SIGNING MANUAL

Pima County
Department of
Transportation

City of Tucson
Department of
Transportation

Pima County &
City of Tucson
Department of
Transportation

SIGNING MANUAL

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

TRAFFIC SIGNING DESIGN MANUAL

CHAPTER 1

INTRODUCTION

Purpose

The purpose of this Manual is to provide a set of guidelines, practices, and standards for the design, installation and maintenance of traffic signing within and throughout the boundaries of Pima County. The manual is intended to be a working document structured to assist the staffs of Pima County, the City of Tucson and other public agencies within the County in performing the day to day design, installation and maintenance of the public sector traffic signing program. Additionally, the manual is intended to provide information needed by the private sector community to design, install and maintain signs that will be consistent throughout the County regardless of whether the signs are placed on private property or within County or City right-of-way. The private sector includes designers, engineers, contractors, and developers in planning, designing, installing and maintaining signs on private land. This Manual is intended to combine multiple publications and documents which address various aspects of traffic signing into a single document. As such it is intended to supplement the Manual on Uniform Traffic Control Devices (MUTCD) and Pima County's Process/Procedure Guidelines (PPG), and to replace Pima County's Sign Installers Handbook.

The fact that new design values are presented does not imply that existing streets and highways are unsafe. The values contained herein will provide a more satisfactory design for new street and highway facilities, as well as for major modifications of existing facilities. This publication is intended to provide guidance in the design of new and major reconstruction projects, as well as resurfacing, restoration, or rehabilitation projects. Sufficient flexibility is permitted to encourage independent designs tailored to particular situations.

Basis for Plan Preparation

Sign locations, placement and frequency shall be based on the proposed posted speed limit as directed by the jurisdiction.

Application

This Manual is a compilation of Practices/Procedures and Guidelines used by the Pima County Department of Transportation Traffic Engineering Division (PCDOT/TED) and the City of Tucson Traffic Engineering Division (COTDOT/TED) for signing of County and City roadway conditions. It is designed to expedite the production and review of plans by providing drafting symbols, standard notes, plan presentation and details to attain uniformity and consistency in plan development and production. As a result, engineers, designers, sign installers and contractors will have one reference document to

assist in their respective roles in signing streets and highways within Pima County. Additionally, this Manual should prove invaluable to signing private property.

The guidelines in this Manual become effective upon its approval by both agency DOT directors for all new and for all subsequently maintained field installations starting one month following the last signature date. Changes to existing field installations may be made in compliance with this Manual at the discretion of either agency based on available resources on a case-by-case basis.

As with all similar documents, this Manual is a guide and should not be substituted for good engineering judgment. Undoubtedly, there will be many situations which arise during the course of planning, design and implementation which will not be specifically identified or covered in this Manual. Users are encouraged to apply similar sections of the manual coupled with good engineering judgment when confronted with unusual situations. All users are encouraged to suggest changes to improve this Manual. Suggestions should be submitted in written and/or diagram form to either the PCDOT/TED or the COTDOT/TED at the address listed herein. Each suggestion will be reviewed and responded to. If both the PCDOT/TED and the COTDOT/TED staff agree with the suggested change or addendum, the manual will be updated to reflect the change in the next revision.

Should questions arise in the use of the manual, they should be referred to either the PCDOT County Traffic Engineer or the COTDOT City Traffic Engineering Manager.

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Abbreviations

AD	All Directions: a description of tubular hazard markers and delineators.
ADOT	Arizona Department of Transportation
B2B	Back to Back
BD	Bi-direction: a description of signs (i.e. hazard markers, delineators, and chevrons) mounted back to back on a single sign post.
BOC	Back of Curb
BOS	Back of Sidewalk
BS	Blue Stake
CIP	Capital Improvement Project
CL	Centerline
COT	City of Tucson
COTDOT/TED	City of Tucson Department of Transportation Traffic Engineering Division
DG	Diamond Grade Sign Sheeting – Type IX
D	A series of signs denoting destination and distances.
DL	Dual Left Turn
E	A series of signs used for expressway guide signs.
EB	Eastbound
EG	Engineering Grade Sign Sheeting – Type I
EL	Edge Line
EP	Edge of Pavement
FOC	Face of Curb
FT	Facing Traffic
FHWA	Federal Highway Administration
HI	High Intensity Sign Sheeting – Type III

I	A series of signs for informational guide signs.
L	Left: either a side of the road or the direction an arrow is to point.
M	A designation for a sign location in a median. A series of signs used for trailblazer marker assemblies.
MOAS	ADOT Manual of Approved Signs
MUTCD	Manual on Uniform Traffic Control Devices
NB	Northbound
NEC	Northeast Corner
NP	No Parking
NWC	Northwest Corner
O	When used as a sign location, it means OTHER. It is used when no other side is appropriate.
OT	Opposing Traffic
PC	Point of Curvature. The point where a straight section of road begins to curve.
PCDOT/TED	Pima County Department of Transportation Traffic Engineering Division
PIA	Public Improvement Agreement
PR	A Pima County Regulatory Sign: An old special sign designation.
PT	Point of Tangency. The point where a curved section of road becomes straight.
PVCW	White 360° Delineator
PVCY	Yellow 360° Delineator
PW	A Pima County Warning Sign: an old special sign designation.
R	A series of signs for Regulatory Signs, the right side of the road, or a direction an arrow is to point.
R/W	Right-of-Way
S	A series of signs for school zones.

SB	Southbound
SEC	Southeast Corner
SEG	Super Engineering Grade Sign Sheeting – Type II
SEQ	Sequence Number – Tells the total number of signs either on the computer work order or the computer inventory located at the same odometer reading and on the same side. These numbers are determined by listing the signs from top to bottom, from left to right.
SF	Square Feet
SN	Street Name Sign
SP	Pima County Special Signs: The new designation.
SWC	Southwest Corner
TWLTL	Two-Way Left Turn Lane
W	A series of signs for Warning Signs.
WB	Westbound

Definitions

85th Percentile — The speed at or below which 85 percent of the motorized vehicles travel.

Bicycle Lane — A portion of a roadway that has been designated by signs and pavement markings for use by bicyclists.

Black Shield — A black non-reflective panel used to shield the view of a sign panel. The panel shall be the same size as the sign it shields.

Change Sign — This is used to change anything about a sign, except the odometer reading, on a work order.

Design Speed — A selected speed used to determine the various geometric design features of a roadway.

Divided Highway — A road that has the opposing traffic streams separated, as with a median.

Guide Signs — A sign that shows route designations, destinations, directions, distances, services, points of interest, or other geographical, recreational, or cultural information.

Install — Task for new, first time installations, on a work order.

Island — A defined area between traffic lanes for control of vehicle movements or for pedestrian refuge.

Major Street — The street normally carrying the higher volume of vehicular traffic.

Median — A median is defined as a portion of a divided highway separating the traveled way for traffic in opposing directions.

Minor Street — The street normally carrying the lower volume of vehicular traffic.

Odometer — The distance read off a meter to 1000ths of a mile, on a work order.

One Way Road — A road that allows traffic movement in only one direction.

Other — When used as a task on a work order, it is used for any miscellaneous type work that the other tasks do not cover.

Posted Speed — The speed limit established by ordinance and shown on Speed Limit signs.

Regulatory Signs Regulatory signs are used to inform road users of selected traffic laws or regulations and indicate the applicability of the legal requirement.

Remove When used as a task on a work order, it is used to take down an existing sign assembly completely from the field.

Replace When used as a task on a work order, it is used to get any individual parts or an entire sign assembly changed with the same type sign or parts e.g., vandalized, missing, damaged, etc.

Reset When used as a task on a work order, it is used to have a sign assembly put back up correctly for one of several possible reasons, e.g., down, leaning, to standard height, etc.

Retroreflectivity A property of a surface that allows a large portion of the light coming from a point source to be returned directly back to a point near its origin.

Right-of-Way In the context of real property it is the publicly owned or publicly controlled lands that a road and /or utilities are constructed on.

Sequence Number Tells the total number of signs either on the computer work order or the computer inventory located at the same odometer reading and on the same side. These numbers are determined by listing the signs from top to bottom, from left to right.

Shoulder There are two types of shoulders:

Unpaved Graded Shoulder: The width from the edge of pavement to the intersection of the shoulder slope.

Paved Surfaced Shoulder: The width outside the travel way having an all-weather surface.

Sign Any traffic control device that is intended to communicate specific information to road users through a word or symbol legend.

Sign Assembly A sign or group of signs located on the same support(s).

Sign Background The standard reflectorized sign sheeting placed over the sign panel of a specific color for the type of sign specified.

Sign Border The area around the edge of the sign consisting of a strip of reflectorized sign sheeting, black or white, of the same type of sheeting as the sign legend.

Sign Legend All word messages, logos, and symbol designs that are intended to convey specific meanings.

Sign Panel A separate panel or piece of material containing a word or symbol legend that is affixed to the face of a sign.

Straighten When used as a task on a work order, it is used to have minor work done to the sign assembly that will not require any new parts, e.g., leaning, twisted, sign plate bent.

Target Position The location and angle for a sign that is best for viewing by an approaching vehicle such that if that vehicle continued in a straight line through an intersection or a curve that vehicle would run across this location.

Thru Edge The outermost edges of the graded/maintained portion of a dirt road; the painted edge line of a striped roadway; or the edge of the pavement on a paved road without painted edge lines.

Traveled Way The traveled way is that portion of the roadway available for movement of vehicles exclusive of shoulders and auxiliary lanes.

Trim Brush When used as a task on a work order, it is used to remove all brush or tree limbs that obstruct sign visibility.

Warning Sign Warning signs call attention to unexpected conditions on or adjacent to a roadway and to situations that might not be readily apparent to road users. Warning signs alert road users to conditions that might call for reduction of speed or an action in the interest of safety and efficient traffic operations.

Wash/Clean When used as a task on a work order, it is used to clean sign face to remove dirt, debris, and graffiti.

PCDOT and COTDOT
TRAFFIC SIGNING PLAN REVIEW CHECKLIST

Reviewer: _____ **Date:** _____

Consultant: _____ **Submittal:** _____

Project: _____

A. Plan Features

1. Plan preparation shall be in accordance with the Traffic Signing Design Manual, PCDOT and COTDOT Standards, and the 2000 MUTCD.

2. North arrow (pointing to the top or right of the sheet, unless approved otherwise by the jurisdiction) and scale (typically 1" = 40') shall be included on each plan sheet, excluding notes and detail sheets.

3. Line weights and types are to be consistent with standard practice used by the City of Tucson and Pima County as identified in Chapter III: *General Elements of Design.*

4. Right-of-Way (R/W), edge of pavement, and curbs are to be clearly delineated. Overhead and underground utilities should be shown, however, topographic lines and features may be omitted.

5. Limits of the project (beginning and ending stations) are to be provided.

6. Construction centerlines (when not conflicting with pavement marking in the same location) and stationing are to be provided and shown within the roadway limits, not external to the curb or edge lines. Station tick marks on the construction centerline are required every 100 feet with stations called out every 500 feet. Station equations may be shown external to the curb or edge line stationing for the major street.

7. An appropriate title block and revision block.

   County: The title block and revision block are located on the right hand side of the sheet and rotated 90 degrees. The project name, number and description, submittal status, date, designer, drafter, checker and project engineer, and a place for the engineer's Registered Professional Engineer Seal shall be provided on each plan sheet.

City: The title block and revision block are located on the bottom right corner of the sheet. The project name, plan number, submittal status, date, designer, drafter, and checker, and a place for the engineer's Registered Professional Engineer Seal shall be provided on each plan sheet.

8. At a minimum, the following plan sheets shall make up a set of signing plans:

    a. Cover sheet (if applicable).
    b. General and project specific notes, project symbols, legend and plan quantities.
    c. Sign summary sheet. This is a summary of all the signs on the project regardless of whether the sign is existing to remain, existing to be removed and salvaged, or new.
    d. The base sheets for the Signing Plans shall be the pavement marking plan sheets. These sheets shall show match lines and include the traffic signal, street lighting and pavement marking in the background. All major and minor streets shall be identified and labeled correctly. The plan symbol legend may be included depending on available space. All signs will be oriented in the direction seen by the motoring public with the correct FHWA sign illustration and identified by the MUTCD letter/number or appropriate designation and station i.e. a Stop Sign would be identified as R1-1, Sta 100+00.
    e. Detail sheets.
        i. Overhead signs and structures
        ii. Elevations of ground-mounted signs in fill sections
        iii. Sign layouts for specialty signs

B. Items to Review

1. Design is prepared in accordance with PCDOT and COTDOT design standards and the 2000 MUTCD.

2. Design speed and posted speed limits of the project are to be noted on the Traffic Signing General Notes.

3. Roadway plans showing the horizontal alignment for the facility to be signed.

4. Roadway drainage plans for potential conflicts with underground facilities.

5. Bridge plans identifying bridge rail and guardrail segments.

6. Pavement marking plans for the facility to be signed.

7. The roadway and pavement marking plans should be used to identify the location and frequency of the Regulatory Sign series. This includes regulatory signs for all modes of transportation such as vehicular, bicycle and pedestrian movements.

The regulatory signs should focus on mandatory, restrictive and prohibitive control of traffic.

8. The roadway and pavement marking plans should be used to identify the location and frequency of the Warning Sign series. This includes identification of areas where the roadway geometry is deficient with respect to the design parameters or there is a change in the characteristics of the facility such as curves with operating speeds less than the posted speed limit or impending widening or narrowing of the roadway prism.

9. The roadway and pavement marking plans should be used to identify the location and frequency of the Guide Sign series. This includes signs to guide motorists along streets and routes, to direct them to important destinations, to identify places of interests (i.e. public facility and recreational facility/area), and give information that aids the motorists in reaching their destination in the most simple, direct manner possible.

10. Placement of signs:
    i. Offset from traveled way/edge of pavement/face of curb
       Mounting height
    ii. Overhead signs
    iii. Lateral distance
       Stop or Yield location within an intersection
       Separate turn lane signage
       One-Way roadway signage
       Median signing
       Island signing
       Signs in advance of hazards
       Signs in advance of potential conflicts
       Overhead signs
       School Zone Signing

11. Frequency of certain signs:
    i. Speed Limit signs
    ii. Bike Route signs
    iii. Markers
    iv. Parking Restriction signs
    v. Two Way Left Turn signs (continuous center turn lane)
    vi. Preferential Lane signs

12. Omission of signs.

13. Street name signs.

SIGNING GENERAL NOTES

The following notes that pertain to the project shall appear on the Traffic Signing Plans. The notes are included here for the users' reference and importation into the electronic files for the Traffic Signing Plans.

1. All signs shall be in compliance with the 2000 Edition of the Manual on Uniform Traffic Control Devices, 2002 Edition of the Pima County and City of Tucson Traffic Signing Design Manual, the current Supplemental Specifications, these Plans, and the Special Provisions.

2. Signs may be modified and locations adjusted to fit conditions as directed by the Traffic Engineer.

3. Post lengths indicated on sign summary sheets are approximate. The contractor shall verify actual post lengths.

4. All perforated posts shall be installed in a concrete foundation, unless otherwise directed by the jurisdiction Traffic Engineer.

5(a). All sign station locations are approximate. The contractor shall verify actual sign locations with the Traffic Engineer prior to the installation of all signs.

5(b). The contractor shall be responsible for coordinating all work with Blue Stake and for installing all traffic signs in the field.

6(a). On Pima County projects, all Warning and Regulatory signs shall be Type III (High Intensity) sheeting, unless otherwise determined by the jurisdiction Traffic Engineer. Street Name signs (D3) shall be fabricated using Type II (Super Engineering Grade) sheeting and Advance Street Name signs (TE9) shall be fabricated using Type III sheeting. No Parking signs shall be Type II sheeting. All school zone signs shall be fluorescent yellow-green, Diamond Grade sheeting. All overhead signs shall be Diamond Grade sheeting.

6(b). On City of Tucson projects, all sign panels shall have Type II sheeting.

7. All new signs shall have aluminum backing, unless otherwise specified.

8. All existing signs to be removed as part of this project are to be delivered to the Pima County Sign Shop at 1313 S. Mission (740-2631) or the City of Tucson Sign Shop at 4004 S. Park (791-3154). The contractor is responsible for unloading the salvaged material. Any salvaged sign that is to be reused shall be temporarily stored in a safe location until reinstallation.

9. The Design Speed for the road(s) is____. The Posted Speed limit for the road(s) is ____. Sign placement shall be based on the posted speed limit.

CHAPTER II
PROCESS/PROCEDURE GUIDELINES (PPG)

Introduction

Pima County has developed several PPG's to assist sign installers and the designers of signing systems in the application and installation of signs throughout the County. The purpose of the PPG is to establish uniformity in design, application and installation. This Manual incorporates the intent of the PPG's; however, a copy of the PPG's is included in Appendix A as a reference. Since PPG's are official documents signed and approved by County Transportation Officials, any conflict between this Manual and the PPG's shall be resolved by the County Traffic Engineer. The following is a brief summary of the current PPG (Appendix A).

Guide Signing

The purpose of this PPG is to establish which activity center destination will be signed and what type of sign will be used. This PPG incorporates the guidelines and practices of Pima County, Arizona Department of Transportation (ADOT) and the City of Tucson so that there is consistency and standardization among agencies. Specific criteria has been established for Trail Blazing Guide Signing and Local Guide Signing which must be adhered to when developing Guide Signs for activity center destinations.

Lateral Placement of Traffic Signs

The purpose of this PPG is to establish a uniform method to laterally locate and install traffic signs in the gravel shoulder area off the roadway edge primarily for the protection of the sign system during shoulder maintenance operation. As a part of this Manual, Pima County and the City of Tucson have standardized the placement of single or multiple post sign combinations in shoulder areas as follows:

1. On uncurbed roadways the lateral placement of the single or first post adjacent to the roadway shall be offset 15 feet from the center of the edge line stripe on roads with either paved or unpaved shoulders. When the unpaved area adjacent to the edge of pavement is too narrow for the standard placement, install signs at the extreme outer edge of the area where the fill or cut section begins. This guideline is depicted in Chapter V, *Vertical and Lateral Clearance*, Sheet 5-6.

2. There will be instances when physical constraints will not accommodate the desired placement. Items such as walls, landscaping, trees, or other obstructions limit sign placement. In these cases, the lateral placement should be as close to the preferred distance as possible. Final placement will be the joint responsibility of the Traffic Engineering Division and the Operations Division or Field Inspector in the event of a contract project.

Warning Sign Size

The purpose of this PPG is to establish 36 inches as the standard size for all warning signs within County jurisdiction. For signs within the City of Tucson and on residential streets within the County with a posted speed limit of 25 mph, the standard size is 30 inches. The dimension of the sign is measured along the edge of the diamond shape.

Sign Sheeting

The purpose of this PPG is to establish Type III sheeting for all regulatory and warning signs within the County. Pima County has standardized on the use of Type III sheeting as the standard sign sheeting material for all signs under PCDOT jurisdiction. The City of Tucson has standardized on Type II sheeting for all signs under COTDOT jurisdiction. Use of higher-grade reflectorization sheeting may be approved on a specific application basis by the jurisdiction.

Square Post Breakaway Base Standards

The square post breakaway base standard PPG establishes a standard for materials, hardware, concrete, construction, and application for the installation of traffic control signs.

CHAPTER III
GENERAL ELEMENTS OF DESIGN

III-1 BACKGROUND INFORMATION

Prior to the start of any signing plan design, information relating to the physical elements of the project will be necessary.

Roadway Plans

Information on the proposed roadway geometry that will be in place when the signing plan is implemented will be necessary for the preparation of the signing plan base drawing. This should include existing and/or proposed right-of-way and a typical section or sections. The important elements of the proposed roadway information are alignment, edge of pavement, curb, curb and gutter and sidewalk as appropriate, bridge locations with bridge rail and guardrail.

Pavement Marking Plans

The pavement marking should be depicted on the signing plan base drawings. Where the markings and centerline information coincide, the pavement marking will take precedent. Tick marks should be placed every 100 feet with full station call outs placed every 500 feet.

Drainage

In addition to the information on the proposed roadway elements, information on box culverts and pipe culverts where headwalls or end sections will affect the location of signs should be depicted on the signing plan base drawings.

Utilities

All available underground utility information should be gathered to ensure that any proposed sign foundations will not conflict with underground pipes or cable.

Above Ground Appurtenances

Information on proposed and existing (only if they are to remain) utility poles, streetlight poles, and traffic signal poles should be collected and shown on signing plan base drawings to evaluate their use or impact in the placement of new signs.

Standard Details

Standard details for signing projects are incorporated in this Manual. Pertinent standards that apply to a project shall be incorporated in the design.

CADD Standards

City and County CADD Standards for line type, line weight, and symbols shall be determined and documented. The ADOT sign library of standard signs shall be used to the greatest extent possible. Signs placed on the plans shall be scaled to a reasonable size. All signs shall be shown at their actual size relative to all other signs on the project.

III-2 SIGNING PLAN BASE DRAWINGS

Base drawings shall be prepared in micro-station format utilizing all the pertinent data assembled from the project elements identified above and collected for the purpose of developing base drawings for the project. Only pertinent information shall be used in the development of the signing plan base drawings. This will include centerline alignment with station tick marks and call outs every 500 feet, edge of pavement or curb/curb and gutter, sidewalk, driveways, pavement markings, streetlight and traffic signal poles and drainage structures appropriate to the signing design. All information shall be shown as it will exist at the completion of the project.

III-3 PUBLISHED STANDARDS

The Pima County and City of Tucson Standard Specifications for Public Improvements, 1994 Edition, Standard Details for Public Improvements, 1994 Edition, the PCDOT/TED Supplemental Specifications, and this Design Manual shall be used to the greatest extent possible in the development of the signing plan design. In addition, standards not documented in the above references, but pertinent to the fabrication and installation of signs shall also be incorporated into the signing plans special provisions.

CHAPTER IV
DESIGN PROCESS

IV-1 PREDESIGN

There should be a document that establishes the scope of work. This may be as informal as a one-sheet work order or as formal as a detailed outline of tasks to be accomplished in the development of final signing plans. The scope is generated by the local jurisdiction based on a particular need, usually in conjunction with other work that disrupts the existing signing. However, it is not uncommon to have stand-alone signing rehabilitation or reconstruction projects designed to bring an area or highway into compliance with current standards, a higher quality of material and/or the modernization of a group of signs.

The goal is to have uniformity throughout a jurisdiction. With large agencies such as Pima County and the City of Tucson, this means the constant evaluation of current inventory. The primary element of this phase of the plan is an inventory of existing signage. This can be obtained from office records or from a field reconnaissance. A video taping in VHS format of the signage establishes the type and location of the signs to be affected by the program. The objective is to establish a database that provides a detailed history of the signs to be impacted by the proposed plan. A history of involvement starting with the date of initial installation followed by any subsequent work orders for repair, maintenance or replacement will set the framework for the impending improvement.

IV-2 PLAN PREPARATION

A comprehensive set of signing plans should consist of the following elements:

Cover Sheet

A cover sheet consisting of a general location map, specific location map, project name and number, and approval title block is a minimum requirement if the project is a stand-alone signing project. The cover sheet can be omitted if the signing plan sheets are incorporated with other plans, such as roadway improvements, pavement markings, driveway or subdivision improvements, etc. Sample cover sheets for a County Project and a City Project are located in Appendix B.

Sign Summary Sheet

The sign summary sheet is a tabulation of proposed signs within the project limits. It also includes existing signs to remain in place or to be salvaged and relocated on new support posts. It provides pertinent information relative to each sign and sign support. This plan sheet provides a quick means of assessing the type and quantity of various signs on the project as well as establishing the physical location of each sign. It quickly identifies which signs are to be retained and which will be new. It identifies the type, number and

length of support posts, foundations, and slip base assemblies for quantity purposes. A sample summary plan sheet is located in Appendix B.

Sign Notes, Approximate Quantities and Plan Symbols (as appropriate)

A plan sheet can be dedicated to Signing Plan Notes, Details and Summary of Quantities depending on the complexity of the signing project. Plan Notes and Summary of Quantities can be displayed on other sheets where there is room for this information, such as a cover sheet, sign summary sheet, or the first sheet of the plans. The typical symbols (shown on the plan sheet) would either be on this sheet or placed on the first sheet of the plans. A sample plan sheet showing notes and quantity summary is located in Appendix B.

Sign Format Sheet

A sign format sheet shall be included in the sign plan set if there are to be Regulatory and Guide Signs on the project that require specific data on sign letter height, FHWA Standard Alphabet letter series, and sign width and height dimensions necessary for fabrication. Specialty signs would also have to be formatted once approved for use on the project by the local jurisdiction. An example of a sign format sheet is located in Appendix B.

Plan Sheets

The plan sheets should depict the roadway at 1" = 40' scale including all elements of the roadway that would have some impact on the location and placement of the signs. No more than two segments (strips) of plan presentation shall be placed on a sheet. When two segments are used, they shall be referenced with match lines.

Existing signs (existing to remain or relocated) and proposed signs should then be superimposed on the signing plan base drawing. The signs would be displayed with their exact legends at the approved scale. They should be positioned at their station location (identified beneath the sign) with the project sign number and sign code. They should be identified as new (outline and legend bold) or existing. A sample plan sheet is located in Appendix B.

See Chapter VI, *Approved Signs*, for information on specific signs and guidance for placement and repetitive frequency.

CHAPTER V
VERTICAL AND LATERAL CLEARANCE

V-1 VERTICAL CLEARANCE

Vertical clearance is the height at the bottom of a sign or combination of signs with respect to the elevation at the edge of pavement of the adjacent roadway. In the event that the roadway has curb or curb and gutter, the vertical clearance is the height at the bottom of the sign or sign combination with respect to the elevation at the top of curb.

V-2 LATERAL CLEARANCE

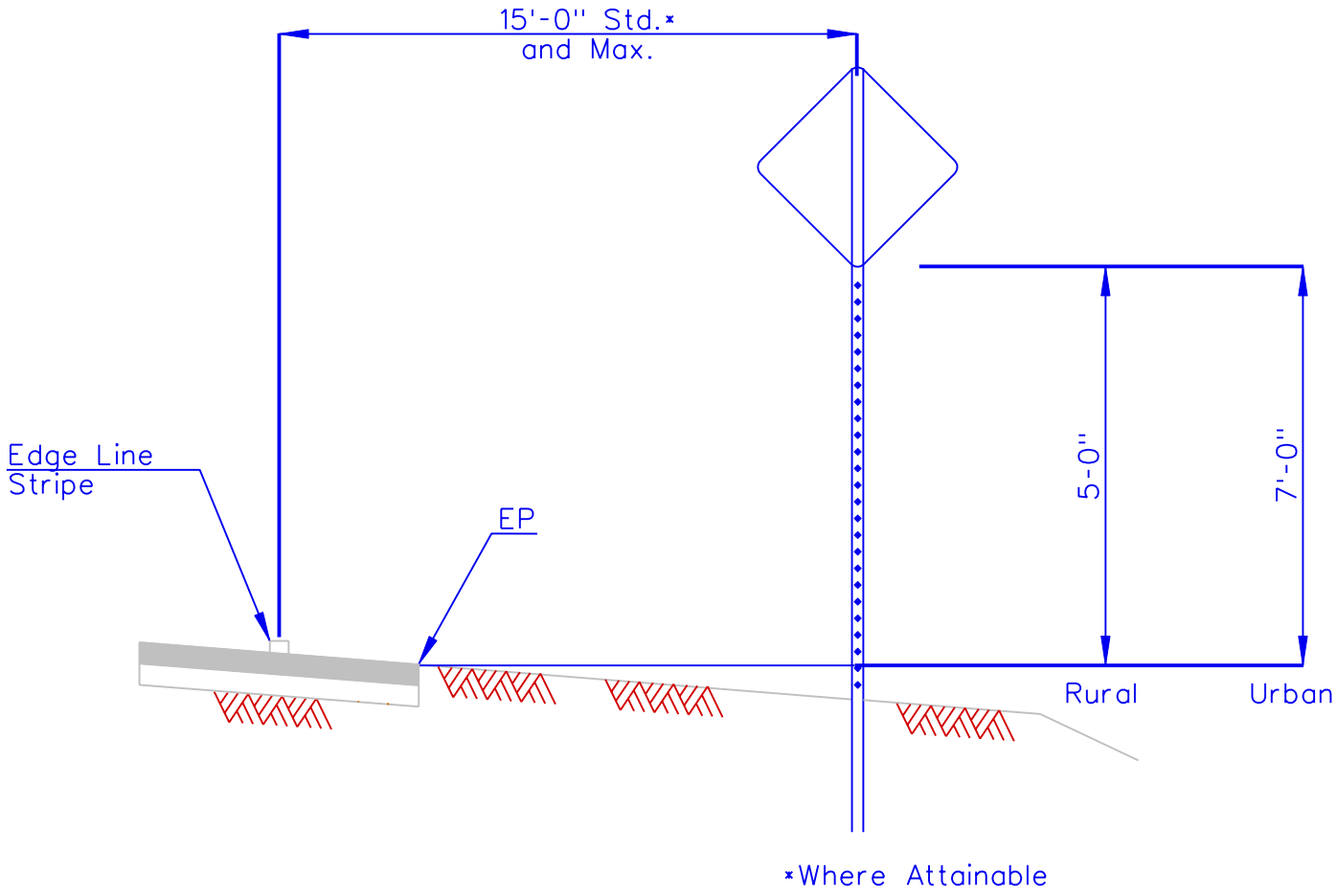
The lateral clearance is the distance from the pavement marking edge line to the center of the single or first sign support post. In the event the roadway has curb or curb and gutter, the lateral clearance is from the back of curb.

In sections of roadway consisting of curb and gutter, but no sidewalk, the lateral placement shall be 1'- 0" from the back of curb to the edge of the sign panel. Sheet 5-7 of this chapter illustrates this scenario.

In sections of roadway consisting of curb and gutter and sidewalk, the lateral placement shall be 1'- 0" from the edge of sidewalk furthest from the roadway and the edge of the sign panel, if the space between the back of curb and the edge of sidewalk is less than 3'- 0". Sheet 5-8 of this chapter illustrates this scenario. If the space between the back of curb and the sidewalk is equal to or greater than 3'- 0", follow the procedure outlined for the no sidewalk scenario depicted on Sheet 5-7.

At an intersection, a sign should be placed in an area no more than 50 feet measured from the edge of pavement of the through street and laterally from the edge line paint stripe or back of curb as identified above. This procedure is depicted on Sheets 5-12 and 5-13 of this chapter.

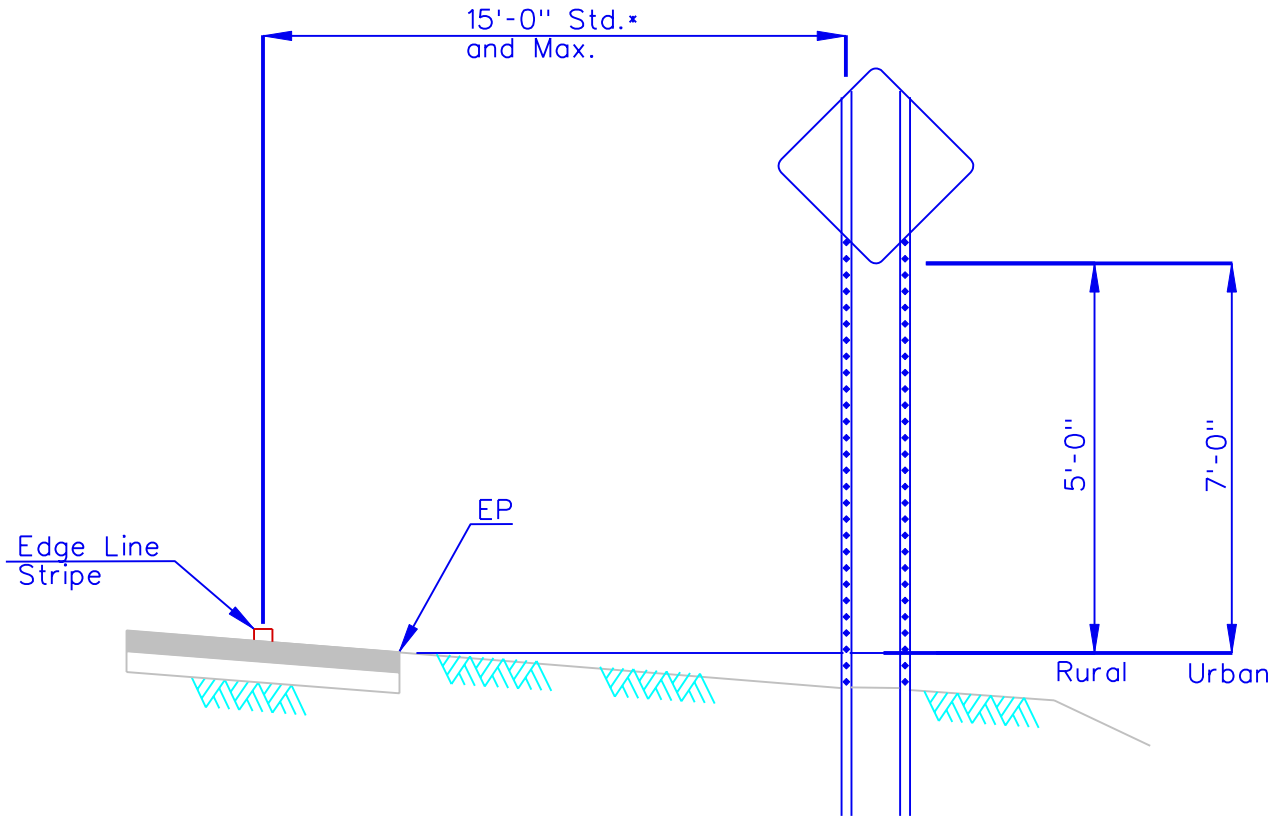
The following Drawing Sheets depict representative vertical and lateral clearance combinations for several common sign installations.



Notes

1. This standard applies to any and all sign types with a square footage of 10 s.f. or less.
2. This standard also applies to non-curbed medians.
3. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		5 - 1
REVISED		Standard Offset and Height For Non-Curbed Roads / Single Post Mount		

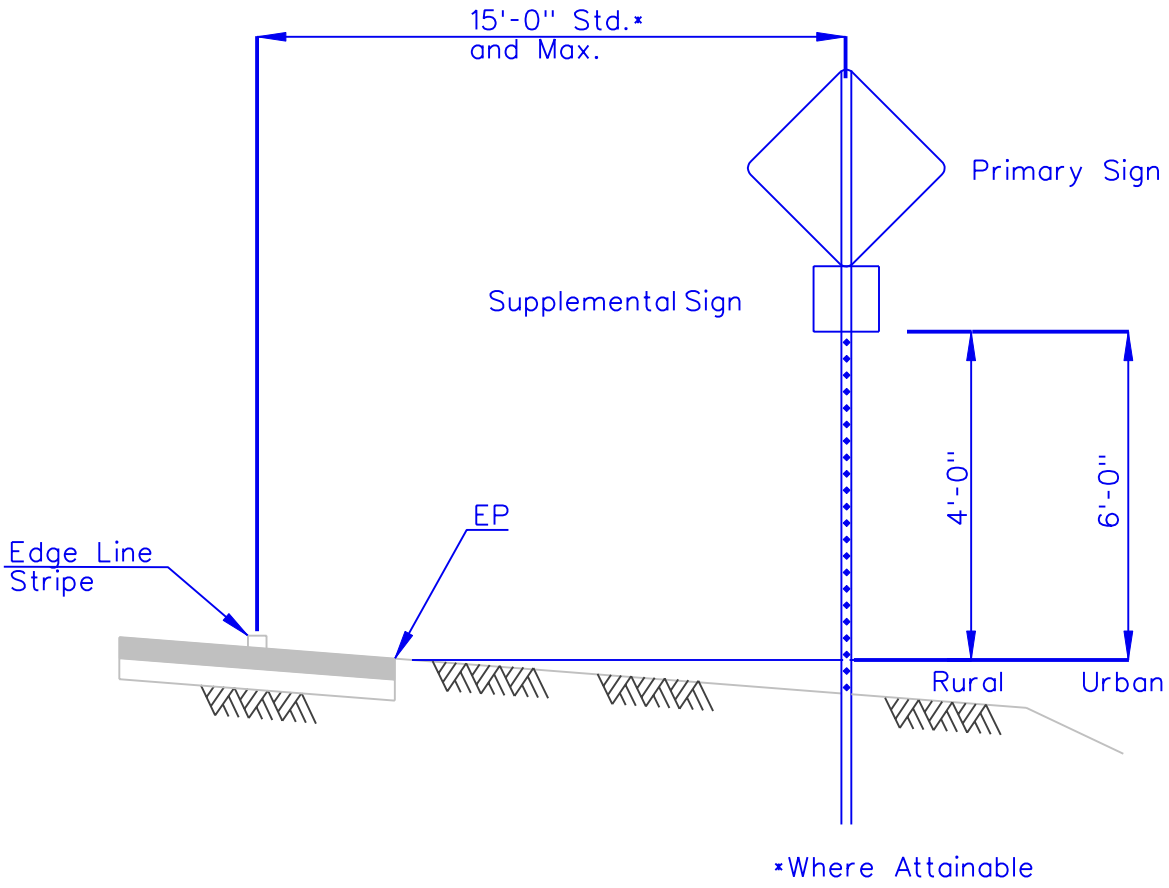


*Where Attainable

Notes:

1. This standard applies to any and all sign types with a square footage of 10 s.f. or greater.
2. This standard also applies to non-curbed medians.
3. Number of posts shall be based Sign area in square feet. Refer to table on Sheet No. 8-2A.
4. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.
5. See Chapter 8 - Sign Support Systems for post spacing.

