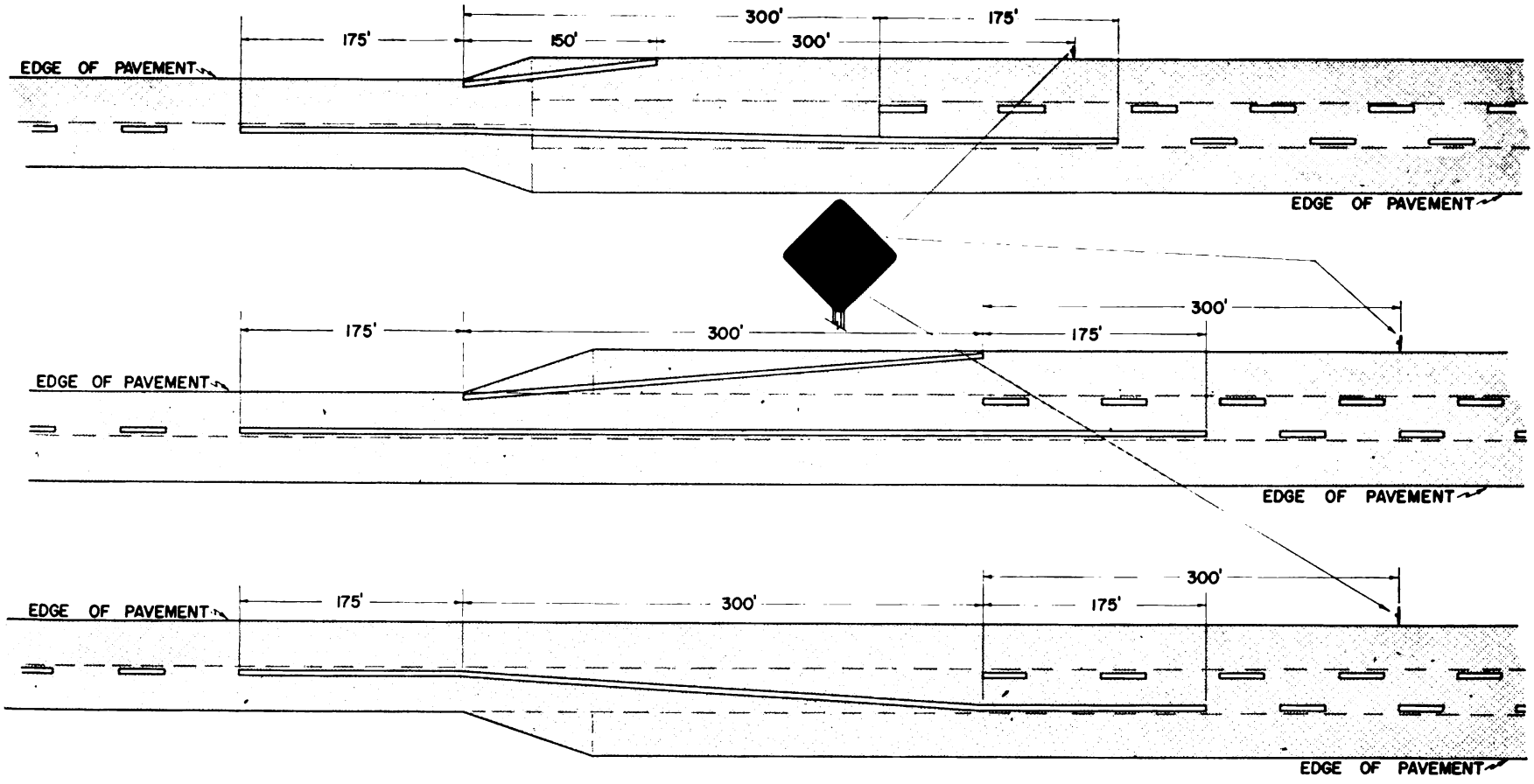


FIGURE 48

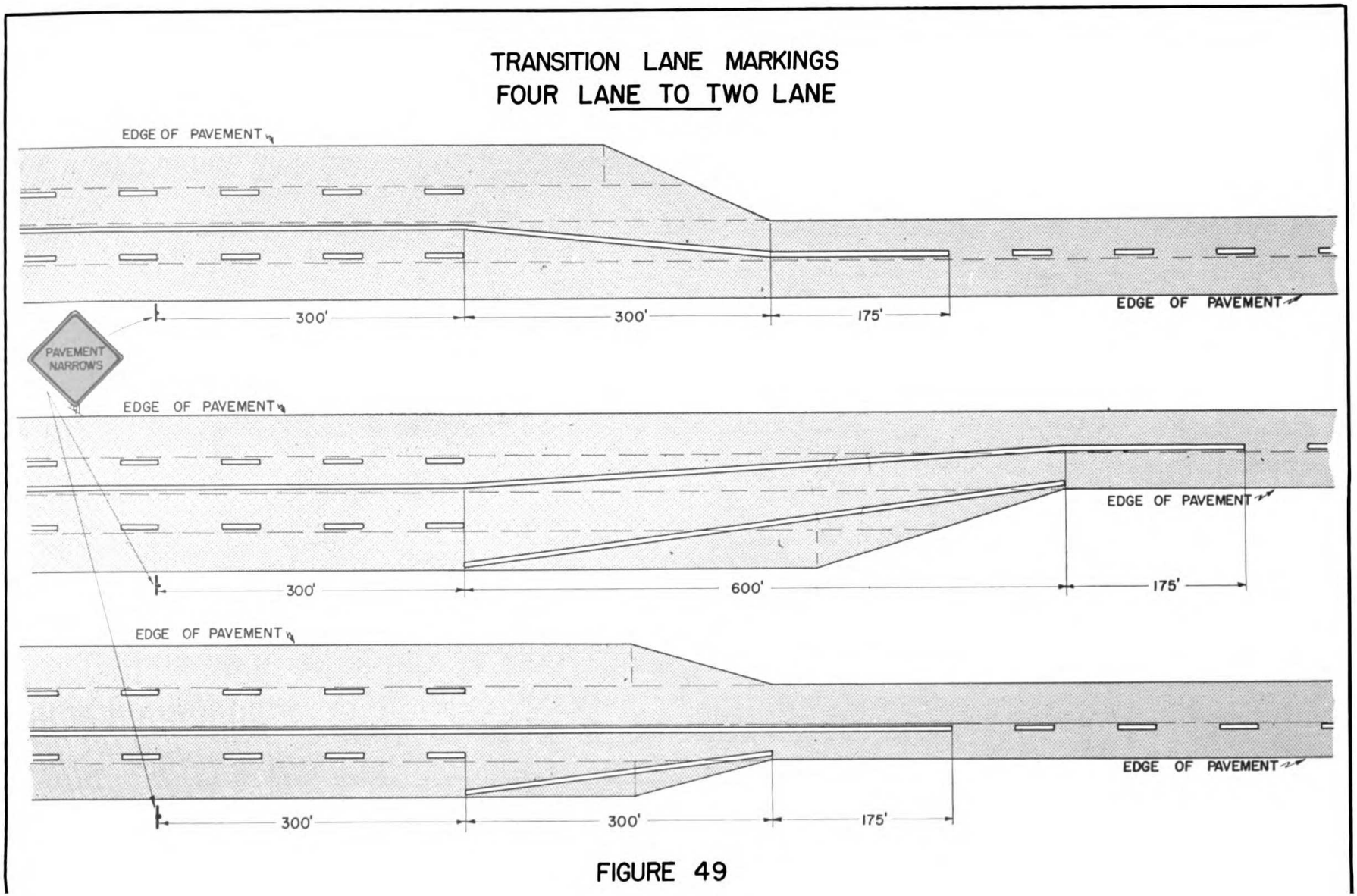


FIGURE 49

TRANSITION LANE MARKINGS
FOUR LANE TO THREE LANE

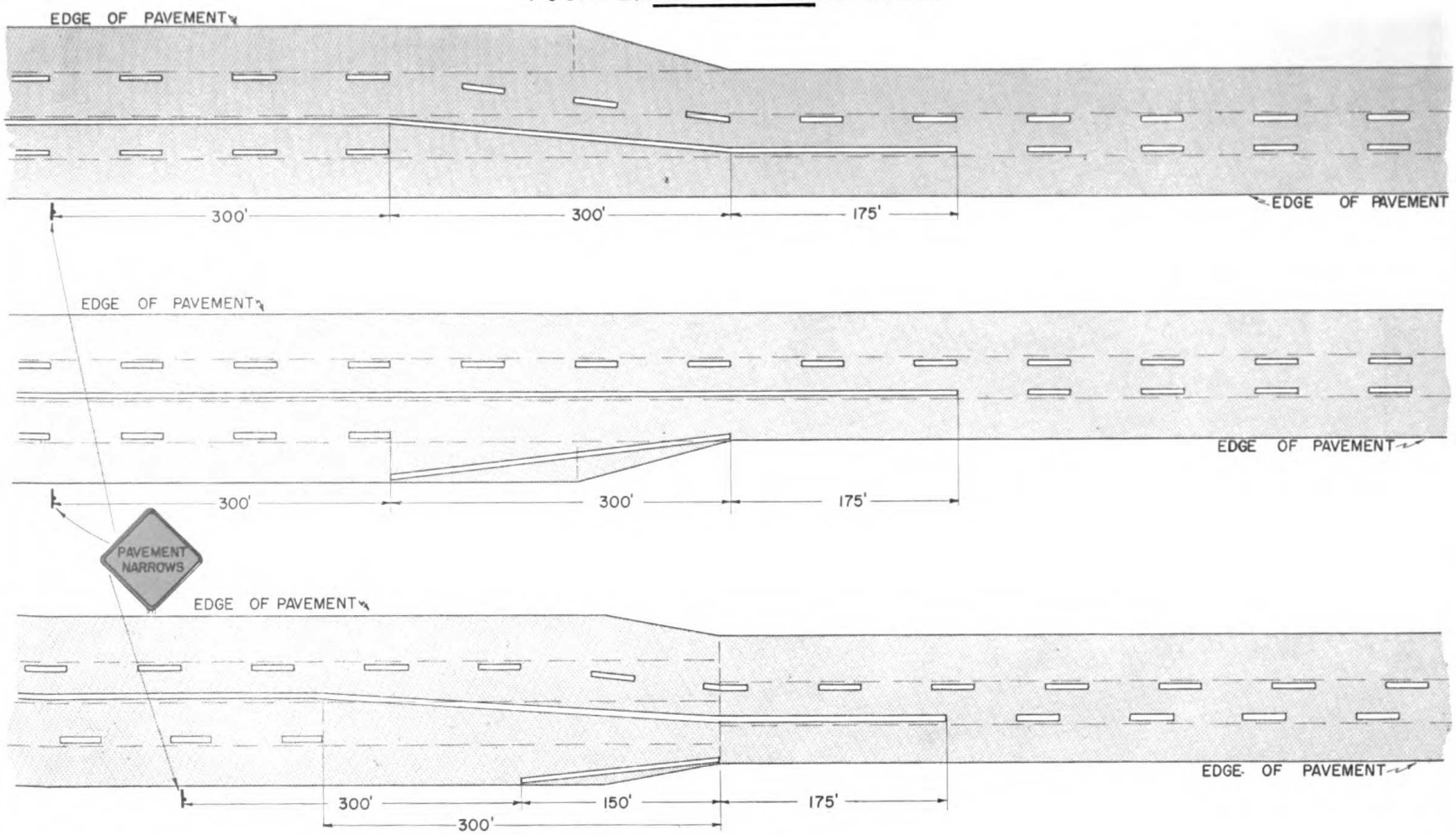
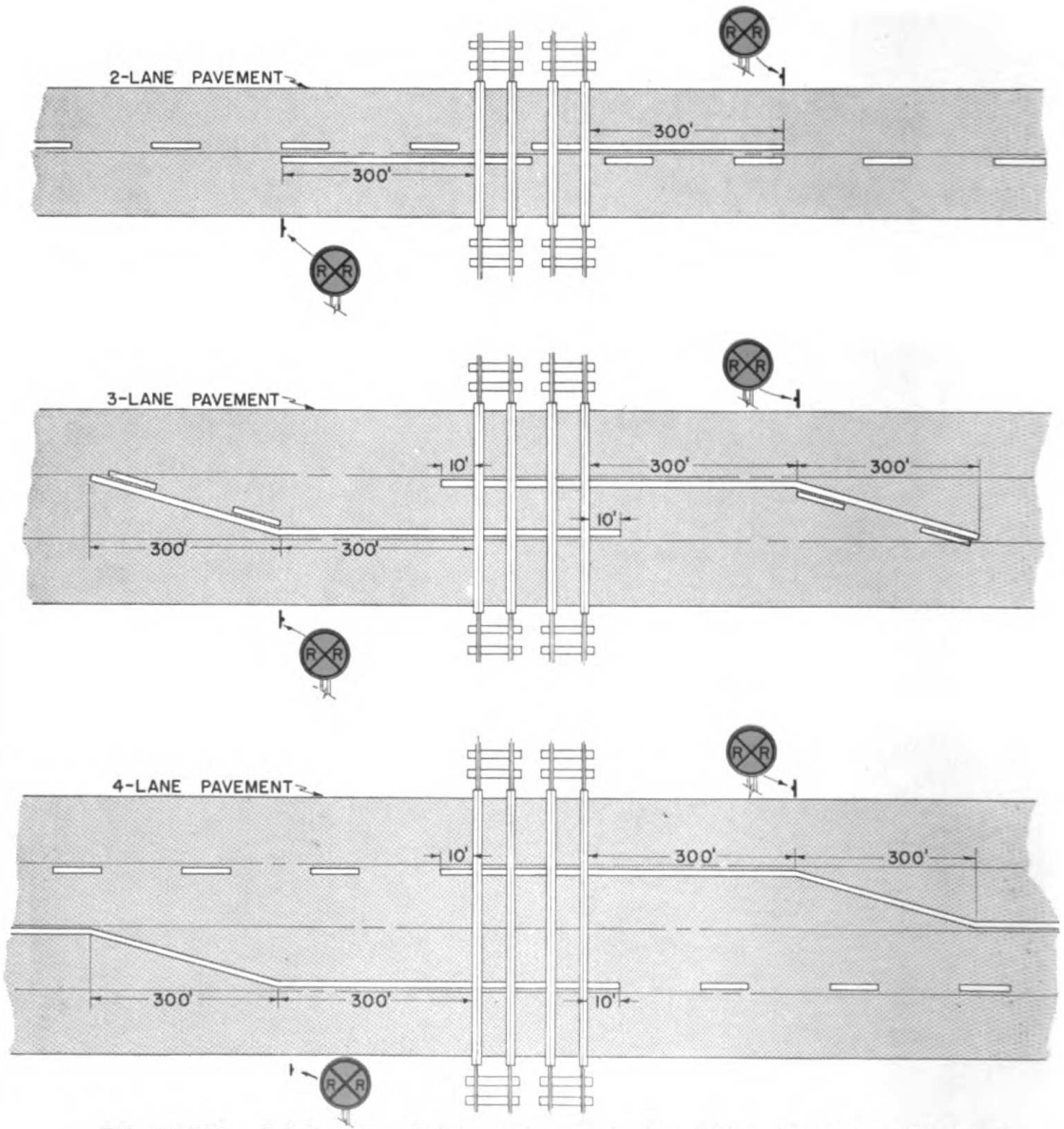


FIGURE 50

RAILROAD GRADE CROSSING MARKINGS



THE MARKING SHOWN FOR 3 & 4 LANE PAVEMENTS SHALL BE USED ONLY WHERE CROSSINGS ARE NOT PROTECTED BY ELECTRIC SIGNALS, 24 HOUR DUTY WATCHMAN, OR BY GATES. WHERE CROSSINGS ARE PROTECTED, PAINT 4" WHITE CENTER LINES FOR A DISTANCE OF 300' ON EITHER SIDE OF THE CROSSING, AS SHOWN ABOVE FOR 2-LANE PAVEMENT. WHERE DISTANCE BETWEEN GRADE CROSSING AND AN INTERSECTION IS LESS THAN 450' ON 3-LANE PAVEMENT OR LESS THAN 600' ON 4-LANE PAVEMENT, OBTAIN SPECIAL MARKING SCHEME FROM THE SECRETARY OF HIGHWAYS.

FIGURE 51

MARKING INTERSECTIONS

Typical intersection pavement markings for rural and urban areas are shown in Figures 52, 53 and 54. At intersections of major and minor routes on tangent, the major route shall not be marked with solid center lines to prohibit passing unless the minor route carries heavy or medium volumes of traffic and accidents have been frequent. Center line markings on horizontal or vertical curves shall be broken only at intersections where the cross highway carries heavy or medium volumes of traffic.

The low angle from which pavement markings are viewed in an approaching vehicle makes it necessary that all transverse lines be proportionately widened to give visibility equal to that of longitudinal lines. This applies particularly to crosswalk markings, Stop or Limit Lines and Word Markings.

Crosswalk boundary lines may be used to safeguard and regulate pedestrians and motorists at points where there is conflict between vehicular and pedestrian traffic such as at:

(a) Intersections where pedestrians should be encouraged to walk in designated lanes.

(b) Intersections which are irregular where pedestrians may not be able to determine the proper crossing.

(c) Intersections of large area to guide and encourage pedestrians to use designated lanes, to loading islands or safety zones where otherwise they would cross the highway in a haphazard manner.

(d) Intersections which are signalized where pedestrian control is in effect.

(e) Other locations of heavy pedestrian concentration, schools, school crossings, churches, business and commercial districts, etc.

All white crosswalk lines shall be 8 inches wide and the width of the crosswalk shall be at least 6 feet, but not more than 20 feet. Between these limits, crosswalks should always be equal to the width of the existing sidewalks.

At intersections where there is an unusual amount of pedestrian traffic, but no sidewalk, crosswalk lines may be placed 6 feet to 10 feet in advance of the edge of the intersected roadway. If, however, crosswalk lines are placed on the side road, they should be so located that it will be necessary for vehicles to stop before entering or crossing the crosswalk.

Stop or Limit Lines may be used where it is important to indicate the point behind which vehicles are to stop in compliance with a Stop Sign, traffic signal or turning regulation. The Stop Line shall be a white bar 24 inches wide painted across the right half of the pavement. If Stop Lines are used to supplement a Stop Sign, the line should be placed approximately opposite the sign, parallel to the edge of the pavement of the intersected roadway. If the Stop Sign cannot be located where the vehicles are required to stop, the Stop or Limit Line should be placed at the desired stopping point.

Stop Lines should be placed not less than 4 feet in advance of the nearest crosswalk line or near edge of the intersected roadway. In the absence of crosswalk lines, the Stop Line may be placed at the desired stopping point, but not more than 15 feet from the near edge of the intersected roadway.

The word **STOP** may be lettered on the pavement as a supplement to the Stop or Limit Line only at locations where every vehicle is required to stop at all times. It shall not be used at intersections with Stop and Go Traffic Signals. See Figure 58 for pavement letter designs.

Lane Lines are helpful in channelizing and guiding traffic at congested intersections where it is necessary to utilize the full width of roadway.

The longitudinal lane line for center lines used on intersection approaches shall be extended to the stop or nearest crosswalk line or in the absence of such line the lane line, or center line, shall be stopped 10 feet back from the edge of the intersected roadway.

Lane Lines in urban areas on approaches to intersections of two-lane, three-lane, or four-lane highways shall be at least 100 feet in length. Lane Lines in rural areas on approaches to intersections shall be at least 300 feet in length.

Channelization and Turn Markings may be used when necessary to restrain drivers from starting left turns before reaching the intersection or to guide vehicles turning at the intersection.

URBAN PARKING

Pavement markings for parking spaces may be placed to insure the efficient use of the maximum parking area available and also to help prevent encroachment of vehicles in no parking areas. All lines for parking spaces shall be solid white lines not less than 4 inches wide. Parking lines may be placed parallel to the curb to indicate the outside boundary of the parking zone. This line, if used, should be placed with the inside edge of the line not less than 7 feet from the face of the curb. The ends of the zone may be indicated by placing a solid line 7 feet long at right angles to the curb.

The parking zone may, if desired, be divided into stalls by the use of a solid line at right angles to the curb. Each stall should be not less than 20 feet long, to accommodate one parked vehicle. However, the end spaces of the zone may be reduced to 18 feet, if desired, because of accessibility. This method of marking is desirable and is generally used where parking meters are installed. Diagonal or angle parking on highways is not recommended.

Parking is prohibited by law within 25 feet of intersecting curb lines at intersections and within 30 feet of Stop Signs. It is often desirable, however, to increase these minimum distances considerably to increase sight distance and to eliminate traffic congestion. All curbs should be painted yellow to indicate areas where parking is prohibited. Parking signs as listed on Page 84, should be used to supplement pavement and curb markings. Typical markings and design details are shown in Figure 55.

SCHOOL CROSSSINGS

Pavement markings and School Signs shall be used to indicate the limits of a school zone. The markings and signs serve as a warning to motorists that they are approaching a restricted area where there are school crossings or school buildings and grounds adjacent to the highway.

School crosswalk lines shall be solid white lines 12 inches wide, placed across the highway usually at right angles to the center line. The width of the crosswalk shall be 10 feet. The school zone shall extend 300 feet beyond the crosswalks or at least 100 feet beyond the school grounds as shown in Figure 56. The word **School** may be painted on the pavement at the beginning of the school zone.

Where a school is not located adjacent to or in the immediate area of the highway, a school crossing may be marked in accordance with the standard crosswalk markings shown in Figures 53 and 54. Such school crossings should be supplemented with school crossing signs, Standard W-252, erected not less than 150 feet nor more than 300 feet in advance of the crossing.

ARROW AND LETTER MARKINGS

Pavement Arrows and Letters may be used for the purpose of guiding, warning or regulating traffic. The markings shall be white and shall be used only to supplement standard signs, generally at locations of unusual traffic or physical conditions where the motorists may not readily see the sign. The word markings are elongated at a ratio of 4 to 1 to a height of 8 feet because of the low angle at which they are viewed by approaching motorists. Where normal traffic speeds are greater than 35-Miles Per Hour, usually in rural areas, the message, if more than one word should read UP; that is, the first word in the message should be located nearest the approaching motorist. The space between the words should be four times the height of the letters.

Where normal traffic speeds are 35-Miles Per Hour or less, usually in urban areas, the message, if more than one word, should read DOWN; that is, the last word being nearest the motorist. The space between the words should be equal to the height of the letters. In urban areas where space is limited, the size of the letter may be reduced one-half.

The message **Stop** or **Limit** when used shall be placed 4 feet in advance of the stop, limit or crosswalk lines.

The message **School** and **Slow** when used, shall be placed adjacent to their respective signs.

The location of the message Right (or Left) Turn Only is variable and shall be placed at the point where it is desired that vehicles move to their proper traffic lane. For design details of Arrow and Letters refer to Figures 57 and 58.

PROTECTION OF FRESHLY PAINTED LINES

The durability, visibility, serviceability and general overall results obtained from pavement markings depends on the degree of protection given to freshly painted lines. It is important that sufficient time be allowed for the paint film to dry so that it will not track or discolor under ordinary traffic conditions.

