

CHAPTER 3 - STREETS

3.00 Functional Classification

The functional classification of existing and proposed roads is established by the City on an individual basis using the existing land use and existing operational characteristics. Stevenson classifies roads and streets as follows:

A. Principal Arterials.

These facilities are the supporting elements of both the principal routes and collector systems. Major arterials, in combination with principal routes, are intended to provide a high level of mobility for travel within the region. All trips from one sub-area through an adjacent sub-area traveling to other points in the region should occur on a major arterial or principal route. No direct land access is permitted on to major arterial unless no other access is available. Where permitted, shared access between lots may be required.

B. Collectors.

The collector system is deployed nearly entirely within sub-regions to provide mobility between neighborhoods or from neighborhoods to arterial systems. An adequate collector system is needed to ensure these movements do not occur on principal routes or major arterials. Emphasis is on collection and distribution of trips within an arterial grid and direct access from parcels is limited to the extent possible. Subcategories of collectors include major collectors and minor collectors.

C. Local Streets.

The local street system is used throughout developed areas to provide for local circulation and direct land access. It provides mobility within neighborhoods and other homogenous land uses and comprises the largest percentage of total street mileage, but is also the slowest for travel. They are designed specifically to have high accessibility and to connect to collector and arterial roads, and are typically not used for through traffic. In general, local traffic should not occur on major arterials and principal routes.

3.01 General Requirements for Layout

The City's Comprehensive Plan states that future street construction will encourage connectivity. Additionally, the City has adopted a Complete Streets Policy to encourage connectivity and accessibility for pedestrians and bicyclists. Street sizing for arterials and collectors assumes that the transportation system will encourage non-motorized transportation. The City's objective is to impose an average spacing for new local streets of five hundred (500) feet (a 500-foot grid) within all new developments and to the limits of the entire parcel of property being developed.

Layout of new development will provide the capability of extending future streets through adjacent parcels by having streets proposed for that development extended to the limits of the property and located so as to provide a spacing of 400 to 600 feet. Where this requirement is not feasible due to topography, zoning constraints, or critical area impacts, an 8-foot wide paved bikeway\multimodal trail can be substituted for the street if approved by the City. The bikeway\multimodal trail shall be extended to the limits of the property. Said bikeway\multimodal trail shall follow the general grid pattern of the street layout (500 foot grid) and shall extend from the ends of dead-end streets that are not capable of being extended to the limits of the property due to topographic constraints, or shall be established mid-block

to provide pedestrian connectivity between parallel streets. To meet the through-street planning objectives, streets, bikeway, or multi-modal trails shall be designed and constructed to extend to the limits of the property with the all costs borne by the developer of the property without reimbursement by the City.

3.02 Access

Access to public and private streets shall conform to the requirements listed herein. The City Engineer shall have the authority to limit access and designate access locations on public and private streets under the jurisdiction of the City. Access to streets and highways under Skamania County or State of Washington jurisdiction must be formally approved by those entities at the applicant's initiative and expense.

3.03 Street Cross Sections

- A. Street Cross sections are defined by the functional classification of the road. Table 2.03A lists the design parameters for each of the functional classifications. It should be noted that public utility easements beyond the right-of-way are typically required.

All new roadways shall be provided with a centerline crown with an allowable cross slope between 2% and 4%.

3.04 Alleys.

Alleys provide direct access to adjoining lots. They reduce the number of required curb cuts along public streets and improve the appearance and human scale of streetscapes by reducing the amount of parking and parking garages oriented to the street.

Alleys may be used to provide alternative access to lots only under unusual circumstances as approved by the City Engineer. Alleys may not be used to provide primary access to lots.

Stormwater runoff must be managed with a gutter or other means.

See Table 2.03B for additional requirements.

3.05 Number of Lanes

The number of lanes for each class of road shall be as directed by the City Engineer. Additional lanes may be required at intersections in excess of the road sections shown in Table 2.03A. Right-of-way may be needed in addition to that shown in Table 2.03A to accommodate the increased number of lanes at intersections.

3.06 Design Speed

The minimum design speed for each road classification shall be as shown in Table 2.03A or as otherwise determined by the City Engineer.