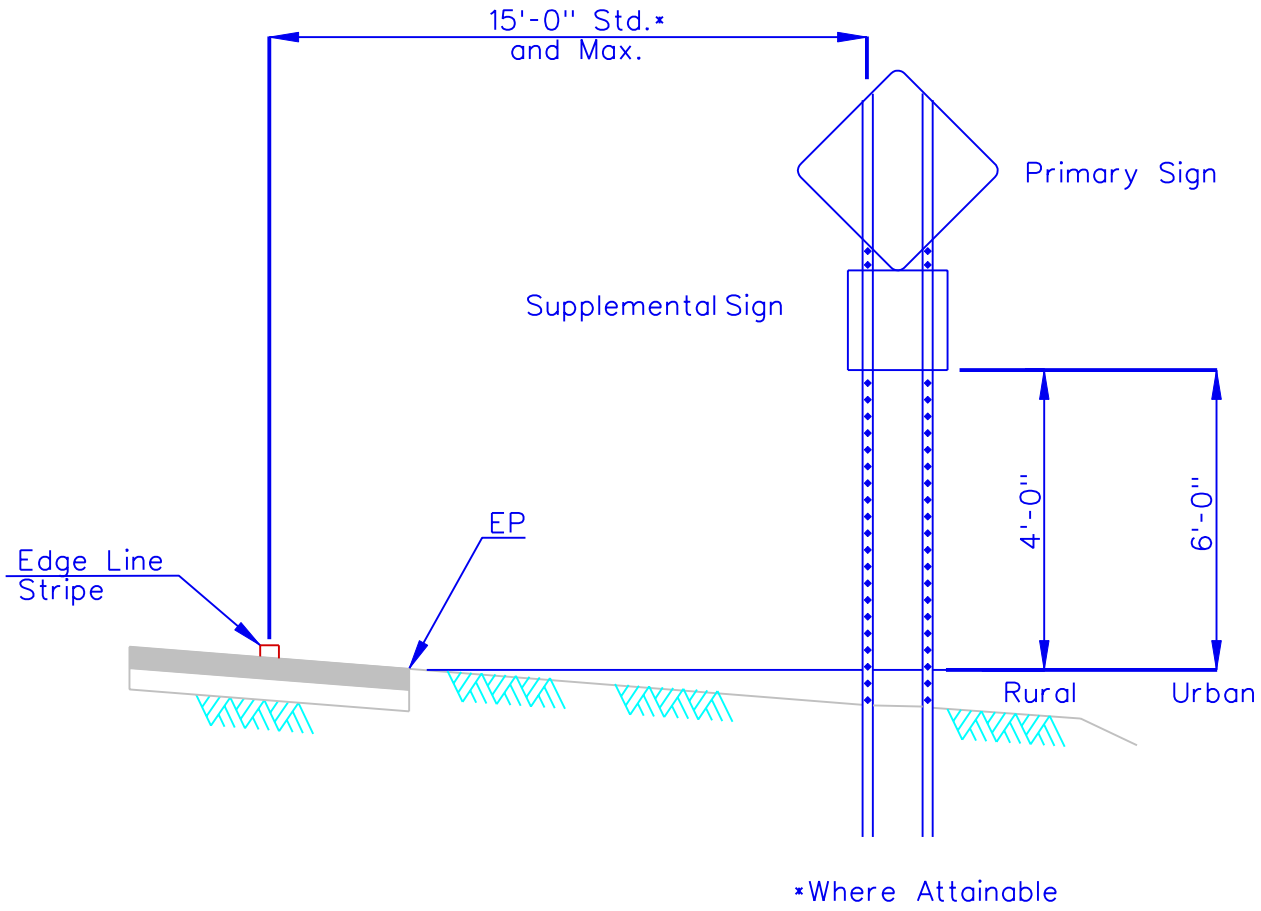
ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Standard Offset and Height For Non-Curbed Roads / Double Post Mount		5 - 2



Notes:

1. This standard applies to any supplemental sign under any type of primary sign with a square footage of 10 s.f. or less.
2. This standard also applies to non-curbed medians.
3. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

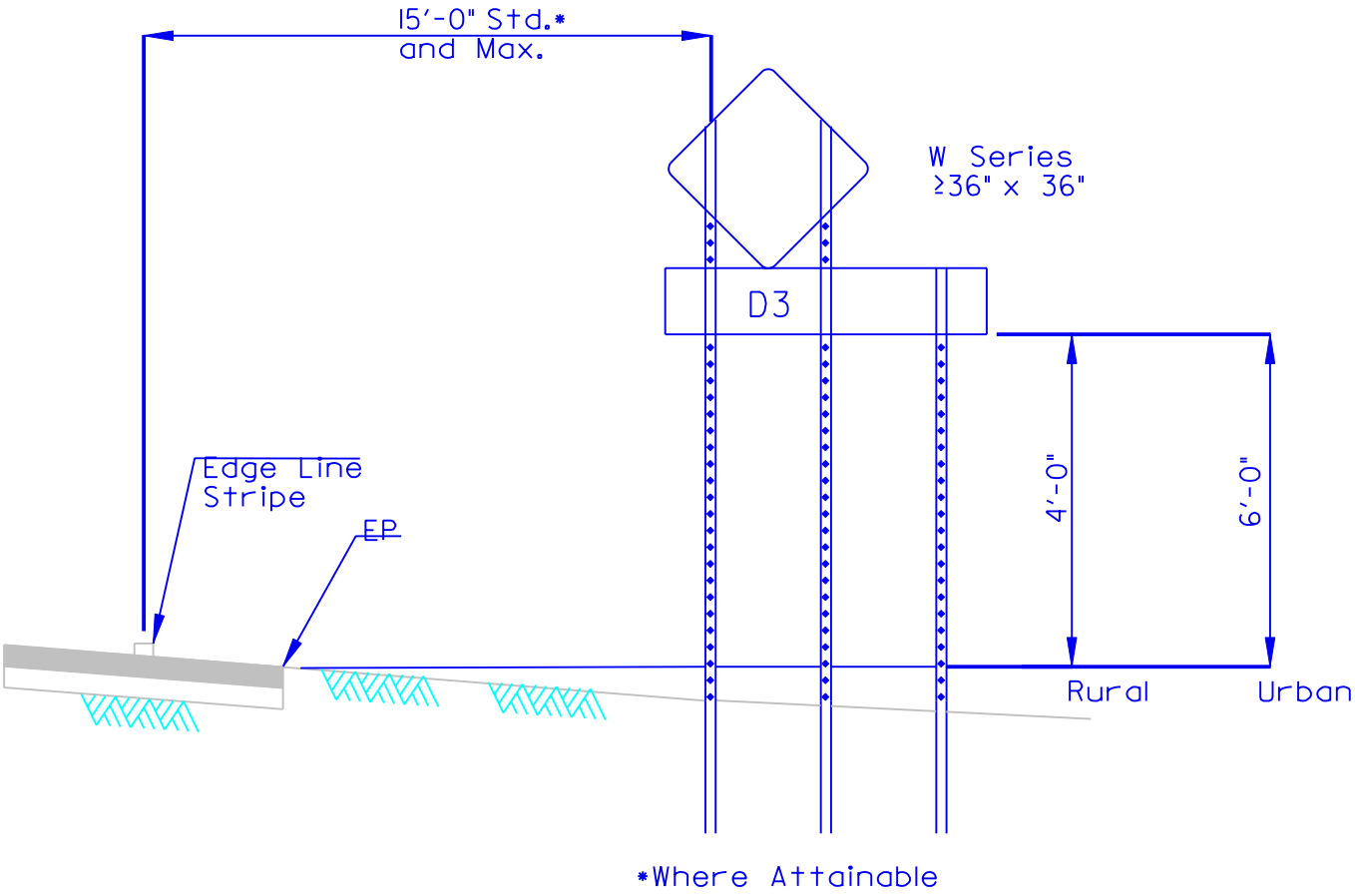
ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Standard Offset and Height For Sign w/ Supplemental Plate / Single Post Mount		5 - 3



Notes:

1. This standard applies to any supplemental sign under any type of primary sign with a square footage of 10 s.f. or greater.
2. This standard also applies to non-curbed medians.
3. Number of posts shall be based on the sign area in sqare feet. Refer to table on Sheet No. 8-2A.
4. See Chapter 8 - Sign Support Systems for post spacing.
5. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

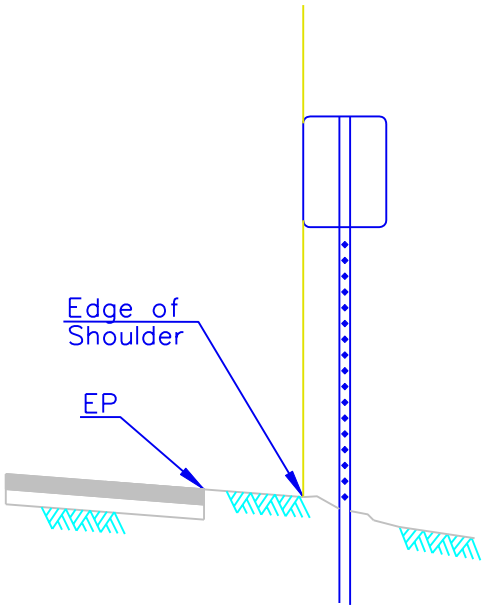
ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Standard Offset and Height For Sign w/ Supplemental Plate / Double Post Mount		5 - 4



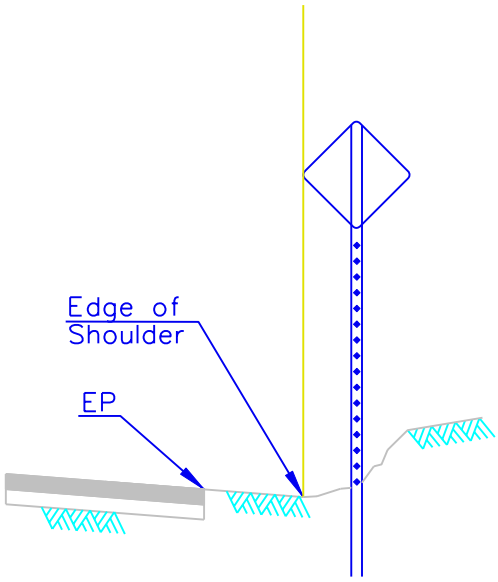
Notes:

1. The D3 is an advance street name sign with black letters on a yellow background.
2. The D3 is not extended beyond the W Series sign on the road side.
3. Number of posts shall be based on the sign area in square feet. Refer to table on Sheet No. 8-2A.
4. See Chapter 8 - Sign Support Systems for post spacing.
5. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		5 - 5
REVISED		Standard Offset and Height For W Series Sign w/ a D3		



Fill Section

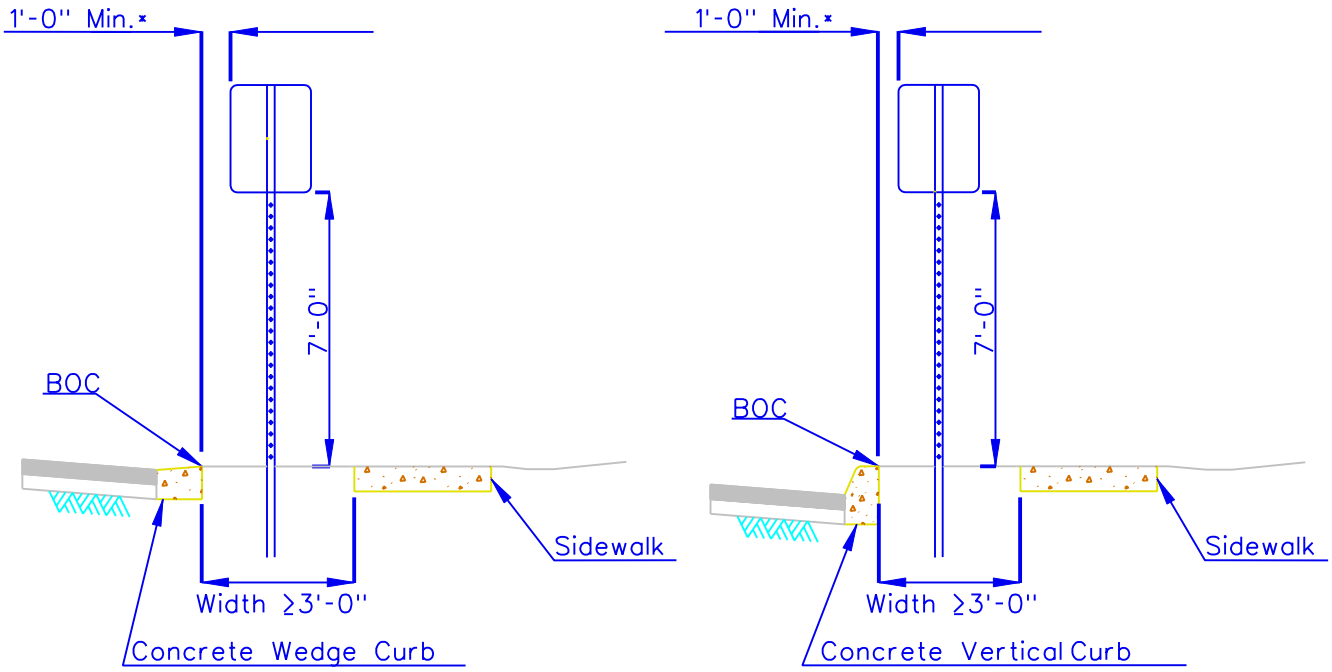


Cut Section

Note:

When the shoulders of the road are too narrow for the standard placement, install signs at the extreme outer edge of the shoulder.

ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS Standard Offset For Roads w/ Sub-Standard Shoulder Widths		SHEET NO. 5 - 6

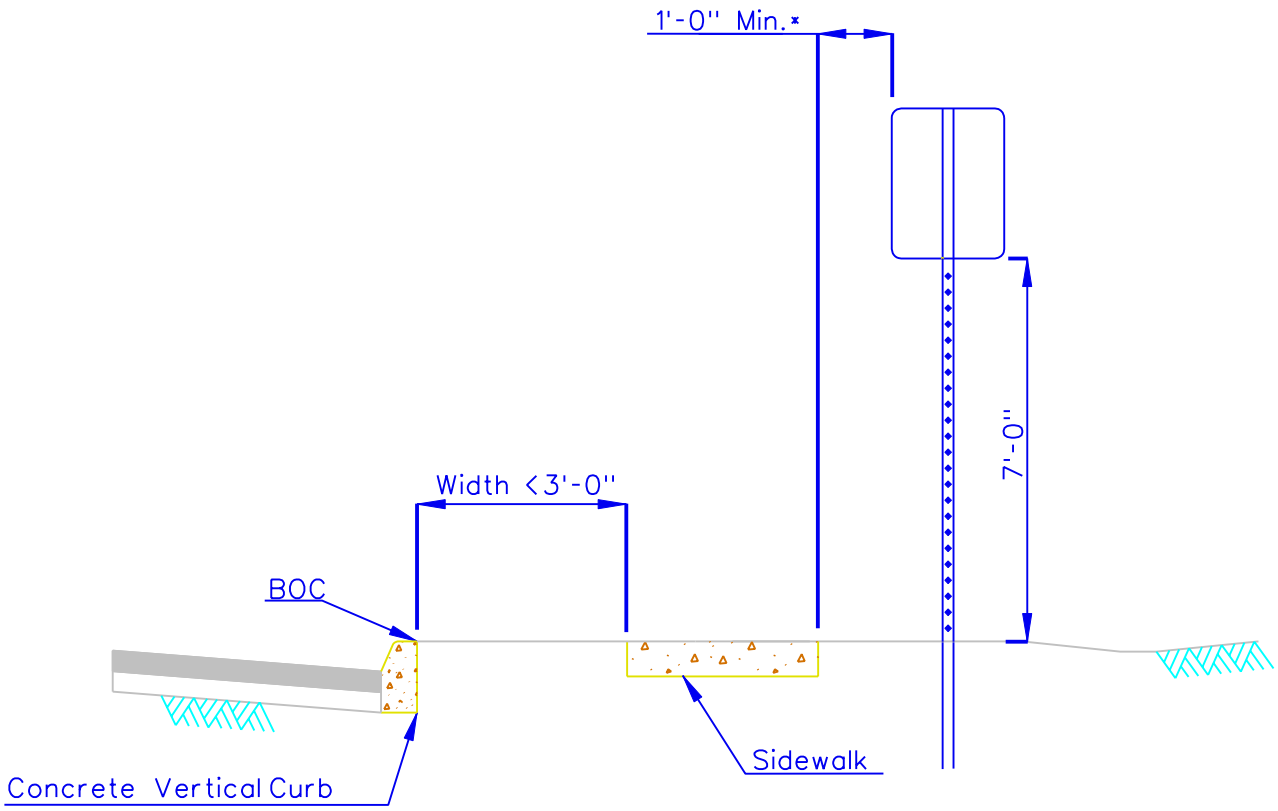


*Where Attainable

Notes:

1. This standard applies to any and all sign types with square footage of 10 s.f. or less.
2. This standard also applies to curbed medians.
3. This standard applies with or without sidewalk.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Standard Sign Placement For Curbed Roads		5 - 7

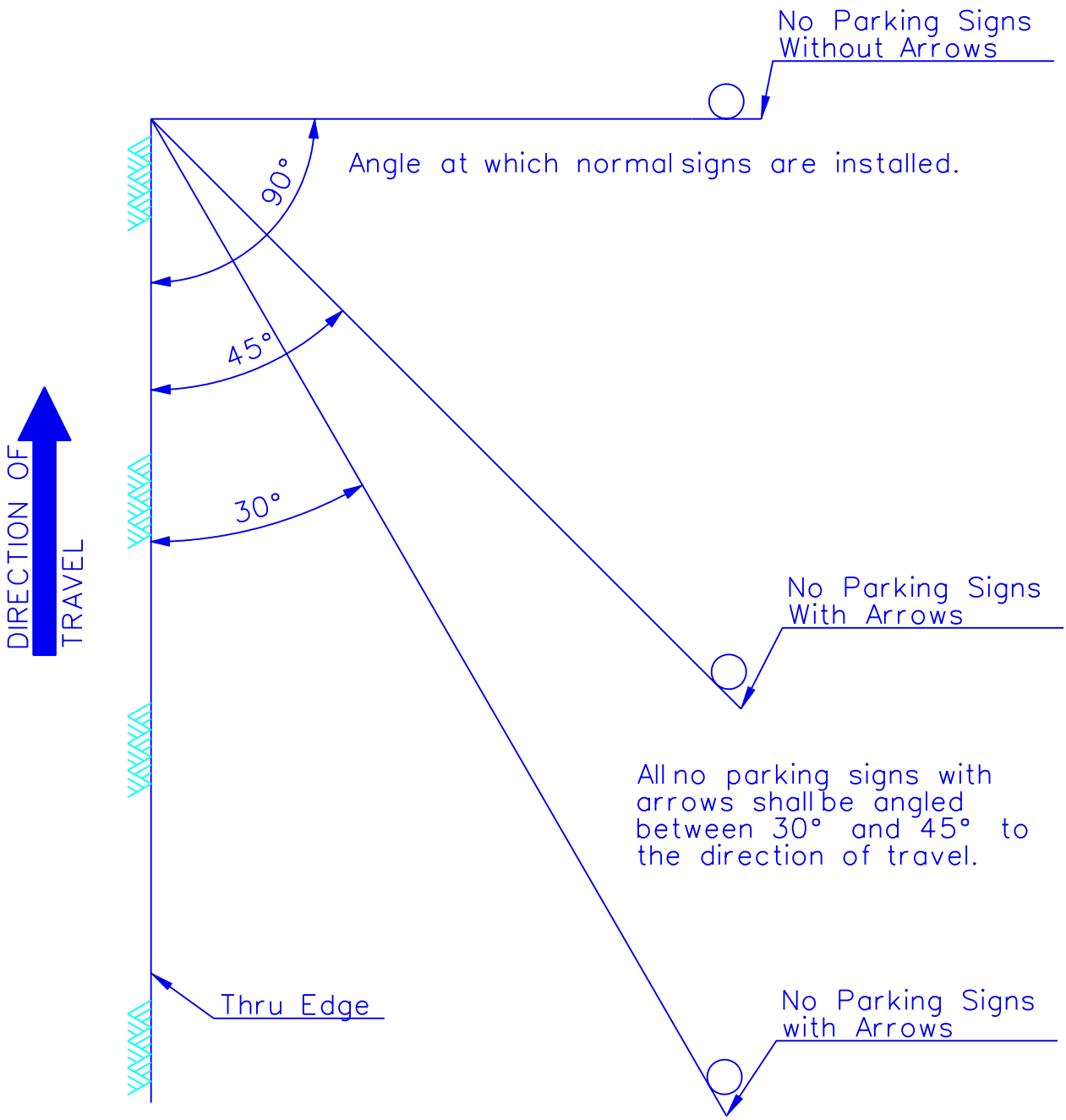


*Where Attainable

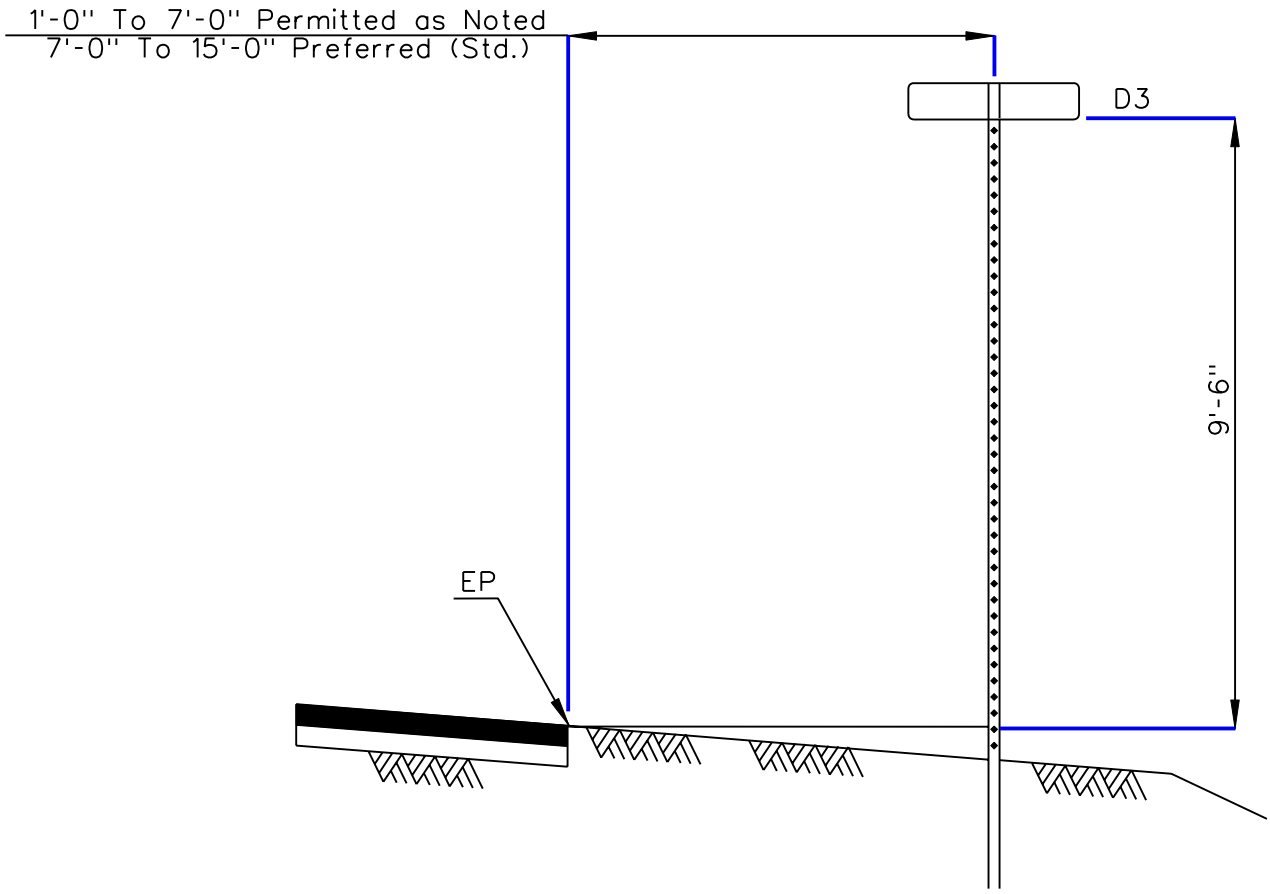
Notes:

1. This standard applies to any and all sign types with square footage of 10 s.f. or less.
2. This standard also applies to curbed medians.
3. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS Standard Sign Placement Behind Sidewalks		SHEET NO. 5 - 8



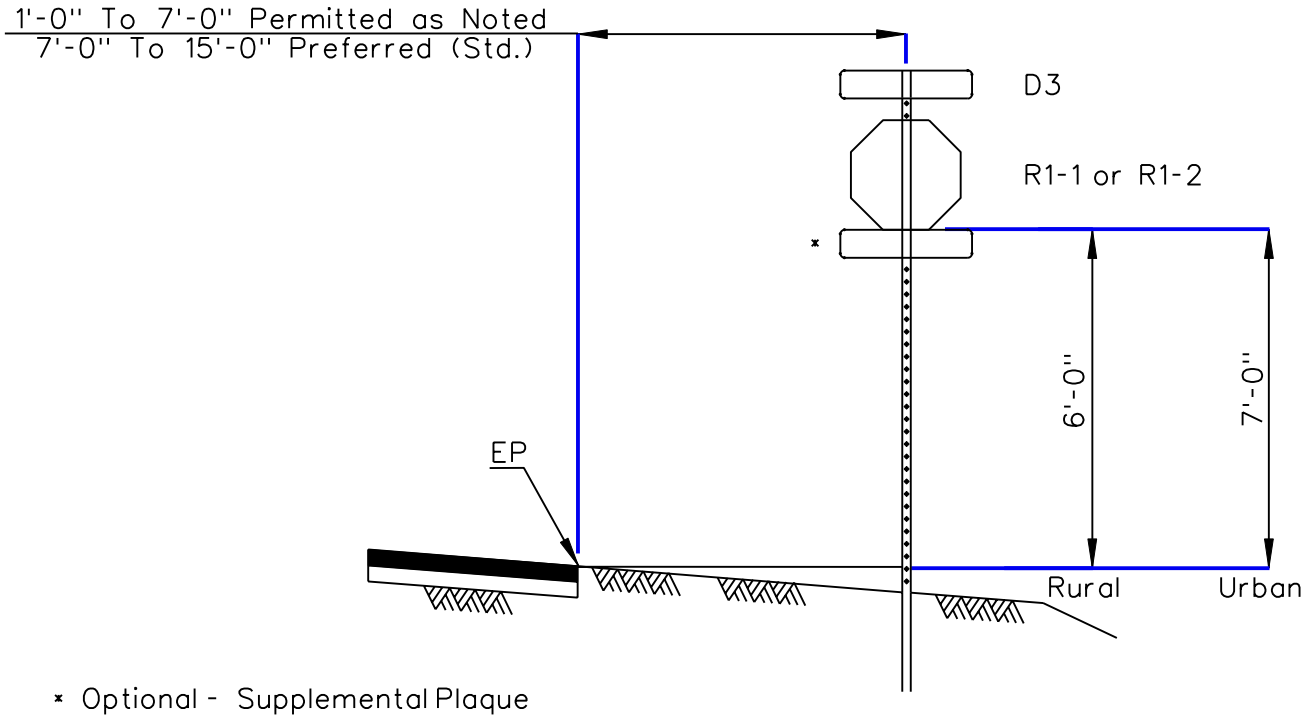
ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS Standard For The Angling of No Parking Signs w/ Arrows		SHEET NO. 5 - 9



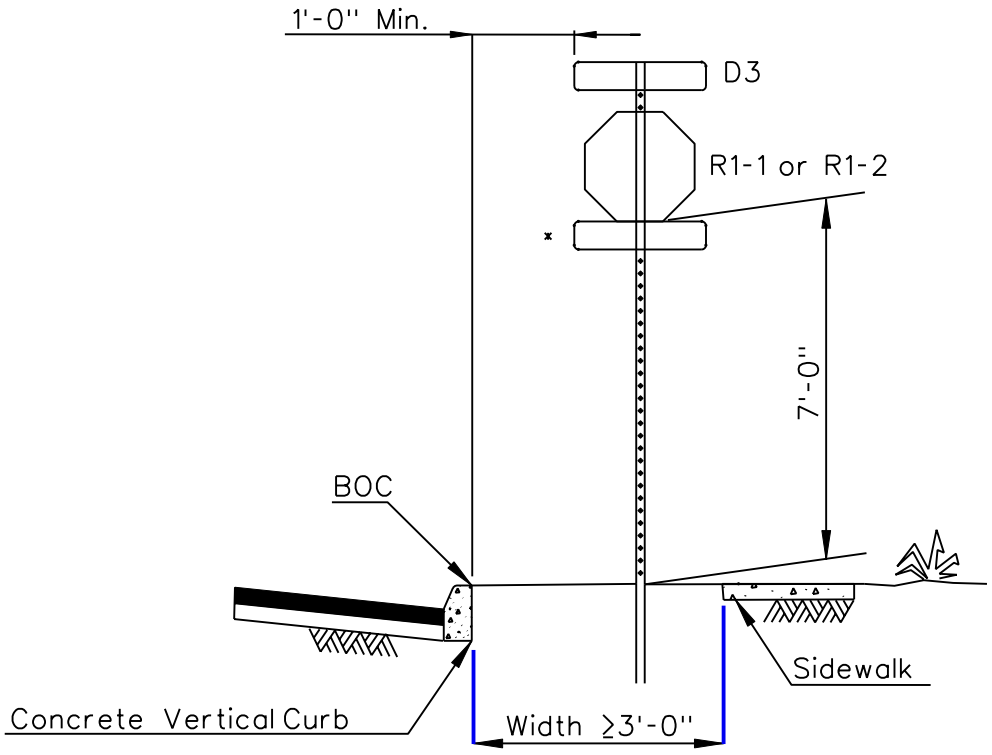
Notes:

1. Use 1'-0" to 7'-0" when walls, sidewalks, trees, or other obstructions will not allow installation within the preferred range of distances.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		5 - 10
REVISED		Standard Offset and Height For Street Name Signs (D3)		



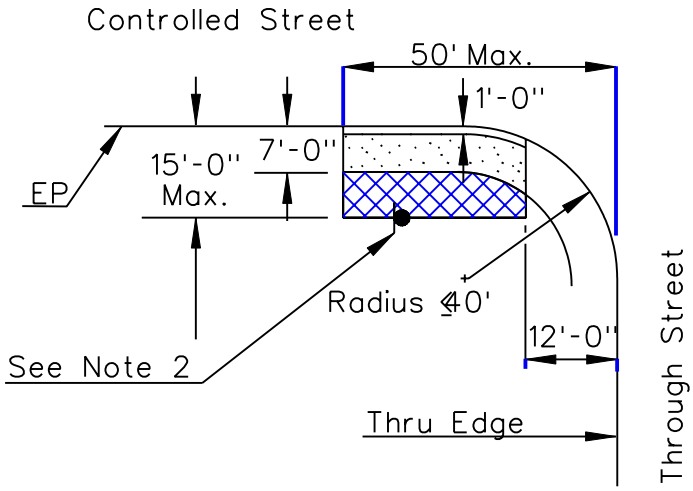
* Optional - Supplemental Plaque



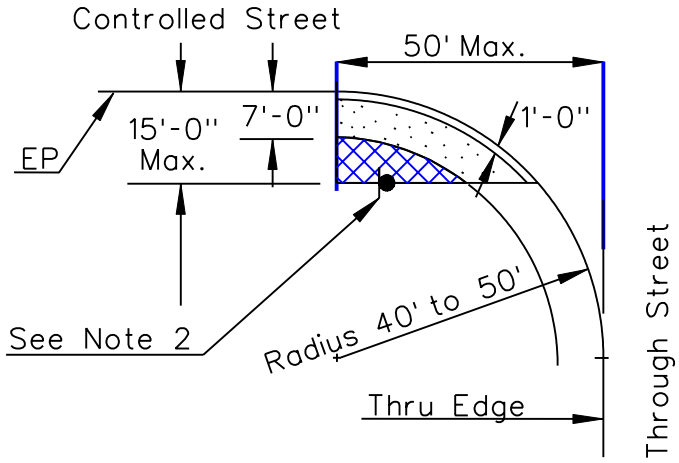
Note:

1. Refer to Plates No. 5-12A and 5-12B for offsets.
2. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		5 - 11
REVISED		Standard Height For all R1-1's and R1-2's w/ D3		



Uncurbed Street w/ Radius 40'



Uncurbed Street w/ Radius 40' to 50'

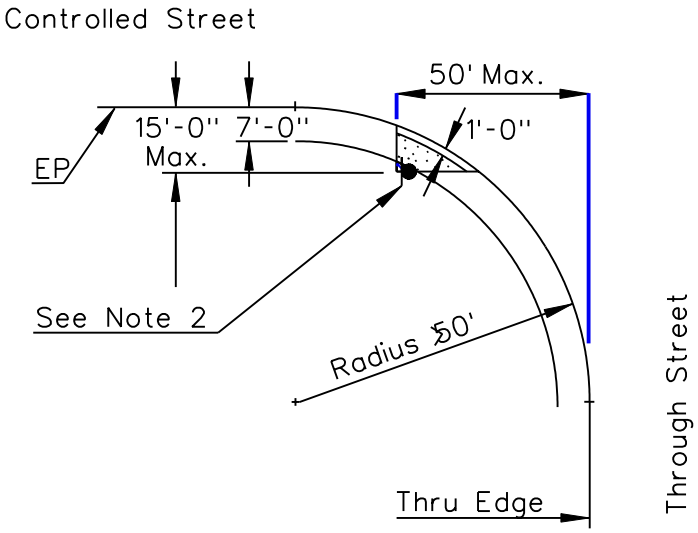
Preferred Location (Std.)

Permitted Location as Noted

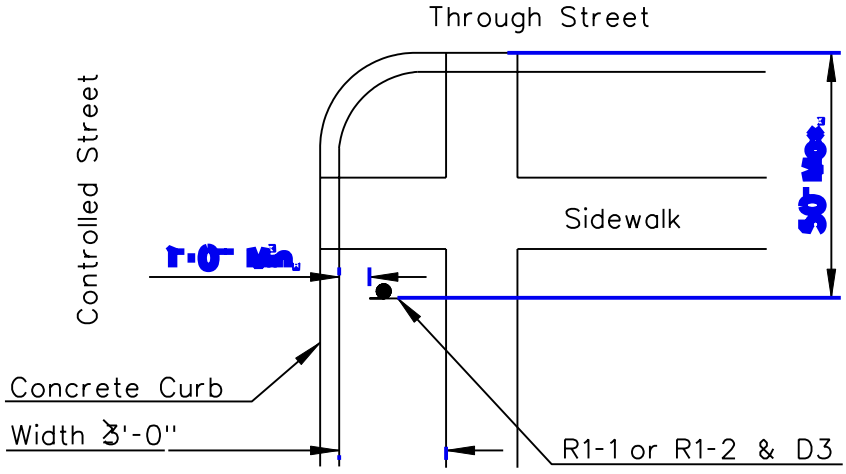
Notes:

1. This standard applies to both stop signs (R1-1) and yield signs (R1-2).
2. The sign pole location shall be a maximum of 15' off the edge of pavement.
3. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		5 - 12 A
REVISED		Standard Location of R1-1 and R1-2 at Intersections		



Uncurbed Street w/ Radius 50'



Curbed Street

Preferred Location (Std.)

Permitted Location as Noted

Notes:

1. This standard applies to both stop signs (R1-1) and yield signs (R1-2).
2. The sign pole location shall be a maximum of 15' off the approach edge of pavement.
3. All signs to be placed in advance of curb access ramps.
4. See Chapter 8 - Sign Support Systems for sign post installation & foundation details.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		5 - 12 B
REVISED		Standard Location of R1-1 and R1-2 at Intersections		

CHAPTER VI
APPROVED SIGNS

INTRODUCTION

This chapter provides guidelines for the use of Regulatory Signs, Warning Signs, Guide Signs, Object Markers, Delineators, and Mileposts Markers. The use of these sign and marker types shall be in accordance with this Manual and the 2000 Edition of the MUTCD at the discretion of the jurisdiction. Chapter 1A, *General,* of the MUTCD sets forth general guidance in recognizing and understanding the purpose, principles, design considerations, application and placement of signs as they fulfill the role of a traffic control device. It reinforces the authority and responsibility of Pima County, the City of Tucson and other public agencies to install and maintain traffic control devices within their jurisdiction.

VI-1 REGULATORY SIGNS (R & SPR SERIES)

Regulatory Signs (R Series)

Applicable guidelines for the use of Regulatory signs (R series) are contained in Chapter 2B, *Regulatory Signs,* of the MUTCD. Regulatory signs are used to regulate the movement of all modes of transportation including vehicles, bicycles and pedestrians. Table VI-A below identifies the topic and location of the R series information contained in the MUTCD and the MOAS.

TABLE VI-A
REGULATORY SIGNS

TOPIC	MUTCD			ADOT MANUAL OF APPROVED SIGNS
	SECTION	PAGE	COMMENTS	
General Information	2A	2A-1 thru 2A-25		
Application of Regulatory Signs	2B.01	2B-1		
Design of Regulatory Signs	2B.02	2B-1		"R" Series – R1-1 thru R18-1Z
Size of Regulatory Signs	2B.03	2B-1	Refer to Table 2B-1	"R" Series – R1-1 thru R18-1Z
Regulatory Sign Types & Function	2B.04 thru 2B.43 2B.45 thru 2B.48, & 2B.51	2B-6 thru 2B-56 & 2B-58	Refer to Table 2B-1	

Specialty Signs (SPR Signs)

Specialty signs (SPR series) that have been designed and approved by Pima County and the City of Tucson for use are shown on Sheets 6-1A, B and C of this chapter. See Appendix C for the sign format. New sign(s) may be implemented at the discretion of the jurisdiction. Refer to FHWA Standard Alphabet Series "C" or "D" to format a specialty sign.

Vertical and Lateral Sign Placement

Refer to Chapter V, *Vertical and Lateral Clearance,* of this Manual for the placement of Regulatory Signs. Additional information is contained in Chapter 2A, *General,* of the MUTCD.

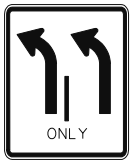
Location and Frequency/Spacing

Regulatory signs shall be placed at the point where the jurisdiction wants the sign to control driver behavior. For instance, a STOP or YIELD sign would be located in advance of a crosswalk or back from the cross street so that the stopped or approaching vehicle does not interfere with cross street traffic. Signs should be placed on existing streetlight and traffic signal poles to the greatest extent possible to reduce pole clutter within street and highway right-of-way.

Additional guidance is depicted on the drawings in Chapter IX, *Typical Signing Detail Sheets*. Table VI-B is a summary of the initial and repetitive placement of the most common regulatory signs used on major highways.

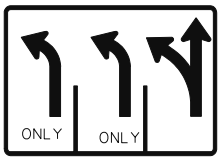
TABLE VI-B
REGULATORY SIGN PLACEMENT AND FREQUENCY (MAJOR ROADWAYS)

SIGN	FIRST LOCATION	FREQUENCY			COMMENTS
		URBAN	SUBURBAN	RURAL	
SPEED LIMIT	After a Major Intersection (10 times posted speed limit)	½ Mile	½ Mile	2 Miles	4 Lane Divided (also place sign in median)
TWO WAY LEFT TURN	Beginning of TWLT Lane	¼ Mile	¼ Mile	½ Mile	
DO NOT ENTER WRONG WAY	On approach to intersection per MUTCD Figure 2B-2	At radius return 100' to 150' from radius return	At radius return 150' to 200' from radius return	At radius return 250' from radius return	
ONE WAY	Place on the near right and far left corners of the intersection or on signal span wire or mast arm near the appropriate signal face. Place directly across from a "T" intersection, major driveway, or alleyway.	Not Applicable	Not Applicable	Not Applicable	
Parking Restrictions	Beginning of zone	Pima County -- After a Major Intersection; then, 500' to 750' spacing	Pima County -- After a Major Intersection; then, 750' to 1000' spacing	Not Applicable	City of Tucson Streets -- Not Applicable
Preferential Lane Signs HOV Lane Golf Cart Lane	Beginning of zone	After a Major Intersection; then, 600' to 800' spacing	Not Applicable	Not Applicable	

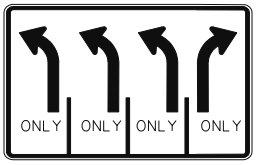


SPR03-01
24" x 30"

SPR03-02
24" x 30"



SPR03-03
30" x 30"

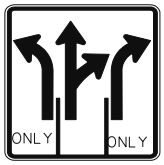


SPR03-04
48" x 30"

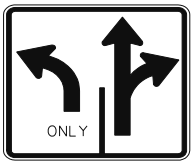
SPR03-05
30" x 30"

SPR03-06
30" x 30"

SPR03-07
24" x 30"

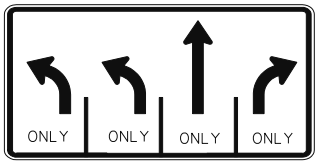


SPR03-08
30" x 30"

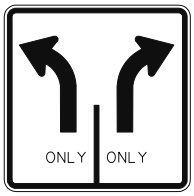


SPR03-09
36" x 30"

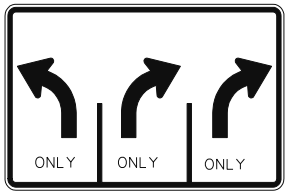
SPR03-10
42" x 30"



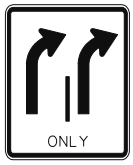
SPR03-11
60" x 30"



SPR03-12
36" x 36"



SPR03-13
54" x 36"



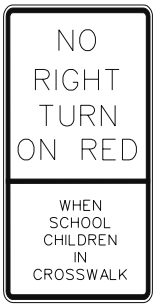
SPR03-14
24" x 30"

SPR03-15
24" x 30"

SPR03-16
30" x 30"

SPR03-17
24" x 24"

SPR03-18
24" x 36"



SPR03-19
24" x 48"

SPR04-01
24" x 30"

SPR07-01
12" x 18"

SPR07-02
12" x 18"

SPR07-03
12" x 18"

SPR07-04
24" x 36"

SPR07-05
24" x 30"

ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS APPROVED SPECIALTY SIGNS - REGULATORY		SHEET NO. 6 - 1 A

SPR08-01
12'' x 18''

SPR08-02
12'' x 24''

SPR08-03
30'' x 36''

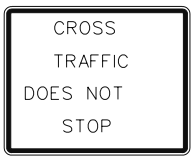
SPR09-01
12'' x 18''

SPR09-02
18'' x 24''

SPR09-03
12'' x 18''

SPR09-04
18'' x 24''

SPR09-05
18'' x 24''



SPR10-01
30'' x 24''

SPR10-02
24'' x 30''

SPR12-01
24'' x 36''

SPR12-02
24'' x 36''

SPR12-03
24'' x 36''

ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS APPROVED SPECIALTY SIGNS - REGULATORY		SHEET NO. 6 - 1B

SPR7-02a
12" x 6½"

SPR7-02b
12" x 6½"

SPR7-02c
12" x 3.5"

SPR7-02d
12" x 6½"

SPR7-02e
12" x 6½"

SPR7-02f
12" x 6½"

SPR7-02g
12" x 6½"

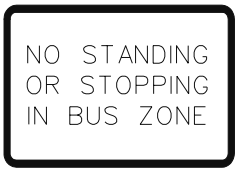
SPR7-02h
12" x 6½"

SPR7-02i
12" x 6½"

SPR7-02j
12" x 6½"

SPR7-02k
12" x 9"

SPR7-02l
12" x 6½"



SPR7-02m
12" x 9"

SPR7-02n
12" x 9"

SPR7-02o
12" x 6½"

SPR7-02p
12" x 6½"

SPR7-02q
12" x 6½"

SPR7-02r
12" x 6½"

SPR7-02s
12" x 6½"

SPR7-02t
12" x 6½"

SPR7-02u
12" x 6½"

SPR7-02v
12" x 9"

SPR7-02w
12" x 6½"

SPR7-02x
12" x 9"

ISSUED	THE SEAL OF PIMA COUNTY · ARIZONA ·	PCDOT and COTDOT Traffic Engineering Division	CITY OF TUCSON ARIZONA	SHEET NO.
REVISED		SIGNING STANDARDS		6 - 1C
		NO PARKING SUPPLEMENTAL PLAQUES		

VI-2 WARNING SIGNS (W & SPW SERIES)

Warning Signs (W Series)

Applicable guidelines for the application, design, and use of Warning Signs (W series) are contained in Chapter 2C, *Warning Signs,* of the MUTCD. Warning Signs call attention to unexpected conditions on or adjacent to a roadway and to situations that might not be readily apparent to road users. Table VI-C below identifies the topic and location of the W series information contained in the MUTCD and the MOAS.

The installation of a warning sign is dependent on two variables: the posted speed limit of the street or highway being signed and the intent of the warning as high road user judgment needed to take action, road user judgment to stop, or road user judgment to slow down to an advisory speed. Pima County uses Table 2C-4 of the MUTCD for Condition A and the PCDOT/TED Warning Sign Placement Chart for Condition B and C to determine the advance placement distance for these conditions. The City of Tucson uses Table 2C-4 of the MUTCD for the advance placement distance for all three judgment conditions.

TABLE VI-C
WARNING SIGNS

TOPIC	MUTCD			ADOT MANUAL OF APPROVED SIGNS
	SECTION	PAGE	COMMENTS	
General Information	2A	2A-1 thru 2A-25		
Function and Application of Warning Signs	2C.01 & 2C.2	2C-1	Refer to Table 2C-1	
Design of Warning Signs	2C.03	2C-1		"W" Series W1-1R thru W30-3
Size of Warning Signs	2C.04	2C-3	Refer to Table 2C-2 & 2C-3	"W" Series W1-1R thru W30-3
Placement of Advance Warning Signs	2C.05	2C-3	Refer to Table 2C-4	
Warning Sign Types & Function	2C.06 thru 2C.11 2C.13 thru 2C.46	2C-8 thru 2C-36	Refer to Table 2C-1, 2C-2 & 2C-5	

Specialty Signs (SPW Signs)

Specialty signs (SPW Series) that have been designed and approved by Pima County and the City of Tucson for use are shown on Sheet 6-2A of this chapter. See Appendix C for the sign format. New sign(s) may be implemented at the discretion of the jurisdiction. Refer to FHWA Standard Alphabet Series "C" or "D" to format a specialty sign.