MARKING RURAL INTERSECTIONS

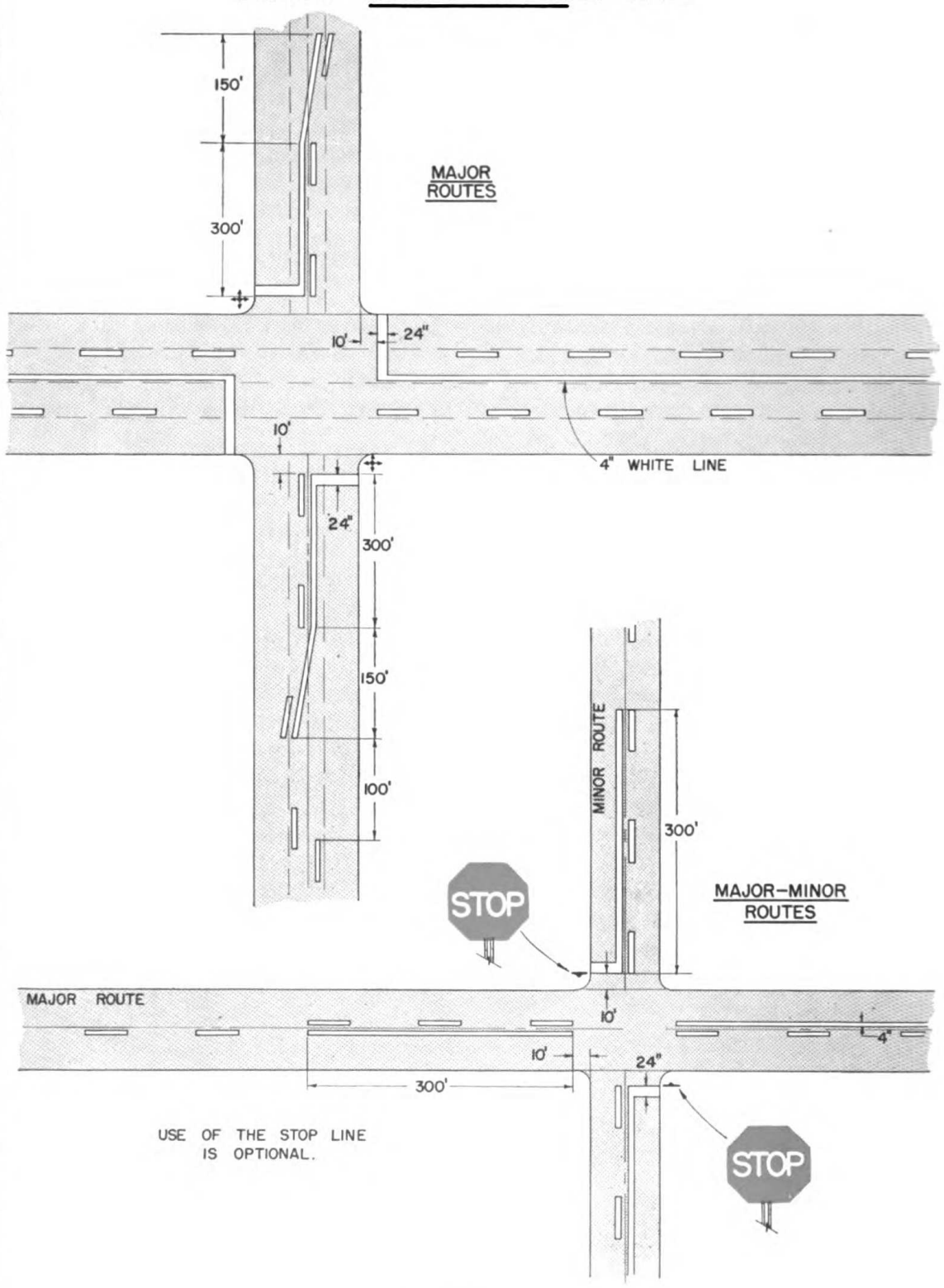


FIGURE 52

MARKING URBAN INTERSECTIONS

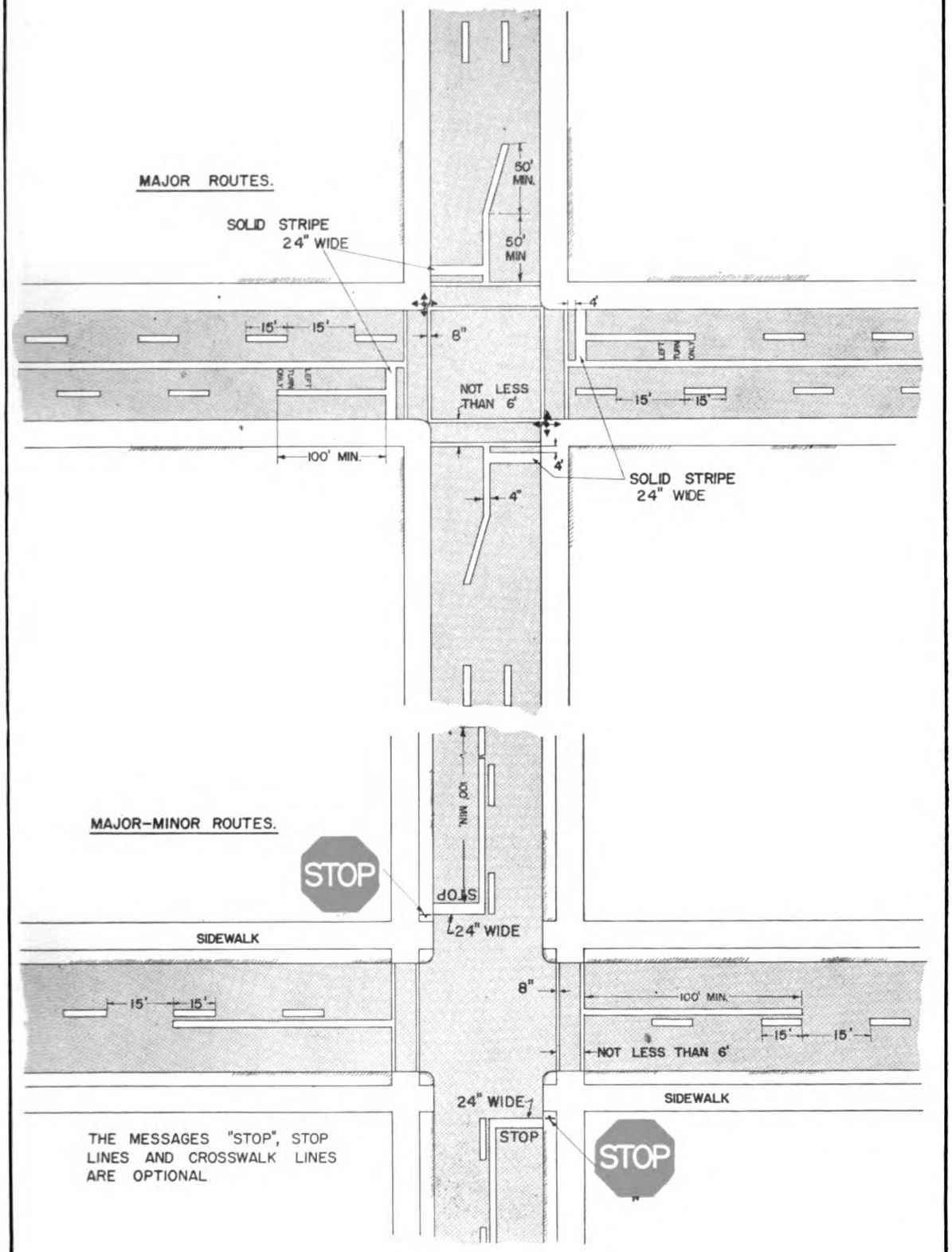


FIGURE 53

CHANNELIZATION AND TURN MARKINGS AT WIDE INTERSECTIONS

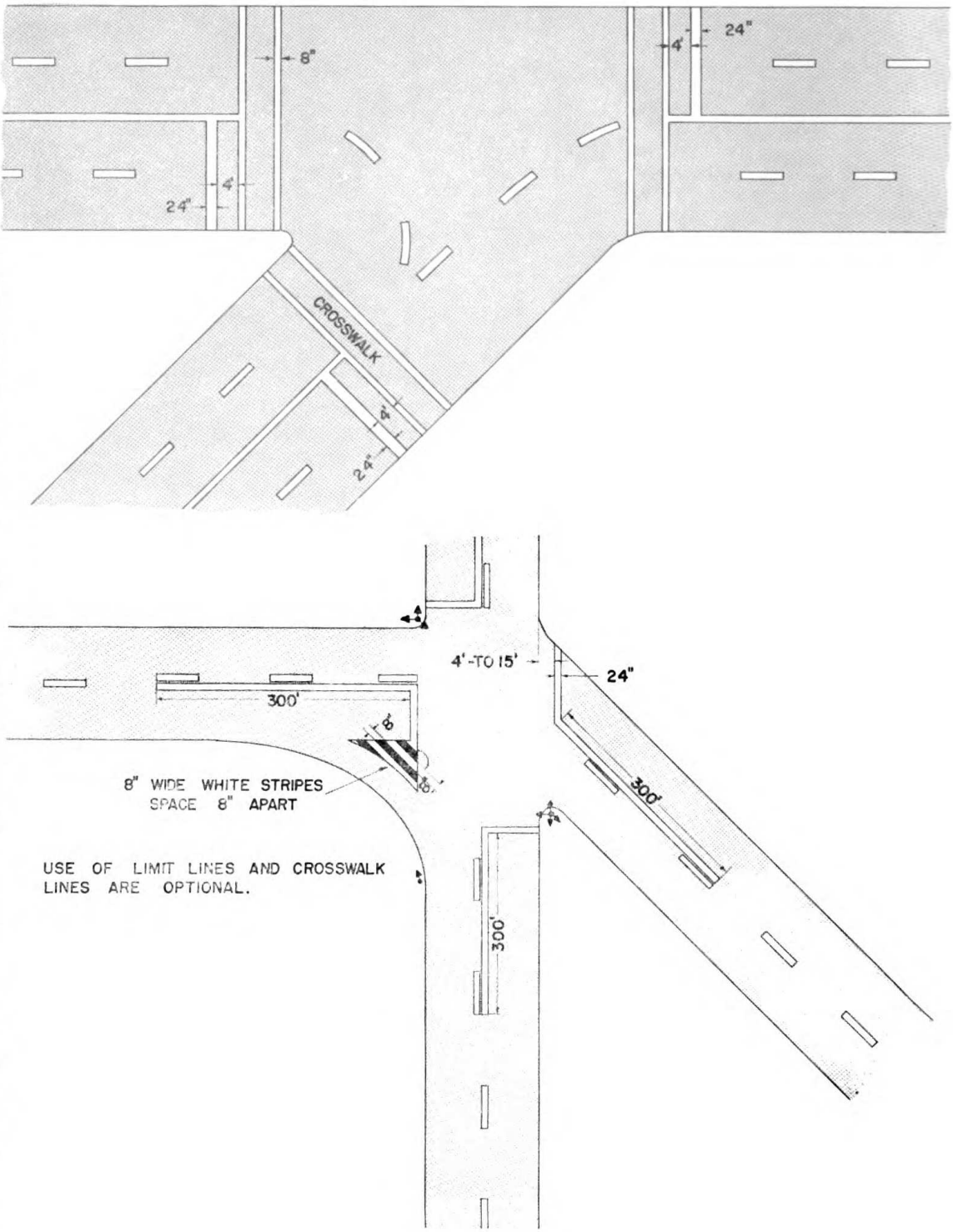


FIGURE 54

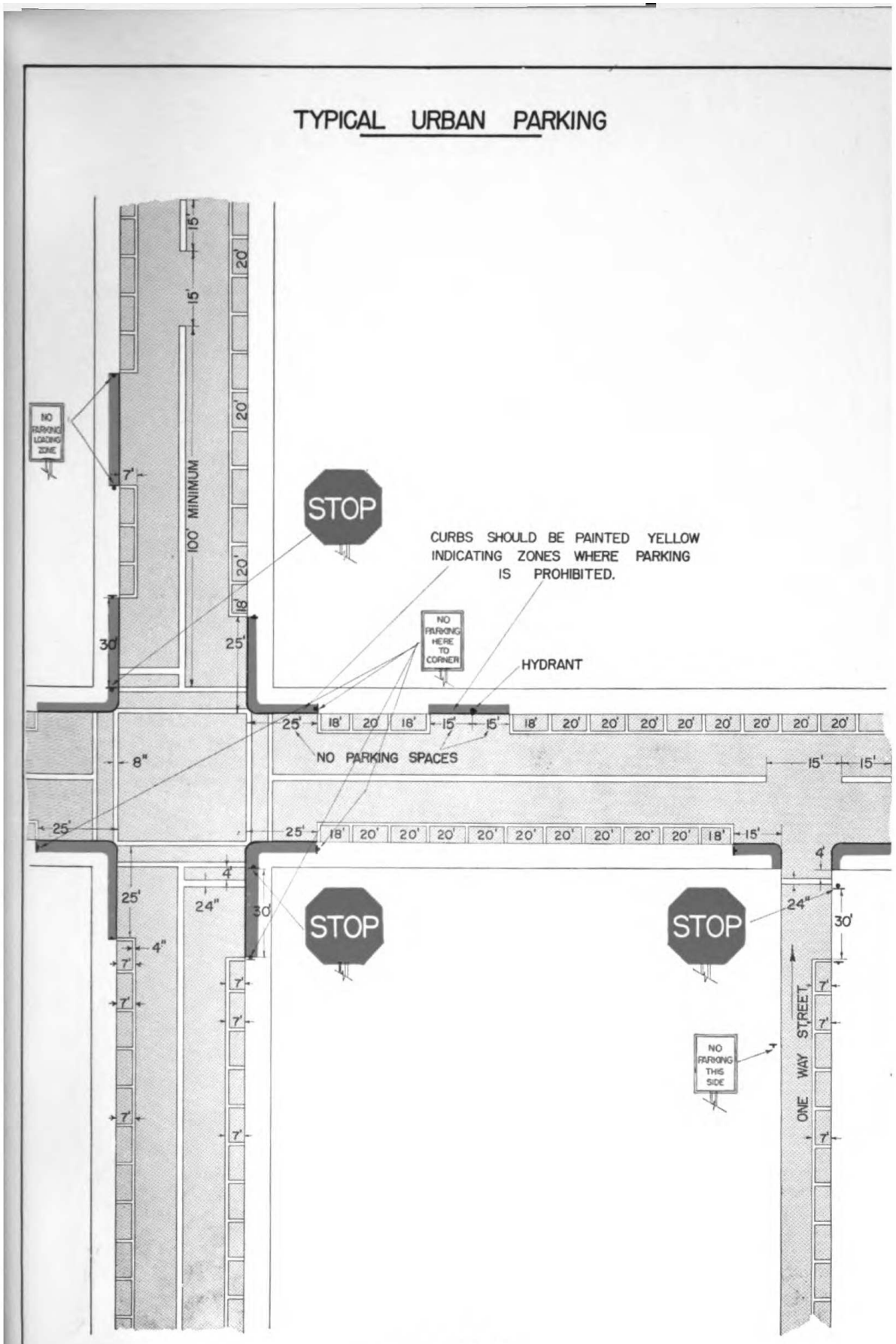


FIGURE 55

SCHOOL CROSSING

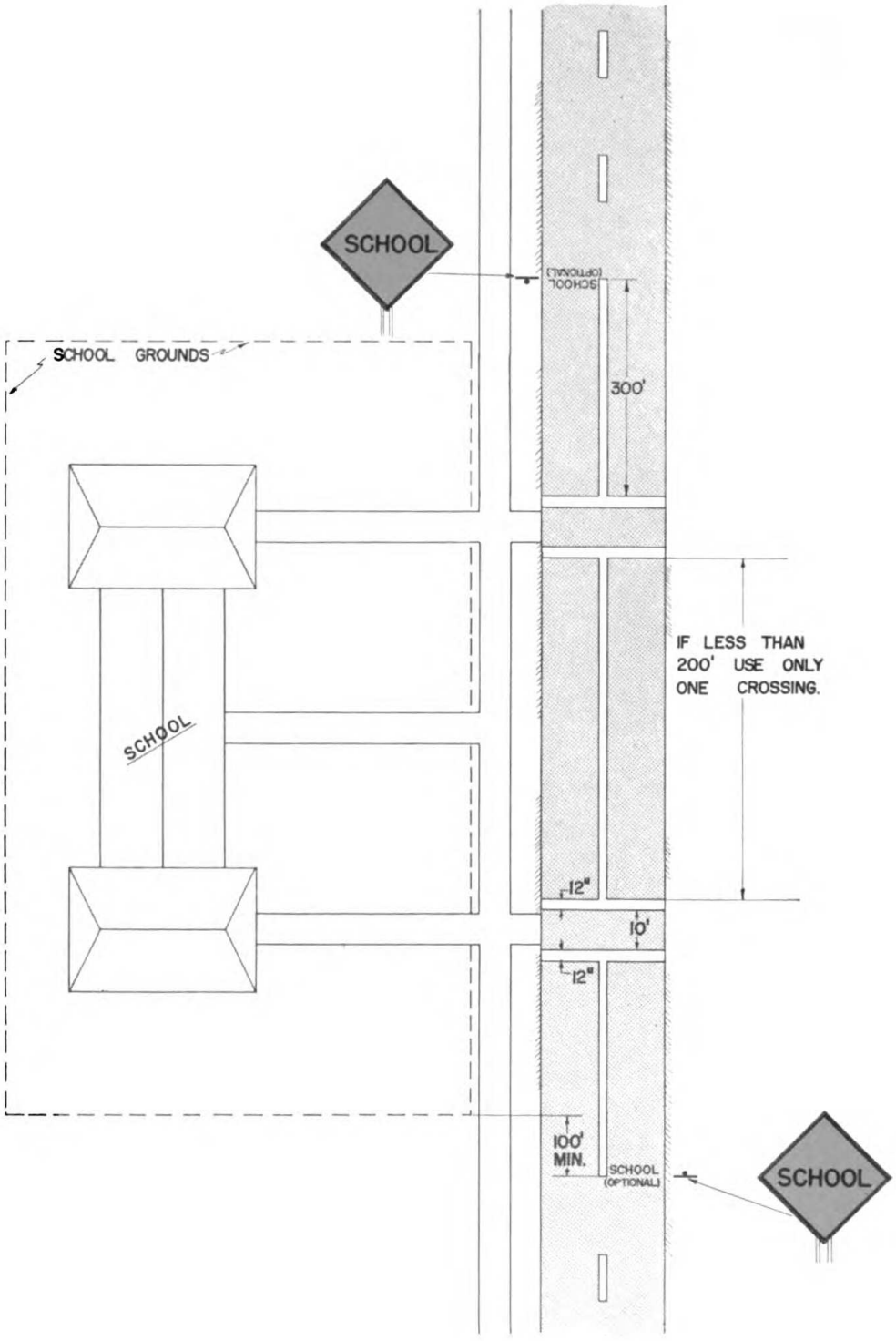
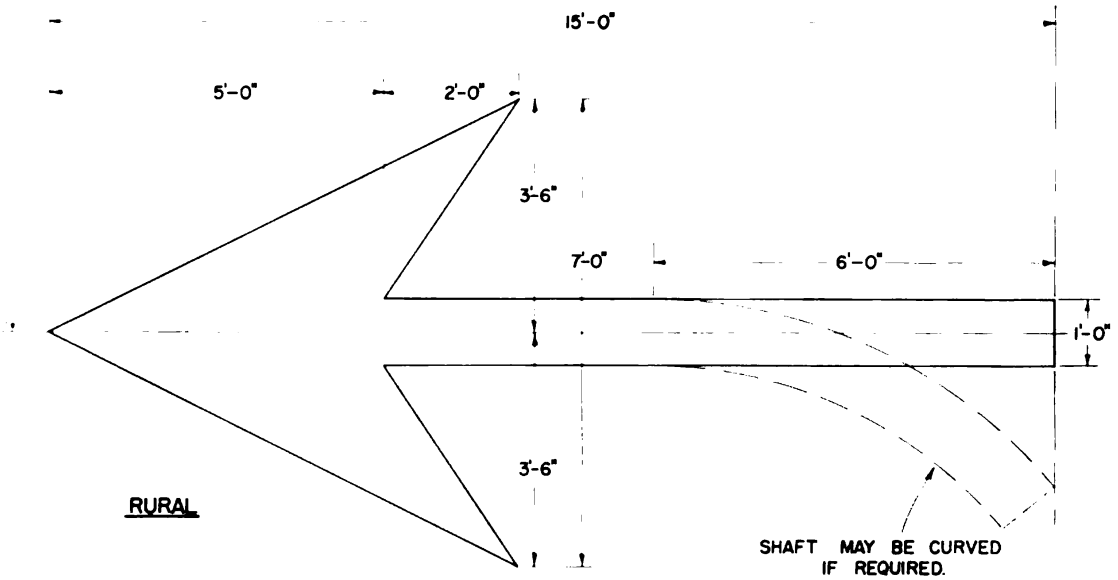


FIGURE 56

DETAILS OF PAVEMENT ARROWS



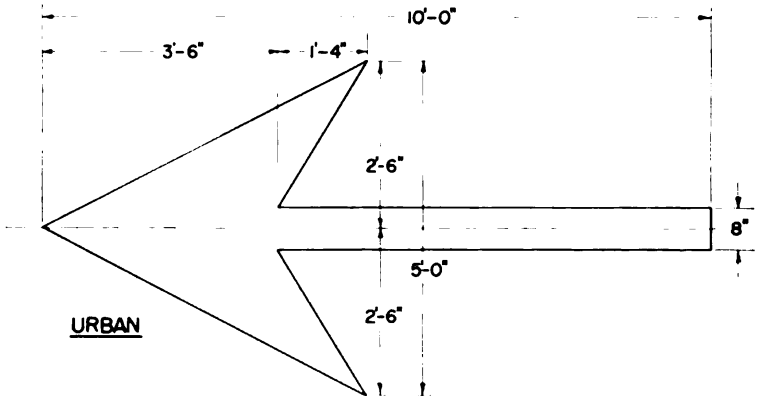


FIGURE 57

DETAILS OF PAVEMENT LETTERS

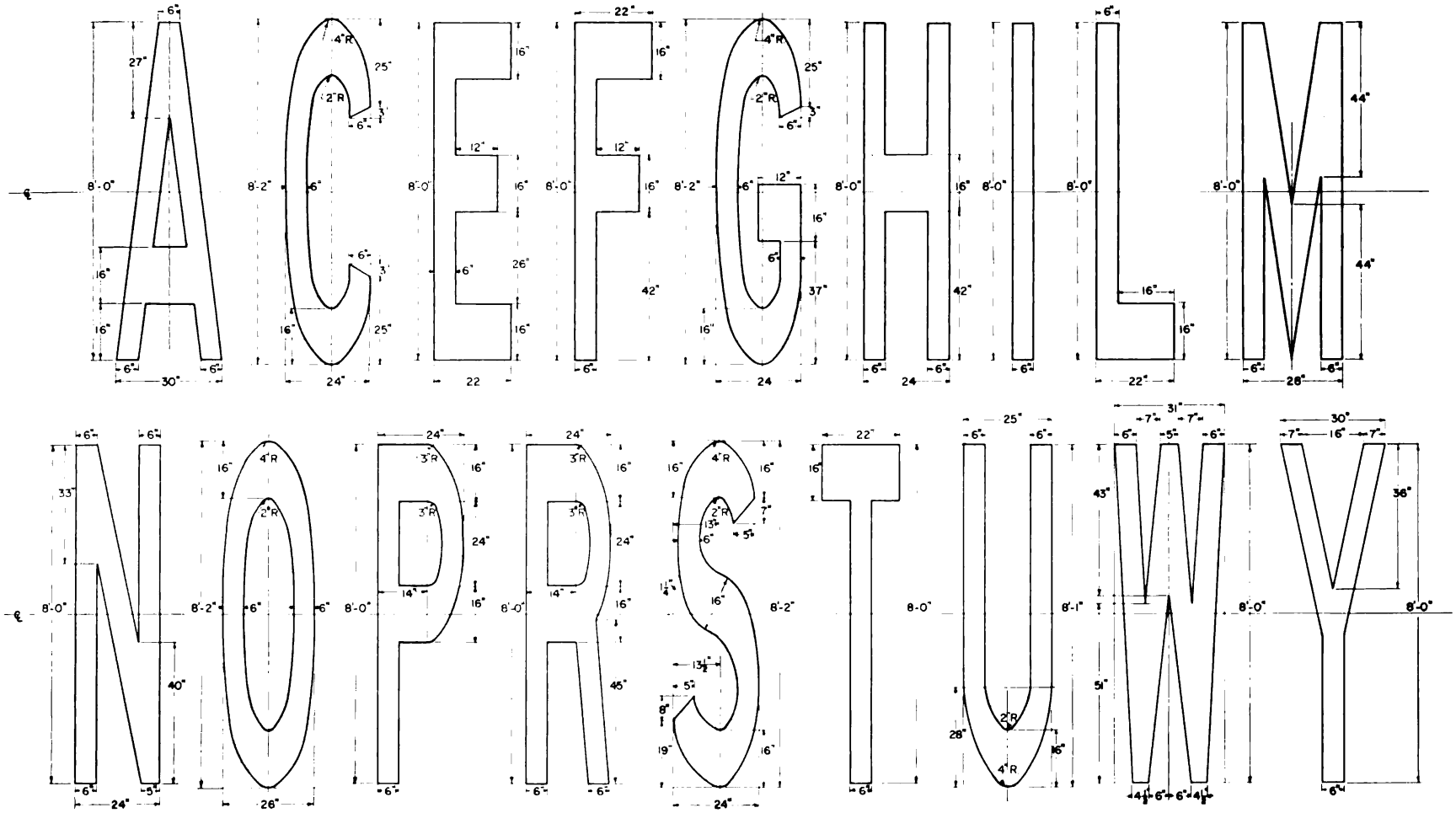


FIGURE 58

PROTECTION OF FRESHLY PAINTED LINES

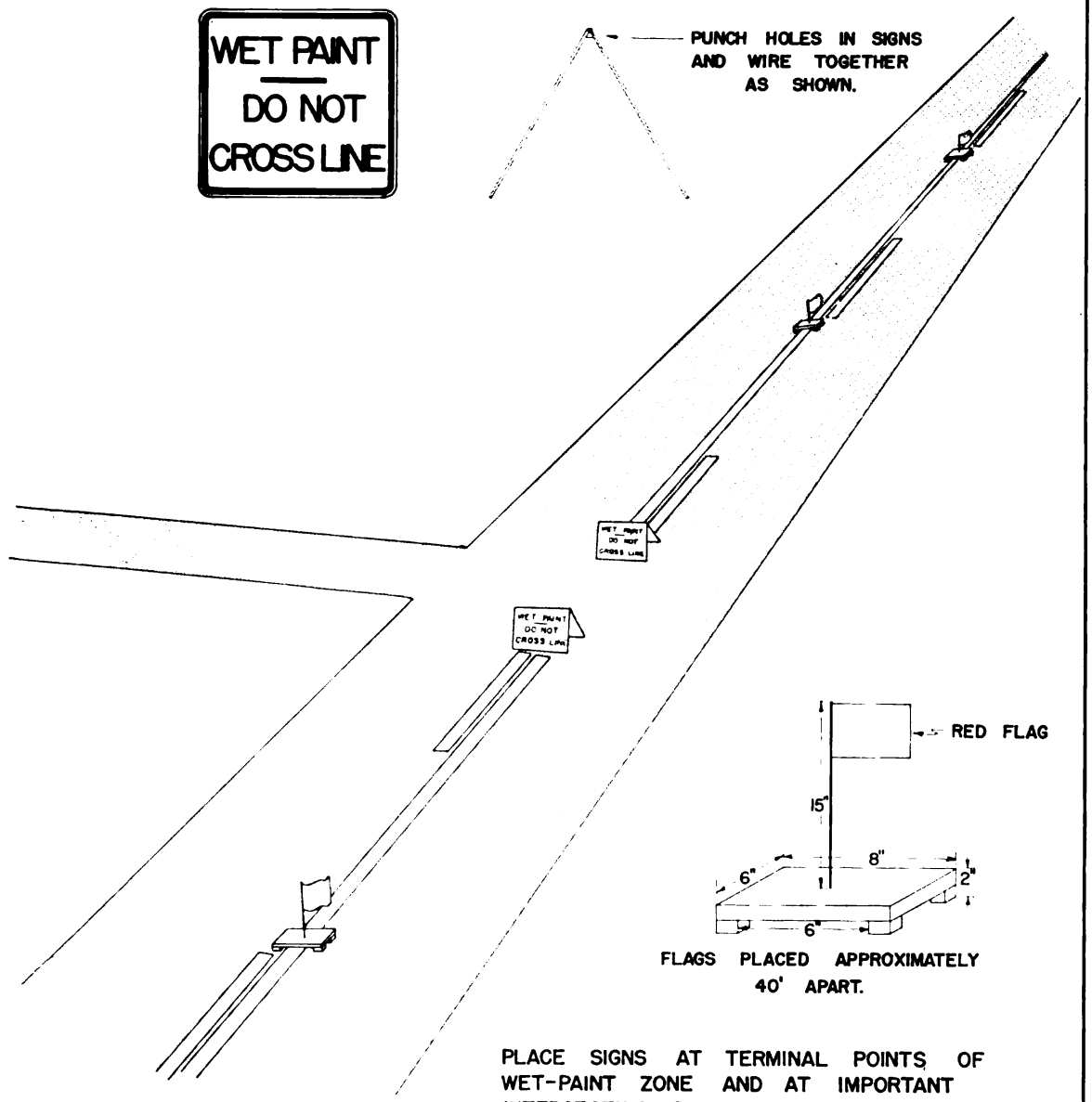


FIGURE 59

DETAILS OF OBSTRUCTION MARKING

MARKING APPROACHES TO OBSTRUCTIONS

The term **ISLAND** is applied to certain areas within the roadway from which vehicular traffic is diverted by pavement markings or physical construction. The islands are designed to segregate vehicles or pedestrians and vehicles to minimize conflicts and increase safety. However, a careful engineering study should be made of the necessity and value of islands before they are placed in areas which would otherwise be available for vehicular traffic.

Pavement markings shall be carefully used to mark all islands whether they be pedestrian or refuge islands, safety or loading zones, or highway divisors, to provide approaching traffic a maximum degree of warning of the presence of the island or obstruction.

Typical markings in urban areas used to warn motorists approaching islands or obstructions are shown in Figure 60. Markings should begin not less than 100 feet in advance of the island. The zone, not less than 50 feet in advance of the island, shall be marked with white stripes 8 inches wide, spaced 3 feet apart, sloping at an angle of 45 degrees toward the side of the island on which traffic shall pass. All other lines are 4 inches wide. If the island is more than 6 feet wide or if speeds are normally greater than 35-Miles Per Hour, the length of these markings should be increased accordingly.

In addition to pavement markings, alternate white diagonal stripes should be painted on each end of the island. Signs shall be erected indicating the existence of a safety zone as well as the side or sides of the island around which traffic is permitted to flow. If possible, all islands should be illuminated by floodlights or overhead lights to show their location and the proper lanes for vehicular travel. Extreme care must be given the location of such lights so that they will not throw a glare in the face of traffic approaching from either direction.

Pavement markings used to warn approaching traffic of islands or other obstructions in rural areas are shown in Figures 61 and 64. The markings shall begin not less than 300 feet in advance of the obstruction. The zone in advance of the obstruction (150 feet in length) shall be marked with white stripes 8 inches wide spaced 3 feet apart, sloping at an angle of 45 degrees toward the side of the obstruction on which traffic shall pass. All other lines shall be 4 inches wide. Longitudinal lines bordering the 8 inch stripes, shall be sloped sufficiently to end 12 inches from the outside edges of the obstruction.

Signs shall be used in conjunction with pavement markings at or in advance of the obstruction to warn traffic of the condition.

MARKING OF OBSTRUCTIONS

Obstruction within or near the roadway that constitutes a potential hazard to traffic such as bridge and underpass piers, abutments, wing walls, headwalls, buffers for islands or signal supports, shall be clearly marked.

