

CITY OF PLANO

Thoroughfare Standards Rules & Regulations

Rules and Regulations Governing the Design & Construction
of Streets and Thoroughfares, Sidewalks & Appurtenances



Thoroughfare Standards Rules & Regulations

TABLE OF CONTENTS

| Section I | Street Design Standards | Page |
|--------------------|---|-------------|
| A. | City of Plano Thoroughfare Definitions | 1 |
| B. | Minimum Horizontal Radius | 2 |
| C. | Minimum Vertical Alignment | 2 |
| D. | Intersection Design | 4 |
| E. | Type C Intersection ROW | 4 |
| F. | Residential Frontage | 4 |
| G. | Preston Road and Spring Creek Parkway Special Standards | 7 |
| H. | Tollway and Access-Controlled Highway Corridor Special Standards | 7 |
| | 1. Highway and Tollway Service Roads (one way), except U.S. 75 | 10 |
| | 2. Highway and Tollway Service Roads | 10 |
| | 3. Thoroughfare Intersecting the DNT Tollway | 10 |
| | | |
| Section II | Median and Left Turn Lane Design Standards | |
| A. | Median Width | 14 |
| B. | Required Median Openings and Left-Turn Lanes | 14 |
| C. | Cost of Median Openings and Left-Turn Lanes | 14 |
| D. | Minimum Design, Left-Turn Lanes | 14 |
| E. | Minimum Design, Median Opening | 14 |
| F. | Median Where No Left Turn Pocket is Needed | 15 |
| G. | Medians on Public Street Into Developments | 15 |
| H. | Close or Modify Existing Media Opening | 15 |
| | | |
| Section III | Alley and Service Road Design Standards | |
| | | |
| Section IV | Procedure for Allowing Access on City Street | |
| A. | Procedure for Allowing Access on City Streets | 18 |
| B. | Procedure for Allowing Access on State Roads | 18 |
| C. | Driveway Definition | 19 |
| D. | Driveway Width | 20 |
| E. | Driveway Radius | 23 |
| F. | Driveway Spacing and Location in Relation to Other Drives | 23 |
| G. | Driveway Spacing in Relation to a Cross Street | 23 |
| | | |
| Section V | Sidewalk and Location Design Standards | |
| A. | Definition of Sidewalk | 26 |
| B. | Barrier-Free Ramps | 27 |

Thoroughfare Standards Rules & Regulations
TABLE OF CONTENTS *continued*

| | |
|--|-------------|
| Section VI Public Right-of-Way Visibility | Page |
| A. Visibility Triangles | 28 |
| B. R.O.W. Obstructions <u>Outside</u> the Visibility Triangles | 32 |
| C. Abatement | 32 |
| D. Preservation of existing laws | 32 |

Section VII Alternative Subdivision Street & Sidewalk Standards
(New Draft Section)

| | |
|---------------------|----|
| A. Introduction | 33 |
| B. Front Entry Lots | 33 |
| C. Rear Entry Lots | 33 |
| D. Mews Streets | 33 |

TABLES

| | |
|--|----|
| Table 1 City of Plano’s Thoroughfare Definitions | 1 |
| Table 2 Minimum Design Speed of Each Type of Street | 2 |
| Table 3 Minimum Horizontal Centerline Radius | 3 |
| Table 4 Minimum Acceptable Crest Curve Given Speed and Difference In Grade of Road | 3 |
| Table 5 Minimum Acceptable SAG Curve Given Speed and Difference In Grade of Road | 3 |
| Table 6 Minimum Left Turn Storage Requirements | 15 |
| Table 7 Driveway Spacing in Relation to Other Drives Given the Design Speed of the Street | 22 |
| Table 8 Summary of Drive Requirements | 22 |
| Table 9 Minimum Sight Distance at an Intersection | 30 |

FIGURES (graphic examples)

| | |
|---|---|
| Figure 1 Intersection of Type “C” Thoroughfare with Type C and Above, ROW-Requirements | 5 |
| Figure 2 Intersection of Type “C” Thoroughfare with Tollway Service Road, ROW-Requirements | 6 |
| Figure 3 Type B+ Thoroughfare Standards | |
| (a) for property with more than 410 feet of frontage | 8 |
| (b) for property with more than 380 to 410 feet of frontage feet | 8 |
| (c) for property with less than 300 feet of frontage | 8 |
| (d) for property with downstream R-O-W being a street | 8 |
| (e) Hooded Median Design | 9 |
| (f) Hooded Median Opening Detail | 9 |
| (g) Minimum Design | 9 |

Thoroughfare Standards Rules & Regulations
TABLE OF CONTENTS *continued*

| | | Page |
|-----------|---|-------------|
| Figure 4 | DNT | |
| | (a) Driveway to Driveway Spacing Along Service Road | 11 |
| | (b) Driveway to Thoroughfare Intersection Spacing Along Service Road | 11 |
| | (c) Driveway to On-Ramp Spacing Along Service Road | 12 |
| | (d) Tollway/SH 121 Access Standards – Driveway to Off-Ramp Spacing Along Service Road | 12 |
| Figure 5 | Dallas North Tollway Access Standards – Crossing Thoroughfare Drive Spacing | 13 |
| Figure 6 | Typical Median Spacing on a Major Street from a Commercial Drive to a Major Street | 16 |
| Figure 7 | Typical Median Dimensions without Back-to-Back Left Turn Pockets | 16 |
| Figure 8 | Parallel Service Road/Alley Minimum Intersection at a Major Road | 17 |
| Figure 9 | Driveway Width | |
| | (a) Radius, Spacing for Residential Driveways | 21 |
| | (b) Radius, Spacing for Undivided, Two Lane Commercial and Industrial Driveways | 21 |
| | (c) Radius, Spacing for Divided Commercial and Industrial Driveways | 21 |
| | (d) Driveway Layout for Undivided, three-lane commercial driveways | 21 |
| Figure 10 | Driveway Spacing in Relation to a Cross Street | |
| | (a) Driveway at 90° on a Collector or Residential Street | 24 |
| | (b) Driveway at 90° on a Secondary Thoroughfare | 24 |
| | (c) Driveway at 90° on a Major Thoroughfare | 24 |
| | (d) Angle Driveway Spacing in Relation to a Cross Street | 25 |
| Figure 11 | Street Intersection Minimum Visibility Triangle | 28 |
| Figure 12 | Street Intersection Desirability Visibility Triangle | 30 |

CITY OF PLANO TRANSPORTATION DIVISION, ENGINEERING DEPARTMENT

Rules And Regulations Governing The Design & Construction Of Streets And Thoroughfares, Sidewalks, & Appurtenances

SECTION I. STREET DESIGN STANDARDS

A. General

Design standards for city streets are defined through two documents: 1) the Thoroughfare Standards - the document contained herein - which is part of the Development Regulations Manual, covering the technical details of street and transportation system design; and 2) the separate Thoroughfare Plan - a map that establishes the general alignment, size, and function of significant city streets - which is a part of the Transportation Chapter of the Comprehensive Plan. A third document – the–Traffic Impact Analysis [TIA] Guidelines – is used to analyze site development and is part of the Development Guidelines. All of the aforementioned documents are updated by staff and adopted by ordinance on a periodic basis by the City Council.

TABLE 1
CITY OF PLANO
THOROUGHFARE
DIMENSIONS

The basic elements of the thoroughfare standards are the street types. **TABLE 1** summarizes the basic thoroughfare dimensions. Special design standards for several thoroughfares, tollways, and highways are detailed in the body of this document. **TABLE 2** gives the minimum design speeds for the listed thoroughfare type. The Appendix has cross-sections of each thoroughfare type.

| Category | Designation Right of Way | Minimum | Pavement | Median |
|---------------------------|-----------------------------|--------------|----------|--------|
| Major Thoroughfare | B+ | ±140 | 8@12' | 20' |
| | B | ±130' – 160' | 6@12' | 24' |
| Major Thoroughfare | C | 110 | 6@11' | 20' |
| Secondary Thoroughfare | D | 92' | 4@12' | 20' |
| Secondary Thoroughfare | E+ | 75' | 5@11' | None |
| | E | 68' | 4@11' | None |
| Collector | F | 60' | 36' | None |
| Residential Street | G | 50' | 26' | None |

Note: Major and secondary thoroughfares flare at intersections to provide auxiliary lanes, see Figure 1 and 2.

The City Traffic Engineer, and/or City Engineer, have the authority to apply these standards to proposed street and infrastructure design and construction within the City of Plano. Authorized city staff may allow or require different values for design parameters than those given herein to resolve unusual field conditions, to better serve the safety, and/or to better meet other needs of the public infrastructure.

As a general rule, the reference dimensions given herein for distances are measured from the face-of-curb. Distances such as between two driveways, two median openings, etc. are measured between the two closest curb-lines of both elements (e.g. face-of-curb to face-of-curb). Exceptions are noted in the body of the text.

An applicant for construction plan approval to the city may appeal the value of a given design parameter following the written decision of authorized city staff to allow or require a different value than those listed in this book. The appeal process - unless otherwise specified elsewhere in this document is as follows:

The applicant - typically a developer or owners representative - may request to have a design parameter staff decision appealed at the next available Planning and Zoning (P&Z) Commission meeting. The request for a P&Z appeal must be in writing in a parameter acceptable to authorized city staff, and it must describe the nature and location(s) of the design parameter in question. The applicant may also submit a technical memorandum prepared by a professional engineer explaining why the appeal is justified. The applicant may also present his position verbally during the P&Z meeting. The P&Z Commission will then consider and vote on the question of whether to accept or deny the request of the applicant under the commission’s normal rules of order.

B. Minimum Horizontal Radius

The minimum centerline radius is defined by the design speed of the respective street. The minimum design speed of each street category in the City of Plano, as defined by the Thoroughfare Plan, is listed in **Table 2**.

| STREET TYPE | MINIMUM DESIGN SPEED (MPH) |
|-------------|----------------------------|
| F, G | 30 |
| D, E, E+ | 35 |
| C | 40 |
| B, B+ | 45 |

The resulting minimum acceptable horizontal centerline radius for each respective street is determined by considering the speed (V), superelevation (e), and friction (f) as shown in **Table 3**, and as calculated by the following formula :

$$R = \frac{V^2}{15 (e+f)}$$

The maximum length of a horizontal curve on Type E, F, or G roadways shall not exceed 1.6 times the centerline radius (i.e. shall not encompass an angle greater than 90-degrees for a radii of 250 feet or greater. Also, the minimum arc length of a centerline radius design shall be 100 ft. The minimum centerline radius for residential streets shall be 250 feet. However, for corners of 90-degrees to 100 degrees on residential streets, the centerline radius may be 43.5 feet.

C. Minimum Vertical Alignment

Vertical Alignment is a function of stopping sight distance (SSD) which is given by the equation:

$$SSD = 1.47PV + \frac{V^2}{30 (f+g)}$$

Stopping sight distances herein are calculated for g=0, and a perception/reaction time of 2.5 seconds (P). The minimum vertical curve length considers the algebraic difference in grades (A) of the two street segments to be joined by a curve, the rate of curvature (K), the speed, and other factors to derive the crest curve length listed in **Table 4**, or sag curve lengths as shown in **Table 5**. The minimum length of a crest or sag curve is 100 feet.

TABLE 3
MINIMUM HORIZONTAL CENTERLINE RADIUS

| Street Type | V (mph) | f | e (ft/ft) | (e+f) | R (Calculated) (ft) | R (Rounded) (ft) |
|-------------|---------|------|-----------|-------|---------------------|------------------|
| F,G | 30 | 0.16 | -0.02 | .14 | 428.57 | 450 |
| D,E,E+ | 35 | 0.16 | -0.02 | .14 | 583.33 | 600 |
| C | 40 | 0.15 | -0.02 | .13 | 820.51 | 850 |
| B,B+ | 45 | 0.15 | -0.02 | .13 | 1,038.46 | 1,050 |

TABLE 4
MINIMUM ACCEPTABLE CREST CURVE GIVEN SPEED AND DIFFERENCE IN GRADE OF ROAD

| V (MPH) | SSD (ft) | K | L=KA * | | | | | | | | | |
|---------|----------|-----|--------|-----|-----|-----|-----|-----|-------|-------|-------|-------|
| | | | A=1 | A=2 | A=3 | A=4 | A=5 | A=6 | A=7 | A=8 | A=9 | A=10 |
| 30 | 200 | 30 | 100 | 100 | 100 | 120 | 150 | 180 | 210 | 240 | 270 | 300 |
| 35 | 250 | 50 | 100 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| 40 | 325 | 80 | 100 | 160 | 240 | 320 | 400 | 480 | 560 | 640 | 720 | 800 |
| 45 | 400 | 120 | 120 | 240 | 360 | 480 | 600 | 720 | 840 | 960 | 1,080 | 1,200 |
| 50 | 475 | 160 | 160 | 320 | 480 | 640 | 800 | 960 | 1,120 | 1,280 | 1,440 | 1,600 |

* 100 foot minimum

TABLE 5
MINIMUM ACCEPTABLE SAG CURVE GIVEN SPEED AND DIFFERENCE IN GRADE OF ROAD

| V (MPH) | SSD (ft) | K | L=KA * | | | | | | | | | |
|---------|----------|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| | | | A=1 | A=2 | A=3 | A=4 | A=5 | A=6 | A=7 | A=8 | A=9 | A=9 |
| 30 | 200 | 40 | 100 | 100 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 |
| 35 | 250 | 50 | 100 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| 40 | 325 | 70 | 100 | 140 | 210 | 280 | 350 | 420 | 490 | 560 | 630 | 700 |
| 45 | 400 | 90 | 100 | 180 | 270 | 360 | 450 | 540 | 30 | 720 | 810 | 900 |
| 50 | 475 | 110 | 100 | 220 | 223 | 440 | 550 | 660 | 770 | 880 | 990 | 1,100 |

* 100 foot minimum

D. Intersection Design

1. The centerline of the approaches or “legs” of street intersections should intersect perpendicular with each other, or “radially” in the case of curved street alignment. In both cases, the actual intersection angle shall not vary more than five degree in either direction from a 90-degree angle.
2. The corner radius shall be a minimum of 30 feet at the intersection of thoroughfare Types E and above with another thoroughfare Type E and above.
3. At all other intersecting streets, the corner radius shall be a minimum of 20 feet.
4. Along all thoroughfares, adequate right-of-way (ROW) shall be dedicated such that a minimum of 9-1/2 feet of parkway shall be maintained from the back-of-curb of the tangent and curve portions of the street geometry, such that adequate area for sidewalks, utilities, etc. is provided within the parkway. In general, ROW lines between intersections shall be parallel to the centerline and may include tangent and curved alignments.
5. Roadway design work at or near intersections should include a review of the existing and proposed pavement and lane markings on both sides of the intersection to verify proper lane alignment and should include any modifications to the pavement and/or pavement markings necessary to provide for safe and efficient traffic flow through the intersection.
6. The minimum spacing between adjacent streets and between a street and an adjacent median opening shall be as follows:
 - a. On an undivided roadway –
 1. Have at least 150 feet between the near curb of any adjacent street when either of the streets is a Type E or larger street or have at least 110 feet between the near curb of any adjacent street when both streets are Type F or smaller streets.
 2. If an existing street is located on the opposite of the street, the new street shall either:
 - a. align with the existing street and also meet the distance requirements from adjacent streets listed above, or
 - b. meet the distance requirements listed above
 - b. On a divided roadway –
 1. Align with an existing median opening or a new median opening installed to serve the street (subject to median opening spacing requirements of Section II.E.) and have at least 150 feet between the near curb of any adjacent street located on the same side of the street, or
 2. Be at least 150 feet from the near side of any median opening and have at least 150 feet between the near curb of any adjacent street located on the same side of the street,