Vertical and Lateral Sign Placement

Refer to Chapter V, *Vertical and Lateral Clearance,* of this Manual and Chapter 2A, *General*, of the MUTCD for additional information on the vertical and lateral placement of Warning Signs.

Location and Frequency/Spacing

The City of Tucson and Pima County use different standards for the initial location of warning signs as follows. Pima County uses Table 2C-4 of the MUTCD for Condition A and the PCDOT/TED Warning Sign Placement Chart for Condition B and C to determine the advance placement distance for these conditions. The City of Tucson uses Table 2C-4 of the MUTCD for the advance placement distance for all three judgment conditions. Either document will provide the correct location of most Warning Signs since they are of a stand-alone nature designed to forewarn the road user of an upcoming event of which the road user needs to be aware. Signs should be placed on existing streetlight and traffic signal poles to the greatest extent possible to reduce pole clutter within street and highway right-of-way.

The one warning sign that warrants discussion on frequency/spacing is the chevron sign used in a repetitive array through a curve to continually remind the road user of the curvature of the roadway. The guidance for the spacing of the chevron sign is that at least two chevrons should be in view at all times through the curve. Night driving under low beam headlights should be the criteria used in spacing these signs. ADOT Standard Drawing M-28, prepared for the spacing of delineators through a curve, is also applicable for the spacing of chevrons through a curve and is provided in Chapter IX, *Typical Signing Detail Sheets,* for reference.

Table VI-D is a summary of the initial and repetitive placement of the most common warning signs used on major highways.

TABLE VI-D
WARNING SIGN PLACEMENT AND FREQUENCY

SIGN	FIRST LOCATION	FREQUENCY		
		URBAN	SUBURBAN	RURAL
Horizontal Alignment -- Turn / Curve / Reverse Turn / Reverse Curve / Curve with Intersection /Winding Road (all with or without advisory speed plate) Vertical Alignment -- Hill / Bump / Dip	Advance of condition. For City of Tucson placement use MUTCD Table 2C-4. For Pima County placement use their Warning Sign Placement Chart.	Not Applicable	Not Applicable	Not Applicable
One-Direction Large Arrow	At or near the target position on the outside of a turn or curve within driver line of sight.	Not Applicable	Not Applicable	Not Applicable
Chevron Alignment	At or near the beginning of turn or curve.	Repeat so that the road user has at least two chevron signs in view at all times spaced in accordance with ADOT Standard Drawing M-28(See Chapter IX).	Repeat so that the road user has at least two chevron signs in view at all times spaced in accordance with ADOT Standard Drawing M-28(See Chapter IX).	Repeat so that the road user has at least two chevron signs in view at all times spaced in accordance with ADOT Standard Drawing M-28(See Chapter IX).
Advance Traffic Control Stop Ahead / Yield Ahead Signal Ahead	Advance of condition. For City of Tucson placement use MUTCD Table 2C-4. For Pima County placement use their Warning Sign Placement Chart.	Not Applicable	Not Applicable	Not Applicable
Lane Ends / Lane Ends Merge Right (Left) / Lane Reduction	Placement of all signs associated with a trap lane or lane drop shall be in accordance with Sheet 4-12b of the PCDOT / COTDOT Pavement Marking Design Manual (See Chapter IX).	Not Applicable	Not Applicable	Not Applicable
Divided Highway (Ends) / Two-Way Traffic Keep Right	In advance of and at the beginning and end of a divided segment of highway as depicted on Sheet 9 (See Chapter IX).	Not Applicable	Not Applicable	Not Applicable.

TABLE VI-D
WARNING SIGN PLACEMENT AND FREQUENCY, CONTINUED

SIGN	FIRST LOCATION	FREQUENCY		
		URBAN	SUBURBAN	RURAL
NO PASSING ZONE	Beginning of the no-passing section of the roadway, left side.	Not Applicable	Not Applicable	Not Applicable
Emergency Vehicles	Advance of condition. For City placement use MUTCD Table 2C-4. For County placement use their Warning Sign Placement Chart.	Not Applicable	Not Applicable	Not Applicable
Crossing Signs Pedestrians / Bicyclists	Advance of condition. For City placement use MUTCD Table 2C-4. For County placement use their Warning Sign Placement Chart.	Not Applicable	Not Applicable	Not Applicable
Share the Road -- Bicycles / Golf Carts	At or near the beginning of the affected section	Not Applicable	Repeat if necessary approximately every 1 mile.	Repeat if necessary approximately 3 to 5 miles.
Traffic Management – SPEED HUMP AHEAD (with advisory 15 MPH speed plate)	Place between 125’ and 175’ in advance of the first hump within the neighborhood as depicted on Sheet 10 (See Chapter IX).			

TABLE VI-E
WARNING SIGN PLACEMENT CHART

Friction Factor (f) wet cond	*Approach Speed (mph)	Advisory Speed (mph)																										*Passing Sight Distance (PSD)		*Stopping Sight Distance (SSD)	
		Stop Ahead Sign		5		10		15		20		25		30		35		40		45		50		55		60					
				Advance Warning Distance																											
		FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI	FT	MI
0.40	10	52	.010	50	.010	44	.008																							45	.009
0.40	15	85	.016	83	.016	77	.015																							74	.014
0.40	20	122	.023	119	.023	113	.021	103	.019	88	.017																			107	.020
0.38	25	165	.031	163	.031	156	.030	145	.028	130	.025	110	.021																	147	.028
0.35	30	218	.041	216	.041	208	.039	197	.037	180	.034	158	.030	132	.025													500	.095	196	.037
0.34	35	274	.052	272	.052	265	.050	252	.048	235	.045	213	.040	186	.035	154	.029											550	.104	249	.047
0.32	40	343	.065	340	.064	333	.063	320	.061	302	.057	278	.053	249	.047	215	.041	176	.033									600	.114	314	.059
0.31	45	416	.079	414	.078	405	.077	392	.074	373	.071	349	.066	319	.060	284	.054	244	.046	198	.038							700	.133	383	.073
0.30	50	498	.094	496	.094	487	.092	473	.090	454	.086	429	.081	398	.075	362	.069	321	.061	273	.052	221	.042					800	.152	462	.087
0.30	55	579	.110	576	.109	568	.107	554	.105	534	.101	509	.096	479	.091	443	.084	401	.076	354	.067	301	.057	243	.046			900	.170	538	.102
0.29	60	678	.128	676	.128	667	.126	653	.124	632	.120	607	.115	575	.109	538	.102	494	.094	446	.084	391	.074	331	.063	265	.050	1000	.189	634	.120

Advance Warning Distance = Reaction Distance + Comfortable Braking Distance (D)

Reaction Distance = 3 second reaction time x Approach Speed x 1.47
Braking Distance => D =(V1xV1 - V2xV2)/30f

Passing Sight Distance (PSD) ==> Min. sight distance required to permit passing (Operational)
Reaction Distance = 2.5 second for Stopping Sight Distance (SSD)(far right column)
Note: Distances reflect formula calculated numbers

NOTE:
__ **Approach Speed = Posted Speed*
(unless the 85%'tile is known via a speed study)

__ *1 mph ==> 1.47 ft/s ==> 5280/3600 = 1.47 ft/s*
__ *SSD ==> 3.5 ft for eye height, 2.0 ft object height*
__ *PSD ==> 3.5 ft for eye height, 3.5 ft object height*
__ *ISD ==> 3.5 ft for eye height, 3.5 ft object height*

SPW03-01
48" x 48"

SPW03-02
24" x 18"

SPW03-03
24" x 12"

SPW03-04
30" x 30"

SPW03-05
30" x 30"

SPW03-06
30" x 30"

SPW05-01
36" x 36"

SPW05-02
48" x 48"

SPW05-03
48" x 24"

SPW07-01
30" x 30"

SPW07-02
24" x 18"

SPW08-01
30" x 30"

SPW08-02
30" x 30"

SPW11-01
30" x 30"

SPW11-02
30" x 30"

SPW17-01
30" x 30"

SPW17-02
30" x 30"

SPW17-03
36" x 24"

ISSUED REVISED	THE SEAL OF PIMA COUNTY · ARIZONA ·	PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS APPROVED SPECIALTY SIGNS - WARNING	CITY OF TUCSON ARIZONA	SHEET NO. 6 - 2

VI-3 GUIDE SIGNS – CONVENTIONAL ROADS

Conventional roads are defined as any road or street other than low-volume roads, as defined in Section 5A.01 of the MUTCD, expressways, and freeways. This section addresses the use of guide signs on conventional roads.

A. Marker Signs (M Series)

Marker signs (M Series) consist of either a black legend on a white background (brown and/or blue in the case of Scenic Route Signs) or a white legend on a green or blue background. Guide signs direct road users along streets and highways and provide guidance on impending intersecting routes and provide sufficient information on destinations and points of interest to make for an informed user. Milepost markers also fall into this category. Signs in this category consist of US, State or County Route Designation signs with or without supplemental signs with cardinal directions or directional arrows. ADOT has created a series of Scenic Route Signs that has been adopted by Pima County in their inventory of standard signs.

Marker signs are contained in Chapter 2D *Guide Signs – Conventional Roads* of the MUTCD. Table VI-F below identifies the topic and location of the M series information contained in the MUTCD and the MOAS.

TABLE VI-F
MARKER SIGNS

TOPIC	MUTCD			ADOT MANUAL OF APPROVED SIGNS
	SECTION	PAGE	COMMENTS	
General Information	2A	2A-1 thru 2A-25		
Application of Marker Signs	2D.02, 2D.09 & 2D.10	2D-1, 2D-5 & 2D-6	Refer to Figure 2D-2	
Design of Marker Signs	2D.03 thru 2D.08, 2D11 & 2D.12	2D-1 thru 2D-3 & 2D-6 thru 2D-9		M1-1a thru M7-7
Marker Sign Types & Function	2D.13 thru 2D.32	2D-10 thru 2D-23	Refer to Figure 2D-1 & 2D-2	

B. Destination and Information (D & I SERIES)

Destination and information signs consist of a white legend on green, blue or brown background. Destination and information signs may be supplemented either with an arrow or number of miles. General service signs graphically identify specific services such as hospitals, food, lodging and gas as well as recreational services.

TABLE VI-G
DESTINATION SIGNS

TOPIC	MUTCD			ADOT MANUAL OF APPROVED SIGNS
	SECTION	PAGE	COMMENTS	
General Information	2A	2A-1 thru 2A-25		
Application of Destination & Information Signs,	2D.02, 2D.09, 2D.10, D.27 thru 37	2D-1, 2D-5, 2D-6, 2D-15 thru 2D-29	Refer to Figure 2D-2 & 2D-3	
Design of Destination & Information Signs,	2D.03 thru 2D.08, 2D.11& 2D.12	2D-1 thru 2D-3 & 2D-6 thru 2D-9		D1-1 thru D13-2 I1-1 thru I70Z
Destination & Information Sign Types & Function	2D.13 thru 2D.42, & 2D.44 thru 2D.50	2D-10 thru 2D-49		

For all guide signs with a variable width as identified in the MOAS, the overall dimension shall be determined by formatting the sign using the sign height and letter series identified in the MOAS. The margin space between the start and end of the sign legend, arrow symbol or mileage distance should be set between three and six inches so that the overall sign width will be in multiples of six inches.

Specialty Signs (SPD Signs)

New sign(s) may be implemented at the discretion of the jurisdiction. Refer to FHWA Standard Alphabet Series "C" or "D" to format a specialty sign.

Vertical and Lateral Sign Placement

Guide Signs shall be placed at the discretion of the jurisdiction. Refer to Chapter 2D, *Guide Signs – Conventional Road*, of the MUTCD and Chapter V, *Vertical and Lateral Clearance,* of this Manual for additional information on the placement of Guide Signs.

Location and Frequency/Spacing

In the case of Route Marker placement, it is important to place a confirming sign both at the intersection across the intersection on the right hand side of the street or highway and again past the intersection, especially when the route changes direction or multiple routes utilize the same highway segment. The confirming or reassuring signs placed beyond the intersection should be placed no closer than 200 feet past the intersection and periodically along the route as deemed appropriate by the local agency.

Destination signs with distances to the nearest cities should be placed both in advance and beyond intersecting highways or major streets in combination with the Route Marker signs. The destination sign should follow the route sign spaced approximately 300 feet along the street or route. Destination signs need not be placed more frequently than one mile unless marked routes intersect the street or highway within this one mile space. Where the distance between intersecting highways or major streets is greater than five miles, an auxiliary destination sign should be placed on the route at spacing no greater than five miles.

Figure 2D-2 of the MUTCD provides a graphic representation of the placement of both advance and trailing marker and destination signs at a major intersection. Signs should be placed on existing streetlight and traffic signal poles to the greatest extent possible to reduce pole clutter within street and highway right-of-way.

Table VI-H is a summary of the initial and repetitive placement of the most common Guide Signs used on major highways.

Street name signing and milepost signing are classified as destination signs. Street name signs should comply with the MUTCD. Special bracketing is depicted on Sheet 8-5 of this chapter. Milepost markers shall consist of individual panels of numbers placed on U-Channel posts as shown on Sheet 11 of Chapter IX, *Typical Signing Detail Sheets*.

Illuminated street name signs are detailed in the Traffic Signal Design Manual and are not addressed in this Manual.

C. Recreational and Cultural Interest Area (RG, RM, RA, RL, RW, and RS Series for Various Symbols)

The 2000 MUTCD has identified a category of symbols for this series of signs. Pima County, the City of Tucson and communities within the County are rich in recreational and cultural heritage. The county has developed considerable signage both in the D Series and SP Series of signs to identify, guide and inform the road user of these areas. The Recreational and Cultural Interest Series of signs is a new category not yet created or adopted by ADOT in the MOAS. Table 2H-1 of the MUTCD summarizes a series of symbols for six general categories of information. These categories are General Information (RG); Motorist Services (RM); Accommodation Services (RA); Land Recreation (RL); and Winter Recreation (RS). These categories describe areas within Pima County that can be applied to standard guide signs as deemed appropriate by the approving jurisdiction.

TABLE VI-H
GUIDE SIGN PLACEMENT AND FREQUENCY

SIGN	FIRST LOCATION	FREQUENCY		
		URBAN	SUBURBAN	RURAL
Marker Scenic Route Plaque	Generally, 600 feet beyond a Major intersection.	Not Applicable	Approximately 1 mile.	Approximately 5 miles.
Destination and Distance For Traffic Generators such as TIA, City and Government Centers, MVD, Schools, etc. / Arrow / Mileage	Generally, 200 to 600 feet in advance and 200 to 400 feet past a Major intersection.	Generally, 200 to 600 feet in advance of a Major intersection when a change in direction is required and 200 to 400 feet past a Major intersection.	Generally, 200 to 600 feet in advance of a Major intersection when a change in direction is required and 200 to 400 feet past a Major intersection.	Generally, 200 to 600 feet in advance of a Major intersection when a change in direction is required and 200 to 400 feet past a Major intersection.
Street Name	See Frequency. Place the sign in the median for roadways with separate left turn lanes otherwise place the sign on the right side of the road.	All intersections either alone or in combination with STOP, YIELD, or Traffic Signal Poles.	For signalized intersections place within 100 feet in advance of a turn lane. For non-signalized intersections place on a case-by-case basis at the discretion of the jurisdiction.	A sign may be placed in advance of the intersection in combination with the cross road warning sign at the discretion of the jurisdiction.
Parking Area / Park and Ride	Generally, 200 to 600 feet in advance of the facility.	Not Applicable	Not Applicable	Not Applicable
Mile Post	See Frequency	Not Applicable	Not Applicable	Placed at each Mile along the route in both directions of travel.
General Service Lodging / Camping / Hospital / Emergency Medical Services / Tourist Information / Police / Etc.	Generally, 200 to 600 feet in advance of the facility at the discretion of the jurisdiction.	Additional signs may be installed at the discretion of the jurisdiction.	Additional signs may be installed at the discretion of the jurisdiction.	Additional signs may be installed at the discretion of the jurisdiction.
Recreational and Cultural Interest	Generally, 200 to 600 feet in advance of the facility in the urban and suburban area. and ¼ mile in advance of the facility in the rural area.	Additional signs may be installed at the discretion of the jurisdiction.	Additional signs may be installed at the discretion of the jurisdiction.	Additional signs may be installed at the discretion of the jurisdiction.

TABLE VI-I
RECREATIONAL AND CULTURAL INTEREST SIGNS

TOPIC	MUTCD			ADOT MANUAL OF APPROVED SIGNS
	SECTION	PAGE	COMMENTS	
General Information	2A & 2H.01	2A-1 thru 2A-25 & 2H-1		
Application of Recreation & Cultural Signs	2H.02, 2D.03, 2H.06 thru 2H.08	2H-1 & 2H-2	Refer to Table 2H-1 & Figure 2H-1	
Design of Recreation & Cultural Signs	2h.04 & 2H.05	2H-2 & 2H-4	Refer to Figure 2H-5 & 2H-6	
Recreation & Cultural Sign Types & Function	2H.04	2H-2	Refer to Figure 2H-2 thru 2H-4	

Vertical and Lateral Sign Placement

Refer to Chapter V, *Vertical and Lateral Clearance,* of this Manual for the placement of Recreational and Cultural Interest Signs identified in this section. Additional information is contained in Chapter 2A, *General*, and Figure 2H-3 of the MUTCD.

Location and Frequency/Spacing

The location and frequency/spacing shall comply with the requirements of destination guide signs as identified in that section of the manual.

VI-4 DELINEATORS and OBJECT (HAZARD) MARKERS

General

Delineators and object (hazard) markers are considered as pavement marking and as such are described in detail in Part 3 Markings of the MUTCD. Pima County has chosen to incorporate delineators and markers with this Manual due to the similarity of the marker and delineator to a highway sign. Standard Highway Delineators are described as M8 Series Panels, Buttons or 360^{o} 4-inch diameter reflective pipe installed on either flexible or U-Channel post for use on rural highways with or without shoulders as described on Sheet 12 in Chapter IX, *Typical Signing Detail Sheets*.

In areas where snow removal is anticipated, Snow Marker Delineators described as SM Series single or double green buttons to be placed at the beginning and end of guardrail or curb are depicted on Sheet 13 in the Chapter IX, *Typical Signing Detail Sheets*. These markers are installed on flexible or U-Channel posts.

Object (hazard) markers are described as M9 Series buttons, stick-on reflective tape or panels as depicted on Sheets 14 through 20 in Chapter IX, *Typical Signing Detail Sheets*. These markers are installed on flexible or U-Channel posts.

Vertical and Lateral Sign Placement

Vertical and lateral sign placement is shown on Sheets 12 through 20 in Chapter IX, *Typical Signing Detail Sheets*.

Location and Frequency/Spacing

The location for the placement of standard highway delineators is at the direction of the agency. The spacing shall be in accordance with ADOT Standard Drawing M-28 which is located in Chapter IX, *Typical Signing Detail Sheets*.

TABLE VI-J
OBJECT MARKER DESIGNATIONS

MARKER TYPE	DESCRIPTION
T1	Type One Yellow Marker (MUTCD OM1-1, 2, or 3)
T2	Type Two Horizontal or Vertical Marker (MUTCD OM2-2H or 2V)
T3	Type Three Bridge Marker (MUTCD OM-3L/R)
T4	Type Four End of Road Marker (MUTCD OM4-1, 2, or 3)

CHAPTER VII
SPECIAL APPLICATIONS

VII-1 APPLICATION NOTES

Pima County and the City of Tucson have adopted the MOAS as the basic document supplementing this Manual. That document contains most of the standard signs to be found on County and City streets. In addition to the MOAS, ADOT has developed a series of Policies, Guidelines and Procedures that provide guidance on implementing a sign program. Section 300, SIGNS, of the PGP is a good resource in clarifying or resolving any conflicts between the MUTCD and past County and City documentation regarding signing.

Each jurisdiction has its own standard when it comes to sign sheeting. The City of Tucson uses Type II as their standard sign sheeting material. Pima County uses Type III as their standard sign sheeting material. City Object (hazard) Markers and Delineators shall be fabricated with Type I (Engineering Grade) and Type III sheeting by the City of Tucson and Pima County, respectively.

VII-2 WARNING SIGNS

If a sign is used for a special application such as a bike path, the sign dimension may be reduced as identified in Table 2C-2 of the MUTCD.

VII-3 GUIDE SIGNS

For all guide signs with a variable width as identified in the MOAS, the overall dimension shall be determined by formatting the sign using the sign height and letter series identified in the MOAS. The margin space between the start and end of the sign legend, arrow symbol or mileage distance should be set between three and six inches so that the overall sign width will be in multiples of six inches.

VII-4 MISCELLANEOUS SIGNS

Any sign that is not in the MOAS or documented in this Manual will be considered NON-STANDARD and will require the approval of the County or the City Traffic Engineering Division prior to its use. All new signs shall comply fully with the requirements of this Manual and the MUTCD. Destination signs shall be formatted in accordance with a similar sign in the MOAS using letter height and Standard Alphabet Series as appropriate.

VII-5 SCHOOL PEDESTRIAN CROSSING SIGNS

The ADOT School Crossing Manual Chapter 7 of the Traffic Engineering Manual, Traffic Controls for School Areas, provides guidance for the location and placement of School Zone signing**.** Figure 7B-1 of the MUTCD depicts scenarios of sign placement with respect to intersections adjacent to and/or within the vicinity of a school. This figure depicts standard pentagon signs, regulatory signs, and warning signs associated with a school-crossing plan. The R series sign will continue to be black lettering on white background; however, the S series sign and warning sign supplemental plaques shall have the same color identified for school zone signing, which will be Type IX (Diamond Grade) fluorescent yellow-green. This includes signs S1-1, W16-2, W16-7, and W16-9p. Signs W16-2 and W16-7 are optional in the City of Tucson at the approval of the jurisdiction Traffic Engineer.

CHAPTER VIII
SIGN SUPPORT SYSTEMS

INTRODUCTION

There are three sign support systems used by Pima County and the City of Tucson. Each is unique to a specific application.

The first sign support system is used for stand-alone signs. It consists of one or more 2" perforated square tube post(s), with or without a concrete foundation. In certain instances a slip base design is needed to preserve the integrity of the foundation and for ease of replacement if necessary.

The second sign support system consists of a perforated U-Channel post directly imbedded into the ground. It is used where the sign panel is small and/or relatively close to the ground such as milepost markers, object (hazard) markers, delineators and prohibitive/restrictive parking signs. It is also used to attach signs to pedestrian push button posts in the median nose of a signalized intersection.

The third sign support system is a sign or a sign combination that is attached to a traffic signal mast arm and pole assembly or a streetlight pole.

VIII-1 2" PERFORATED SQUARE TUBE POST

The perforated square tube post will be either a single post design or a series of 2" square tube posts depending on the area of the sign and the sign panel centroid height.

VIII-2 MULTIPLE SUPPORTS

When two or more supports are required the spacing between the supports should be between 1' – 9" and 2' – 10" so that the distance between the end support and the edge of the sign is between 0' – 6" and 1' – 4". Stringer supports are to be used between supports. If the combination of spacing and end sign dimensions exceed the values identified herein an additional perforated sign support should be added to prevent the sign from buckling.

VIII-3 2" PERFORATED SQUARE POST FOUNDATION

A square post base assembly consisting of 2 ¼" and 2 ½" square tube posts, shall be placed into the center of the concrete foundation as shown on Sheets 8-2A and 8-2B of this chapter. Unless specifically authorized to install the perforated post foundation directly into the ground, all perforated post sleeve assemblies will be installed in a concrete foundation.

VIII-4 SLIP BASE ASSEMBLY

When called for on the plans and at the approval of the jurisdiction, a slip base assembly shall be inserted into the concrete foundation outer sleeve as shown on Sheet 8-3 of this chapter.

VIII-5 U-CHANNEL POST

U-Channel posts are to be used for milepost marker assemblies, object (hazard) marker panels, delineators, and prohibitive/restrictive parking sign series and other application signs as directed by the jurisdiction with panel areas between five and six square feet and no more than seven feet above the ground. This application is intended for the use of a single U-Channel post buried directly into the ground or used to attach signs to pedestrian push button posts in the median nose of a signalized intersection. See Sheet 8-4 of this chapter for U-Channel post installation details.

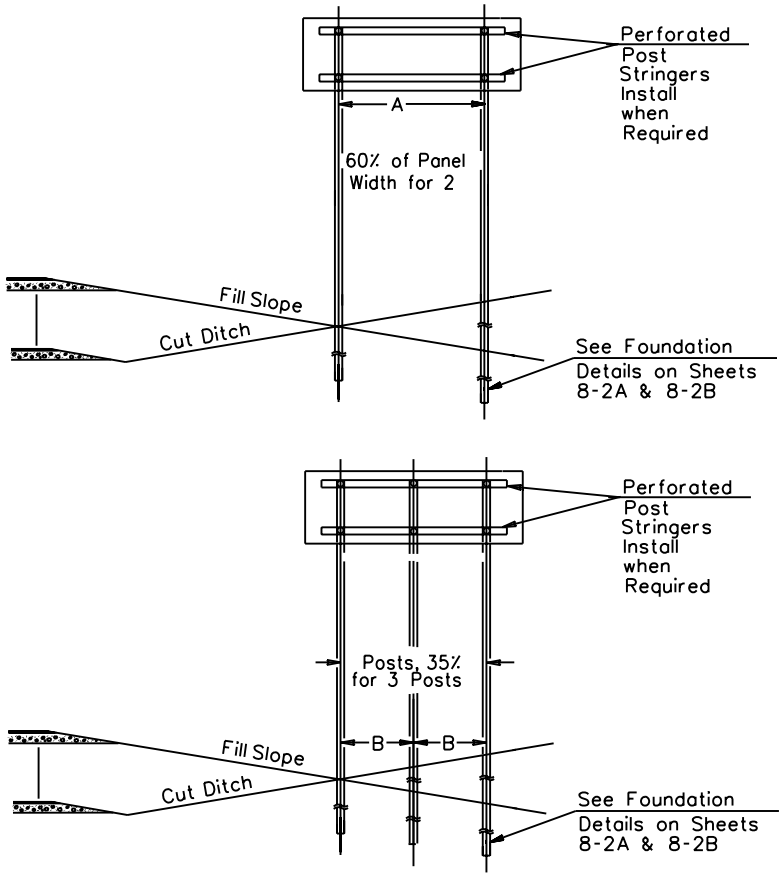
VIII-6 STRAPPING

The third sign support is a combination of straps and sign brackets that attach the sign to the arm of a mast arm and pole assembly or to the vertical segment of a straight or tapered pole or a combination of both. Signs attached to a pedestrian push button post shall be attached to a U-Channel post which in turn shall be strapped to the pedestrian push button post to attain the proper mounting height for the sign.

The strapping should be of sufficient diameter to fit around the arm or pole to make a secure fit. Excess strapping must be trimmed to remove material that would allow tampering or sign removal by unauthorized persons. See Sheet 8-5 of this chapter for additional mounting information.

GUIDE SIGN POST SPACING
(Not for use with Warning, Regulatory or Marker Panels)

Panel Width	3'	4'	5'	6'	7'	8'	9'	10'
Two Posts Spacing (A)	1'-10"	2'-4"	3'-0"	3'-8"	4'-2"	4'-10"	5'-4"	6'-0"
Bolts to Panel (per Stringer)	—	—	3	3	3	3	4	4
Length of each Stringer	—	—	4'-0"	4'-8"	5'-2"	5'-10"	6'-4"	7'-0"
Three Posts Spacing (B)	—	—	1'-9"	2'-1"	2'-5"	2'-10"	3'-2"	3'-6"
Bolts to Panel (per Stringer)	—	—	3	3	3	4	4	4
Length of each Stringer	—	—	4'-6"	5'-2"	5'-10"	6'-8"	7'-4"	8'-0"



GUIDE SIGN

Note

1. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.

ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS Mounting Details for Two or More Square Tube Posts	SHEET NO. 8–1

2 " (2S) SINGLE POST 12 GAUGE

SIGN AREA IN SQUARE FEET

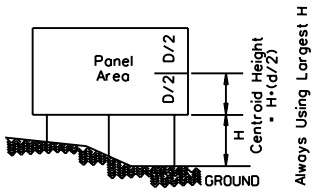
PANEL CENTROID HEIGHT H-D/2	5	10	15	20	25	30	35
6	1	1	2	2	3	3	3
7	1	1	2	2	3	3	
8	1	2	2	3	3		
9	1	2	2	3			
10	1	2	3				
11	1	2	3				
12	2	3					

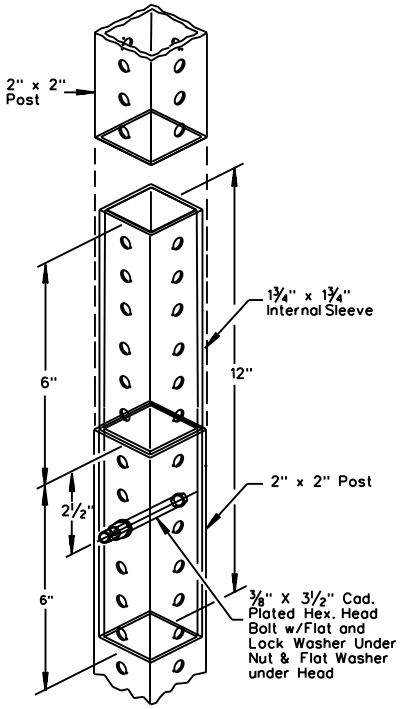
→ SLIP BASE REQUIRED

SLIP BASE REQUIRMENTS

	2S
1 POST	NO
2 POST	NO
3 POST	SLIP BASE

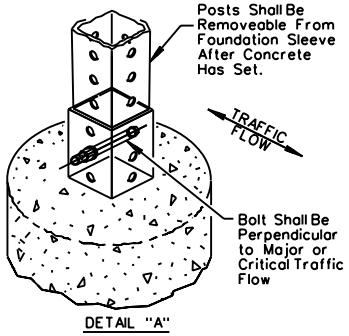
1. Signs greater than 42" in width shall be mounted on two or more posts.
2. Slip bases should not be used in locations protected by guardrail, barrier, or outside the clear zone.



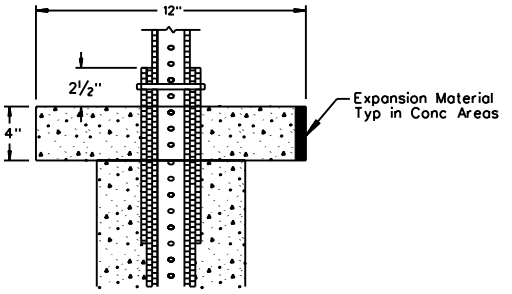


SINGLE POST PERMISSIBLE FIELD SPLICE

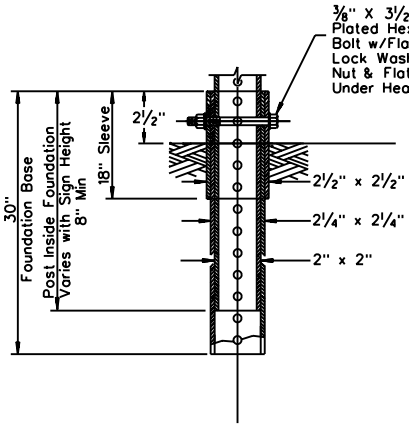
NOTES:
For single post field splices, if the shortest post section is less than panel height, then splice shall be behind panel.



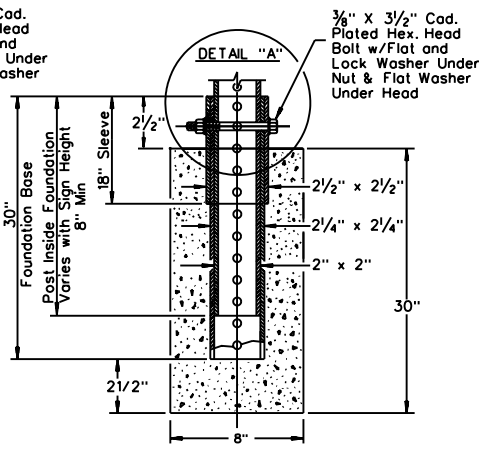
DETAIL "A"



SQUARE CAP DETAIL



SINGLE POST FOUNDATION DETAIL
DIRECT BURY



SINGLE POST FOUNDATION DETAIL
IN CONCRETE

ISSUED	THE SEAL OF PIMA COUNTY · ARIZONA ·	PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS	CITY OF TUCSON ARIZONA	SHEET NO.
REVISED		2" Square Tube Post		8-2A

MATERIALS:

1. Perforated posts shall be square tube formed from 0.105 U.S.SS gauge ASTM A-366 cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts shall be externally scarfed to agree with standard corner radii of $\frac{5}{32}$" to $\frac{1}{64}$".

2. Perforated posts shall be galvanized to conform to ASTM A-525. Coating designation G-90.

3. All hardware shall conform to ASTM A-307 Class A.

4. All hardware shall be galvanized to conform to ASTM A-153 or cadmium plated to conform to ASTM A-165.

5. All concrete shall be Class B.

NOTES:

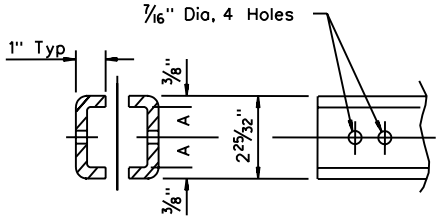
1. The foundation will be constructed with 2" x 2" starter sign post. Starter sign post shall be removed after concrete has set and exposed square tubing wrapped and sealed with duct tape.

2. Foundation location to be approved by Traffic Engineering.

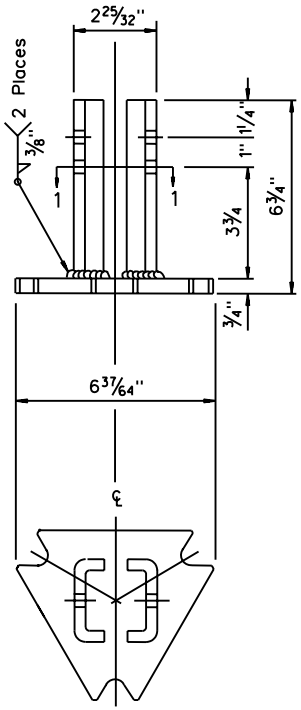
3. Post foundations shall be perpendicular to the roadway.

4. Bolt with nut and lock washer to be $\frac{7}{16}$" x 3" galvanized.

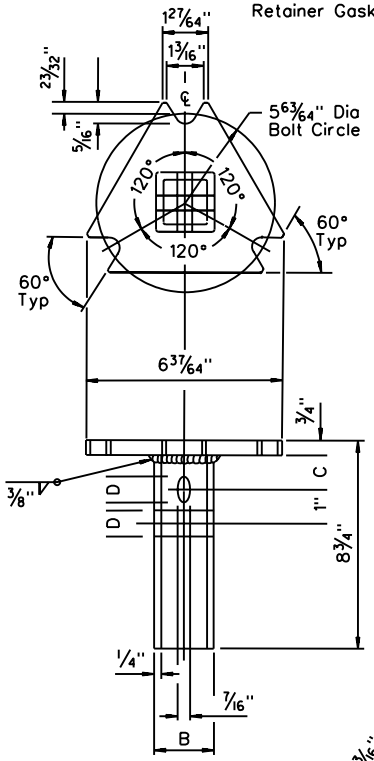
ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		8–2B
REVISED		2" Square Tube Post Foundation w/ Cap		



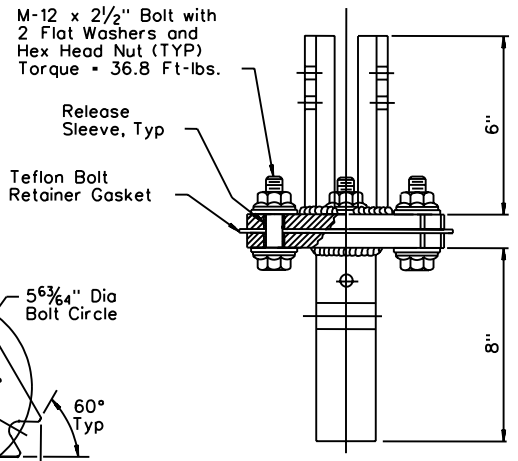
SECTION 1- 1



TOP FITTING



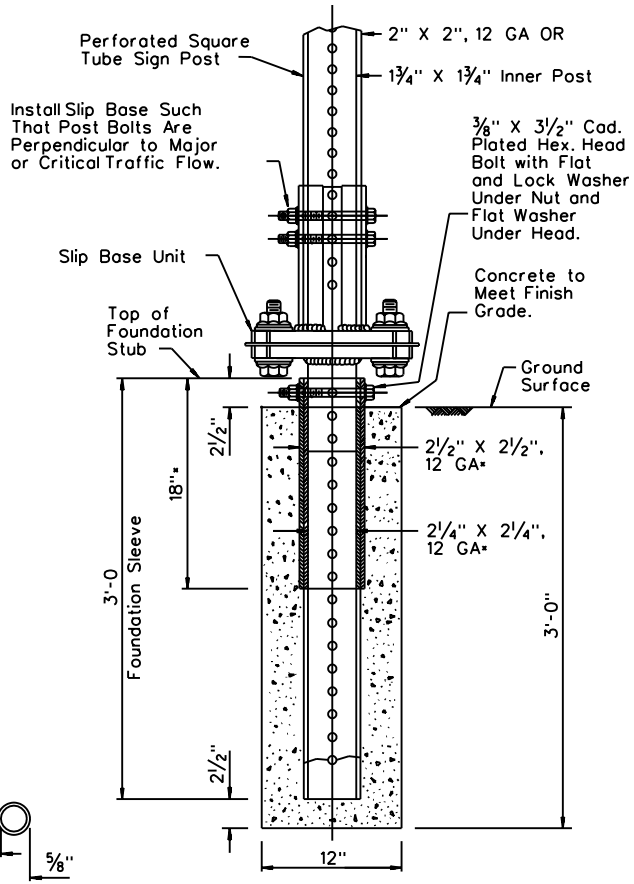
BOTTOM FITTING



ASSEMBLY (REAR VIEW)

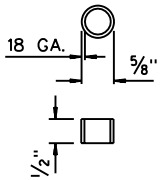
NOTE:

Slip base shall be used when called for on sheet 8-2a.



FOUNDATION DETAILS

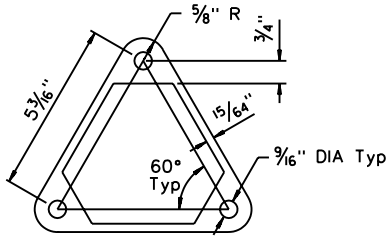
* Single 36" long 2 1/2" x 2 1/2", 7 ga foundation sleeve may be substituted for 2 1/4" x 2 1/2" nested combination for 2" slip base.



