# City of Sheridan

# Engineering Design Standards For Public Improvements

Adopted October 5, 2009

City of Sheridan
Public Works/Engineering
55 Grinnell Plaza
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# TABLE OF CONTENTS

# Chapter 1

# General Provisions

# Chapter 1
# General Provisions

## General Provisions

### 1.1 Short Title

These regulations, together with all future amendments, shall be known as the *City of Sheridan Engineering Design Standards for Public Improvements* (hereinafter called Design Standards).

### 1.2 Jurisdiction

These Design Standards, along with the City of Sheridan Standard Specifications (hereinafter referred to as Standard Specifications) and the City of Sheridan Standard Plates (hereinafter referred to as Standard Details), shall apply to all public improvements within the incorporated area of the City of Sheridan except where superseded by federal or state requirements.

### 1.3 Amendments and Revisions

These standards and criteria may be amended as new technology is developed or experience gained in the use of these Design Standards. The City Engineer shall consider revisions and/or amendments to these Design Standards.

### 1.4 Enforcement Responsibility

It shall be the duty of the City Engineer under the direction of the Public Works Director to enforce the provisions of these Design Standards.

### 1.5 Review Process

The City will review all submittals for compliance with the specific Design Standards. Acceptance by the City does not relieve the Owner, Design Professional, or Contractor from responsibility for ensuring that the calculations, plans, specifications, construction, and record drawings are in compliance with the Design Standards.

### 1.6 Prior Approval

These Design Standards shall not abrogate or annul: (a) any permits issued before the effective date of these Design Standards; (b) any construction plans approved before the effective date of these Design Standards; (c) any final plat documents that have been recommended for approval by the City of Sheridan Planning Commission prior to the effective date of these standards; or (d) any easements or covenants already in effect.

### 1.7 Relationship to Other Standards

If special districts impose more stringent standards, this difference is not considered a conflict and the more stringent standard shall apply. If state or federal government imposes more stringent standards, criteria, or requirements, these shall be incorporated into these Design Standards in accordance with Section 1.3 of this Manual.

### 1.8 Variances

Variances from these Design Standards will be considered on a case-by-case basis by the City Engineer.

### 1.9 Private Facilities

If an owner of private street or utility facilities wishes to dedicate these facilities for public use and maintenance, the facilities must meet the standards set forth herein prior to being accepted by the City.

**END CHAPTER**

# Chapter 2
# Street Access and Parking Lot Criteria

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## Street Access and Parking Lot Criteria

### 2.1 Traffic Studies

#### 2.1.1 Responsibilities for Traffic Impact Report

**2.1.1.1** Traffic impact reports may be required by the City in order to adequately assess the impact of a proposal on the existing and/or planned street system. The primary responsibility for assessing the traffic impacts associated with a proposed development will rest with the developer with the City serving in a review capacity.

**2.1.1.2** Unless waived by the City Engineer, a written report meeting the City guidelines will be required for a nonresidential development proposal when trip generation during the peak hour is expected to exceed 100 vehicles, or any multifamily residential development with 10 or more dwelling units. All major subdivisions, all commercial subdivisions and industrial sites shall be held to the same standards.

**2.1.1.3** Preparation of the report shall be the responsibility of the developer and must be prepared by a licensed design professional with experience in transportation planning. Upon submission of a draft traffic impact report, the City will review the study data sources, methods, and findings. Comments will be provided in a written form. The developer and his engineer will then have an opportunity to incorporate necessary revisions prior to submitting a final report. All reports must be reviewed by the City before acceptance.

**2.1.1.4** All previous traffic impact reports relating to the development that are more than two years old may be required to be updated, unless it is determined that conditions have not changed enough to warrant an update. This will be assessed on a case-by-case basis.

**2.1.1.5** Traffic impact reports will be required if the trip generation/dwelling unit criteria as noted in Section 2.1.1.2 are exceeded for the following submittals:

A. For a rezoning application or Conditional Use Permit.

B. For a preliminary or final plat or final development plan if the property has already been rezoned for the proposed use and no traffic impact report was required for the rezoning.

C. Prior to issuance of a building permit, if the property has already been zoned/platted and no previous traffic impact report less than two years old exists.

D. Additional access from an arterial street to an existing use is being requested.

E. The developer will be required to submit a new traffic impact report if, after submitting the original traffic impact report, the land use intensity and traffic generation area increased by more than 15 percent.

**2.1.1.6** Where access points are not defined or a site plan is not available at the time the traffic report is prepared, additional traffic analysis may be required when a site plan becomes available or the access points are defined.

**2.1.1.7** The developer will be notified at the conceptual planning stage if a traffic impact report will be required, provided sufficient information is available for the City to determine whether the trip generation/dwelling unit criteria have been met. If insufficient information is available but the property appears to involve a sufficiently intense land use, the applicant will be informed that a traffic impact report is required.

### 2.1.2 Traffic Report Format

Traffic consultants are encouraged to discuss projects with the City prior to starting the report. Topics for possible discussion at such meetings might include directional distribution of traffic, definition of the study area, intersections requiring critical lane analysis, and methods for projecting build-out volume. This should provide a firm base of cooperation and communication between the City, the owner or developer, and his consultant in creating traffic characteristics that are in the best interest of the total community. Specific requirements will vary depending on the site location. However, all traffic reports shall contain, as a minimum, the following information:

**2.1.2.1** Introduction.

**2.1.2.1.1** Land Use, Site, and Study Area Boundaries. A brief description of the size of the land parcel, general terrain features, the location within the jurisdiction and the region should be included in this section. In addition, the roadways that afford access to the site, and are included in the study area, should be identified.

The exact limits of the study area should be based on engineering judgment, and an understanding of existing traffic conditions at the site. In all instances, however, the study area limits shall be discussed with the developer, his design professional, and determined by the City Engineer. These limits will usually result from initial discussion with staff. A vicinity map that shows the site, in relation to the surrounding transportation system, should be included.

**2.1.2.1.2** Existing and Proposed Site Uses. The existing and proposed uses of the site should be identified in terms of the various zoning categories of the City. In addition, the specific use for which the request is made should be identified if known, since a number of uses may be permitted under the existing ordinances.

**2.1.2.1.3** Existing and Proposed Uses in Vicinity of the Site. A complete description of the existing land uses in the vicinity of the site, as well as their current zoning and use, should be included.

**2.1.2.1.4** Existing and Proposed Roadways and Intersections. Within the study area, the developer must describe existing roadways and intersections (geometrics and traffic signal control) as well as improvements contemplated by government agencies. This would include the nature of the improvement project, its extent, implementation schedule, and the agency or funding source responsible.

**2.1.2.2** Trip Generation and Design Hour Volumes.

**2.1.2.2.1** A summary table listing each type of land use, the size involved, the average trip generation rates used (total daily traffic and a.m./p.m. peaks), and the resultant total trips generated shall be provided.

**2.1.2.2.2** Trip generation will be calculated from the latest data contained within the *Institute of Transportation Engineers' Trip Generation Guide* (latest edition) or NCHRP Report No. 365, or other local data. In the event that data is not available for the proposed land use, the City must approve estimated rates prior to acceptance.

**2.1.2.2.3** Site design hour volumes approximating the peak hour volume used to determine public improvements will be estimated by one of the following methods:

A. Traffic volume counts for existing uses.

B. Peak hour trip generation rates as published in the *ITE Trip Generation Guide* (latest edition).

C. NCHRP Report No. 365 where justified.

D. WYDOT

**2.1.2.3** Trip Distribution. The direction of approach for site-generated traffic will be presented in this section. The technical analysis steps, basic methods, and assumptions used in this work must be clearly stated.

**2.1.2.4** Trip Assignment. This section will describe the utilization of study area roadways by site-generated traffic. The anticipated site traffic volumes must be combined with existing and projected area traffic volumes in Section 2.1.2.2.3 to describe mainline and turning movement volumes for future conditions with the site developed as proposed. Internal trips in excess of 10 percent will require analytical support to demonstrate how the higher figures were derived. Nongenerated passerby traffic reductions in generation volumes may be considered if applicable. All estimates of trip distribution, assignment, and modal split are subject to review and approval by the City.

**2.1.2.5** Existing and Projected Traffic Volumes.

**2.1.2.5.1** Graphics shall show:

A. a.m. peak hour site traffic (in and out) including turning movements.

B. p.m. peak hour site traffic (in and out) including turning movements.

C. a.m. peak hour total including site (in and out) and through traffic including turning movements for current conditions and 20-year projections or build-out, whichever is greater.

D. p.m. peak hour total including site (in and out) and through traffic including turning movements for current conditions and 20-year projections or build-out, whichever is greater.

**2.1.2.5.2** All raw traffic count data (including hourly ADT and peak hour turning movements) and analysis worksheets shall be provided in the appendices. Computer techniques and the associated printouts can be used as part of the report.

**2.1.2.5.3** Build-out projections shall include major vacant properties around the proposed development as defined by the City. Volume projections for background traffic growth will be provided by the City, or a method for determining their volume will be recommended by the City.

**2.1.2.5.4** All traffic will be assigned to existing and planned facilities in a manner consistent with existing traffic patterns and approved by the City.

**2.1.2.6** Level of Service Analysis. A capacity analysis will be conducted for the street intersections at access points for the proposed development. Within the limits of the previously defined study area,

capacity analyses will also be conducted for major street intersections. The highest peak period will be tested to determine which will be analyzed. Pedestrian movements shall also be considered in the evaluation.

**2.1.2.7** Traffic Signals.

**2.1.2.7.1** The need for new traffic signals shall be checked using the warrants in the *Manual on Uniform Traffic Control Devices*, latest edition. Traffic progression is of paramount importance. Generally a spacing of one-half mile for all signal-controlled intersections should be maintained. This spacing is usually desirable to achieve good speed, capacity, and optimum signal progression.