APPROACH MARKINGS TO PEDESTRIAN ISLAND & SAFETY ZONES

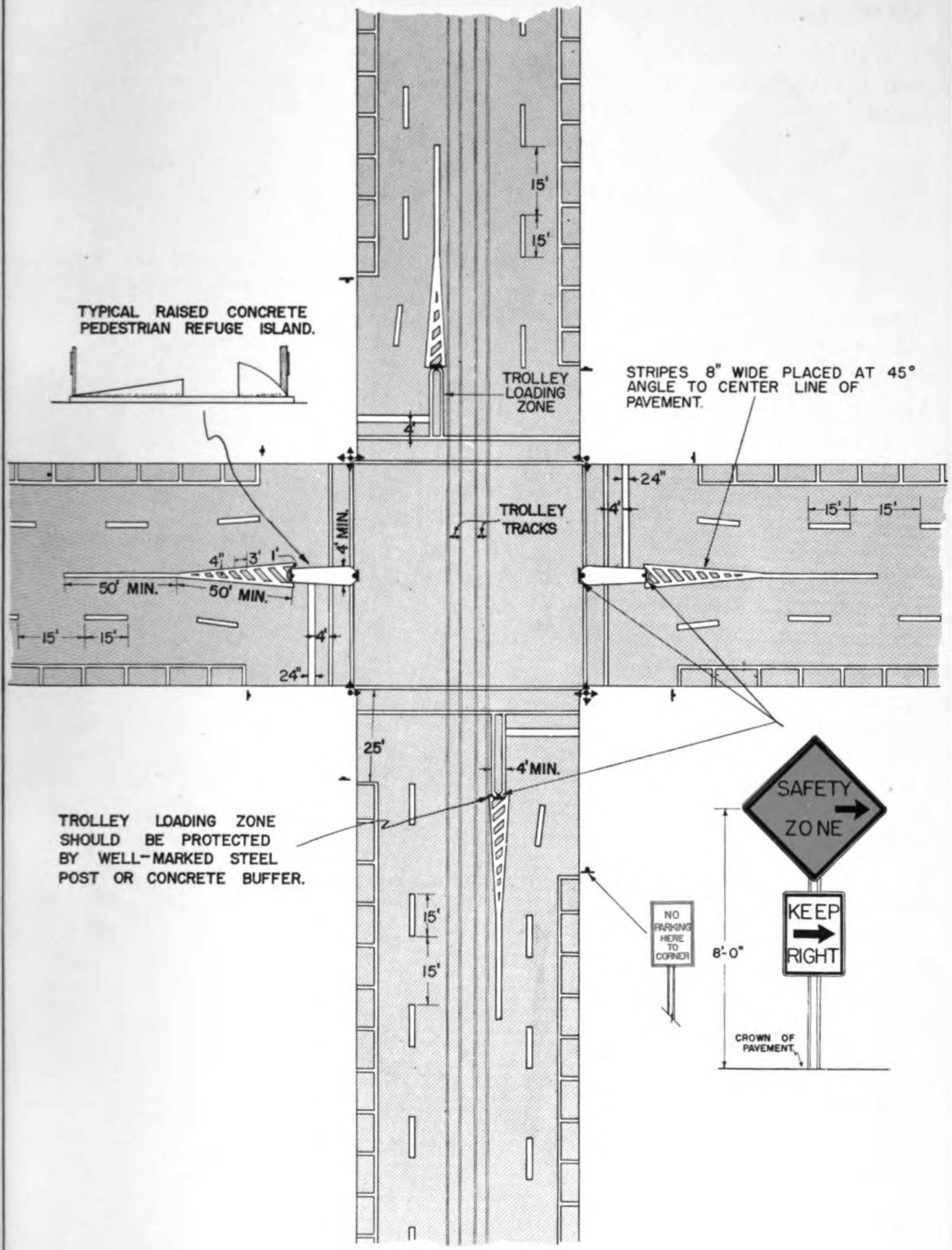


FIGURE 60

APPROACH MARKINGS TO DIVIDED HIGHWAYS

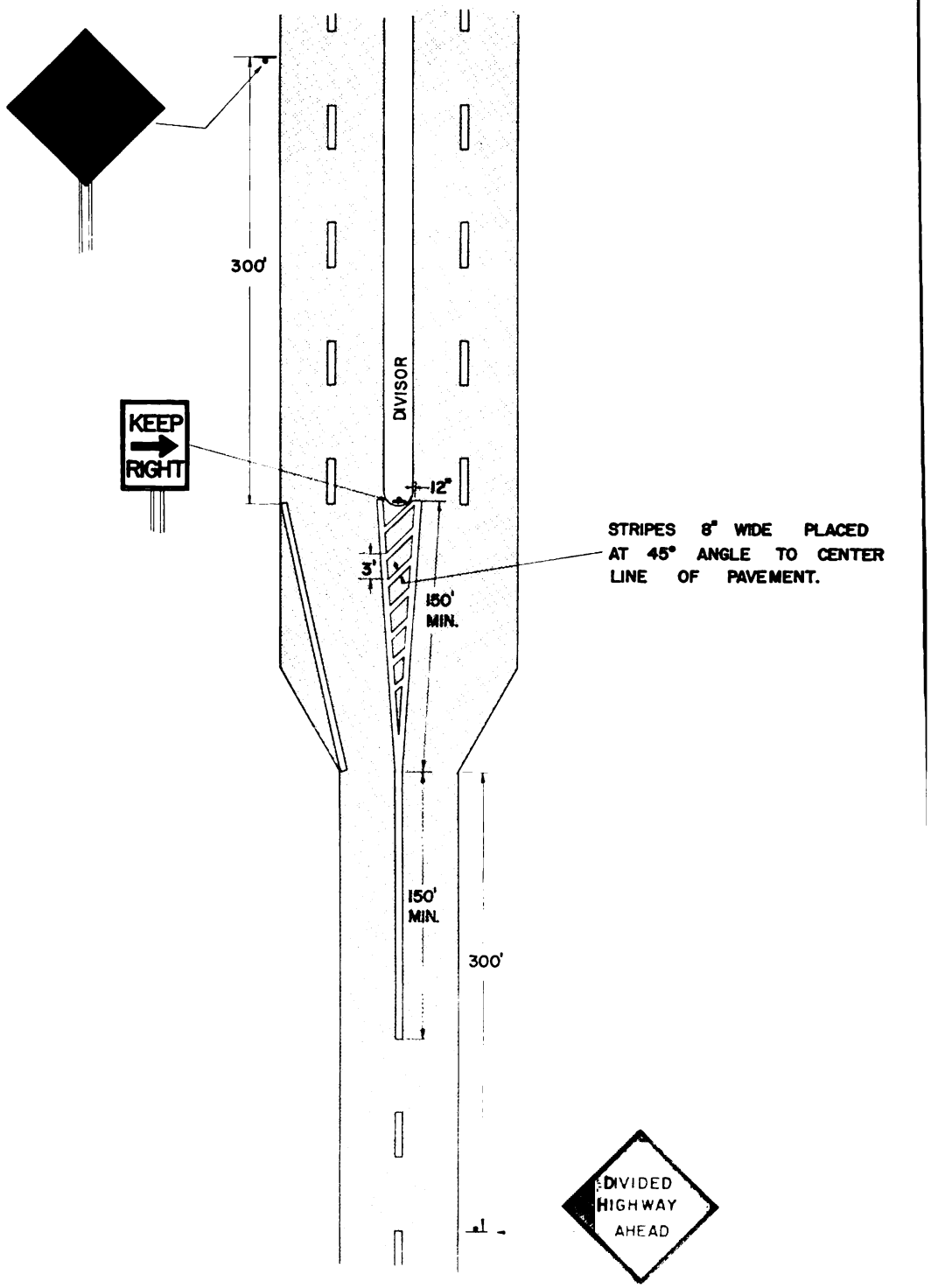


FIGURE 61

SINGLE UNDERPASS MARKINGS

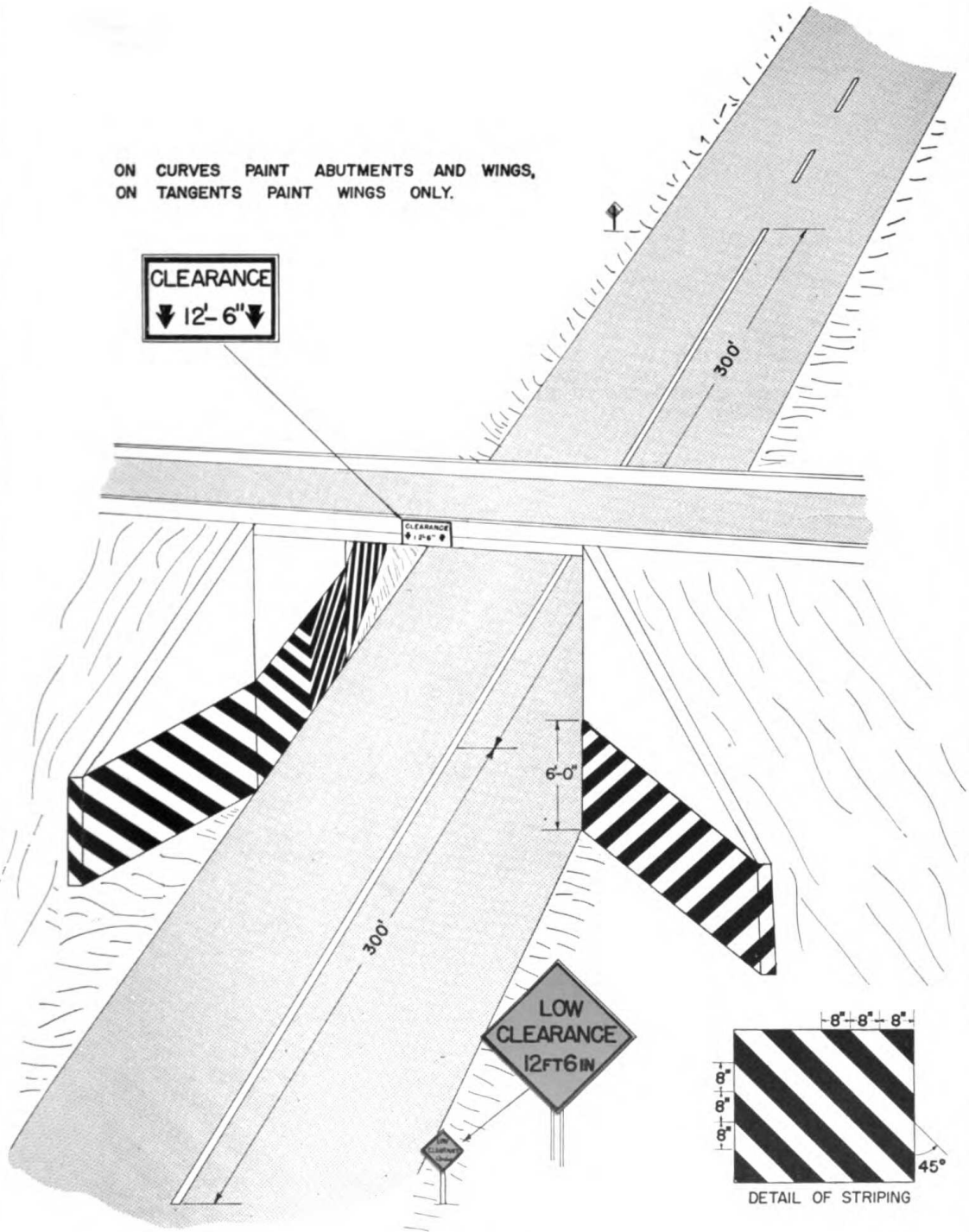


FIGURE 62

SINGLE ARCH UNDERPASS MARKINGS

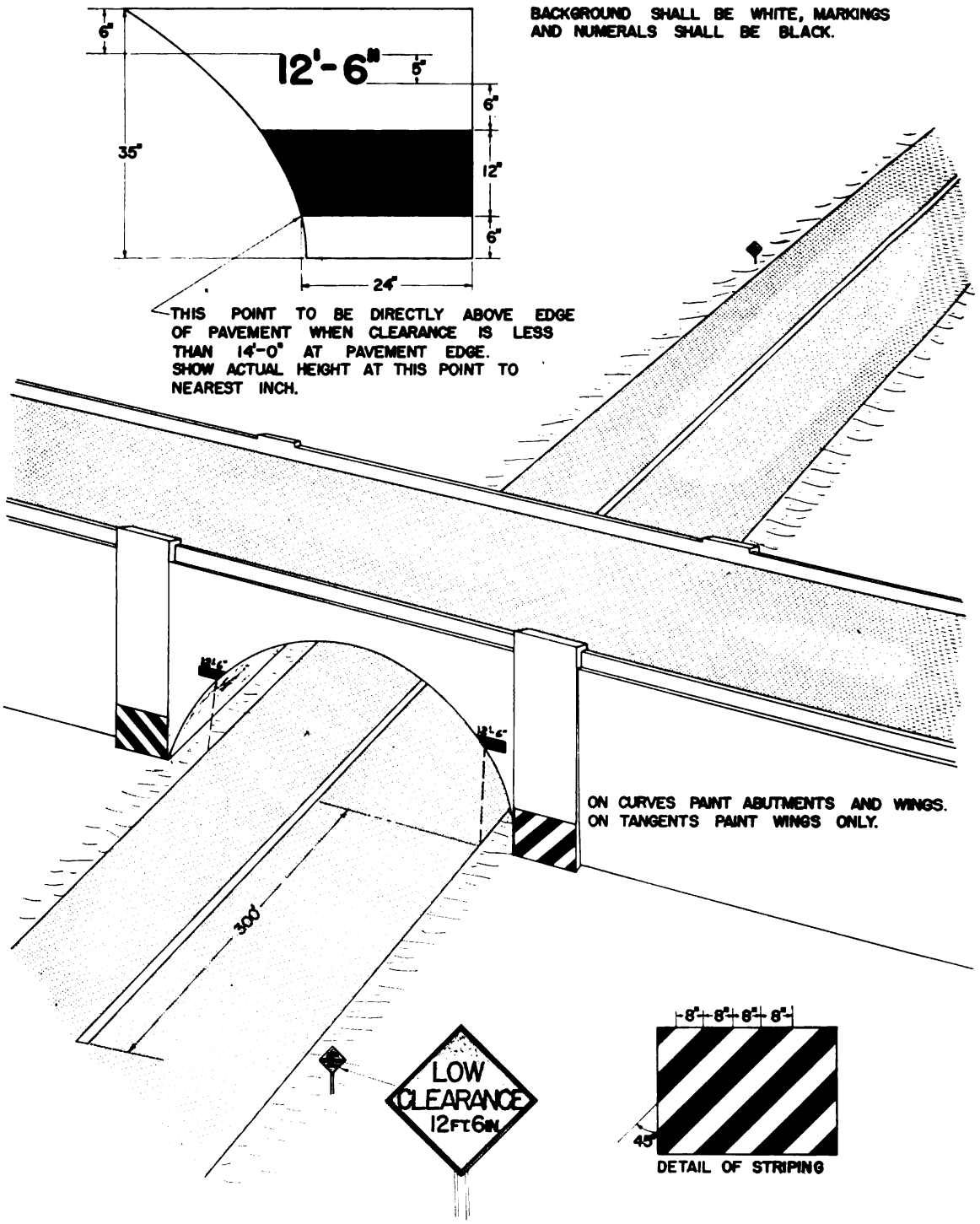


FIGURE 63

DIVIDED UNDERPASS MARKINGS

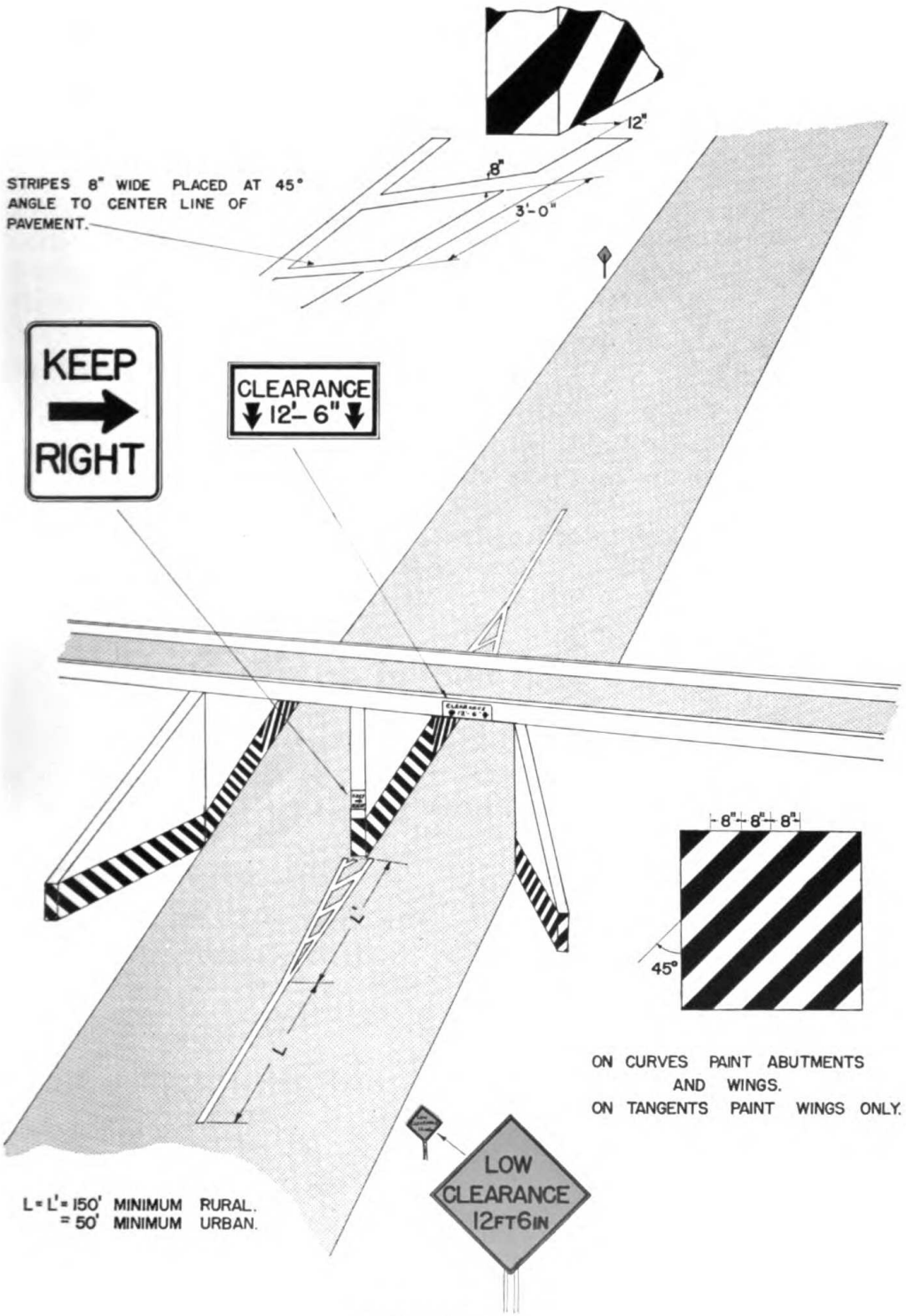
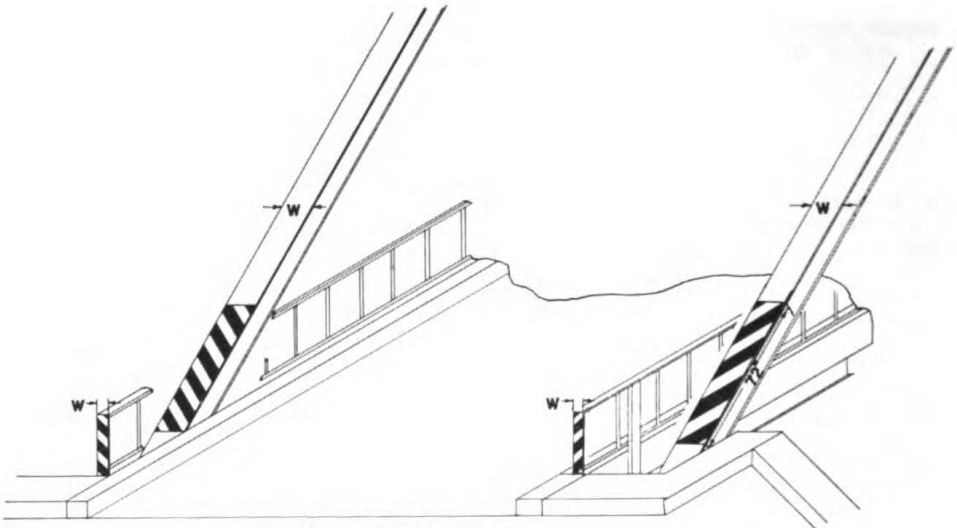


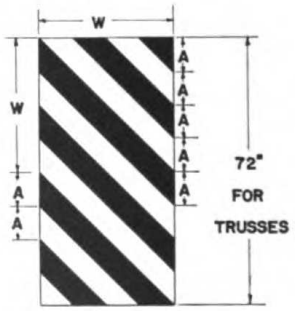
FIGURE 64

PORTAL & HEADWALL MARKINGS

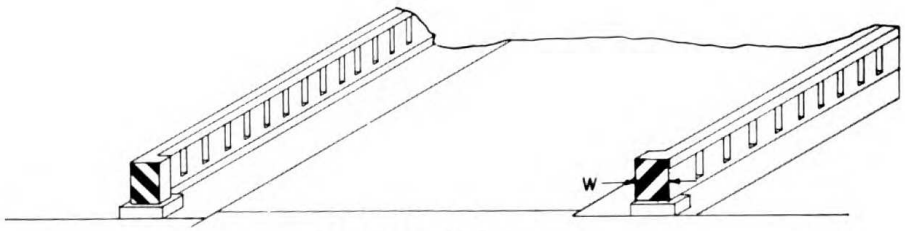


TYPICAL TRUSS BRIDGE

WIDTH OF END POST "W"	DIMENSION OF STRIPE "A"
10" TO 20"	6"
OVER 20"	8"



DETAIL OF STRIPES.



TYPICAL CONCRETE BRIDGE

FIGURE 65

The exposed wall or wing, etc., shall be striped for a height of 6 feet. The white stripes shall slope downward at an angle of 45 degrees toward the edge of roadway or center of the structure as shown in Figures 62, 63, 64 and 65.

If the surface of the obstruction to be striped is unusually rough, or if it gives very little contrast to white paint, a black background may be prepared before the striping. Use of this method of striping shall be kept to a minimum.

Standard signs and pavement markings shall be used as shown to supplement striping. Objects such as guard rails, trees, and rocks which make an unusual encroachment within the ordinary width of berm may be painted white. However, this does not mean every rock and tree along a highway with narrow berms, should be painted. It is recognized that many conditions will be found not covered herein, but the use of the obstruction markings should be sufficiently obvious so that no further detailed specifications are necessary.

REFLECTIVE MARKINGS

All utility poles within highway right-of-way limits, which are 8 feet or less from the edge of roadway shall be delineated by the Utility Company. However, exceptions may be made in cases where the poles are not considered a hazard to traffic due to their location on cut or fill slopes, or behind guard rails, fences, curbs or other intervening structures. The location of this delineation shall be in accordance with the standard as shown in Figure 66.

DETAILS OF DELINEATION MARKING

Roadside delineators are reflective devices which may be erected along the edge of the roadway to aid night-driving by indicating horizontal and vertical curves, irregular alignment and other similar hazards.

SPACING OF DELINEATORS

The spacing of delineators varies with the degree of curvature as shown in Figure 67. The spacing shown applies to distance between delineators located on the outside of the curve. Delineators on the inside of the curve shall be placed radially opposite those on the outside of the curve.

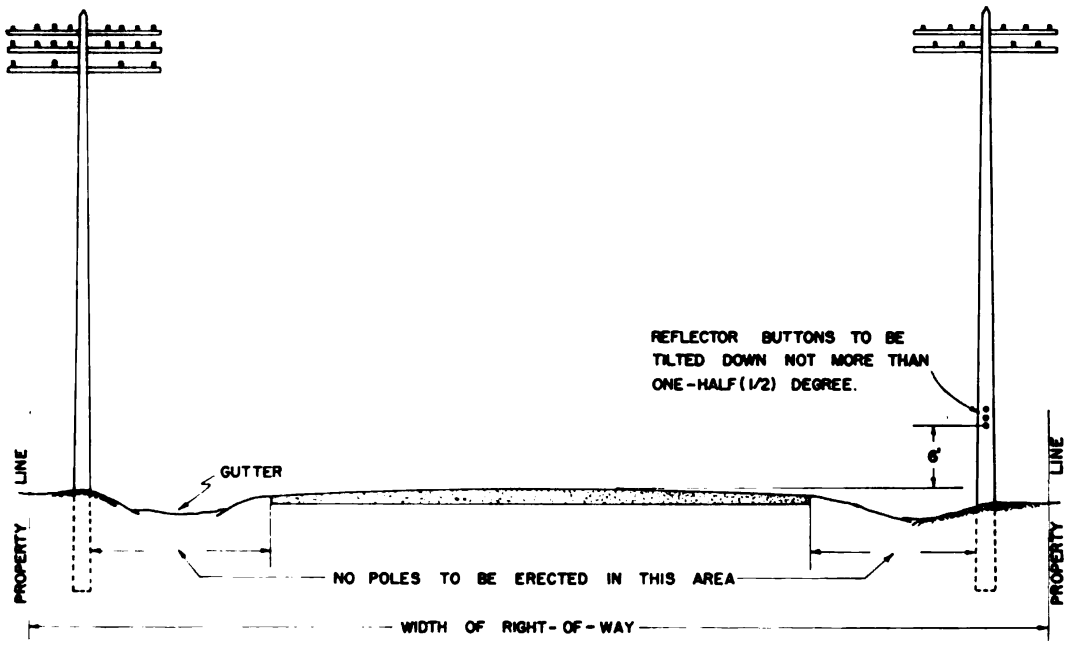
ERECTION OF DELINEATORS

Delineators shall be erected at a uniform distance from the edge of the pavement as shown in Figure 68. They shall be erected 42 inches above the crown of the pavement and preferably 8 feet from the edge of the pavement. When an obstruction along the highway is only a few feet in length, such as, at a small culvert or pole, where the delineator in front of the obstruction falls within 15 feet of it, the delineator shall be located so that it will be the same distance from the edge of roadway as the face of the obstruction.

At no time shall the delineator be placed more than 10 feet from the edge of roadway, and on roadways with shoulders less than 8 feet wide, the delineator shall be located on the shoulder edge or in back of the guard fence or ditch line.

Delineators, if used along curbed sections of roadway, shall be erected not less than 2 feet nor more than 5 feet from the face of the curb. The delineator shall be so angled that it faces approaching traffic at a point 300 feet in advance of the delineator. On sharp curves where sight distances fall below 300 feet, the delineator should face a point a distance equal to the sight distance. If there are driveways of unusual width, delineators may be moved one-quarter of the normal spacing in either direction.

MARKING UTILITY POLES WITHIN HIGHWAY RIGHT-OF- WAY



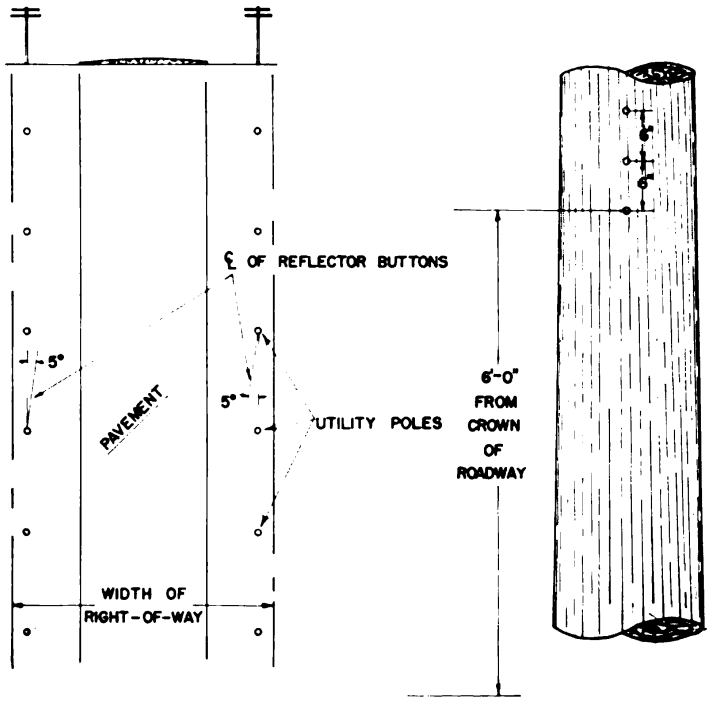
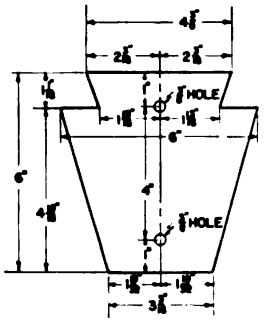


FIGURE 66

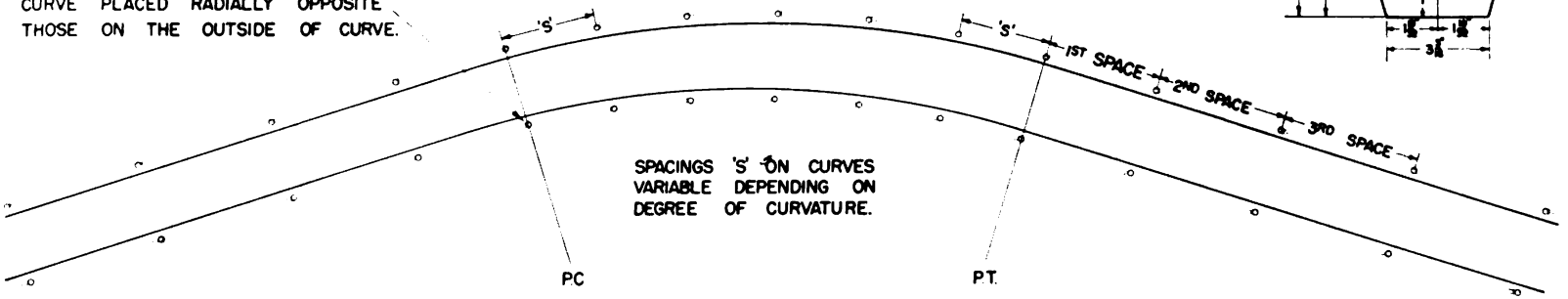
ROADSIDE DELINEATOR SPACINGS

DEGREE OF CURVE	'S' SPACING IN FEET	DELINEATOR SPACING ON APPROACHES TO CURVES		
		1ST SPACE	2ND SPACE	3RD SPACE
0° TO 1° 59'	150'	180'	200'	200'
2° TO 2°59'	100'	120'	200'	200'
3° TO 3°59'	80'	95'	160'	200'
4° TO 5°59'	65'	80'	130'	195'
6° TO 8°59'	55'	65'	110'	165'
9° TO 11°59'	45'	55'	90'	135'
12° TO 14°59'	40'	50'	80'	120'
15° AND OVER	35'	40'	70'	105'

DESIGN DETAILS OF DELINEATOR



DELINEATORS ON INSIDE OF CURVE PLACED RADIALLY OPPOSITE THOSE ON THE OUTSIDE OF CURVE.