RELEASE SLEEVE

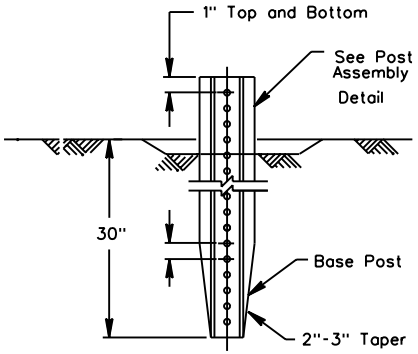
6 Required per Installation

VARIABLE DIMENSIONS	
DIMENSIONS	2 INCH POST
A	1 1/64"
B	2"
C	1 1/32"
D	7/16"W x 5/8"H

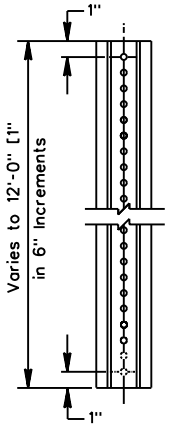


TEFLON BOLT RETAINER GASKET
1/32" THICK

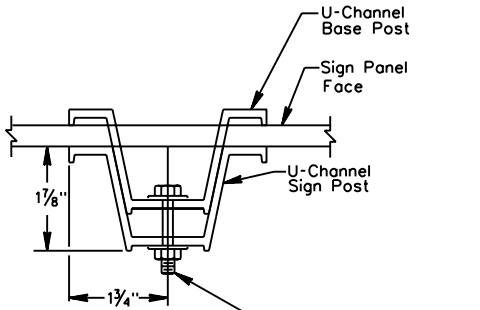
ISSUED		PCDOT and COTDOT Traffic Engineering Division	SHEET NO.
REVISED		SIGNING STANDARDS	8-3
		Square Tube Post Slip Base Details	

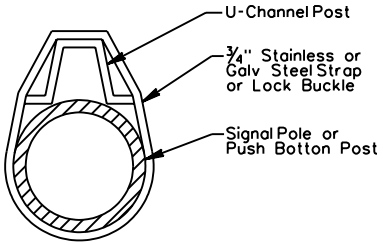


BASE POST AND INSTALLATION

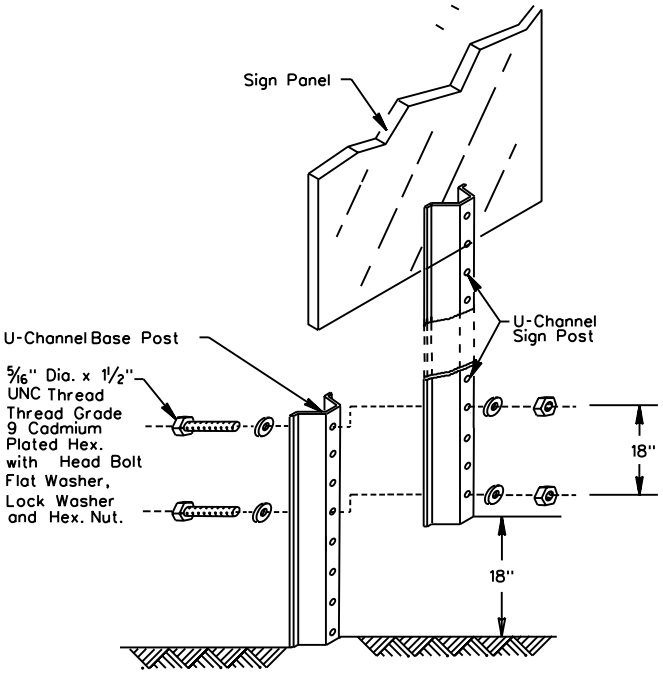


SIGN POST

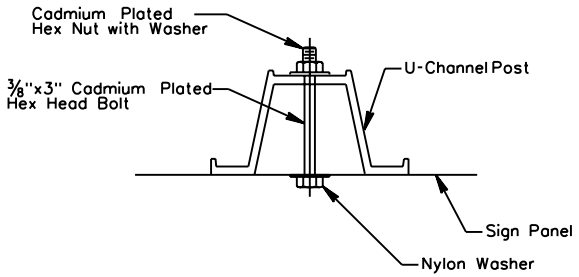




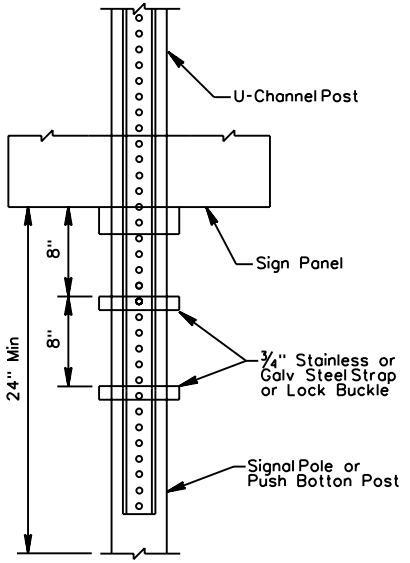
TOP VIEW



INSTALLATION PICTORIAL

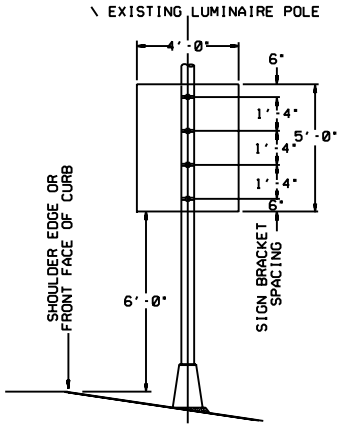


SIGN PANEL TO U-CHANNEL POST

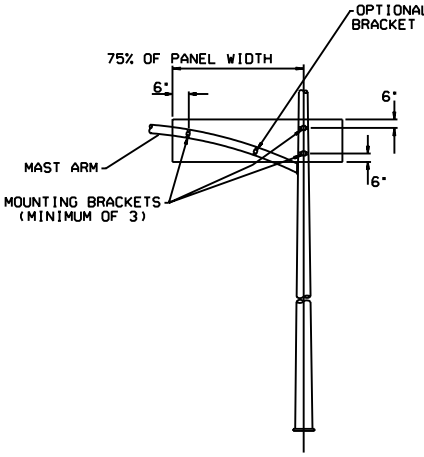


SIDE VIEW

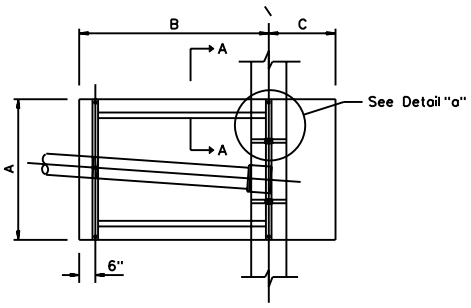
ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS	SHEET NO.
REVISED		U–Channel Post Sign Installation	8–4



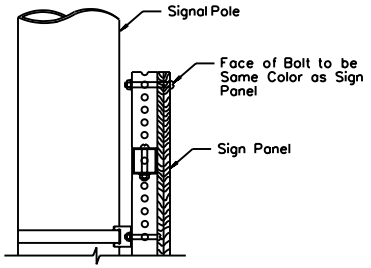
TYPICAL INSTALLATION OF SIGN ON SIGNAL OR LUMINAIRE POLE



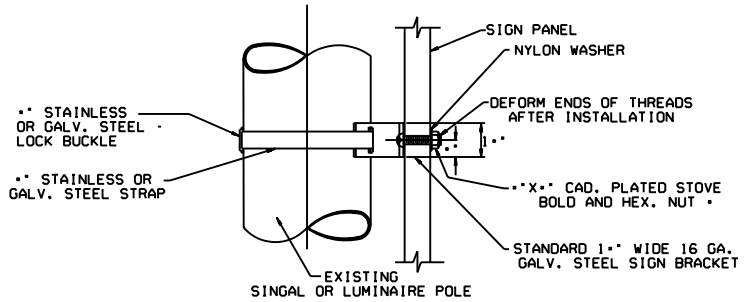
D3 STREET NAME SIGN MOUNTING DETAIL ON SIGNAL POLE



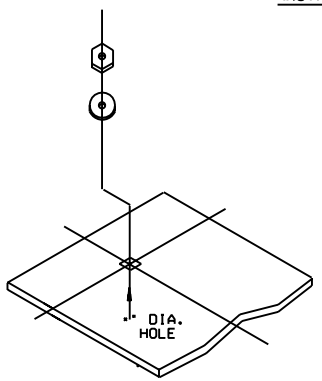
ATTACHMENT OF GUIDE SIGN (TYPE I) TO SIGNAL POLE

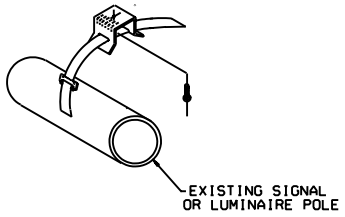


SECTION "A-A"

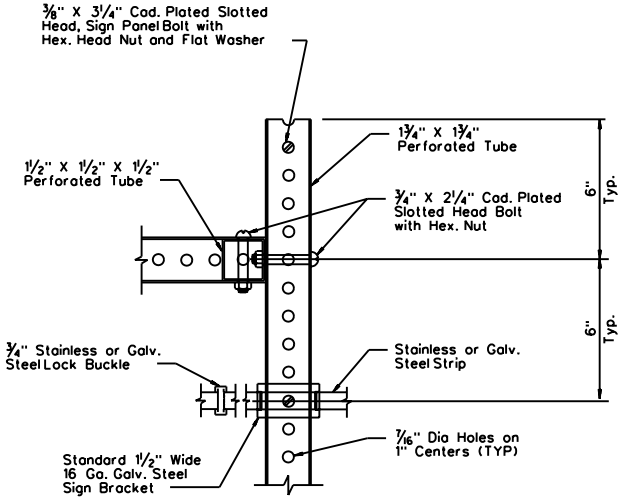


SIGN MOUNTING BRACKET INSTALLATION





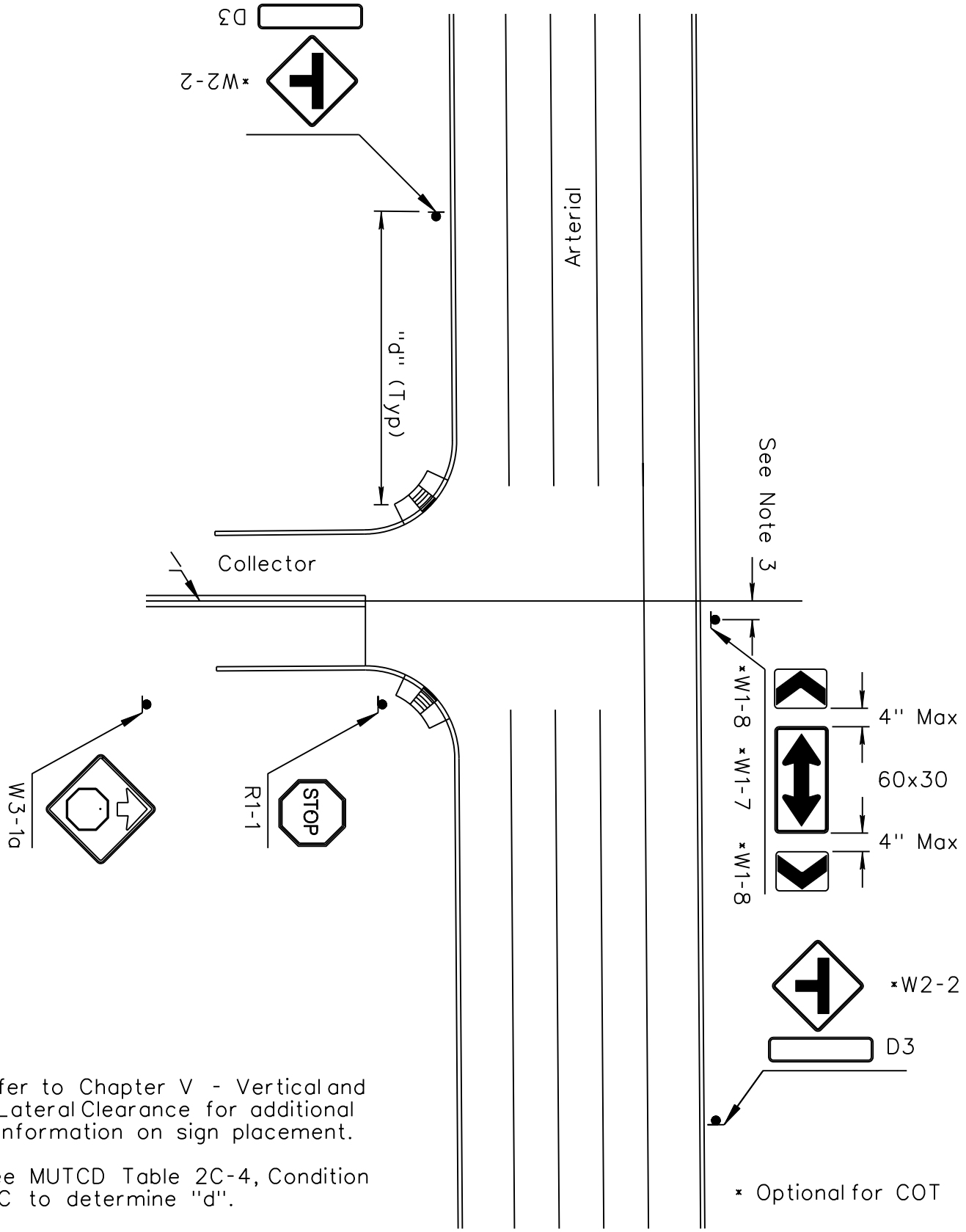
• FACE OF BOLT, NUT AND WASHER SHALL BE PAINTED SAME COLOR AS PANEL.



DETAIL "A"

ISSUED	SEAL OF PIMA COUNTY ARIZONA	PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS	CITY OF TUCSON ARIZONA	SHEET NO.
REVISED		Sign Installation on Pole		8–5

CHAPTER IX
TYPICAL SIGNING DETAIL SHEETS

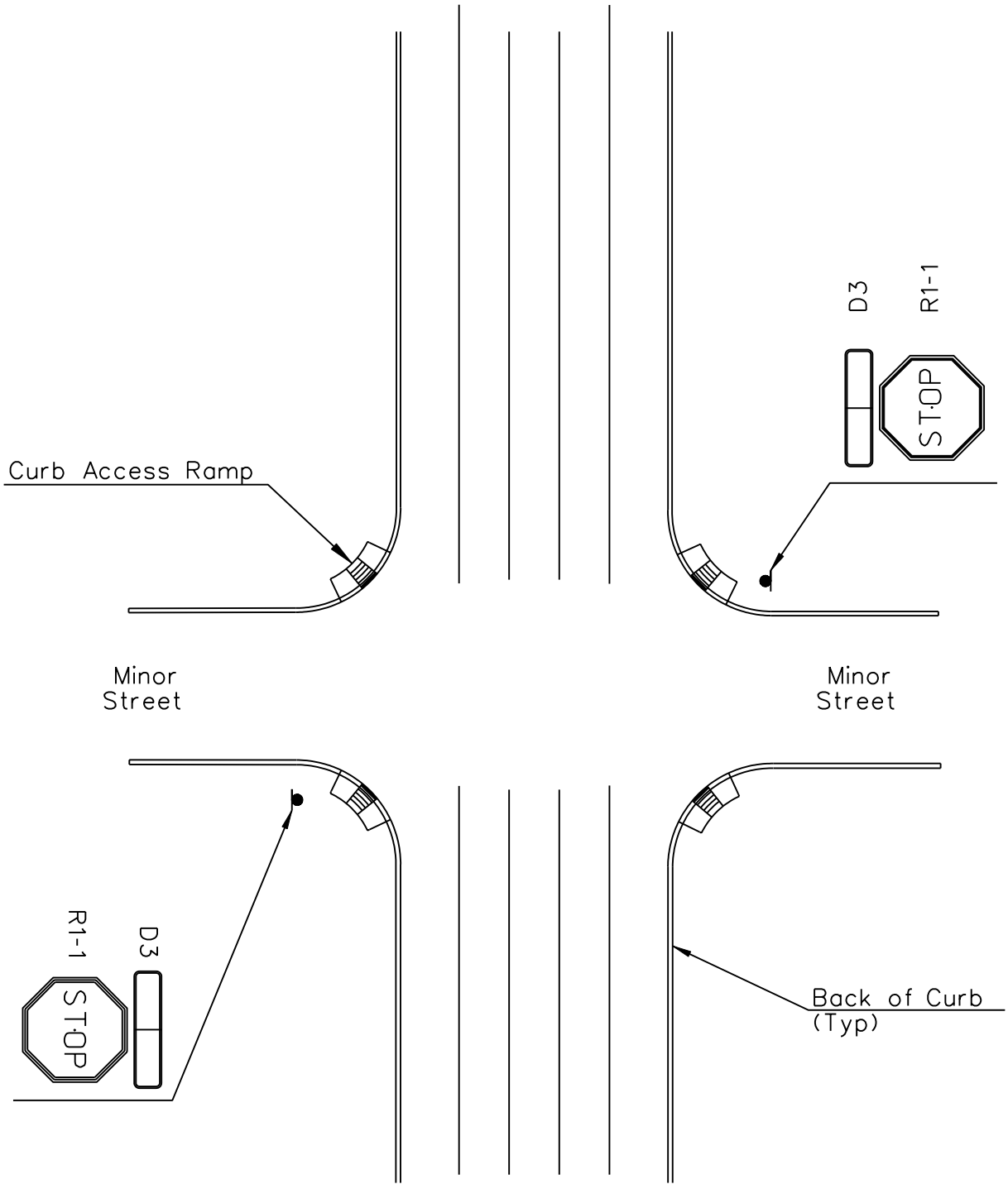


Notes

1. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.
2. See MUTCD Table 2C-4, Condition C to determine "d".
3. Typical placement is in target position for approaching vehicles.

* Optional for COT

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		9–1
REVISED		Typical Collector/Arterial Signing Detail (T–Intersection)		

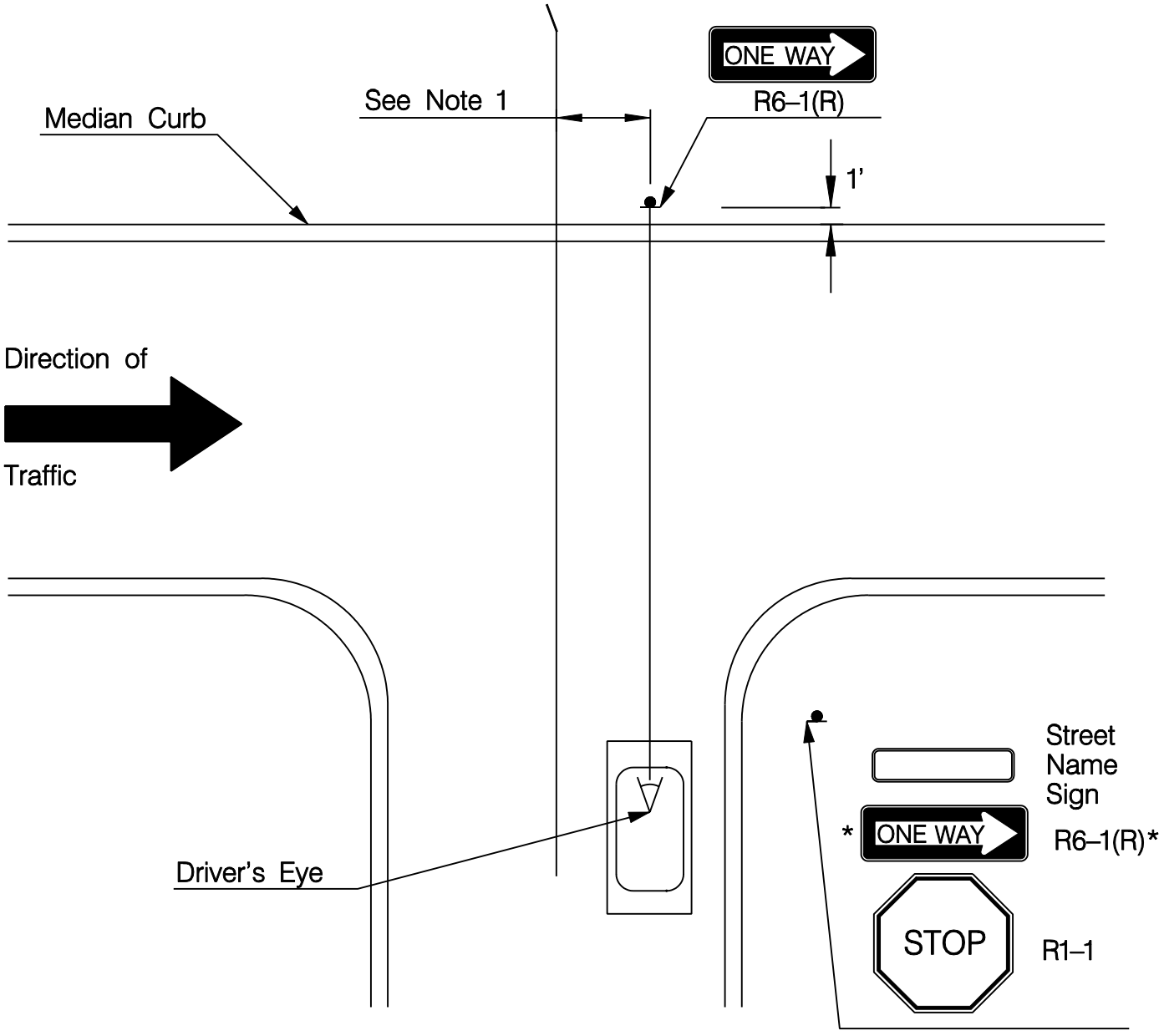


Notes

1. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.

2. When sidewalk is present, locate sign in accordance with Chapter VII - In Special Applications

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		9–2
REVISED		Typical Stop Sign Placement on the Minor Street Intersection		



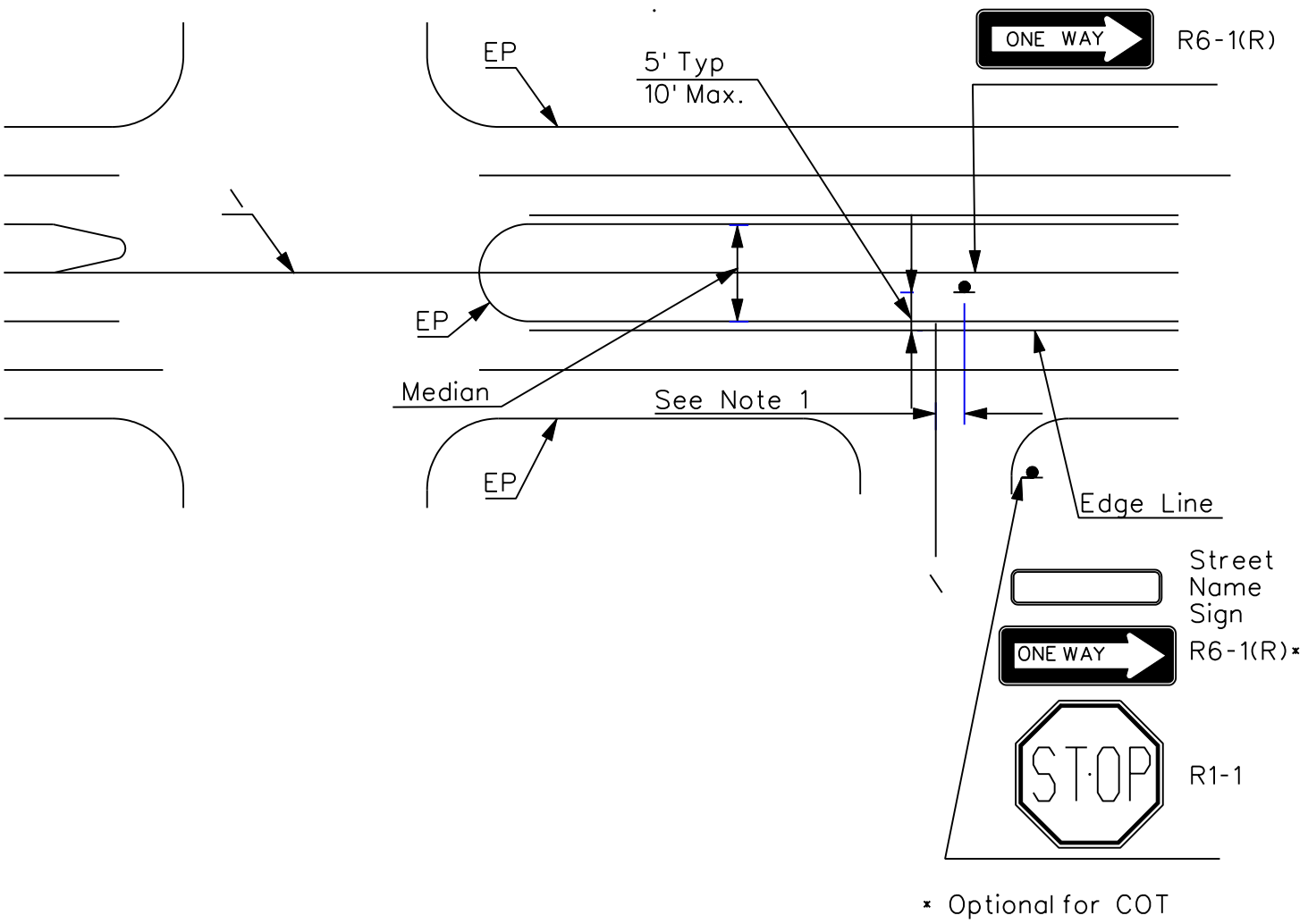
Notes

1. Typical placement is in target position for approaching vehicles.
2. Height to the bottom of the sign R6–1(R) in the median shall be 5'–0" from the top of curb elevation. Refer to Chapter V – Vertical and Lateral Clearance for additional information on sign placement of the R6–1(R) and R1–1 assembly.

* Optional for COT

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		9–3A
REVISED		Standard Placement of R6–1 Sign in a Curbed Median		

Uncurbed Median

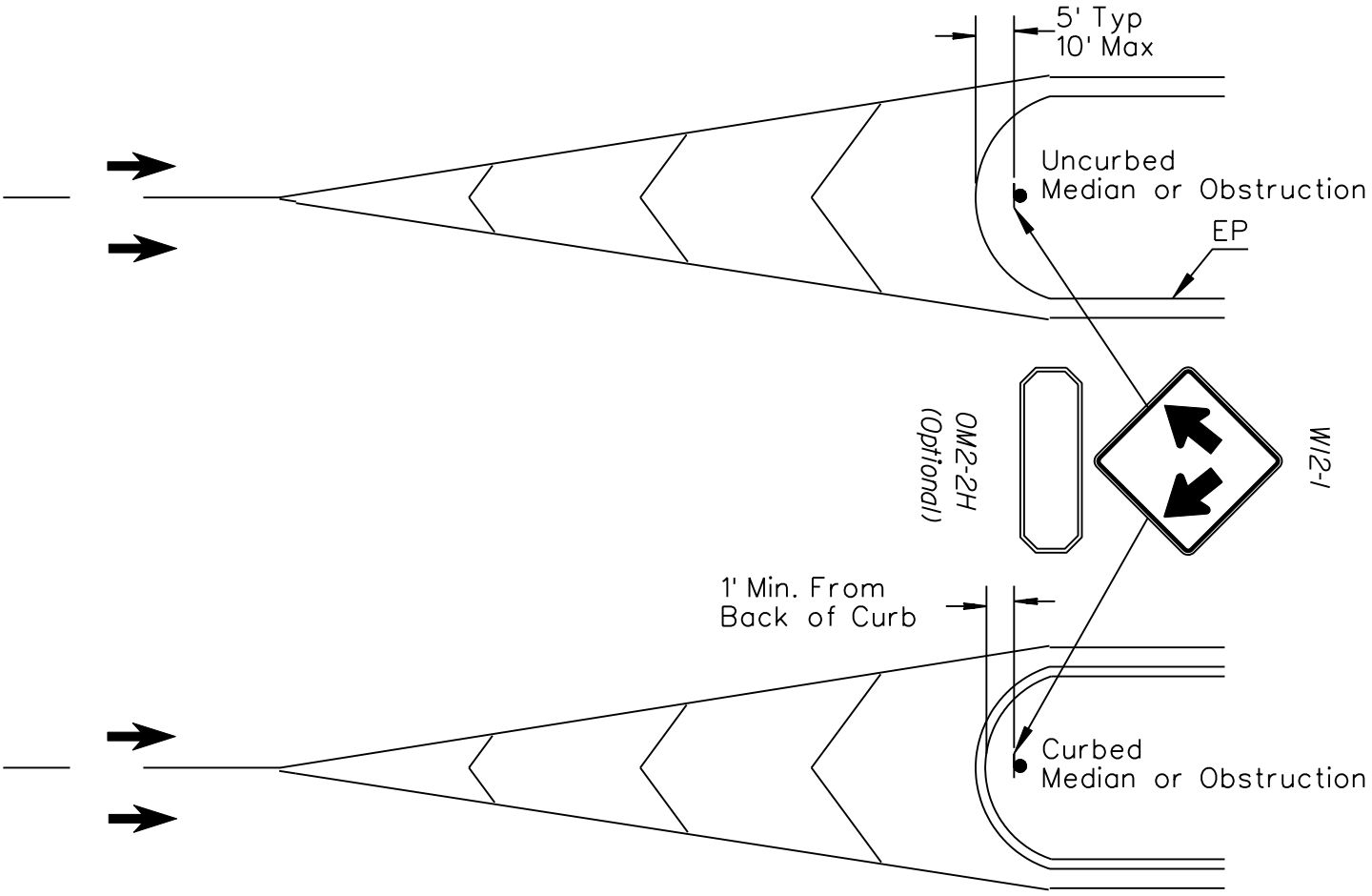


Notes:

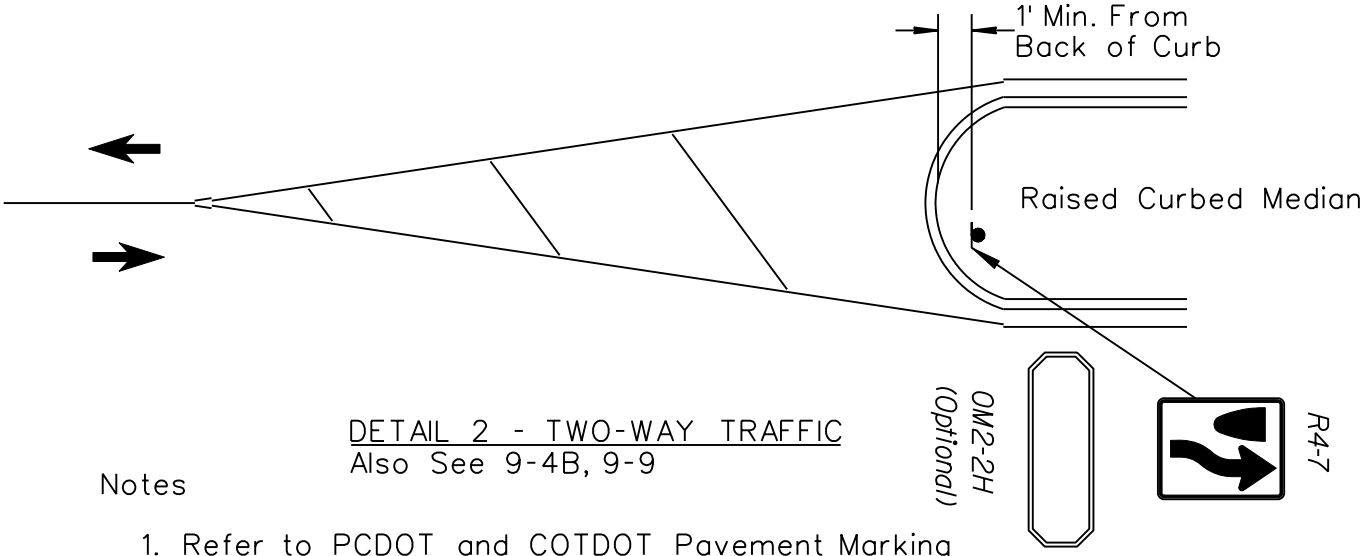
1. Typical placement is in target position for approaching vehicles.

2. Height to the bottom of the sign R6-1(R) in the median shall be 5'-0" from the edge of pavement elevation. Refer to Chapter V - Vertical and Lateral Clearance for addtional information on sign placement of the R6-1(R) and R1-1 assembly.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Standard Placement of the R6-1 Sign in an Uncurbed Median		9-3B



DETAIL 1 - ONE-WAY TRAFFIC

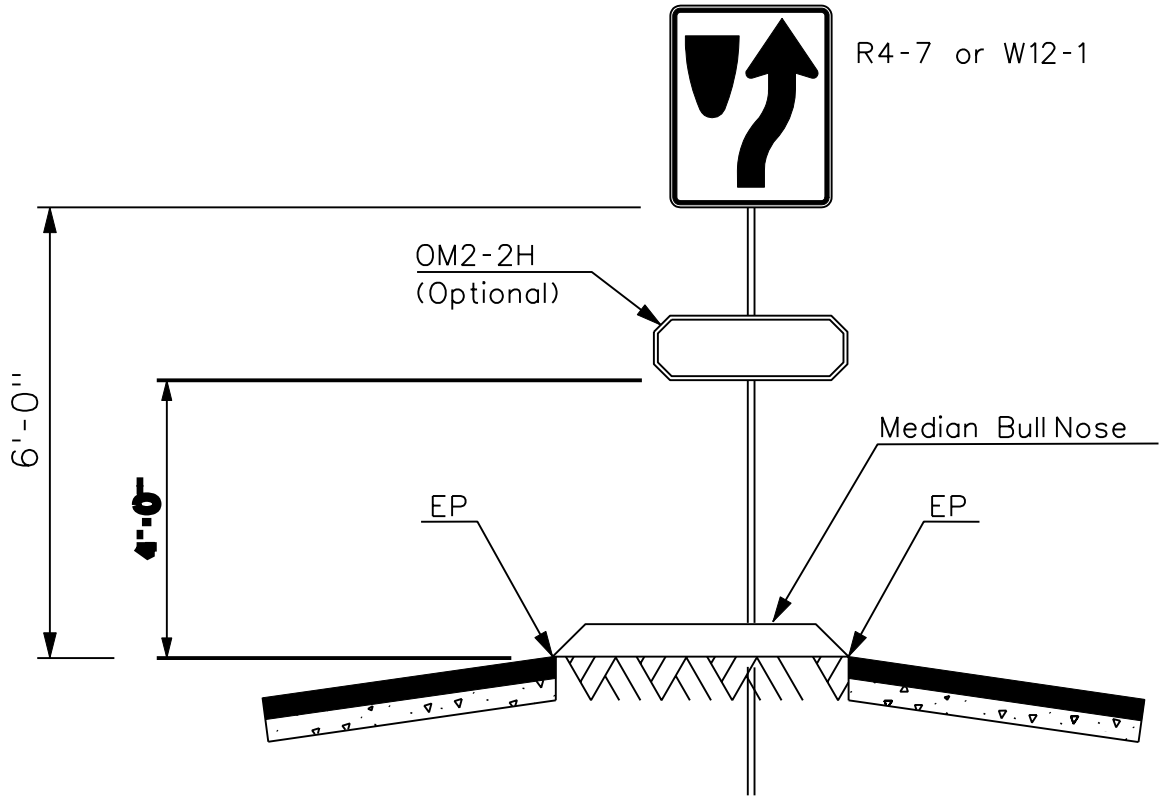


DETAIL 2 - TWO-WAY TRAFFIC
Also See 9-4B, 9-9

Notes

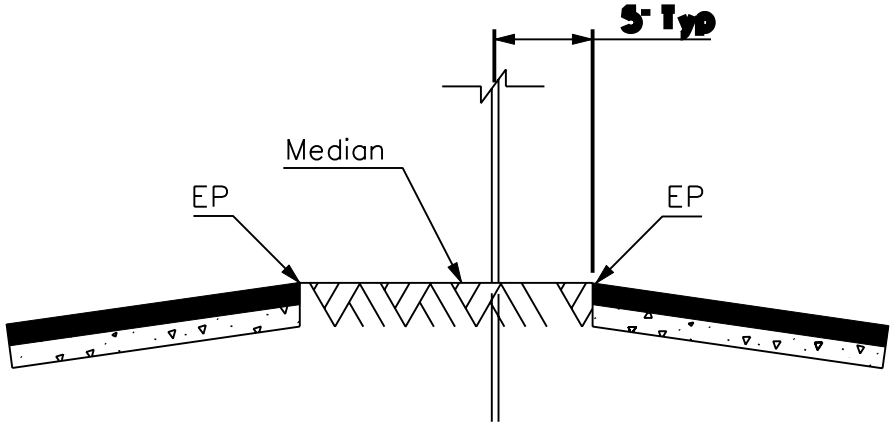
1. Refer to PCDOT and COTDOT Pavement Marking Design Manual for typical line styles and spacing.
2. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.
3. Also, See Sheet 9-9.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Typical Median End Signing Treatment		9-4A



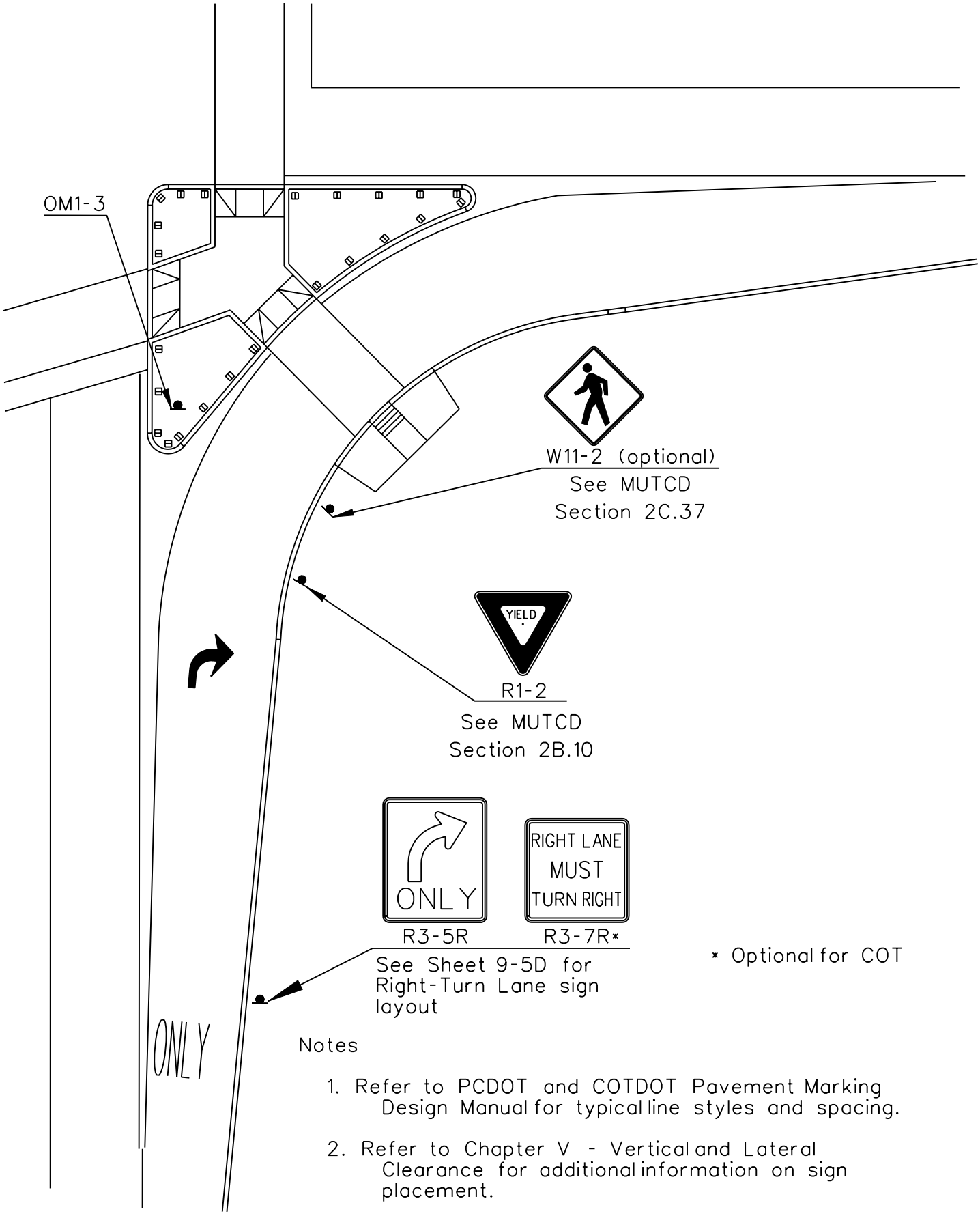
Bull Nose

* Where Attainable



Uncurbed or Curbed Median (Offset)

ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		Typical Median Sign Placement		9-4B

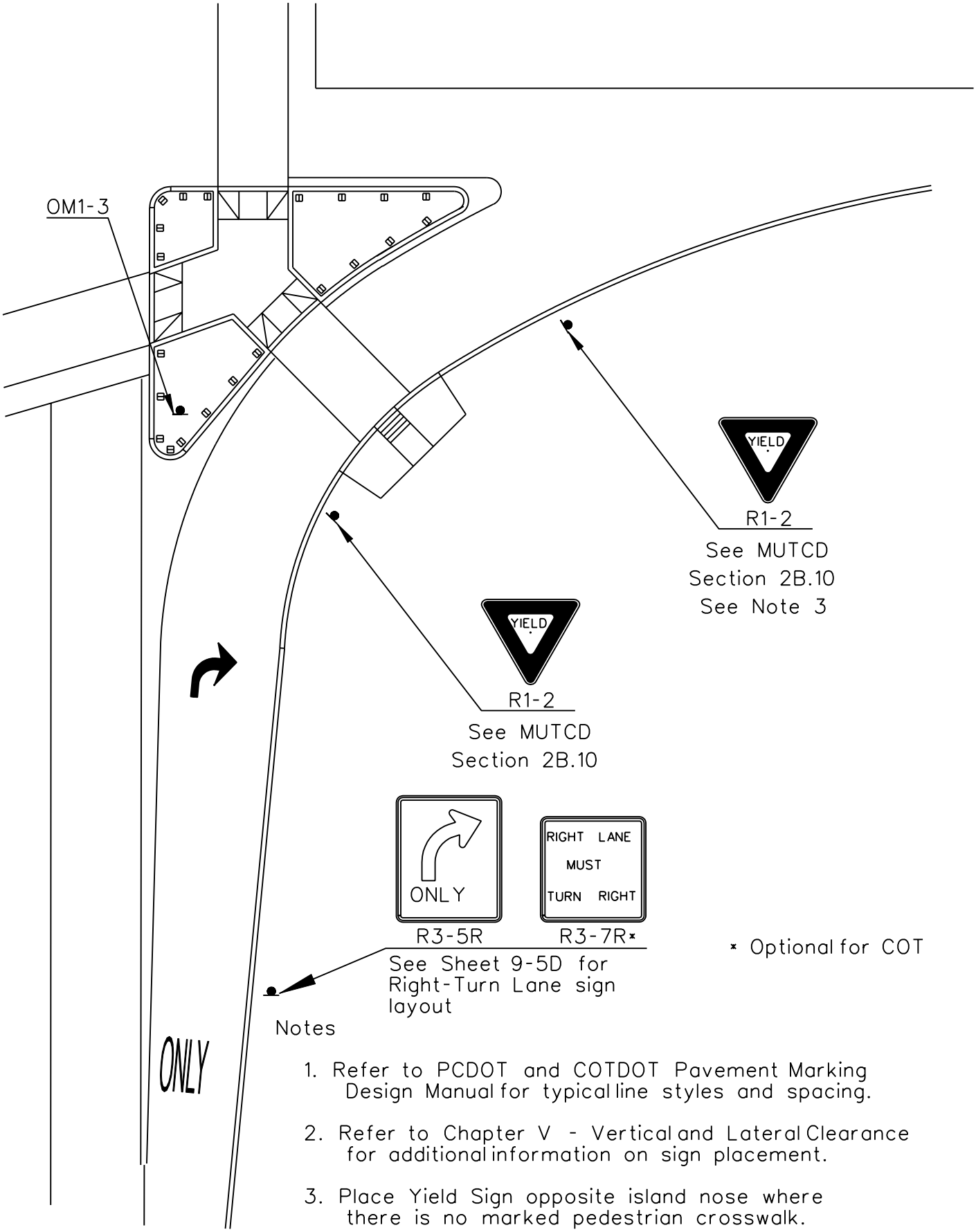


* Optional for COT

Notes

1. Refer to PCDOT and COTDOT Pavement Marking Design Manual for typical line styles and spacing.
2. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Right-Turn Traffic Island Supplemental Signs		9-5A

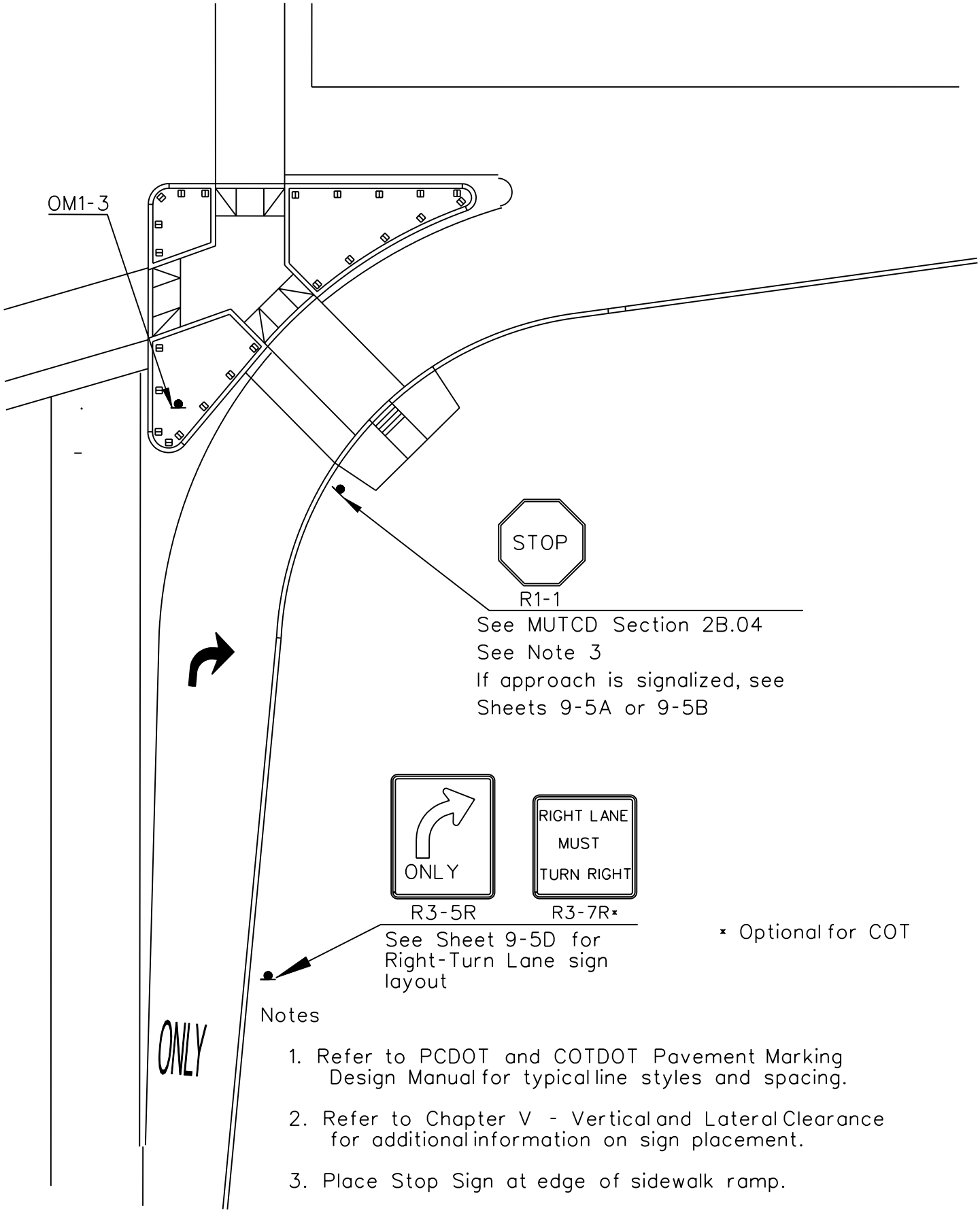


* Optional for COT

Notes

1. Refer to PCDOT and COTDOT Pavement Marking Design Manual for typical line styles and spacing.
2. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.
3. Place Yield Sign opposite island nose where there is no marked pedestrian crosswalk.