**2.1.2.8** Level of Service. Level of Service C during the peak hour will be the design objective. The design year will be approximately 20 years following construction. Levels of service are defined in *The Highway Capacity Manual*.

**2.1.2.9** Traffic Accidents. Traffic accident data for affected street corridors may be required for the study for the last 5 years. Traffic accident data may be obtained from WYDOT. Where this is necessary, estimates of increased or decreased accident potential shall be evaluated for the development.

**2.1.2.10** Recommendations. In the event that analysis indicates unsatisfactory levels of service on study area roadways, a description of proposed improvements to remedy deficiencies shall be included. These proposals would not include committed projects by the City or WYDOT. In general, the recommendation section should include:

**2.1.2.10.1** Proposed Recommended Improvements. This section shall describe the location, nature, and extent of proposed improvements to assure sufficient roadway capacity.

**2.1.2.10.2** Volume/Capacity Analysis at Critical Points. Another iteration of the volume/capacity analysis will be described, which demonstrates the anticipated results of making these improvements.

**2.1.2.10.3** Levels of Service at Critical Points. As a result of the revised volume/capacity analysis presented in the previous section, levels of service for the highway system with improvements will be presented.

**2.1.2.11** Conclusion. The last chapter of the report must be a clear, concise description of the study findings. It is anticipated that this concluding chapter will serve as an executive summary.

**2.1.2.12** Revisions to Traffic Report. Revisions to the traffic report must be provided as required by the City. The need to require revisions will be based on the completeness of the traffic report, the thoroughness of the impact evaluation, and the compatibility of the study with the proposed access and development plan.

## 2.2 Access Control

### 2.2.1 General Access

Access in newly developing areas will follow these provisions. In areas being redeveloped, access will be determined as to the best fit based on traffic safety, existing conditions, future street improvements, and property development along with other considerations as appropriate.

Access to streets or highways within the city limits under the jurisdiction of the Wyoming Department of Transportation (WYDOT) are also governed by requirements of WYDOT. In addition to obtaining permission from the City Engineer, a permit from the District Traffic Engineer of WYDOT must be obtained. Access shall be limited as dictated by this City of Sheridan Design Standards. For any discrepancy between WYDOT and the City of Sheridan regarding precedence of access design standards, WYDOT standards shall prevail.

Fire department access to all buildings shall be provided and maintained during construction and upon completion of all improvements. Fire department access shall meet all requirements outlined in the International Fire Code Section 501.

### 2.2.2 Definition of Terms for Access Control

Several terms are used herein which have a somewhat distinct meaning. For the purpose of clarity, the definitions of some of these terms are listed below.

**2.2.2.1** Width of Curb Opening (W)—The width of curb opening measured at the throat of the driveway from the edge of pavement to the edge of pavement.

**2.2.2.2** Property Line (P)—The distance measured along the property line from the nearest edge of the driveway to the property line.

**2.2.2.3** Corner Clearance (C)—At an intersecting street the distance measured along the curb line from the end of the corner radius to the nearest edge of the curb opening.

**2.2.2.4** Distance Between Double Drives (D)—The distance measured along the curb line between the radii.

**2.2.2.5** Frontage—The distance along the street right-of-way line of a single property or development within the property lines. Corner property at an intersection would have a separate frontage along each street.

**2.2.2.6** Residential—Property used primarily for residential purposes such as single-family, two-family, and multifamily units.

**2.2.2.6.1** Single-Family (SF) Residential—Single, detached family dwelling units or double bungalows or duplexes.

**2.2.2.6.2** Multifamily (MF) Residential—Three or more attached dwelling units including townhouses, condominiums, and apartments.

### 2.2.2 Basic Principles for Curb Openings and Driveways

**2.2.2.1** Arterial Street Access

**2.2.2.1.1** Private residential access directly to arterial streets and any access to a principal arterial street shall be permitted only when the property in question has no other reasonable access to the general street system, or when denial of direct access to the arterial and alternative access to another roadway would cause traffic operation and safety problems as shown in a Traffic Report. Any access to arterials must adhere to City street standards.

**2.2.2.2** General Access

**2.2.2.2.1** High Volume Access. In general, when trip generation served by the driveway exceeds 100 vehicles per hour during the peak hour or the driveway accesses an arterial street, returns using a standard street return radius as set forth in Table 1 and Figure 1 will be required.

**2.2.2.2.2** Access Points. Access will not be approved for parking or loading areas that require backing maneuvers onto or from a public street right-of-way except for uses on local and minor collector streets or approved by City Engineer.

## Table 1 : Driveway Dimensions

(All Dimensions in Feet)

| Arterial | Dimension Reference (See Fig. 1) | Local | | | Collector | | | Arterial | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Resi-dential | Com-mercial | Indus-trial | Resi-dential | Com-mercial | Indus-trial | Resi-dential | Com-mercial | Indus-trial |
| Width[1] | W | | | | | | | | | |
| Minimum | | 12 | 20 | 20 | 12 | 20 | 20 | 15 | 15 | 20 |
| Maximum | | 32[2] | 40 | 40 | 30 | 40 | 40 | 36 | 40 | 40 |
| Right-turn Radius | R | | | | | | | | | |
| Minimum | | 0 | 5 | 10 | 0 | 15 | 25 | 0 | 25 | 30 |
| Maximum[3] | | 0 | 10 | 20 | 0 | 50 | 50 | 0 | 50 | 50 |
| | | | | | | | | | | |
| Minimum Spacing[4] | | | | | | | | | | |
| From Property Line | P | 0 | R | R | 0 | R | R | R | R | R |
| From Street Corner | C | 20 | 40 | 40 | 50 | 50 | 50 | NA | NA | NA |
| Between Driveways | D | 10[5] | 25 | 25 | 35 | 50 | 50 | NA | NA | NA |
| Angle[6] | A | 45° | 70° | 70° | 45° | 70° | 70° | | | |

[1] The minimum width of commercial driveways is intended to apply to one-way operation. In high pedestrian activity areas, such as in a central business district or in the same block with an auditorium, school, or library, the maximum basic width should be 30 feet. The width shown applies to rural routes and most City streets including neighborhood business, residential, and industrial streets. The width is intended to be measured along the right-of-way line, in most instances, at the inner limit of a curbed radius or between the line of the radius and the near edge of a curbed island at least 50 square feet in area.

[2] Maximum width on bulb of cul-de-sac shall be 24 feet.

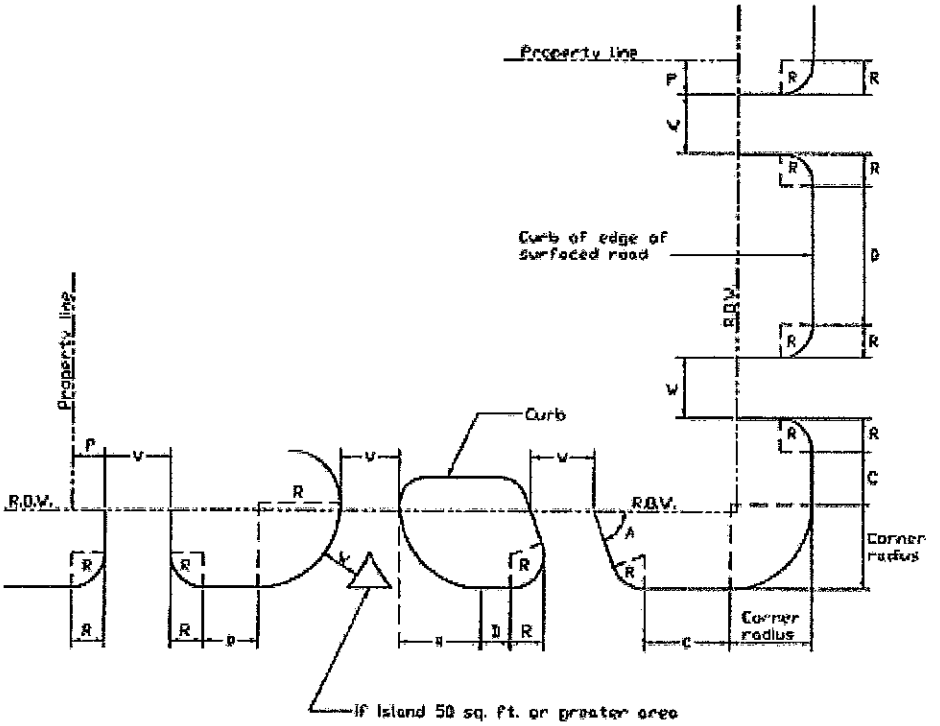
[3] On the side of a driveway exposed to entry or exit by right-turning vehicles. In high pedestrian activity areas, the radii should be half the values shown. The maximum radii for major generator driveways shall be designed in accordance with *A Policy on Geometric Design of Highways and Streets*, published by AASHTO latest edition.

[4] Measured along the curb or edge of pavement from the roadway end of the curb radius. In high pedestrian activity areas, the minimum spacing between driveways should be 5 feet.

[5] Minimum space between driveways may be reduced to 5 feet on one side on local streets only at the discretion of the City Engineer.

[6] Minimum acute angle measured from edge of pavement, and generally based on one-way operation. For two-way driveways, and in high pedestrian activity areas, the minimum angle should be 80 degrees.

**Figure 1 : Driveway Dimensions**




**2.2.2.2.3** Standards. Every property that accesses the street shall have a driveway. Driveways shall be constructed in accordance with the City of Sheridan Standard Specifications.