SPACINGS 'S' ON CURVES VARIABLE DEPENDING ON DEGREE OF CURVATURE.

SEE FIGURE 33 FOR METHOD OF DETERMINING DEGREE OF CURVATURE.

FIGURE 67

TYPICAL ERECTION OF ROADSIDE DELINEATORS

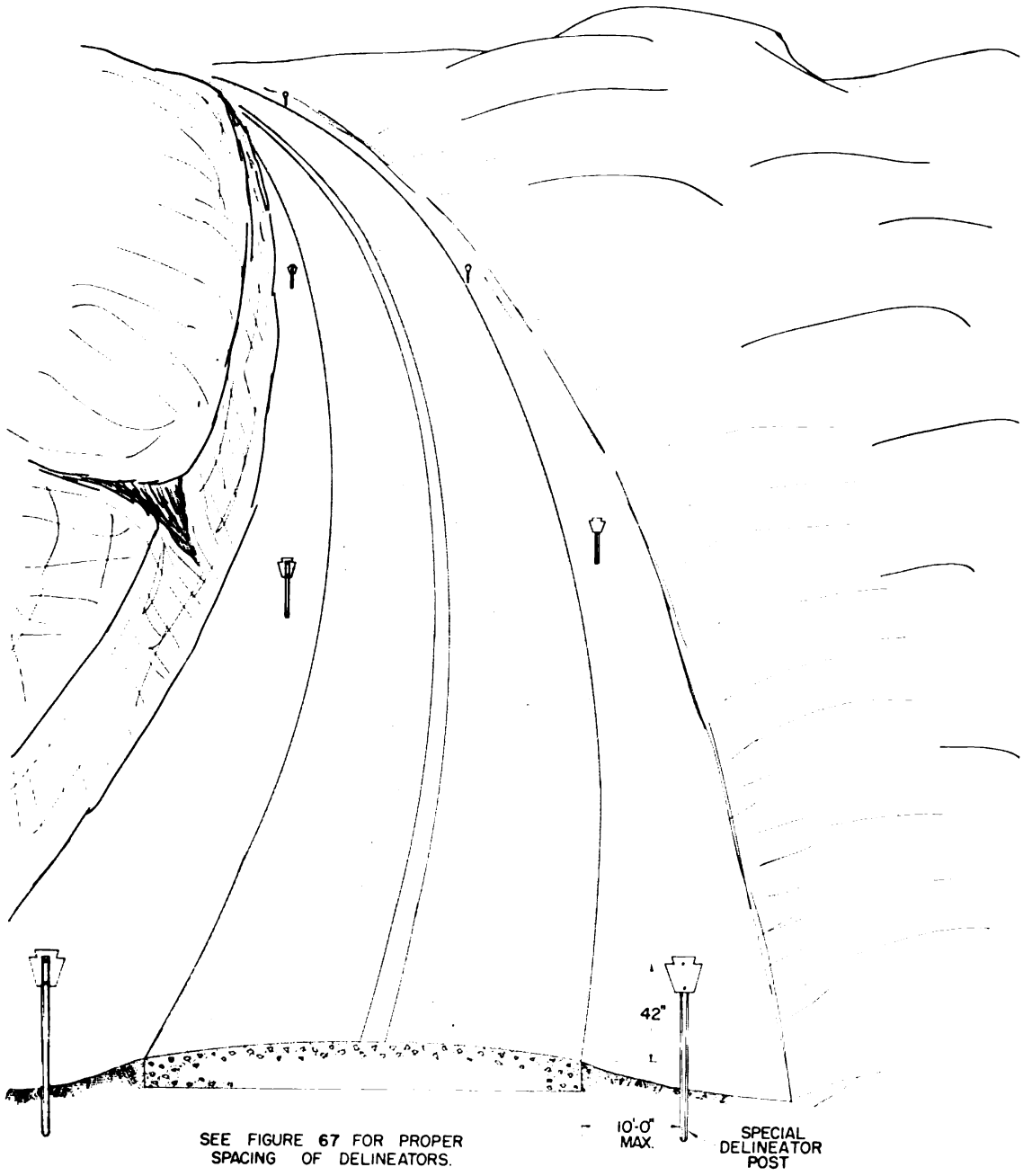


FIGURE 68

TRAFFIC SIGNALS

INTRODUCTION

DEFINITION

Highway traffic signals include all power operated traffic control devices, except signs, by which traffic is warned or is directed to take some specific action.

LEGAL AUTHORITY

Traffic signals are not enforceable if placed by other than public authority. The Pennsylvania Vehicle Code, Section 1110 (a) gives certain officials authority to erect traffic signals after receiving approval from the Secretary of Highways; and Section 1105 (a) directs the Secretary of Highways to make and publish regulations for the design, location and operation of all official traffic signals.

Authority for the removal, alteration or adjustment of signals that do not conform with the regulations of the Pennsylvania Department of Highways, as well as the removal of any lights, signs or markings so located as to interfere with signal indications, is provided for in Section 1105 (b) and (c) of the Pennsylvania Vehicle Code.

STANDARDIZATION

All types of signals can be substantially standardized as to design, location and operation, and it is of primary importance that such features that affect the public participation in traffic movements be standardized.

VALUE OF TRAFFIC SIGNALS

Traffic signals involve considerable expense and retard the natural flow of traffic. Therefore, they shall never be installed except on the basis of a thorough analysis of traffic volumes, traffic accidents and other pertinent factors. Warranted traffic signals provide the following advantages:

1. They provide for orderly movement of traffic.
2. They reduce the frequency of certain types of accidents.
3. They can be co-ordinated to provide for continuous or nearly continuous movements of traffic at a predetermined rate of speed along a given route.
4. They can be used to interrupt heavy traffic at intervals to permit other traffic to cross or enter the intersection.
5. They represent a considerable economy as compared with control by manpower.

ADVANCE ENGINEERING DATA REQUIRED

The installation of traffic signals at intersections shall be preceded by a thorough study of traffic, highway and accident conditions. Among the facts that shall be obtained are the following:

1. Complete vehicle volume counts, including right and left turns. These counts shall include the periods in an average day when the signal would appear to be most needed.
2. Pedestrian volume counts on each crosswalk during the same periods as the vehicle counts.
3. Speed of vehicles on approaches to the intersection.
4. Details of the physical layout, such as roadway width, channelization, grades on approaches, corner sight-distance restrictions, bus-stop locations, parking practice, and location of railroad grade crossings. These data are of most value when assembled on a scaled drawing.
5. Summary of accidents by type, location, vehicle or pedestrian direction, time, etc., for the preceding three years.

TRAFFIC SIGNAL PERMITS

When the proper officials of a political subdivision, such as, a city, borough or township (except first and second class cities) desire to install a traffic signal at any intersection of highways, they shall apply to the Secretary of Highways who will furnish official application forms. When the local officials return the application forms, properly executed, investigations and studies will be made by representatives of the Department of Highways.

If the necessary warrants or conditions as described further in this manual are met, the Secretary of Highways will give his approval on issuing a permit with the understanding that all signal equipment shall be installed and operated in accordance with the standards given in this manual. The completed signal installation shall be exactly in conformance with the provision of the issued permit and location diagram. The Pennsylvania Department of Highways will not assume any expense occasioned by the purchase, erection, and operation of traffic signals, nor will it guarantee materials or workmanship.

The Secretary of Highways, by law, reserves the right to revoke and annul the issued permit if the Permittee shall at any time wilfully or negligently fail to comply with the conditions contained in this permit, or, upon changes in traffic conditions, fail to make any changes in the construction or operation of this signal, or to remove it, when so ordered by the Secretary of Highways; or if this installation is not in operation within six (6) months of the receipt of this permit.

If an intersection is partly in one political subdivision and partly in another, the proper officials of both subdivisions shall make application and also furnish the Secretary of Highways with either a copy of their agreement on installing and maintaining the signals or a brief description of the principal features of said agreement.

When a railroad grade crossing is within 300 feet of an intersection, the Public Utility Commission approval shall be obtained before a traffic signal permit is granted.

CLASSIFICATION

Signals are classified as follows:

1. **Fixed-Time Signals:**
   a. Isolated
   b. Simultaneous
   c. Alternate
   d. Limited Progressive
   e. Flexible Progressive
2. **Traffic Actuated Signals:**
   a. Full Traffic Actuated
   b. Semi-Traffic Actuated
   c. Pedestrian Actuated
   d. Speed Control Signals
3. **Special Traffic Signals:**
   a. Pedestrian Signals
   b. Flashing Signals
   c. Flashing Beacons
   d. Lane Direction Traffic Signals
   e. Signals at Drawbridges
   f. Train Approach Signals

FIXED-TIME SIGNALS

DEFINITION

A fixed-time signal is one by which traffic is alternately commanded to stop and permitted to proceed in accordance with a predetermined time schedule.

APPLICATION

Fixed-time signals are applicable where the proportion of traffic entering the intersection on one street remains nearly constant to intersecting traffic on the other street.

REQUIRED WARRANTS

The following warrants have been set up from nationally accepted engineering standards. They are divided into two classifications, Rural and Urban, in recognition of differences in the nature and environment of traffic in these general area classes. The Urban area is considered to be a metropolitan area having a population of 5000 or more. All other places, for the purpose of these warrants, are considered as rural areas.

1. **Minimum Vehicular Volume in Urban Areas:**
   a. Total vehicular volume entering the intersection from all approaches shall average at least 750 vehicles per hour for any 8 hours of an average day; and,
   b. Total vehicular volume entering the intersection from the side highway or highways, shall average at least 250 vehicles per hour for the same 8 hours.

2. **Minimum Vehicular Volume in Rural Areas:**
   a. Total vehicular volume entering the intersection from all approaches shall average at least 500 vehicles per hour for any 8 hours of any average day; and,
   b. Total vehicular volume entering the intersection from the side highway or highways, shall average at least 125 vehicles per hour for the same 8 hours.

3. **Minimum Pedestrian Volumes in Urban Areas:**
   a. Pedestrian volume crossing the main highway shall average at least 250 persons per hour for any 8 hours of an average day; and
   b. Vehicular traffic entering from the main highway shall average at least 600 vehicles per hour for the same 8 hours; and,
   c. The average vehicular speed shall exceed 15 miles per hour on the approaches to the intersection.

4. **Minimum Pedestrian Volumes in Rural Areas:**
   a. Pedestrian volume crossing the main highway shall average at least 125 persons per hour for any 8 hours of an average day; and,
   b. Vehicular traffic entering from the main highway shall average at least 300 vehicles per hour for the same 8 hours; and,
   c. The average vehicular speed shall exceed 30 miles per hour on the approaches to the intersection.

5. **Interruption of Continuous Traffic in Urban Areas:**
   a. At an intersection on an important highway the vehicular volume along that principal highway shall average at least 750 vehicles per hour for any 8 hours of an average day; and,
   b. The combined vehicular and pedestrian volume from the side highway or highways shall average at least 75 units per hour for the same 8 hours; and,
   c. The average vehicular speed shall exceed 20 miles per hour on the principal highway approaches to the intersection.
   d. The signal installation must not adversely affect coordinated traffic flow.

6. **Interruption of Continuous Traffic in Rural Areas:**
   a. At an intersection on an important highway, the vehicular volume along that principal highway shall average at least 500 vehicles per hour for any 8 hours of an average day; and,
   b. The combined vehicular and pedestrian volume from the side highway or highways shall average at least 50 units per hour for the same 8 hours; and,
   c. The average vehicular speed shall exceed 35 miles per hour on the principal highway approaches to the intersection.

7. Interruption of Continuous Traffic at Industrial Plants, Stadiums, etc.

At industrial plants, parks, stadiums, resorts and other places where surges of traffic occur for relatively short durations, any one of the following warrants may justify signal installation.

In Urban Areas:

a. Vehicular volume on the main highway past an establishment of the type mentioned above, shall exceed 800 vehicles per hour at the approximate time of the heaviest movement of traffic to and from the establishment; and, traffic to or from the side or entrance highway during the same period of time shall meet one of the following warrants:
   (1) A minimum of 300 cars per hour, or,
   (2) A minimum of 200 pedestrians crossing the main highway per hour, or,
   (3) A combined minimum volume of 200 vehicles and 100 pedestrians crossing per hour.

b. Left turns into or from the side or entrance highway shall exceed 30 percent of the 800 vehicles per hour past the establishment.

c. On a four-lane highway past the establishment, traffic shall exceed an average speed of 40 miles per hour during the heaviest traffic movement.

d. A sharp vertical or horizontal curve or other obstruction of sight distance shall exist near the entrance or exit of the establishment, one or a combination of which creates a serious traffic hazard.

In Rural Areas:

Warrants for establishments located in rural areas shall be 50 percent of the foregoing traffic volumes for main highways and side or entrance highways.

8. Co-ordinated Movement:

A fixed-time signal may be warranted as part of a co-ordinated signal system under the following conditions:

a. The proposed signals shall be installed at an intersection which is located between two intersections that are qualified for signalization on the basis of meeting one or more of the necessary warrants; and,

b. The proposed signals are necessary to maintain compact group movements or desired group speeds.

9. Accident Hazard:

A fixed-time signal which would not meet preceding warrants would be allowed where:

a. Five or more reported accidents, of types susceptible to correction by a traffic control signal, shall have occurred within each of the three preceding years, each accident involving personal injuries or property damage to an apparent extent of $50.00 or more; and,

b. When adequate trial of less restrictive remedies with satisfactory observance and enforcement shall have failed to reduce the accident toll; and,

c. There shall exist a volume of vehicular and pedestrian traffic not less than 50 percent of the requirements specified in the minimum vehicular volume warrant, the interruption of continuous traffic, or the minimum pedestrian volume warrant.

10. **Combination of Warrants—Other Factors:**

Fixed-time signals may occasionally be justified where no one warrant is satisfied but two or more shall be satisfied to the extent of 80 percent or more of the stated values, particularly if there are present other important factors, such as:

a. A sudden change from rural conditions where relatively high speeds are safe to those of an urban business district;

b. Extreme width of roadway which pedestrians must cross;

c. Predominance of especially handicapped pedestrians, such as, small children or blind, aged, or crippled adults, who need to cross the roadway; or

d. An intersection on or at the bottom of a long or steep grade.

DESIGN

The design requirements of all traffic signal equipment are practically identical, and the principal specifications are given in this manual under the section on General Design Requirements.

CONTINUOUS OPERATION

It is desirable that a person approaching a traffic signal should presume it is functioning unless he is given a conspicuous and specific indication to the contrary. Hence, it is required that all signals in use be in operation at all times. When not operating as a Stop and Go device, the signal shall be operated as a flashing device in accordance with recommendations in the next section.

Signals not in operation shall be hooded, or removed, so persons will be under no misapprehension that a lamp may be burned out.

FLASHING OPERATION OF FIXED-TIME SIGNALS

When for two or more consecutive hours the vehicular or pedestrian volumes drop to 50 percent or less than the justifying warrants, the signals shall be operated as flashers. They shall give a Stop indication (flashing **RED**) to the side highway and a caution indication (flashing **YELLOW**) to the main highway.

Both the yellow and red indications shall flash at a rate of not less than 50, nor more than 60 times per minute. This flashing operation is accomplished by means of an electrical mechanism, supplementary to the signal timer, which operates in a manner similar to a motor flashing switch, to provide intermittent illumination of the red and yellow lenses. The illuminated period of each flash shall be approximately equal to the non-illuminated period.

SELECTION OF TYPE OF FIXED-TIME CONTROL MECHANISM

When a decision has been reached to install fixed-time signals, the question of choosing a proper controller arises. The following list of available types with descriptions of their operation is presented for guidance:

1. **Non-synchronous Fixed-Time Controller:**

   This type of controller is the least desirable. Its operation, and hence, the resultant timing varies with changes in line voltage and air temperature. Controllers of this type already purchased should be shifted to relatively unimportant isolated intersections warranting signalization where:

   a. There is little likelihood that the signal installation will ever be co-ordinated with any other; and,
   b. The fixed length of cycle and intervals will be tolerable during all hours of traffic control (Stop and Go) operation.

2. **Program Type of Fixed-Time Controller:**

   This type of controller provides for a limited number of changes in cycle length and in the proportion of time allotted to various Go intervals. Such controllers may be used at isolated intersections where:

   a. There is little likelihood that the signal installation will be co-ordinated with any other; and,
   b. There are marked variations for considerable periods in the traffic demand. For example, where the heavier traffic stream requires longer Go intervals in the morning or evening peak hours than is required during other hours; and,
   c. With this program in effect, delays are not unreasonable.

3. **Synchronous Type of Fixed-Time Controller:**

   This type of controller involves the use of a synchronous motor and should be used at isolated intersections where:

   a. The installation is likely to be co-ordinated with one or more other signal installations, but interconnection with a master controller is not economically justified; and,
   b. The fixed length of cycle and intervals will be tolerable during all hours of traffic control operation.

   This type of controller is always preferable to the non-synchronous type controller.

4. **Controllers Providing For Co-ordination:**

   Two types of control are available for co-ordination. One of these includes non-interconnected synchronous motors; the other, a master controller interconnected to local controllers at each signal installation in the system. The selection should be based upon:

   a. The volumes of traffic involved; and,
   b. Variations in traffic volume during the hours of intended Stop and Go control; and,
   c. Variations between traffic volumes in the two directions on the highways involved; and,

d. An analysis of the differences of cost involved.

In general, the non-interconnected synchronous motor plan should not be used for very heavy traffic because of its limitations as to flexibility and because of the absence of assurance that the desired co-ordination will continue indefinitely. If funds do not immediately permit interconnection and the use of a master controller, it is possible to install synchronous motor controllers of a type which can later be utilized for interconnection. Under such conditions the use of synchronous controllers of this type is recommended.

MANUAL CONTROL OF FIXED-TIME SIGNALS

At heavily travelled intersections operating under isolated control, manual operation of signals at certain times may be warranted by varying traffic requirements. Manual operation of signal installations in a co-ordinated system, however, is not generally recommended.

TIMING OF FIXED-TIME SIGNALS

Signals should be timed so that the length of the Go indication is in accordance with the traffic demand. The use of unduly long cycles or improper division of cycles fosters impatience, disrespect and poor observance of signal indications.

In general, a total time cycle in the range of from 35 seconds to 50 seconds is acceptable for a simple right angled intersection where the roadways are of average width and traffic volumes are not extremely heavy. Where intersecting highways are wider, necessitating longer pedestrian crossing time, or volumes are extremely heavy, or turning interferences substantial, the cycle shall be between 45 seconds and 60 seconds long. The time cycle of an intersection of three highways shall range from 55 seconds to 70 seconds.

CO-ORDINATION OF FIXED-TIME SIGNALS

In general, all signals within 1200 feet of one another, and controlling the same traffic, should be operated in co-ordination. The following are various types of co-ordination and a brief description of each:

1. **Simultaneous System:**

   This system has a limited application in modern traffic control. In this system all signals show the same indication to the same highway at the same time. It is used primarily at intersections less than 300 feet apart.

2. **Alternate System:**

   This system may under favorable conditions, and where the blocks are of equal length, and the traffic volumes uniform, provide for continuous movement of groups of vehicles along the main highway. In an alternate system all signals change their indication at the same time but adjacent signals, or groups of signals, show opposite indications alternately along the given highway.

3. **Simple Progressive System:**

This system uses individual synchronous motor controllers at each intersection without interconnection. They must, however, be supplied from a common power source in order to maintain synchronization. This system utilizes a common cycle length throughout, and the individual signal faces controlling traffic on a certain highway show Go indications independently in accordance with a timing schedule designed to permit (as nearly as possible) continuous operation of undelayed groups of vehicles along the highway at a predetermined rate of speed. The intervals of a signal installation at any given intersection may be adjusted independently to the traffic requirements at that intersection so long as the common cycle length is maintained.

4. **Flexible Progressive System:**

This system utilizes individual controllers at each intersection supervised by a master controller which requires an interconnecting cable. The master controller regulates the length of the time cycle and permits the use of two or more timing schedules. A common cycle length, which may be varied by the master controller, is used throughout, but Go intervals are scheduled independently to meet, so far as possible, the demands of traffic for movement through the system as well as individual intersections. This system is recommended for highways that have considerable variance in traffic flow during different periods of the day.

TRAFFIC-ACTUATED SIGNALS

DEFINITION

A traffic-actuated signal is a type of signal in which the intervals are varied in accordance with the demands of traffic as registered by the actuation of detectors or push buttons.

APPLICATION

Traffic-actuated control is applicable to any isolated intersection and is especially effective at complicated intersections where multiple phases are needed. It is also used at intersections where traffic volumes vary considerably during the day and where special conflicting movements should be handled separately, particularly if they vary in time requirements at different hours.

WARRANTS

Because traffic-actuated signals at intersections do not normally delay traffic except when it needs to be delayed to avoid conflict with traffic on cross highways, it is not advisable to set values of minimum traffic volumes or other fixed warrants for their installation. There are, however, a number of factors that should be considered and weighed before selecting and installing such signals. These factors are:

1. **Vehicular Volumes:**

   At intersections where the volume of vehicular traffic is not great enough to justify fixed-time signalization, traffic-actuated signals may be applied if other conditions are such as to indicate the need for Stop and Go signal control, and if the cost of the installation can be justified by the conditions.

2. **Cross Traffic:**

   When the volume of traffic on a main highway is so great as to restrict and jeopardize unduly the movement of vehicular cross traffic on a cross highway, semi-traffic-actuated signals may be installed to provide assignment of right-of-way to the cross highway without seriously delaying traffic on the main highway. Traffic-actuated signals are desirable at all such intersections except in cases when they constitute a part of a co-ordinated or progressive system, thus warranting fixed-time control.

3. **Peak Hour Volumes:**

   When signal control is required at an intersection during only a small part of the day, such as, during peak traffic hours, traffic-actuated signals may be installed if economically justified since they will not unduly delay traffic at other times.

4. **Pedestrians:**

   If the principal need for a traffic signal is to accommodate pedestrian traffic, pedestrian-actuated signals are usually desirable and may be economically justified. Most urban intersections with heavy pedestrian volumes also have heavy vehicular volumes and thereby warrant the use of fixed-time signals. However, signals may be warranted at special locations, such as, in the vicinity of schools, when pedestrian crossings are the primary consideration. In these special cases pedestrian-actuated signals will delay vehicular movements only when the highways are being crossed by pedestrians.

5. **Accident Hazard:**

   When a study of intersection conditions indicates that signalized control would be an effective remedy for the accident hazard existing, but the minimum warrants established for installation of fixed-time signals are not met, a traffic-actuated signal installation may be justified.

6. **Wide Traffic Fluctuations Between Streets:**

   When the preponderance in traffic varies from one highway to another at an intersection where one or more of the warrants for fixed-time signals are substantially fulfilled, full traffic-actuated control will usually provide the greatest efficiency in intersection operation.

7. **Complicated Intersections:**

   Traffic-actuated signals offer special advantages at complicated intersections with conditions substantially warranting signals, where multiple traffic phases are needed, in that they are capable of skipping phases when some of the highways are not being used. In each case they use only the time actually then required, thus providing a high degree of efficiency.

WARRANTS FOR NON-INTERSECTION CONTROL

At highway locations other than intersections the use of traffic-actuated signals may be justified when traffic can only move in one direction at a time on a two-way highway because of narrow bridges, tunnels, etc. Under such conditions traffic-actuated signals may be used to assign the right-of-way and provide clearance intervals in accordance with traffic requirements.

The installation of signals between intersections for the purposes indicated above shall be accompanied by the erection of appropriate signs advising the motorist of this special application. Immediately subsequent to installation, there shall be a period of strict enforcement so that disrespect for signal indications will not develop.

DESIGN

The design requirements of traffic-actuated equipment are the same as for any other traffic signal installation except for the mechanism that operates them. These identical design requirements are given in this manual under the section on General Design Requirements.

CONTINUOUS OPERATION

Traffic-actuated signals of all types shall be operated at all times as Stop and Go devices except:

1. As a caution signal (flashing yellow) when interconnected with other signals and/or remotely controlled for emergency vehicles such as fire trucks; or
2. As a caution signal, or as a combination caution and Stop signal (flashing yellow on certain approaches and flashing red on others) when failure of controller, wiring or signal lamps prevent normal operation.

Since traffic-actuated signals, properly timed, cause a minimum of unnecessary delays, there is no justification for changing them to flashing operation during light traffic periods. Right-of-way is normally denied approaching motorists only when intersecting highways are in use by others or when safe approach speeds are exceeded.

TYPES OF TRAFFIC-ACTUATED CONTROL

1. **Full Traffic-Actuated:**

   This type of controller should be used at intersections where failure to take into account varying traffic demands will seriously affect the efficiency of control. In full traffic-actuation, detectors are installed on all approaches to the intersection (See **Figure 69-K**) and right-of-way is assigned to a highway only as a result of actuation thereon. When there is no traffic on either highway, the green indication will ordinarily remain upon the highway to which it was last assigned.

2. **Semi-Traffic-Actuated:**

Semi-Traffic-Actuated control is applicable primarily to intersections of heavy-volume or high-speed highways with relatively low volume side highways. Detectors are located only on the side highway (See Figure 69-J). The signal is normally green on the main highway, changing to the side highway only as a result of vehicular actuation. In some types of control the side highway green interval is of fixed duration, but in the more flexible types the duration of the side highway green interval is proportioned to the traffic demand thereon, with provision for a maximum limit beyond which the green light may not be retained on the side highway even when traffic demand thereon is heavy. Upon the expiration of the required or maximum side highway interval, the Go signal will revert automatically to the main highway where it must remain for at least a predetermined minimum interval. At the expiration of this minimum interval the control is again free to respond at once to side highway actuation.

3. **Pedestrian-actuated:**

This type of signal is used where the signals are intended primarily to insure the safe crossing of numerous pedestrians over a heavily travelled highway. This signal normally flashes yellow on the main highway and flashes red on the side highway and crosswalks. When a pedestrian pushes one of the control buttons mounted conveniently on poles on either side of the crosswalks, the flashing yellow lights turn steady green on the main highway; next, they turn yellow and then red on the main highway and the cross traffic (vehicular and pedestrian) is given a green light. When the signals resume their normal flashing operation, they will not provide a new Stop and Go phase until after a minimum wait time has elapsed.

4. **Speed Control:**

Speed control can be applied at non-intersection locations and also at intersections controlled by full traffic-actuation. For the non-intersection locations, such as, curves, narrow bridges, school zones, etc., the equipment consists of a speed controller, a vehicular detector and a traffic signal. The signal indication is normally Red or stop. Detector actuation at a point in advance of the signal causes the signal to turn Green in time to permit the passage of a vehicle travelling at the proper speed. However, a vehicle travelling at too great a speed will arrive at the signal light stop line before the signal changes to green and will, therefore, have to stop. Succeeding vehicles, if spaced closely enough, will extend the Go interval indefinitely, but when the maximum spacing is exceeded, the indication will revert to red until actuation again takes place. This type of signal should always be identified with appropriate signs (see Sign Standard R-203) so that the motorist will recognize and understand the function of the signal. For the same reason strict enforcement may be desirable for a period immediately after the installation is made. At intersections where speeding on the main highway approaches is a hazard in addition to the normal problems

of intersection control, it may be desirable to employ full traffic-actuated control incorporating speed control features on the main highway. Both main highway approaches are subject to speed control individually, while the side highways are given the right-of-way by the normal operation of a traffic-actuated signal.

DETECTORS FOR ACTUATED SIGNALS

Since the traffic-actuated signal responds to either vehicular or pedestrian actuations by providing Go indications for the appropriate movements, it is necessary that detectors be designed for this service.

The following is a list of the various types of detectors:

1. Pressure Sensitive
2. Magnetic Sensitive
3. Sound Sensitive
4. Light Sensitive
5. Pedestrian Push Buttons

Of the first four types listed above, the pressure sensitive and magnetic sensitive are the most common used.

Pressure sensitive vehicular detectors are pads installed in the roadway which operate when depressed by vehicles passing over them. They are of two types: directional, which records vehicles going in only one direction, and non-directional, which records vehicles going in either direction.

Magnetic sensitive vehicular detectors are installed in or near the roadway and are operated by the magnetic or electrical disturbance caused by the passage of a vehicle. There are two types available: compensated, which is not affected by extraneous electromagnetic influences, and non-compensated, which may be affected by undesired traffic movements.

Location of vehicle detectors. The proper location for vehicle detectors in relation to the Stop Line depends upon the type and operating characteristics of the controller, the speed of vehicles approaching the intersection, physical characteristics of the highway (grades, widths, parking, visibility, etc.) and special signal functions, such as, turns on separate intervals, stopping side-road traffic before entrance to high-speed artery, etc.