E. Type C Intersection ROW -

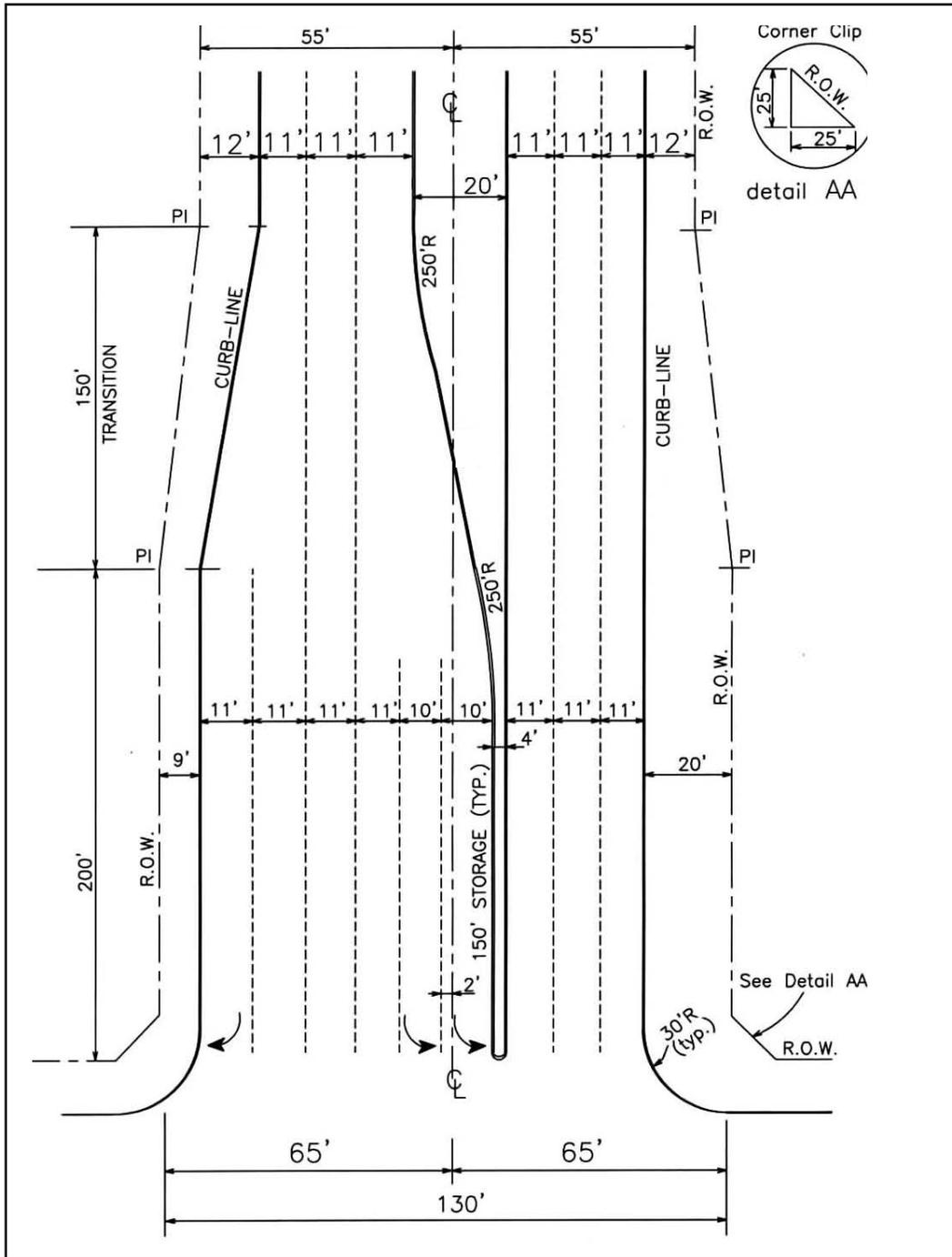
1. For intersections of a Type C, Major Thoroughfare with a Type B, B+, or C, the “legs” of the Type C ROW shall be expanded to 130 feet for a distance of 200 feet from the ROW line of the cross-street, and then transition back for 150 feet to the standard ROW width of 110 feet (**see Figure 1**). This flare will allow auxiliary turn lanes to be added to the intersection as needed. In general, right-turn lanes are required at all such intersections of Type C with Type B, B+, or C.
2. Tollway Intersection ROW - For intersections of a Type C, Major Thoroughfare with a tollway service road, the approach intersection width of the Type C ROW shall be expanded to 140 feet for a distance of 200 feet from the ROW line of the cross-street, and then transition back for 150 feet to the standard ROW width of 110 feet (**see Figure 2**). This flare will allow auxiliary turn lanes to be added to the intersection as needed.

F. Residential Frontage -

Residential houses shall not front a Type B thru D thoroughfare unless a parallel residential frontage road between the house and the adjacent side of the thoroughfare is provided. A minimum distance of 20 feet shall separate the typical curb-line of the thoroughfare and the residential frontage road in the form of a parkway. Residential frontage road ROW shall be in addition to the thoroughfare ROW.

FIGURE 1

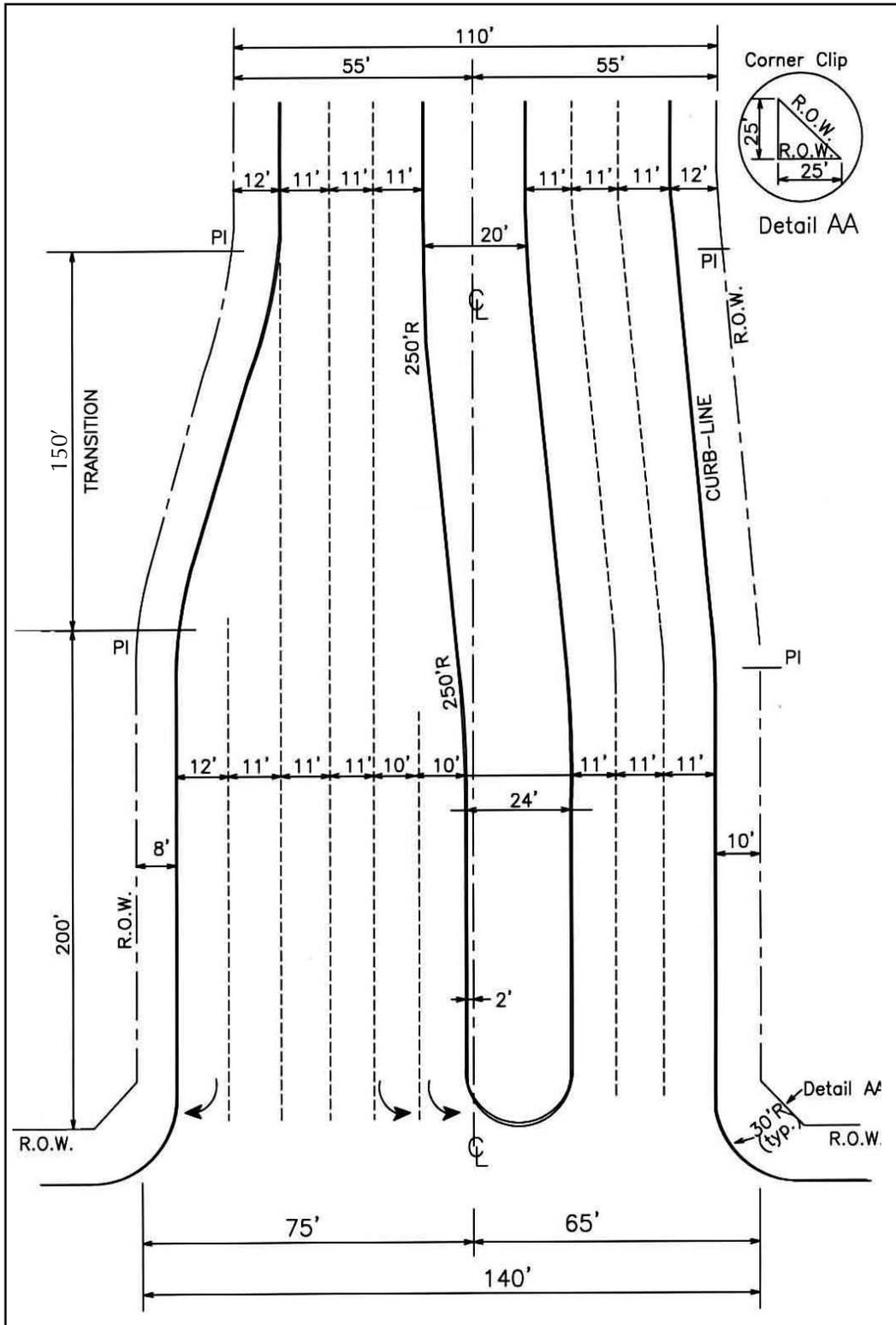
INTERSECTION OF TYPE "C" THOROUGHFARE WITH TYPE C AND ABOVE, ROW-REQUIREMENTS



Note: dashed lines show possible geometric construction, not lane lines.

FIGURE 2

INTERSECTION OF TYPE "C" THOROUGHFARE WITH TOLLWAY SERVICE ROAD, ROW-REQUIREMENTS



Note: dashed lines show possible geometric construction, not lane lines.

G. Preston Road and Spring Creek Parkway Special Standards -

For its entire length within the city, Preston Road is designated as a “special” major thoroughfare (Type B+), meaning the number and type of driveways and median openings allowed is different than the typical major thoroughfare, thus increasing its traffic-carrying capacity.

Spring Creek Parkway is designated as a “special” major thoroughfare (Type B+) as well, from Alma Road west to the city limit line. East of Alma Drive, Spring Creek Parkway is a Type C thoroughfare that follows normal standards.

For both Type B+ streets as defined above, the following special standards shall be used:

1. Along a Type B+ street, a deceleration lane shall be provided at commercial or industrial driveways, and at its intersection with thoroughfares that are less than Type D as shown in Figure 3(a), 3(b), or 3(c).
2. The outbound right-turn lane of a driveway feeding directly onto a Type B+ thoroughfare shall use a 40-foot corner radius - see **Figure 3(a), 3(b), or 3(c)**.
3. The minimum distance between two driveways along a Type B+ thoroughfare shall be per the typical driveway spacing on thoroughfares covered in Section IV.
4. Deceleration lanes and other auxiliary lanes required along a type B+ thoroughfare shall be constructed to the same standards as the adjoining street and the cost shall be the developer’s responsibility - see **Figure 3(a) - 3(g)**.
5. Full median openings at street intersections shall be separated from other full median openings by a minimum distance of one-quarter mile along a Type B+ thoroughfare. Median openings shall be accompanied by median left-turn storage lanes with no less than 60 feet in length in both directions.
6. Hooded left-turn median openings at commercial driveways shall be designed with a barrier island that blocks all traffic movements from the adjacent driveways or cross-street, but allows left-turn movements originating from a Type B+ thoroughfare to turn at the median as shown in **Figure 3(e), and 3(f)**. Along Preston Road, hooded median openings may be allowed at predetermined locations by authorized city staff. Along Spring Creek Parkway, one hooded median opening serving each direction of travel may be allowed at the approximate midpoint between two adjacent full median openings. The hooded median opening must be at least 500 feet from the near side of any adjacent full median opening.
7. There are presently no plans to construct any grade-separated interchange on Preston Road or Spring Creek Parkway. The intersection of Preston Road and Legacy Drive should be monitored over time as future traffic conditions may require re-evaluation to determine if a grade-separated interchange would be necessary.

H. Tollway and Access-Controlled Highway Corridor Special Standards

The City Traffic Engineer, and/or City Engineer, have the authority to apply these standards to proposed street and infrastructure design and construction within the City of Plano. Authorized city staff may allow or require different values for design parameters than those given herein to resolve unusual field conditions, to better serve the safety, and/or to better meet other needs of the public infrastructure.

There are both tollways and access-controlled highways that operate within the City of Plano as further described below. The following standards will not apply to U.S. 75 as it was developed under very old requirements, and redevelopment would not be feasible under the current design standards. Access/drive design along the U.S. 75 service roads will be designed to Type C thoroughfare standards.

A segment of the Dallas North Tollway (DNT) runs through the western sector of the city. The DNT Corridor as defined by Plano is bounded on the north by SH 121 and on the south by the city limits. Its east and west boundaries are defined by two parallel thoroughfares - Parkwood Boulevard and Communications Parkway.

The President George Bush Tollway (PGBT) Corridor runs east-west, at or near the south city limit lines. Its east and west boundaries are the city limits.

FIGURE 3 (a)
TYPE B+
THOROUGH-
FARE
STANDARDS
 (for property
 with more than
 410 feet of
 frontage)

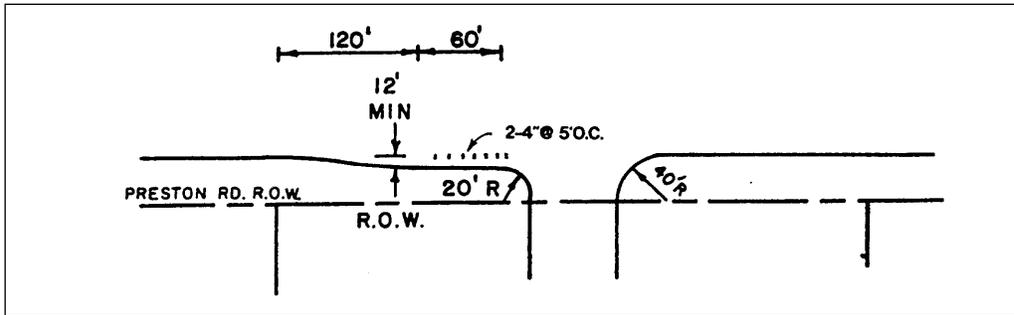


FIGURE 3 (b)
TYPE B+
THOROUGH-
FARE
STANDARDS
 (for property
 with more than
 380 to 410 feet
 of frontage feet)

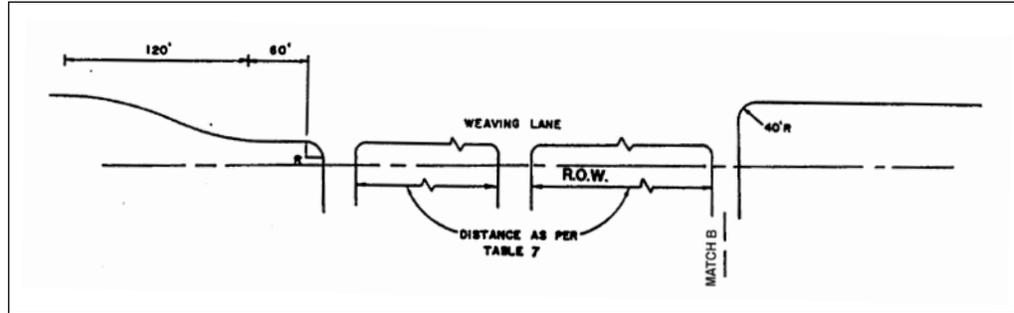


FIGURE 3 (c)
TYPE B+
THOROUGH-
FARE
STANDARDS
 (for property
 with less than
 380 feet of front-
 age)