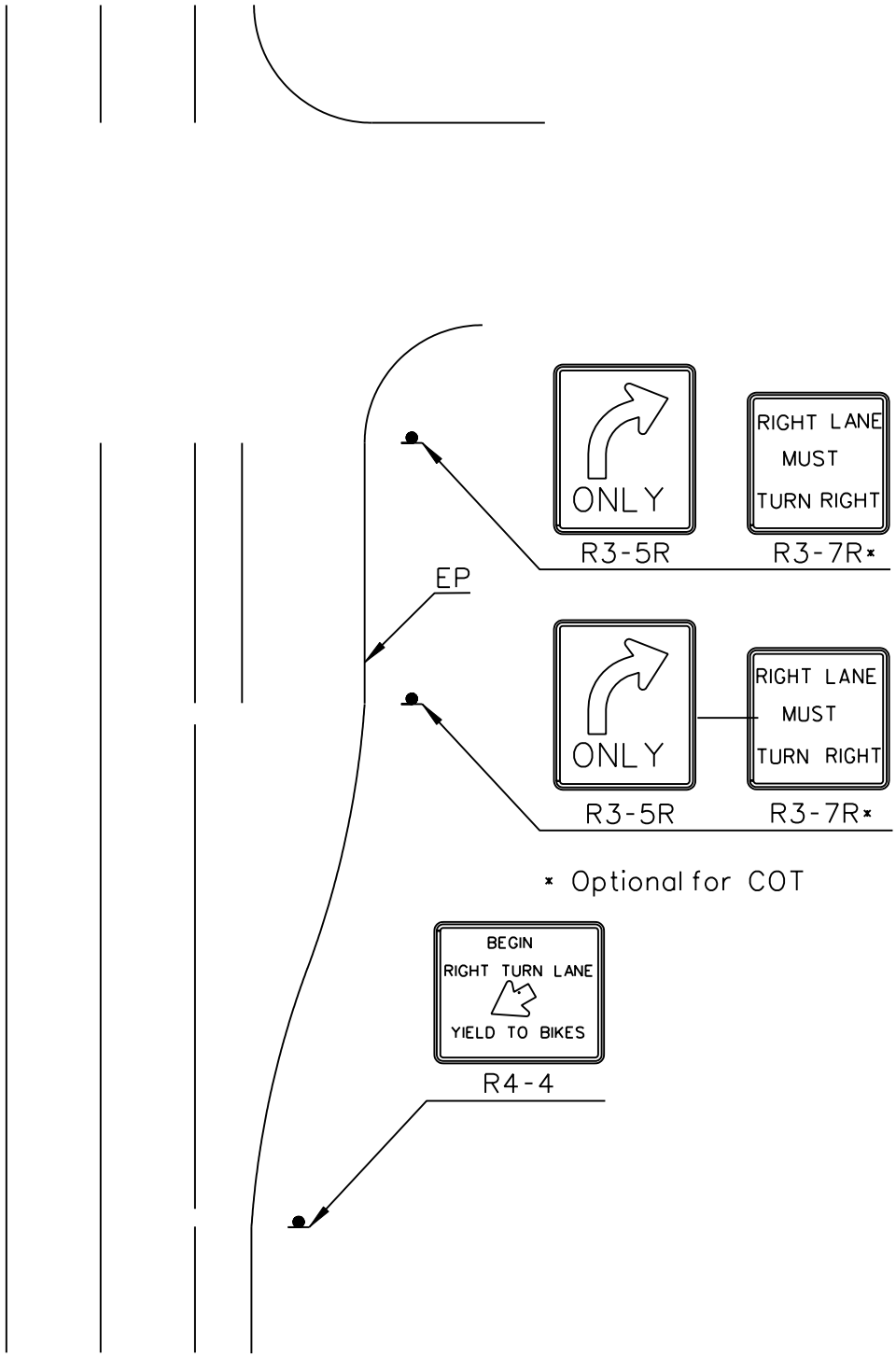
ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Right-Turn Traffic Island Supplemental Signs		9-5B



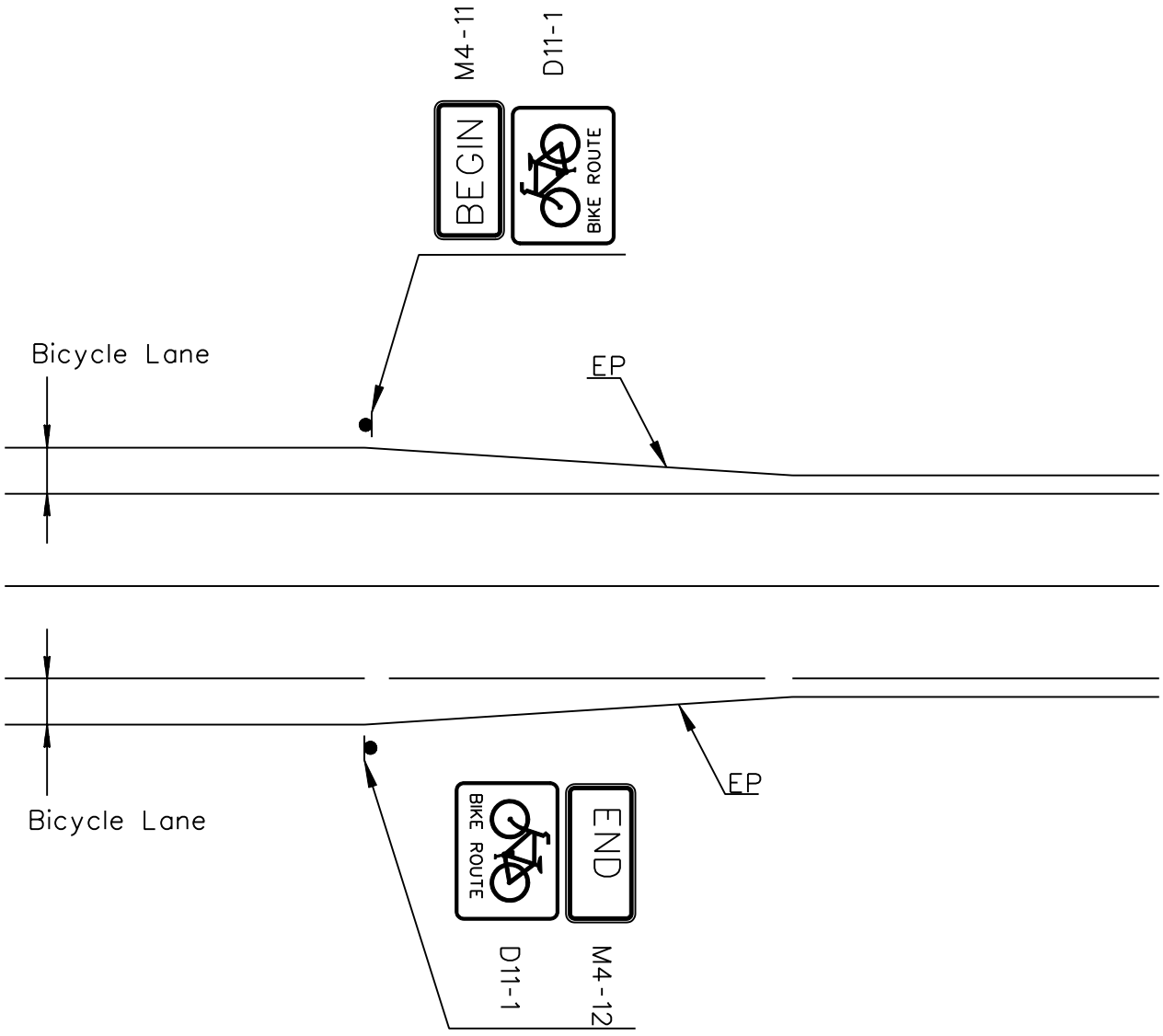
Notes

1. Refer to PCDOT and COTDOT Pavement Marking Design Manual for typical line styles and spacing.
2. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.
3. Place Stop Sign at edge of sidewalk ramp.

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Right-Turn Traffic Island Supplemental Signs		9-5C



ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		9-5D
REVISED		Right Turn Lane with Bicycle Lane Detail		



BICYCLE ROUTE TRANSITION

Notes:

1. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.

ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS Beginning and Ending Bicycle Route Signs		SHEET NO. 9-6

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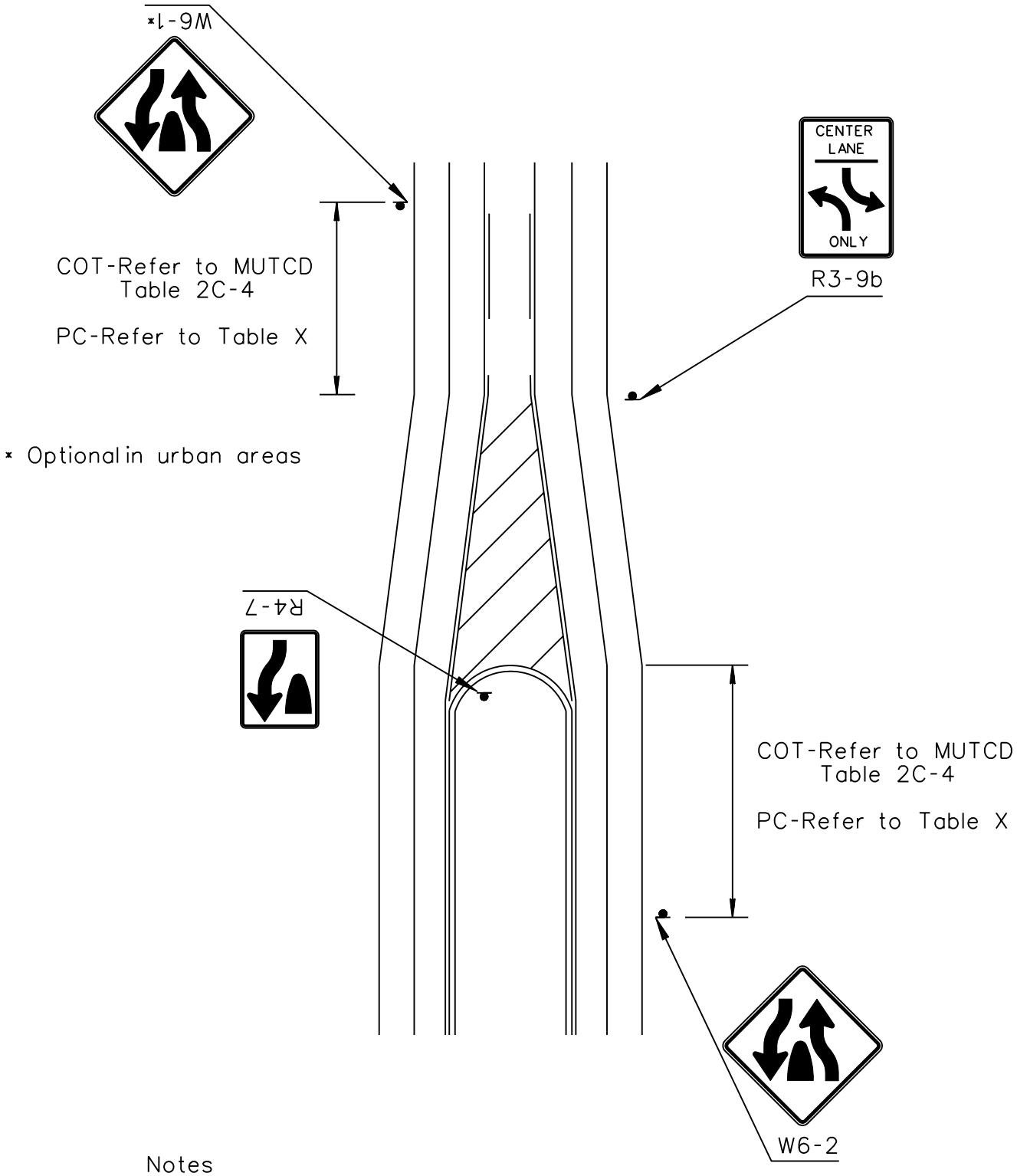
ISSUED REVISED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS Bus Pull-Out with Bicycle Lane Detail		SHEET NO. 9-8

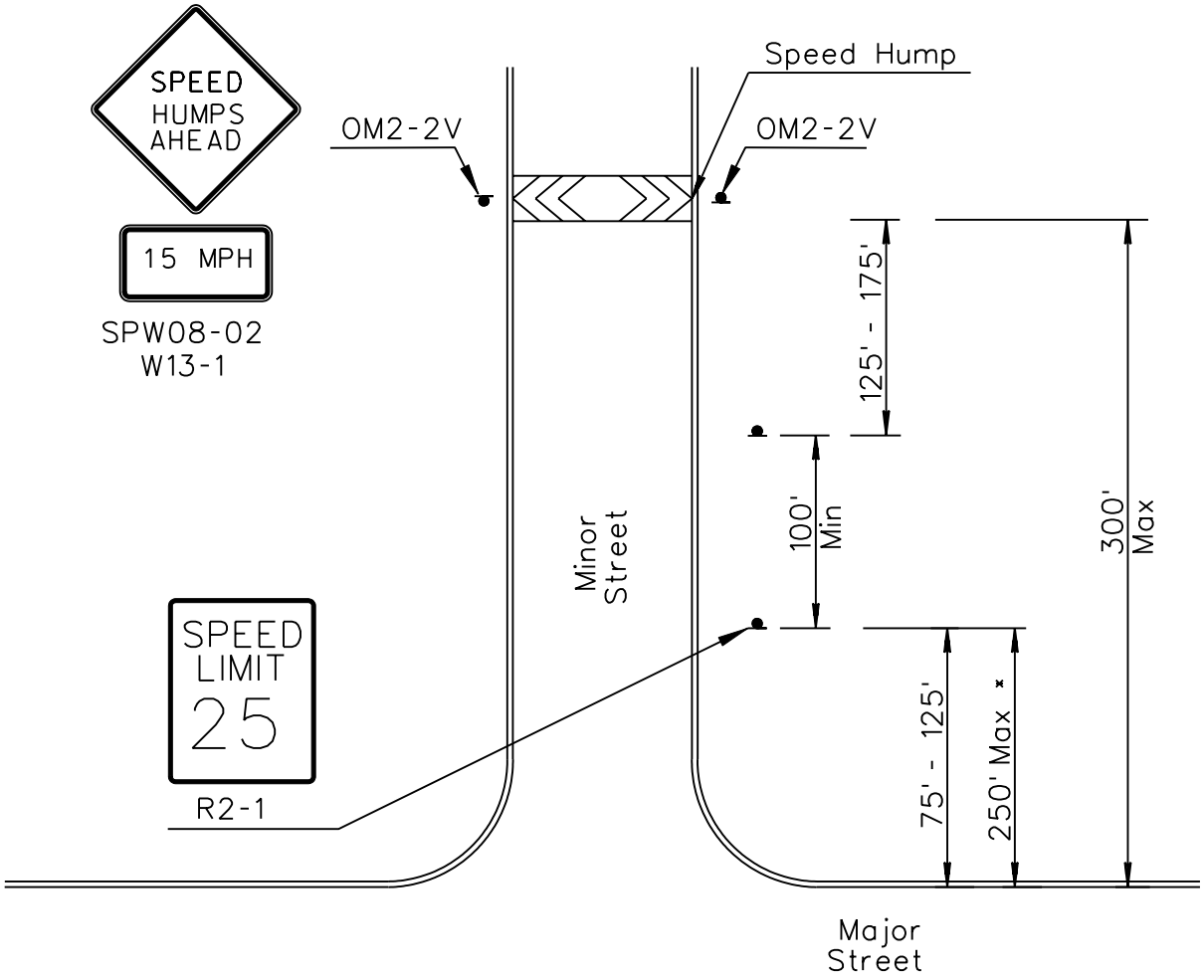


Notes

1. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.

2. When sidewalk is present, locate sign in accordance with Chapter VII - In Special Applications

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Typical Begin and End Treatment of a Divided Roadway Segment		9 - 9



* w/o Hump, Max 250'

Notes

1. Refer to Chapter V - Vertical and Lateral Clearance for additional information on sign placement.

2. When sidewalk is present, locate sign in accordance with Chapter VII - In Special Applications

ISSUED		PCDOT and COTDOT Traffic Engineering Division		SHEET NO.
		SIGNING STANDARDS		
REVISED		Typical Sign Placement for Local Streets w/ and w/o Speed Humps		9 - 10

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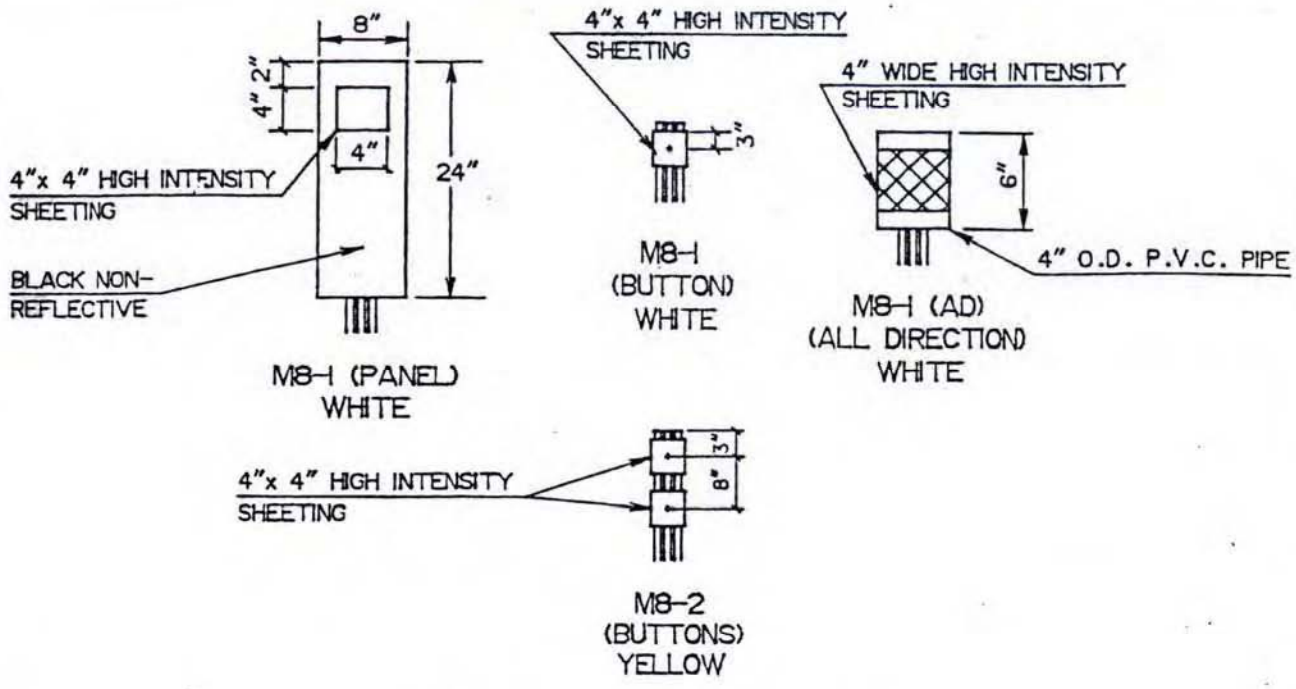
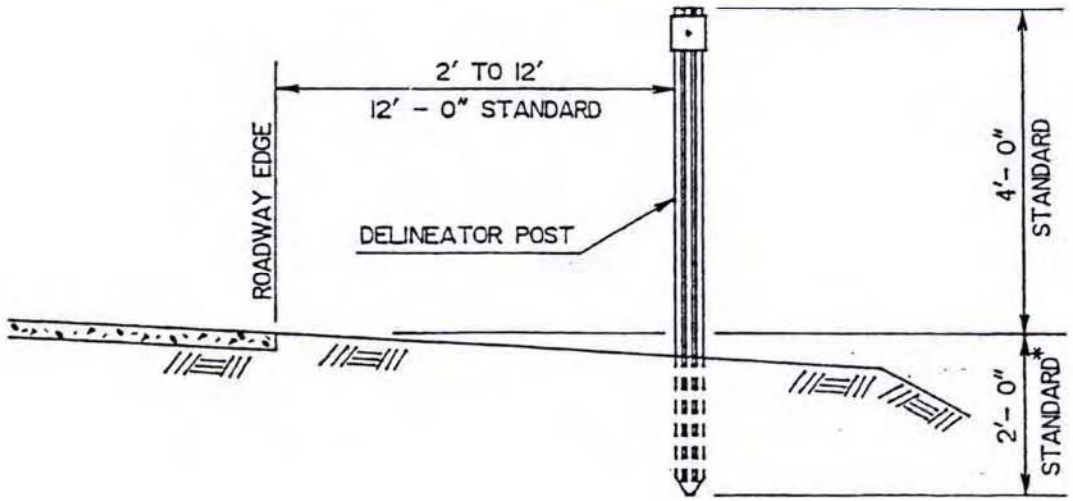


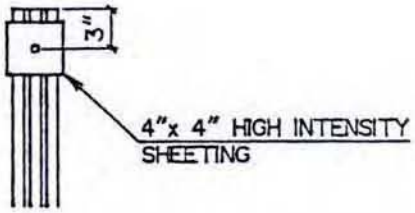
TYPICAL DELINEATOR INSTALLATION



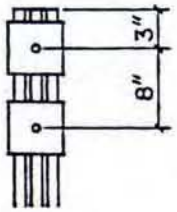
*WHERE ATTAINABLE

NOTE: IF SHOULDER IS TOO NARROW FOR STANDARD PLACEMENT, INSTALL AT EXTREME EDGE OF SHOULDER.

ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		Delineation Standards		9–12

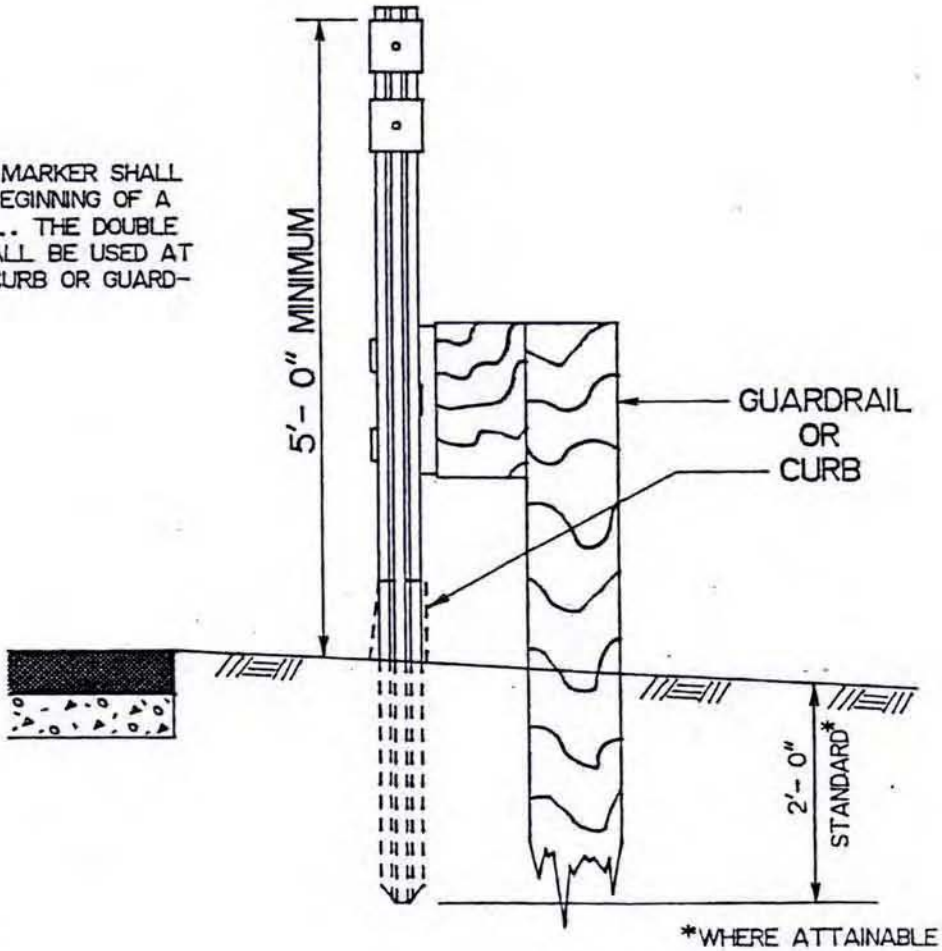


SM-1
GREEN

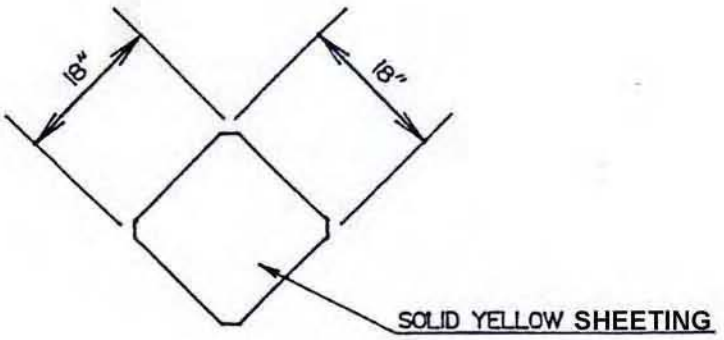


SM-2
GREEN

THE SINGLE GREEN MARKER SHALL BE USED AT THE BEGINNING OF A CURB OR GUARDRAIL. THE DOUBLE GREEN MARKER SHALL BE USED AT THE ENDING OF A CURB OR GUARD-RAIL.

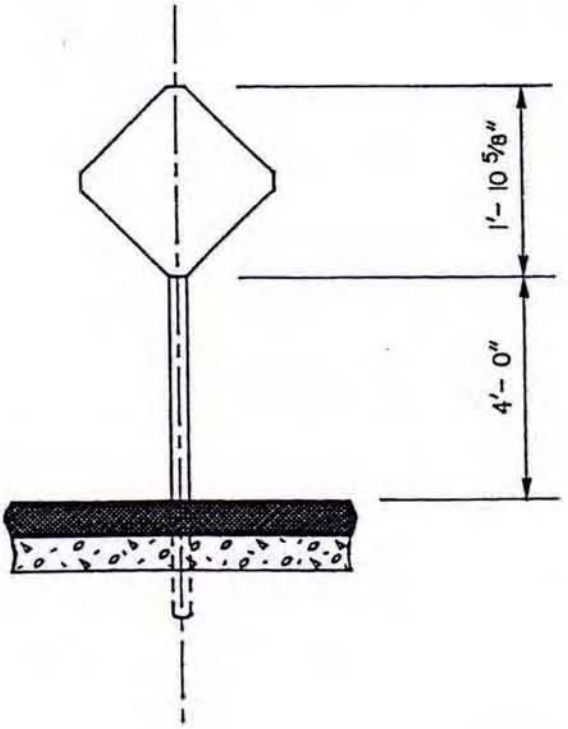


ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		SM-1 and SM-2 Snow Marker Standards		9-13

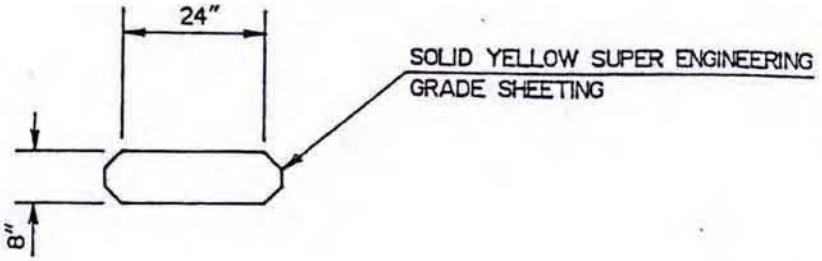


OM1-3

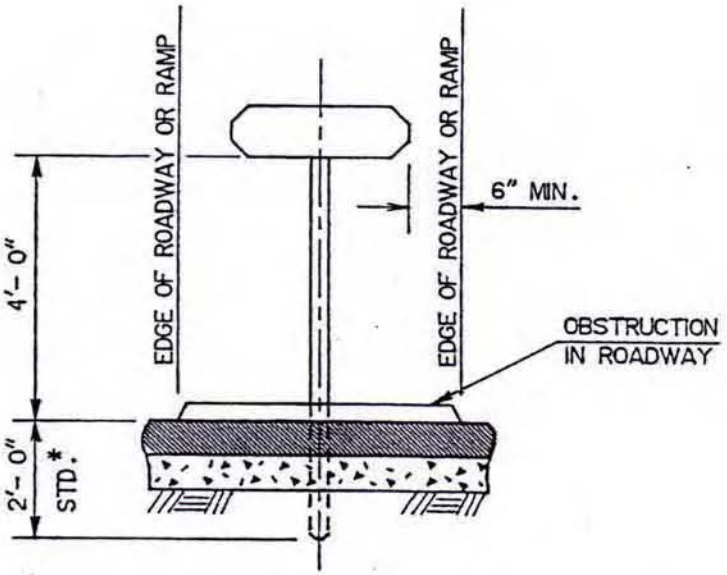
THE OM-1 IS USED TO MARK EXTREME HAZARDS WITHIN THE ROADWAY, SUCH AS TRANSITIONS FROM TWO-WAY ROADWAYS TO DIVIDED ROADWAYS OR AT "T" INTERSECTIONS AS PART OF AN END OF ROADWAY TREATMENT.



ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		OM1-3 Standard		9–14

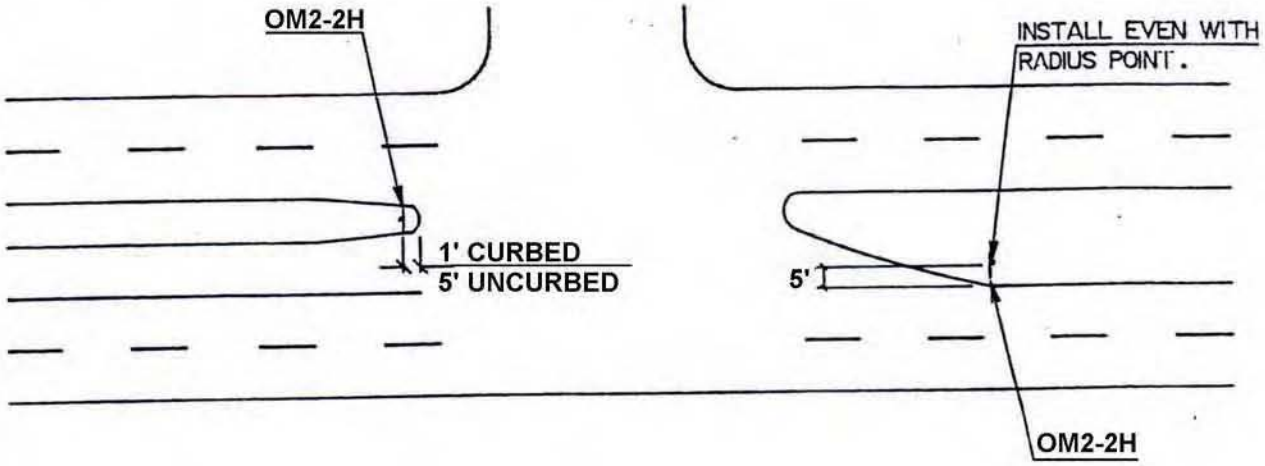


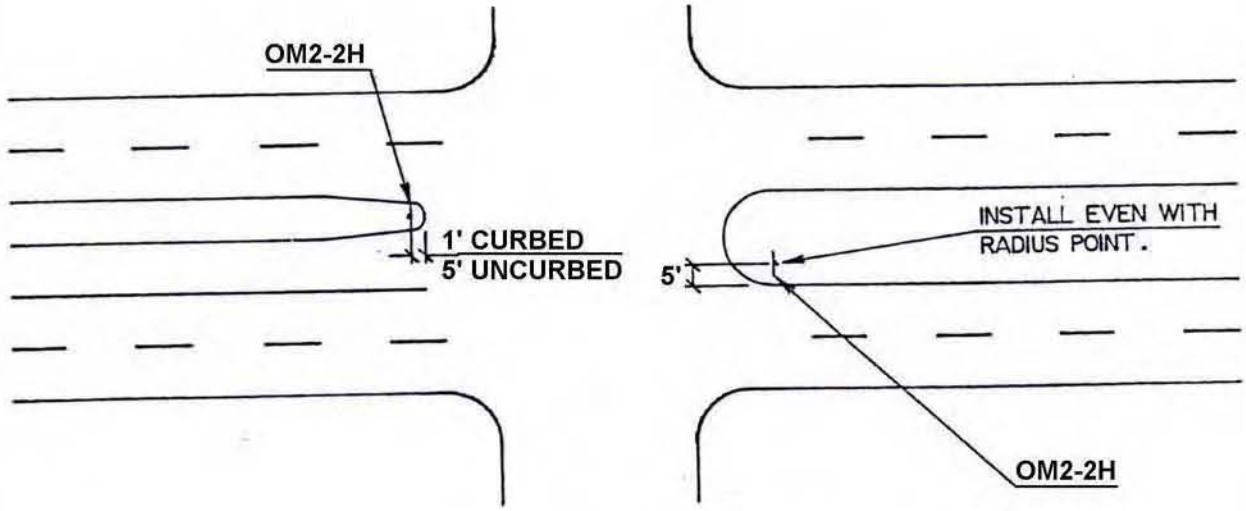
OM2-2H



*WHERE ATTAINABLE

ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		OM2-2H Standard		9–15

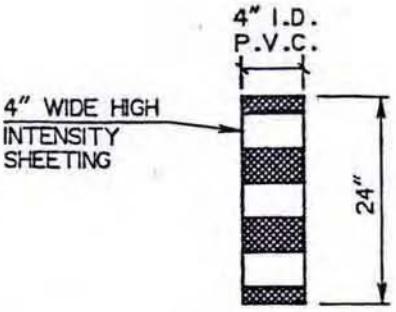




* OPTIONAL FOR COT

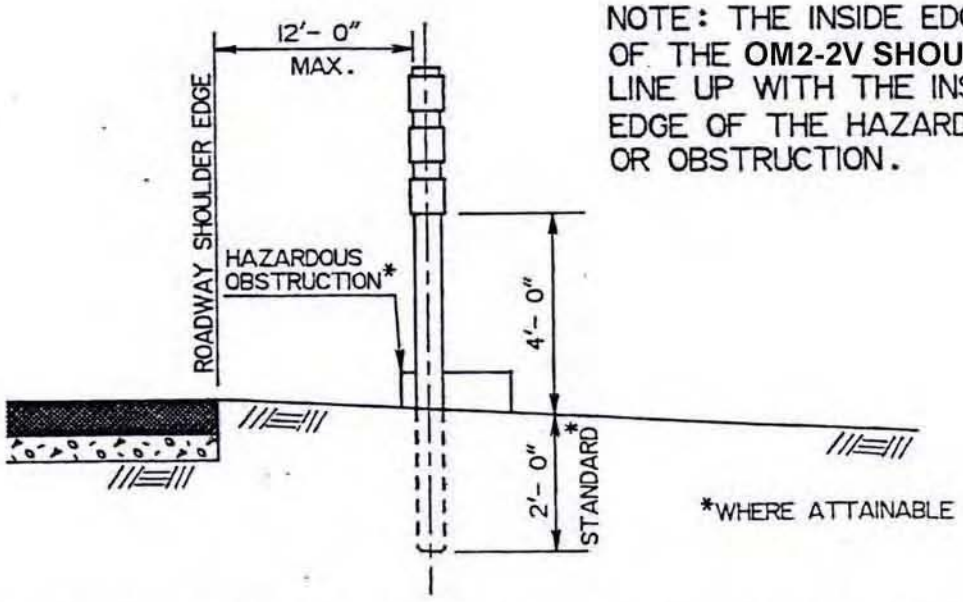
ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		OM2-2H Placement Standard*		9–16

OM2-2V OR OM2-2V(SO)
(BUTTONS) (STICK-ON)
YELLOW



OM2-2V
(PANEL)
YELLOW

OM2-2V(AD)
(ALL DIRECTION)
YELLOW

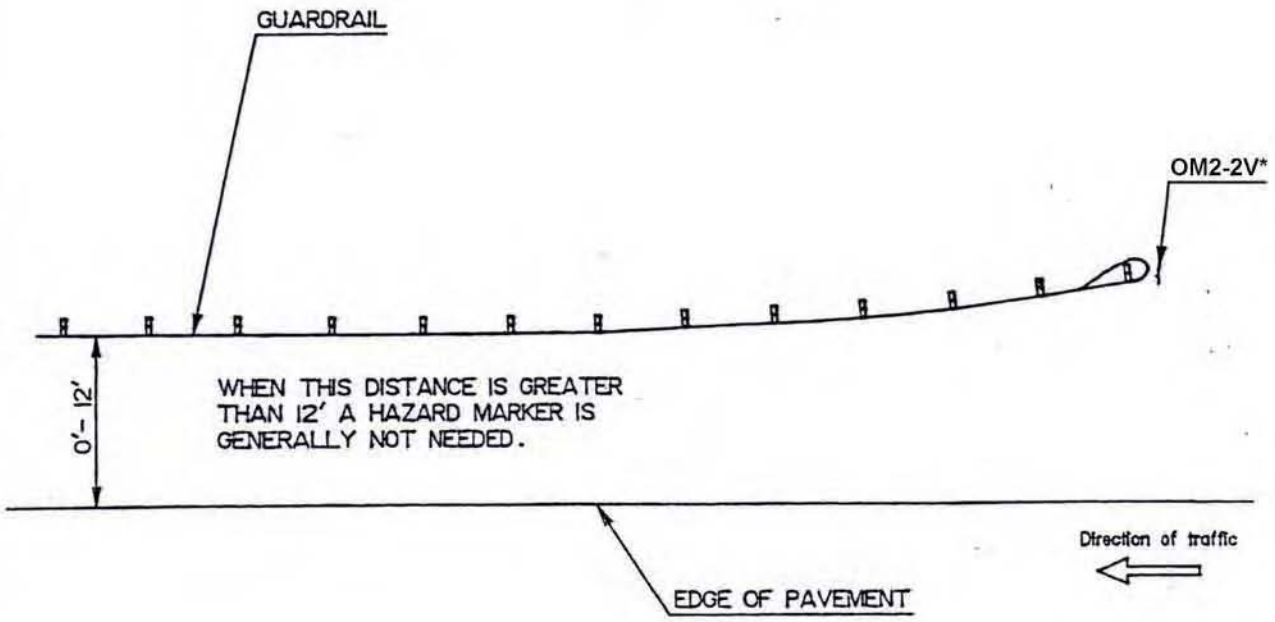


NOTE: THE INSIDE EDGE OF THE **OM2-2V SHOULD** LINE UP WITH THE INSIDE EDGE OF THE HAZARD OR OBSTRUCTION.