Detectors for conventional full and semi-traffic-actuated controllers used under average conditions, i.e., level roadway, not more than two traffic lanes in each direction, and good visibility, produce good results when the distance from the Stop Line to the detector is related to the speed of approaching vehicles[1] as follows:

Speed (miles per hour):	Distance from Stop Line (feet)
Less than 20	110
20-30	140
30-40	170
40-50	210
Over 50	225

[1] Eighty-five percent of vehicles approaching the intersection at or below given speed at approximate point of detector location.

When the approach to the intersection is on a grade, the distance from the Stop Line should be increased about 4 percent for each 1 percent down grade and decreased about 4 percent for each 1 percent up grade. Where there are more than two lanes approaching the intersection, and visibility is not restricted, it has often been found desirable to increase the above distances by small amounts, since higher speeds through the intersections usually can be allowed with safety. The increased distances in such cases may be as much as 15 percent greater than the average values given above. Under no condition should detectors be located less than 40 feet from the Stop Line. Where they are installed to permit left turn movements on a separate signal interval, detectors are usually placed much closer to the intersection than for the control of normal traffic. Where a side highway intersects a high speed highway, it may be desirable to stop most vehicles on the side highway before they enter or cross the main highway. In such cases, the spacing of detectors should be shortened on the side highway so that most vehicles will arrive at the Stop Line on a red signal.

Bus stops, filling-station drives, and other special conditions near an intersection, may necessitate the installation of a second detector very near the Stop Line. Such installations would in no way interfere with the spacing of the initial detectors of the highway so affected.

Detectors for complex, two-movement, full traffic-actuated controllers, with automatic adjustment of periods with respect to traffic volume, relative density, and elapsed time should be located farther from the Stop Line than would be the case with other types of traffic-actuated control. This enables the control to recognize the presence of platoons of vehicles and in general to get the complete data on traffic conditions necessary to regulate its refinements of control. For normal highway and traffic conditions, the recommended distance from the Stop Line to the detector as related to the speed of approaching vehicles[2] is as follows:

Speed (miles per hour)	Distance from Stop Line (feet)
20-30	240
30-40	270
40-50	320
Over 50	375

For special highway conditions these values may be changed as recommended for other types of installations discussed above. Where the greatest coordination effect is desired, between a series of intersections, the detector spacings on the highway on which through movement is desired should be increased about 20 percent.

Detectors for speed-control signals normally require longer spacings between detectors and Stop Lines, so that desired speed reductions can be achieved gradually and stops required only in cases of abnormally high speeds, or at intersections when right-of-way has been assigned to the cross highway. For normal highway and traffic conditions, when speed-control features are provided, the recommended distance from the Stop Line to the detector as related to the speed of approaching vehicles[3] is as follows:

[2] **Eighty-five percent** of vehicles approaching the intersection at or below given speed at **approximate** point of detector location.

[3] **Eight-five percent** of vehicles approaching the intersection at or below given speed at **approximate** point of detector location.

Speed (miles per hour)	Distance From Stop Line (feet)
20-30	190
30-40	220
40-50	265
50-60	325
Over 60	350

These values should also be increased or decreased as explained previously, to accord with highway grades, visibility, and special traffic conditions. Where speed control is applied at an intersection, the above values should be used in locating detectors on the main highway and those previously given for standard traffic-actuated control should be used in locating the detectors on the side road.

SPECIAL PEDESTRIAN SIGNALS

DEFINITION

Special pedestrian signals are highway signals erected for the exclusive purpose of directing the pedestrian to take some specific action.

APPLICATION

They shall be erected only at locations where there are many vehicular turns combined with exceptionally heavy traffic; or, where the vehicular movement through which the pedestrians must cross is continuous.

WARRANTS

These signals shall only be installed in conjunction with traffic signals already meeting one or more of the minimum warrants previously mentioned, and under the following conditions:

1. When pedestrians and vehicles move during the same phase and the pedestrian volume crossing the main highway averages at least 500 persons per hour for any eight hours of an average day; or
2. When a separate phase is provided for pedestrian movement in all directions (as at a "T" intersection or traffic circle), all vehicles being stopped; or
3. When heavy vehicular turning movements require a separate pedestrian indication for the protection and convenience of the pedestrian desiring to cross the highway; or
4. When pedestrian movement on one side of an intersection is permissible while through vehicular traffic is stopped to protect a turning movement on the other side of the intersection; or
5. When a separate phase is made available for pedestrians in the operating cycle of a traffic-actuated signal.

Special pedestrian signals should not ordinarily be installed at school crossings where schoolboy patrols can be used effectively or where students

can be directed to cross at locations already controlled by signals or police officers. However, they may be warranted at an intersection used as a school crossing under the following conditions:

When minimum vehicular volume entering an urban intersection from all directions averages 600 or more vehicles per hour for the opening and closing hours of school, and minimum pedestrian volume crossing the urban main highway averages 100 or more persons per hour during the opening and closing periods of the school. The rural warrant is 50 percent of the foregoing urban volumes.

If the intersections adjacent to a school are more than 1000 feet away, consideration can be given to using pedestrian signals at the school crossing.

In connection with signals installed for school crossings, it should be understood that the signal is not the only remedy nor is it necessarily the best solution to the perplexing problem of traffic conflicts between vehicles and school children. Brief periods during which the hazards are unusually high may often be better handled by officer control. In some circumstances, the pupils respect for traffic signal indications may be so low as to make the installation of a signal a contributory factor in increasing rather than decreasing accidents. The obedience and response to officer control is usually less uncertain. Complete facts should be obtained and studied by competent traffic engineering authorities before decisions are made on special school signal installations.

TYPE OF CONTROL

The control of pedestrian signal indications may be accomplished with the timing mechanism normally employed with traffic signals, in which case the pedestrian phase or indication is given at a predetermined point during each cycle; or, the control may be such as to permit the use of a push button to introduce the pedestrian phase or indication in accordance with the needs of pedestrian traffic.

GENERAL DESIGN REQUIREMENTS

Special pedestrian signals shall meet with three important conditions:

1. They shall be located directly in the line of vision of each crossing of pedestrians in either direction.
2. The signal indications should attract the attention of and be clearly readable or understandable to the pedestrian both day and night and at distances from 10 to 150 feet.
3. The signal indications shall be such that they will not be mistaken as vehicle indications by motorists.

Two types of design described below for pedestrian control signals are approved as standard:

1. Two sections of the standard traffic signal face, one lens of which contains the word **Walk**, the other lens of which contains the word **Wait.**

2. A rectangular box-type signal in which the words **Walk** and **Don't Walk** are properly illuminated.

The lettering used in the above types of pedestrian signals shall not be less than 3 inches high and shall be so designed and spaced as to provide maximum legibility.

LOCATION

Special pedestrian signals shall be mounted on corner posts with the bottom of the signal not lower than 7 feet nor more than 10 feet above the sidewalk level. There shall be a separate signal indication facing pedestrians crossing in any direction. These signals may be mounted separately or with the traffic control signals.

The push buttons, if used, shall be conveniently located near each end of crosswalks used by pedestrians. The buttons should be 3½ feet to 4 feet above the sidewalk in view of the persons using the crosswalks. Permanent signs shall be used to explain the use of this equipment.

FLASHING SIGNALS

A flashing signal is a standard fixed-time traffic signal which is operating as a flashing unit rather than a Stop and Go signal during the time traffic volumes do not warrant Stop and Go operation. For further details refer to Page 139.

FLASHING BEACONS

DEFINITION

A flashing beacon is a section of a standard traffic signal head or a similar type device having one yellow or red lens in each face which is illuminated by rapid intermittent flashes.

WARRANTS

The installation of a flashing **Yellow Beacon** (see Figure 70-B) may be warranted as an advance warning device at an intersection or other location under one or more of the following conditions:

1. Physical obstruction existing in the highway.
2. Important intersection hidden by an obstruction or sharp curve in the highway.
3. Extreme curve after a long straightaway.

WARRANTS

The installation of a flashing **Red** and **Yellow Beacon** (See Figure 70-C) at an intersection with yellow flashing on the main highway and red flashing on the side highway or highways, may be warranted by one or more of the following conditions:

1. Instead of Stop Signs at intersections where sight distance is extremely limited or where other conditions make it especially desirable to emphasize the need for stopping on one highway and for proceeding with caution on the other. This type of installation is especially effective at intersections where approach speeds are too high for existing conditions.
2. Minimum vehicular volume entering an urban intersection from all directions averages 300 vehicles per hour for at least two consecutive hours, of which vehicular traffic entering the intersection from the side highway or highways averages at least 30 vehicles per hour for the same hours. Warrants for rural areas are 50 percent of the above urban volumes.

TYPE OF CONTROL

The motor flashing switch usually installed in the housing of the flashing beacons is used to provide intermittent illumination of the beacon lenses.

DESIGN

Flashing beacon units shall follow the general design specifications of standard traffic signals which include the following essentials:

1. Each signal unit lens shall have a visible diameter of 8 inches.
2. The illuminating element lens, reflector, and visor shall each be of such design as to render the lens, when illuminated, clearly visible to traffic facing the signal at all distances from 10 to 300 feet under all atmospheric conditions, except dense fog, both day and night.
3. The color of the lens shall be red for Stop and yellow for caution.
4. Each lens shall be independently illuminated.

LOCATION

The particular purpose of a flashing beacon should largely govern its location with respect to the highway and the hazard or other conditions warranting the beacon. If located at the roadside, flashing beacons measured from the bottom of the signal head should be at least 8 feet above the pavement. If suspended over the roadway, they shall not be less than 15 feet above the pavement. In no case shall they be mounted on pedestals in the roadway unless the pedestal is within the confines of a traffic or pedestrian island.

OPERATION

The illuminating element in a flashing yellow or flashing red beacon shall be flashed continuously at a rate of not less than 50 nor more than 60 times per minute. The illuminated period of each flash shall be approximately equal to the nonilluminated period. Flashing beacons shall be operated continuously throughout the 24 hour period.

LANE-DIRECTION TRAFFIC SIGNALS

DEFINITION

Lane-direction or off-center traffic signals are traffic signals used to control the direction of traffic movement by individual lanes of a highway. These installations are distinguished by signal units over each lane of the roadway, and supplementary signs are often used to explain their significance.

WARRANTS

Lane-direction signals are warranted when:

1. Vehicular traffic flow in one direction on a two-way highway, bridge, or tunnel, having three lanes or more, exceeds the reasonable capacity of the lane or lanes normally used for traffic moving in that direction and, at the same time, traffic flow from the opposite direction does not require the number of lanes which it is generally allocated.
2. Traffic movement at toll-booth areas and single-lane tunnels, requires reversal in direction of traffic flow for efficient operation.
3. Traffic movement in one direction at an entrance or exit of a parking lot at an industrial plant, stadium, or similar location greatly exceeds the capacity of the traffic lanes allocated for handling balanced traffic flow.
4. Heavy traffic flow is slowed down and congested on a long uphill grade of a three-lane roadway because of slow-moving commercial vehicles travelling up the hill, thereby warranting the use of two lanes for uphill and one lane for downhill movement.
5. Temporary road conditions reduce the number of lanes normally available to handle traffic movement, even though it is extremely unbalanced at various periods of the day.

TYPES OF CONTROL

The type of control provided for lane-direction signals shall be such as to permit automatic or manual operation of the signals. The control mechanism shall permit the illumination of the red lenses in both directions in the same lane for those lanes where the traffic flow is subject to being reversed. The possibility of an erroneous indication of green in both directions in the same lane should be avoided by wiring the green signal so that it can be illuminated only when the red signal shows in the opposite direction. Normally, no more than a two-lens signal, having red and green lenses, is required for each direction of traffic, since the signals are not often placed at intersections.

DESIGN

Traffic signal heads used for controlling the direction of movement by lanes shall have two faces. Each face controlling a lane subject to reversing traffic flow shall contain standard red and green lenses and otherwise shall follow the general design specifications of traffic control signals. In lanes not subject to reversing traffic flow, signal faces shall have a single lens, red or green, whichever is appropriate for the location. Mountings shall permit the signals to be suspended over lanes on cables or fixed supports.

LOCATION

A traffic signal head with a face for each direction of traffic to be controlled shall be located over the center of each lane of the roadway at the beginning and end of the lane-controlled section. If the area to be controlled is more than 1000 feet in length, or if the vertical or horizontal alignment is curved, intermediate signal heads shall be placed over each lane at frequent enough intervals so that motorists will at all times be able to see at least two signals along the roadway and have a definite indication of the lanes specifically reserved for their use. At the terminal and intermediate signal installation points on the lane-controlled section, signal heads above the various lanes shall be located in a transverse straight line at right angles with the roadway alignment.

OPERATION

All traffic signals used to control traffic movement by lanes shall be coordinated and wired to a master control which will operate so as to permit all two-lens signal faces for each direction in any of the reversing lanes to change from red to green or from green to red, except that the showing of green in both directions over the same lane shall be guarded against by electrical interlock. It shall also be possible to show a red indication in both directions in any of the lanes subject to reversing traffic flow. This latter feature permits the establishment of a neutral area or safety zone during light traffic periods, or during an emergency traffic situation. The system shall operate either manually or automatically through the use of a time clock.

TRAFFIC SIGNALS AT DRAWBRIDGES

APPLICATION

Signals installed at drawbridges to control vehicular traffic are a special application of highway traffic signals.

WARRANTS

Traffic signals should always be used in conjunction with gates and the other types of protection commonly employed at drawbridges.

DESIGN

The traffic signal heads and mountings shall follow the standard design specifications of traffic signals. Drawbridge signals may be supplemented with bells which operate with the red signal indication to provide additional warning to drivers.

LOCATION

Traffic signals shall be located at both ends of the movable span. To assure positive visibility, two signal heads should be mounted on each approach to the movable span, one on the right and the other on the left side of the roadway. They should ordinarily be not less than 50 feet nor more than 100 feet from the end of the movable span.

OPERATION

Traffic signals at drawbridges shall be interconnected with the drawbridge gates and, if feasible, with other signals on the same street or highway within 500 feet of the bridge. Not less than 15 seconds before the gates are closed, the signal shall change from green to yellow to red. While the gates are closed and the draw is open, the signals shall show a continuous red indication. After the draw is closed and the gates opened, the indication shall change to a steady green and remain so until the next bridge opening.

TRAIN APPROACH SIGNALS

This type of signal comes under the jurisdiction of the Public Utility Commission at Harrisburg, Pennsylvania, and any application to install such signals must be presented to that Department for approval.

GENERAL REGULATIONS ON PLACING TRAFFIC SIGNALS

LOCATION IN RELATION TO CURB LINE

For the purpose of achieving desirable standards of uniformity wherever physical conditions will permit, traffic signals shall be placed on or near the right curb line at the far side of the intersection facing in the direction of the approaching traffic. (See Figure 69-A.)

The bottom of these signals shall be at a height of approximately 8 feet above the curb or crown of pavement and they shall be so placed that the signal head shall not extend within one foot of the curb line. A signal, or its support, shall not obstruct the sidewalk. (See Figure 71.)

Signal faces shall be located so as to give drivers and pedestrians a clear and unmistakeable indication of the right-of-way assignment from their normal positions on the approaches and as they enter or pass through the intersection.

Whenever the Secretary of Highways shall determine that such locations are not effective for the purpose of safety or visibility, he may, within his discretion, authorize any other type of installation as provided in the Manual of Uniform Traffic Control Devices herein referred to.

Examples of standard locations for corner post, mast arm, and overhead signals are shown in Figure 69.

LOCATION IN RELATION TO ROADWAY

Regardless of the highway cross-section design, a signal face shall not be more than 10 feet to the right of the pavement or travelled surface. Signals placed in areas exposed to vehicular movements shall be protected by guard posts, curbing or other means.

LOCATION AS TO VISIBILITY

Traffic signals shall be so located as to be plainly visible to all traffic for about 10 seconds before reaching the stop line. Where physical conditions prevent a driver from having a continuous view of at least one indication

for 10 seconds, an auxiliary signal shall be used to provide the visibility. See Figure 69-C. If physical conditions make it impossible to provide a location which can be seen for 10 seconds, a flashing yellow beacon or Signal Ahead Sign, W-221, shall be erected in a suitable position to warn approaching traffic.

LOCATION OF AUXILIARY SIGNALS

Any roadway having two or more moving lanes of traffic in each direction shall have an auxiliary signal face on the left-hand side of the highway preferably on the far left corner of the intersection. This is in addition to the normal far right corner face. See Figure 69-D and 69-G.

Where signals are installed on the basis of minimum pedestrian volumes, a vehicle or pedestrian signal face shall be installed at the far end of each crosswalk. See Figure 69-G.

LOCATION OF OVERHEAD SIGNALS

Where overhead signals are used, they shall be so located as to provide maximum visibility. See Figure 69-B. The bottom of the overhead signal shall clear the pavement by at least 15 feet. Where conditions are such that one overhead signal cannot control traffic effectively, additional signals shall be installed to provide the necessary indications. See Figure 69-H.

LOCATION OF PEDESTAL SIGNALS

Pedestals in the roadway, to mount signals, are considered a driving hazard and are not recommended. This, however, does not preclude the use of signals on posts or pedestals within the area of a well defined traffic island or in the median strip of divided highways provided it is wide enough to safely contain the signal.

MOUNTINGS FOR SIGNAL HEADS

The following is a list of various types of signal head mountings:

1. **Alongside the roadway:**
   (a) Posts 8 feet to 10 feet high.
   (b) Short brackets attached to poles, at the same heights mentioned above. (See Figure 70-A & D.)
2. **Over or in the roadway:**
   (a) Long brackets or mast arms extending from poles off the roadway. (See Figure 72.)
   (b) Cable suspension. (See Figure 69-B, F & H.)
   (c) Posts or pedestals on islands.

Group 1 has many advantages, including simplicity of design, See Figure 73-A & B, ease of access and maintenance, and better conformity in height to the needs of traffic. Of the two types in this group, post mountings are preferable. Where an existing pole is at the position desired for the signal faces, however, it is generally used. New poles may be installed to provide necessary support and clearance for overhead cable.

Mast arm and cable suspension involve considerable lateral strain. Cable suspension may interfere with fire fighting and requires overhead maintenance equipment. Both of these types involve difficulties in cleaning and maintenance, besides placing the signal too high for best visibility to waiting traffic and to operators of vehicles close to the intersection. Suspended signals are desirable, however, at locations where side-mounted signals are apt to be overlooked, as at isolated rural intersections; where high-speed highways enter built-up areas; or where advertising signs and other distracting lights interfere with visibility of signals mounted along the highway. Where this type of signal is to be installed, care should be taken to determine if adjustable or non-adjustable units are required. See Figure 73-C & D. To improve the effectiveness of the signal indications to waiting vehicles and pedestrians, post-mounted signals may be used to supplement overhead installations at such locations. See Figure 69-K.

Signals on posts or pedestals on islands are justifiable only in certain large, channelized, or irregular intersections. Under these conditions, the signals shall be well-protected by properly designed islands, signs and illumination.

All mountings shall be substantially constructed with a strong foundation, preferably concrete, and shall be able to withstand all weather conditions.

Any traffic signal not permanently mounted in a fixed position shall not be approved for use in this Commonwealth.

GENERAL SPECIFICATIONS FOR TRAFFIC SIGNAL EQUIPMENT

CABLE

Underground cable is recommended for all urban areas. The cable shall be of high quality, well-insulated, and shall employ a standard color code to facilitate repairs or replacements. It is sound economy to provide spare conductors in each local and interconnecting cable and to confer with utility companies and governmental agencies in regard to the proper positions for the cables on poles or underground.

Overhead cables shall be supported by messenger wires to insure longer life of the cable and to avoid interruption of signal operation.

HARDWARE

Satisfactory rust-proof hardware shall be used and control boxes shall be gasketed to prevent entrance of dust and moisture to the operating part of the controller. A breathing hole of ½ inch diameter, located in the bottom of the outer housing, may be desirable to prevent excessive heat and as a precaution against condensation of moisture.

PREVENTION OF EXPLOSIONS

Suitable steps shall be taken such as installing weatherproof vent control boxes, to prevent explosions when underground wiring is used.

WIRING AND FUSES

All wiring in the signal installations with adequate provisions for fuses shall be installed in accordance with current standards and requirements of the Board of Fire Underwriters.

CONTROLLERS

All controllers shall be equipped with apparatus to prevent an objectionable degree of radio and television interference.

LAMPS

Traffic signal lamps shall not be less than 60 Watt capacity or its equivalent, but in any case, shall furnish adequate illumination to enable the signal to be seen at the required distance.

LAMP RECEPTACLES

These shall be of heat resisting material and shall be designed to securely hold a traffic signal lamp with the light center at the focal point of the reflector.

REFLECTORS

The reflectors shall be mounted in the housing or on the door. They shall consist of a one-piece, clear glass reflector with a surface silvered by chemical deposition so that a strong light would be invisible through the layer, and moisture, solids or gas cannot get between the reflector and the glass.

TRUNNIONS AND BRACKETS

All trunnions and brackets used for the assembling of adjustable-face traffic signal faces into two-, three-, four-, or multi-way signal heads shall be adequately protected against atmospheric conditions and shall be entirely weather proof. All arms shall be not less than 1¼ inch pipe to permit the traffic-control signal wires or cable to be threaded through same. Provisions shall be made for the connection of brackets at both top and bottom of the housing.

EXTERIOR FINISH

All exposed metal parts of signals shall be painted black or dark green.

SIGNAL LENSES

Traffic signal lenses shall be circular with a visible diameter of not less than 8 inches.

The color of the light emitted by the traffic signal lenses shall meet the specifications of the standards established by the American Standards Association (D-10.1, 1942). Each standard traffic signal face shall have at least three lenses, Red, Yellow and Green. It may have additional lenses for Green Arrow or Walk and Wait indications.

The approved color and position of lenses, in a vertical arrangement, are as follows, (See Figure 73-A & B) :

Position	**1. Red (Top)**	**5. Left Turn Arrow**
	2. Yellow	**6. Right Turn Arrow**
	3. Green	**7. Wait (or Don't Walk)**
	4. Straight Thru Arrow	**8. Walk**

These same positions are from left to right for horizontal positioning, See Figure 70-A & D.

All arrows shall be green on an opaque background. They shall be so designed that they will be distinctly visible at a distance of 200 feet. There shall be no lettering on signal lenses except in the case of Walk and Wait Signals.

Each lens shall be illuminated independently of others and shall be so shielded by visors or hoods that only the driver approaching on the lane to be controlled will be able to see the light.

SEQUENCE OF ILLUMINATION

The sequence of illumination for all standard Stop and Go Signals shall be Green, Yellow, Red and repeat, with no overlapping of Yellow with either the Green or Red indications. See Figure 74.

MAINTENANCE

SIGNAL LAMP REPLACEMENT

Burned-out signal lamps convert traffic signals to the role of a traffic hazard. Immediate replacement of such lamps, or scheduled replacement of lamps short of their anticipated life, is an extremely important maintenance function.

LUBRICATION

Controllers shall be carefully lubricated as often as is necessary to insure efficient operation of the lights.

CLEANING AND PAINTING

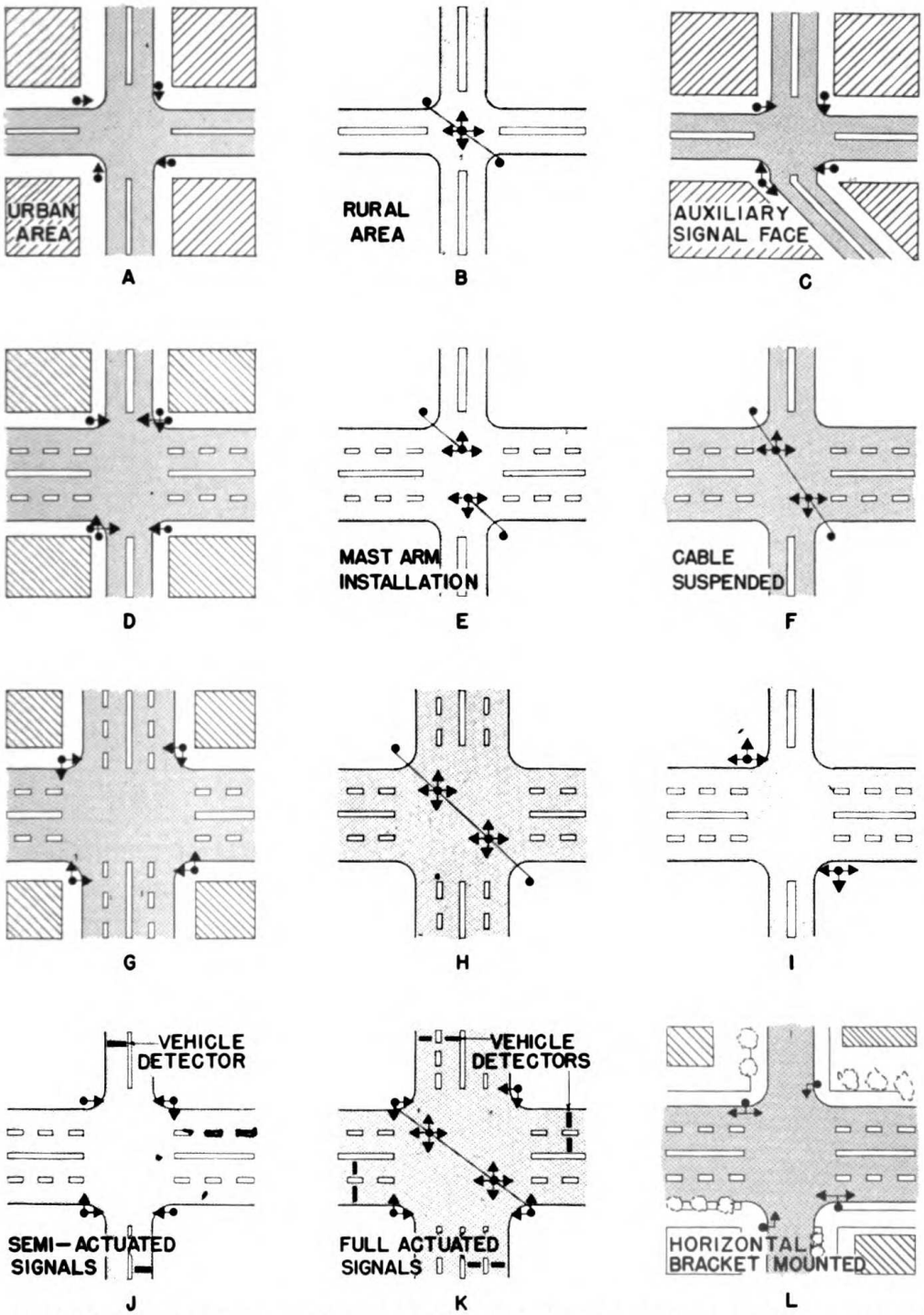
Signal lenses, reflectors and lamps shall be thoroughly cleaned at least once every six months. This may vary in accordance with location.

Signal heads, brackets, poles, posts, control boxes, housings and conduits above ground shall be painted once every two years or as often as is necessary to prevent corrosion.

MAINTENANCE RECORDS

Detailed maintenance records should be kept and analyzed at regular intervals to determine future policies as to equipment purchases and maintenance programs.

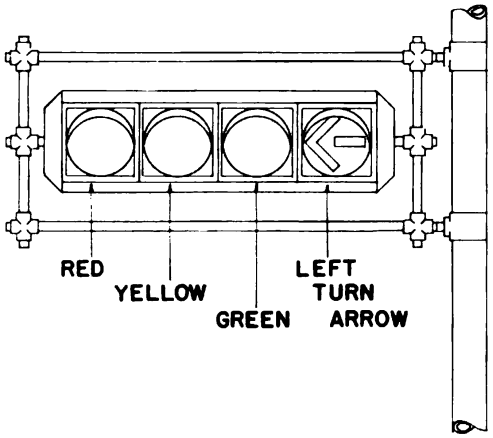
STANDARD LOCATIONS FOR TRAFFIC SIGNALS



MINIMUM HEIGHT OF ALL SIGNALS LOCATED OVER THE ROADWAY SHALL BE 15' ABOVE THE ROADWAY.