**2.2.2.2.4** Existing and Future Demands. The opening or driveway width shall be adequate to properly handle the anticipated traffic volume and character of traffic, as well as being within the limits specified for the type of property development. The controls established for curb openings and driveways shall apply to existing streets as well as new streets that may be developed in the future.

**2.2.2.2.5** Utility Conflicts. Any adjustments which must be made to utility poles, street light standards, fire hydrants, catch basins or inlets, traffic signs and signals, or other public improvements or installations which are necessary as the result of the curb openings or driveways, shall be accomplished without any cost to the City.

**2.2.2.2.6** Access Signs. Driveway approaches, whereby the driveway is to serve as an entrance only or as an exit only, shall be appropriately signed by, and at the expense of, the property owner subject to approval of City Planning and Building Services. Sign location, height, and legend must be in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD).

**2.2.2.2.7** Abandoned Driveways. Any curb opening or driveway which has been abandoned shall be removed and the street restored by the property owner according to the current City of Sheridan Standard Specifications.

### 2.2.3 General Requirements

**2.2.3.1** Number of Openings.

**2.2.3.1.1** Single-Family Residential—In general, each single-family residential property shall be limited to one access point. However, where houses are located on corner lots or have extra wide frontage, more than one access point may be permitted. Applicable zoning setback requirements must be followed.

**2.2.3.1.2** Multi-Family Residential—In general, access shall be determined by information provided by the owner/developer in a Traffic Impact Report and/or by comments generated during the City's review and acceptance of that report.

**2.2.3.1.3** Commercial/Industrial—In general, access to commercial and industrial property shall be limited to the requirements as set forth in the Engineering Design Standards and shall be based on the street classification described by the then-current Master Transportation Plan that is kept in the Office of the City Engineer. If no plan is current, the City Engineer will make the final determination. For commercial/industrial property located on a corner of an arterial street, access may be restricted to a side street only. Access may also be restricted if use of such access would be precluded by existing left turn lanes or other traffic control devices.

**2.2.3.2** Access Roadways with No Curb and Gutter. Private drives and alley accesses to local, collector, or arterial streets that are proposed as the emergency access and/or primary access shall be constructed to meet the following requirements:

**2.2.3.2.1** The private drive or alley shall extend from right-of-way line to the edge of the existing driving surface and shall be constructed to comply with Fire Code and in accordance with Table 1 of Chapter 7.

**2.2.3.2.2** Access shall be governed by the driveway criteria.

**2.2.3.2.3** A culvert properly sized for the ditch flow shall be installed at the established roadside ditch flow line beneath the private drive

access. Minimum size for the culvert shall be 15 inches. Culverts shall have a precast concrete-sloped end section or cast-in-place concrete headwall. If a cast-in-place headwall is built, it shall have a maximum slope of 4:1 on any exposed face. No vertical headwalls will be allowed.

All Culverts shall be made up of pipe that is consistent with the then-current City of Sheridan Standard Specifications.

**2.2.3.2.4** A sketch plan of the installation must be submitted. No building permit will be issued until the access and its construction plan, or sketch, are approved by the Office of the City Engineer.

**2.2.3.3** Amount of Curb Opening Permitted. Driveway width shall comply with Table 1.

**2.2.3.4** Mutual Access. On commercial, industrial, and multifamily developments, mutual use of access to streets is encouraged and may be necessary to meet driveway spacing requirements. When used, mutual access will be shown on the plans prior to construction. The City Engineer will approve the minimum access width based on the proposed mutual use.

## 2.3 Access Design

### 2.3.1 Driveway Spacing

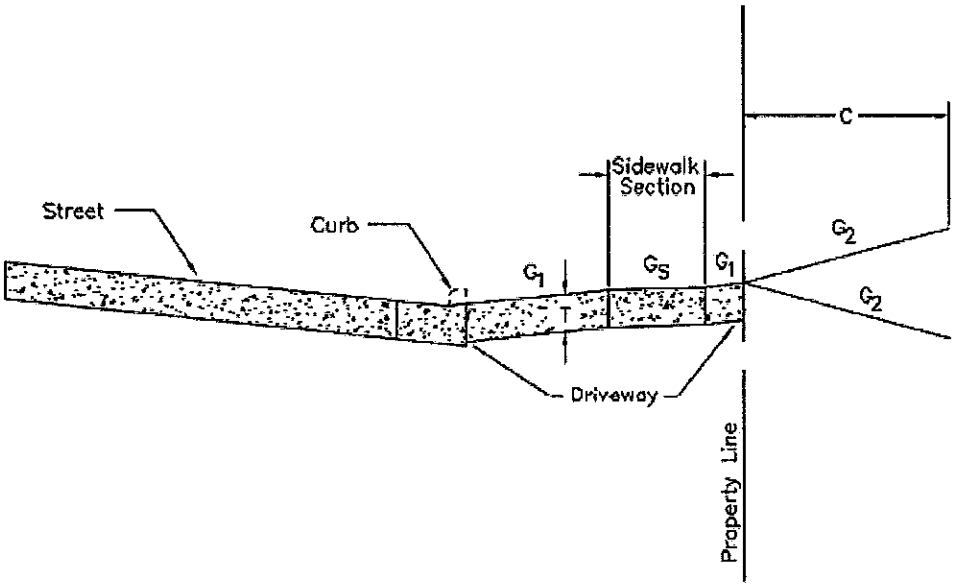
Where lots are large enough, the center of driveways not in alignment will normally be offset a minimum of 150 feet for all commercial/multifamily properties on collectors and arterials. Greater distances may be required if left-turn storage lanes require such on arterial streets. Minimum sight distance shall be provided at all access points in accordance with ASSHTO Site Distance Standards.

### 2.3.2 Driveway Design

Driveway sectional details are shown in Figure 3 with design suggestions listed in Table 2.

**Figure 3**

**Driveway Grades**




*All sidewalk grades (Gs) shall be 2.0%.

**Table 2**

| Type of Driveway | T Minimum Thickness | Grade (G1) | | Grade (G2) | | Min. Control Distance (C) |
|---|---|---|---|---|---|---|
| | | Min. | Max. | Min. | Max. | |
| Low Volume Residential | 6" | ±0.5% | +8.0% | ±0.5% | ±15% | 20' |
| Low Volume Commercial/Industrial | 6" | ±0.5% | ±6% | ±0.5% | ±8% | 40' |
| High Volume | 6" | ±0.5% | ±3% | ±0.5% | ±5% | 40' |

## 2.4 Off-Street Parking Area

**2.4.1 General.** In accordance with City Code, Appendix A, Section 2 Definitions, the following guidelines regarding the design of off-street parking areas shall be followed.

**2.4.2 Minimum Stall Width.** The minimum stall width shall be 10 feet.

**2.4.3 Minimum Stall Depth.** The minimum stall depth shall be 22 feet.

**2.4.4 Backing Into Street Not Allowed.** The spaces shall be so arranged so that no vehicle will be required to be backed into the street in order to exit the lot except for single-family or duplex dwelling units.

**2.4.5 Backing Over Sidewalk Not Allowed as Designated Parking Area.** The spaces shall be so arranged so that no designated parking area will infringe upon the public sidewalk.

**2.4.6 Drive Aisle Width.** The drive aisle shall be a designed for turning movements in and out of the spaces and shall comply will the current fire code access requirements.

**END CHAPTER**

# Chapter 3
# Street Lighting

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## 3.1 General

**3.1.1** This chapter sets forth the design and technical criteria to be used in the preparation of all street lighting plans. Where design information is not provided herein, the following standards (most current edition) shall be used:

1. National Electrical Safety Code (NESC)

2. National Electrical Code (NEC)

3. City of Sheridan Design Standards, Supplemental Specifications, and Standard Details and Night Sky Ordinance.

4. Requirements and Standards of the State of Wyoming

5. City of Sheridan Electrical Code

**3.1.2** Where a conflict occurs between the above standards, the most restrictive requirement shall apply.

**3.1.3** Street lights shall be placed on lot/property lines that are perpendicular to street centerline where applicable.

**3.1.4** Street lighting on cul-de-sacs must terminate with a street light on the lot line nearest where the turnaround begins.

**3.1.5** Street lights, junction boxes, meter pedestals, and conduit shall be free and clear of any permanent obstructions, which would impair the ability of future maintenance operations by Sheridan MDU. Layout of street lighting must also consider vertical and horizontal alignment with respect to other utilities that might conflict with the installation of the street lighting system.

**3.1.6** Design of street lighting systems will typically consist of installation of street lights in areas that have concrete curb and gutter installed. If concrete curb and gutter has not been installed, a street lighting system will not necessarily be required. Sheridan MDU will evaluate each project before final design is complete.

**3.1.7** If necessary, removal of street lights shall be coordinated with Sheridan MDU. All materials removed will become the property of Sheridan MDU unless otherwise noted.

## 3.2 Street Light Locations and Spacing

**3.2.1** Street lights shall not be located closer than five (5) feet horizontally to fire hydrants.

**3.2.2** Residential lighting shall be spaced 175–250 feet apart with a non-staggered pattern and located at intersections.

**3.2.3** Local, Collector, or Arterial (minor) lighting shall be spaced 200-275 feet apart with a non-staggered pattern and located at intersections.

**3.2.4** Commercial lighting, or Arterial (major), shall be spaced 175–250 feet apart located at intersections and with a staggered pattern if possible.

**3.2.5** Historical District lighting in residential locations within the boundaries of the City of Sheridan city limits shall be installed with a minimum of four lights per block located at intersections and with a staggered pattern if possible. Maps of Historical District boundaries are available by contacting Sheridan Public Works GIS Department.

**3.2.6** Special Lighting - Entry Way Corridor - coordinate lighting during DRB.

**3.2.7** Please contact the Sheridan Planning Department to identify special Historical District lighting pedestrian walking or entrance areas. These special locations shall be installed with four to five lights per block located at intersections and with a staggered pattern.