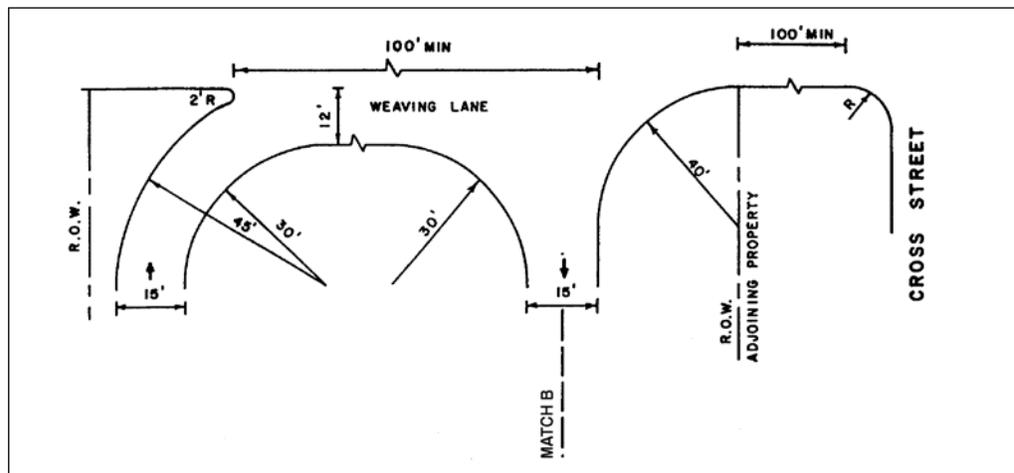


FIGURE 3 (d)
TYPE B+
THOROUGH-
FARE
STANDARDS
 (for property
 with downstream
 R-O-W being a
 street)

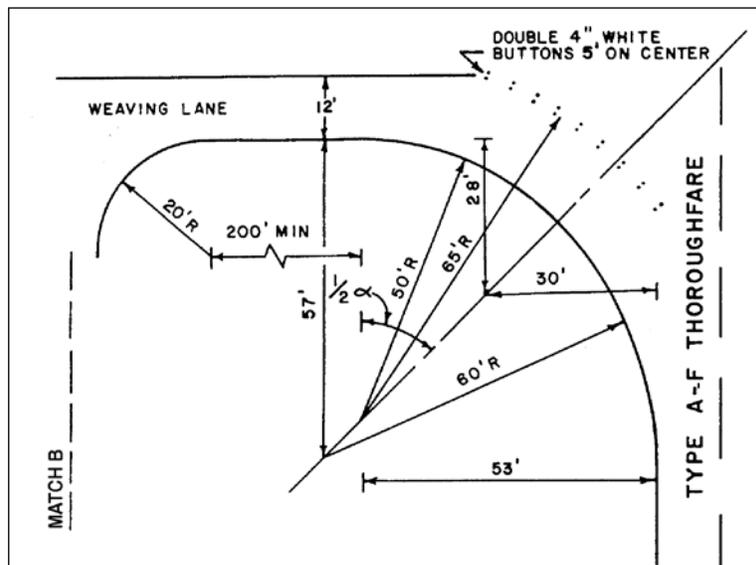


FIGURE 3 (e)
TYPE B+
THOROUGH-
FARE
STANDARDS
Hooded Median
Design

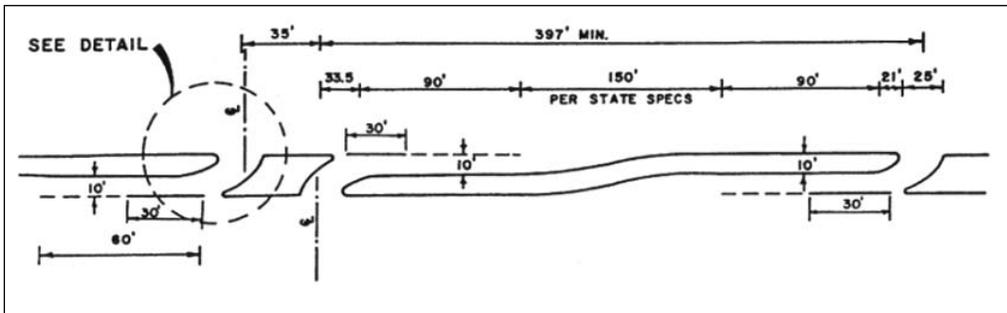


FIGURE 3 (f)
TYPE B+
THOROUGH-
FARE
STANDARDS
Hooded Median
Opening Detail

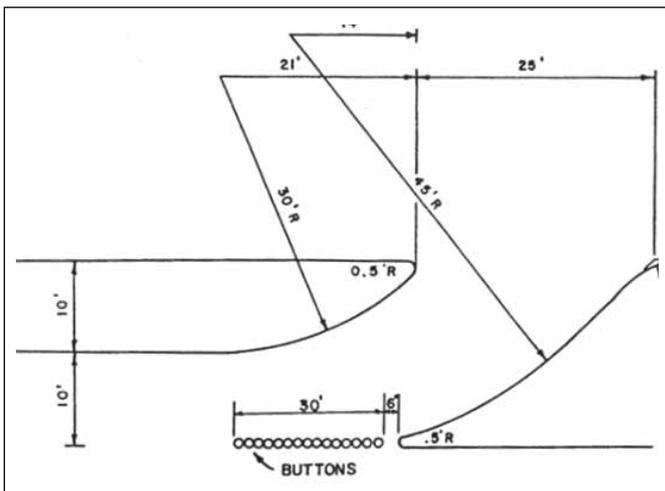
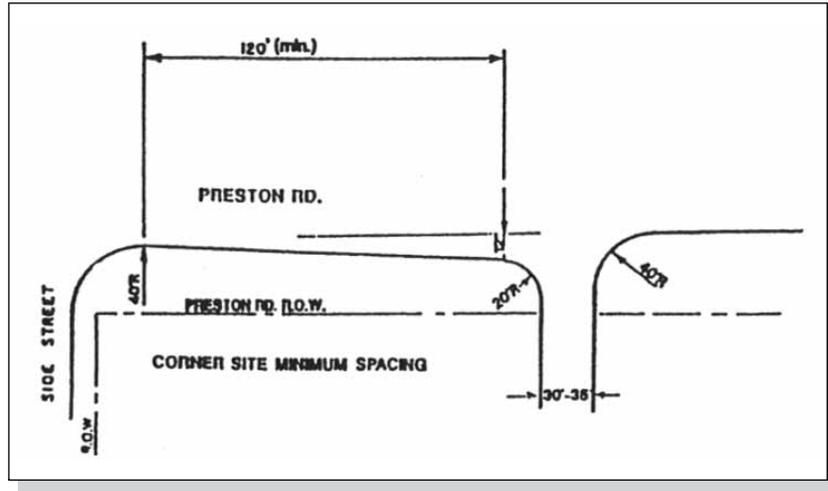


FIGURE 3 (g)
TYPE B+
THOROUGH-
FARE
STANDARDS
Minimum
Design



State Highway 121 (SH 121) runs approximately east-west, at or near the north city limit line. It is proposed to become a tollway for at least a portion of its length through Plano. It is bounded by the city limits (at Spring Creek Parkway) on the west, and Custer Road to the east.

United States Highway 75 (US 75) runs north-south in the eastern part of the city, and is bounded by PGBT to the south, and the city limits to the north.

Design standards for select elements of said corridors are detailed in the following sections.

1. Highway and Tollway Service Roads (one-way), except U.S. 75

- a. For driveway spacing relative to ramps gores, see section 2 below.
- b. For driveway-to-driveway spacing, and all other service road design elements under city jurisdiction, use the requirements of the Thoroughfare Standards Rules & Regulations herein, Section 2 below.

2. Highway and Tollway Service Roads

- a. Place no driveway neither less than 50 feet in advance of the concrete curb gore, nor less than 460 feet beyond the painted gore tip of an exit ramp - see **Figure 4(d)**.
- b. Place no driveway neither less than 460 feet in advance of the painted gore tip, nor less than 50 feet beyond the concrete curb gore of an entrance ramp - see **Figure 4(c)**.
- c. For all other roadway design elements under city jurisdiction, use other requirements of the Thoroughfare Standards Rules & Regulations .
- d. Provide a minimum spacing of 400 feet from the intersection of a crossing thoroughfare to the first downstream driveway, and provide a minimum 160 feet to the first upstream driveway - see **Figure 4(b)**.
- e. Provide minimum spacing of 325 feet between individual driveways, except where two drives are served by one deceleration lane – where the minimum driveway spacing within the lane is 120 feet - see **Figure 4(a)**.
- f. Provide a deceleration lane with at least 60 feet of storage (120 feet transition, 12 feet wide) into all driveways or multiple driveways off the service road. One deceleration lane may serve multiple driveways - see **Figure 4(a)**.

3. Thoroughfare Intersecting the DNT Tollway

Crossing thoroughfares are those streets that form an intersection, interchange, or otherwise cross the ROW of the DNT tollway to carry through traffic. At these ROW crossings, the following standards shall apply:

- a. Provide minimum spacing of 160 feet along the crossing street, from its intersection with the tollway, to the first driveway - see **Figure 5**.
- b. Starting with the second driveway, provide a minimum spacing of 150 feet between all driveways on a crossing street.
- c. On divided thoroughfares within the DNT Corridor, mid-block full-movement median openings are not allowed.
- d. On divided thoroughfares within the DNT Corridor, median hooded left turn lanes may be permitted mid-block as shown by **Figure 5** of the previous article.
- e. In the DNT Corridor, if only one mid-block turn lane is possible, priority will be given to the south side east of the tollway, and to the north side west of the tollway.

FIGURE 4(a)
DNT Driveway to
Driveway Spacing
Along Service
Road

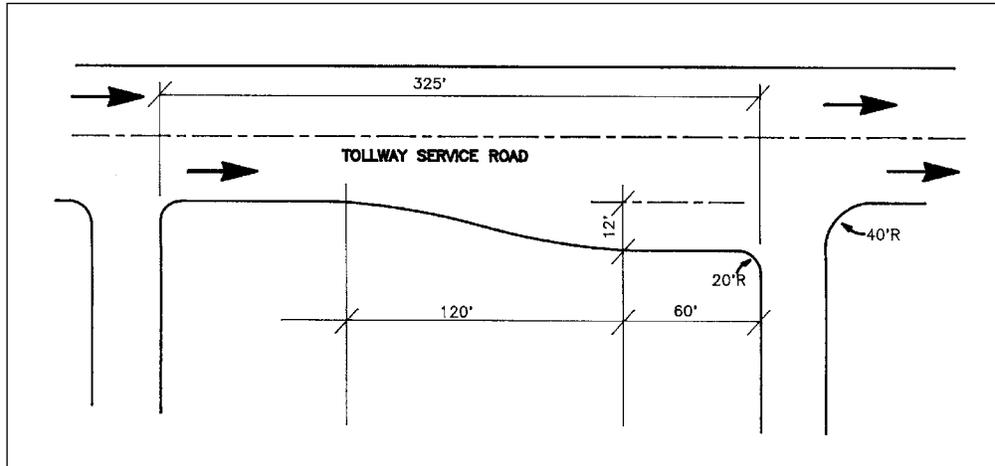


FIGURE 4(b)
DNT Driveway to
Thoroughfare Intersec-
tion Spacing
Along Service
Road

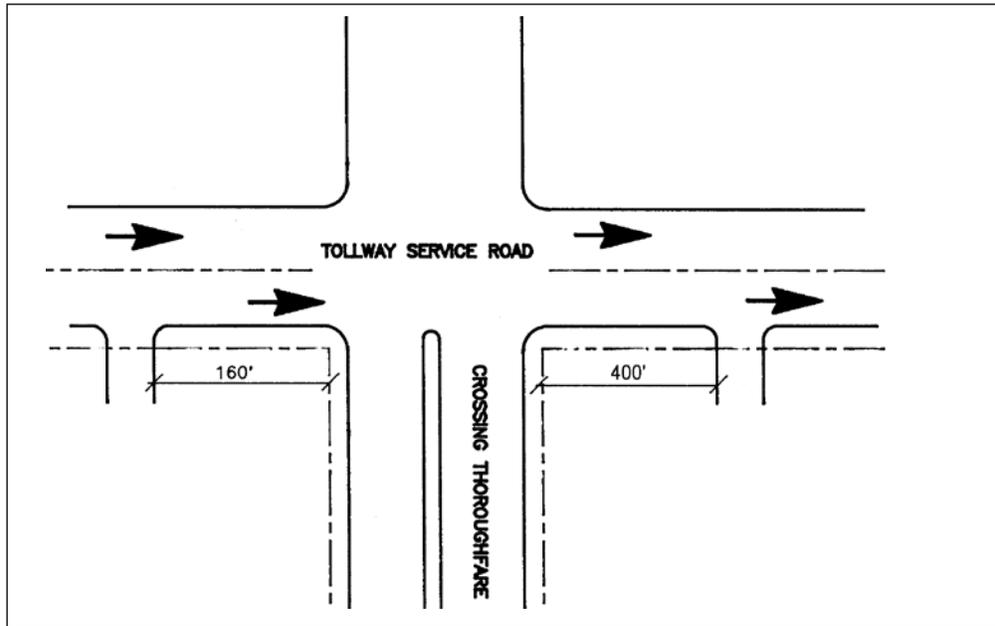


FIGURE 4(c)
DNT Driveway to
On-Ramp Spacing
Along Service
Road

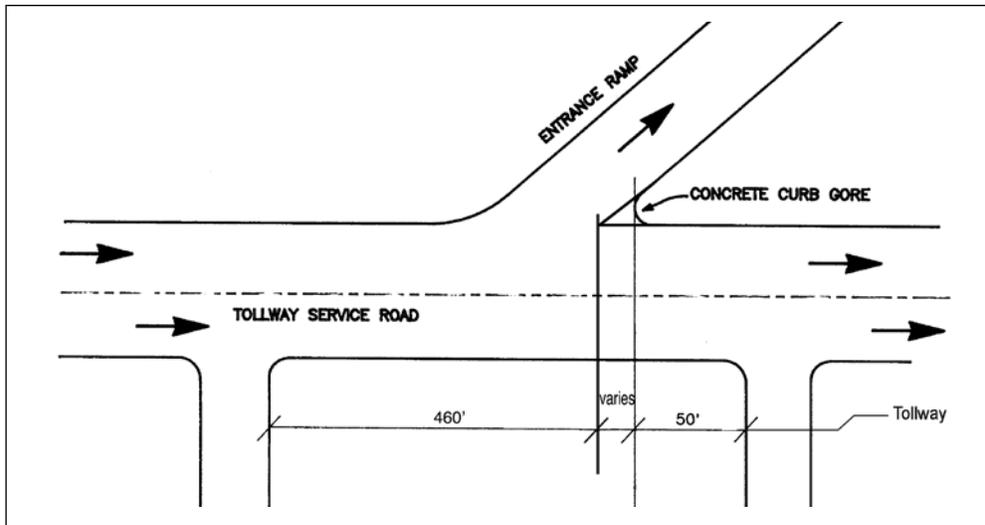


FIGURE 4(d)
TOLLWAY / SH
121 ACCESS
STANDARDS
Driveway to Off-
Ramp Spacing
Along Service
Road