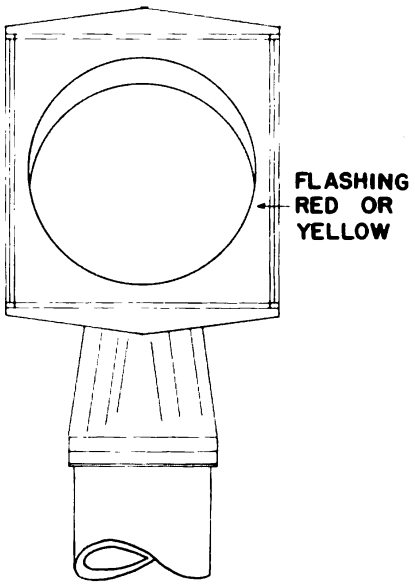
FIGURE 69

TYPICAL SIGNAL HEAD ASSEMBLIES



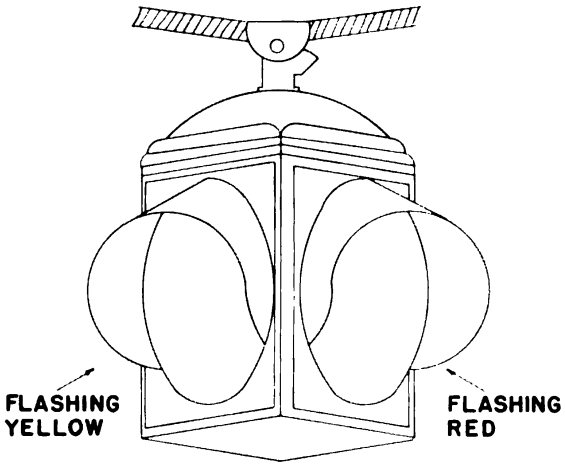
CORNER POST BRACKET MOUNTING

A



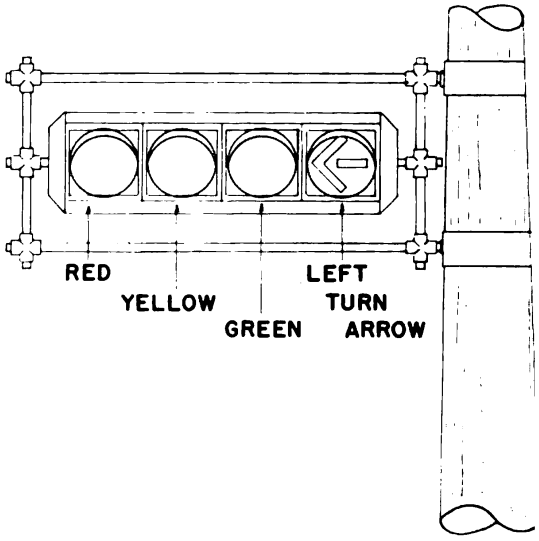
FLASHING CORNER POST BEACON (ENLARGED)

B



FLASHING OVERHEAD BEACON (ENLARGED)

C



CORNER POST BRACKET MOUNTING ON EXISTING POLE

D

FIGURE 70

TYPICAL CORNER POST SIGNAL

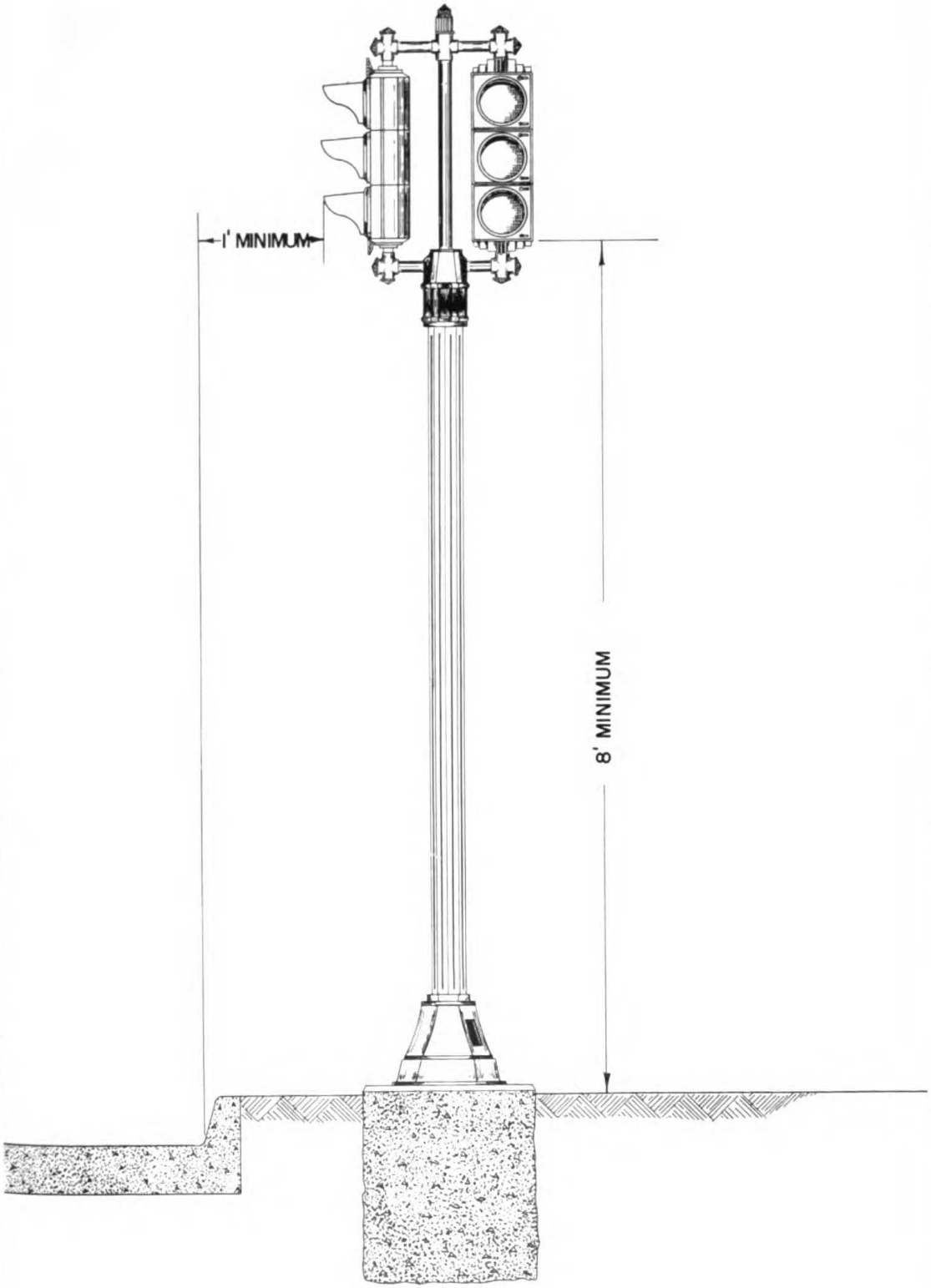


FIGURE 71

TYPICAL MAST ARM SIGNAL

STEEL POLE MOUNTING

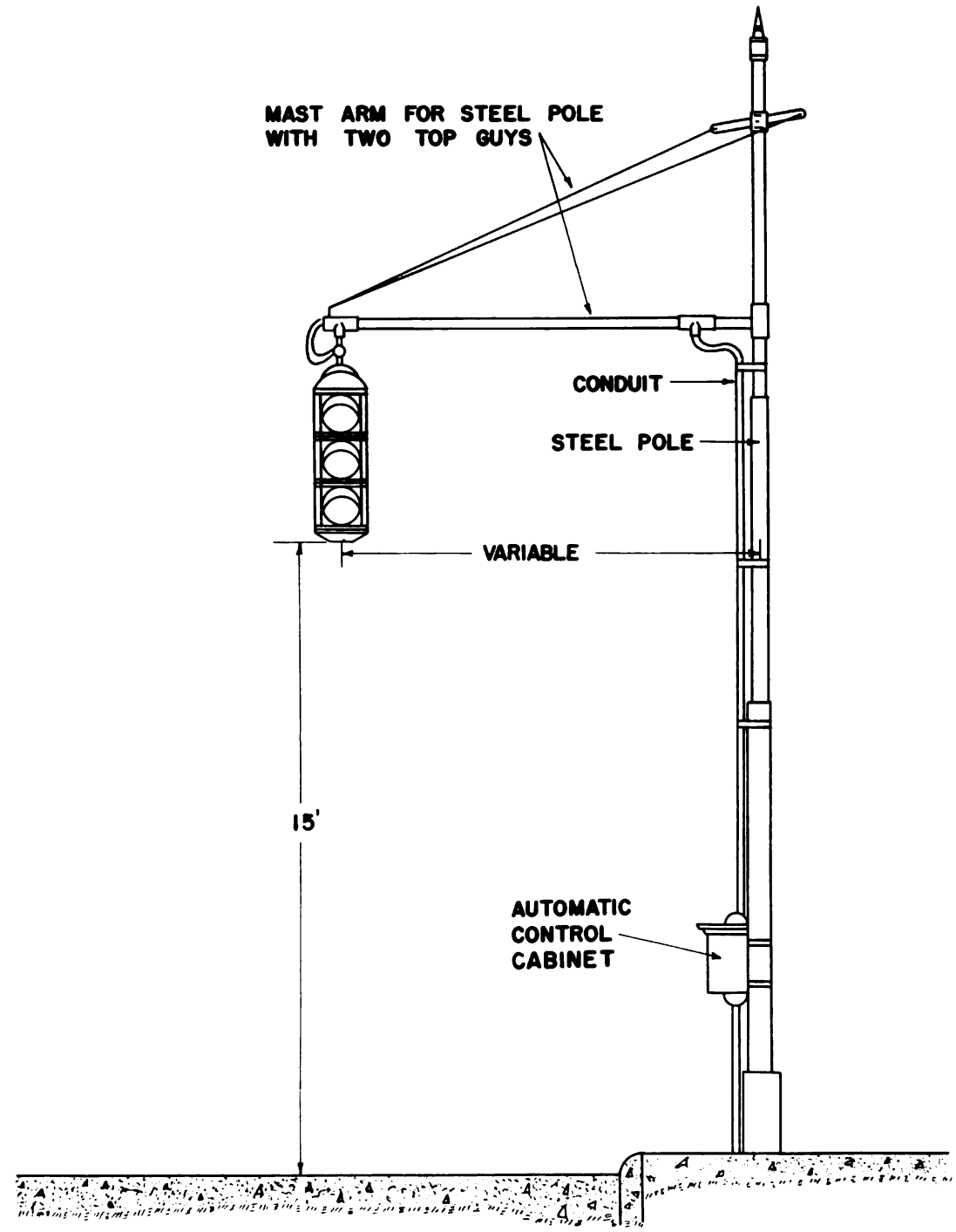
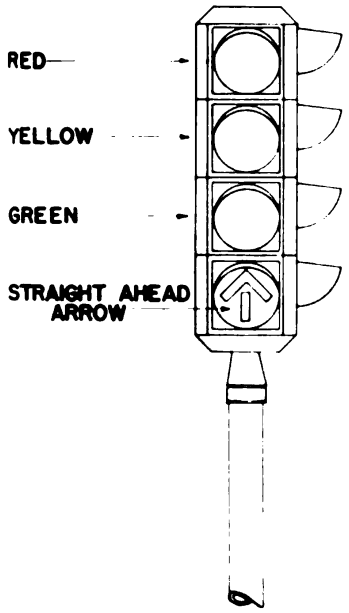


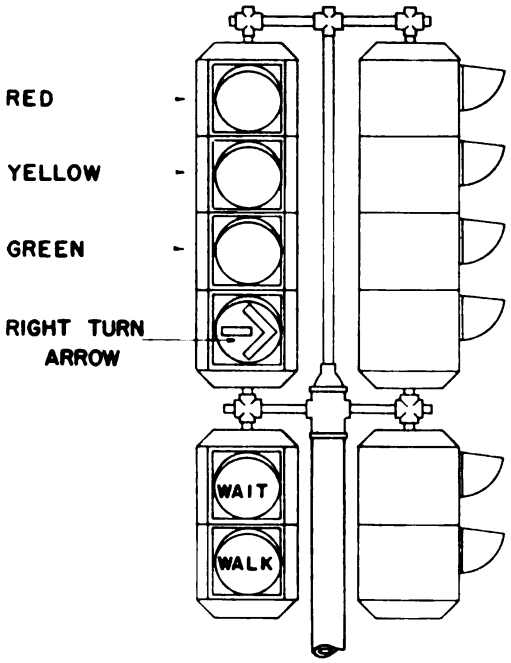
FIGURE 72

TYPICAL SIGNAL HEAD ASSEMBLIES



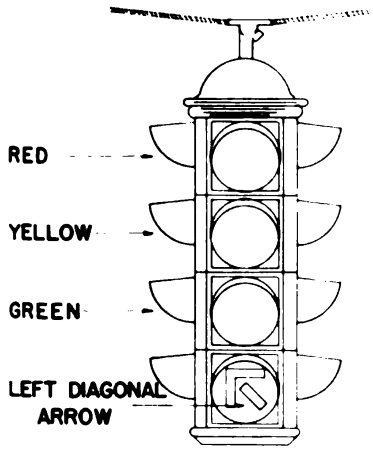
NON - ADJUSTABLE CORNER POST

A



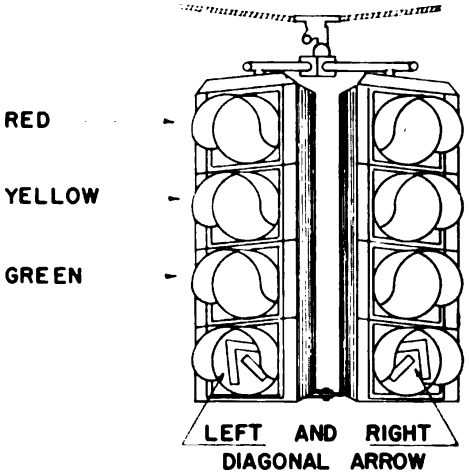
ADJUSTABLE CORNER POST

B



NON- ADJUSTABLE OVERHEAD

C



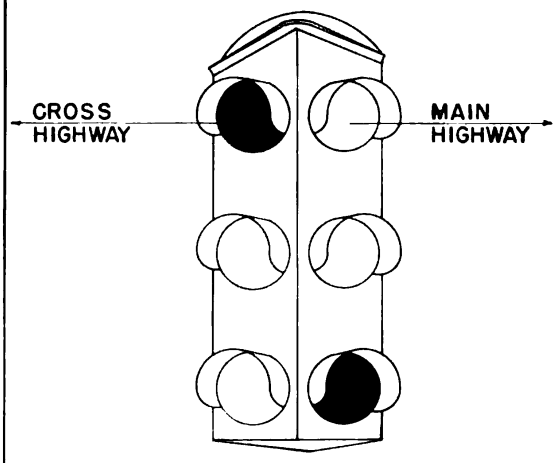
ADJUSTABLE OVERHEAD

D

FIGURE 73

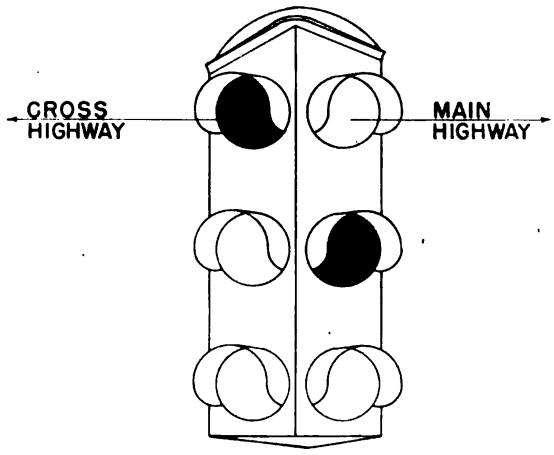
STANDARD COLOR SEQUENCE FOR TRAFFIC SIGNALS

INTERVAL NO. 1



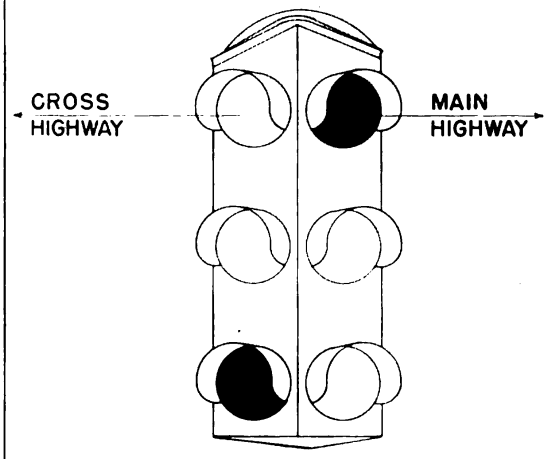
MAIN HIGHWAY___GREEN
CROSS HIGHWAY___RED

INTERVAL NO. 2



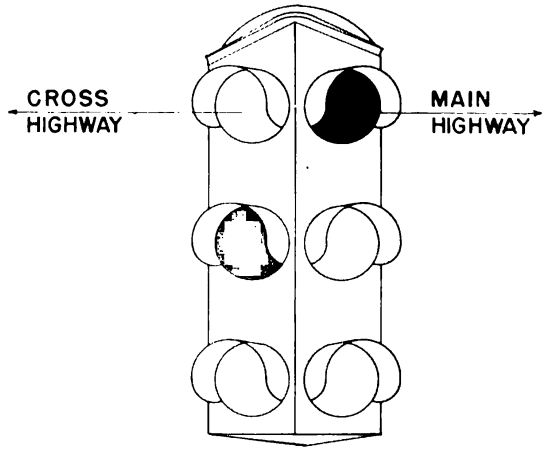
MAIN HIGHWAY___YELLOW
CROSS HIGHWAY___RED

INTERVAL NO. 3



MAIN HIGHWAY___RED
CROSS HIGHWAY___GREEN

INTERVAL NO. 4



MAIN HIGHWAY___RED
CROSS HIGHWAY___YELLOW

FIGURE 74

SIGN SPECIFICATIONS

MATERIAL SPECIFICATIONS

All material used for sign construction must meet minimum Department standards. Detailed specifications are not given in this Manual because of necessary changes which occur from time to time as materials presently being used are improved or as new materials are developed. The latest detailed specifications are listed below and are available from the Department of Highways upon request.

Sign Lumber—"Specifications For Lumber, Plywood, Shingles and Preservative Treatment."

Wooden Sign Posts—"Specifications For Lumber, Plywood, Shingles and Preservative Treatment."

Steel and Aluminum—Traffic Standard D-204—"Sign Material Requirements."

Paint and Color—Traffic Standard D-204—"Sign Material Requirements."

Reflectorization—"Specifications For Flat Surface Sheet Sign Material;" and "Specifications For Reflecting Sheet Sign Material."

All signs purchased or constructed by the Pennsylvania Department of Highways must be in accordance with these specifications. Materials for signs purchased or constructed by municipalities, must be approved by the Pennsylvania Department of Highways Testing Laboratory.