**3.2.8** Generally, street lights will be located within the public right-of-way 2 feet from the back of curb unless otherwise noted. Street lights shall be located on a lot line whenever possible. Streets that have sidewalks installed behind the curb and gutter will require street lights to be installed behind the sidewalk but still within the public right-of-way. If street lights cannot be installed within the public right-of-way, a utility easement will be required.

**3.2.9** When street light locations are being considered, overhead obstructions must be evaluated prior to placement location. In general, street lights shall maintain a minimum clear distance of 8 feet from any overhead electrical power lines. Other overhead obstructions such as trees, cable television lines, communications lines, etc., shall be evaluated on a case-by-case basis.

### 3.3 Junction Boxes

**3.3.1** Need to coordinate and develop plan with Sheridan MDU.

### 3.4 Conduits

**3.4.1** Need to coordinate and develop plan with Sheridan MDU.

### 3.5 Concrete Street Light Footings

**3.5.1** Need to coordinate and develop plan with Sheridan MDU.

### 3.6 Direct Bury Street Lights

**3.6.1** Need to coordinate and develop plan with Sheridan MDU.

### 3.7 Meters and Meter Pedestals

**3.7.1** Electrical meters will be furnished and installed by Sheridan MDU when they provide the power supply.

**3.7.2** When necessary, installation locations are determined by Sheridan MDU. Sheridan MDU will be required to install an approved meter socket.

### 3.8 Power Supply

**3.8.1** All street lighting plans shall indicate a designated power supply feed point. The power supply shall be installed from the designated supply point to a meter pedestal, if required. For most cases, a meter pedestal will be required if the power supply is obtained from companies other than Sheridan MDU.

### 3.9 Material Specifications

**3.9.1** Material specifications are included in the Supplemental Standard Specifications for Public Works Improvement Projects.

**3.9.2** Materials supplied by the Developer or City Capital Improvements Project should be coordinated with local utility company.

**3.9.3** Home owner associations with public streets may apply for a different lighting specification if the association will maintain.

## 3.10 Manufactured Home Parks and Private Streets

**3.10.1** Private streets require private street lighting that will not be operated, maintained, or administered by the City of Sheridan.

## 3.11 Easements

**3.11.1** Easements shall be obtained for all lighting and power lines located on private and public property. Easements shall have a minimum width of 10 feet. In addition, temporary easements may be required for construction. Easements shall be accessible for maintenance workers to maintain the lighting and power system. The most current version of the lighting and power easement forms shall be used and obtained from the City Engineer's Office.

**END CHAPTER**

# Chapter 4
# Utility Locations and City Utility Easements

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# Utility Locations and City Utility Easements

## 4.1 Purpose of Standard Locations

**4.1.1 Conflicts.** It is necessary to provide adequate space for utilities in a manner that will minimize conflicts between using the public right-of-way for transportation purposes and utility purposes. When street grades, alignments, or widths are changed, utilities are usually required to relocate. Oftentimes, standard locations are inapplicable and unobtainable in street areas where existing utilities are seriously crowded and where it would not be feasible to expect major or dramatic reorientation of the underground. The location criteria must be practical and applicable in new developments, in urban relocation work, and in cases where overhead facilities are being converted into underground structures and plans.

**4.1.2 Relocations.** Utilities are not expected to revise existing facilities as to location or depth solely or primarily for the purpose of creating uniformity. However, when new or relocation work is undertaken, uniformity should be sought. It is acknowledged that the present may be locked in because of the past, but there should be consideration for uniform utility locations for the future.

## 4.2 Plans Required

**4.2.1 Construction Approval.** Any utility or other facility constructed in City right-of-way shall have construction plans submitted and approved in accordance with requirements in the Design Standards of the Sheridan City Code, and the latest addition of the City of Sheridan Standard Specifications and Details for Street and Utility Construction. No construction permit shall be issued for construction of new utilities or extension of existing facilities (except service taps or laterals to individual properties) without prior construction plan approval by the City.

**4.2.2 Conformance.** The applicant's completed facility shall be in conformance with the drawings or sketches referred to above, unless a special variance has been requested and approved by the City.

## 4.3 Location Requirements

All utilities located within the public right-of-way shall be approved by the City of Sheridan or presiding right-of-way owner.

**4.3.1** Utilities already existing in non-standard locations may be replaced in the same location when approved by the City of Sheridan City Engineer.

**4.3.2** Gravity lines shall take preference as to horizontal and vertical alignment over non-gravity systems and pressure systems.

**4.3.3** Consideration will be given to the use of utility easements adjacent to the public right-of-way and to the use of alleys and medians.

**4.3.4** In the event of a conflict, or if a particular utility requires more than one system be installed in the right-of-way, the alternate location may be used when approved by the City Engineer.

**4.3.5** Utilities shown are primarily for local distribution and collection. Large diameter lines may make it necessary to modify utility locations.

**4.3.6** Street trees placed between the curb and street side of sidewalk must not interfere with underground or overhead utilities.

**4.3.7** Normally street lights will be placed on the same side of the street as the electric utility.

**4.3.8** Street lights shall not be located closer than five (5) feet horizontally to fire hydrants.

**4.3.9** Fire Hydrants generally shall be located at the Northeast corner of street intersection. Water main valves shall be located and spaced per DEQ regulations.

## 4.4 Street Closures

All utility permits where work will be done in the street pavement or in the right-of-way and would require a lane closure, must be approved by the City Engineer and comply with the street closure procedure. All proposed permits shall be submitted a minimum of 3 days prior to construction and be accompanied by a traffic control plan. The street category list shall be maintained and revised as needed by the City Engineering Department.

## 4.5 City Utility Easements

Easements for sanitary sewers, storm sewers, drainage, and water mains shall be obtained when the utilities are to be constructed outside of the typical street right-of-way (ROW) on private property. Sanitary sewer, storm sewer, drainage, and water main easements shall have a minimum width of 20 feet. Additional width may be required by the City Engineer to ensure proper access for City maintenance equipment. When City utilities are to be located adjacent to one another, the minimum separation distance between the utilities shall be 10 feet. All DEQ regulations must be followed. City Utilities Director to approve any variance in separation prior to DEQ approval.

Easements shall be labeled specifically for the utility in which it is describing; for example:

> Sanitary Sewer Easement, Storm Sewer Easement, Drainage Easement, Water Main Easement.

**4.5.1 Easement for Sanitary Sewer, Storm Sewer, Drainage, and/or Water Main.** The easement form shall be used where the City utility is to be constructed on private property. The most current version of the easement form shall be used and obtained from the City of Sheridan Utilities Department.

**4.5.2 Construction Easement for Sanitary Sewer, Storm Sewer, Drainage, and/or Water Main.** The easement form shall be used with the appropriate description inserted when a temporary easement is required during construction.

**END CHAPTER**

# Chapter 5
# Geotechnical Exploration and Report

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# Geotechnical Exploration and Report

## 5.1 General

The geotechnical evaluation shall indicate whether a project will be subject to any geotechnical hazards, make recommendations for site preparation, grading, foundations, retaining walls, earth-supported slabs, utility trench work, pavement design and drainage as necessary to the project.

The purpose of geotechnical evaluation is to attempt to determine whether the project will be subject to a geotechnical hazard. Geotechnical hazards include landslide conditions, expansive soils, flooding, high groundwater conditions, and any other conditions that could pose a risk to a planned construction project.

## 5.2 When Required

For site development, the determination as to when a geotechnical evaluation report will be required will be determined by code or on an individual, case-by-case basis by the City Engineer.

Public projects and subdivisions will be required to provide a geotechnical evaluation report.

## 5.3 Soil Exploration

**5.3.1 General.** When geotechnical explorations are required, all sampling and testing of the soil shall be performed in accordance with the appropriate AASHTO (American Association of State Highway and Transportation Officials) and ASTM (American Society for Testing and Materials) designations.

**5.3.2 Sampling.** Representative soil samples shall be obtained by subsurface exploration along the route of the existing or proposed public right-of-way.

**5.3.2.1** Explorations shall extend to a minimum depth of 5.0 feet below the proposed foundation subgrades, or 2.0 feet below the flow line elevation of any pipe or conduit. Every fourth exploration, or a minimum of one exploration per four completed, shall be of sufficient depth for monitoring of the ground water elevation.

**5.3.2.2** Explorations will be performed at close enough intervals to determine the boundaries of each significant soil type present.

If the boundaries are not accurately identified (i.e. subdivision report) a more detailed site developed geotechnical report will be required.

**5.3.2.3** Sampling locations should be selected by the project geotechnical engineer as the result of a geotechnical reconnaissance.

**5.3.2.4** Spacing of the explorations will vary with the uniformity of the soil profile and the topography. The maximum interval between soil explorations may not exceed 2500 feet.

**5.3.2.5** Where the original ground surface is to be covered with fill material, explorations a minimum of 5 feet deep are necessary to determine the character of the subgrades.

**5.3.2.6** Where drainage areas are crossed or boggy areas are encountered, the spacing of the explorations shall be at closer intervals in order to determine the boundaries of the "soft" area. At these "weak" areas, the depth of the explorations may also have to be increased in order to determine if and to what depth improved subgrade material will be required to provide uniform support for the construction.

**5.3.2.7** Representative samples from the explorations shall be collected for submittal to a soils testing laboratory for evaluation.

**5.3.2.8** An exploration log shall be maintained for each soil exploration performed. The exploration log shall contain a complete record of the soil material observed.