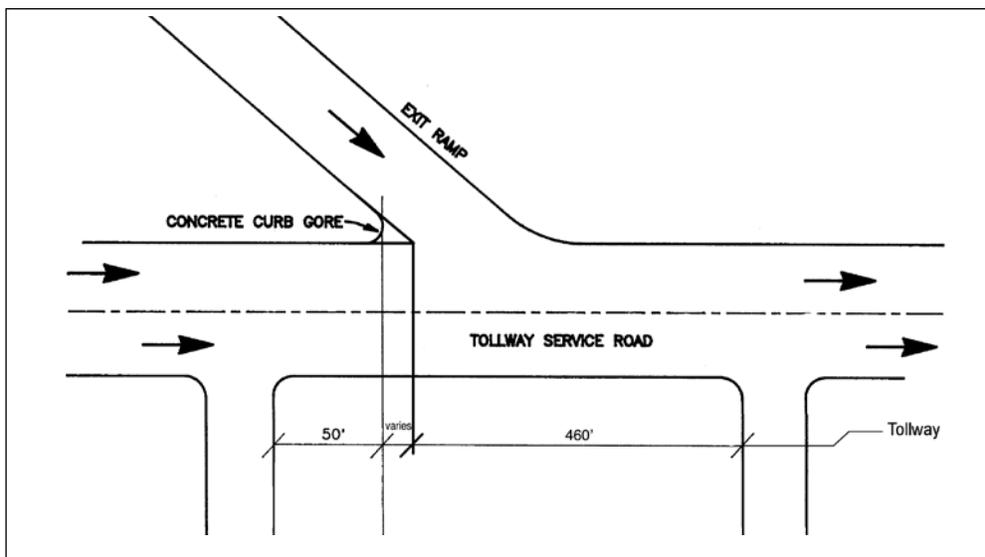
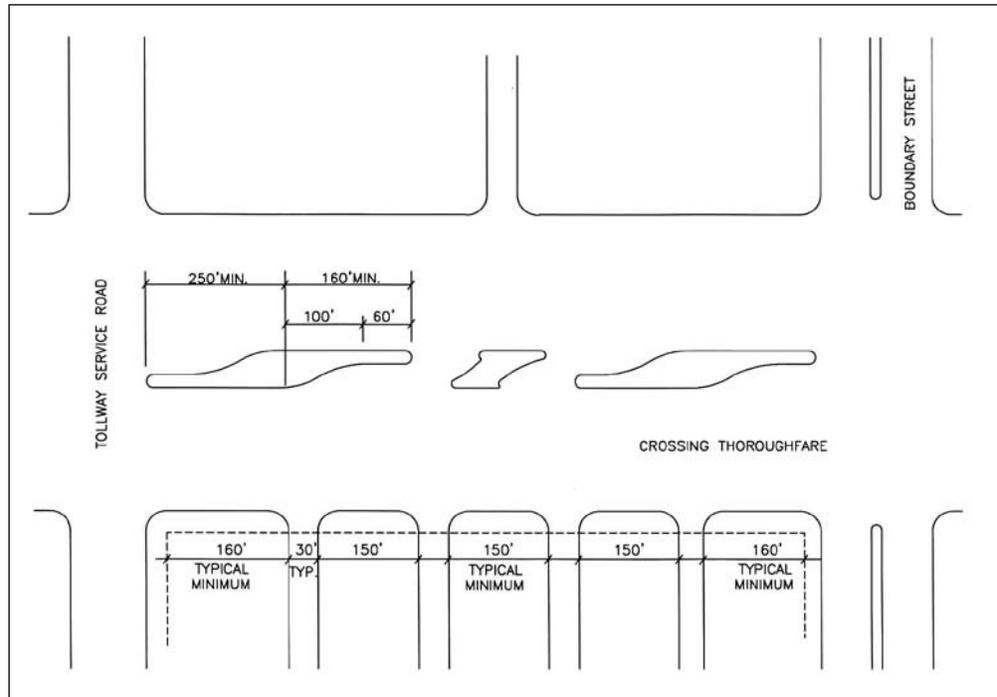


FIGURE 5
DALLAS NORTH
TOLLWAY
ACCESS
STANDARDS
Crossing
Thoroughfare
Drive Spacing



SECTION II. MEDIAN AND LEFT TURN LANE DESIGN STANDARDS

A. Median Width -

For regular thoroughfares not subject to special design standards covered in the previous section, the design standards herein shall apply. In general, the required median width varies from a minimum of 4' to a maximum of 28' depending on the thoroughfare classification of a given street as defined in the previous **Table 1**.

B. Required Median Openings and Left-Turn Lanes -

Median openings on divided thoroughfares shall be required at all at-grade street intersections, when those intersections are of a **Type B+, B, C, D, E, E+, and F**. Median openings may be required by authorized city staff at all other street intersections, private drives, and non-residential driveways. The driveways where a median opening is required must also conform to the spacing and other design requirements herein, and the overall geometrics of the street must accommodate a median opening. Also, the median opening shall also feature left-turn lanes in the median - one in each direction that serves a single approved driveway, or the approaches of a single intersection.

C. Cost of Median Openings and Left-Turn Lanes -

Median openings and left-turn lanes constructed to serve private drives and new roads shall be paved to City standards, inspected by City inspectors, and paid for by owners served by the median openings and left-turn lanes. The City of Plano shall pay the costs of median openings and left-turn lanes constructed to serve existing dedicated streets and drives, when a Community Investment Program widening project is undertaken by the City of Plano on an existing public street.

D. Minimum Design, Left-Turn Lanes -

The minimum left-turn lane design for regular thoroughfares shall be as described below, and as illustrated in **Figure 6**. Other standards may apply as defined herein for special thoroughfares.

1. All left-turn storage areas shall be a minimum of 10 feet wide with minimum storage length as defined in **Table 6** of this section.
2. The transition curves used in left-turn lanes shall be two, 250 foot radius reverse curves with a total transition length of 100 feet for single lanes. Add 100 feet to transition length for double-left turn lanes.

E. Minimum Design, Median Opening -

1. Median openings at intersections (as measured from nose to nose of the median) shall have a minimum opening distance equal to the width of the intersecting street as measured from right-of-way line to right-of-way line, unless otherwise approved by authorized city staff.
2. The width of a mid-block median opening – as measured longitudinally along the centerline of the street - shall not be less than 60 feet, –or greater than 70 feet unless otherwise approved by authorized city staff.
3. Using the above requirements, examples of the resulting minimum distance between two (2) median openings with left-turn lanes in opposite directions (for two different driveways/intersections) are:
 - a. 310 feet from nose to nose of the median from the intersection of two major thoroughfares to a street or drive (**see Figure 6**).
 - b. 260 feet from nose to nose of the median from the intersection of two secondary thoroughfares or a secondary thoroughfare and a major thoroughfare to a residential street or a drive, and,
 - c. 220 feet from nose to nose of the median for intersection combinations of drives and/or residential streets.

F. Medians Where No Left Turn Pocket is Needed -

- 1. In a given segment of median (typically between two intersection) where only one “nose” of the median has left-turn provided, and where the other end or nose of the median does not have a median left-turn (in the opposite direction) because a driveway cannot or will not be installed, then the minimum tangent distance between median end and the beginning of the transition for the single left-turn lane shall be 30 feet - **see Figure 7.**
- 2. If the left-turn storage is not required on either end of a median segment , but the median is simply a spacer or barrier between two median openings, the minimum length of said median segment shall be 50 feet, measured nose to nose. (**see Figure 6).**

G. Medians on Public Street Into Developments –

Medians may be installed on Type E thoroughfares or smaller (undivided streets) that intersect with an equal or higher type thoroughfare, if the smaller thoroughfare serves as an entrance to a subdivisions for the purpose of aesthetic or any other purpose. In such cases, the median shall be a minimum of 4 feet wide, a maximum of 10 feet wide and at least 90 feet long. Additional right-of-way may be required to accommodate the median.

H. Close or Modify Existing Media Opening

Existing median openings may be closed or modified by city staff to better meet the travel and access needs of a given road segment. City staff shall notify, in writing, the property owners within 500 feet of the proposed median modification as measured linearly along the street on either side of the median opening. Property owners in opposition may contact city staff to discuss the proposal. Property owners in opposition may request an appeal to the P&Z using the general appeal process.

TABLE 6
MINIMUM LEFT TURN STORAGE REQUIREMENTS

| INTERSECTING THOROUGHFARES | MINIMUM STORAGE |
|-------------------------------------|------------------------|
| Major with major | 150 feet |
| Major with Secondary | 100 feet |
| Major with Residential | 60 feet |
| Major with Private Drive | 60 feet |
| Secondary with Major | 100 feet |
| Secondary with Secondary | 100 feet |
| Secondary with Residential | 60 feet |
| Secondary with Private Drive | 60 feet |

FIGURE 6
TYPICAL
MEDIAN
SPACING ON A
MAJOR STREET
FROM A
COMMERCIAL
DRIVE TO A
MAJOR STREET

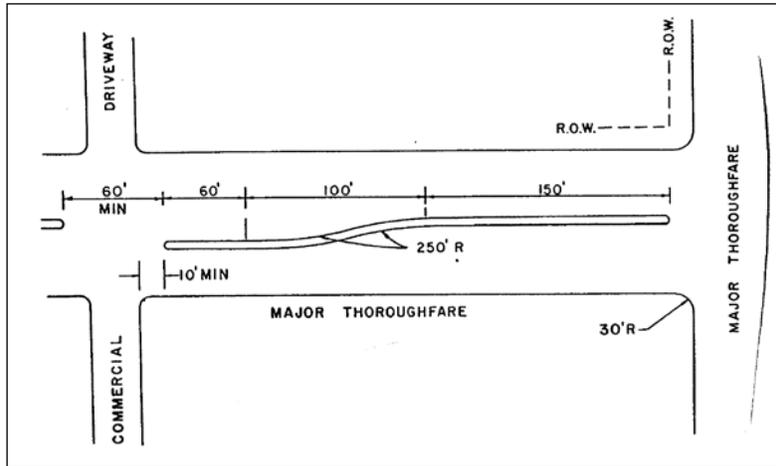
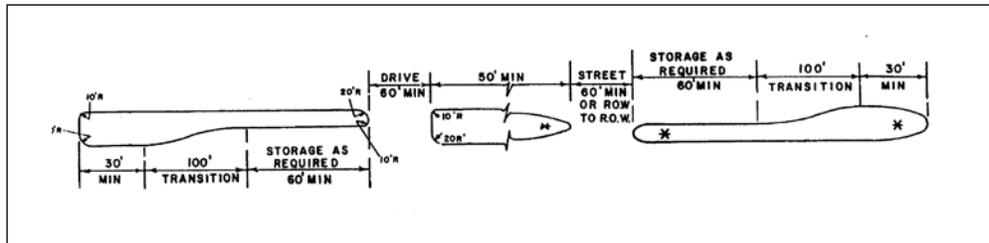


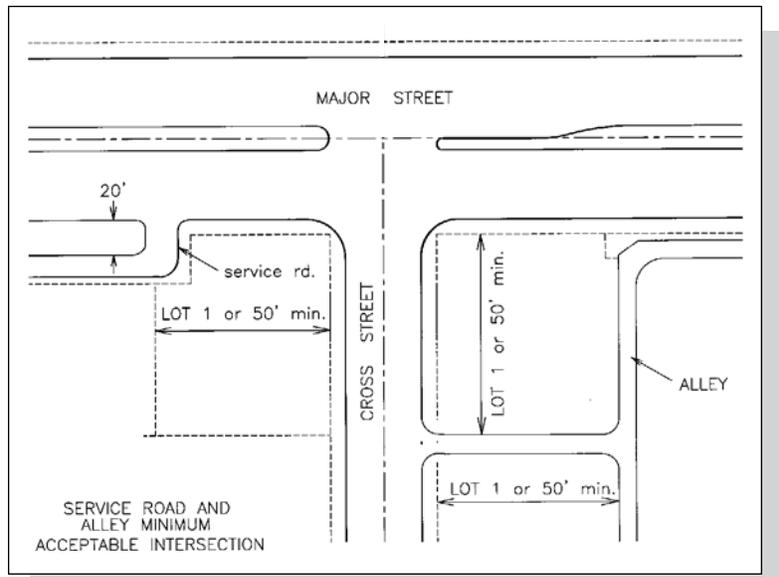
FIGURE 7
TYPICAL
MEDIAN
DIMENSIONS
WITHOUT
BACK TO BACK
LEFT TURN
POCKETS



**SECTION III.
ALLEY AND SERVICE ROAD DESIGN STANDARDS**

- A. All alley junctions with streets shall be perpendicular or radial, within 5-degree tolerance (in either direction), at the intersection of the right-of-way lines. At their intersection with streets, alley corner radii shall not be less than 15 feet.
- B. The distance between alleys on opposite sides of an undivided street shall be less than 15 feet or greater than 75 feet as measured between closest point between the face-of-curb of one alley and the face-of-curb of the other alley.
- C. Alleys shall not form junctions with Type D and larger thoroughfares. If an alley runs parallel to, and shares a common right-of-way line with a major thoroughfare, then its alignment shall curve away from the major street and connect with another area alleyway, thus avoiding the formation of a junction. This curved alignment of a parallel alley shall occur not less than one subdivision lot-width, or a minimum of 50 feet (whichever is greater) from a cross street intersection formed by another thoroughfare that is Type F or greater as indicated in **Figure 8**.
- D. Alley Visibility Obstructions : No fence, wall, screen, sign, structure, or foliage of hedges, trees, bushes, or shrubs shall be erected, planted or maintained in any alley right-of-way. However, the city may place traffic control devices as necessary. Foliage of hedges, trees, bushes, and shrubs planted adjacent to the alleys right-of-way which are not otherwise governed by the following triangles or Section 3-1000 of the Comprehensive Zoning Ordinance of the City, shall be maintained such that the minimum overhang above the ground 1 foot outside the edge of pavement shall be 14 feet. A minimum 12 foot overhang above the entire width of the alley shall be provided in every case.
- E. At the junction of alleys with city streets, if fencing or foliage is provided near or at the property line, it shall be placed in a configuration that creates a triangular clear zone whereby the sides of the resulting triangle are 8 feet in length. (Ref. Section 3-1000, Comprehensive Zoning Ordinance.)

FIGURE 8
**PARALLEL SERVICE ROAD/
ALLEY MINIMUM INTER-
SECTION AT A
MAJOR ROAD**



SECTION IV

ACCESS MANAGEMENT POLICY AND DRIVEWAY DESIGN STANDARDS

Many elements are involved in providing access to residential and commercial properties. However, for the purposes of this document, "access" (or access point) is defined as the location, frequency, spacing, and design of driveways along the frontage, or perimeter of a given property that allow vehicular traffic to cross between the public right-of-way to the private property, whether entering or exiting.

The City's policy on access management is to allow access points to be developed for a property that are consistent with the technical criteria herein, and that achieve a balance among the following major factors: the mobility needs of the adjacent roadway; the access needs of the property; the design parameters and operations of adjacent highway elements (state/federal); and the safety needs of general vehicular and pedestrian traffic. These and other technical factors should be considered in applying the design criteria herein.

The issue of access is covered in this section. Elements such as median openings and auxiliary lanes for driveways are covered elsewhere in this document, and may be a part of the technical considerations for an access point. Table 7 specifies the relative distance between successive driveways on any given street, thoroughfare, or State roads within Plano. The sections below give further details about applying the access policy.

A. Procedure for Allowing Access on City Streets

1. Application Procedure

An applicant wishing to apply for a new access point should submit a site plan or concept plan depicting the driveway or median opening location on a given city street. Typically, these documents are generated as part of a new development approval process as required in the *Zoning and Subdivision Ordinance*. The proposed access point shall satisfy all applicable City requirements.

2. Deviation Procedure

A party wishing to deviate from the City's access standards for a driveway on a city street shall submit an engineering study detailing why a deviation from the criteria will not adversely affect vehicular and pedestrian traffic and safety. The engineering study is then subject to review and approval by authorized city staff.

The study area size and analysis requirements may be determined at the sole discretion of authorized city staff. However, the study area is generally limited to a 1,000-foot radius from the site containing the access point. The engineering study may typically include an analysis of the following considerations:

calculated site traffic assigned to the driveways and street network; existing area traffic; level of service analysis for street segments, driveways, unsignalized intersections, and signalized intersections for a given area; and a preliminary engineering plan depicting the proposed access deviation plotted in conjunction with the area city street network, including distances between the proposed drive, and other driveways, intersections, median openings, etc.