* A HAZARDOUS OBSTRUCTION CAN BE AN EROSION DROP-OFF, CULVERT, SERVICE POLE, OR ANY OTHER NON-MOVABLE OBJECT WITHIN THE SHOULDER AREA.

ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		OM2-2V Standard		9–17

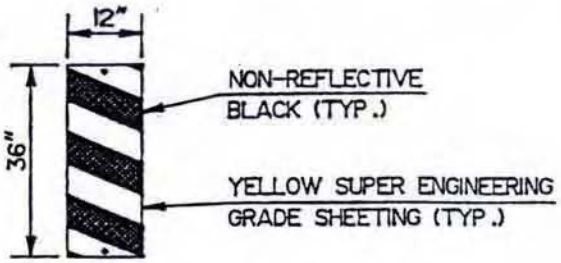
STANDARD OM2-2V LOCATION FOR GUARDRAIL ENDS



NOTE: AN **OM2-2V (SO)**,"STICK ON", IS STANDARD. WHERE THERE IS NO PLACE TO STICK AN **OM2-2V (SO) USE AN OM2-2V OR OM2-2V** (PANEL).

*** OMIT SIGN FOR "GET" END TREATMENT**

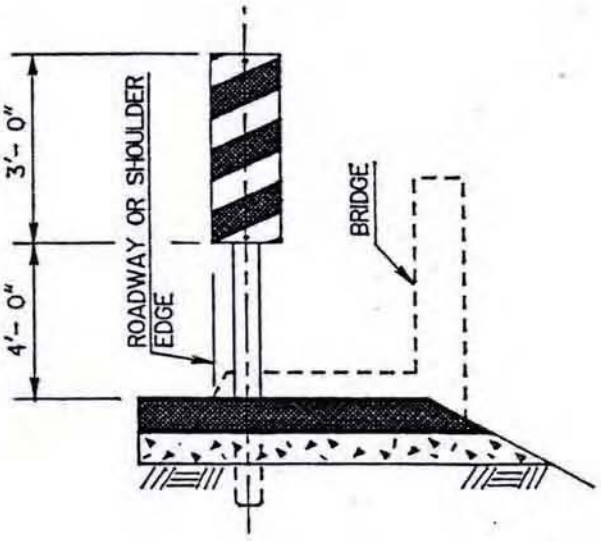
ISSUED		**PCDOT and COTDOT Traffic Engineering Division**		**SHEET NO.**
		SIGNING STANDARDS		
REVISED		**OM2-2V Standard at Guardrail Ends**		**9–18**



OM-3 (L)

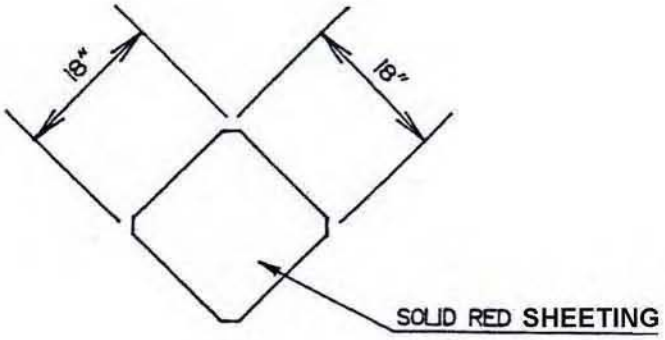
OM-3 (R)

THE OM-3'S STRIPING SHALL SLOPE TOWARD THE SIDE OF THE OBSTRUCTION ON WHICH THE TRAFFIC IS TO PASS.

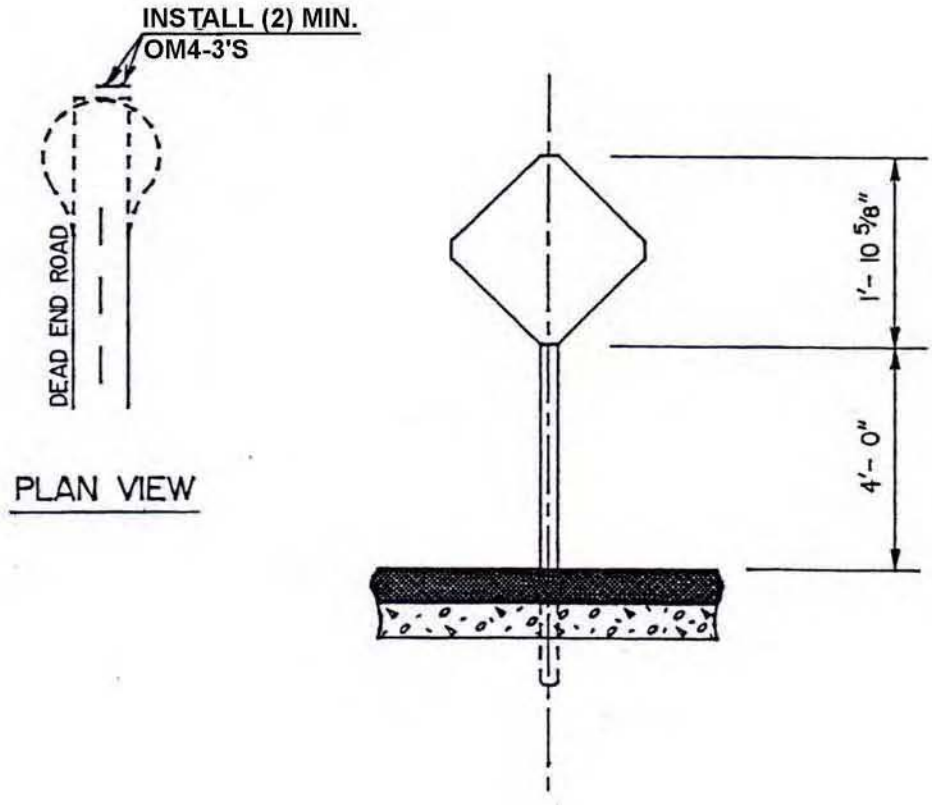


NOTE: THIS MARKER CAN ALSO BE USED AT ANY SEVERE ROADSIDE HAZARD, SUCH AS CATTLEGUARDS, CULVERTS, ROAD EDGE DROP-OFFS, BARRIER ENDS, ETC.

ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		OM-3 Standard		9–19

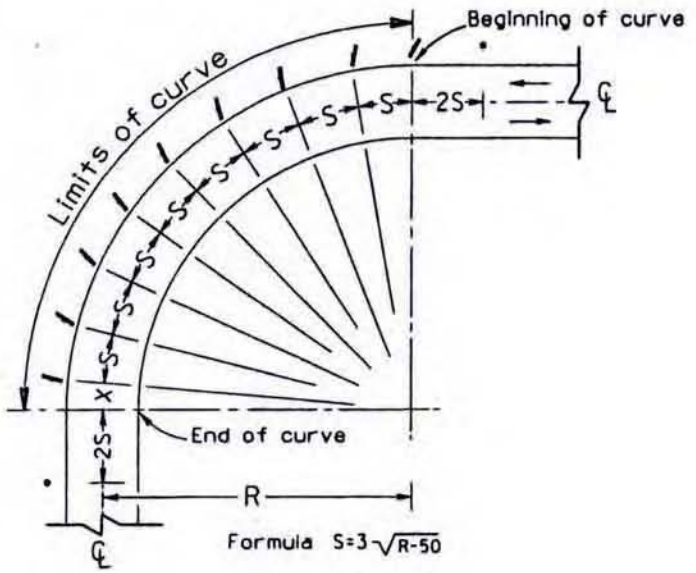


OM4-3



ISSUED		PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS		SHEET NO.
REVISED		OM4-3 Standard		9–20

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-



LEGEND

→ = Direction of travel
| = Chevron delineator
• = Existing delineator
S = Chevron spacing in feet
R = Centerline curve radius in feet
X = Distance from last chevron to the end of curve limits.

CALCULATION NOTES:

1. Maximum spacing for chevron delineators on curves is 160 ft.
2. Minimum spacing for chevron delineators on curves is 20 ft.
3. This design and formula is intended for simple curves only.
4. This formula is designed to present at least three chevrons to the road user at all times.

NOTES:

1. Chevrons should be aimed at the middle of approach lane.
2. Chevrons should be offset a minimum of 2' from the edge of roadway when behind guardrail and should be offset 8' to 12' where there is no guardrail.
3. Chevrons should normally be mounted 5' above pavement but may be adjusted by Engineer to fit conditions.
4. Final placement of chevrons should be checked by Engineer in the field.
5. Chevron installations are not normally installed on new road construction, but are used as replacements for delineators in response to operational problems.

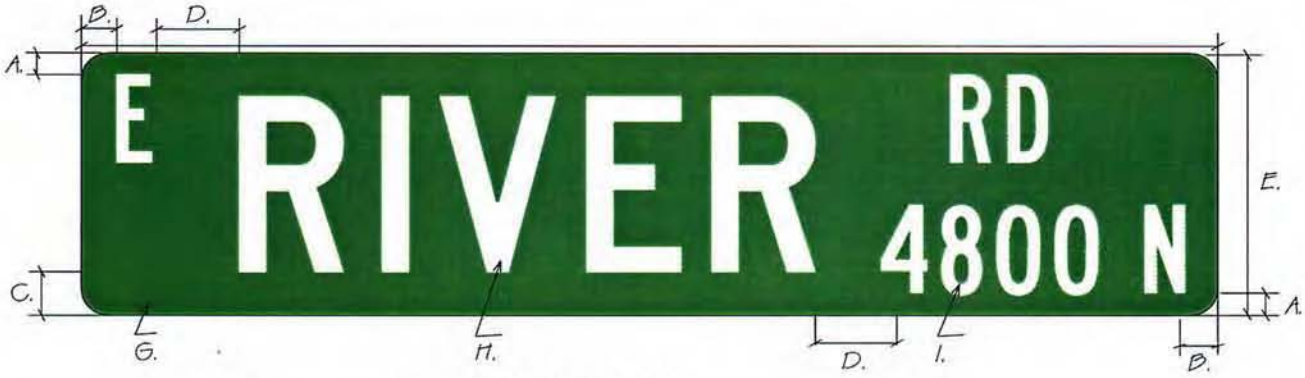
SPACING TABLE		
R (ft)	S (ft)	#
50'	20'	3
75'	20'	4
100'	25'	# 5
150'	30'	3 6
200'	35'	4 6
300'	50'	5 7
400'	55'	6 8
500'	65'	6 8
600'	70'	7 9
700'	75'	8 10
800'	80'	8 10
900'	85'	9 11
1,000'	90'	10 12
1,200'	100'	10 12
1,400'	110'	11 13
1,600'	115'	12 14
1,800'	125'	12 15
2,000'	130'	13 16
2,500'	150'	14 17
3,000'	160'	15 19

NOT TO SCALE

DESIGN APPROVED	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION STANDARD DRAWINGS	REV. 1/01
APPROVED FOR DISTRIBUTION	CURVE TREATMENT - CHEVRONS	9-21

MINIMUM SPACING MEASUREMENTS FOR STREET NAME SIGNS

(D-3)



A. - 1/2"
B. - 3/4"
C. - 1"
D. - 1 1/2"
E. - 6"
F. - SIZE DEPENDING ON LEGEND

G. - BACKGROUND
GREEN TYPE II (SEG)

H. - PRIMARY LETTER SIZE
4"C or 4"B
WHITE TYPE II (SEG)

I. - SECONDARY LETTER SIZE
2"C
WHITE TYPE II (SEG)

NOTE: ABBREVIATIONS, SUFFIXES, AND PREFIXES MUST COMPLY WITH PIMA COUNTY ORDINANCE #1988-2, PAGE 12

ABBREVIATIONS, SUFFIXES, PREFIXES, AND ADDRESSES ON STREET NAME SIGNS INSTALLED IN THE CITY TO BE APPROVED BY THE CITY TRAFFIC ENGINEER.

ISSUED	THE SEAL OF PIMA COUNTY ARIZONA	PCDOT and COTDOT Traffic Engineering Division SIGNING STANDARDS	CITY OF TUCSON ARIZONA	SHEET NO.
REVISED		MINIMUM SPACING MEASUREMENTS FOR STREET NAME SIGNS		9-22

REFERENCES

Arizona Department of Transportation Manual of Approved Signs

Arizona Department of Transportation Signing and Marking Standard Drawings

Federal Highway Administration Standard Alphabet

Manual on Uniform Traffic Control Devices 2000 – Part 2 Signs

APPENDIX A

PROCESS / PROCEDURE GUIDELINES (PPG's)

Section 5	**Signing**	**Effective Date**
5.1	Guide Signing	June 1, 2000
5.2	Lateral Placement of Traffic Signs	September 15, 2001
5.11	Warning Sign Size	July 1, 2001 (DRAFT)
5.12	Traffic Sign Sheeting	March 18, 2002
– –	Square Post Breakaway Base Standards	March 18, 2002

TRAFFIC ENGINEERING DIVISION

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

Process / Procedure Guideline (PPG)

SECTION 5: Signing

SUBJECT 5.1: Guide Signing

EFFECTIVE DATE: June 1, 2000

PARAGRAPH:

1. PURPOSE

To establish a uniform method for Traffic Engineering Division (TED) staff to determine which activity center destinations will be signed with guide signing, and what type of signing will be used.

2. BACKGROUND

Requests for guide signs to activity centers are received by TED staff from the owners of these centers. The owners desire to guide visitors via the County's roadway system, which is growing in complexity and traffic volume each year. At the same time, it is necessary to limit the number of guide signs installed along County roadways so as not to overload the driving public with too many signs, and so as not to detract the drivers' attention from the necessary traffic control signs.

In the past, TED has approached this matter on a case-by-case basis without any criteria to use. As the demand for this type of signing is anticipated to grow, and since it is desirable not to overload the driving public with too many signs, it has become necessary to develop criteria and guidelines for the installation of guide signs.

Research was done on the use of guide signing, and meetings have been held to develop this PPG. At one meeting, representatives of the City of Tucson (COT) and the Arizona Department of Transportation (ADOT) participated in the discussion, and brought information regarding their guidelines and practices. It was felt important to incorporate important criteria by these agencies to effect standardization of practices in Pima County, and to interface our signing with the signing of these agencies to common destinations.

The criteria selected below were based on the following general considerations;

a) Compatibility with guide-signing practices of the COT and ADOT.
b) Simple to understand and apply.
c) Easy to measure.
d) Reasonable and supportable.

Several factors were initially discussed, and grouped into three general priority classifications: high, medium, and low. The criteria described in Section 4 of this PPG were selected among the high and medium categories.

3. DEFINITIONS

Guide Sign – Traffic sign that serves to direct motorists to a specific destination.

Trailblazing Guide Sign - Signs describing a specific activity center by name that are installed periodically along the roadway network to lead a driver from some location to a activity center destination.

Local Guide Sign - Signs describing a generic activity center that are located only at one location or intersection very close to activity center.

"Grand-fathered" Signing - Guide signing that was installed previous to the enactment of this PPG for an activity center that may or may not meet the criteria spelled out in this PPG.

Non-Profit Organization – An organization or business whose financial tax status is established under the tax rules of the Internal Revenue Service.

Tourist – a visitor to or citizen of Pima County who is unfamiliar with the County roadway system and/or the route to an activity center.

MUTCD - Manual On Uniform Traffic Control Devices, FHWA, 1988, or latest edition.

4. DESCRIPTION

A guide signing analysis will be performed in response to receiving a written request from an appropriate representative of the requesting organization.

There are two types of guide signing that may be installed on Pima County roadways if the following criteria are met. In general, both types of guide signing will not be used for a given activity center.

A) Trail-blazing Guide Signing

Criteria 1-7 must all be met to warrant the installation of trail-blazing guide signing for an activity center. Existing signing will remain in place if already approved prior to the implementation of this PPG (see criteria 8).

1. A non-profit organization.
2. A "tourist" destination, visited by a minimum of 100,000 visitors a year.
3. A year-round activity center, open to visitors 12 months of the year.
4. Open to the general public.
5. Conforms to the guide signing practices of the COT and/or ADOT, and the MUTCD.
6. A signed agreement with the requesting organization, including the organization's commitment to pay for all installation and maintenance costs.
7. Location of activity center is not directly on a major arterial, or it is located several miles from a typical origin (i.e.; I-10 or I-19, resort/hotel areas, Tucson International Airport, University of Arizona, etc.).

8. "Grand-fathered" activity center that has authorized signing prior to the effective date of this PPG (maintenance of this signing would be conditional upon execution of a signed agreement).

See the Section 7, Attachment 1 for examples of activity centers that would be approved for trail-blazing guide signing, and those that would not be approved.

See the Section 7, Attachment 2 for specific practices for installing these signs.

B) Local Guide Signing

At least one of the following criteria for a given, specific activity center location must be met to approve the installation of local guide signing:

1. A non-profit or government organization.
2. A destination, employing a minimum of 25 employees, or visited by 100 people per week.

3. Unique local point of interest (geological, geographical, historic, tourist, etc.) not meeting the criteria for Trail-blazing signing)

5. REFERENCES

1) ADOT Traffic Engineering Policies, Guidelines and Procedures Manual, Section 336, Supplemental and Miscellaneous Guide Signing Requests, January, 2000.

2) Public Works Department, City of Battle Creek Michigan, Guidelines for Signing on State Trunkline Highways, April 10, 1980.

3) Federal Highway Administration: Manual on Uniform Traffic Control Devices, 1988.

6. AUTHORIZATION

Originator: _____
Dennis Dalton, Senior Civil Engineering Assistant

County Traffic Engineer: _____
Albert G. Letzkus, P.E.

Director of Transportation: _____
Brooks Keenan, P.E.

7. ATTACHMENTS

See Attachments 1 and 2 on the following pages

file: Traffic I:\Data\PPG Read Only\PPG Guide Signs 050200.doc

ATTACHMENT 1

Examples of Activity Centers Qualifying or Not Qualifying for Trail-blazing Guide Signing

Examples of activity centers that would be approved for trail-blazing guide signing:

- universities and colleges
- major historical sites
- major geographical features
- government complexes
- Tucson International Airport
- regional/Federal/State parks, campgrounds, and recreational areas

Examples of activity centers that would not be approved for trail-blazing guide signing:

- private, for-profit company
- cities, incorporated, or non-incorporated communities
- local parks
- churches (non-historic)
- elementary and high schools (private or public)
- subdivisions

Examples of activity centers that would be approved for local guide signings:

- neighborhoods (approved signing program)
- libraries
- hospitals, emergency health service centers
- County/State/Federal district offices, branches
- local parks
- cities or incorporated communities
- historical landmark

ATTACHMENT 2

Guide Signing Installation Practices

Part A: Trail-blazing Guide Signs

1) Signs placed at recognized travel origins, at route turns, and no closer than every 3 miles on "through" travel links.
2) Sign size will be no larger than 36"(w) x 30"(h).
3) Signs will be placed only on the right side of the roadway.
4) Signs will be placed so as not to interfere with the visibility of other existing signing (traffic control or other pre-existing guide signing).
5) Sign face will be a maximum of two colors, not including the activity center's logo.
6) The requesting organization will provide the logo sheeting, to be of a type compatible with TED's signing material and application processes.

Part B: Local Guide Signs

1) Signs only placed at one location or intersection.
   - At a mid-block location, a maximum of 1 sign per direction of travel.
   - At an intersection, a maximum of 1 sign per approach.
2) Sign size will be no larger than 24"(w) x 30"(w).
3) Signs will be placed only on the right side of the roadway.
4) Signs will be placed so as not to interfere with the visibility of other existing signing (traffic control or other pre-existing guide signing).
5) Sign face will be a maximum of two colors, not including the activity center's logo.
6) The requesting organization will provide the logo sheeting, to be of a type compatible with TED's signing material and application processes.

TRAFFIC ENGINEERING DIVISION

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

Process / Procedure Guideline (PPG)

SECTION 5: Signing

SUBJECT 5.2: Lateral Placement of Traffic Signs

EFFECTIVE DATE: September 15, 2000

PARAGRAPH:

1. PURPOSE

To establish a uniform method for Traffic Engineering Division (TED) staff to laterally locate and install traffic signs in the gravel shoulder area off the roadway edge.

2. BACKGROUND

The TED sign installers handbook, dated June 4, 1992, showed the lateral placement of signs to be 12 feet from the right edge of pavement to the roadside edge of the sign - see Exhibit 1. This placement assumed the road was the standard 24-ft wide rural County roadway, without paved shoulders. However, with the construction of paved shoulders, the 12-ft placement of the signs (interpreted to be from the right edge of the through-lane) resulted in the signs being installed in the central area of the gravel shoulder. This location made it difficult for grader operators to maintain the gravel shoulders, and subjected the sign posts to damage.

With the advent of the new square tubing sign post system to be used by TED, it became necessary to clearly establish the sign locations for both sign crews and for grader operators. The new sign post system utilizes the installation of an

anchor assembly which will facilitate the much quicker reinstallation of a post that is damaged or knocked down. However, because the installation requires more time and materials, it is very important to minimize damaging the anchor assembly during shoulder maintenance operations.

3. DEFINITIONS

Not applicable.

4. DESCRIPTION

Sign posts installed at roadside locations will be located 15 feet to the right of the **painted white edgeline** for all rural roads (no curb and gutter), **with or without paved shoulders.** See Exhibit 2. NOTE: the 15-ft dimension is measured from the painted edgeline (not the edge of pavement), and to the sign post itself (not to the roadside edge of the sign face). Signs installed at/near intersection or gore areas will be located as needed for the particular installation.

For signs with more than one post, the left-most post (closest to the roadway) will be located as per the 15-ft dimension. Other posts will be located to the right, and spaced apart as necessary.

For roads with irregular gravel shoulder widths, signs will be installed to the right of the right painted edgeline as far as practical. The location of nearby trees, obstacles, or utilities also will be factored into the placement of the sign. Communication of potential conflicts along roadsides with irregular shoulders will be the joint responsibility of the Traffic Engineering Division and the Operations Division field foremen or supervisors.

This sign placement applies to all roadside signs, either facing oncoming traffic or opposing traffic. It applies to all types of sign posts, channel or square tubing.

TED sign crews will actively measure the location of the sign post for each installation through the use of a 15-ft measuring device to ensure its proper placement +/- a maximum of 6 inches. Sign posts installed outside this tolerance will be reinstalled.

Grader operators will be provided with a copy of this PPG, and will display Exhibit 2 prominently in the cab of their graders.

5. REFERENCES

1) PCDOT TED Sign Installer's Handbook, dated June 4, 1992.

2) Federal Highway Administration: Manual on Uniform Traffic Control Devices, 1988.

6. AUTHORIZATION

County Traffic Engineer: _____
Albert G. Letzkus, P.E.

Operations Division Manager: _____
David Cummings, P.E.

Signing & Striping Supervisor: _____
Trace Lowe

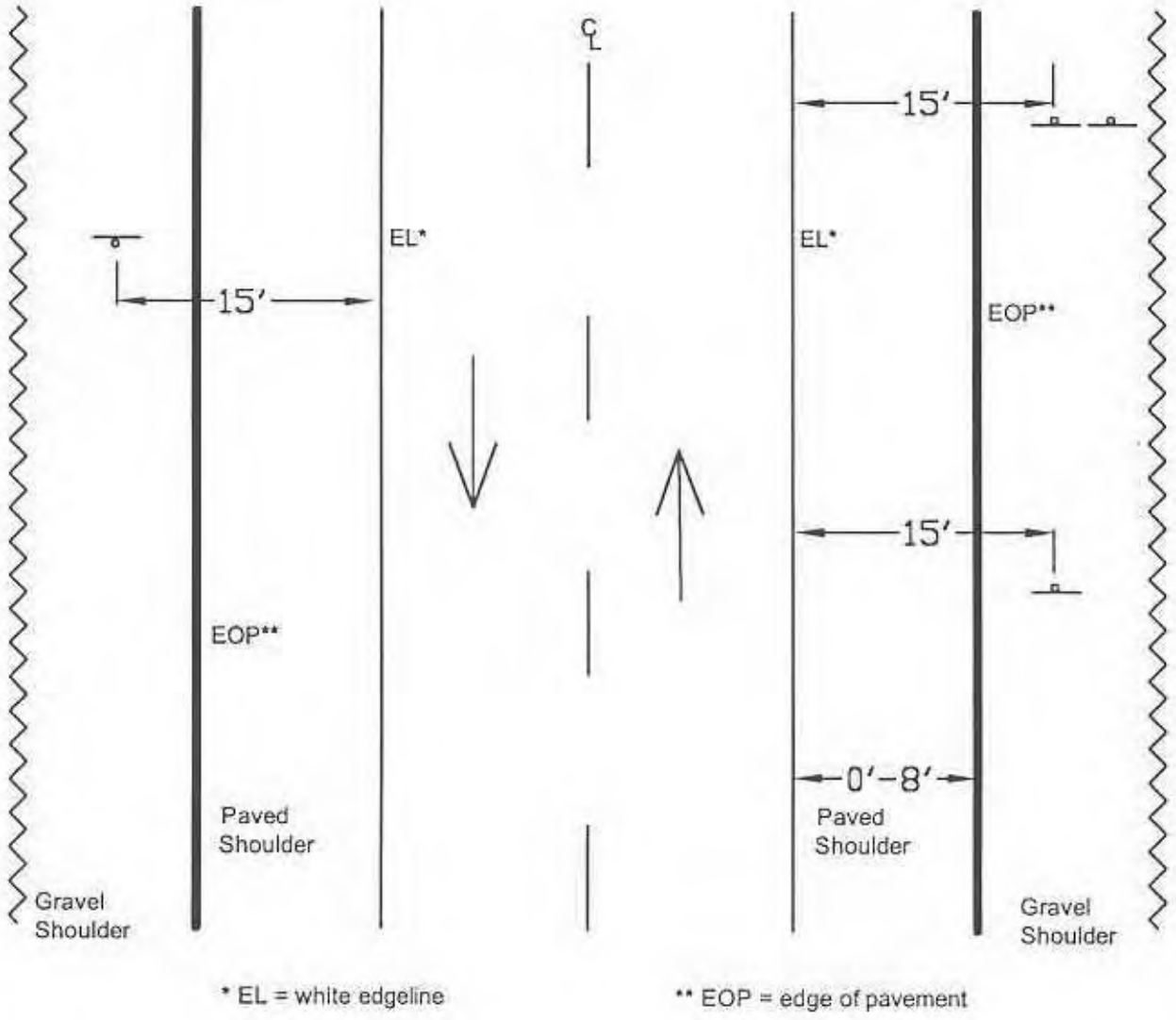
Public Works Manager: _____
Jerry Worrell

Director of Transportation: _____
Brooks Keenan, P.E.

7. ATTACHMENTS

Not applied.

file: Traffic I:\Data\PPGs\PPG Lateral Placement of Traffic Signs 051800.doc



- Place sign post 15 ft from white edgeline for all paved shoulders up to 8 ft in width.
- For multiple-post signs, place closest sign post 15 ft from white edgeline.

Exhibit 2

Lateral Placement of Signs

File name: signplacement.dwg
Originator: D. Silvester, Traf Eng, June 2000

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
DEPARTMENT PROCEDURE

Procedure Number: _____

Effective Date: _____

Approved: _____
Benjamin H. Goff, P.E., Deputy Director

SUBJECT: Warning Sign Size

TRAFFIC ENGINEERING DIVISION

Process / Procedure Guideline (PPG)

DRAFT

SECTION 5: Signing

SUBJECT 5.11: Warning Sign Size

EFFECTIVE DATE: October 1, 2001

PARAGRAPH:
1. **Purpose**
2. **Background**
3. **Definitions**
4. **Description**
5. **References**
6. **Authorization**
7. **Attachment**

1. PURPOSE

To establish a uniform method for Traffic Engineering Division (TED) staff to establish 36" as the standard size for warning signs.

2. BACKGROUND

In the past, TED has approached this matter on a case-by-case basis without any written criteria to use. It has been generally understood that warning signs would be made 30", but no written guidelines were established for staff to use. Many 36"warning signs have been installed. As a result the Pima County roadway system has a mixture of many of sign sizes.

3. DEFINITIONS

Warning Sign: Warning signs call attention to unexpected conditions on or adjacent to a roadway and to situations that might not be readily apparent to road users. Warning signs alert road users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations.

4. DESCRIPTION

This document establishes that 36" should be the standard warning sign for general use on arterial and collector roadways. The use of 30" warning signs should be limited to residential streets with a posted speed limit of 25 mph. The use of larger warning signs should be limited to locations where an engineering study indicates a potential benefit by their use.

5. REFERENCES

Federal Highway Administration: Manual on Uniform Traffic Control Devices, 1988.

6. AUTHORIZATION

Originator: _____
Trace Lowe, Senior Civil Engineering Assistant

County Traffic Engineer: _____
Albert G. Letzkus, P.E.

Deputy Director of Transportation: _____
Benjamin H. Goff, P.E.

7. ATTACHMENTS

N/A

file: Traffic I:\Data\PPG Read Only\PPG Warning Sign Size 100101.doc

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
DEPARTMENT PROCEDURE

Procedure Number: 02-4

Effective Date: March 18, 2002

Approved:

Benjamin H. Goff, Deputy Director

SUBJECT: Traffic Sign Sheeting

TRAFFIC ENGINEERING DIVISION

Process / Procedure Guideline (PPG)

SECTION: 5 Signing

SUBJECT: 5.12 Traffic Sign Sheeting

EFFECTIVE DATE: March 15, 2002

PARAGRAPH:
1. **Purpose**
2. **Background**
3. **Definitions**
4. **Description**
5. **References**
6. **Authorization**
7. **Attachment**

1. PURPOSE

To establish a uniform method for Traffic Engineering Division (TED) staff to determine proper sheeting for Traffic Signs within the Pima County Dept. of Transportation roadway system.

2. BACKROUND

In the past, TED has approached this matter on a case-by-case basis without any written criteria to refer to. As a result, there are too many different types of sheeting used on signs within the same category. This PPG would provide uniformity for sheeting the various categories of Traffic Signs within the County roadway system.

3. DEFINITIONS

Sign Sheeting

The material substrate affixed to a blank sign panel on which the wording or legend message is applied. The sheeting incorporates the retro-reflective properties of the traffic control sign. There are currently six different categories of reflective sheeting listed under ASTM D 4956. The types of sheeting to be used for traffic control signing within Pima County as established by this document will be:
Type II Super Engineering Grade
Type III High Intensity (Encapsulated Glass Bead)
Type IX VIP Diamond Grade

Guide Sign

A guide sign shows route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information.

Warning Sign

Warning signs call attention to unexpected conditions on or adjacent to the roadway and to situations that might not be readily apparent to road users. Warning signs alert road users to road conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations.

Regulatory Sign

Regulatory signs are used to inform road users of selected traffic laws or regulations and indicate the applicability of the legal requirement.

4. DESCRIPTION

This document establishes **minimum** sheeting standards to be used on the following categories:

A. Guide Signs

All guide signs mounted on signal poles or mast arms – Type IX sheeting.
Advance Street Name signs – Type III sheeting.
Route Markers and Trailblazer signs – Type III sheeting.
All other guide signs – Type II sheeting.

B. Warning Signs

All warning signs mounted on signal poles or mast arms – Type IX sheeting.
All S-series (school) signs - Type IX Diamond Grade Fluorescent Yellow-Green
All other warning signs – Type III sheeting.

C. Regulatory Signs

All regulatory signs mounted on signal poles or mast arms – Type IX sheeting.
Parking restriction signing – Type II sheeting.
No Dumping signs, Neighborhood Watch signs – Type II sheeting.
All other Regulatory signs – Type III sheeting.

5. REFERENCES

Federal Highway Administration: Manual on Uniform Traffic Control Devices, 1998.

6. AUTHORIZATION

Originator:

Kurt Brei
Traffic Sign Supervisor

Signing and Striping
Shop Manager:

Trace Lowe

County Traffic Engineer:

Albert G. Letzkus, P.E.

Deputy Director:

Ben Goff, P.E

7. ATTACHMENTS

Not Applicable.

file: Traffic I:\Data\PPG's FINAL\PPG5.12 Traffic Sign Sheeting 01-01-02

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
DEPARTMENT PROCEDURE

Procedure Number: 02-3

Effective Date: March 18, 2002

Approved:

Benjamin H. Goff, Deputy Director

SUBJECT: Square Post Breakaway Base Standards

TRAFFIC ENGINEERING DIVISION

Process / Procedure Guideline (PPG)

SECTION: Signing

SUBJECT: Square Post Breakaway Base Standards

EFFECTIVE DATE: March 01, 2002

PARAGRAPH:
1. **Purpose**
2. **Background**
3. **Definitions**
4. **Description**
5. **References**
6. **Authorization**
7. **Attachment**

1. PURPOSE

To establish standard specifications for square post breakaway base installations. This PPG will provide specifications for use by staff and contractors so that all installations shall be consistent. This will allow future maintenance of such installations to be performed with standardized materials specified herein, regardless of who performed the original installation.

2. BACKGROUND

Square Post breakaway base materials are manufactured in a wide range of types and sizes. Pima County Traffic Signing staff has researched and tested a variety of these materials and has adopted a standardized system of components for use within the Pima County roadway system.

3. DEFINITIONS

Breakaway Base – A traffic control sign support that breaks or yields upon impact.

4. DESCRIPTION

All Square Post Breakaway Bases shall conform to the following specifications:

A. Square Tube Material

1. Fabrication - Components shall conform to the standard specification for hot rolled carbon sheet steel, structural quality, ASTM designation A1011. Square tubes shall be welded directly in the corner by high frequency resistance welding or equal.
2. Finish - All materials shall have a smooth, uniform finish conforming to ASTM A653, G90. It shall be possible to telescope all consecutive sizes of tubing freely, regardless of face orientation, with a minimal amount of play. Standard outside corner radius shall be 5/32 of an inch
3. Holes – Square tube components shall be perforated with holes 7/16 inches in diameter on one (1) inch centers on all four sides, down the entire length of the tube, in true alignment and opposite each other directly and diagonally.
4. Cross Section - Posts shall be 2" x 2" O.D Bases shall be 2 ¼ " x 2 ¼ " O.D. Sleeves shall be 2 ½" x 2 ½" O.D Wall thickness for all components shall be 12 gauge.
5. Length – Post length shall be determined as needed. Bases shall be 30 inches. Sleeves shall be 18 inches.

B. Hardware

All hardware shall conform to ASTM A-153 Galvanize plated or ASTM A-165 Cadmium plated. Bolts to be 3/8" x 3" plated.

C. Concrete

All concrete shall be Class B.

D. Construction

Hole should be a minimum of 8 inches wide and 36 inches deep. A 12" square by 4" deep cap hole shall be centered and formed around the base hole for finishing. Top of cap hole form shall be at finish grade. Sleeve and base shall be telescoped so that the tops of both components are flush and holes in both components are directly in alignment with each other. Sleeve and base component shall be wrapped so that no concrete may penetrate the inside of the components. These components shall be centered in the hole so that the top of the base and sleeve structure is 2 ½" above finish grade. A 2" leveling post should now be slid into the sleeve/base so the structure can be leveled vertically and set for pouring. Concrete is then poured into the surrounding hole to finish grade and allowed to dry for 24 hours. After curing, remove the temporary 2" leveling post. Install the new sign post a minimum of 8" into base/sleeve structure and fasten with 3" x 3/8" bolt and nut. Bolt shall be perpendicular to critical traffic flow.

E. Application

Square Post Breakaway Base structures are to be used in new construction and for upgrading old U-channel installations on Collector and Arterial roadways. Use of Breakaway Base structures on Local roadways shall be at the discretion of the County Traffic Engineering Dept. All locations for Breakaway Base installations are to be approved by the County Traffic Engineering Dept.

5. REFERENCES

6. AUTHORIZATION

Originator:

Kurt Brei
Traffic Sign Supervisor

Signing and Striping
Shop Manager:

Trace Lowe

County Traffic Engineer:

Albert G. Letzkus, P.E.

Deputy Director:

Ben Goff, P.E

7. ATTACHMENTS

file: Traffic I:\Data\PPG's DRAFTS\PPG Square Post Base standards/ Kbrei 021502

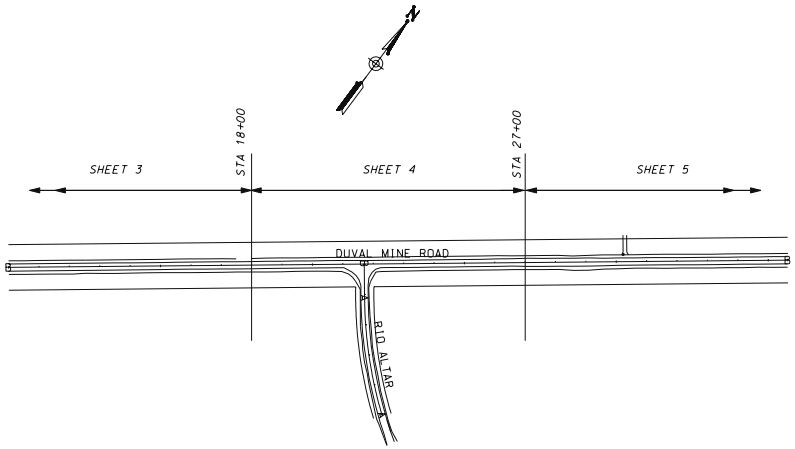
APPENDIX B

SAMPLE PLAN SHEETS

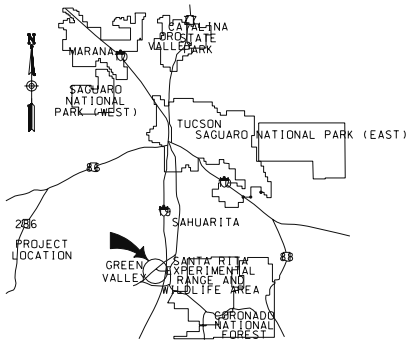
PIMA COUNTY BOARD OF SUPERVISORS
SHARON BRONSON, CHAIR
ANN DAY — DAN ECKSTROM
RICHARD ELIAS — RAYMOND CARROLL
PROJECT IS LOCATED WITHIN SUPERVISOR DISTRICT 4.

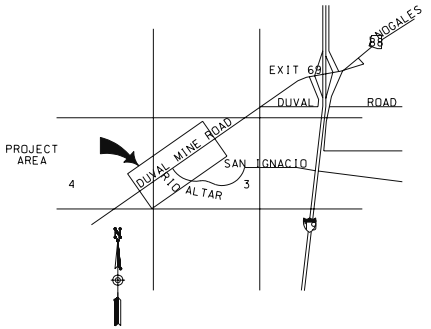
DUVAL MINE ROAD
SIGNING IMPROVEMENT PROJECT
W.O. # XXXXXX

THIS PROJECT REPLACES THE EXISTING SIGNS WITH NEW SIGNS ON DUVAL MINE ROAD AT RIO ALTAR. THE TOTAL LENGTH OF THE PROJECT IS APPROXIMATELY 1976 FEET.



LOCATION PLAN
SCALE: 1" = 200'





VICINITY MAP
SECTION 03, T18S, R13E
G & S R M
PIMA COUNTY, ARIZONA
NTS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	SIGNING NOTES
3-5	SIGNING PLANS

CALL FOR THE BLUE STAKE 1-800-782-5348
Blue Stake Center CALL COLLECT

PRELIMINARY
NOT FOR CONSTRUCTION

COMPANY NAME, ADDRESS
& PHONE NUMBER

NO.	REVISIONS	ENGINEER	DATE
NO.	AS BUILT	ENGINEER	DATE

100% Submittal
04-02

WORK ORDER NO. | W.O. No. XXXXXX

PIMA COUNTY DEPARTMENT OF TRANSPORTATION
AND FLOOD CONTROL DISTRICT
201 N. STONE AVE. TUCSON, ARIZONA 85701
KURT WEINRICH, P.E., DIRECTOR

REVIEWED BY	ENGINEER	DATE
MGR. DESIGN ENGR.		
MGR. FIELD ENGR.		
MGR. TRAFFIC ENGR. DIV.		

APPROVED _____ 20__
DIRECTOR

W.O. No. XXXXXX

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
	ARIZ.				