**5.3.3 Testing.**

**5.3.3.1** The tests required are those for identification and classification purposes. These tests include standard sieve analysis (ASTM D422 of AASHTO T-88) and Atterburg Limits (ASTM D4318 or AASHTO T-89 and 90). The test results are used to give a soil a descriptive name and letter symbol (in accordance with the Unified Soils Classification System) indicating its principal characteristics. Based on the test results, similar soil types can be placed into several major groups.

**5.3.3.2** These major groups shall be plotted on a profile sheet to determine their limits. The profile sheet is used with the laboratory data in selecting which soil types should be tested further. Additional testing includes the moisture-density relationship (ASTM D698 or AASHTO T-99 or T-180) and California Bearing Ratio (MIL STD 621 Method 101 or ASTM D1883). The moisture-density relationship determines the maximum dry density and optimum moisture content for that particular soil. The CBR test is performed at 95 percent of the maximum dry density and at the optimum moisture content. The results of the CBR test determine the relative bearing value of the subgrade and is used in the pavement thickness design. A minimum of a three-point curve will be utilized for the CBR testing with a five-point curve preferred. If the various soil type areas are not large enough to justify separate pavement designs, a single design shall be made on the worst soil type.

## 5.4 Report

**5.4.1 General.** The geotechnical report and any recommendations based on soil investigations must be prepared by a licensed engineer with experience in geotechnical engineering. The report shall identify any geotechnical hazards and recommendations to mitigate the special conditions along with grading, foundations, and subgrade and pavement requirements. The recommendations may be divided into three parts: geotechnical special conditions, grading and foundation, and subgrade and pavement.

**5.4.2 Special Geotechnical Conditions.** The special conditions portion of the report shall consider ground water, frost susceptibility, erosion potential, soils creep, landsliding, expansive soils, soil corrositivity, consolidation and any other special geotechnical conditions the Geotechnical Engineer becomes aware of.

Geotechnical hazards include landslide conditions, expansive soils, flooding, high groundwater conditions, and any other conditions that could pose a risk to a planned construction project.

**5.4.3 Grading and Foundation.** The grading and foundation portion shall include data regarding the distribution and engineering characteristics of the various soil materials, data about groundwater levels, recommendations about the need for mitigation measures for special geotechnical conditions, grading criteria, foundation design criteria, and any other information the Geotechnical Engineer considers pertinent.

**5.4.4 Subgrade and Pavement.** The subgrade and pavement portion shall include data regarding the distribution of various subgrade materials and design tests (such as CBR, R-value, and/or plate bearing) to be made. Where soils are susceptible to erosion, recommendations shall be made for preventing the undermining of pavements. The pavement design may be included in this report or prepared and submitted separately by the licensed Engineer responsible for preparation of the construction plans and contract documents.

**END CHAPTER**

# Chapter 6
# Grading

# Chapter 6
# Grading

# Chapter 6
# Grading

## 6.1 General

**6.1.1** All proposed developments shall be graded such that storm water runoff is managed on site or is conducted away from proposed building sites to swales constructed in drainage easements along lot lines, to public rights-of-way, or to another approved drainage course and complies with the City of Sheridan Storm Drainage Criteria.

**6.1.2** No filling will be allowed in areas of land within a proposed subdivision or other type of development within the flood plain of a river, stream, creek, or lake unless under the terms of a permit granted by the U.S. Corps of Engineers, FEMA, and approved by the City of Sheridan where applicable.

## 6.2 Grading Requirements for Subdivisions

**6.2.1 Reserved.**

**6.2.2** The longitudinal slope along a rear yard drainage easement shall be not less than 1.0 percent but not so great as to cause erosion.

**6.2.3** All grade point elevations shall be shown for each lot at the property corners and at the low and high points along the property lines.

**6.2.4** The general direction of overland drainage in the rear yard shall be indicated on each lot by an arrow.

**6.2.5** High and low street grade points, slope direction (by arrow), and the location of all inlets and drainage ditches shall be shown on the grading plan.

**6.2.6** A maximum slope of 3 feet horizontal to 1 foot vertical shall not be exceeded for all terracing. The toe of the slope shall be located outside of drainage easements and natural drainage ways unless adequate drainage is provided.

**6.2.7** Grading plans shall be drawn to a scale of 1 inch = 100 feet (1" = 100') or larger.

**6.2.8** Grading plans shall include details of typical lot grading and drainage patterns intended to be used.

**6.2.9** The grading plans shall show the contours with intervals of 1 foot for land with a slope of 1 percent or less, intervals of 2 feet for a slope between 1 and 1.1 and 9 and 9.9 percent and contours of 5 feet for land with a slope exceeding 10 percent.

**6.2.10** All elevations shall be on the NAVD 1988 vertical control datum. All coordinates shall be based on the State Plane Coordinate System or at a minimum, contain ties to State Plane Coordinate System.

**6.2.11** Drainage patterns other than those shown in standard details may be used and will be acceptable for review. Details of the typical lot drainage pattern shall be shown on the grading plan with all grade control points identified.

**6.2.12** In general, for streets with ditches and no curbs, elevation of the front lot line shall be at least 6 inches above the centerline of the road.

**6.2.13** All nonconforming lots with drainage patterns other than those in standard details shall be noted on the grading plan.

**6.2.14** Storm sewers and inlets shall be placed in rear yard swales at low (sump) points where front to rear grading is used.

**6.2.15 Reserved.**

**6.2.16** Drainage swales shall be constructed entirely within the easements.

**6.2.17** The grading plan shall show the minimum ground elevation adjacent to buildings for each lot. This may be accomplished with a typical section showing minimum slope away from building.

**END CHAPTER**

# Chapter 7
# Street Design Standards and Pavement Thickness

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# Street Design Standards and Pavement Thickness

## Street Design and Pavement Thickness

### 7.1 General

**7.1.1** This chapter sets forth the design and technical criteria to be used in the preparation of all roadway plans. Where design information is not provided herein, *"A Policy on Geometric Design of Highways and Streets"* (AASHTO Standards) as published by AASHTO's most current edition (English units) shall be used.

#### 7.1.1.1 Corridor Access Management

The Office of the Public Works Director or City Engineer may initiate an access management plan or corridor study that would supersede the design standards for access along an arterial or major collector street. Preparation of the study shall be the responsibility of the City of Sheridan, Wyoming Department of Transportation, and/or private individuals, or jointly prepared. However, the study must be prepared by a licensed design professional engineer with experience in transportation planning. The access plan or corridor study shall be approved by the Office of the Public Works Director or City Engineer and/or Wyoming Department of Transportation.

Access planning that has not been identified in any type of study in existing development areas will be considered on a case by case basis. Retrofit techniques will adhere to best access management practices as identified in the Transportation Research Board National Access Management Manual.

### 7.1.2 Functional Street Classification

**7.1.2.1 Regional Arterial.** A regional arterial street is a general term denoting a roadway designed or operating with the following characteristics:

A. Posted speed limits typically of greater than or equal to 45 miles per hour.

B. Anticipated traffic volumes in excess of 25,000 vehicles per day within the corridor.

C. Direct intersections with local streets and access from adjacent properties shall not be allowed except for existing lots with no other method of access.

D. The indirect access intersections will be with arterials or major collectors and will normally be spaced at 1-mile intervals and may be at one-half mile intervals for commercial areas.

E. Traffic control devices may be provided to enhance through traffic movements.

F. No on-street parking will be allowed.

G. Detached bicycle and/or pedestrian facilities shall normally be constructed.

**7.1.2.2 Major Arterial.** A major arterial street is a general term denoting a roadway designed or operating with the following characteristics:

A. Posted speed limits typically of greater than or equal to 40 miles per hour.

B. Designed to accommodate through traffic, intersecting with Minor Arterial and Collector Streets only. Intersections with local streets and access from adjacent properties shall not be allowed except for existing lots with no other method of access. The number of intersections will normally not be spaced less than one-quarter mile. ("T" intersections will be considered an intersection for half-mile spacing purposes.)

C. Continuous for several miles through the urban area.

D. Provides continuity for rural arterials which intercept the urban boundary.

E. Traffic control devices provided to enhance through traffic primarily by signal control and/or limited access.

F. No on-street parking will be allowed.

**7.1.2.3 Minor Arterial.** A minor arterial street is a general term denoting a roadway designed or operating with the following characteristics:

A. Posted speed limit typically of greater than or equal to 30 miles per hour.

B. Designed to accommodate through traffic and serve adjacent major developments. Intersections with local streets will not be allowed.

Development access will use shared driveways and be encouraged to utilize collector streets. The number of intersections will normally not be spaced less than one-quarter mile. ("T" intersections will be considered an intersection for spacing purposes.) Right-in and right-out access may be allowed.

C. Continuous for several miles.

D. Provides continuity for rural arterials which intercept the urban boundary.

E. Traffic control devices provided to enhance through traffic primarily by signal control or other warranted control.

F. No on-street parking will be allowed.

**7.1.2.4 Major Collector.** A major collector street is a general term denoting a roadway designed or operating with the following characteristics:

A. Posted speed limit typically of greater than or equal to 30 miles per hour.

B. Continuous for two or more miles.

C. Designed to handle traffic volumes loading from and onto local, other collector, and arterial roadways.

D. Traffic control is provided generally by signs.

E. No on-street parking will be allowed.

F. Access locations will not be allowed within 300 feet from the intersection with an arterial street.

G. Individual residential lots should not front on or have direct access to a major residential collector.

**7.1.2.5 Minor Collector.** A minor collector street is a general term denoting a roadway designed or operating with the following characteristics:

A. Posted speed limits typically of greater than or equal to 25 miles per hour.

B. Continuous for less than two miles.

C. Designed to handle traffic volumes loading from and onto local, other collector, and arterial roadways.

D. Traffic control is provided generally by signs.

E. Provide frontage and direct access for individual residences.

**7.1.2.6 Local Street.** A local street is a general term denoting a roadway designed or operating with the following characteristics:

A. Posted speed limit typically not in excess of 30 miles per hour.

B. No criteria for traffic volumes.

C. Limited continuity.

D. Designed for ease of access to adjacent developments.

E. Traffic control is by signage or rules for uncontrolled intersections.

F. On-street parking permitted.

G. Does not intersect with an arterial street.

## 7.2 Roadway Design and Technical Criteria

This Street Plan designates streets as local, minor, and major collector, minor and major arterial. See Table 1 for design standards for each of these street classifications.