A constructability analysis should also be presented based on the preliminary design. Its purpose would be to illustrate site and area conditions that may impede an adherence to the standards of the access policy. Also, pedestrian access routes should comply with the Americans with Disabilities Act and Texas Department of Licensing and Regulation (TDLR) requirements.

B. Procedure for Allowing Access on State Roads

1. Application Procedure

An applicant wishing to apply for an access point on a new or existing state road should submit a site plan or concept plan depicting the driveway or median opening location on a given state roadway to the City. Typically, these documents are generated as part of a new development approval process as required in the *Zoning and Subdivision Ordinance*.

If the plan satisfies all applicable City and TxDOT (Texas Department of Transportation) requirements and standards, the access points on the plans will be certified as “access meets city requirements” by the City. If the proposed access points do not meet the access policy criteria (e.g. two successive driveways are too close), the access points will be certified as “access does not meet city requirements.” The applicant may then resubmit a modified access plan that does meet the existing technical criteria, or they may offer an alternative access strategy under the “deviation procedure” detailed below.

However, if the driveway is needed to keep from land-locking a property where TxDOT does not own the access rights, or if it is a replacement, or re-establishment of access to the state highway system under reconstruction, rehabilitation, then the full engineering study may be replaced by a preliminary design of access plan. This plan will be submitted to the city for review and approval by authorized city staff first, and then to the appropriate TxDOT office for review and approval.

The study area size and analysis requirements may be determined at the sole discretion of the authorized city staff – such as the Manager of the Transportation Engineering Division. However, the study area is generally limited to a 1-mile radius from the site containing the access point. The engineering study may typically include an analysis of the following considerations:

calculated site traffic assigned to the driveways and street network; existing area traffic – Including service road and ramp volumes; level of service analysis for ramps, ramp junctions, service roads, street segments, driveways, and signalized intersections for a given area; and a preliminary engineering plan depicting the proposed access deviation plotted in conjunction with the area city street and state road network, including distances between ramps and driveways.

A constructability analysis should also be presented based on the preliminary design. Its purpose would be to illustrate site and area conditions that may impede an adherence to the standards of the access policy. Also, pedestrian access routes should comply with the Americans with Disabilities Act and Texas Department of Licensing and Regulation (TDLR) requirements.

C. Driveway Definition

The definition of the driveway types, for the purposes of this document, are as follows:

1. A “residential” driveway provides access to a single-family residence, to a duplex, or to a multi-family building containing five or fewer dwelling units. These drives shall be allowed to intersect and access some secondary thoroughfares and smaller streets only (Type E and smaller) only. All other access to residential property abutting all other thoroughfares shall be off an alley or a service road, but not the thoroughfare..
2. A “commercial” driveway provides access to an office, retail or institutional building, or to a multiple-family building having more than five dwelling units. Commercial drives shall be allowed to intersect and access Major or Secondary Thoroughfares only (Type B+, B, C, D, E, E+). It is anticipated that such buildings will have minor truck traffic for incidental service or delivery.
3. An “industrial” driveway serves truck movements to and from loading areas of an industrial facility, warehouse, distribution center, truck terminal, etc. Industrial drives shall access Major or Secondary Thoroughfares only (Type B+, B, C, D, E, E+).

Note: See article V. Section 5.4 g of City of Plano Subdivision Ordinance for Type E access restrictions.

At an industrial facility, a driveway whose principle function is to serve administrative or employee parking lots shall be considered commercial driveway.

Centralized retail development, such as a community or regional shopping center, may have one or more driveways specially designed, signed and located to provide access for trucks. Such driveways shall be considered industrial driveways.

4. For all types of driveways herein, two-way driveways shall always be designed to intersect the adjacent street at an approximate 90 degree angle. One-way driveways may be designed to intersect a street at an angle of either 90 degrees or 45 degrees.
5. Joint access residential drives shall have no less than 9 feet on each property.

Note: Joint access residential drives shall have no less than 9 feet on each property.

D. Driveway Width

As the term is used herein, the width of a driveway refers to the width of pavement measured orthogonally between the two curb-lines of the same driveway that define the functional traffic lanes of the driveway, and that have a point-of-intersection with the curb radii that connect the driveway curb-lines to the adjacent street curb-lines.

1. Residential driveways onto streets shall have a minimum width of 12 feet and a maximum width of 24 feet (see Figure 9 (a)).
2. Commercial/Industrial drives, two-way, two lane operation - these types of driveways shall have their width determined as follows:
 - a. Commercial driveways shall have a minimum width of 24 feet and a maximum width of 30 feet. However, up to 40 foot width drives may be used for vehicle-fueling service stations see Figure 9(b).
 - b. Industrial driveways shall have a minimum width of 30 feet and a maximum width of 40 feet - see Figure 9 (b).
3. Commercial/Industrial - two-way, three-lane operation - these types of driveways shall have their width determined as follows:
 - a. Commercial driveways with two-way, three-lane operation shall have a minimum width of 36 feet and a maximum width of 40 feet.
 - b. The radius for the inbound direction shall be 30 feet. The radius for the outbound direction shall be a minimum of 20 feet and a maximum of 30 feet.
 - c. Pavement markings shall be installed to define the centerline between the opposing directions of travel and between the two lanes operating in the same direction.
 - d. Pavement markings and signs to indicate the permitted or required exiting movements shall be installed and maintained by the property owner.
 - e. The pavement markings shall be consistent with the Texas Manual on Uniform Traffic Control Devices, and/or with City practices and standard - see Figure 9 (d).
4. Commercial/Industrial - two-way, divided, two-lane operation - these types of driveways shall have their width determined as follows:
 - a. 90 degree drives shall have a width of 22 feet with a 30 foot radius for the inbound direction, and 22 feet of width for the outbound direction, with a separation or barrier median with a minimum width of 4 feet and a maximum of 10 feet - see Figure 9 (c).
 - b. Joint access commercial/industrial drives shall have no less than 10 feet on each property, with the full drive width and access pavement to the property built for the development at the same time.

Note: Joint access commercial/industrial drives shall have no less than 10 feet on each property, with the full drive width and access pavement to the property built for the development at the same time.

Note: All commercial and industrial drives will have an unbroken curb length of not less than 20 feet from the right-of-way, or 30 feet from the roadway curb, whichever is greater, extending into the site on each side of the drive, see Figures 9 (b) & 9 (c).

Note: A summary of driveway widths, radii and angle requirements are given in Table 8.

FIGURE 9(a)
DRIVEWAY
WIDTH,
RADIUS,
SPACING for
Residential
Driveways

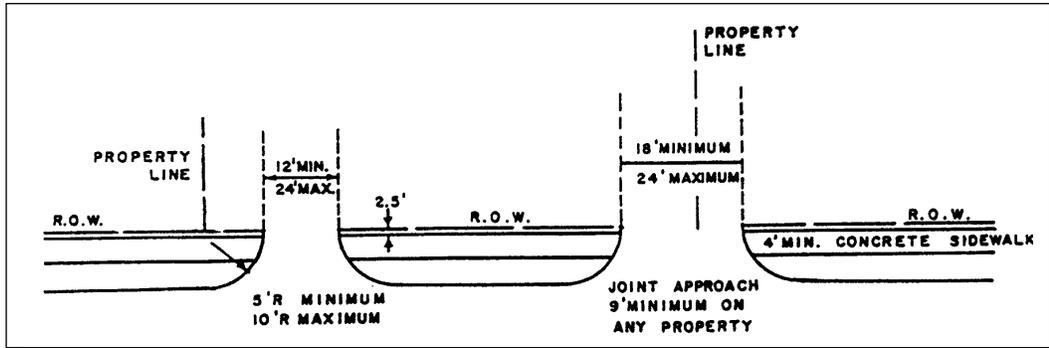


FIGURE 9(b)
DRIVEWAY
WIDTH,
RADIUS,
SPACING for
Undivided,
Two Lane
Commercial
and Industrial
Driveways

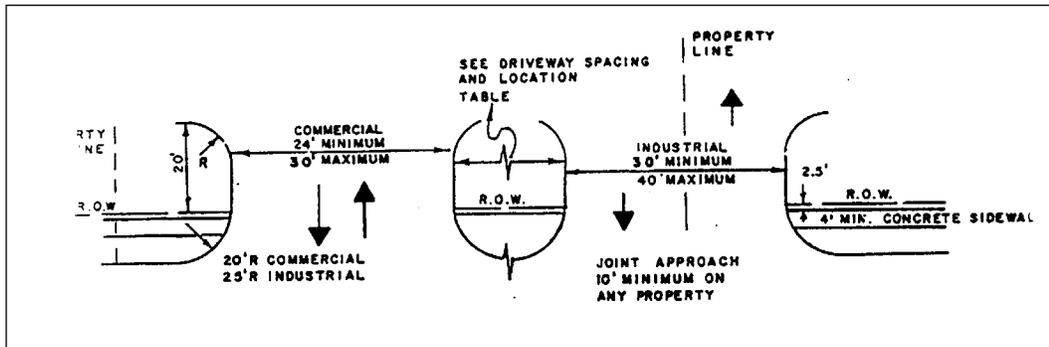


FIGURE 9(c)
DRIVEWAY
WIDTH,
RADIUS,
SPACING for
Divided
Commercial
and Industrial
Driveways

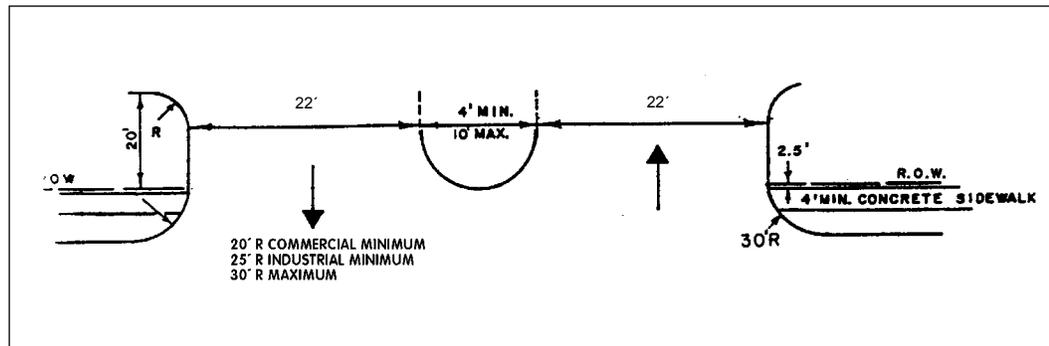


FIGURE 9(d)
DRIVEWAY
LAYOUT for
undivided,
three-lane
commercial
driveways

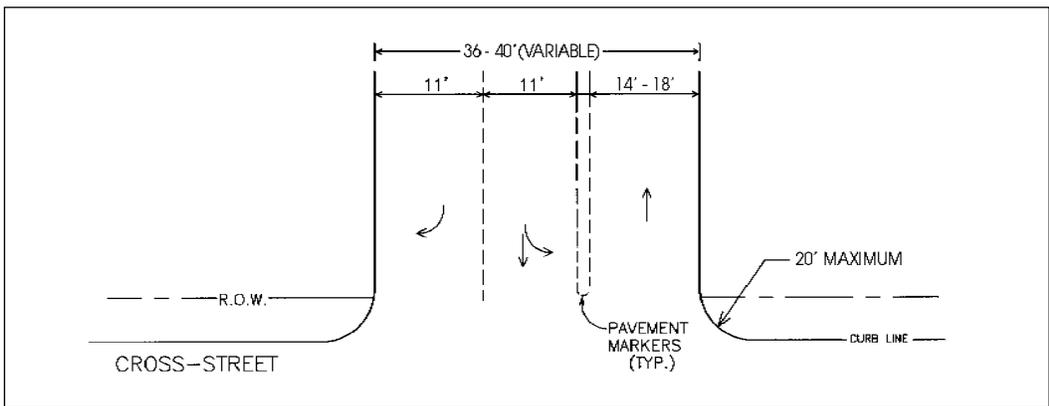


TABLE 7

DRIVEWAY SPACING IN RELATION TO OTHER DRIVES GIVEN THE DESIGN SPEED OF THE STREET

| STREET TYPE | DESIGN SPEED (MPH) | MINIMUM DRIVEWAY SPACING (FT) |
|-------------|--------------------|-------------------------------|
| F, G | 30 | 90 |
| D, E, E+ | 35 | 100 |
| C | 40 | 120 |
| B, B+ | 45 | 150 |

TABLE 8
SUMMARY OF DRIVE REQUIREMENTS

| | RESIDENTIAL | COMMERCIAL | INDUSTRIAL | COMMERCIAL/ INDUSTRIAL-DIVIDED | |
|--------------------|-------------|------------------------------------|------------|--------------------------------|--|
| | | | | IN | OUT |
| Minimum Width | 12' | 24' (two lane) 36' (three-lane) | 30' | 22' | 22' |
| Maximum Width | 24' | 30' (two lane) 40' (three-lane) | 40' | 22' | 22' |
| Curb Radii | 5' - 10' | 20'-30'* | 25'-30' | 30' | 20'-30' Commercial 25'-30' Industrial |
| Intersecting Angle | 90°, 45° | 90°, 45° | 90°, 45° | 90°, 45° | 90°, 45° |

* 30 foot radius required for inbound direction on two-way three-lane drive

E. Driveway Radius

All driveways intersecting dedicated streets should be built with a circular curb radius connecting the raised curb line of the roadway to the curb line or pavement edge of the driveway. Driveway radii shall have a point-of-curvature on the adjacent street curb-line (typically established along the back-of-curb line), so that the rest of the driveway falls entirely within the subject property line. This does not apply to alleys.

1. 90 Degree Driveway Curb Radii

- a. The curb radii for a residential drive shall be a minimum of 5 feet and a maximum of 10 feet - see Figure 9(a).
- b. The curb radii for a commercial drive shall be a minimum of 20 feet and a maximum of 30 feet, except as otherwise noted in this document.
- c. The curb radii of an industrial driveway shall be a minimum of 25 feet and a maximum of 30 feet - see Figures 9 (b), 9 (c). except as otherwise noted in this document.

F. Driveway Spacing and Location in Relation to Other Drives

1. Residential - Driveways or access points on a given lot of land devoted to a single land use shall not occupy more than 70% of the linear frontage of one side of the lot adjacent to a roadway. No more than two (2) driveways or access points per adjacent street shall be permitted on any lot.
2. Commercial and Industrial - For a given tract of land or development, the spacing and location of driveways shall be a function of both existing adjacent driveways, and proposed driveways on other approved plans. The spacing between driveways shall depend upon the speed limit of the Major or Secondary Thoroughfare as shown in Table 7. Driveways shall not be permitted in the transition area of any deceleration lane or right turn lane.
3. The "minimum driveway spacing" shall be measured parallel to the street right-of-way between every two, successive driveways (both existing and proposed). The distance being measured will be from the beginning of the closest tangent curb-line of one driveway, to the closest tangent curb-line of the next driveway. Please note the measurement is not taken from centerline or radius of any driveway - see Figure 9 (b).

G. Driveway Spacing in Relation to a Cross Street

1. 90 Degree Drive, Distance to Cross-street

- a. Driveways along the curblines of a Collector (Type F) or Residential Street (Type G and smaller) shall be located a minimum distance equal to the driveway radius from the end of the street radius of the closest intersection of a Type F or smaller street - see Figure 10(a). That is, the driveway radius may begin at the end of the intersecting street radius.
- b. Driveways along the curblines of a Residential Street (Type G or smaller), Collector Street (Type F), or Secondary Thoroughfare (Type D, E, E+) shall be located a minimum of 30 feet from the end of the street radius of the closest Major Thoroughfare (Type B, B+, C) or Secondary Thoroughfare (Type D, E, E+) - see Figure 10(b).
- c. Driveways along the curblines of a Major Thoroughfare (Type B, B+, C) shall be located a minimum of 100 feet from the closest right-of-way line of the closest intersection (any Thoroughfare type) along the Major Thoroughfare - see Figure 10(c). If the property frontage being served by said driveway is such that both the drive and the drive's curb radius cannot be totally within the proposed development, the drive shall be situated so as to create a joint access drive.