SPECIFICATIONS CHART

The Sign Specifications Chart lists all standard signs by code number and shows the legend, the size, the message, etc., of each sign as well as the general erection details of each sign. The height and location of the signs, of course, may vary from the details given if the existing physical conditions warrant such variation.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
G-201	Special U. S. Route Marker		16" x 16½"	Shield	Black	White	Optional	Line 1—2" A Line 2—2" E Numeral—5" D Letter—3" D		2'-6"			7'	7'	500' Max.	300' Max.	6'-10'	1' Min.		Used only on Northbound section of U. S. T. R. 6N in Erie County.
G-202	U. S. Route Marker		16" x 16½"	Shield	Black	White	Optional	Line 1—2" A Line 2—2" E Line 3—5" D 3 Digits 5" C		2'-6"			7'	7'	500' Max.	300' Max.	6'-10'	1' Min.	23	See Figures 1 and 2 for typical installations.
G-203	Oversize U. S. Route Marker		24" x 24¾"	Shield	Black	White	Yes	Line 1—3" A Line 2—3" E 2 Digits 8" D 3 Digits 8" C		2'-6"			7'	7'	500' Max.	300' Max.	6'-10'	1' Min.	23	See Figure 3 for further information on erection details.
G-204	Pennsylvania Route Marker		16" x 16½"	Keystone	Black	White	Optional	Line 1—2" D Line 2—1 & 2 Digits 5" D 3 Digits 5" C		2'-6"			7'	7'	500' Max.	300' Max.	6'-10'	1' Min.	23	See Figures 1 and 2 for typical installations.
G-205	Oversize Pennsylvania Route Marker		24" x 24¾"	Keystone	Black	White	Yes	Line 1—3" D Line 2—1 & 2 Digits 8" D 3 Digits 8" C		2'-6"			7'	7'	500' Max.	300' Max.	6'-10'	1' Min.	23	See Figure 3 for further information on erection details.
G-206	Right and Left Turn Marker	↔	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'			6'-10'	1' Min.	24	Mounted on Intersection Assembly.
G-207	Oversize Right and Left Turn Marker	↔	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'			6'-10'	1' Min.	24	Same as G-206.
G-208	Straight Ahead Arrow Marker	↑	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	25	See Figures 9-13.
G-209	Oversize Straight Ahead Arrow Marker	↑	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	25	See Figures 9-13.
G-210	Right or Left Arrow Marker	←	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	75' Max.	75' Max.	6'-10'	1' Min.	25	See Figures 9-13.
G-211	Oversize Right or Left Arrow Marker	←	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	75' Max.	75' Max.	6'-10'	1' Min.	25	See Figures 9-13.
G-212	Advance Route Right Arrow Marker	↱	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	26	See Figures 9-13.
G-213	Oversize Advance Route Right Arrow Marker	↱	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	26	See Figures 9-13.
G-214	Advance Route Left Arrow Marker	↰	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	33	See Figures 9-13.
G-215	Oversize Advance Route Left Arrow Marker	↰	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	33	See Figures 9-13.
G-216	Diagonal Right Arrow Marker	↗	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	75' Max.	75' Max.	6'-10'	1' Min.	33	Used only on Assemblies located within the intersection. See Figures 9-13.
G-217	Oversize Diagonal Right Arrow Marker	↗	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	75' Max.	75' Max.	6'-10'	1' Min.	33	Same as G-216.
G-218	Diagonal Left Arrow Marker	↖	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	75' Max.	75' Max.	6'-10'	1' Min.	34	Same as G-216.
G-219	Oversize Diagonal Left Arrow Marker	↖	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	75' Max.	75' Max.	6'-10'	1' Min.	34	Same as G-216.
G-220	Straight and Diagonal Right Turn Marker	↓↗	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'			6'-10'	1' Min.	34	Used only on Assemblies located within the intersection.
G-221	Oversize Straight and Diagonal Right Turn Marker	↓↗	15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'			6'-10'	1' Min.	34	Same as G-220.
G-222	Straight and Left Diagonal Turn Marker	↓↖	10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'			6'-10'	1' Min.	35	Same as G-220.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
G-223	Oversize Straight and Left Diagonal Turn Marker		15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'			6'-10'	1' Min.	35	Same as G-220.
G-224	Advance Route Diagonal Right Arrow Marker		10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	35	Used only on Advance Warning Assemblies. See Figure 12.
G-225	Oversize Advance Route Diagonal Right Arrow Marker		15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	35	Same as G-224.
G-226	Advance Route Diagonal Left Arrow Marker		10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	36	Same as G-224.
G-227	Oversize Advance Route Diagonal Left Arrow Marker		15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'	300' Max.	200' Max.	6'-10'	1' Min.	36	Same as G-224.
G-228																				
G-229	North Direction Marker		8" x 16½"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	36 & 37	Used on all types of Route Marker Assemblies. See Figure 13.
G-230	Oversize North Direction Marker		12" x 24¾"	Rectangle	Black	White	Yes	6" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-231	South Direction Marker		8" x 16½"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-232	Oversize South Direction Marker		12" x 24¾"	Rectangle	Black	White	Yes	6" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-233	East Direction Marker		8" x 16½"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-234	Oversize East Direction Marker		12" x 24¾"	Rectangle	Black	White	Yes	6" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-235	West Direction Marker		8" x 16½"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-236	Oversize West Direction Marker		12" x 24¾"	Rectangle	Black	White	Yes	6" C									6'-10'	1' Min.	36 & 37	Same as G-229.
G-237	Alternate Route Marker		8" x 16½"	Rectangle	Black	White	Optional	3" B									6'-10'	1' Min.	37	Shall be erected above all Route Markers along Alternate Route.
G-238	Oversize Alternate Route Marker		12" x 24¾"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	37	Same as G-237.
G-239																				
G-240																				
G-241	By-Pass Route Marker		8" x 16½"	Rectangle	Black	White	Optional	4" B									6'-10'	1' Min.	38	Shall be mounted above all Route Markers along By-Pass Route.
G-242	Oversize By-Pass Route Marker		12" x 24¾"	Rectangle	Black	White	Optional	5" C									6'-10'	1' Min.	38	Same as G-241.
G-243																				
G-244																				
G-245	Business Route Marker		8" x 16½"	Rectangle	Black	White	Optional	3" B									6'-10'	1' Min.	38	Shall be mounted above all Route Markers along Business Route.
G-246	Oversize Business Route Marker		12" x 24¾"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	38	Same as G-245.
G-247	Truck Route Marker		8" x 16½"	Rectangle	Black	White	Optional	4" C									6'-10'	1' Min.	39	Shall be mounted above all Route Markers along Truck Route.
G-248	Oversize Truck Route Marker		12" x 24¾"	Rectangle	Black	White	Optional	6" C									6'-10'	1' Min.	39	Same as G-247.
G-249	Junction Marker		8" x 16½"	Rectangle	Black	White	Optional	4" E							500' Max.	300' Max.	6'-10'	1' Min.	39	Used only in advance of intersections.
G-250	Oversize Junction Marker		12" x 24¾"	Rectangle	Black	White	Optional	6" E							500' Max.	300' Max.	6'-10'	1' Min.	39	Same as G-249.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
G-251	Straight and Right Turn Marker		10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'			6'-10'	1' Min.	40	Used only on Assemblies located within the intersection.
G-252	Oversize Straight and Right Turn Marker		15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'			6'-10'	1' Min.	40	Same as G-251.
G-253	Straight and Left Turn Marker		10" x 13"	Rectangle	Black	White	Optional			2'-6"			7'	7'			6'-10'	1' Min.	40	Same as G-251.
G-254	Oversize Straight and Left Turn Marker		15" x 19½"	Rectangle	Black	White	Yes			2'-6"			7'	7'			6'-10'	1' Min.	40	Same as G-251.
G-255	45" Rolled Edge Destination Sign	Variable Arrow	7" x 45"	Rectangle	Black	White	Yes	4" A, B, C, D, E		4'-6" 6'-6"			6'-6"	6'-6"	50' Max.	Corner of Intersection	7'-12'	1' Min.	42	See Figures 14, 17, & 18.
G-256	56" Rolled Edge Destination Sign	Variable Arrow	9" x 56"	Rectangle	Black	White	Yes	5" A, B, C, D, E		4'			7'	7'	150' Max.	Corner of Intersection	6'-10'	2' Min.	44	See Figures 15, 19, & 21.
G-257	72" Rolled Edge Destination Sign	Variable Arrow	11" x 72"	Rectangle	Black	White	Yes	6" A, B, C, D, E		4'			7'	7'	150' Max.	Corner of Intersection	6'-10'	2' Min.	46	See Figures 15, 19, 20, 21 and 22.
G-258	50" Rolled Edge Confirmation Sign		20" x 50"	Rectangle	Black	White	Yes	5" A, B, C, D, E		4'			7'	7'	300' Max.	150'-300'	6'-10'	2' Min.	46	Located beyond major intersections and municipal limits. See Figures 20, 22 and 23.
G-259	Town Name Sign		20" x 50"	Rectangle	Yellow	Blue	Yes	Line 1—4" C, E Line 2—5" or 6" A, B, C, D, E		4'			7'	7'			6'-10'	2' Min.	47	Located at Town, City or Borough Line. See Figure 23.
G-260	River Name Sign		20" x 50"	Rectangle	Yellow	Blue	Yes	5" A, B, C, D, E		4'			7'	7'			6'-10'	2' Min.	48	Located at each end of bridge. See Figure 23.
R-201	Stop Sign		24" x 24"	Octagon	White	Red	Yes	8" C			8'	8'			6'-30'		6'-10'	1' Min.	61-63	Used in urban areas. See Figures 25 and 26.
R-202	Stop Sign		30" x 30"	Octagon	White	Red	Yes	10" C	3'-6"		8'	8'			6'-30'		6'-10'	1' Min.	61-63	Used in rural areas. See Figures 24 and 26.
R-203	Signals Set for (25) M.P.H. Sign		12" x 18"	Rectangle	Black	White	Optional	Line 1 & 2—2" C Line 3—4" D Line 4—2" D		2'-6"			7'	7'			6'-10'	1' Min.	63	Erected at the beginning and throughout coordinated sections.
R-204	25-Mile Speed Regulation Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—4" D Line 3—8" E					7'	7'			6'-10'	1' Min.	64	Spaced not greater than 660' apart.
R-205	Oversize 25-Mile Speed Regulation Sign		24" x 30"	Rectangle	Black	White	Yes	Line 1—4" E Line 2—4" E Line 3—10" E					7'	7'			6'-10'	1' Min.	64	Same as R-204.
R-206	End 25-Mile Speed Regulation Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—6" D Line 3—3" D Line 4—3" D					7'	7'			6'-10'	1' Min.	64	Shall be erected at the ends of 25-Mile Speed Zones.
R-207	Oversize End 25-Mile Speed Regulation Sign		24" x 30"	Rectangle	Black	White	Yes	Line 1—4" E Line 2—8" E Line 3—3" E Line 4—3" E					7'	7'			6'-10'	1' Min.	64	Same as R-206.
R-208	35-Mile Speed Regulation Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—4" D Line 3—8" E		2'-6"			7'	7'			6'-10'	1' Min.	65	Spaced not greater than 660' apart.
R-209	Oversize 35-Mile Speed Regulation Sign		24" x 30"	Rectangle	Black	White	Yes	Line 1—4" E Line 2—4" E Line 3—10" E		2'-6"			7'	7'			6'-10'	1' Min.	65	Same as R-208.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
R-210	End 35-Mile Speed Regulation Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—6" D Line 3—3" D Line 4—3" D		2'-6"			7'	7'			6'-10'	1' Min.	69	Shall be erected at the end of 35-Mile Speed Zones.
R-211	Oversize End 35-Mile Speed Regulation Sign		24" x 30"	Rectangle	Black	White	Yes	Line 1—4" E Line 2—8" E Line 3—3" E Line 4—3" E		2'-6"			7'	7'			6'-10'	1' Min.	69	Same as R-210.
R-212	50-Mile Speed Regulation Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—4" D Line 3—8" E		2'-6"			7'	7'			6'-10'	1' Min.	69	Erected only on rural highways.
R-213	Oversize 50-Mile Speed Regulation Sign		24" x 30"	Rectangle	Black	White	Yes	Line 1—4" E Line 2—4" E Line 3—10" E		2'-6"			7'	7'			6'-10'	1' Min.	69	Same as R-212.
R-214	State Line Speed Information Sign		8' x 10'	Rectangle	Black	White	Optional	Line 1 & 3—10" D Line 2 & 4—5" D Line 5—8" D Line 6 & 7—6" D		2'							6'-10'		69	Sign erected 100' to 500' from State Line. See Figure 27.
R-215	Speed Zone Ahead Sign		24" x 30"	Rectangle	Black	White	Yes	Line 1—6" C Line 2—6" C except N 6" D Line 3—6" C		2'-6"			7'	7'			6'-10'	1' Min.	70	Erect 300' to 500' in advance of restricted section.
R-216	No Right Turn Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—5" D Line 2—4" D Line 3—4" D		2'-6"			7'	7'			6'-10'	1' Min.	70	
R-217	No Right Turn Sign		9" x 14"	Rectangle	Black	White	Optional	Line 1—2" D Line 2—2" D		7'			7'	7'					70	On mast arm or overhead signals sign clearance must be 14'6".
R-218	No Left Turn Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—5" D Line 2—4" D Line 3—4" D		2'-6"			7'	7'			6'-10'	1' Min.	70	
R-219	No Left Turn Sign		9" x 14"	Rectangle	Black	White	Optional	Line 1—2" D Line 2—2" D		7'			7'	7'					70	Same as R-217.
R-220	No Turns Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—6" D Line 2—4" D		2'-6"			7'	7'			6'-10'	1' Min.	70	
R-221	No Turns Sign		9" x 14"	Rectangle	Black	White	Optional	Line 1—2" F Line 2—2" E		7'			7'	7'					70	Same as R-217.
R-222	No "U" Turn Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—6" F Line 3—4" D		2'-6"			7'	7'			6'-10'	1' Min.	70	
R-223	No "U" Turn Sign		9" x 14"	Rectangle	Black	White	Optional	Line 1—2" F Line 2—3" F Line 3—2" E		7'			7'	7'					70	Same as R-217.
R-224	Keep Right (With Arrow) Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" D Line 2—4" D		2'-6"			7'	7'			6'-10'	1' Min.	72	See Figure 25.
R-225																				
R-226	One Way Sign		12" x 36"	Rectangle	Black	Arrow White	Optional	Line 1—4" D		7'			7'	7'				1' Min.	73	See Figure 28.
R-227																				
R-228	No Passing Sign		24" x 24"	Square	Black	White	Yes	N—6" E O—6" D Line 2—4" D except N—4" E		2'-6"			7'	7'			6'-10'	1' Min.	75	Spaced not greater than 660' apart. When erected pavement markings shall be altered if necessary.
R-229	End No Passing Zone Sign		20" x 24"	Rectangle	Black	White	Optional	Line 1—3" D Line 2—3" D Line 3—3" D Line 4—3" D		2'-6"			7'	7'			6'-10'	1' Min.	75	Shall be erected at the ends of all posted No Passing Zones.
R-230	Keep Right Except To Pass Sign		24" x 30"	Rectangle	Black	White	Optional	Line 1 & 2—5" E Line 3 & 4—3" E		2'-6"			7'	7'			6'-10'	1' Min.	75	Located along multiple lane highways.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
R-231	Thru Traffic Keep Right Sign		18" x 24"	Rectangle	Black	White	Optional	Line 1—4" C Line 2—4" C Line 3—4" C Line 4—4" C		2'-6"			7'	7'			6'-10'	1' Min.	76	Erected 100' to 300' in advance of location where traffic should move to the right.
R-232	Keep Right Sign		12" x 18"	Rectangle	Black	White	Optional	Line 1—5" A Line 2—5" A		2'-6"			7'	7'			6'-10'	1' Min.	76	
R-233	Oversize Keep Right Sign		24" x 24"	Square	Black	White	Yes	6" D		2'-6"			7'	7'			6'-10'	1' Min.	76	
R-234																				
R-235	Walk On Left Facing Traffic Sign		18" x 24"	Rectangle	Black	White	No	Line 1—4" D Line 2—3" D Line 3 & 4—2" D		2'-6"							10' Max.	1' Min.	77	Located at outskirts of built up areas where pedestrians must walk on road shoulders.
R-236	Bridge Restrictions Gross Weight Maximum Speed Sign		24" x 30"	Rectangle	Black	White	Optional	Line 1—2" C Line 2—3" C Line 3—3" C Line 4—2" D Line 5—2" D		2'-6"			7'	7'			6'-10'	1' Min.	77	Erected 50' to 100' in advance of the entrance to the bridge, requiring gross weight limitations.
R-237																				
R-238																				
R-239	Cross On Green Light Only Sign		12" x 18"	Rectangle	Black	White	Optional	Line 1, 3, 4, 5—2" D Line 2—1½" D					7'	7'				1' Min.	77	Erect on far side of roadway facing pedestrians wishing to cross.
R-240																				
R-241	Right Turn Keep Moving Sign		24" x 30"	Rectangle	Black	White	Yes	5" C		2'-6"			7'	7'	25' 50'		6'-10'	1' Min.	78	Shall not be used at Stop Intersections.
R-242	Right Turn Only Sign		18" x 24"	Rectangle	Black	White	Yes	5" C		2'-6"			7'	7'			6'-10'	1' Min.	79	Not used where traffic may move straight thru intersections.
R-243																				
R-244																				
R-245	Route (88) Use Center Lane Sign		24" x 36"	Rectangle	Black	White	Yes	Line 1, 3, 4, 5—4" D Line 2—6" D		2'-6"			7'	7'			6'-10'	1' Min.	79	Placed 300' to 500' in advance of location where it is desired that traffic move to center lane.
R-246	Thru Traffic Keep Moving Sign		24" x 30"	Rectangle	Black	White	Yes	5" C		2'-6"			7'	7'			6'-10'	1' Min.	80	
R-247	Turn Right On Green Arrow With Caution Sign		24" x 30"	Rectangle	Black	White	Optional	3" D		7'			7'	7'				1' Min.	80	
R-248																				
R-249	No Dumping Sign		12" x 18"	Rectangle	Black	White	No	Line 1—3" D Line 2—2" C		2'-6"			2'-6"	2'-6"			6'-10'	1' Min.	81	Erect parallel to highway.
R-250	Penalty For Vandalism of Roadside Planting Sign		12" x 18"	Rectangle	Black	White	No	Line 1 & 2—2" C Line 3, 4, 5, 6, 7—1" C Line 8—½" D		2'-6"			2'-6"	2'-6"			6'-10'	1' Min.	81	Erect parallel to highway.
R-251	No Parking Sundays and Holidays—2 Hour Parking Weekdays		12" x 24"	Rectangle	Red and Green	White	Optional	Line 1—3" C Line 2, 6, 7—2" C Line 3, 5, 8—1⅛" C Line 4—1" C		7'			7'	7'			6'-10'	1' Min.	81-84	The number is variable in message.
R-252	No Parking Any Time		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3—2" C Line 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-253	No Parking This Side		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3—2" C Line 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
R-254	No Parking Between Signs		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3—2" C Line 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-255	No Parking Here To Corner		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3—2" C Line 4—2" C Line 5—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-256	No Parking Loading Zone		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3 & 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-257	No Parking 8:30 A.M. to 5:30 P.M.		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3 & 4—2" B		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-258	30 Min. Parking 8:30 A.M. to 5:30 P.M.		12" x 18"	Rectangle	Green	White	Optional	Line 1, 2—3" B Line 3, 4—2" B		7'			7'	7'			6'-10'	1' Min.	81-84	Minutes and hours are variable in message.
R-259	Parking One Hour		12" x 18"	Rectangle	Green	White	Optional	Line 1, 3—3" B Line 2—4" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-260	Two Hour Parking 8 AM to 6 PM Except Sunday		12" x 18"	Rectangle	Green	White	Optional	Line 1—3" D Line 2—2" C Line 3—2" C Line 4—2" D, 1½" B, 1" B Line 5—1" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-261	2 Hrs. Parking 9:00 A.M. to 6:00 P.M.		12" x 18"	Rectangle	Green	White	Optional	Lines 1, 2, 3, 5— 2" C Line 4—1½" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-262	Parking 15 Minutes		12" x 18"	Rectangle	Green	White	Optional	Line 1 & 3—3" B Line 2—4" D		7'			7'	7'			6'-10'	1' Min.	81-84	Minutes are variable in message.
R-263	No Parking School Hours		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3 & 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-264	Three Hour Parking 8 A.M. to 8 P.M. Except Sunday		12" x 18"	Rectangle	Green	White	Optional	Line 1—3" C Line 2 & 3—2" C Line 4—2" D, 1½" B, 1" C Line 5—1" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-265	15 Min. Parking 8:00 to 9:30 A.M. 4:30 to 6:00 P.M.		12" x 18"	Rectangle	Green	White	Optional	Line 1 & 2—2" C Line 3, 4, 5, 6— 1½" D		7'			7'	7'			6'-10'	1' Min.	81-84	Minutes and Hours are variable in message.
R-266	No Parking 8:00 to 9:30 A.M. 4:30 to 6:30 P.M.		12" x 18"	Rectangle	Red	White	Optional	Line 1 & 2—2" C Line 3, 4, 5, 6— 1½" D		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-267	1 Hr. Parking 6 P.M. to 10 P.M. Fri.—Sat. Only		12" x 18"	Rectangle	Green	White	Optional	Line 1 & 2—2" C Line 3, 4, 5, 6— 1½" D		7'			7'	7'			6'-10'	1' Min.	81-84	Hours and Days are variable in message.
R-268	No Parking On Bridge		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3 & 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-269	No Parking—Loading Zone 8 A.M. to 6 P.M.		12" x 18"	Rectangle	Red	White	Optional	Line 1, 2, 3, 4— 2" C Line 5, 6—1½" D		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-270	1 Hr. Parking 8:00 A.M. to 8:00 P.M. Except Sundays and Holidays		12" x 18"	Rectangle	Green	White	Optional	Line 1—3" C Line 2—2" C Line 3 & 5— 1½" D Line 4, 6, 7— 1" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
R-271	No Truck Parking In This Block		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2, 3, 4, 5—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-272	No Parking—Taxi Stand		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3 & 4—2" C		7'			7'	7'			6'-10'	1' Min.	81-84	
R-273	No Parking 10 A.M. to 2 P.M.— Sunday Only		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2, 3, 4—2" C Line 5—1" D		7'			7'	7'			6'-10'	1' Min.	81-84	Hours and Days are variable in message.
R-274	Parking Two Hours		12" x 18"	Rectangle	Green	White	Optional	Line 1 & 3—3" B Line 2—4" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-275	30 Min. Parking 8 A.M. to 5 P.M. Except Sunday		12" x 18"	Rectangle	Green	White	Optional	Line 1 & 2—2" C Line 3 & 4—1½" D Line 5—1" C		7'			7'	7'			6'-10'	1' Min.	81-84	Minutes and hours are variable in message.
R-276	No Parking 12 Midnight Sundays to 7 A.M. Mondays		12" x 18"	Rectangle	Red	White	Optional	Line 1 & 2—2" C Line 3 & 5—2" B Line 4 & 6—1½" B		7'			7'	7'			6'-10'	1' Min.	81-84	Hours and days are variable in message.
R-277	No Parking 7:30 A.M. to 6:00 P.M. Except Sundays and Holidays		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—2" C Line 3 & 5—1½" D Line 4, 6, 7—1" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-278	1 Hour Parking 8 A.M. to 6 P.M. Saturday 8 A.M. to 9 P.M.		12" x 18"	Rectangle	Green	White	Optional	Line 1 & 2—2" C Line 3 & 5—1" C, 1½" B, 2" D Line 4—1½" C		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-279	No Parking 2 A.M. to 6 A.M. 1 Hour Parking 8 A.M. to 6 P.M.		12" x 24"	Rectangle	Red and Green	White	Optional	Line 1—3" C Line 2, 5, 6—2" C Line 3, 4, 7, 8—1½" D		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-280	No Parking 9 A.M. to 7 P.M. Saturday 9 A.M. to 10 P.M.		12" x 24"	Rectangle	Red	White	Optional	Line 1—3" D Line 2—2" C Line 3, 4—1½" D Line 5—1½" C Line 6, 7—1½" D		7'			7'	7'			6'-10'	1' Min.	81-84	Hours are variable in message.
R-281	No Parking Police Cars Only		12" x 24"	Rectangle	Red	White	Optional	Line 1—3" D Line 2, 3, 4, 5—2" C		7'			7'	7'					81-84	
R-282	No Parking on Sidewalk		12" x 18"	Rectangle	Red	White	Optional	Line 1—3" C Line 2—3" B Line 3—2" C Line 4—2" B		7'			7'	7'			6'-10'	1' Min.		
R-283	One (Two) Way Traffic Ahead Sign		24" x 30"	Rectangle	Black	White	Optional	Line 1—5" B Line 2 & 3—5" C		2'-6"			7'	7'			6'-10'	1' Min.	84	Placed 50' to 100' in advance of restriction. Message can be Two Way Traffic Ahead.
R-284	No Left Turn— 7:30-9:30 A.M.— 4:00-6:00 P.M.		18" x 24"	Rectangle	Black	White	Optional	Line 1, 2, 3—4" D Line 4, 5—2" C		2'-6"			7'	7'			6'-10'	1' Min.	85	Hours are variable in message.
R-285	No Fishing From Bridge Sign		12" x 18"	Rectangle	Black	White	No	Line 1—3" C Line 2, 3, 4—2" C											85	
R-286	Truck Traffic Use (Center) Lane Sign		24" x 36"	Rectangle	Black	White	Optional	Line 1, 2—5" C Line 3, 4, 5—4" D		2'-6"			7'	7'			6'-10'	1' Min.	86	Placed 100' to 300' in advance of lane. Designated lane may be changed.
R-287	No Passing On Right Sign		24" x 30"	Rectangle	Black	White	Optional	5" C		2'-6"			7'	7'			6'-10'	1' Min.	86	
R-288	Stop Pay Toll Sign		24" x 30"	Rectangle	Black	White	Optional	6" D		2'-6"			7'	7'			6'-10'	1' Min.	87	Placed at or in advance of entrance to highway or bridge where toll is paid.
R-289																				
R-290	Do Not Enter Sign		24" x 24"	Square	Black	White	Optional	6" C		2'-6"			7'	7'			6'-10'	1' Min.	87	

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
R-291	Maximum Gross Weight (10) Tons		18" x 24"	Rectangle	Black	White	No	4" B		2'-6"			7'	7'			6'-10'	1' Min.	87	Tonnage in message is variable.
R-292	Play Street—Closed 3:00 P.M. to 6:00 P.M.		18" x 24"	Rectangle	Black	White	No	Line 1, 2—3" D Line 3, 4, 5, 6—2" D		2'-6"			7'	7'	25' Max.	25' Max.	6'-10'	1' Min.	88	Hours in message are variable.
R-293	Keep Off Seeded Sign		12" x 18"	Rectangle	Black	White	Optional	Line 1—4" B Line 2—3" D		2'-6"			7'	7'			6'-10'	1' Min.	88	
R-294	Trucks Prohibited Except For Local Deliveries Sign		24" x 30"	Rectangle	Black	White	Optional	Line 1—1½" D Line 2, 3—3" D Line 4, 5—2" D		2'-6"			7'	7'			6'-10'	1' Min.	89	Trucks prohibited except for local deliveries. Erect not over 50' inside restricted zone.
R-295	School Bus Stop Sign		12" x 18"	Rectangle	Black	White	No	3" A		2'-6"			7'	7'			6'-10'	1' Min.	89	If required, erect on both sides of highway.
R-296	School Bus Warning Sign		36" x 36"	Square	Black	White	No	Line 1,4—4" B Line 2—6" B Line 3—3" B Line 5—2" B		2'-6"			7'	7'			6'-10'	1' Min.	89	Erected 100' to 500' from State Line facing traffic entering State.
R-297	No Passing Zone Ahead Sign		36" x 48"	Rectangle	Black	White	Optional	6" D		2'-6"			7'	7'			6'-10'	1' Min.	90	Erected 300' to 500' in advance of restricted zone.
R-298	Center Lane Left Turn Only Sign		24" x 30"	Rectangle	Black	White	Optional	4" D		2'-6"			7'	7'			6'-10'	1' Min.	90	Erect 100' to 300' in advance of location where traffic moves to center lane.
W-201	Right Turn Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	98	For proper use of signs see Figures 33 and 39.
W-202	Left Turn Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	98	Same as W-201.
W-203	Right Curve Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	99	Same as W-201.
W-204	Left Curve Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	99	Same as W-201.
W-205	Right Reverse Curve Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	102	Used only where curves meet requirements defined for W-203.
W-206	Left Reverse Curve Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	102	Same as W-205.
W-207	Right Reverse Turn Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	103	Used only where turns meet requirements defined for W-201.
W-208	Left Reverse Turn Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	103	Same as W-207.
W-209	Right Winding Road Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	104	Used only where curves are separated by tangents of less than 400'.
W-210	Left Winding Road Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	104	Same as W-209.
W-211	"T" & Side Road Intersection Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	105	Not ordinarily used on approach where traffic is required to stop.
W-212	Crossroad Intersection Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	106	Same as W-211.
W-213	"Y" Intersection Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	106	
W-214	Right Side Road Intersection Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	107	
W-215	Left Side Road Intersection Sign		30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	107	
W-216	Left or Right Arrow Sign		20" x 40"	Rectangle	Black	Yellow	Yes			2'-6"			7'	7'			6'-10'	1' Min.	108	Erected at point of turn on the outside of curve. See Figure 35.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color		Reflectorized	Letter Height & Series	Minimum Height of Sign						Distance from Intersection or Hazard		Lateral Distance from Pavement		Manual Page	Remarks
					Legend or Symbol	Background			Rural		Urban									
									Center	Bottom	Center		Bottom							
											Res.	Bus.	Res.	Bus.	Rural	Urban	Rural	Urban		
W-217	Junction Arrow Sign	⟷	20" x 40"	Rectangle	Black	Yellow	Yes			2'-6"			7'	7'			6'-10'	1' Min.	108	Located on far side of intersection at right angle to direction of travel.
W-218	Double Arrow Sign	⟷	30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'					6'-10'	1' Min.	110	Mounted on ends of obstructions where traffic may pass on either side.
W-219	Slow Sign		30" x 30"	Diamond	Black	Yellow	Yes	SLO—8" D W —8" E	3'-6"		8'	8'					6'-10'	1' Min.	110	Mounted 300' to 500' before sign indicating nature of hazard.
W-220	Hill Sign		30" x 30"	Diamond	Black	Yellow	Yes	10" D	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	111	Where more emphasis is needed, use W-245 or W-255.
W-221	Signals Ahead Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" D except N—5" E Line 2—5" D	3'-6"		8'	8'			300'-500'	200'-500'	6'-10'	1' Min.	111	Located in urban areas according to conditions.
W-222	Railroad Advance Warning Sign		30" diameter	Circle	Black	Yellow	Yes	R R—7" E		2'-6"			7'	7'	300'-500'	100' Min.	6'-10'	1' Min.	112	
W-223	Narrow Road Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" D except N & W—5" E Line 2—5" D	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	112	Used when pavement widths are less than 16'.
W-224	Underpass Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" E Line 2—5" E	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	113	Used where minimum clearance of overhead structure is greater than 13'.
W-225	One Lane Bridge Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" C Line 2—5" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	113	Used to mark all bridges with roadway width less than 16'.
W-226	Narrow Bridge Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" D except N & W—5" E Line 2—5" D	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	114	Used to mark bridges with width of 16' to 18'.
W-227	School Sign		24" x 24"	Diamond	Black	Yellow	No	Line 1—6" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	114	See Figure 56.
W-228	Clearance Sign		20" x 40"	Rectangle	Black	White	Optional	Line 1—5" D Line 2—5" D											115	Erect on structure where clearance is less than 13'. Show clearance to nearest inch.
W-229																				
W-230	Divided Highway Ahead Sign		36" x 36"	Diamond	Black	Yellow	Yes	Line 1—5" D Line 2—5" D except W—5" E Line 3—5" D	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	115	See Figure 61.
W-231	Divided Highway Ends Sign		36" x 36"	Diamond	Black	Yellow	Yes	Line 1—5" D Line 2—5" D Line 3—5" D N & W—5" E	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	116	
W-232	Pavement Ends Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1 & 2—5" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	116	
W-233	Pavement Narrows Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" C Line 2—5" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	116	See Figures 49-50.
W-234																				
W-235																				
W-236	Stop Ahead Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—6" D Line 2—6" C	3'-6"		8'	8'			300'-500'	150'-300'	6'-10'	1' Min.	117	
W-237																				
W-238																				
W-239																				
W-240	Slippery When Wet Sign		30" x 30"	Diamond	Black	Yellow	Optional	Line 1—5" C Line 2—5" B	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	118	Erect if necessary throughout slippery area.
W-241	Soft Shoulder Sign		30" x 30"	Diamond	Black	Yellow	Optional	Line 1—5" C Line 2—5" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	118	Remove sign when hazard no longer exists.

SIGN SPECIFICATIONS CHART

Standard Number	Legend	Symbol	Size	Shape	Color: Legend or Symbol	Color: Background	Reflectorized	Letter Height & Series	Minimum Height of Sign: Rural: Center	Minimum Height of Sign: Rural: Bottom	Minimum Height of Sign: Urban: Center: Res.	Minimum Height of Sign: Urban: Center: Bus.	Minimum Height of Sign: Urban: Bottom: Res.	Minimum Height of Sign: Urban: Bottom: Bus.	Distance from Intersection or Hazard: Rural	Distance from Intersection or Hazard: Urban	Lateral Distance from Pavement: Rural	Lateral Distance from Pavement: Urban	Manual Page	Remarks
W-242	Slides Sign		30" x 30"	Diamond	Black	Yellow	Yes	8" D	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	119	
W-243	Crosswalk Sign		30" x 30"	Diamond	Black	Yellow	Yes	6" D except W—6" E	3'-6"		8'	8'			300'-500'	150'-200'	6'-10'	1' Min.	119	For low speeds, erect 150' to 200' from crosswalk.
W-244	Truck Crossing Sign		30" x 30"	Diamond	Black	Yellow	Yes	5" C	3'-6"		8'	8'			300'-500'	150'-300'	6'-10'	1' Min.	120	
W-245	Special Background for Warning Signs		60" x 60"	Square or Diamond	Black	Yellow	Yes			2'-0" Min.			2'0" Min.	2'0" Min.			6'-10'	1' Min.	120	May be used with W-216 and W-217.
W-246																				
W-247	"Y" Intersection Sign Secondary Right	Y	30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	121	
W-248	"Y" Intersection Sign Secondary Left	Y	30" x 30"	Diamond	Black	Yellow	Yes		3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	122	
W-249																				
W-250	Safety Zone Sign		30" x 30"	Diamond	Black	Yellow	Yes	4" D	3'-6"		8'	8'						1' Min.	122	Set on buffer or post inside safety zone.
W-251	Cattle Crossing Sign		24" x 24"	Diamond	Black	Yellow	No	4" C	3'-6"		8'	8'			150'-300'		6'-10'	1' Min.	123	
W-252	School Crossing Sign		24" x 24"	Diamond	Black	Yellow	No	4" C	3'-6"		8'	8'			150'-300'	150'-300'	6'-10'	1' Min.	123	Used at school crossings where schools are not located along the highway.
W-253	Low Clearance Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" D Line 2—5" C Line 3—3" and 4" D	3'-6"		8'	8'			300'-500'	150'-300'	6'-10'	1' Min.	123	Used where clearance is less than 13'. See Figures 62, 63 and 64.
W-254	Park Entrance Sign		30" x 30"	Diamond	Black	Yellow	Yes	Line 1—5" D Line 2—5" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	124	
W-255	Hill—Trucks Use Low Gear Sign		48" x 48"	Diamond	Black	Yellow	Yes	Line 1—14" D Line 2—4" D Line 3—4" D W—4" E Line 4—4" D	5'		5'	5'			300'-500'		6'-10'	1' Min.	125	Erect in accordance with specifications for W-220.
W-256	Watch Children Sign		24" x 24"	Diamond	Black	Yellow	No	Line 1 & 2—4" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	125	
W-257																				
W-258	Cemetery Entrance Sign		24" x 24"	Diamond	Black	Yellow	No	4" B	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	126	
W-259																				
W-260	Merging Traffic Ahead Sign		36" x 36"	Diamond	Black	Yellow	Yes	5" D Letter N—5" E	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	126	
W-261	Tunnel Sign		30" x 30"	Diamond	Black	Yellow	Yes	6" D except N—6" E	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	127	
W-262	Playground Sign		24" x 24"	Diamond	Black	Yellow	No	4" B	3'-6"		8'	8'			150'-300'	150'-300'	6'-10'	1' Min.	127	
W-263	Church Sign		24" x 24"	Diamond	Black	Yellow	No	6" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	127	
W-264	Hospital Sign		24" x 24"	Diamond	Black	Yellow	Optional	5" C	3'-6"		8'	8'			300'-500'	150'-300'	6'-10'	1' Min.	128	
W-265	County Home Sign		24" x 24"	Diamond	Black	Yellow	Optional	5" C	3'-6"		8'	8'			300'-500'		6'-10'	1' Min.	128	
W-266																				
W-267	Safe Speed Limit Sign For Curves and Turns		15" x 15"	Square	Black	Yellow	Yes	Line 1—7" D Line 2—3" E		2'			2'	2'	300'-500'		6'-10'	1' Min.	129	For proper use of sign see Figures 34 and 35.
W-268	No Outlet Sign		30" x 30"	Diamond	Black	Yellow	Optional	6" D	3'-6"		8'	8'			150' Min.	150' Min	6'-10'	1' Min.	129	

APPENDIX

INSTRUCTIONS FOR USING THE BALL BANK INDICATOR

The Ball Bank Indicator can be easily mounted to the dashboard by means of rubber suction cups. It should be mounted in such a position as to allow the ball to rest freely at the zero point when the vehicle is standing level or moving in a straight line. The movement of a car around a curve to the left, for example, causes the ball to swing to the right of the zero point. See Figure 34. The faster the car moves around the curve, or the sharper the curve, the greater distance the ball swings away from the zero point. Superelevation, however, tends to bring the ball back to the zero position. The net result is the indicator reading.

The Ball Bank Indicator is used to determine when Turn and Curve Signs are required on horizontal curves. In addition, it is used to determine the Safe Speed for any curve.

Two men are needed to properly check the curve. One for driving, the other for observing the indicator. All test runs must be made carefully.

Beginning well in advance of the curve being checked, the driver should enter the curve at a pre-determined speed, stay in the center of his lane, and maintain a uniform speed throughout the curve. The observer should note as closely as possible the maximum degree of swing shown on the indicator as well as the direction of the swing from the zero point.

For Turn and Curve Sign checks the driver should make the test run at 31 miles per hour (or less, for safety). If the ball bank indicator reads 10° or more, a Turn Sign, W-201 or W-202, will be required. If the indicator reading is less than 10° at test run speeds of 31 miles per hour, then test runs should be made at greater speeds. If the indicator reads 10° or more at speeds between 31 miles per hour and 50 miles per hour, then a Curve Sign is required.

For Safe Speed Sign checks the driver should estimate the approximate safe speed by making trial runs over the curve. He should then make a sufficient number of test runs to determine the exact speed required to swing the ball 10° off center. This is a safe speed for the curve. Any speed which causes the ball to move more than 10° away from the zero position is considered unsafe.