### 7.2.1 Traffic Lane Widths

The minimum traffic lane width shall be 12 feet unless approved by the Director of Public Works or City Engineer.

In the design of local streets, the number of lanes for moving traffic will be a secondary consideration.

## Table 1: Minimum Street Design Criteria

| | Local | | | Collector | | Arterial | |
|---|---|---|---|---|---|---|---|
| Design Elements | Cul-de-sac | Single family | Commercial, Industrial, Multi-Family | Minor | Major | Minor | Regional or Primary |
| 24-hour Volumes (vpd) | 500 or less | 2000 or less | 2500 or less | <5000 | >5000 | >7000 | >25000 |
| Design Speed (mph) | --- | --- | --- | 30 | 35 | 35 | 50 |
| Driving Lanes | --- | --- | 2 | 2 | 2-4 | 2-4 | 4 or more |
| Right-of-Way (ft) | 60 | 60 | 66 | 80 | 80 | 100 | 100 or more |
| Roadway Width (ft) (1) | 50 | 36 | 39 | 39 | 41-49 | 41-53 | 65 or more |
| Lane Width (ft) | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Sidewalk | 5' | 5' | 5' (2) | 5' detached | | 5' detached | |
| Curb & Gutter | Type "A" or "B" | Type "A" or "B" | 6" vertical Type "B" | Type "B" | | Type "B" | |
| Min.-Max. Grade (%) | 0.5-8.0 | 0.5-8.0 | 0.5-8.0 | 0.5-7.0 | | 0.5-7.0 | |
| Curb Return Radii (ft) | | | | | | | |
| -intersect local | 15 | 15 | 15 | 25 | | | |
| -intersect collector | 25 | 25 | 25 | 25 | | 30 | |
| -intersect arterial | | | | 30 | | 35 | |
| Horizontal Curve Radius (ft) | 150 | 150 | 300 | --- | | AASHTO Standards | AASHTO Standards |
| Vertical Alignment Control | ------- | ------- | --- AASHTO -- Standards | ------ | ------ | ------- | -------- |
| Grade at Intersection (%) | | | | | | | |
| -intersect local | 3 | 3 | 3 | --- | | --- | |
| -intersect collector | 2 | 2 | 2 | 2 | | --- | |
| -intersect arterial | | | | 2 | | 2 | |

(1) All dimensions are measured to back of curb.
(2) Where sidewalk is attached to curb, sidewalk shall be one foot wider.
(3) Street Grades greater than 8% shall meet the Street Grade Criteria.

### 7.2.2 Separate Turning Lanes.

Separate turning lanes may be constructed on arterial and collector streets but will, as a rule, not be found on local streets.

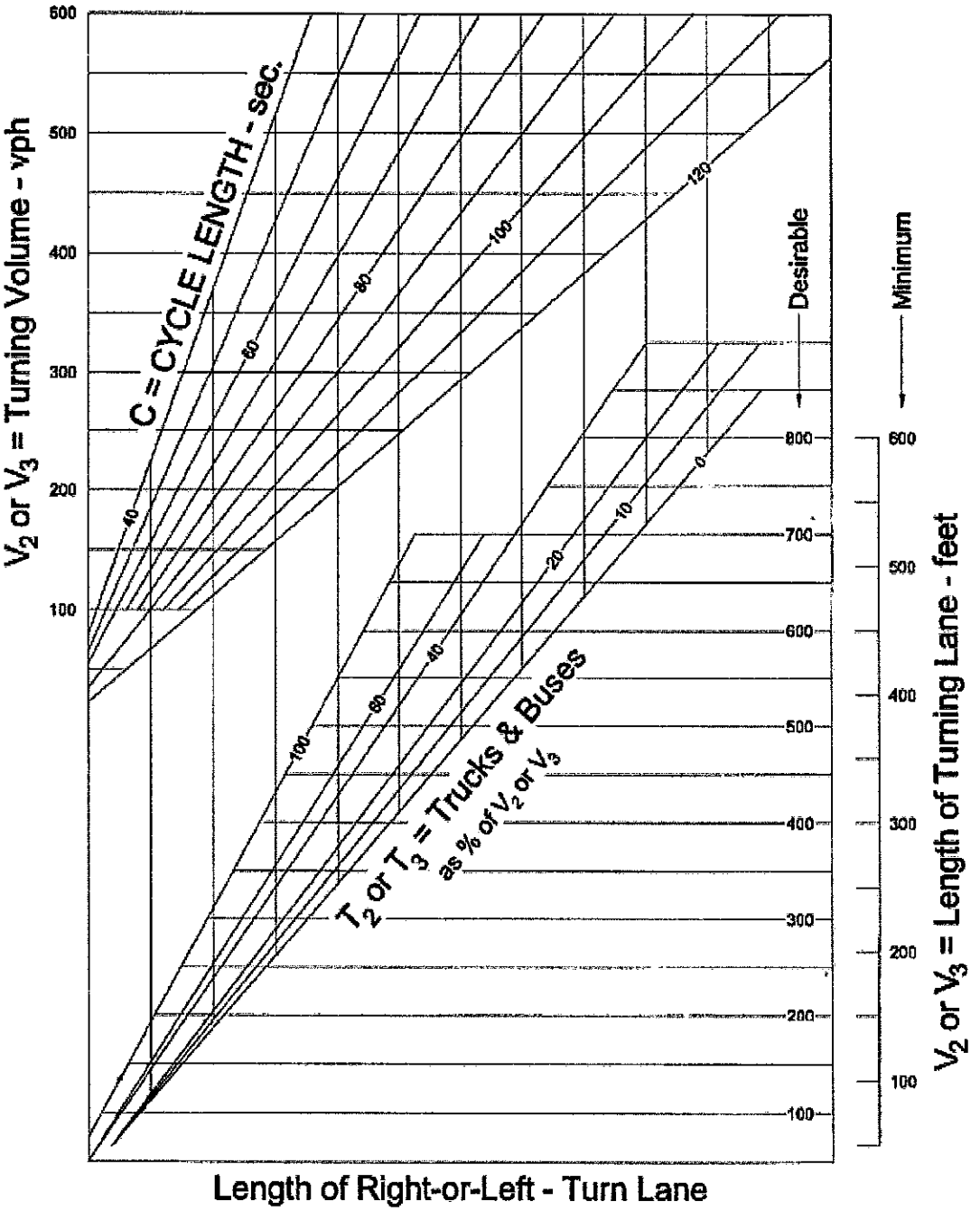
Where separate turning lanes are constructed on the basis of a capacity analysis at the intersection, a width of 12 feet will be used for arterial streets where truck traffic is involved and 11 feet in width for other streets.

### 7.2.2 Left-turn Lane Storage Lengths for New Facilities

Left-turn lane storage design at both signalized and unsignalized intersections for proposed street design plans may be determined from Figure 1. New streets will use the desirable lengths.

Minimum design lengths will only be permitted under constraints imposed by geometrics of existing streets. Lengths of dual left-turn lanes shall be independently designed.

**Figure 1: Design of Left-Turn Storage Length Volume-Based Nomograph for At-Grade Signalized Intersections**



### 7.2.4 Parking

Parking lanes will not be provided on arterial or major collector streets.

Where on-street parking is provided on collector streets, the parallel lane width shall be a minimum of eight (8) feet, which would include the gutter pan.

### 7.2.5 Medians

Generally, medians will be built only on arterial streets. The width may vary anywhere from a minimum of 16 feet to a maximum of 50 feet. At intersections, medians may be used to provide for separate left-turn storage lanes.

Medians are not desired on local streets. However, when permitted, the median shall conform to the same design standards as set forth for arterial streets. No bushes or shrubbery may be placed in any median unless approved by the City Engineer.

**7.2.6 Design Speed.** The highway design speed shall be used to establish features such as superelevation rate, critical length of grade, vertical and horizontal curves, intersections, etc. See Table 1 for design speeds.

**7.2.7 Traffic Calming.** Traffic calming is the process by which vehicular speeds and volumes on local streets are reduced to acceptable levels. This is achieved through the installation of approved devices such as traffic circles, flares, and center islands. Traffic calming serves the purpose of reducing cut-through traffic, truck traffic, excessive speeding, noise, vibration, air pollution, and accidents in an attempt to provide a safer environment for motorists and pedestrians.

Traffic calming devices may be installed if the traffic volume exceeds, or is projected to exceed, 1,000 vehicles per day; and if the 85th percentile speed of traffic exceeds, or is reasonably expected to exceed, 25 mph.

Traffic calming devices shall be designed to accommodate emergency vehicles that may use the local street. All final construction plans are to be approved by the Public Works Director or City Engineer.

Landscaping agreements for the continued care of vegetation within traffic circles and center islands shall be considered with adjacent property owners and determined on a case by case basis.

**7.2.8 Flares.** A flare is a roadway narrowing used to achieve speed reductions. Flares are usually coupled with sidewalks and serve to make streets more pedestrian friendly by reducing the amount of roadway the pedestrian is exposed to. They also draw motorists' attention to pedestrians via the raised peninsulas.