FIGURE 10(a)

DRIVEWAY SPACING IN RELATION TO A CROSS STREET —
 Driveway at 90° on a Collector or Residential Street

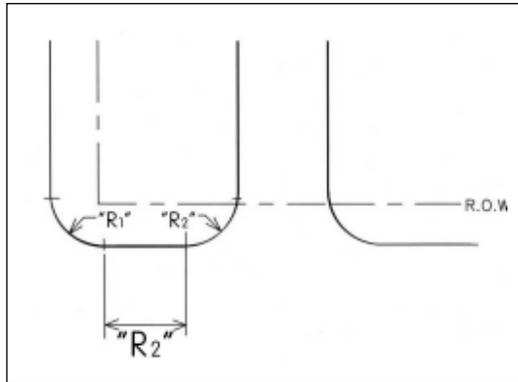


FIGURE 10(b)

DRIVEWAY SPACING IN RELATION TO A CROSS STREET —
 Driveway at 90° on a Secondary Thoroughfare

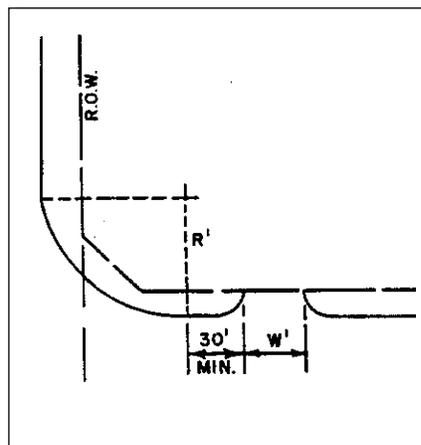
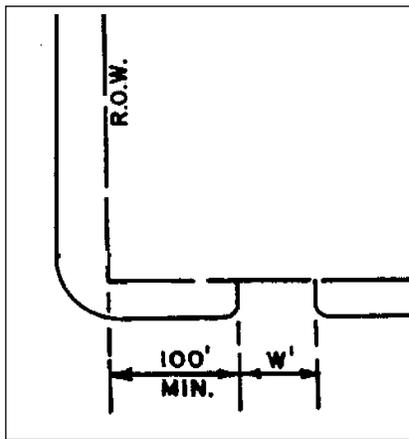


FIGURE 10(c)

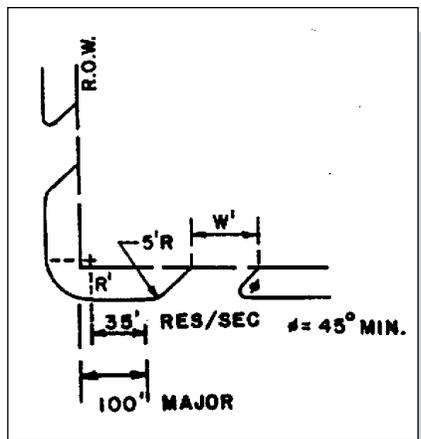
DRIVEWAY SPACING IN RELATION TO A CROSS STREET — Drive-
 way at 90° on a Major Thoroughfare



2. 45 Degree Drive, Distance to Cross Street
 - a. If one-way angle drives are used, the radius for the driveway on a Residential Street, Collector, or Secondary Thoroughfare shall be a minimum 35 feet from an intersecting street's end of curb radius. On a Major Thoroughfare, the drive shall be located a minimum of 100 feet from the closest right-of-way line of the closest street intersection (any Thoroughfare Type) along the Major Thoroughfare. If the property frontage being served by said driveway is such that both the drive and the drive's curb radius cannot be totally within the proposed development, the drive shall be situated so as to create a joint access drive - see Figure 10(d).
3. Driveways at 90 Degree Corners

Commercial and industrial driveways and driveways serving other than a single family residence shall not be located within the limits of the radius at approximate 90 degree corners or turns. Driveways located near approximate 90 degree corners or turns should be at least as far away from the corner as the spacing requirements established in 1 and 2 above.

FIGURE 10(d)
ANGLE
DRIVEWAY
SPACING IN
RELATION TO
A CROSS
STREET



Section V Sidewalk and Location Design Standards

A. Definition of Sidewalk

A sidewalk is defined as that paved area in a roadway right-of-way between the curb line or the edge of pavement of the roadway and the adjacent property lines for the use of pedestrians. The maximum grade of the sidewalk shall be 1/2" per foot, the maximum crossfall of the sidewalk shall be 1/4" per foot. However, the sidewalks shall also be designed in accordance to the requirements of the Americans with Disabilities Act (ADA) regulations where applicable.

Sidewalks shall conform to the following standards:

1. Zoning Classification Requiring Sidewalks - Concrete sidewalks designed and located according to City standards shall be constructed along all streets in all zoning classifications except agriculture zoning. Sidewalks shall be built at the time of site development. Should it be impractical to install the sidewalk at that time, funds for the sidewalk construction shall be placed in escrow with the City for use when the City determines sidewalks are needed. Payment of escrow shall be made prior to site plan or final plat approval.
2. Residential Areas (Single Family and Duplex) - A concrete sidewalk, minimum 4 feet in width, shall be located within the street right-of-way (R-O-W), 2-1/2 feet from the R-O-W line, unless pre-existing physical encroachments (e.g. utility infrastructure or trees) dictate otherwise. An adequate passing zone as defined in the Americans with Disabilities Act Accessibility Guidelines (ADAAG) should be provided where appropriate along the sidewalk. Sidewalks and parkways (curb to R-O-W) shall be graded at 1/4 inch per foot above the top of the street curb.
3. Non-residential Areas and Apartment Complexes - A concrete sidewalk, a minimum 4 feet in width, shall be located in street right-of-way (R-O-W) not more than 2 1/2 feet from the R-O-W line. An adequate passing zone as defined in the Americans with Disabilities Act Accessibility Guidelines (ADAAG) should be provided where appropriate along the sidewalk. If other materials are placed in the R-O-W between the sidewalk and curb, the material shall meet City specifications and be of a color and texture distinctly different from the sidewalk and specified on the site plan.
4. Meandering Sidewalks - Sidewalk easements adjacent to the standard R-O-W will be required, if necessary, for meandering sidewalks. The edge of the sidewalk closest to the street shall be located minimum 5 feet from the back-of-curb and shall meander into the sidewalk easement. Sidewalk easements shall provide a minimum clearance of 2-1/2 feet beyond the edge of the sidewalk farthest from the street.
5. Exceptions - If it should be necessary to construct the walk adjacent to the curb line, the walk shall be a minimum of 5 feet in width. If the required sidewalk is to be placed outside of the roadway right-of-way, it must be placed in a sidewalk easement. Approval of planned exceptions and sidewalk easements shall be made at the time of site plan or plat approval.
6. Waiver - The sidewalk required in non-residential areas may be waived by the Planning & Zoning Commission either temporarily or permanently at the time of site plan or final plat approval. The Waiver may be granted based on site conditions and/or location of the tract.
7. Areas Without Screening Walls - In areas on major and secondary roadways where screening is not required or a type of screening other than a wall is used, (e.g., a berm, foliage, etc.) a minimum 4 foot sidewalk will be constructed not more than two and 2-1/2 feet from the right-of-way line.
8. Areas with Screening Walls - In areas where a screening wall is provided, a concrete sidewalk shall be constructed contiguous with the screening wall. The street side of the sidewalk shall run parallel to the street curb. The sidewalk shall be a minimum of 5 feet wide and the measurement shall be made from the

street side of the sidewalk to the face of the screening wall columns.

9. Sidewalk on Bridges. Bridges on Type C or larger thoroughfares shall have a sidewalk constructed on each side of the bridge. If the sidewalk is part of a designated or planned bike route the minimum width of sidewalk shall be 10 feet to accommodate two-way bike traffic. If the sidewalk is not part of a bike route, the minimum width of sidewalk shall be 6 feet. In both cases, a parapet wall shall be provided adjacent to the curb of the thoroughfare, and with a standard pedestrian bridge rail protecting the sidewalk on the outside edge of the bridge.
10. Sidewalks Under Bridges. When a pedestrian pathway is needed along the embankment of a roadway that traverses under the bridge of another roadway - new or reconstructed, and if the subject sidewalk is part of a designated or planned bike route, the minimum width of sidewalk shall be 10 feet to accommodate two-way bike traffic. If the sidewalk is not part of a bike route, the minimum width of sidewalk shall be 8 feet.

B. Barrier-Free Ramps -

Curbs and walks constructed at intersections of all streets and thoroughfares must comply with the provisions of the ADA and be constructed in a manner to be easily and safely negotiated by disabled persons. Additionally, they should also meet the city standards as detailed in the city's *Standard Construction Details* plan sheets.

Section VI Public Right-of-Way Visibility

A. Visibility Triangles

It is the goal of the city to maintain adequate visibility between opposing or conflicting traffic movements at intersections and at access point locations where private streets or commercial or industrial driveways connect to public streets. This is accomplished by restricting the presence of obstructions within specified areas of the right-of-way and adjacent property at and/or near the intersection corners or access points.

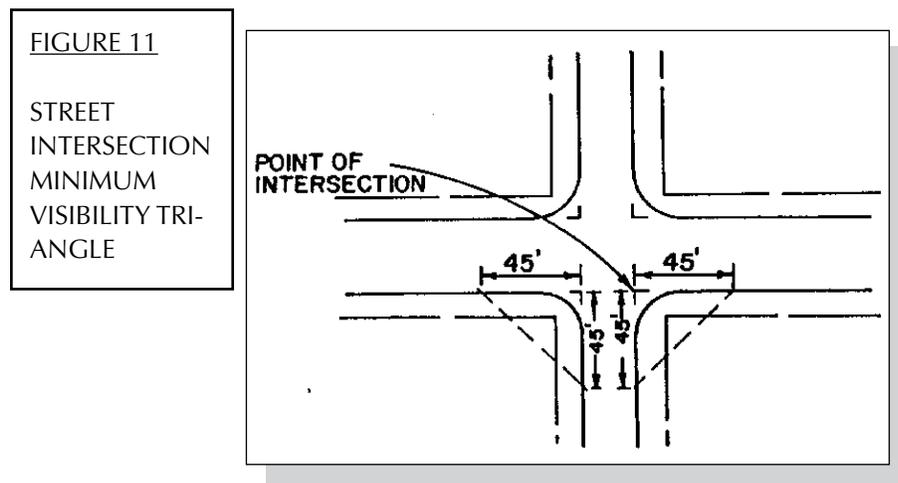
This corner clear zone is equivalent to the portion of the driver's field of vision (or cone of vision) necessary to maneuver through an intersection, and it can be defined as a "visibility triangle" as detailed herein.

A plan showing the plan/profile of the street on both sides of each proposed intersection or access point to the proposed development with the grades, curb elevations, adjacent intersections or access points, and all items (both natural and man-made) within the visibility triangles shall be provided with all site plans, if not already shown on engineering plans that are submitted at the same time.

The plan and profile shall be free of obstructions within the horizontal and vertical limits of the visibility triangles defined herein.

1. Visibility Triangle Obstructions Defined: Obstructions within a visibility triangle include fences, walls, screens, signs, structures, foliage, hedges, trees, bushes, shrubs, berms, parked vehicles, or any other item or element, either man-made or natural that are erected, built, planted, or maintained.

However, single-trunk trees, traffic control devices, street lights, and other utility elements that cannot reasonably be placed elsewhere, may be placed within a given visibility triangle.



2. Minimum Visibility Triangle Defined

- a. The field of vision at intersections and access points shall have a clear zone free of obstructions between the elevation of 2.5 feet (30 inches) and 9 feet above the average gutter elevation within a triangular area formed by extending the two curb lines 45 feet back from their imaginary point of intersection at each corner of the given intersection, and connecting the two resulting end points with an imaginary line, thereby making a right triangle (90-degree) for the typical intersection as shown in Figure 11. ***This triangle will be implemented through the platting process and will apply only to new construction.***
- b. The criteria for the minimum triangle applies to intersections and access points that are controlled by a Yield sign, Stop sign, traffic signal, or no traffic control device. Furthermore, the visibility triangle shall be used when considering intersections that are existing, proposed, under construction, and existing intersections with proposed modifications.
- c. The minimum visibility triangle at intersections and access points with a slight skew angle should be drawn to approximate an orthogonal intersection. The minimum triangle at intersections with a significant skew angle (over 30 degrees) may be increased or modified by authorized city staff to maintain or improve the field of vision of drivers.
- d. The minimum visibility triangle at an intersection or access point within a curve on the street alignment should be drawn to approximate a street with a linear alignment.
- e. If there are no curb lines existing, the triangular area shall be formed by extending imaginary lines along the property lines from their real intersection point 30 feet back from the street intersection, and then connecting the two resulting end points with an imaginary line, thereby making a triangle similar to the one shown in Figure 11.

3. Desirable Visibility Triangle Defined:

- a. The field of vision at intersections and access points shall have a clear zone free of obstructions between the elevation of 2.5 feet and 9 feet above the average gutter elevation, within a “desirable” visibility triangle area as detailed further in this section. The desirable visibility triangle is not intended for application at intersections of two Type G roadways, at access points along the curbline of a Type G or smaller street, at intersections of a Type G with a Type F or smaller street, or at residential driveways.
- b. The criteria for the minimum triangle applies to intersections and access points that are controlled by a Yield sign, Stop sign, traffic signal light, and those with no traffic control devices. Furthermore, the desirable visibility triangle shall be used when considering intersections that are existing, proposed, under construction, and existing intersections with proposed modifications.
- c. In previous years, the visibility triangle was based in part on the stopping sight distance of the opposing cars, a distance which can vary with road speed. However, the year 2001 edition of AASHTO’s Policy on Geometric Design of Highways and Streets presents a method based on “gap acceptance” which is adopted herein.

The gap acceptance method is based on research that shows the driver on the minor street requires a small time period when there is no oncoming traffic near the intersection to execute a maneuver. This “gap” in the traffic stream, as measured in seconds, tends to remain constant for a variety of speeds and conditions.

The standard, minimum case for the desirable triangle requirement herein includes a 8.0 second time gap to accommodate left, right, or through movements of a passenger vehicle from a cross-street to a major, multilane street (6-lane divided street). The cross-street centerline grade can vary between 3% upgrade (uphill), to a 3% downgrade (downhill) value of for the standard case. Table 9 summarizes the length of the triangle leg along the major street, which uses the same value for a left-turn or right-turn triangle. The through movement is automatically covered by these two triangles.

In the event that the posted speed limit and the design speed are not the same, the higher of the two speeds shall be used to determine the visibility triangle. Figure 12 depicts the typical geometric construction of a visibility triangle for a given cross-street. Note that significant portions of the median may be encompassed by these triangles.