SIGNING NOTES

1. ALL SIGNS SHALL BE IN COMPLIANCE WITH THE 2000 EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).THE 2002 EDITION OF THE PIMA COUNTY AND CITY OF TUCSON TRAFFIC SIGNING DESIGN MANUAL.THESE PLANS, AND THE SPECIAL PROVISIONS.
2. SIGNS MAY BE MODIFIED AND LOCATIONS ADJUSTED TO FIT CONDITIONS AS DIRECTED BY THE TRAFFIC ENGINEER.
3. POST LENGTHS INDICATED ON SIGN SUMMARY SHEETS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ACTUAL POST LENGTHS.
4. ALL PERFORATED POSTS SHALL BE INSTALLED IN A CONCRETE FOUNDATION.UNLESS OTHERWISE DIRECTED BY THE JURISDICTION TRAFFIC ENGINEER.
5. ALL SIGN STATIONS LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ACTUAL SIGN LOCATIONS WITH THE TRAFFIC ENGINEER PRIOR TO THE INSTALLATION OF ALL SIGNS.
6. ON PIMA COUNTY PROJECTS, ALL WARNING AND REGULATORY SIGNS SHALL BE TYPE III (HIGH INTENSITY) SHEETING,UNLESS OTHERWISE DETERMINED BY THE JURISDICTION TRAFFIC ENGINEER. ALL STREET NAME SIGNS (D3) SHALL BE FABRICATED USING TYPE II (SUPER ENGINEERING GRADE) SHEETING AND ADVANCE STREET NAME SIGNS (TE9) SHALL BE FABRICATED USING TYPE III SHEETING. ALL SCHOOL ZONE SIGNS SHALL BE FLUORESCENT YELLOW-GREEN,DIAMOND GRADE SHEETING. ALL OVERHEAD SIGNS SHALL BE DIAMOND GRADE SHEETING.
7. ALL NEW SIGNS SHALL HAVE ALUMINUM BACKING,UNLESS OTHERWISE SPECIFIED.
8. ALL EXISTING SIGNS TO BE REMOVED AS PART OF THIS PROJECT ARE TO BE DELIVERED TO THE PIMA COUNTY SIGN SHOP AT 1313 S.MISSION (740-2631) THE CONTRACTOR IS RESPONSIBLE FOR UNLOADING THE SALVAGED EQUIPMENT.
9. THE DESIGN SPEED FOR THE ROAD(S) IS 45 MPH. THE POSTED SPEED LIMIT FOR THE ROAD(S) IS 35 MPH. SIGN PLACEMENT SHALL BE BASED ON THE POSTED SPEED LIMIT.

SUMMARY OF SIGN QUANTITY

ESTIMATED QUANTITIES			
ITEM		UNITS	TOTAL QUANTITIES
SIGN SHEETING TYPE	TYPE II	SF	000
	TYPE III	SF	000
	DG	SF	000
SIGN POST	P-1	LF.	000
	P-1 FOUNDATION	EA.	000
	U-CHANNEL	EA.	000

LEGEND

PRELIMINARY
NOT FOR CONSTRUCTION

DUVAL MINE ROAD
INTERSECTION IMPROVEMENT
SIGNING NOTES
W.O. XXXXXX

W.O. 4DMRRA | SHEET 2 OF 5

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT
KURT WEINRICH, P.E., DIRECTOR

	DESIGNED	DRAWN	CHECKED	PROJ. ENGR.
DATE	02-02	02-02	02-02	02-02

DUVAL MINE ROAD
INTERSECTION IMPROVEMENT
SIGNING NOTES
W.O. XXXXXX

NO.	REVISION DESCRIPTION	DIV./SECT.ENGR.	DATE

COMPANY NAME, ADDRESS
& PHONE NUMBER

100% Submittal 04-02

cccccDGNcSPECIFICATIONccccc cccccSYSTIMEccccc

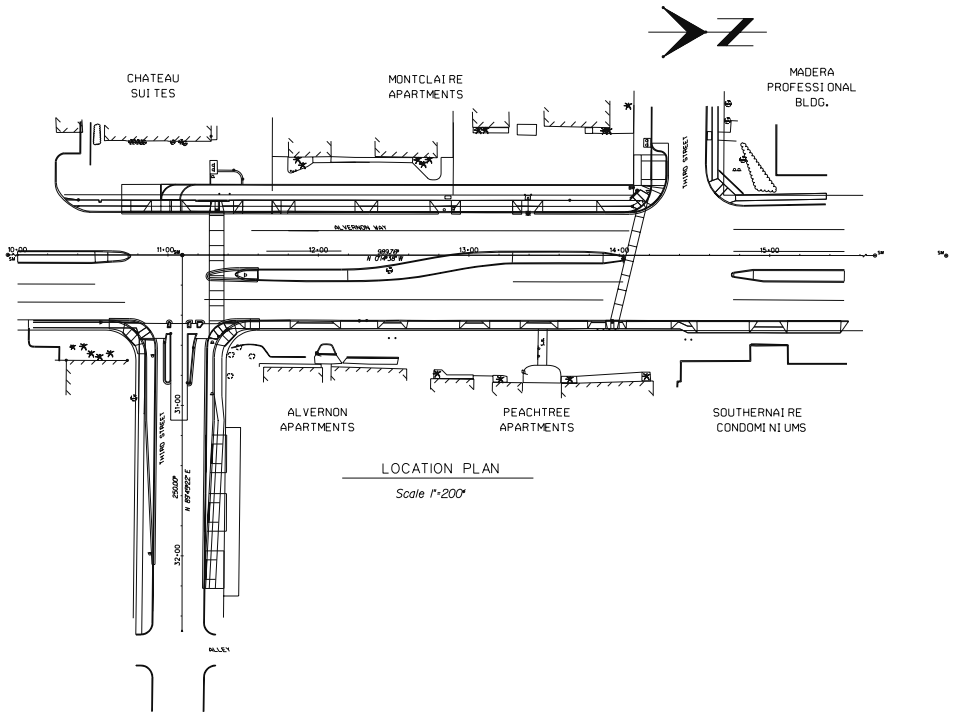
ALVERNON WAY & THIRD STREET
BICYCLE / PEDESTRIAN CROSSING

JOB NO. 0000

SIGNING NOTES

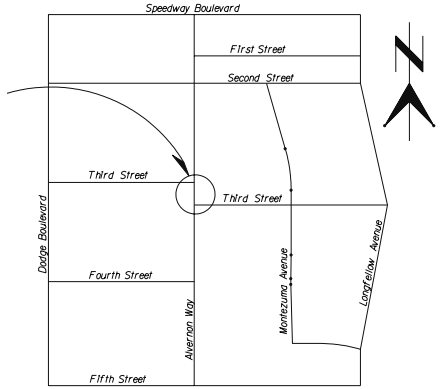
1. All signs shall be in compliance with the 2000 Edition of the Manual on Uniform Traffic Control Devices (MUTCD), the 2002 Edition of the Pima County and City of Tucson Traffic Signing Design Manual, these plans, and the Special Provisions.
2. Signs may be modified and locations adjusted to fit conditions as directed by the Traffic Engineer.
3. Post lengths indicated on sign summary sheets are approximate. The contractor shall verify actual post lengths.
4. All perforated posts shall be installed in a concrete foundation, unless otherwise directed by the jurisdiction Traffic Engineer.
5. All sign stations locations are approximate. The contractor shall verify actual sign locations with the Traffic Engineer prior to the installation of all signs.
6. On City of Tucson projects, all signs panels shall be Type II sheeting.
7. All new signs shall have aluminum backing, unless otherwise specified.
8. All existing signs to be removed as part of this project are to be delivered to the City of Tucson Sign Shop at 4004 S. Park (791-3154). The contractor is responsible for unloading the salvaged equipment.
9. The Design Speed for the road(s) is 40 mph. The posted speed limit for the road(s) is 30 mph. Sign placement shall be based on the posted speed limit.

SHEET INDEX



LOCATION PLAN

Scale 1"=200'



VICINITY MAP

NTS

Sec 9 & 10, T14S, R14E

G&SRM, Pima County, Arizona

LEGEND

Exist		New
⊗	Water Valve	
	Fire Hydrant	
	Sign	
W □	Water Meter	
SM ⊕	Survey Monument	
BM ⊛	Bench Mark	
	TEP Power Pole	
◎	Storm Drain Manhole	

1-800-782-5348

COVER SHEET

NOT FOR CONSTRUCTION

COMPANY NAME, ADDRESS & PHONE NUMBER

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

CITY OF TUCSON

ALVERNON WAY & THIRD STREET
BICYCLE / PEDESTRIAN CROSSING

XXXX SUBMITTAL XX-XX

APPROVALS	SIGNATORY	DATE
DESIGN SECTION/PERMITS AND CODES		
TRAFFIC ENGINEERING		
TRANSPORTATION PLANNING		
ENGINEERING LANDSCAPE ARCH		
ENGINEERING ADMINISTRATOR		

APPROVED _____ 20__

TRANSPORTATION DIRECTOR

DRWN. BY XXXXXX 20 02 | DSGN. BY XXXXXX 20 02 | CHKD. BY XXXXXX 20 02

REF. _____ SCALE: AS NOTED

PLAN NO. _____

1 OF 4

NO.	DATE	REVISION	BY	CHKD.	APPR.

$FILE$ $DATE$ $TIME$

SIGN NO.	STATION	SIGN CODE	W (IN)	H (IN)	SIGN PANEL AREA (S.F.)	SHEETING TYPE	No. POST	POST TYPE	TOTAL POST LENGTH (FT)	REMARKS

NOTES:

1. THE ENGINEER SHALL VERIFY POST LENGHTS AND ELEVATIONS.
2. THE ENGINEER MY SHIFT A SIGN IN ORDER TO ACHIVE A MORE DESIRABLE LOCATION.
3. QUANTITIES ARE APPOXIMATE AND FOR THE CONTRACTOR'S INFORMATION ONLY.

POST TYPES:

PI: SQUARE TUBE POST

U: U-CHANNEL

NOT FOR CONSTRUCTION

XXX% SUBMITTAL XX-XX

NO.	DATE	REVISION	BY	CHKD.	APPR.

SIGN SUMMARY

COMPANY NAME, ADDRESS & PHONE NUMBER

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

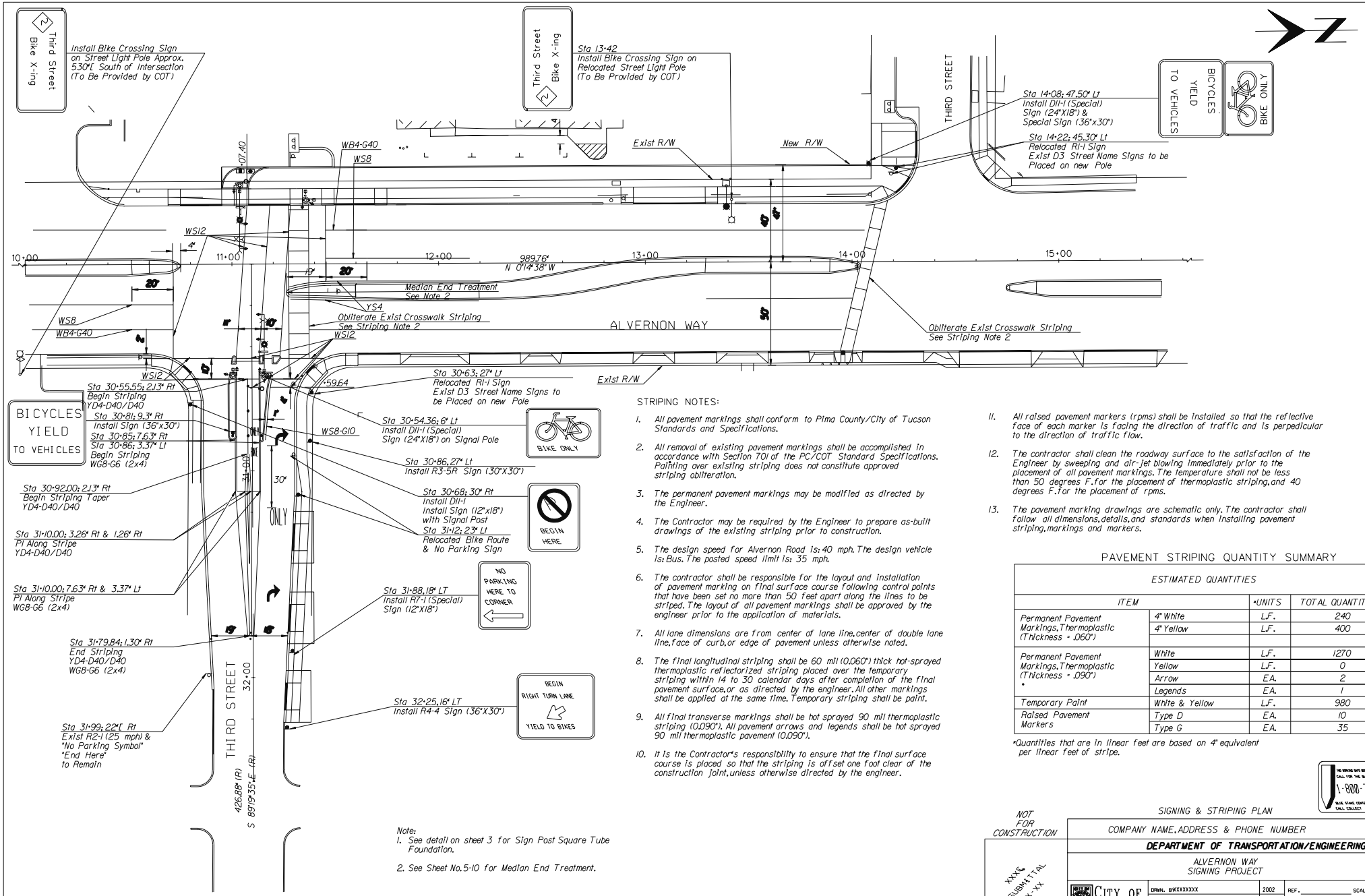
ALVERNON WAY & THIRD STREET
BICYCLE / PEDESTRIAN CROSSING

2 OF 4

CITY OF TUCSON

DRWN. BYXXXXXXXX	2002	REF.	SCALE:
DSGN. BYXXXXXXXX	2002		
CHKD. BYXXXXXXXX	2002	PLAN NO.	

$FILE$ $DATE$ $TIME$



Note:
1. See detail on sheet 3 for Sign Post Square Tube Foundation.
2. See Sheet No. 5-10 for Median End Treatment.

STRIPING NOTES:

1. All pavement markings shall conform to Pima County/City of Tucson Standards and Specifications.
2. All removal of existing pavement markings shall be accomplished in accordance with Section 701 of the PC/COT Standard Specifications. Painting over existing striping does not constitute approved striping obliteration.
3. The permanent pavement markings may be modified as directed by the Engineer.
4. The Contractor may be required by the Engineer to prepare as-built drawings of the existing striping prior to construction.
5. The design speed for Alvernon Road is: 40 mph. The design vehicle is: Bus. The posted speed limit is: 35 mph.
6. The contractor shall be responsible for the layout and installation of pavement marking on final surface course following control points that have been set no more than 50 feet apart along the lines to be striped. The layout of all pavement markings shall be approved by the engineer prior to the application of materials.
7. All lane dimensions are from center of lane line, center of double lane line, face of curb, or edge of pavement unless otherwise noted.
8. The final longitudinal striping shall be 60 mil (0.060") thick hot-sprayed thermoplastic reflectorized striping placed over the temporary striping within 14 to 30 calendar days after completion of the final pavement surface, or as directed by the engineer. All other markings shall be applied at the same time. Temporary striping shall be paint.
9. All final transverse markings shall be hot sprayed 90 mil thermoplastic striping (0.090"). All pavement arrows and legends shall be hot sprayed 90 mil thermoplastic pavement (0.090").
10. It is the Contractor's responsibility to ensure that the final surface course is placed so that the striping is offset one foot clear of the construction joint, unless otherwise directed by the engineer.
11. All raised pavement markers (rpms) shall be installed so that the reflective face of each marker is facing the direction of traffic and is perpedicular to the direction of traffic flow.
12. The contractor shall clean the roadway surface to the satisfaction of the Engineer by sweeping and air-jet blowing immediately prior to the placement of all pavement markings. The temperature shall not be less than 50 degrees F. for the placement of thermoplastic striping, and 40 degrees F. for the placement of rpms.
13. The pavement marking drawings are schematic only. The contractor shall follow all dimensions, details, and standards when installing pavement striping, markings and markers.

PAVEMENT STRIPING QUANTITY SUMMARY

ESTIMATED QUANTITIES

ITEM		*UNITS	TOTAL QUANTITIES
Permanent Pavement Markings, Thermoplastic (Thickness = .060")	4" White	L.F.	240
	4" Yellow	L.F.	400
Permanent Pavement Markings, Thermoplastic (Thickness = .090") *	White	L.F.	1270
	Yellow	L.F.	0
	Arrow	EA.	2
	Legends	EA.	1
Temporary Paint	White & Yellow	L.F.	980
Raised Pavement Markers	Type D	EA.	10
	Type G	EA.	35

*Quantities that are in linear feet are based on 4" equivalent per linear feet of stripe.

NOT FOR CONSTRUCTION

XXXX SUBMITTAL XX-XX

NO.	DATE	REVISION	BY	CHKD.	APPR.

SIGNING & STRIPING PLAN

COMPANY NAME, ADDRESS & PHONE NUMBER

DEPARTMENT OF TRANSPORTATION/ENGINEERING DIVISION

ALVERNON WAY
SIGNING PROJECT

SHEET 4 OF 4

CITY OF TUCSON

DRWN. BWXXXXXXX	2002	REF.
DSGN. BWXXXXXXX	2002	SCALE 1" = 20'
CHKD. BWXXXXXXX	2002	PLAN NO.

$FILE$ $DATE$ $TIME$

Sign Number	Sign Code	Work: New	Work: Existing: Replace Panel	Work: Existing: Overlay Panel	Work: Existing: Relocate	Work: Existing: See Remarks	Offset (ft)	Panel: Legend	Panel: Width (ft)	Panel: Height (ft)	Panel: Area (sq. ft.)	Panel: Type	Panel: Min Sheeting Type	Panel: Bid Item Number	Ground Mounted: Foundations	Ground Mounted: Posts: Type	Ground Mounted: Posts: Total length (ft)	Ground Mounted: New Slipbases	Ground Mounted: Retrofit Slipbases	Ground Mounted: Stringer Type	Ground Mounted: Stringer Length (ft)	Overhead: Structure Type	Overhead: Number of Lights	Location / Remarks
1	R1-1	X						STOP	3	3	9	RWM	3		1	P1	12							SH 292+90
		X						STREET NAME: N SHANNON RD 2900 W	3	0.5	1.5		2											FORMAT BY PCDOT
2		X						INA ROAD	3	2	6		2		1	P1	10							FORMAT BY PCDOT SH 295+50
3	R1-1	X						STOP	3	3	9	RWM	3		1	P1	12							SH 295+00
		X						STREET NAME: N SHANNON RD 2900 W	3	0.5	1.5		2											FORMAT BY PCDOT
		X						STREET NAME: W MAXIMILLIAN PL 7100 N	3	0.5	1.5		2											FORMAT BY PCDOT
		X						NO OUTLET RIGHT ARROW SYMBOL	3	0.5	1.5		2											FORMAT BY PCDOT
4	R2-1(45)	X						SPEED LIMIT 45	2	2.5	5	RWM	3		1	P1	10							SH 295+00
5	R3-9B	X						CENTER LANE TWO-WAY TURN ONLY	2	2.5	5	RWM	3		1	P1	10							SH 296+40
6		X						ADOPT A ROADWAY: LES GIFFORD					2		2	P1	20							SH 297+50 SUPPLIED BY PCDOT
7	W4-2R	X						RIGHT LANE MERGE SYMBOL	3	3	9	RWM	3		1	P1	20							SH 298+80
8	SP04-03	X						DUAL LEFT TURN ARROW SYMBOL, NO U TURN	2.5	2.5	6.3	RWM	3											MOUNT ON MAST ARM
9	R10-5L	X						LEFT ON GREEN ARROW ONLY	2	2.5	5	RWM	3											MOUNT ON MAST ARM
10	R10-5L	X						LEFT ON GREEN ARROW ONLY	2	2.5	5	RWM	3											MOUNT ON MAST ARM
11	R13-6	X						BIKE ROUTE W/SYMBOL	2.5	2.5	6.3	RWM	3		1	P1	10							SH 11+15
		X						BEGIN	2.5	1	2.5		3											
12	R8-3A	X						NO PARKING SYMBOL	2	2	4	RWM	3		1	P1	10							SH 12+00
13	R2-1(35)	X						SPEED LIMIT 35	2	2.5	5	RWM	3		1	P1	10							SH 14+50
14	R3-9B	X						CENTER LANE TWO-WAY TURN ONLY	2	2.5	5	RWM	3		1	P1	10							SH 15+20
15		X						BEGIN RIGHT TURN LANE DOWN ARROW SYMBOL	2.5	2.5	5		3		1	P1	10							SH 14+80
16		X						INA ROAD	3	0.5	1.5		2		1	P1	10							SH 13+90 FORMAT BY PCDOT

ABBREVIATIONS:
SH - SHANNON ROAD STATIONING
IN - INA ROAD STATIONING

NOTE: ALL PI POSTS SHALL BE SINGLE SQUARE TUBE POST, 2 INCH.

Notes:
1. The engineer shall verify post lengths and elevations.
2. The engineer may shift a sign in order to achieve a more desirable location.
3. Quantities are approximate and for the contractor's information only.

$DATE$ $FILE$

Panel Types:
- RWM: Regulatory, Warning, or Marker
- F-DA: Flat-sheet aluminum with direct applied or silk-screened characters
- F-Dem: Flat-sheet aluminum with demountable characters
- Ext: Aluminum extrusions
- Incr: Aluminum sheet increment
- Over: Overhead (New overlaid extrusions)

Stringer Types:
- P: Square-tube post
- T: T-section (WT 3x6)

SIGNING PLAN SUMMARY

SHANNON ROAD
INA ROAD TO MAGEE ROAD
PIMA COUNTY W.O. # XXXXXX

SCALE N.T.S.

SHEET SN9 OF SN15

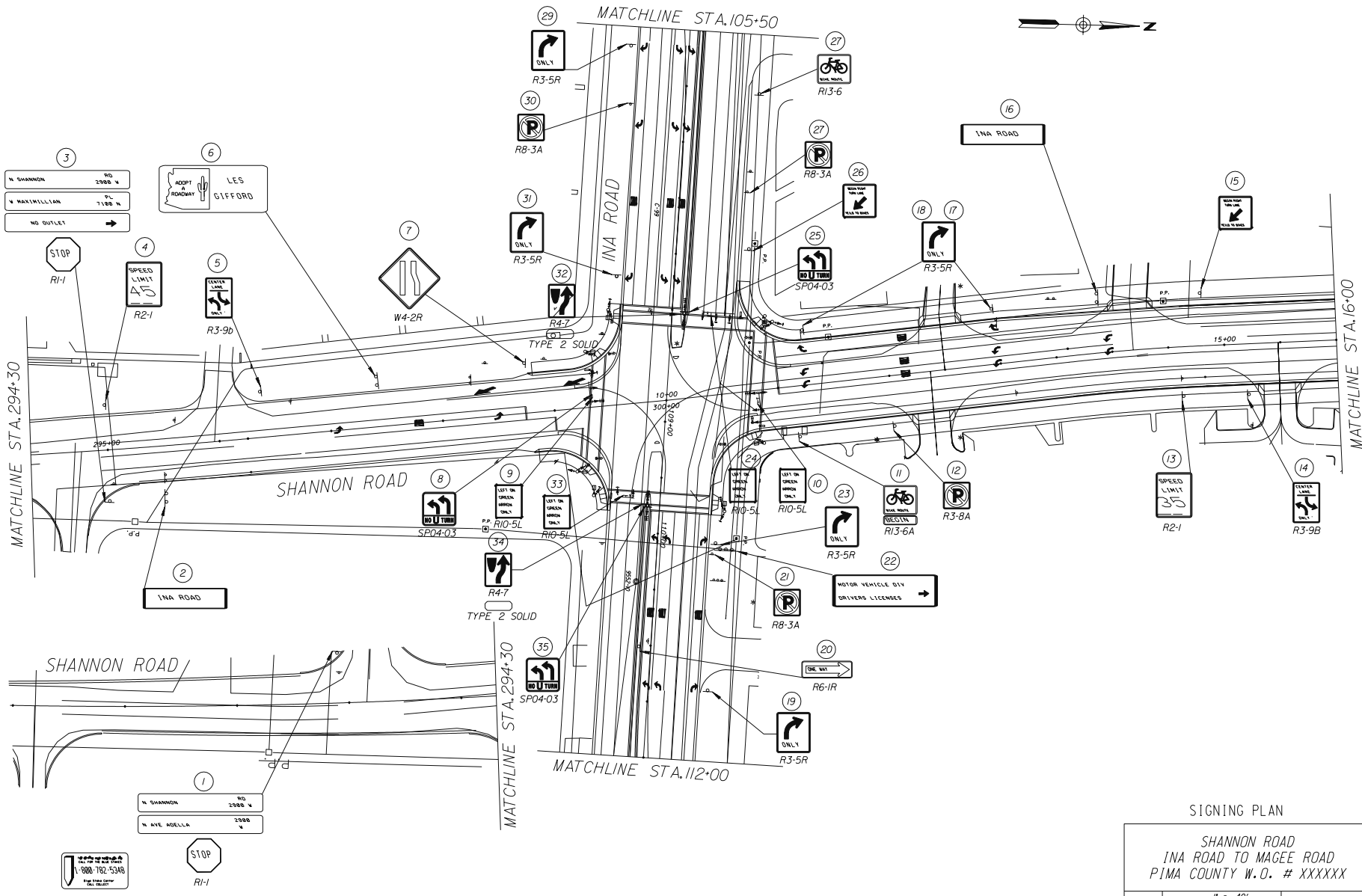
PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

BROOKS A. KEENAN P.E. DIRECTOR

NO.	REVISION DESCRIPTION	DIV./SECT.ENGR. DATE

DESIGNED
DRAWN
CHECKED
PROJ. ENGR.
DATE

COMPANY NAME,
ADDRESS & PHONE NUMBER



SIGNING PLAN

SHANNON ROAD
INA ROAD TO MAGEE ROAD
PIMA COUNTY W.O. # XXXXXX

SCALE 1" = 40' SHEET SN2 OF SN15

PIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

BROOKS A. KEENAN P.E. DIRECTOR

NO.	REVISION DESCRIPTION	DIV./SECT.ENGR.	DATE

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APPENDIX C

SPECIALTY SIGN FORMAT
(For Future Use)

APPENDIX D

PIMA COUNTY SIGN BOOK LISTING
(For Future Use)

APPENDIX E

PIMA COUNTY ORDINANCE NUMBER 1988-2
RELATING TO STREET NAMES AND ADDRESSES

ORDINANCE NUMBER 1988-2

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF PIMA COUNTY, ARIZONA; RELATING TO STREET NAMES AND ADDRESSES; ADOPTED PURSUANT TO A.R.S TITLE 11, CHAPTER 6.

BE IT ORDAINED BY THE BOARD OF SUPERVISORS OF PIMA COUNTY, ARIZONA:

SECTION 1. That Chapter 15.28 of the Pima County Building Code, Ordinance #1981-14, be repealed and the Pima County Zoning Code, Ordinance #1985-82, be amended by adding chapter 18.83, to read:

CHAPTER 18.83

ADDRESS STANDARDS

SECTIONS:

Planning and Development Services

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

18.83.010 Purpose.

A. It is the purpose of this Chapter to provide for uniformity in street names and addresses, and to facilitate emergency vehicle response, by establishing a uniform system for street names and address numbers, street name standards, display standards, and official address maps, and by eliminating non-conforming street names and addresses.

18.83.020 Definitions.

A. For the purposes of this Chapter, the following terms shall mean:

1. Access: A way or means by which a vehicle enters a lot or parcel or a person enters a building.
2. Address: A number, directional prefix, primary street name, and suffix, and an occupant identifier when required. The property address is also called the situs.
3. Address system: A discrete area of Pima County given its own baselines, Grid system and street numbers.

Planning and Development Services

8209 1244

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

4. Addressing Official: The Director of the Planning and Development Services Department or an authorized representative charged with the administration of these Standards.

5. Administrative address: An address assigned exclusively for the management by the County of records and permits. It shall not be used for other purposes.

6. Baseline:. A north-south or east-west line used as a zero starting point for address numbers.

7. Building: A structure designed for human occupancy or use.

8. Commercial: A development not intended for human residence.

9. Cul-de-sac: A street ending in a dead-end, not being an extension of another street, having no other street intersections, and not having the capability of connecting or intersecting with another street in the future.

10. Directional prefix: A prefix assigned to a street based on the general direction of travel from an appropriate baseline. North (N.), South (S.), East (E.) and West (W.). The determination may be 45° either side of the true direction.

11. Directional signage: Address information signs.

12. Entrance signage: Address information located at access points.

13. Hundred block: An incremental number breakdown of a section of land. Its length is one-eighth of a side or 660+ feet. It has a hundred numbers, 0 through 99.

Planning and Development Services

8209 1245

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

14. Hundred block base map: A graphic representation of Pima County boundaries showing established hundred block numbering Grids for each section corner.

15. Hundred block indicator: A number and a directional prefix indicating the perpendicular distance of a street from its parallel baseline. E.g., Ina Road is located at 7200 N. It is 72 hundred blocks north of Congress Street.

16. Major arterial: A street falling on a section line, quarter section line or sixteenth section line and designed to accommodate through traffic with comparatively long vehicle trip lengths. A street so designated on the County Major Streets and Routes Plan.

17. Number: Part of an address based on numerical distance from an appropriate baseline.

18. Occupant identifier: A specific number delineating individual unit locations within a single situs address. This number shall be used following the situs address. (E.g., 1000 N. Oracle Rd. Apt. 1100 or 1000 N. Oracle Rd. Suite 100.)

19. Person: Any individual, firm, corporation, partnership or other legal entity or their authorized agent.

20. Photo-mylar: A map produced on film polyester material photographically, having a wet processed silver halide emulsion. Standard shall be double matte, reverse reading transparent or translucent mylar.

Planning and Development Services

8209 1246

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

21. Point-of-origin: The intersection of the north-south and east-west baselines establishing zero at the intersection.

22. Primary access: Principal point of ingress-egress. It may be different than recorded legal access.

23. Primary street name: Principal component of street name not including suffix or directional prefix. E..g., E. Broadway Boulevard.

24. Residential: Facilities intended for human dwelling.

25. Site plan: Map showing property boundaries with dimensional ties to section, township and range monuments, building locations, dimensions of property, buildings and setback distances to property lines, primary access points for property and buildings, dimensional ties of tenant improvements to building shell, access from closest public street for unsubdivided parcels, with north arrow.

26. Situs: Address of a lot, parcel or building; also called "property address".

27. Street: A public or private thoroughfare or easement with abutting properties, reserved for vehicle travel and access.

28. Street name: Primary street name and suffix. Does not include the directional prefix. E.g., E. Broadway Boulevard.

29. Street sign: Displays primary name, suffix, direction from a baseline, and the north, south, east or west hundred block indicator of each street name.

Planning and Development Services

8209 1247

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

30. Subdivision Design Review: The submittal of a subdivision plat or development plan for review by the County Subdivision Design Review Committee.

31. Suffix: A word in a street name used to indicate a type of street. E.g., E. Broadway Boulevard.

32. Tax code number: Number assigned a lot or parcel for tax assessment identification.

33. Tenant improvement: Space within a building, which is under separate control, has primary access to exterior or interior public spaces, and is used for business activity.

18.83.030 General Provisions.

A. Authority:

1. The Director of the Planning and Development Services Department or authorized representative shall be designated as the Addressing Official and shall be responsible for the administration of these Standards.

2. These Standards shall regulate all lots, parcels, buildings, occupant identifiers and streets within the unincorporated areas of Pima County and those incorporated areas included by intergovernmental agreement.

Planning and Development Services

8209 1243

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

3. Only the Board of Supervisors, or the Addressing Official or authorized representative, may assign, approve or change an address.

B. Address Standards Regulations: The Board of Supervisors by resolution may adopt and amend Regulations to implement the provisions of this Chapter.

C. Address maps and indexes:

1. The Addressing Official shall establish and maintain the following maps and indexes:

a. A Hundred Block Grid Address Map of Pima County;

b. Map sets delineating each assigned address for subdivided land and unsubdivided parcels;

c. An index of approved street names; and

d. An index of approved reserved street names.

2. All maps and indexes shall be kept on file with the Planning and Development Services Department and shall be available for inspection during normal working hours.

3. Maps and indexes may be created, updated, stored and viewed in electronic media.

D. Development information: The Department of Transportation and Flood Control District shall provide the Planning and Development Services Department maps and legal descriptions of the following proposed right-of-way developments and modifications at the planning stages:

1. Amendments to the Major Streets and Routes Plan;

2. Right-of-way development;

Planning and Development Services

8209 1249

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

3. Realignments of existing rights-of-way;

4. Abandonments of existing rights-of-way; and

5. Changes in access to property caused by road improvements.

E. Application information: Any person requesting an address or a change of address from the Addressing Official shall provide the information required by these Standards.

F. Fees: Fees shall be adopted by the Board of Supervisors in a fee schedule to cover the administration and enforcement of these Standards.

18.83.040 Addressing.

A. Address numbering concept: The address numbering concept used in this Chapter is point-of-origin/baseline. North- south and east-west baselines shall be established for each Address System. The intersection of the north-south and east-west baselines shall be the point-of-origin. Numbering shall increase in the north, south, east and west directions from the point-of-origin.

B. Address Systems. Discrete areas of Pima County shall be given their own baselines, points-of-origin, Grids radiating from the points-of-origin, and street numbers.

1. Address Systems shall be established only in areas which will not overlap other Address Systems, however distant.

Planning and Development Services

8209 1250

2. If an existing Address System expands to overlap another Address System, a dominant System shall be selected, and:

   a. The non-dominant System shall have limits established to restrict further expansion; or

   b. The non-dominant System shall be abandoned and re-addressed to conform to the dominant System.

3. A Grid shall be based upon the standard land surveying construct of section, township and range.

4. The section (one square mile) shall be the primary Grid division with:

   a. each section line divided into eight equal parts, each part being a hundred block; and

   b. each hundred block divided into equal numeric increments 0 through 99.

   c. Hundred block numbers shall be established on each section line, quarter-section line, sixteenth-section line, and sixty-fourth section line.

   d. Hundred block numbers shall be displayed on each section line of the hundred block base map for each Address System.

   e. Existing sections with non-conforming hundred blocks shall remain unchanged.

C. The following Address Systems are established:

1. Tucson:

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

a. East-west baseline: Congress Street thence into Broadway Boulevard and the east and west prolongations of their alignments. Deviations are shown on Map 18.83.110(A).

b. North-south baseline: Stone Avenue and the north and south prolongations of its alignment. Deviations are shown on Map 18.83.110(B).

2. Green Valley:

a. East-west baseline: Esperanza Boulevard and the east and west prolongations of its alignment.

b. North-south baseline: Interstate 19 (I-19) and the north and south prolongations of its alignment.

c. Boundaries:

1) North: Duval Road and the east and west prolongations of its alignment; also identified as the line common to T17S and T18S.

2) South: Township Line common to T18S and T19S; also identified as the 4000 South of the Green Valley Address System east of I-19 and the north-south half-line of the San Ignacio de la Canoa Land Grant west of I-19.

3) East: The west bank of the Santa Cruz River.

4) West: the 2100 East block of the Green Valley Address System; also identified as the section line common to Sections 4 and 5 of T18S R13E and its south prolongation.

Planning and Development Services

8209 1252

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

3. Ajo:

a. East-west baseline: the west prolongation of Rocalla Avenue and the east prolongation of the Ajo Highway. Deviations are shown on Map 18.83.110(C).

b. North-south baseline: the Tucson Cornelia Gila Bend Railroad right-of-way. Deviations are shown on Map 18.83.110(D).

D. Street names. .

1. Any person may request establishment of a street name for any unnamed existing or proposed street or the renaming of any street. The requesting person shall submit proposed names.

a. A request for naming shall be made during the planning stages or the tentative subdivision plat or development plan phases.

b. A request for renaming shall be accompanied by the written consent of the owners of more than 50% by number of the properties addressed from the street. Consent petitions shall be on forms provided by the Planning and Development Services Department.

c. Street names found in conformance with these Standards by the Addressing Official shall be submitted to the Board of Supervisors for approval and then recorded with the County Recorder.

2. Street names shall be composed of:

Planning and Development Services

8209 1253

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

a. A primary name: The primary name may be composed of one or two words and each primary name shall be considered unique. For example, Park Avenue, Midvale Avenue and Midvale Park Road would each be considered unique primary names. Foreign language names are also included, such as Placita Vista Hermosa and Via Hermosa.

b. A suffix: The following are acceptable suffixes and the two letter abbreviation shall be used on all street signs when complete spelling is limited by space. Abbreviations in ( ) may be used only on signs which must meet TFCD installation standards:

1. Alley	Al	12. Pass	Ps
2. Avenue	Av (Ave)	13. Path	Ph
3. Beltway	Bw	14. Place	Pl
4. Boulevard	Bl (Blvd)	15. Road	Rd
5. Circle	Ci (Cir)	16. Square	Sq
6. Court	Ct	17. Stravenue	Sv (Stra)
7. Drive	Dr	18. Street	St
8. Highway	Hy (Hwy)	19. Terrace	Te (Terr)
9. Lane	Ln	20. Trail	Tr
10. Loop	Lp	21. Way	Wy
11. Parkway	Pw (Pkwy)		

Planning and Development Services

8209 1254

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

3. Review criteria for acceptance of street names:

   a. Non-duplication;

   b. Alignment;

   c. Correct spelling;

   d. Reasonableness;

   e. Phonetics;

   f. Length of name;

   g. Same language usage; and

   h. Foreign language compliance.

4. Foreign language usage:

   a. The person submitting foreign language street names shall provide the Addressing Official with a notarized affidavit of review compliance from a qualified Street Name Reviewer on a form provided by the Planning and Development Services Department. An applicant for qualification as a Street Name Reviewer shall submit to the Addressing Official evidence of a degree from a four-year college or university with a major in the language being reviewed.

   b. Indian names shall be certified by a Tribal Council Chief.

   c. Foreign language name review shall include:

      1) Proper gender and number (generally used version; avoid exceptions);

Planning and Development Services

8209 1255

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

2) Appropriate article;

3) Commonly used meanings;

4) Proper use and placement of diacritical marks;

5) English translation; and

6) Language type.

d. Subdivision and development plan names also shall conform to the foreign language format.

5. General restrictions on street names. Unless otherwise permitted by these Standards:

a. A new street falling on the alignment of an existing named street shall not assume a different name than the existing aligned street, regardless of distance or jurisdiction.

b. A new street falling on an alignment with multiple names shall assume the predominate or closest proximity street name.

c. Perpendicular directions for the same street name shall not be permitted.

d. Existing names shall not be assigned to any other alignment.

e. Each name shall not have more than one version of spelling.

6. Phonetically unsuitable names shall not be used:

a. Homonyms, Homophones;

b. Names that tend to be slurred;

c. Names which are likely to be run together (e.g., Golden Rod); and

Planning and Development Services

8209 1256

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

d. Names which may be difficult to pronounce.

7. Primary name and suffix (abbreviation) shall be limited in length:

a. Public streets: Fourteen letters and spaces; fifteen if the name has an "I" in it;

b. Private streets: Seventeen letters and spaces.

8. Mixed language usage shall not be used (e.g., Camino Rock).

9. Directional prefixes in primary names:

a. Directional prefixes shall not be used as a primary name, either in whole or in a compound form (e.g., North St., Northaire Ave., or Northwest Road).

b. Derivative forms of directional prefixes are permissible (e.g., Northern Ave., Southern Star Lane).

10. A primary street name may be duplicated once if the street has:

a. The same primary name as a street it intersects perpendicularly; and

b. A suffix of Place or Court.

11. Abbreviations and slang terms shall not be used.

12. [redacted]

13. No east-west numbered street shall be permitted north of Speedway Boulevard and no north-south numbered street shall be permitted east of N. 1st Avenue.

Planning and Development Services

8209 1257

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

14. All east-west numbered streets shall use the suffix of Street unless otherwise permitted.

15. All north-south numbered streets shall use the suffix of Avenue unless otherwise permitted.

16. No new east-west numbered streets shall be permitted between the existing 48th Street (3700 South) and Irvington Road (4900 South). Entirely new east-west numbered streets south of Irvington Road shall be permitted but shall conform numerically to established hundred blocks in which they are aligned (e.g., 5400 South = 54th Street).

17. No new north-south numbered streets shall be permitted between the existing 19th Avenue (950 West) and La Cholla Boulevard (2100 West). Entirely new north-south numbered streets west of La Cholla Boulevard shall be permitted but shall conform numerically to established hundred blocks in which they are aligned (e.g., 2400 West = 24th Avenue).

18. Fractions of streets shall not be used (e.g., 25 1/2 Street).

19. No primary street name shall be duplicated in another Address System.

20. Suffix Identifier. The following suffixes shall be restricted to specific street directions or configurations. Spanish equivalent prefixes are shown in parentheses and shall be treated as suffixes:

    a. Avenue (Avenida): A north-south street.

    b. Beltway: A very large oval-shaped street, considered a major thoroughfare, with multiple intersections and limited access.

Planning and Development Services

8209 1253

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

c. Circle (Circulo): An oval-shaped street having a single intersection with one street and not accessing or intersecting another street.

d. Loop (Vuelta): A horseshoe-shaped street having two distinct intersections with the same street.

e. Parkway: A meandering street, considered a major thoroughfare, which has limited access and multiple intersections.

f. Place (Placita) or Court (Corte): A cul-de-sac.

g. Stravenue: A street which runs diagonally between and intersects a Street and an Avenue.

h. Street (Calle): An east-west street.

21. Criteria and configurations for street naming:

a. Alignment: A street shall be considered aligned and carry one name if:

1) The street is designated a major street, route or arterial; or

2) The street connects with or has reasonable potential of connecting with an existing street or an extension of the original line of an existing street; or

3) The street predominantly follows a section line (mile line), quarter-section line (half-mile line) or sixteenth-section line.

b. Offset alignments:

Planning and Development Services

8209 1259

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

1) Streets with less than a 150 foot centerline-to-centerline offset shall be considered aligned.