1. Street Characteristics: Flares may be installed on streets that have on-street parking. Flares can be located at street intersections or mid-block.

2. Pedestrian Generators: Flares should be considered on streets adjacent to pedestrian generators such as schools, parks, and bike paths.

3. Width of Flares: Flares shall be constructed so that driving lanes are no less than 11 feet wide.

**7.2.9 Center Islands.** Center Islands are raised islands located at the centerline of a street that narrows the travel lanes at that location. When used in conjunction with sidewalks, center islands can provide a refuge area for pedestrians to wait while traffic passes. Center islands can be located near intersections or mid-block.

1. Street Characteristics: Center islands may be used downstream of intersections to reduce the speed of turning vehicles. Center islands may also be used on curves to reduce vehicle speeds and prevent motorists from driving into the path of oncoming vehicles.

2. Length of Center Islands: Center islands should be constructed in short interruptions rather than as a long median that channelizes and separates opposing flows. Island lengths shall be between 25 feet and 75 feet.

3. Pedestrian Characteristics: Center Islands may be required to accommodate pedestrians.

## 7.3 Sidewalks

**7.3.1 Location.** Sidewalks shall be constructed on both sides of all roadways unless specifically waived by the Public Works Director or City Engineer. Generally, the sidewalks shall be located one (1) foot from the property line within the street right-of-way.

**7.3.2 Sidewalk Curb Ramps.** Curb ramps shall be constructed in accordance with the City of Sheridan Standard Specifications. Curb ramps

may be shown at all curb returns or called out by a general note on the development plans, but must be shown (located) at all "T" intersections. Whenever referencing a curb ramp, specify the City of Sheridan Standard Specifications and reference ADA requirements to be used to construct that ramp.

## 7.4 Pathways

Refer to City of Sheridan Pathways Master Plan.

## 7.5 Drainage

Drainage systems shall be designed in accordance with City Code, City Standard Specifications, and City Storm Drain Design Criteria. Development plans, including the drainage report, shall be considered as part of the street design and will be required for concurrent review with the street construction plans. Safe conveyance of traffic is the major function of streets; the storm drainage function of the street must therefore be designed to the limits set forth in City Code, City Standard Specifications, and City Storm Drain Design Criteria.

**7.5.1 Valley Gutters.** Valley gutters shall be constructed in accordance with the City of Sheridan Standard Specifications. Valley gutters are not permitted across collector or arterial streets, nor are they preferred on streets with storm sewer systems.

**7.5.2 Inlets.** Inlets shall be located to intercept the curb flow at the point curb flow capacity is exceeded by the storm runoff as determined by City of Sheridan Storm Drainage Criteria. Inlets shall also be installed to intercept crosspavement flows at points of transition in superelevation. Due to the presence of curb ramps, inlets are not allowed in the curb return, but will be located at the tangent points of the curb returns. In general, inlets shall be placed on the upstream side of the intersection so as to intercept the water before it reaches the pedestrian crosswalk. Sump inlets may be designed on the downstream side.

**7.5.3 Cross-slope.** Except at intersections or where superelevation is required, streets, in general, shall be level from top of curb to top of curb (or flowline to flowline) and shall have a typical two (2) percent crown as measured from centerline to lip of gutter, or lip of median gutter to lip of outside curb on roadways with medians. Where the crownpoint is not centered in the street, the crownpoint can be no further out than the quarter point of the street.

**7.5.4 Temporary Erosion Control.** Temporary erosion control is required at the ends of all roadways that are not completed due to project phasing, subdivision boundaries, etc., in accordance with the City of Sheridan Design Standards.

**7.5.5 Sidewalk.** Storm water from concentrated points of discharge shall not be allowed to flow over sidewalks, but shall drain to the roadway by use of storm sewers. Sidewalk chases will not be allowed unless specifically approved by the Public Works Director or City Engineer. If permitted, sidewalk chase sections shall not be located within the driveway.

## 7.6 Horizontal Alignment

**7.6.1 Horizontal Curves.** Any angular break in horizontal alignment of more than two (2) degrees shall require a horizontal curve (Table 1).

**7.6.2 Curb Return Radius.** Minimum curb return radius shall be as shown in Table 1. Where truck traffic is significant, curb return radii shall be provided in accordance with AASHTO standards.

**7.6.3 Construction Signs and Barricades.** Design and construction shall comply with the requirements of the *Manual on Uniform Traffic Control Devices*, latest edition. Details shall be shown on the construction drawings, and installation shall be provided by the contractor and/or owner.

**7.6.4 Superelevation.** The use of superelevation is discouraged for all streets. However, where superelevation is required for curves, arterial streets and collector streets, horizontal curve radius and superelevation shall be in accordance with the recommendations of the AASHTO standards. Superelevation shall not be used on local roadways. All roadway designs utilizing superelevation are subject to review and acceptance by the Public Works Director or City Engineer.

**7.6.5 Spiral Curves.** Spiral curves shall not be used on streets within the City (State highways excluded) except upon written acceptance of the Public Works Director or City Engineer.

**7.6.6 Cul-de-sacs.** The following criteria shall be used for the horizontal geometry of cul-de-sac turnarounds.

| | |
|---|---|
| (1) Minimum property line radius | 60 feet |

| | |
|---|---|
| (2) Minimum back of curb radius | 50 feet |
| (3) Maximum length of cul-de-sac measured along centerline, between the radius point of the turnaround and the R.O.W. line of the abutting street. | 500.0 feet |

**7.6.7 Spacing of Direct and Indirect Access, Angle of Intersection, and Offsets.**

**7.6.7.1 Spacing.** For collectors and local streets, four-legged intersections will normally be spaced at least 300 feet apart.

The minimum spacing requirements for Principal Arterials may be 500 feet for all property having an approved preliminary subdivision plan after August 1, 2009. For property having an approved preliminary subdivision plan prior to August 1, 2009, the access spacing may be 300 feet. The minimum spacing requirements for Minor Arterials may be 300 feet. These standards may be modified based on the findings of a traffic impact study or other analyses as approved by the Office of the Public Works Director or City Engineer.

**7.6.7.2 Angle of Intersection.** Proposed streets and driveways must intersect one another at 90° angles or as close to 90° as topography permits (no less than 80°).

**7.6.7.3 Offsets.** When "T" intersections are used, the center lines of the streets not in alignment must normally be offset a minimum of 150 feet on local streets, and 300 feet on nonresidential local, and collector streets.

**7.6.8 Transition Length.** If lanes are added, deleted, or adjusted, it will be necessary to construct a transition section for the safe conveyance of traffic. The following formula shall be applied to the taper or lane change necessary for this transition:

$L=WS^2/60$

where:

L = Length of transition in feet
W = Width of offset in feet
S = Speed limit or 85th percentile speed

## 7.7 Vertical Alignment

**7.7.1 Changing Grades.** The use of grade breaks, in lieu of vertical curves, is not encouraged. However, if a grade break is necessary and the algebraic difference in grade is less than one percent, the grade break will be permitted.

**7.7.2 Vertical Curves.** Design controls for vertical alignment must be in accordance with AASHTO standards. When the algebraic difference in grade (A) is at or exceeds one percent, a vertical curve is to be used. All vertical curves shall be labeled, in the profile, with length of curve (L) and K (defined as L/A).

**7.7.3 Intersections.** The following criteria shall apply at intersections.

**7.7.3.1** The grade of the "through" street shall take precedence at intersections. At intersections of roadways with the same classification, the more important roadway, as determined by the Public Works Director or City Engineer, shall have this precedence.

**7.7.3.2** The elevation at the end of curb return on the through street is always set by the grade of the through street in conjunction with normal pavement cross-slope.

**7.7.3.3** Carrying the crown of the side street into the through street is not permitted.

**7.7.3.4** Dipping the flowline to the extent that the lip of gutter is dipped is not permitted, except as specified by Standard Specifications concerning curb opening inlets. Tipping an inlet for the benefit of drainage is also not permitted.

**7.7.3.5** A more detailed review shall be performed for arterial-arterial intersection to maximize drivability.

**7.7.3.6** Flowline profiles and pavement cross-slopes shall be shown through an intersection until a normal cross-section is obtained. Elevations on a 15-foot grid shall be shown on a plan view drawing. This information shall be submitted using a maximum scale of 1" = 20' horizontally and 1" = 2' vertically.

**7.7.4 Curb Returns.** Minimum fall around curb returns shall be one-half of one (1) percent.

### 7.7.5 Connection with Existing Roadways

**7.7.5.1** Existing grade(s) shall be shown for a sufficient distance to assure that horizontal and vertical curve requirements are being or can be met with field verified as-builts showing stations and elevations at twenty-five (25) foot intervals. In the case of connection with an existing intersection, these as-builts are to be shown within a one hundred (100) foot radius of the intersection. This information shall be included in the plan and profile that shows that proposed roadway. Limits and characteristics of the existing improvement are the primary concern in the plan view. Such characteristics include horizontal alignment, offset intersections, limits of the improvements, etc.

**7.7.5.2** Previously approved designs for the existing improvement are not an acceptable means of establishing existing grades; however, they are to be referenced on the construction plan where they occur.

**7.7.5.3** The basis of the as-built elevations shall be the same as the design elevations (both flowline or both top of curb, etc.) when possible.

## 7.8 Off-Site Design

The design grade, and existing ground at that design grade, of all roadways that dead end due to project phasing, subdivision boundaries, etc., shall be continued, in the same plan and profile as the proposed design, for at least three hundred (300) feet or to its intersection with another roadway. This limit shall be extended to six hundred (600) feet when arterial roadways are being designed.