FIGURE 12
STREET INTERSECTION DESIREABLE VISIBILITY TRIANGLE

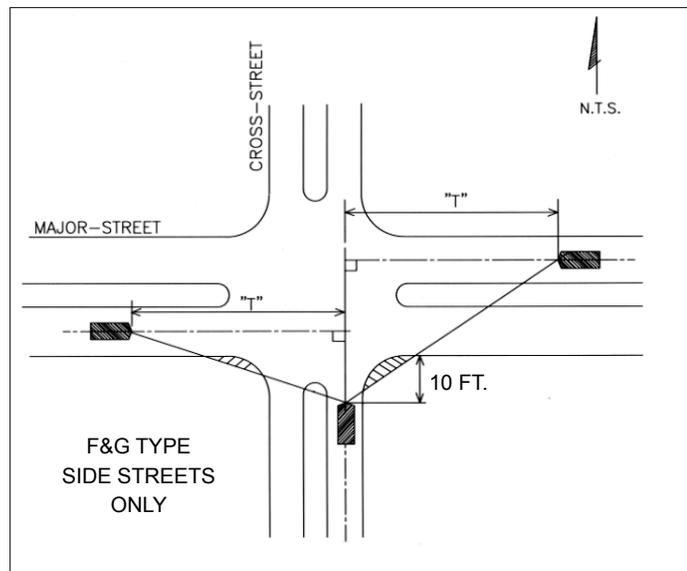
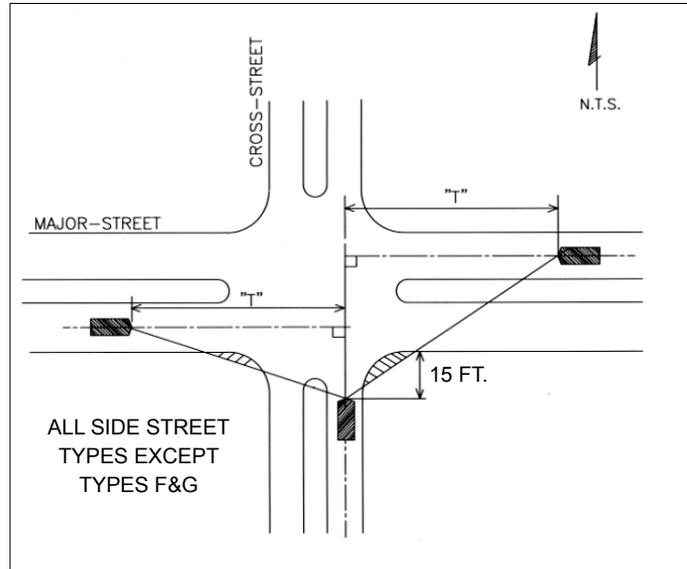


TABLE 9
MINIMUM SIGHT DISTANCE AT AN INTERSECTION

| STREET TYPE | SPEED LIMIT | T (FT.) |
|-------------|-------------|---------|
| F, G | 30 | 355 |
| D, E, E+ | 35 | 415 |
| B, C | 40 | 475 |
| B+ | 45 | 535 |

- d. The desirable visibility triangle at intersections and access points where the minor street or driveway grades are greater than 3-percent (up or down), the triangle dimensions may be increased or modified by authorized city staff to maintain or improve the drivers field of vision based on the AASHTO manual.

Note: No Plantings or berms over 30-inches above the average gutter elevation are allowed in the median for the length of the left turn stacking space unless specifically agreed upon by authorized city staff.

- e. The desirable visibility triangle at intersections and access points with a slight skew angle will result in an acute or obtuse triangle, rather than a right-triangle (90-degrees). The desirable visibility triangle at intersections and access points with significant skew angles (greater than 30 degrees) may be increased or modified by authorized city staff to maintain or improve the field of vision of drivers. Additional analysis based on the AASHTO manual may be required by authorized city staff to determine an adequate visibility clear zone.
- f. The desirable visibility triangle at an intersection or access point where the street alignment has a slight curvature should be drawn to approximate a street with a linear alignment. The desirable visibility triangle at intersections and access points on streets with significant curvature (centerline alignment with a degree of curvature of 7 or sharper) may be increased or modified by authorized city staff to maintain or improve the field of vision of drivers. In these cases, the visibility triangle technique may not be adequate to define a clear zone in the drivers field of vision, and additional analysis based on the AASHTO manual may be required by authorized city staff to determine an adequate clear zone. In general, intersections and access points along a sharp curve on a major street should be avoided in design.
- g. For intersections that are constructed in phases and put into operation during or between construction phases, the desirable visibility triangle shall be established at the initial phase to cover the geometric condition that requires the largest, or most restrictive visibility triangle for any of the foreseeable phases or planned, final street intersection geometry.

For example, in some cases the largest visibility triangle may be required for the final geometric condition of the intersection, but said triangle shall be established with the initial phase of construction.

4. Geometric Construction for Desirable Visibility Triangle for a Typical Intersection - In the plan view, the horizontal clear area at the intersection of a proposed street/drive shall be defined as being within a triangular area formed by the following imaginary lines (see Figure 12):

Beginning at the assumed point of the driver's eye on the minor street approach, 15 feet back of the curb for all street types except Type F and Type G streets; and 10 feet back of the curb for Type F and Type G streets; and running parallel to the centerline of the left most minor street approach lane to a point 5 feet into the nearest lane approaching from the left or to a point 5 feet into the nearest lane approaching from the right for a vertex. Proceeding along the major street parallel to the centerline of the street a distance of "T" to a point for a vertex; and proceeding back to the assumed point of the driver's eye to complete the visibility triangle.

B. R.O.W. Obstructions Outside the Visibility Triangles

1. Fences, walls, screens, signs and other structures shall conform to the Comprehensive Zoning Ordinance of the City, as amended, and to the Sign Ordinance of the City.
2. Foliage of hedges, trees and shrubs in public right-of-ways which are not otherwise governed by Section 3-1000 or 1200 of the *Comprehensive Zoning Ordinance of the City*, or the visibility triangles described herein shall be maintained such that the minimum vertical clear zone for tree and foliage overhang above a sidewalk shall be 7 feet, and the minimum vertical clear zone for tree and foliage overhang above street pavement shall be 14 feet. The vertical clearances stated above shall apply on all Type E and above thoroughfares. The City of Plano Property Standards Department establishes vertical clearance guidelines for smaller streets (Type F, and G).
3. All other areas within medians and islands in the street rights-of-way shall be clear at elevations between 2.5 feet and 9 feet above the average gutter elevation.
4. Plants in the public right-of-way that will grow over 30-inches (when mature) above the adjacent street's average gutter elevation shall conform to all of the above requirements, where applicable. All landscape plans shall show all items as prescribed by the Parks and Recreation Department and Planning Department, including:
 - a. The locations and type of such plants; and
 - b. The prescribed visibility triangles.
5. Ground elevations, within both triangles, will be shown by contour lines.

C. Abatement.

1. The City Manager of the City of Plano, or his designee(s), shall have the authority to enforce the provisions of this Section.
2. When foliage is identified by authorized city staff (including staff from the Property Standards Department) within the restricted height, or in a visibility triangle, and the foliage is on the median or other area in the street ROW that is not immediately adjacent to private property, then the Parks Department will trim or removes the foliage.
3. When a foliage is identified by authorized city staff (including staff from the Property Standards Department) within the restricted height, or in a visibility triangle, and the foliage is immediately adjacent to a private property, then the Property Standards Department contacts the property owner in an adequate manner as prescribed by ordinance and requests that the plants be trimmed or removed. As detailed in the Code of Ordinances Section 14-3, and Section 15-17, the adjacent property owner is required to maintain the plants within the defined, adjacent ROW.

D. Preservation of existing laws.

Nothing contained in this Section shall be construed so as to amend, alter, change or repeal any provision or regulation of the Comprehensive Zoning Ordinance of the City or the sign ordinance of the City.

SECTION VII

ALTERNATIVE SUBDIVISION STREET & SIDEWALK STANDARDS (NEW DRAFT SECTION)

A. Introduction

General subdivision street and sidewalk standards are not always appropriate for some types of enhanced-density, “new urbanism”, or residential-commercial mixed-use development, where high pedestrian activity and lower vehicular activity is to be encouraged. Therefore, alternative standards are provided for local street design that serve certain types of development with defined zoning categories.

B. Front Entry Lots

The street must be built to standard design (50 feet of ROW; 27 feet of pavement) when on-street parking is expected. Where lots are too narrow to allow on-street parking (front entry townhouses, for example), street width may be reduced to 46 feet of ROW, 24 feet of pavement only with the construction of adequate off-street visitor parking. Standard streets must be provided for developments that provide a mix of rear entry and front entry lots.

C. Rear Entry Lots

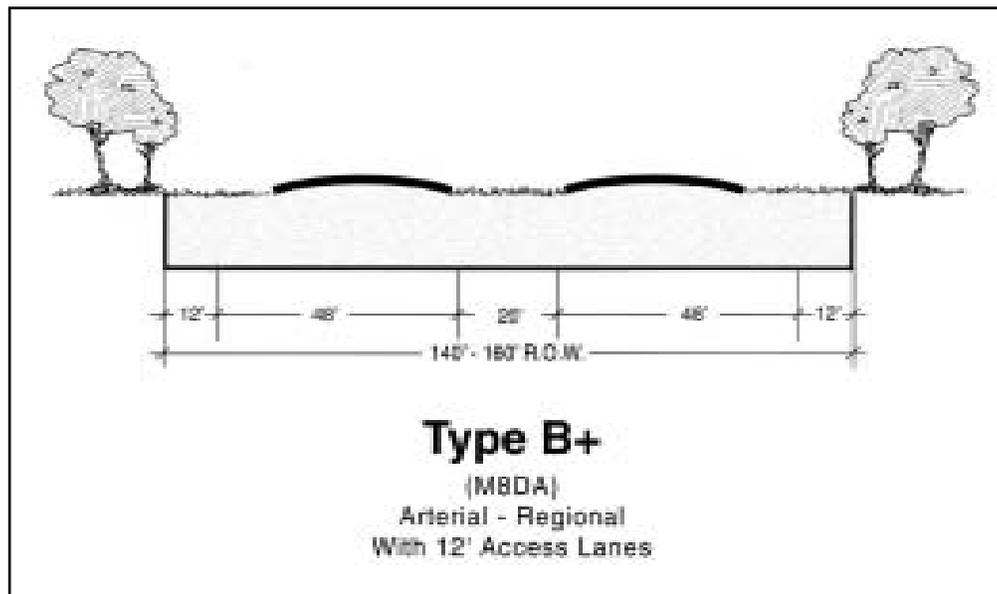
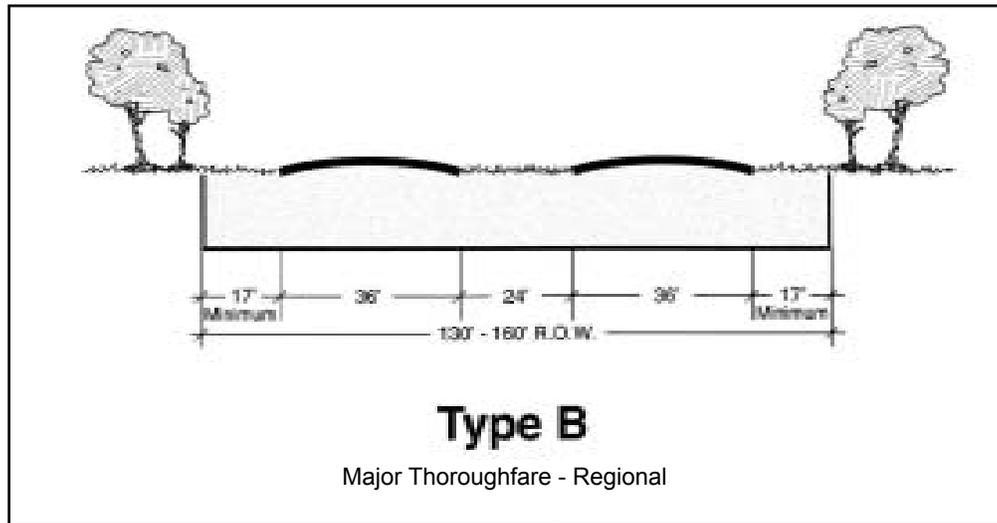
Since on-street parking can be expected on both sides of the street with rear-entry lots, a standard street design must be provided, unless houses are grouped around courtyard cul-de-sacs that provide off-street parking.

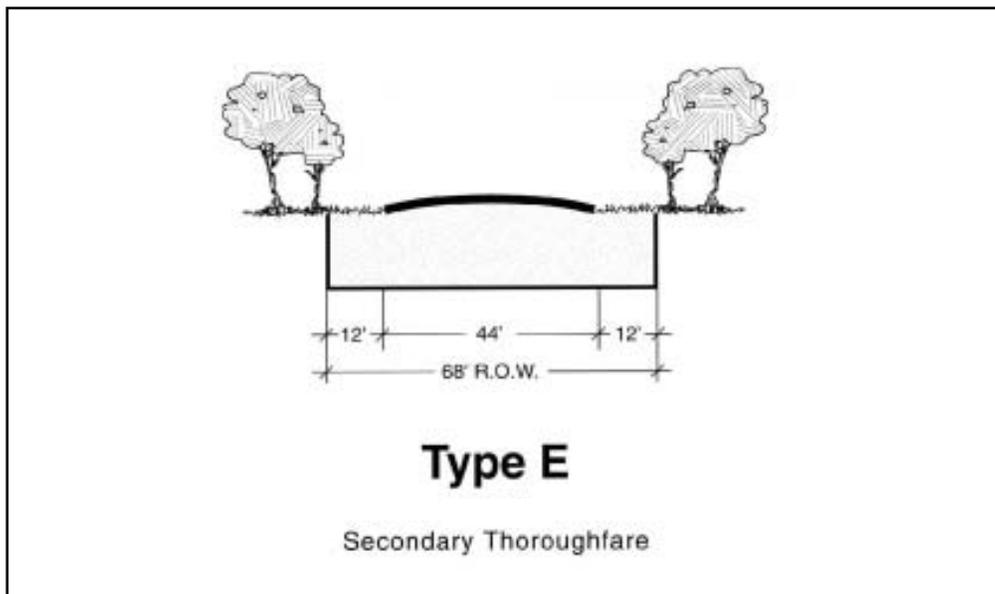
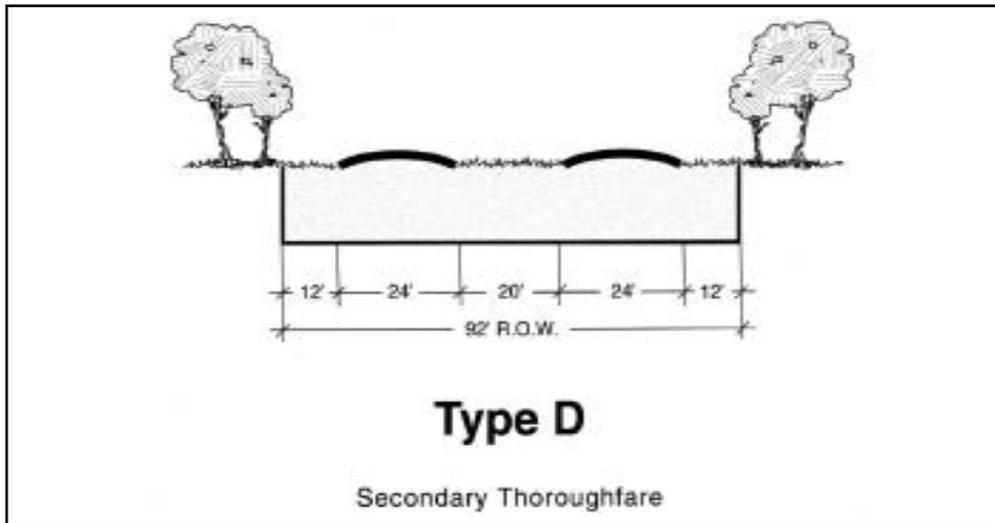
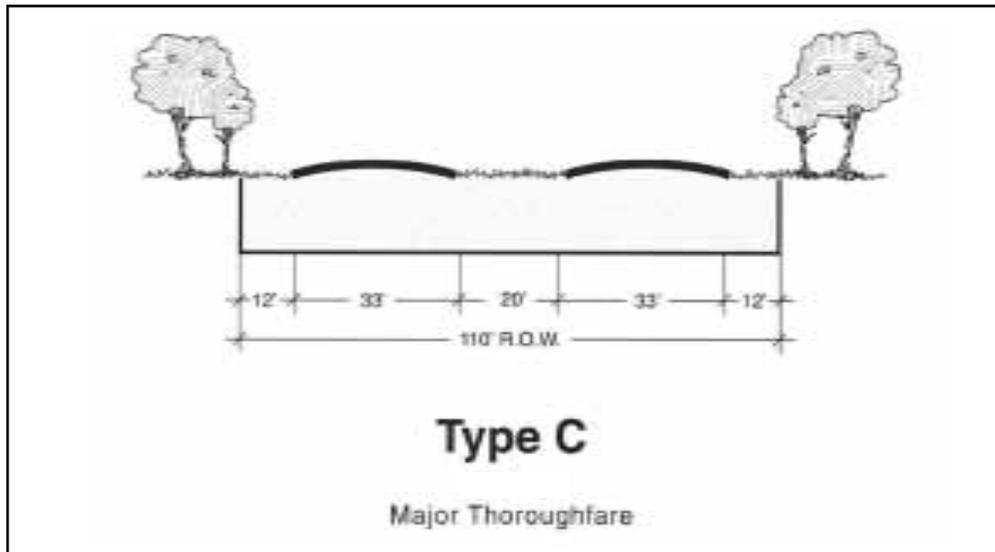
D. Mews Streets