SYMBOLS FOR TRAFFIC LINE PAINTING

The following symbols are suggested for use in designating the type of traffic line painting to be placed on our highways. The round dot symbol should be approximately 3½ inches in diameter and the small dash approximately 3 inches wide and 12 inches long. Where more than one dash line is used they shall be spaced approximately from 18 inches to 24 inches apart. On macadam pavements a single dash will be used for designating center of pavement and shall be spaced at intervals of 100 feet to 150 feet on tangents and on curves 30 feet to 50 feet apart, depending on degree of curve.

SYMBOL	TO BE USED FOR
●	Designates beginning and end of solid lines.
———	Designates center line of highway.
- - -	Designates beginning and end of broken lines.

EXAMPLES

—●	Designates beginning and end of solid line on left of center line.
●—	Designates beginning and end of solid line on right of center line.
—●—	Designates end of solid line on right and beginning of solid line on left. This can be reversed.
- - -	Designates beginning and end of broken line.
- - - ●—	Designates end of solid line on right and beginning of broken line on left. This can be reversed.
—● - - -	Designates end of broken line on right and beginning of solid line on left. This can be reversed.
- - - —●—	Designates beginning of solid line on right and broken line on left of center line.
—● - - -	Designates beginning of solid line on left and broken line on right of center line.
—●- -	Designates end of solid line and beginning of broken line on right of center line. This can be reversed.
- -●—	Designates end of solid line and beginning of broken line on left of center line. This can be reversed.

GUIDE SIGNS

G-201—Special U. S. Route Marker
G-202—U. S. Route Marker
G-203—Oversize U. S. Route Marker
G-204—Pennsylvania Route Marker
G-205—Oversize Pennsylvania Route Marker
G-206—Right and Left Turn Marker
G-207—Oversize Right and Left Turn Marker
G-208—Straight Ahead Arrow Marker
G-209—Oversize Straight Ahead Arrow Marker
G-210—Right or Left Arrow Marker
G-211—Oversize Right or Left Arrow Marker
G-212—Advance Route Right Arrow Marker
G-213—Oversize Advance Route Right Arrow Marker
G-214—Advance Route Left Arrow Marker
G-215—Oversize Advance Route Left Arrow Marker
G-216—Diagonal Right Arrow Marker
G-217—Oversize Diagonal Right Arrow Marker
G-218—Diagonal Left Arrow Marker
G-219—Oversize Diagonal Left Arrow Marker
G-220—Straight and Diagonal Right Turn Marker
G-221—Oversize Straight and Diagonal Right Turn Marker
G-222—Straight and Diagonal Left Turn Marker
G-223—Oversize Straight and Diagonal Left Turn Marker
G-224—Advance Route Diagonal Right Arrow Marker
G-225—Oversize Advance Route Diagonal Right Arrow Marker
G-226—Advance Route Diagonal Left Arrow Marker
G-227—Oversize Advance Route Diagonal Left Arrow Marker
G-228—None
G-229—North Direction Marker
G-230—Oversize North Direction Marker
G-231—South Direction Marker
G-232—Oversize South Direction Marker
G-233—East Direction Marker
G-234—Oversize East Direction Marker
G-235—West Direction Marker
G-236—Oversize West Direction Marker
G-237—Alternate Route Marker
G-238—Oversize Alternate Route Marker
G-239—None
G-240—None

G-241—By-Pass Route Marker
G-242—Oversize By-Pass Route Marker
G-243—None
G-244—None
G-245—Business Route Marker
G-246—Oversize Business Route Marker
G-247—Truck Route Marker
G-248—Oversize Truck Route Marker
G-249—Junction Marker
G-250—Oversize Junction Marker
G-251—Straight and Right Turn Marker
G-252—Oversize Straight and Right Turn Marker
G-253—Straight and Left Turn Marker
G-254—Oversize Straight and Left Turn Marker
G-255—45″ Rolled Edge Destination Sign
G-256—56″ Rolled Edge Destination Sign
G-257—72″ Rolled Edge Destination Sign
G-258—50″ Rolled Edge Confirmation Sign
G-259—Town Name Sign
G-260—River Name Sign

REGULATORY SIGNS

R-201—Stop Sign 24″
R-202—Stop Sign 30″
R-203—Signals Set for (25) M.P.H. Sign
R-204—25-Mile Speed Regulation Sign
R-205—Oversize 25-Mile Speed Regulation Sign
R-206—End 25-Mile Speed Regulation Sign
R-207—Oversize End 25-Mile Speed Regulation Sign
R-208—35-Mile Speed Regulation Sign
R-209—Oversize 35-Mile Speed Regulation Sign
R-210—End 35-Mile Speed Regulation Sign
R-211—Oversize End 35-Mile Speed Regulation Sign
R-212—50-Mile Speed Regulation Sign
R-213—Oversize 50-Mile Speed Regulation Sign
R-214—State Line Speed Information Sign
R-215—Speed Zone Ahead Sign
R-216—No Right Turn Sign 18″ x 24″
R-217—No Right Turn Sign 9″ x 14″
R-218—No Left Turn Sign 18″ x 24″
R-219—No Left Turn Sign 9″ x 14″
R-220—No Turns Sign 18″ x 24″
R-221—No Turns Sign 9″ x 14″

R-222—No "U" Turn Sign 18" x 24"
R-223—No "U" Turn Sign 9" x 14"
R-224—Keep Right (with arrow) Sign
R-225—None
R-226—One Way Sign
R-227—None
R-228—No Passing Sign
R-229—End No Passing Zone Sign
R-230—Keep Right Except To Pass Sign
R-231—Thru Traffic Keep Right Sign
R-232—Keep Right Sign
R-233—Oversize Keep Right Sign
R-234—None
R-235—Walk On Left Facing Traffic Sign
R-236—Bridge Restriction Gross Weight Maximum Speed Sign
R-237—None
R-238—None
R-239—Cross On Green Light Only Sign
R-240—None
R-241—Right Turn Keep Moving Sign
R-242—Right Turn Only Sign
R-243—None
R-244—None
R-245—Route (88) Use Center Lane Sign
R-246—Thru Traffic Keep Moving Sign
R-247—Turn Right on Green Arrow With Caution
R-248—None
R-249—No Dumping Sign
R-250—Penalty for Vandalism to Roadside Planting Sign
R-251—Parking Restriction (No Parking Sun. & Holidays—*2* Hr. Parking Weekdays)
R-252—Parking Prohibition (No Parking Any Time)
R-253—Parking Prohibition (No Parking This Side)
R-254—Parking Prohibition (No Parking Between Signs)
R-255—Parking Prohibition (No Parking Here To Corner)
R-256—Parking Prohibition (No Parking Loading Zone)
R-257—Parking Restriction (No Parking *8:30* AM to *5:30* PM)
R-258—Parking Restriction (*30* Min. Parking *8:30* AM to *5:30* PM)
R-259—Parking Restriction (Parking One Hour)
R-260—Parking Restriction (Two Hour Parking—*8* AM to *6* PM except Sunday)
R-261—Parking Restriction (*2* Hr. Parking—*9:00* AM to *6:00* PM)
R-262—Parking Restriction (Parking *15* Minutes)
R-263—Parking Prohibition (No Parking School Hours)
R-264—Parking Restriction (*3* Hr. Parking *8 AM* to *8 PM* except Sunday)
R-265—Parking Restriction (*15* Min. Parking *8* to *9* AM—*4* to *6* PM)
R-266—Parking Restriction (No Parking *8* to *9* AM—*4* to *6* PM)

R-267—Parking Restriction (*1* Hr. Parking *6 PM to 10 PM Fri-Sat Only)*
R-268—Parking Prohibition (No Parking on Bridge)
R-269—Parking Restriction (No Parking Loading Zone—*8* AM to *6* PM)
R-270—Parking Restriction (*1* Hr. Parking—*AM* to *PM* except Sun., & Holidays)
R-271—Parking Prohibition (No Truck Parking in This Block)
R-272—Parking Prohibition (No Parking—Taxi Stand)
R-273—Parking Restriction (No Parking *AM* to *PM Sunday Only)*
R-274—Parking Restriction (Parking *Two* Hours)
R-275—Parking Restriction (*30 Min.* Parking *8 AM* to *5 PM* except Sun.)
R-276—Parking Restriction (No Parking *12 Midnight Sun.* to *7 AM Mon.)*
R-277—Parking Restriction (No Parking *AM* to *PM* except Sun. & Holidays)
R-278—Parking Restriction *(1* Hr. Parking *AM* to *PM* Sat. *AM* to *PM)*
R-279—Parking Restriction (No Parking *AM* to *AM—1* Hour Parking *AM* to *PM)*
R-280—Parking Prohibition (No Parking *AM to PM*—Sat. *AM to PM)*
R-281—Parking Prohibition (No Parking Police Cars Only)
R-282—No Parking on Sidewalk
R-283—One (Two) Way Traffic Ahead Sign
R-284—Special No Left Turn Restriction (*7-9* AM — *4-6* PM)
R-285—No Fishing From Bridge Sign
R-286—Truck Traffic Use (Center) Lane Sign
R-287—No Passing On Right Sign
R-288—Stop Pay Toll Sign
R-289—None
R-290—Do Not Enter Sign
R-291—Maximum Gross Weight (10) Tons Sign
R-292—Play Street Sign
R-293—Keep Off Seeded Sign
R-294—Trucks Prohibited Except For Local Deliveries Sign
R-295—School Bus Stop Sign
R-296—School Bus Warning Sign
R-297—No Passing Zone Ahead Sign
R-298—Center Lane Left Turn Only Sign

WARNING SIGNS

W-201—Right Turn Sign
W-202—Left Turn Sign
W-203—Right Curve Sign
W-204—Left Curve Sign
W-205—Right Reverse Curve Sign
W-206—Left Reverse Curve Sign
W-207—Right Reverse Turn Sign
W-208—Left Reverse Turn Sign
W-209—Right Winding Road Sign

W-210—Left Winding Road Sign
W-211—"T" and Side Road Intersection Sign
W-212—Crossroad Intersection Sign
W-213—"Y" Intersection Sign
W-214—Right Side Road Intersection Sign
W-215—Left Side Road Intersection Sign
W-216—Left or Right Arrow Sign
W-217—Junction Arrow Sign
W-218—Double Arrow Sign
W-219—Slow Sign
W-220—Hill Sign
W-221—Signals Ahead Sign
W-222—Railroad Advance Warning Sign
W-223—Narrow Road Sign
W-224—Underpass Sign
W-225—One Lane Bridge Sign
W-226—Narrow Bridge Sign
W-227—School Sign
W-228—Clearance Sign
W-229—None
W-230—Divided Highway Ahead Sign
W-231—Divided Highway Ends Sign
W-232—Pavement Ends Sign
W-233—Pavement Narrows Sign
W-234—None
W-235—None
W-236—Stop Ahead Sign
W-237—None
W-238—None
W-239—None
W-240—Slippery When Wet Sign
W-241—Soft Shoulders Sign
W-242—Slides Sign
W-243—Crosswalk Sign
W-244—Truck Crossing Sign
W-245—Special Background for Warning Signs
W-246—None
W-247—"Y" Intersection Secondary Right Sign
W-248—"Y" Intersection Secondary Left Sign
W-249—None
W-250—Safety Zone Sign
W-251—Cattle Crossing Sign
W-252—School Crossing Sign
W-253—Low Clearance Sign
W-254—Park Entrance Sign
W-255—Hill—Trucks Use Low Gear Sign
W-256—Watch Children Sign
W-257—None

W-258—Cemetery Entrance Sign
W-259—None
W-260—Merging Traffic Ahead Sign
W-261—Tunnel Sign
W-262—Playground Sign
W-263—Church Sign
W-264—Hospital Sign
W-265—County Home Sign
W-266—None
W-267—Safe Speed Limit For Turns and Curves Sign
W-268—No Outlet Sign

PAVEMENT AND OBSTRUCTION MARKINGS

P-201—Standard Pavement Markings
P-202—Fog Line Markings
P-203—Marking Two-Lane Vertical Curves
P-204—Marking Successive Vertical Curves
P-205—Marking Three-Lane Vertical Curves
P-206—Measuring Sight Distances on Vertical Curves
P-207—Marking Two-Lane Horizontal Curves (Limited Sight Distance)
P-208—Marking Two-Lane Horizontal Curves (Sharp Radius, Unlimited Sight Distance)
P-209—Marking Successive Horizontal Curves
P-210—Marking Three-Lane Horizontal Curves
P-211—Marking Four-Lane Pavements
P-212—Measuring Sight Distance on Horizontal Curves
P-213—Transition Lane Markings (Three-Lane to Two-Lane)
P-214—Transition Lane Markings (Four-Lane to Two-Lane)
P-215—Transition Lane Markings (Four-Lane to Three-Lane)
P-216—Railroad Grade Crossing Markings
P-217—Marking Rural Intersections
P-218—Marking Urban Intersections
P-219—Channelization and Turn Markings at Wide Intersections
P-220—Typical Urban Parking
P-221—School Crossing
P-222—Details of Pavement Arrows
P-223—Details of Pavement Letters (A, C, E)
P-224—Details of Pavement Letters (F, G, H)
P-225—Details of Pavement Letters (I, L, M)
P-226—Details of Pavement Letters (N, O, P)
P-227—Details of Pavement Letters (R, S, T)
P-228—Details of Pavement Letters (U, W, Y)
P-229—Approach Markings to Pedestrian Islands and Safety Zones
P-230—Approach Markings to Divided Highways
P-231—Single Underpass Markings
P-232—Single Arch Underpass Markings
P-233—Divided Underpass Markings
P-234—Portal and Headwall Markings
P-235—Symbols for Traffic Line Painting

APPLICATION FORMS

Below are listed application and permit forms which require execution by local officials to legally establish various methods of traffic control on streets and highways under their jurisdiction. There is also listed the permit form which is required by manufacturers to legally sell signs, signals or other traffic control devices in this Commonwealth.

Form No.	Title
952	Application For Permit To Install and Operate Traffic Signals
964	Traffic Signal Permits
4155	Traffic Sign and Signal Manufacturers' Permit
4160	Thru Highway Resolution
4160B	Stop Intersection Resolution
4161	By-Pass or Auxiliary Route Establishment
4165	Traffic Route Establishment
4193	One Way Street Application
4194	Restricted Speed Zone Application
4195	Vehicle Class Limitation Application

Samples of these forms are shown on the following pages. Copies are available upon request.

Form 952 (R-1-20-42)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION
HARRISBURG

APPLICATION FOR PERMIT TO INSTALL AND OPERATE TRAFFIC SIGNAL

WHEREAS, the .....

..... County, desires to erect, operate and maintain traffic signals at the intersection of .....

....., and

WHEREAS, the Vehicle Code requires the approval of the Secretary of Highways before any traffic signals may be legally erected or reconstructed,

NOW, THEREFORE, BE IT RESOLVED, that traffic signals be erected at the above mentioned location, subject to the approval of the Secretary of Highways, and that his approval is hereby requested, and

BE IT FURTHER RESOLVED, that, in the event a traffic signal permit is approved after proper investigation by the Secretary of Highways or his agent, the .....

..... will be bound by the following provisions:

The installation shall be made in accordance with the requirements of the Vehicle Code and the Manual of Regulations for Official Traffic Signs and Signals of this Commonwealth, and

Should future highway or traffic conditions, or legal requirements, necessitate alteration of the construction or operation, or hours of operation, or removal of the traffic signals at the above mentioned intersection, they shall be altered or removed when and as directed by the Secretary of Highways.

I, ..., Secretary of the

..... do certify that the foregoing is a true and correct copy of the resolution legally adopted at a meeting held

.....

(SEAL) *Signed*

.....
Secretary

Form 964 (R-3-19-52) PERMIT No.....

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
HARRISBURG

TRAFFIC SIGNAL PERMITS

In accordance with the provisions of Section 1110 of Act 360 approved June 5, 1937, the Secretary of Highways hereby approves the installation and operation of a traffic signal at the intersection of .....

.....

in the ....., County of .....

This permit is issued to, and accepted by the .....

..... hereinafter known as the Permittee, as follows—

This installation shall be in accordance with the provisions of the Vehicle Code of the Commonwealth of Pennsylvania and the Manual of Regulations for Official Traffic Signs and Signals of the Department of Highways, and shall conform to the following—

Type of Signal ..... Type of Controller .....

Number of Posts ..... Number of Signal Faces ..... Special Lenses .....

Sequence of Lens Illumination .....

Hours of Operation as "Stop" and "Go" .....

.....

Hours of Operation as "FLASHING" .....

.....

.....

TIMING .....

.....

.....

.....

All work performed by the Permittee in the erection of the traffic signal, shall be under and subject to the direction of the Secretary of Highways or his authorized assistants or representatives. The Permittee shall maintain the signal in a safe condition at all times.

The Permittee covenants and agrees to fully indemnify and save harmless the Department of Highways and assume all liability for damages or injury, occurring to any person, persons, or property through or in consequence of any act or omission of anyone working on the construction, or from faulty maintenance or operation of such traffic signal.

The Permittee shall provide that no color or flashing light signs or other lights, signs or markings are so located as to interfere with the signal indications, by authority of Section 1105 (c) of The Vehicle Code.

The said Permittee shall use due diligence in the execution of the work authorized under this permit and shall not obstruct or endanger travel along the said road. All operations must be conducted so as to permit safe and reasonably free travel at all times over the road within the limits of the work herein permitted.

The Secretary of Highways, by law, reserves the right to revoke and annul this permit if the Permittee shall at any time wilfully or negligently fail to comply with the conditions contained in this permit, or, upon changes in traffic conditions, fail to make any changes in the construction or operation of this signal, or to remove it, when so ordered by the Secretary of Highways; or if this installation is not in operation within six (6) months of the receipt of this permit.

The Permittee agrees to notify the Department of Highways in writing, within 48 hours, of any change in the construction or operation of this signal, or of any change of the local official with authority over it.

This permit cancels and supersedes all previous permits issued for this intersection.

APPROVED—JOSEPH J. LAWLER
Secretary of Highways

Date..... By .....
Deputy Secretary of Highways

Form 4155

APPROVAL NO.....

DATE.....

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
HARRISBURG

CERTIFICATE OF APPROVAL FOR THE MANUFACTURE OR USE OF TRAFFIC SIGNS, SIGNALS, MARKINGS OR ANY OTHER TRAFFIC REGULATORY DEVICES.

TO.....

.....

.....

.....

.....

Under authority of an act of the General Assembly, No. 360, dated June 5, 1937, the Secretary of Highways hereby approves the following described traffic sign, signal, marking or other traffic regulatory device.

TYPE OF DEVICE .....

DESCRIPTION—

APPROVED—JOSEPH J. LAWLER
Secretary of Highways

By.....
Deputy Secretary of Highways

Date.....

RESOLUTION

WHEREAS, The ..... desires to designate State Highway ..... in the ..... of ..... in the county of ..... as a "Thru Highway" between ..... and ....., and

WHEREAS, Signs will be required at the entrance of all streets or highways that intersect therewith—

NOW, THEREFORE, BE IT RESOLVED, That State Highway ..... from ..... to ..... shall be and is hereby designated as a "Thru Highway" and all traffic shall come to a full stop before entering or crossing the same after proper signs have been erected, and

BE IT FURTHER RESOLVED, That the ..... of ..... does hereby request the Department of Highways to erect signs at the intersections of all highways which enter upon said State highway between the points aforesaid, and

BE IT FURTHER RESOLVED, That said State highway shall not be considered a "Thru Highway" unless or until the Secretary of Highways approves this resolution and the Department of Highways erects the necessary signs to stop traffic as above.

I, ... Secretary of the ..... do hereby certify that the foregoing is a true and correct copy of the resolution duly adopted in accordance with law at a meeting held ..... 19.....

.....
Secretary

(SEAL) Recommended by..... Date .....
District Engineer

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION

APPROVED—JOSEPH J. LAWLER Date.....
Secretary of Highways

By.....
Deputy Secretary of Highways

Form 4160 (R-3-19-52)

RESOLUTION

WHEREAS, The ..... desires to designate as a "Stop Intersection," the intersection of .....

..... traffic to be stopped on

.....

..... in ..... in the county of ....., and

WHEREAS, The approval of the Secretary of Highways is necessary as provided in the Motor Vehicle Code.

NOW, THEREFORE, BE IT RESOLVED, That the intersection of .....

.....

..... is hereby designated as a "Stop Intersection" and all traffic shall come to a full stop when proper signs are erected at said intersection, and

BE IT FURTHER RESOLVED, That the ..... of ..... does hereby request, and grant authority and approval for the erection of the necessary signs by the Department of Highways, and

BE IT FURTHER RESOLVED, That said intersection shall not be considered a "Stop Intersection" unless or until the Secretary of Highways approves this resolution and the Department of Highways erects the necessary signs to stop traffic as indicated above.

I, ..., Secretary of the ....., do hereby certify that the foregoing is a true and correct copy of the resolution duly adopted in accordance with law at a meeting held ..... 19.....

.....

Secretary

(SEAL) Recommended by ..... Date .....

District Engineer

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION

APPROVED—JOSEPH J. LAWLER Date .....

Secretary of Highways

By .....

Deputy Secretary of Highways

Form 4160B (R-3-19-52)

Form 4161

RESOLUTION

WHEREAS, The ..... of ..... desires to designate certain streets as a by-pass or auxiliary route for traffic using State Highway Traffic Route ..... as shown on sketch attached hereto and made part hereof, and

WHEREAS, It is desired to have such by-pass or auxiliary route established and marked in accordance with the standards, rules and regulations of the Pennsylvania Department of Highways.

NOW, THEREFORE, BE IT RESOLVED:

That the following by-pass or auxiliary route is hereby established for traffic using State Highway Traffic Route .....:

Beginning at the intersection of ..... Street and ..... Street; thence over ..... Street, ... Street and ..... Street to the intersection of the latter with ..... Street (Traffic Route .....), said by-pass or auxiliary route to be established and maintained under and subject to the following terms and conditions:

(a) The ..... of ..... shall be responsible for the policing, maintenance (including snow removal) and proper traffic marking of the street or streets forming part of said by-pass or auxiliary route, and

(b) Shall provide the necessary signs and markings for said by-pass in accordance with the standards as prescribed by the Department of Highways, and shall annually repair these signs and markings using paint equivalent to P.H.D. Specifications No. 5 for white paint and No. 6 for black paint.

(c) The by-pass or auxiliary route hereby established shall be discontinued and all signs and markings directing State Highway Traffic thereon shall be removed therefrom if the provisions of (a) and (b) are not complied with, or if changes in physical or traffic conditions make such by-pass or auxiliary route impracticable in the judgment of the Secretary of Highways, or if the installation of proper signs and markings has not been completed within six months from the date of the approval of this resolution by the Secretary of Highways.

A certified copy of this resolution shall be sent to the Secretary of Highways, and upon approval thereof by him, or his authorized deputy, the aforesaid by-pass or auxiliary route shall be deemed to have been authorized in accordance with the terms hereof.

ATTEST:

....

Clerk or Secretary *President of Council*

I hereby certify the foregoing to be a true and correct copy of resolution of the Council of the ..... of ..... duly adopted at a meeting of said body on the ..... day of ....., 19.....

.....

City Clerk—Borough Secretary

(SEAL)

The establishment of the aforesaid by-pass or auxiliary route is hereby approved in accordance with the terms and conditions expressed in the foregoing resolution.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

Date ..... By .....

Deputy Secretary of Highways

Form 4165

RESOLUTION

WHEREAS, It is desired *to designate certain highways as State Highway Traffic* Route ..... as shown on sketch attached hereto and made a part hereof, and

WHEREAS, It is desired to have such Traffic Route established and marked in accordance with the standards, rules and regulations of the Pennsylvania Department of Highways.

NOW, THEREFORE, BE IT RESOLVED:

That the following route is hereby established for traffic using State Highway Traffic Route ..... :

Via *From* *To*

said Traffic Route to be established and maintained under and subject to the following terms and conditions:

(a) The ..... of ..... shall be responsible for the policing, maintenance (including snow removal) and proper traffic marking, except route markers, of the highways under the jurisdiction of ....., forming part of said Traffic Route, and

(b) Shall provide and annually repair the necessary signs and markings, except route markers, for said Traffic Route in accordance with the standards as prescribed by the *Secretary* of *Highways*.

(c) The Traffic Route hereby established shall be discontinued and all signs and markings directing State Highway Traffic thereon shall be removed therefrom if changes in physical or traffic conditions make such Traffic Route impracticable in the judgment of the Secretary of Highways.

A certified copy of this resolution shall be sent to the Secretary of Highways, and upon approval thereof by him, or his authorized deputy, the aforesaid Traffic Route shall be deemed to have been authorized in accordance with the terms hereof.

ATTEST: .....

Burgess

.....

Chief Clerk *Secretary*

I hereby certify the foregoing to be a true and correct copy of resolution of the ..... of the ..... of ..... duly adopted at a meeting of said body on the ..... day of ....., 19.....

.....

Chief Clerk

(SEAL)

The establishment of the aforesaid Traffic Route is hereby approved in accordance with the terms and conditions expressed in the foregoing resolution.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

Date ..... By .....

Deputy Secretary of Highways

RESOLUTION

WHEREAS, The ..... desires to designate State Highway ..... in the ..... of ..... in the county of ..... as a "One-Way Street" between ..... and ....., and

WHEREAS, Signs will be required at the entrance of streets or highways that intersect therewith,

NOW, THEREFORE, BE IT RESOLVED, That State Highway ..... from ..... to ..... shall be and is hereby designated as a "One-Way Street" and all traffic moving thereon shall move in ..... direction, after proper signs have been erected, and

BE IT FURTHER RESOLVED, That the ..... of ..... does hereby request the Department of Highways for authority to erect signs at the intersection of all Highways which enter upon said State Highway between the points aforesaid, and

BE IT FURTHER RESOLVED, That said State Highway shall not be considered a "One-Way Street" unless or until the Secretary of Highways approves this resolution and authorizes the erection of the necessary signs to direct traffic as above.

I, ... Secretary of the ..... do hereby certify that the foregoing is a true and correct copy of the resolution duly adopted in accordance with law at a meeting held ..... 19....

.....
Secretary

(SEAL) Recommended by ..... Date .....
District Engineer

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION

APPROVED—JOSEPH J. LAWLER Date .....
Secretary of Highways

By .....
Deputy Secretary of Highways

Form 4193 (R-8-19-52)

RESOLUTION

WHEREAS, The ..... desires to limit the speed on State Highway ..... in the ..... of ..... in the county of ....., between ..... and ..... and

WHEREAS, Signs will be required in accordance with the provisions of The Vehicle Code and the Manual of Regulations for Official Traffic Signs and Signals.

NOW, THEREFORE, BE IT RESOLVED, That the speed on State Highways ..... from ..... to ..... shall be and is hereby limited to ..... miles per hour, and from ..... to ..... shall be, and is hereby limited to ..... miles per hour, after proper signs have been erected, and

BE IT FURTHER RESOLVED, That the ..... of ..... does hereby request the Department of Highways to authorize the erection of signs on said State Highway Route in accordance with The Vehicle Code, and the Manual of Regulations, and

BE IT FURTHER RESOLVED, That speed on said State Highway shall not be restricted unless or until the Secretary of Highways approves this resolution and authorizes the erection of the necessary signs as above.

I, ... Secretary of the ..... do hereby certify that the foregoing is a true and correct copy of the resolution duly adopted in accordance with law at a meeting held ..... 19.....

.....
Secretary

(SEAL) Recommended by ..... Date .....
District Engineer

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION

APPROVED—JOSEPH J. LAWLER Date .....
Secretary of Highways

By .....
Deputy Secretary of Highways

Form 4194 (R-3-19-52)

RESOLUTION

WHEREAS, The ..... desires to regulate the kinds or classes of traffic on certain city streets running through the ..... of ....., between ..... and ....., and

WHEREAS, Signs will be required at the entrance of all streets or highways that intersect therewith.

NOW, THEREFORE, BE IT RESOLVED, That State Highway Route No. ..... from ..... to ..... shall be and is hereby restricted for the use of ..... traffic, and ..... traffic is excluded therefrom after proper signs have been erected, and

BE IT FURTHER RESOLVED, That the ..... of ..... does hereby request the Department of Highways for authority to erect signs at the intersections of all Highways which enter upon the said State Highway Route between the points aforesaid.

BE IT FURTHER RESOLVED, That the said State Highway Route shall not be restricted as to kinds or classes of traffic unless or until the Secretary of Highways approves this resolution and authorizes the erection of the necessary signs to exclude certain classes of traffic as above.

I, ... Secretary of the ..... do hereby certify that the foregoing is a true and correct copy of the resolution duly adopted in accordance with law at a meeting held ..... 19.....

.....
Secretary

(SEAL) Recommended by ..... Date .....
District Engineer

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TRAFFIC DIVISION

APPROVED—JOSEPH J. LAWLER Date .....
Secretary of Highways

By .....
Deputy Secretary of Highways

Form 4195 (R-3-19-52)

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