**7.9 Construction Traffic Control** (typically administrated and developed by the contractor)

### 7.9.1 Pedestrian Traffic

**7.9.1.1** Every precaution shall be taken to ensure that construction work does not interfere with the movement of pedestrian traffic, which shall be maintained on the sidewalk at all times and flagmen provided for guidance as necessary.

**7.9.1.2** Where an excavation interrupts the continuity of the sidewalk, the Contractor shall provide suitable bridge or deck facilities, to be supplemented by the use of such proper devices and measures as prescribed in the *Manual on Uniform Traffic Control Devices*, latest

edition, for the safe and uninterrupted movement of pedestrian traffic complying with ADA standards. The edges or ends of the pedestrian bridge or decking shall be beveled or chamfered to a thin edge to prevent tripping.

**7.9.1.3** Temporary diversion walkways shall be hard surfaced and electric lighting shall be provided and kept continuously illuminated during hours of darkness, when required by the Public Works Director or City Engineer.

**7.9.1.4** Unless otherwise authorized by the Public Works Director or City Engineer, pedestrians shall not be channeled to walk on the traveled portion of a roadway.

**7.9.1.5** Under certain conditions, it may be necessary to divert pedestrians to the sidewalk on the opposite side of the street. Such crossings shall only be made at intersections or marked pedestrian crossovers.

**7.9.1.6** Facilities satisfactory to the Public Works Director or City Engineer shall be provided for pedestrians crossing at corners, pedestrian crossovers, and public transportation stops.

### 7.9.2 Vehicular Traffic.

**7.9.2.1** Construction work zone traffic shall be controlled by signs, barricades, detours, etc., which are designed and installed in accordance with the *Manual on Uniform Traffic Control Devices*, latest edition. A traffic control plan shall be submitted to and approved by the City Project Manager, or designated agent, prior to start of any construction.

**7.9.2.2** For construction of new facilities, traffic control should strive to keep the motorist from entering the facility. The primary means to accomplish this are by use of temporary barricades, located in advance of the construction area and with appropriate signing. New construction shall not be opened to traffic, and the construction traffic control removed, without the approval of the City Project Manager.

**7.9.2.3** The details of the traffic control plan must be shown on a map. For minor projects or local roadways, a neat sketch of the roadways and the proposed control devices will suffice. For major projects or major roadways, the traffic control plan shall be superimposed on as-builts, construction plan drawings, or other detailed map.

**7.9.2.4** The *Manual on Uniform Traffic Control Devices*, latest edition, shall be the basis upon which the traffic control plan is designed, in concert with proper, prudent, and safe engineering practice. All necessary signing, striping, coning, barricading, flagging, etc., shall be shown on the plan.

**7.9.2.5** Any plan for traffic control during construction that indicates a complete closure of an arterial or collector street must show detour routes and must be approved by the Public Works Director and Fire Marshal. Requirements as to rerouting of traffic, signing, time of closure, and length of closure will be determined on a case-by-case basis. When a local street is to be closed to traffic, the City Engineer must be notified, preferably 24 hours in advance.

**7.9.2.6** Directional access on roadways may be restricted (minimum travel lane width in construction area is ten [10] feet), but proper controls including flagging must be indicated. Removal of on-street parking shall be considered, and noted where applicable.

## 7.10 Speed Change Lanes

The design of the arterial street system depends upon the proper control of access to developments. The location and design of access points must minimize traffic hazards and interference to through-traffic movements. In order to ensure proper access control, the following standards for deceleration lanes have been established.

**7.10.1 Where Required.** Speed change lanes may be required along segments of arterial or collector streets if the proposed development constitutes a potential for creating a traffic hazard or unnecessarily impedes through-traffic movements as determined by the Traffic Impact Report or the Public Works Director or City Engineer. A high volume access must be provided with a turning or speed change lane to allow the driver to maneuver out of the main travel lanes before slowing down. Speed change lanes and left-turn lanes must be provided in the center or median of the road for left-turning traffic at a high volume access; if such lanes cannot be provided, left turns will be restricted.

**7.10.1.1** Speed change lane for right-turning movements will be required according to Table 2:

**Table 2: Volume Warrants For Speed Change Lanes for Right-Turning**

| | POSTED SPEED OF STREET IN MPH | | | | |
|---|---|---|---|---|---|
| | Less than 25 | 26 to 40 | 41 to 50 | 51 or greater | For |
| If the design hour volume of the high-way lanes will exceed | 500<br>1400 | 400<br>1200 | 200<br>800 | 150<br>600 | 2-lane streets<br>4 or more lanes |
| and the designated volume of the access approach will exceed | 50<br>70 | 40<br>60 | 20<br>40 | 15<br>25 | 2-lane streets<br>4 or more lanes |

For streets with four or more through travel lanes, design hour volumes shall be measured only in the direction of the access approach.

**7.10.1.2** For left-turning movements, speed change lanes will be required according to Table 3:

**Table 3: Volume Warrants For Speed Change Lanes for Left-Turning Movements**

| | POSTED SPEED OF STREET IN MPH | | | | |
|---|---|---|---|---|---|
| | Less than 25 | 26 to 40 | 41 to 50 | 51 or greater | For |
| When design hour volume of the high-way will exceed | 500<br>1000 | 400<br>900 | 200<br>600 | 150<br>400 | 2-lane streets<br>4 or more lanes |
| and the left-turning design hour volume into the access approach will exceed | 50<br>70 | 40<br>60 | 20<br>40 | 15<br>25 | 2-lane streets<br>4 or more lanes |

For streets with four or more through travel lanes, design hour volumes shall be measured only in the direction of the median speed change lane.

**7.10.1.3** For both tables, where the existing street design hour volume is below the values in the tables, a 20-year prediction shall be made and compared to the table. If 20-year prediction requires a turn lane, additional Right-of-Way for future turn lane shall be dedicated.

**7.10.1.4** Where public safety so requires, due to specific site conditions, such as sight distance, a turn lane may be required even

though the warrants in Tables 2 and 3 are not met. Where the design hour volume of the street is twice the street design hour volume in Tables 2 and 3, the City may require a minimum speed change lane for any access approach.

### 7.10.2 Speed Change Lane Design

**7.10.2.1** On highway arterial and collector streets in the City, the design of acceleration/deceleration lanes shall meet the minimum requirements as shown in Tables 4 and 5, providing sufficient off-site right-of-way is available. These absolute minimum requirements were developed recognizing the severe limitations that currently exist on right-of-way availability for most of the urban street network. Where grades are significant, modifications to these lengths will be required by the City. If off-site right-of-way is insufficient, lanes will be designed to maximize the use of available right-of-way at the time that construction plans receive final approval.

**Table 4: Acceleration Lane and Taper Lengths**

| (1) SPEED (MPH) | LANE LENGTH | | TAPER LENGTH |
|---|---|---|---|
| | Stop Condition | From 15 mph(2) | |
| 30 | 150' | 125' | 120' |
| 35 | 175' | 150' | 150' |
| 40 | 250' | 200' | 180' |
| 45 | 300' | 250' | 180' |

(1) 85th percentile speed.
(2) Assumes vehicles start at 15 miles per hour.

**Table 5: Deceleration Lane and Taper Lengths**

| SPEED (MPH) | LANE LENGTH | | TAPER LENGTH |
|---|---|---|---|
| | 15 mph Turn* | Stop Condition | |
| 30 | 100' | 125' | 120' |
| 35 | 125' | 150' | 150' |
| 40 | 175' | 225' | 180' |
| 45 | 200' | 250' | 180' |

* Assumes vehicle turns at speed of 15 mph at the end of the deceleration lane.

**7.10.3 Exemptions.** Requests for exemption from the requirements for a deceleration lane shall be based upon a traffic engineering study that presents trip generation data for the proposed development in terms of impacts upon through-traffic flows.

Such requests shall be reviewed by the Public Works Director or City Engineer and may be approved, except that such an approval cannot be granted if through traffic would be impeded more than three (3) percent of the total time or more than five (5) percent of the time during peak traffic flow periods or if other unique circumstances warrant special design considerations.

## 7.11 Pavement Thickness

Design of pavement thickness for collector and arterial streets and local streets in industrial and commercial zoned areas shall be based on *AASHTO Guide for Design of Pavement Structures*, latest edition. Pavement design shall be based on an inherent reliability of 75 percent. For traffic conditions where the equivalent 18 kip/single axle loading is less than 1,000,000, the low-volume road design method may be used. Recommendations and subgrade properties developed by the Geotechnical Exploration Report shall be used in the design of the pavement structure.

**7.11.1** Industrial and Arterial Streets must be designed for pavement thickness on an individual street-by-street basis. However, in no event may the pavement thickness be less than that specified in Table 6. Local Residential Streets need not be designed on an individual basis, but must meet the minimum pavement thickness as set forth in Table 6.

**7.11.2** Minimum compressive strength for Portland Cement concrete paving shall be 4800 psi at 28 days.

**7.11.3** Traffic Data. Where traffic data is available, actual counts shall be used along with projections of traffic growth in determining the pavement design. If traffic data is not available, Table 6 may be used to provide data for the pavement design. Traffic data for all arterial streets will be determined by the City Engineer.

**Table 6 - Minimum Pavement Thickness Requirements**

| | Local Residential Streets | Commercial, Industrial & Collector Streets | Arterial Streets |
|---|---|---|---|
| Portland Cement Concrete (Requires Aggregate Base) | 6" PCCP<br>4" Aggregate | 8" PCCP<br>4" Aggregate | 8" PCCP<br>4" Aggregate |
| Asphaltic Concrete with Aggregate Base | 4" AC<br>6" Aggregate | 6" AC<br>6" Aggregate | 6" AC<br>6" Aggregate |

Note: Soils report required to substantiate all proposed roadway sections.

**END CHAPTER**