2) Multiple street offsets deviating from the original alignment without returning to the original alignment shall not be considered aligned and shall comply with other provisions of these Standards.

c. Circle street: shall require a different primary name than the street which it aligns with and shall require two names when required addresses exceed available numbers within a hundred block.

d. Cul-de-sac. A cul-de-sac having a centerline distance less than 100 feet may assume the primary name and directional prefix of the street it intersects, but shall require a unique primary name and directional prefix for lengths which exceed 100 feet.

1) A "T" cul-de-sac is one which has an initial street segment perpendicular to the intersected street, and the remaining segments parallel with the intersected street. One primary name may be used if the perpendicular street segment is less than 100 feet. A different name than that of the cul-de-sac shall be used for the perpendicular street segment exceeding 100 feet in length.

Planning and Development Services

8209 1260

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

e. Loop street: shall have a unique street name and shall not assume the name of any aligned street, and shall only occur on one side of the intersected street.

f. Major arterial alignment and realignment:

1) For name continuity along the entire length of a major arterial which deviates from its original alignment and connects with other street alignments, the arterial may retain one name with the approval of the Addressing Official.

2) The Addressing Official may require existing street alignments and established street names to be changed to facilitate one name for a newly constructed major arterial that deviates from its primary alignment.

g. Frontage roads (also called service roads): A frontage road is a local street that generally parallels and is adjacent to a freeway or through street and that provides access to property isolated by access controls from the freeway or through street.

1) A frontage road shall assume the name of the freeway or through street it services.

2) Interstate 10 (I-10) frontage roads shall be delineated and addressed as "I-10 Frontage Road" and shall be the only frontage road to have a name different than that which it parallels.

Planning and Development Services

8209 1261

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

E. Situs numbering assignment:

1. All recorded lots and parcels of land, subdivided or unsubdivided, and all proposed or built structures, shall have an address assigned before a building permit is issued or occupancy occurs.

2. An address shall not be assigned to a lot or parcel until a fronting named street or easement has been approved by the Board of Supervisors. Frontage may not be required if recorded legal access is less than 330 feet to a named street. Physical access shall be the same as recorded access.

3. An address shall not be issued to a lot, parcel or structure until there has been compliance with Sec. 18.83.040(E)(6).

4. Addresses shall be assigned based upon primary physical access from a named street and not legal access if different.

5. General assignment requirements:

a. The Addressing Official shall determine official addresses upon compliance with Section 18.83.040(E)(6) and:

1) Tentative plat approval; or

2) Approval of a development plan and the submittal of building details (floor plans) as required; or

3) Submittal of an approved site plan and building details (floor plans) as required; or

4) The request by a person, subject to compliance with these Standards.

Planning and Development Services

8209 1262

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

b. In the case of conflict regarding the proper address, the Addressing Official or authorized representative shall make the final determination.

c. Requests for numerical addressing of recorded subdivisions or approved development plans shall not be processed until the recording or approval process is completed pursuant to Chapters 18.69 or 18.71.

6. Document requirements for address issuance:

a) Subdivided property:

1) Tax Code number; and

2) Recorded deed, or sales agreement and property description with escrow number and title company name if newly purchased; and

3) Subdivision name, block number and lot number; and

4) If a corner lot, a site plan; and

5) If multiple buildings or tenants, a site plan.

b) Unsubdivided parcels:

1) Tax Code number or tax statement and copy of Assessor's Map; and

2) Recorded deed, or sales agreement and property description with escrow number and title company name if newly purchased; and

Planning and Development Services

8209 1263

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

3) Site plan showing complete ingress and egress from the closest public road.

c) Projects requiring Subdivision Design Review:

1) For building address: approved and signed development plan on 24 inch x 36 inch photo-mylar; additional copies of site plan may be required for multiple-story projects;

2) For Administrative Address: name of development and case number assigned for Subdivision Design Review.

d) Projects not requiring Subdivision Design Review - single building or single tenant:

1) Tax Code number for parcel; and

2) Legal description or deed or title report; and

3) Blueline of site plan; and

4) If a structure is being added to an existing multi-building site, refer to additional requirements in 18.83.040(E)(6)(f).

e) Projects not requiring Subdivision Design Review - Multi-tenant or multi-buildings:

1) Tax Code number for parcel; and

2) Legal description and deed or title report; and

3) Blueline of site plan - initial (only Administrative Address shall be issued); and

Planning and Development Services

8209 1264

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

4) Upon final approval of site plan:

1) An approved and signed site plan on 24 inch x 36 inch photo-mylar, reverse read; additional copies of site plan may be required for multiple-story projects; and

11) Blueline of maximum tenant space layout (if known) for each building or floor.

f) If buildings, building expansions or multiple tenants are added to an existing multi-building site, a blueline of the total site shall be required, with all buildings and addresses as displayed at the site appropriately labeled.

g) Tenant improvements - New buildings or existing buildings having an approved development plan or site plan on file with the Planning and Development Services Department:

1) Address of building; and

2) Site plan showing tenant improvements; and

3) Development name and case number.

h) Tenant improvements - Existing buildings not having an approved development plan or site plan on file with the Planning and Development Services Department:

1) Site plan showing all existing structures and addresses as displayed on the site and tenant improvements dimensionally tied to building shell; and

Planning and Development Services

8209 1265

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

2) Development name; and

3) Tax Code number; and

4) Legal description.

1. Type and quality of required documents: All map documents required shall be photo-mylars unless otherwise specified. Documents required shall be of sufficient image quality and density to make legible contact prints and to produce micro images.

7. Criteria for address numbering.

a. Even or odd numeric integer of the address: Lots, parcels, buildings and tenants on the right side of a street, ascending from the base line, shall have even numbers. Lots, parcels, buildings and tenants on the left side of a street, ascending from the base line, shall have odd numbers.

b. Address determination:

1) The appropriate hundred block number line shall determine the number of an address for any lot, parcel or building.

2) Address numbers shall be determined by primary property entrance (access) from a named street, mean property street frontage, and may include building location or orientation.

Planning and Development Services

8209 1266

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

3) Property entrances, mean property frontages or building locations which are directly across the street from one another shall generally be one unit apart in the ascending numerical value of the address number (e.g., 1246 across from 1247).

4) With the exception of multi-tenant commercial buildings, one address shall be assigned to each property representing a legal entity; that is, there shall be one address for each legal description and deed. However, multiple street access points to multiple structures may require multiple addresses.

c. Corner lot:

1) The address shall be assigned to the primary access (entrance) street.

2) Subdivision plats shall have a star placed by a lot line to indicate proposed access.

d. Building orientation, ingress and egress: If buildings will occupy all or a major portion of a lot, the structure orientation and the primary ingress and egress of the building shall determine the property address. The primary entrance used by the public shall be considered the primary entrance; secondary doors, such as employee entrances, back or side doors, or delivery doors, shall not be considered primary.

Planning and Development Services

8209 1267

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

e. The order of address determination shall be:

1) Vehicular access for multiple parking (building orientation and site layout may be considered);

2) Vehicular street frontage parking if there is no on-site parking or drop-off point;

3) Primary pedestrian site access;

4) Structure orientation and general public building ingress and egress.

f. Circle street: Address shall be assigned in a counter-clockwise direction beginning at the intersection. Number availability within a hundred block shall determine if multiple names are required.

g. Loop street: Address shall be assigned based on the overall direction of the street layout in relation to the intersected street.

h. Directional prefix: At the time the address is assigned, the street shall have a directional prefix assigned to facilitate address numbering.

i. Number restrictions: A fractional unit of a number or occupant identifier, or alphabetic letters with a number or occupant identifier, or any combination thereof, shall not be used. E.g., 1010 1/2 E. Speedway Blvd.; or 1010 E. Speedway Blvd.,

Planning and Development Services

8209 1268

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

Unit 100 1/2; or 1010A E. Speedway Blvd.; or 1010 E. Speedway Blvd., Unit 100A.

j. Address numbering for specific development types:

1) Residential single family: Each lot or parcel shall be assigned a unique address.

2) Residential multi-family: Each lot or parcel having multiple tenants shall be assigned a unique address and, in addition, occupant identifiers for each tenant.

a) For example, Unit 2 in a duplex or triplex or Space 3 for a trailer or mobile home.

b) Occupant identifier numbers shall ascend from the baseline for parallel building layouts or from the front to rear of the lot or parcel for building layouts.

3) Apartments: All separate and distinct developments having multiple tenant accommodations intended for human dwelling shall be assigned one unique situs address. In addition, an occupant identifier consisting of a four to five-digit number shall be assigned to each apartment unit. This number shall be considered its complete apartment number, and shall be used with the situs address.

Planning and Development Services

8209 1269

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

a) The apartment number shall consist of a building number plus a floor number plus a unit number. For example, Apartment 12130 is in Building 12, on Floor 1, and is the 30th apartment on that floor, or the first apartment on Floor 3 of Building 2 would be Apartment 2301.

b) A zero shall be used for a floor number for all units below ground level.

4) Townhomes: townhouse developments shall be assigned a separate situs address for each legal lot.

5) Condominiums:

a) Condominium developments shall be assigned a situs address for each building.

b) Individual living facilities in each building shall be assigned occupant identifiers (unit numbers): first floor units shall have 100 series numbers, second floor units shall have 200 series numbers, and additional floors shall be numbered accordingly.

6) Commercial developments may be addressed in one of the following formats, which shall not be mixed within a complex:

a) A commercial development is assigned

Planning and Development Services

8209 1270

only one situs address. In addition, building numbers and tenant (suite) numbers are used. Occupant identifiers are building number, plus floor number, plus a two-digit number.

b) A commercial development is assigned individual addresses for each tenant (suite). This method is restricted to single story commercial developments with all tenants having exterior access, and to number availability.

c) A commercial development is assigned individual building addresses plus tenant (suite) occupant identifiers. First floor units shall have 100 series numbers, second floor units shall have 200 series numbers, and additional floors shall be numbered accordingly.

d) A high-rise building shall require a single situs address, plus tenant (suite) occupant identifiers. The occupant identifier for each separate tenant shall be a floor number plus a two-digit number.

1) A single tenant leasing an entire floor shall use the floor number plus 00. E.g., 2300 is the 23rd Floor.

Planning and Development Services

8209 1271

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

11) Multiple tenants on a single floor shall require separate two digit identifiers other than 00 for any tenant on the same floor. E.g., 1217 is number 17 on the 12th floor.

7) Mobile home and recreational vehicle parks:

a) A lot or parcel having five or more spaces developed for the installation of mobile homes, or the parking of travel trailers or recreational vehicles on a daily, seasonal or permanent rental basis, shall require a situs address plus space occupant identifiers.

b) The park's appurtenant structures (offices, recreation buildings, etc.) shall be assigned the situs address plus building identifiers.

c) Interior street names shall not be used. The streets shall be called rows and shall be assigned numbers. East-west rows shall use even numbers. North- south rows shall use odd numbers. E.g., Row 9.

d) Space numbers shall be used with the row numbers. E.g., Space 9-53 is the 53rd space on Row 9.

Planning and Development Services

8209 1272

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

18.83.050 Address Display.

A. General requirements:

1. All structures designed for human occupancy or use which have an assigned address shall display the address.

2. Upon commencement of construction, the assigned address shall be displayed at the primary access of the subject lot, parcel or structure. The address display may be temporary signage during construction.

3. Permanent address display shall be installed on all buildings, tenant spaces and entrance signage, or as otherwise required by these Standards, prior to building inspection final approval, certificate of occupancy or occupancy of any building or structure. Display shall be required at all times thereafter, conforming to standards.

4. More than one address or number display may be required for each building or site.

5. The complete address shall be displayed on all corner buildings at a street intersection, for each side of building facing any street.

6. Addresses shall be displayed and visible from both directions of approaching vehicular travel.

Planning and Development Services

8209 1273

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

7. Numbers and letters shall be made of durable and clearly visible material. Paint shall not be considered durable for building addresses.

8. Numbers and letters shall be of colors contrasting with the background of the sign or wall to which they are attached.

9. Numbers and letters shall have a minimum proportion ratio of height to width of 6 to 1. The formula for width to height is: $w = h/6$, where w is width and h is height in inches.

10. Numbers shall not be spelled.

11. All height requirements are minimum sizes.

B. Residential: The address numbers assigned shall be conspicuously placed immediately at the appropriate location on each building, structure entrance or at the property access point.

1. For properties containing multiple addresses, addresses shall be placed near the primary entrance in addition to the structure placement.

2. A building or structure set back fifty feet or more from the curb line or edge of pavement shall permanently display the address a minimum of 36 inches from ground level at the primary access point of the property. Structure display may also be required by the Addressing Official.

3. Minimum number height shall be three inches.

Planning and Development Services

8209 1274

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

C. Apartments: The address numbers assigned shall be conspicuously placed immediately at the property access points, appropriate locations on each building, and structure entrances.

1. Building numbers shall be a minimum of 15 inches in height.

2. Apartment number ranges shall be placed below building numbers or on signage near the building. Apartment number ranges shall be a minimum of eight inches in height.

3. Individual apartment numbers shall be a minimum of three inches in height for exterior entrances and a minimum of one inch in height for interior (hallway) entrances.

4. Both exterior signage and interior numbering may be required by the Addressing Official on specific development types.

5. Apartment complex with multiple buildings:

   a. All buildings shall have pedestrian directional signage visible from both directions of pedestrian travel, with numbers a minimum of two inches in height.

   b. All interior accessory buildings, structures and pool areas shall be identified and have directional signage.

   c. The apartment complex shall have entrance signage at all access points address.

   d. For access points that enter the complex from other than the addressed street, the complete address shall be displayed on entrance signage.

Planning and Development Services

8209 1275

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

e. Site and building addresses shall be visible at all times.

D. Commercial: The address number assigned shall be conspicuously placed immediately at each property access point, and the appropriate locations on each building, and each structure entrance.

1. Buildings or structures set back no more than fifty feet from the curb line or edge of pavement shall display a 12-inch minimum height number.

2. Buildings or structures set back more than fifty feet from the curb line or edge of pavement shall display a 15-inch minimum height number.

3. Individual addresses shall be placed near the primary entrance, a minimum of three inches in height.

4. The low and high number range may be displayed on buildings with multiple addresses, a minimum of 12 inches in height.

5 Site and building addresses shall be visible at all times.

E. RV and mobile home park: The address numbers assigned shall be conspicuously placed immediately at each property access point, and at the appropriate locations for each building, structure, and property rental space.

1. Number height:

a. Space, directional signage and internal street signage numbers shall be a minimum of three inches; and

Planning and Development Services

8209 1276

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

b. Building numbers shall be a minimum of six inches.

2. Internal street signs shall be placed at each street intersection. The signs shall display the word "Row" plus the appropriate number (e.g., Row 9).

F. Entrance signage: The address or address numbers assigned shall be placed at primary access points immediately and shall be permanently installed prior to first occupancy of any internal structure or building.

1. Numbers or address shall be a minimum of 12 inches in height on all entrance signage.

2. Complete address display shall be required at all street access points in addition to the primary access street.

G. Directional signs: If buildings within a commercial development are obscured from the primary street to which the development is addressed and from parking and access areas, directional signs shall be installed.

1. A directional sign shall be required at each primary entryway to the obscured buildings.

2. A directional sign shall be clearly visible from all parking areas serving a building and shall have numbers of not less than six inches in height.

3. Each directional sign shall carry appropriate addresses or range of addresses and a directional arrow or locational instructions as minimum directional information.

Planning and Development Services

8209 1277

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

4. Additional Signs: Buildings having parking and access areas only at their side or rear shall display additional numbers, at least six inches in height, visible from all such areas.

18.83.060 Street Name Signs.

A. General requirements:

1. Approved street names shall be clearly and visibly displayed at every intersection and street name change break on all public streets and on all private streets within subdivisions and development plans.
2. Approved street names shall be displayed in a temporary manner at all times during construction of such public or private streets.
3. Approved street names shall be displayed in a permanent manner upon completion of street construction.
4. A private street which intersects a public street shall have street name signs of Department of Transportation and Flood Control District installation standards installed by the owner or authorized representative at the intersection or street name change point.
5. Private street name signs within subdivisions and development plans which are not at intersections with public streets may be of owner design and not of Department of Transportation and Flood Control District installation standards, but shall be clearly visible from

Planning and Development Services

8209 1278

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

all directions of vehicular travel, and shall be in conformance with Subsections 6 through 10 below.

6. All street name signs shall be reflective.

7. The direction of each street shall precede the name.

8. Primary street names shall be displayed in a uniform size and be at least four inches in height. The primary name shall not be abbreviated.

9. Street name suffixes may be abbreviated and in a smaller size than the primary name, but shall be at least two inches in height.

10. All street signs shall display the appropriate north, south, east or west hundred block indicator for each street name. Sign placement shall not change the value of the hundred block indicator for each name.

11. A homeowners association or the property owners adjacent to the street shall be responsible in equal shares for maintenance and replacement of signage after installation on a private street in a subdivision or development plan. If the responsible parties fail to adequately maintain or replace street signs in a timely manner, the County may, after thirty days written notice to the responsible homeowners association or property owners, make the necessary repairs or replacements and collect the costs of labor and materials equally from each responsible party.

Planning and Development Services

8209 1279

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

12. A privately installed street name sign not on a public street or in a subdivision or development plan:

a. Shall be of Department of Transportation and Flood Control District installation standards if on a private street which intersects a public street;

b. May be of owner design and not of Department of Transportation and Flood Control District installation standards if not at an intersection with a public street, but shall be clearly visible from all directions of vehicular travel, and shall be in conformance with Subsections 6 through 10 above and Section B below; and

c. Shall have additional signage displaying: (Not a County Street - Pvt.)

B. Street sign format.

1. All street name signs installed or replaced after the effective date of this Chapter shall conform to the following format:

a. Directional prefix (N., S., E. or W.): upper left corner.

b. Primary name: main body of sign.

c. Suffix: centered following primary name, or upper right, or, if foreign language requires, centered preceding primary name.

d. Hundred block indicator: lower right corner.

Planning and Development Services

8209 1280

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

e. The minimum height of a directional prefix, street suffix or hundred block indicator shall be one-half the height of the primary name.

f. See Illustration 18.83.110(E).

18.83.070 Display Exceptions; Nonconforming Street Names and Addresses.

A. Existing addresses displayed prior to January 13, 1981 shall be exempt from the address display provisions of these standards until January 1, 1991, except in the event of:

1. An address change;

2. A building or structure remodeling or repair which requires a building permit; or

3. An exterior sign replacement or repair which requires a building permit.

B. Except as provided in (A), these standards shall not apply to existing street names or to addresses of buildings existing prior to January 13, 1981, unless there is:

1. Gross error in the physical placement of a hundred block increment;

2. Gross error or discontinuity in the assignment of an address number;

3. An incorrect directional prefix for a street;

4. More than one directional prefix for the same street;

Planning and Development Services

8209 1281

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

5. More than one spelling for same street name;

6. Homonyms, Homophones;

7. Use and display of an address not assigned;

8. Duplication of a street name;

9. Excessive discontinuity of alignment for a street name;

10. More than one name for the same alignment;

11. An overlap in address ranges for the same primary name; or

12. Primary access from a street different than the address.

18.83.080 Address and Street Name Changes.

A. An owner of property may request the change of its address, provided:

1. The change shall not conflict with these Standards;

2. The change shall bring the address into conformance with these Standards;

3. The applicant shall comply with the display requirements of these Standards; and

4. The applicant shall provide the required materials specified in Sec. 18.83.040(E)(6).

B. The Addressing Official shall correct an address number or street direction prefix not in conformance with these Standards as follows:

1. Notice of the change shall be mailed to all owners and the occupant of the property whose address is changed. The notice shall:

Planning and Development Services

8209 1282

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

a. Advise the property owners or occupant that they may submit a written objection to the change to the Addressing Official within fifteen working days of the mailing of notice;

b. State the reasons for the change and the effective date of change; and

c. Include an objection form.

2. An owner or occupant of property whose address numbers or street direction prefix is to be changed may object to the change, and shall submit the objection in writing, within fifteen working days of the mailing of notice. Objections received after the fifteen days shall not be considered.

3. Action of Address Official: The Addressing Official shall render a decision on the objection within five working days of receipt and notify the objector in writing of the decision. The effective date of the change shall be unaffected unless altered by the Addressing Official or an order of the Superior Court.

C. The Board of Supervisors shall change the name of a street as follows:

1. Notice of the change shall be mailed to all owners and occupants of property whose existing address will be changed by the renaming. The notice shall:

a. advise the property owners or occupants that they may submit a written objection to the change to the Addressing Official within fifteen working days of the mailing of notice;

Planning and Development Services

8209 1283

(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

b. state the reasons for the change and the date the Board of Supervisors will consider the renaming; and

c. shall include an objection form.

2. An owner or occupant of property whose address is to be changed by the renaming may object to the change, and shall submit the objection in writing to the Addressing Official, within fifteen working days of the mailing of notice. Objections received after the fifteen days shall not be considered.

a. Hearing: The Board of Supervisors shall hold a hearing on the name change. The decision of the Board shall be made in writing to all objectors.

D. Appeal to Superior Court: Any owner of property whose address has been changed by a decision of the Board of Supervisors or the Addressing Official may appeal to the Superior Court within thirty-five days of the effective date of the decision.

18.83.090 Conflicting Actions; Compliance and Citation.

A. Conflicting actions: County departments, officials and staff shall not perform any of the following acts which conflict with these Standards:

1. Approve a final plat or development plan;

2. Issue a permit or address;

Planning and Development Services

8209 1284

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

3. Inspect a building;

4. Grant permission to occupy any construction project, structure relocation, erection, repair, alteration or modification until the address assigned is displayed as required by these Standards;

5. Install a street sign;

6. Approve an Area, Community or Neighborhood Plan;

7. Approve a Transportation or Corridor Plan; or

8. Change a person's property access through road improvements without prior notice to the Planning and Development Services Department.

B. Invalidity: Any address or street name used or issued in conflict with these Standards shall not be deemed or construed to be a valid address or street name.

C. Citation: If the Addressing Official determines an address display violation exists, a written citation may be posted at the site by an authorized representative of the Addressing Official or the Zoning Inspector. In addition,the property owner may be notified of the citation by mail. The citation may include required corrective measures.

D. Compliance: Compliance is required within thirty days of citation. One written time extension of thirty days may be granted by the Addressing Official if adequate progress is being made toward compliance.

Planning and Development Services

8209 1285

{ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS}

18.83.100 Jurisdictions.

A. These Standards shall apply in the unincorporated areas of Pima County and in such incorporated areas as are included by intergovernmental agreements. The governing body and appropriate officials of an incorporated area included by intergovernmental agreement shall be substituted for the Board of Supervisors and County officials, except the Addressing Official, in the application of these Standards within their areas of jurisdiction. The governing bodies of included incorporated areas may establish, by intergovernmental agreements or ordinances, appeals procedures which differ from these Standards.

Planning and Development Services

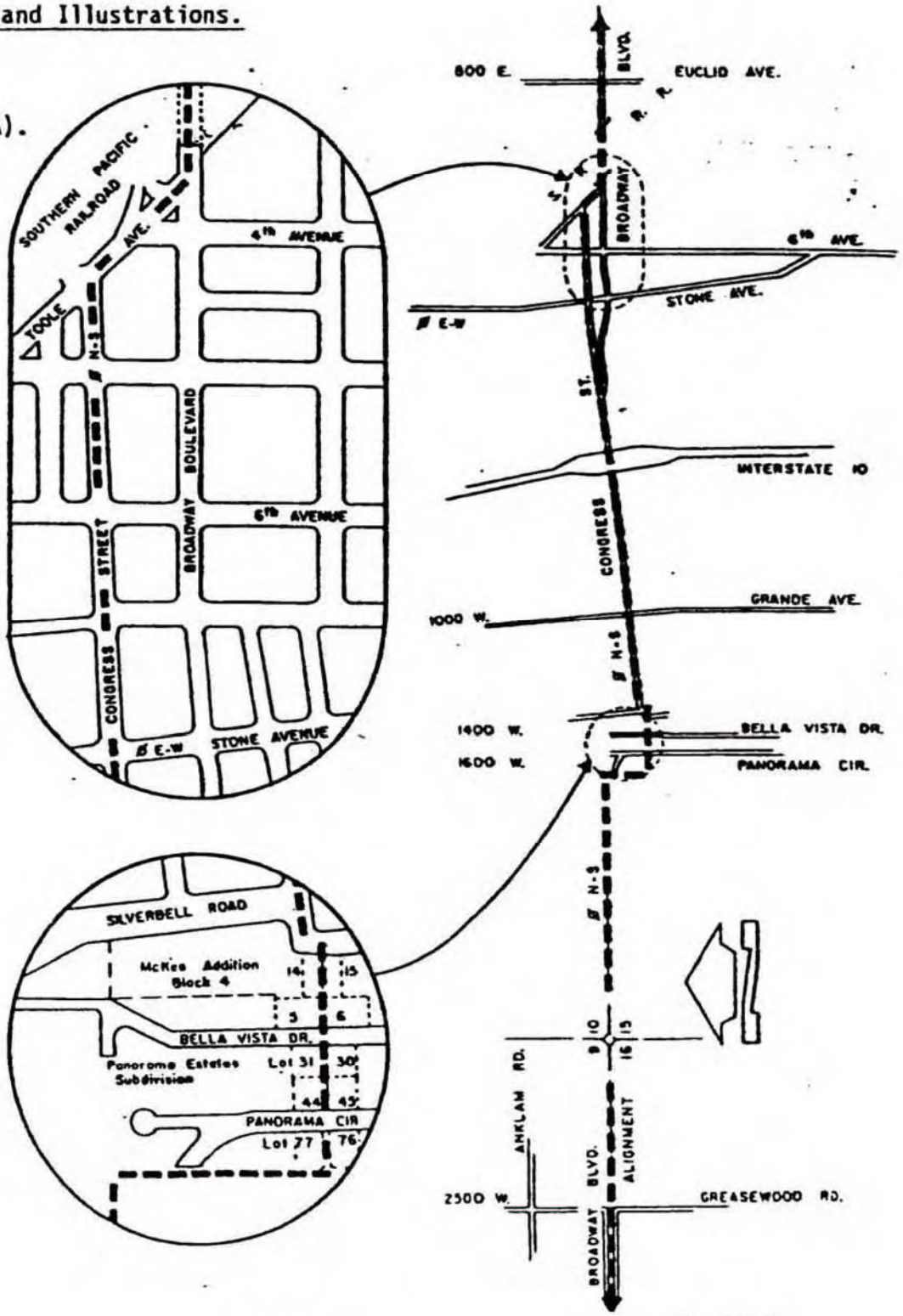
8209 1286

ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS

18.83.110 Maps and Illustrations.

Map 18.83.110(A).

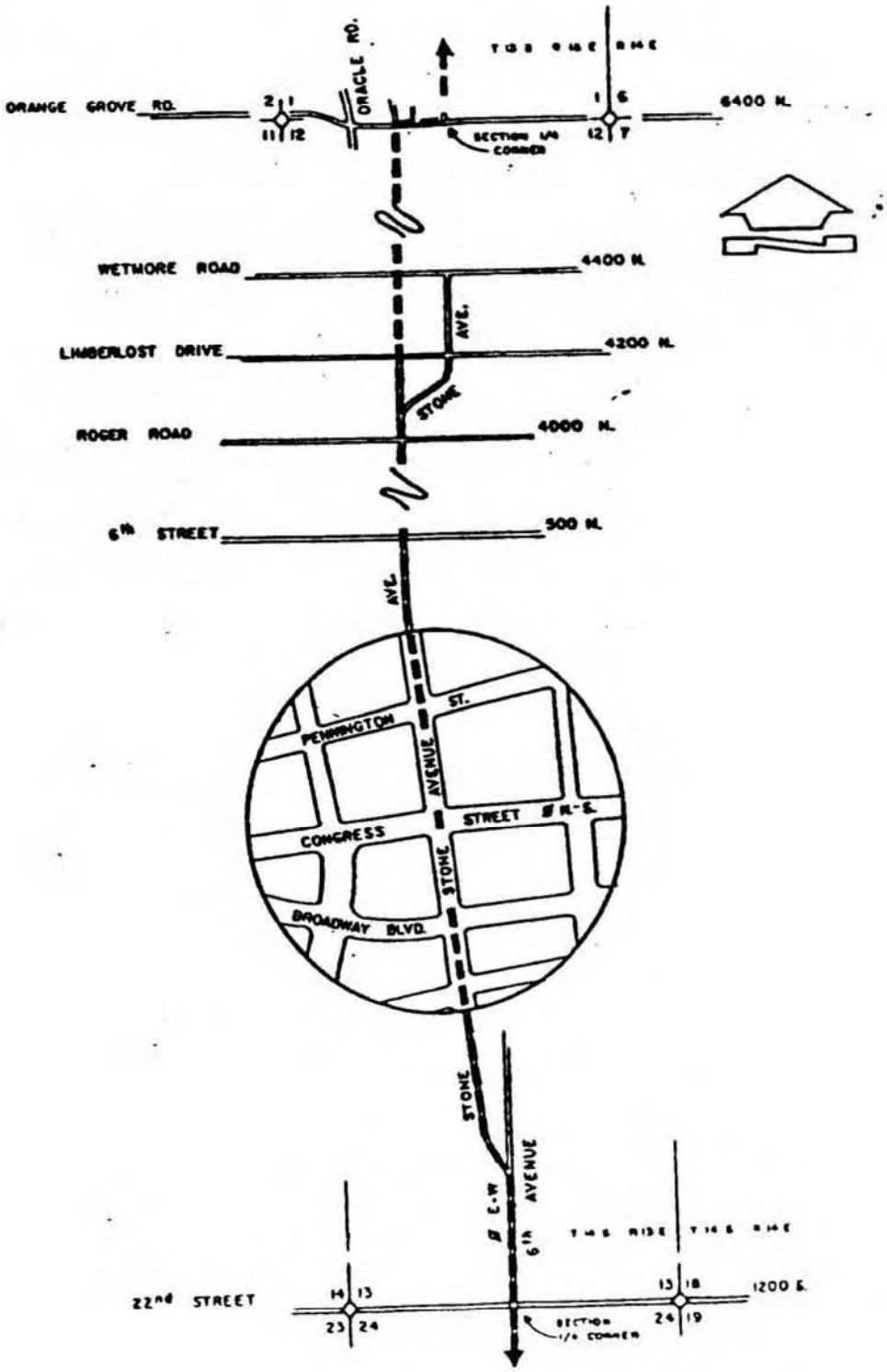


Planning and Development Services

ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS

Map 18.83.110(B).

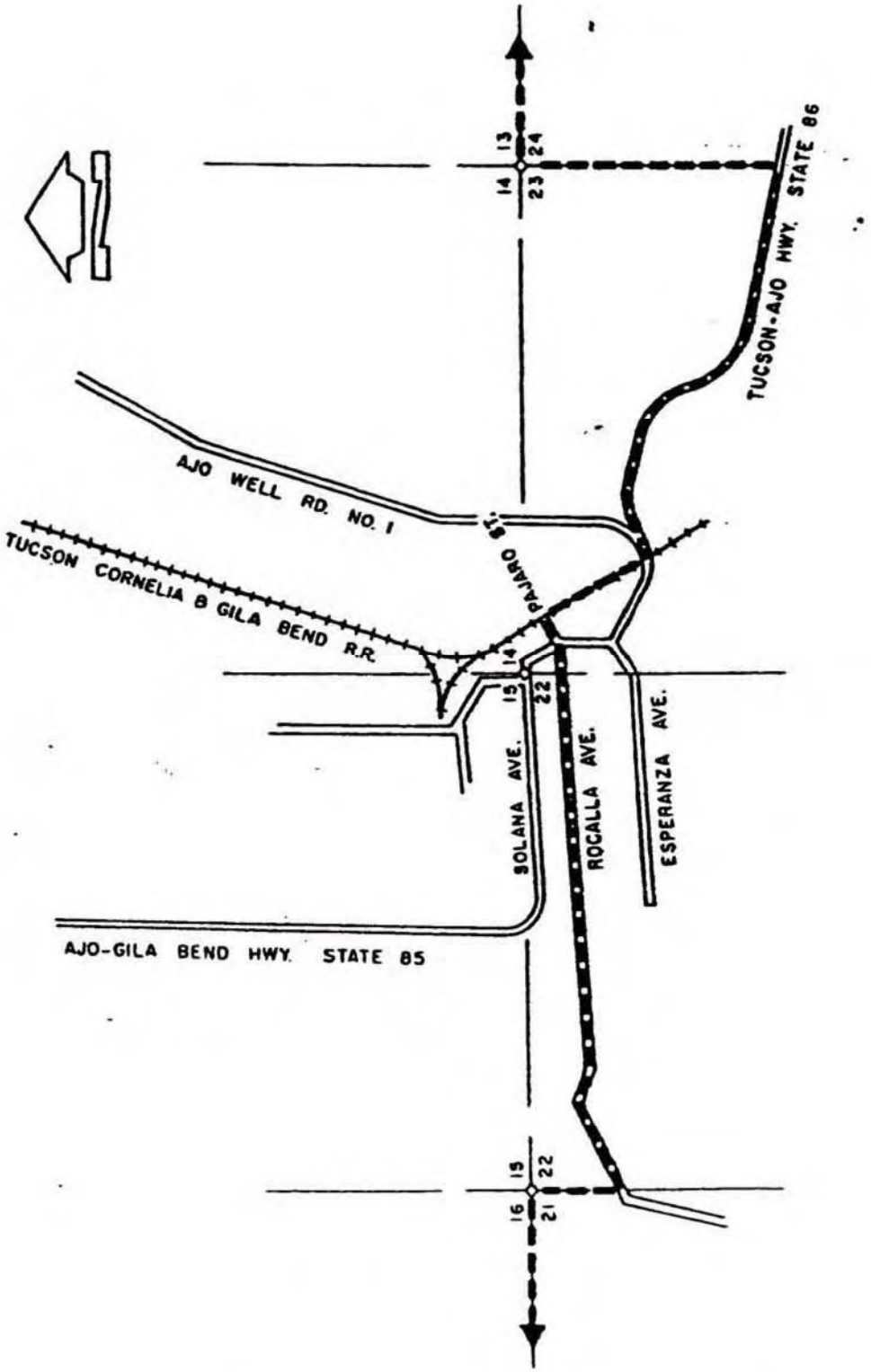


Planning and Development Services

ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS

Map 18.83.110(C).



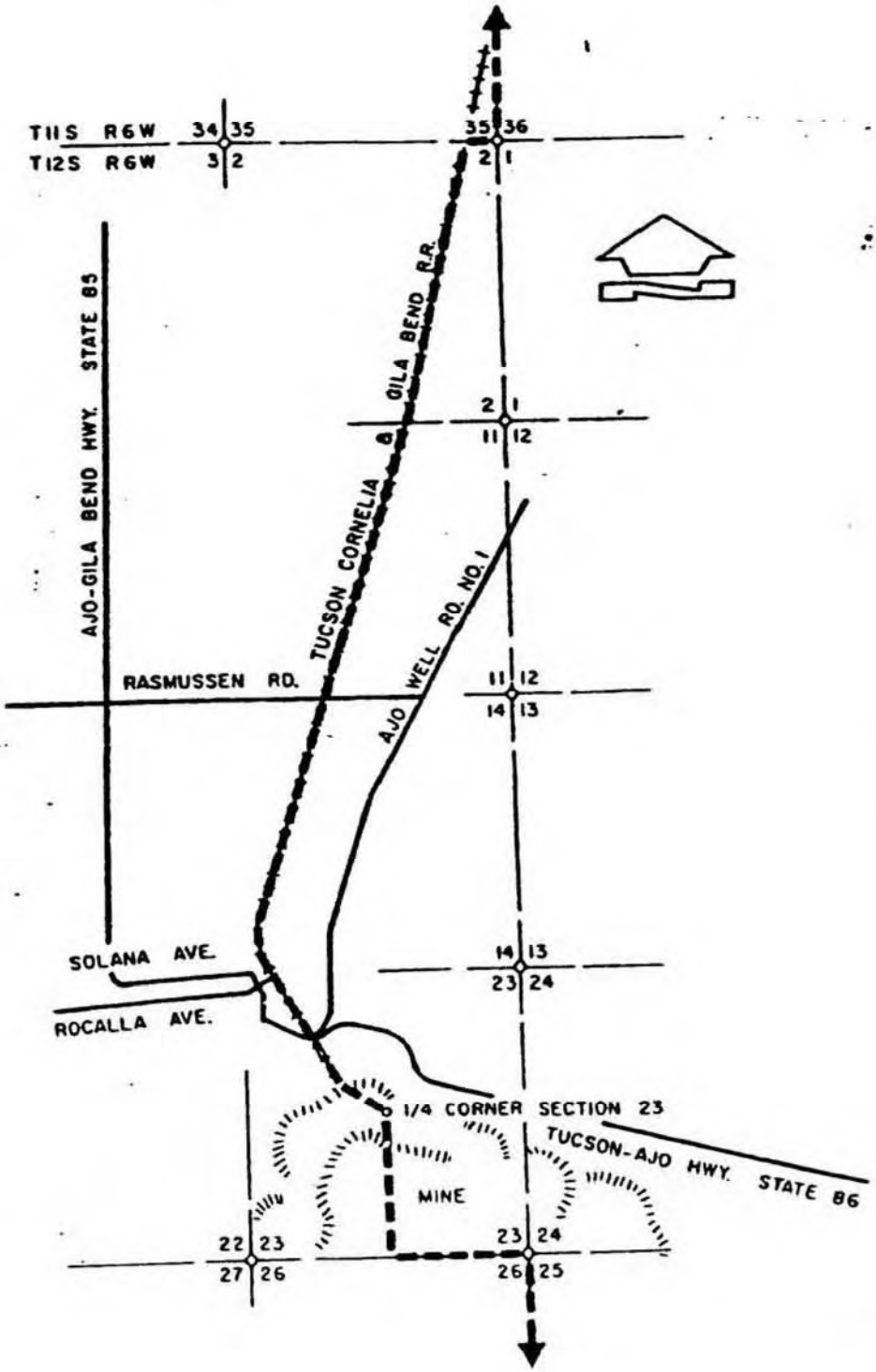
Planning and Development Services

8209 1289

ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS

Map 18.83.110(D).

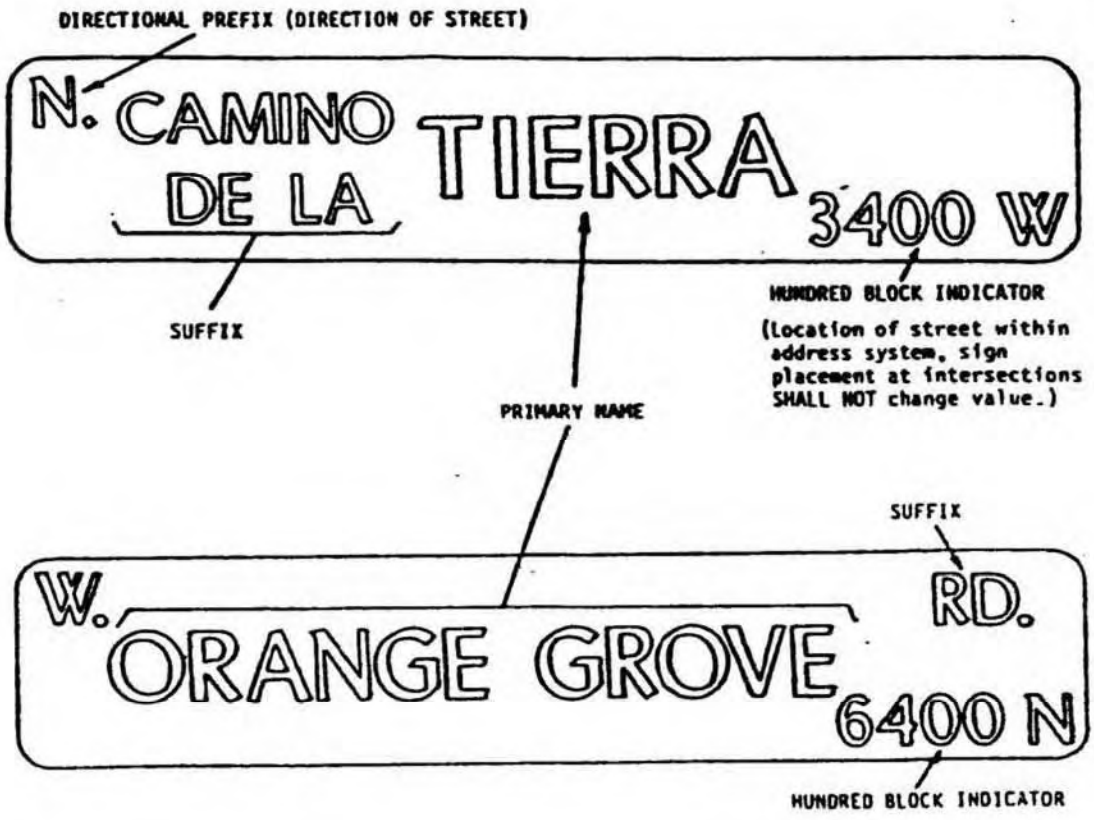


Planning and Development Services

ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS

Illustration 18.83.110(E).



(ORDINANCE INFORMATION ON THIS PAGE

REPLACES PREVIOUS ORDINANCE REQUIREMENTS)

SECTION 2. That all ordinances and parts of ordinances in conflict herewith be and the same are hereby repealed.

SECTION 3. That this ordinance shall become effective immediately upon the adoption by the Board of Supervisors.

PASSED AND ADOPTED by the Board of Supervisors of Pima County, Arizona, this 19th day of January, 1988.

Chairman, Board of Supervisors

ATTEST:

Clerk, Board of Supervisors

APPROVED AS TO FORM:

Deputy County Attorney

Executive Secretary,
Pima County Planning and Zoning Commission

Planning and Development Services