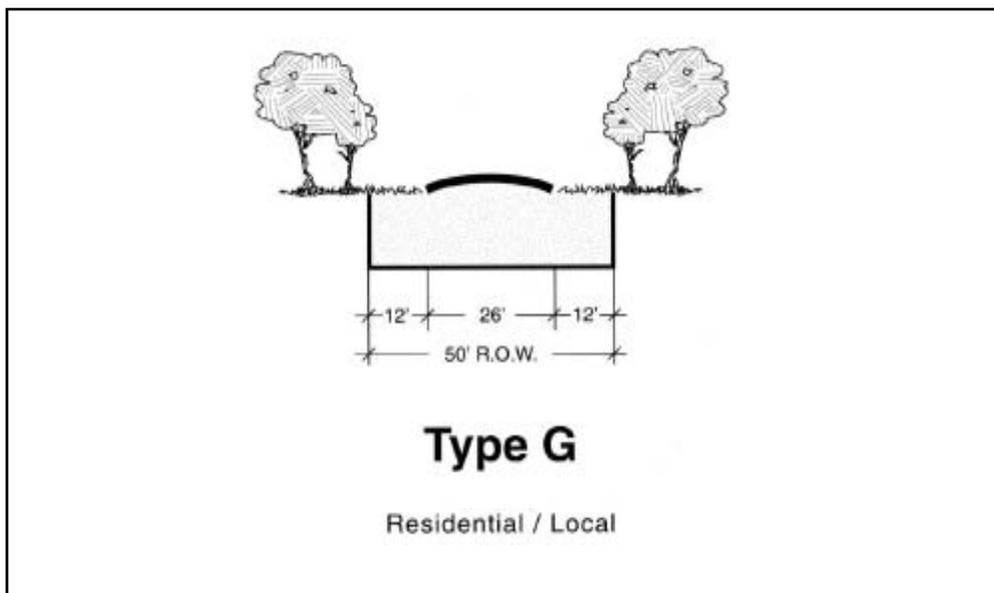
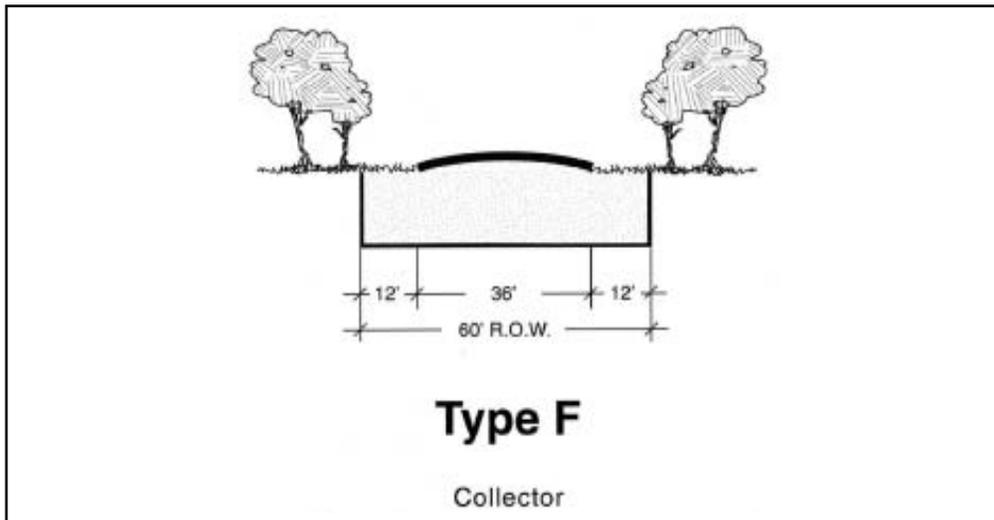
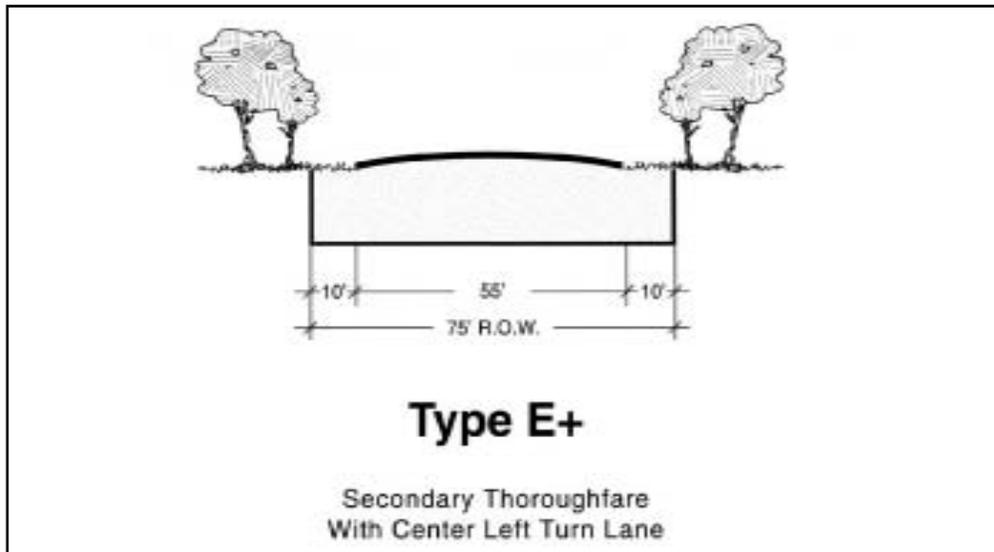
Mews streets are designed to provide garage and service access to individual lots. The minimum design standard for mews streets is 28 feet of ROW with a minimum 22 feet of paved drive lane. Parkways must be paved with a contrasting material. No parking is allowed on mews streets unless additional ROW is provided. If individual garages access Mews Streets, the face of the garage must be placed between 0-3 feet from the ROW line, or at least 20 feet. Because of the significant challenges which can exist with many sites using Mews streets, individual consideration may be given to approve variations to these standards.

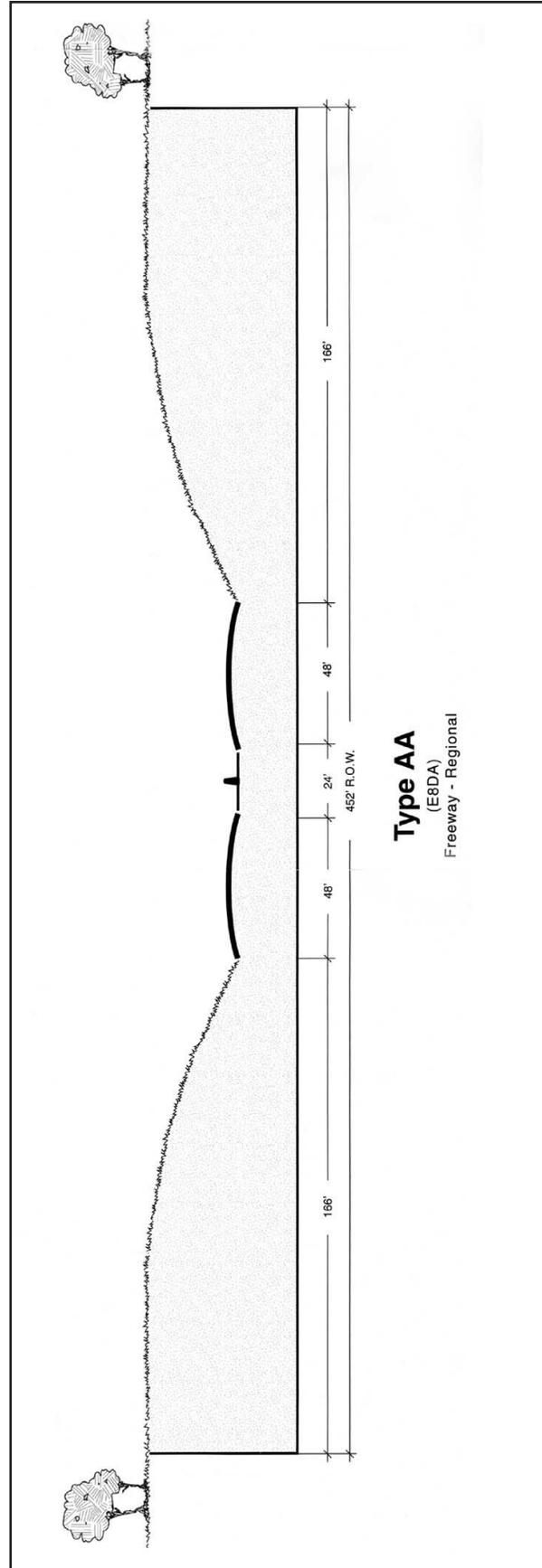
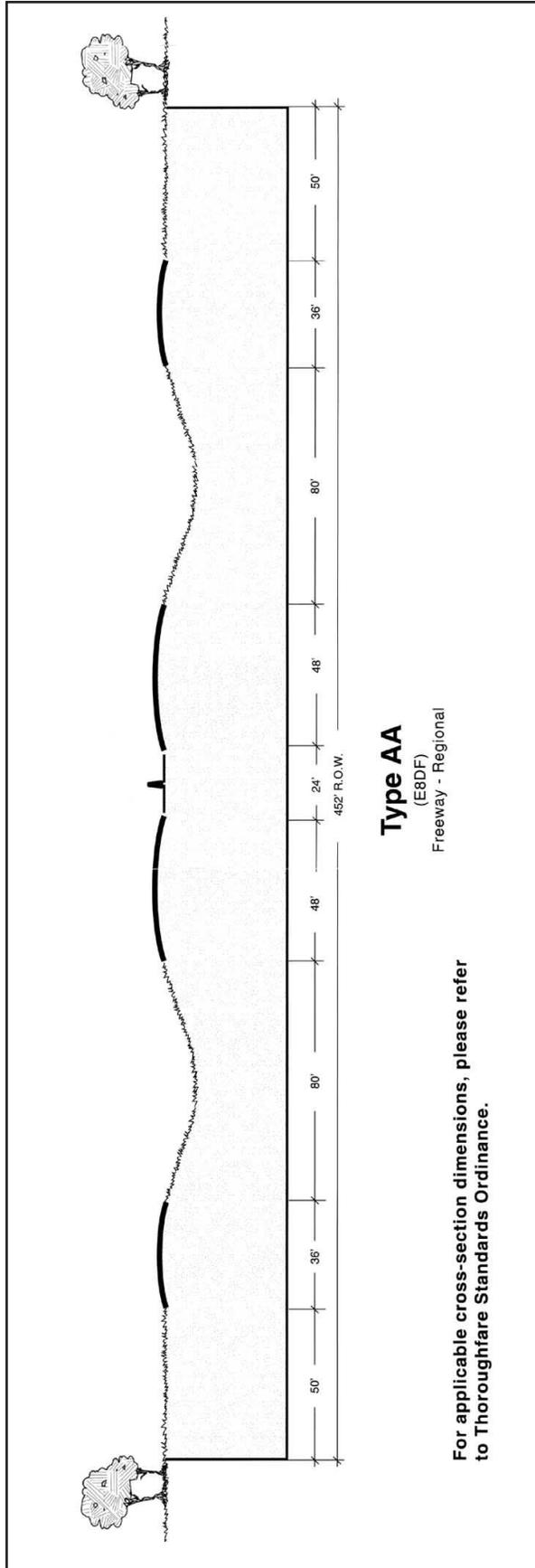
APPENDIX

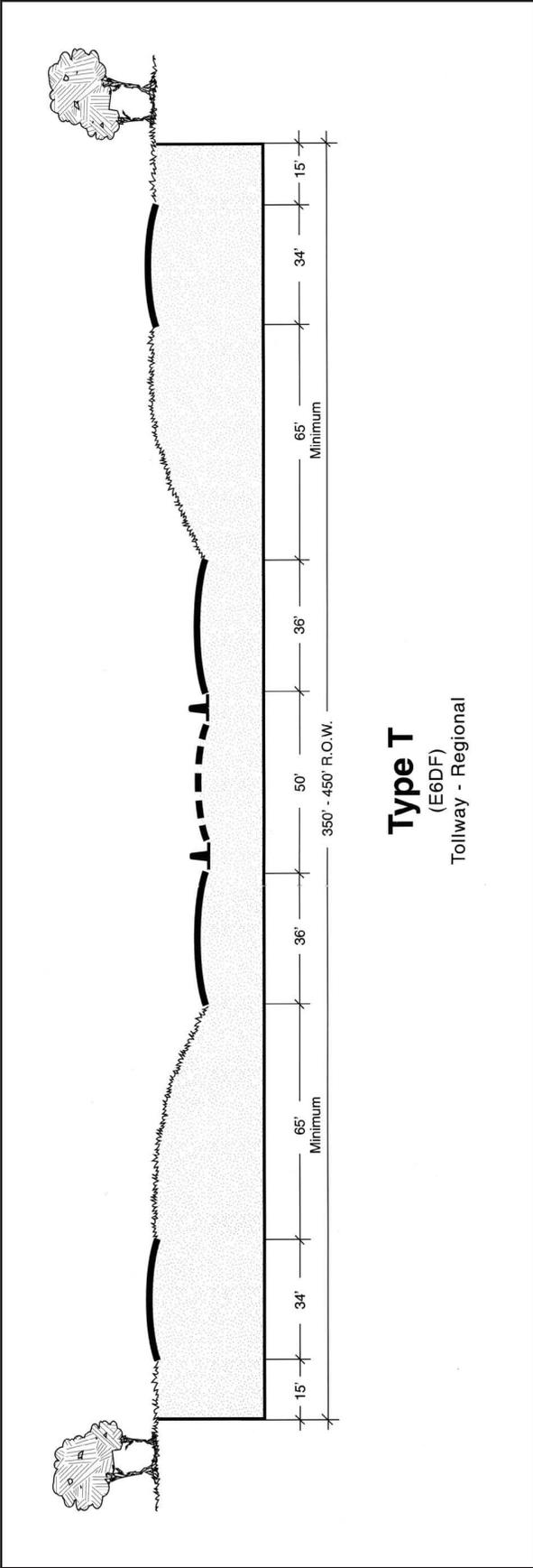
APPENDIX











Type T
(E6DF)
Tollway - Regional