Table 2.03A – Street Cross Sections

Parameter	Roadway Classification					
	Principal Arterial	Downtown Principal Arterial	Major Collector	Minor Collector	Local Access	Private
Right-of-Way	80	60	70	60	50 [1]	[4]
Total Pavement Width	60	40	46	38	28 [2]	20
Number of Drive Lanes	2	2	2	2	2	2
Width of Drive Lanes	11	12	10	11	10	10
Number of Turn Lanes	1	0	0	0	0	0
Width of Turn Lanes	12	0	0	0	0	0
Number of Parking Lanes	2	2	2	2	1 [2, 3]	0
Width of Parking Lane	8	8	8	8	8	-
Number of Bike Lanes	2	0	2	2	0	0
Width of Bike Lane	5	0	5	5	0	0
Number of Sidewalks	2	2	2	0	2	[5]
Width of Sidewalk	8	10	6	0	5	5
Number of Planter Strips	2	0	2	2	2	0
Width of Planter Strip (incl. curbs)	6	0	6	6	5	-
Design Speed	35	25	30	30	25	20
Notes:						

Notes:

1. Right-of-way width may be reduced by five (5) feet subject to Planning Commission, City Council, and Fire Marshal approval and provision of adequate public utility easements.
2. The requirement for a parking lane may be waived subject to City Council, and Fire Marshal approval and Planning Commission verification that the lots served by the street contain adequate off-street parking.
3. To separate automotive and pedestrian traffic, the parking lane should be adjacent to the sidewalk.
4. Private streets are subject to the criteria for authorization and additional requirements of Section 2.07.
5. Private streets serving more than 4 lots shall have a sidewalk on one side.

Table 2.03B – Alley Requirements

	Short Alley¹	Long Alley¹
Function and Limitations	Short alleys are appropriate in low-density residential zones with minimal traffic generation and relatively short blocks (200' to 400'). When used as parking courts, alleys may not exceed 150 feet in length.	Long alleys are appropriate for low-density residential development on longer blocks (400' to 500') and medium and high-density residential development when parking bays are provided. They may also provide access to commercial development. When used as parking courts, alleys may not exceed 150 feet in length.
Access	Full access to adjoining lots provided that all lots having alley access front on a public or private street.	Full access to adjoining lots provided that all lots having alley access front on a public or private street.
Right-of-Way or Easement	12 feet minimum, 15 feet maximum except as wider sections may be approved as necessary for parking courts.	20 feet minimum and maximum except as wider sections may be approved as necessary for parking courts.
Pavement Width	10 feet to 12 feet (1-foot min. clear zone on both sides)	18 feet (1-foot clear zone on both sides)
1. Alleys may function as through-travel lanes terminating at public streets or parking courts only (e.g. hammer-head terminus). 2. The city engineer shall determine which alley standard is used (Short Alley or Long Alley). 3. Additional right-of-way or easement area may be required when parking bays are incorporated into the streetscape, or when slopes/physical conditions require additional right-of-way. Right-of-way requirements shall be determined through the subdivision and site design review permit process. 4. Alleys will be considered public streets to be owned and maintained by the City unless otherwise stated in the Conditions of Approval in the final land use approval or on the Final Plat. 5. Alleys shall meet International Fire Code Section 503 if determined by the Fire District to be a Fire Accessible Roads. 6. Refer to zoning chapters for building setbacks. 7. Low-profile, security lighting is required with new development.		

3.07 Dedications

- A. Right-of-Way shall be deeded for streets and other improvements as required to accommodate motorized and non-motorized transportation, landscaping, utility and buffer requirements. Some reduction in the minimum right-of-way requirement may be granted by the City Engineer where it can be demonstrated that sufficient area has been provided for all functions within the right-of-way and/or alternate locations. Conveyance shall be fee simple using a statutory warranty deed.
- B. Easements for all public utility systems shall be provided as required. Specific requirements for sewer, water, and storm drainage easements are detailed in the relevant chapters. Particular design features of a road may necessitate slope, wall or drainage easements. Such easements may be required by the City Engineer in conjunction with dedication or acquisition of right-of-way and other standard easements (temporary construction, right of entry, sidewalk, pedestrian, street lighting, traffic control devices, etc.).
- C. Special Access Easements or Tracts. Where it is necessary to facilitate pedestrian circulation between neighborhoods, schools, shopping or other activity centers, public access easements or tracts shall be provided.

Improvements to the easement shall include a sidewalk or trail consistent with other non-motorized facilities in the area. Fences shall be constructed along access easements in residential areas where buildings will be located nearer than fifty feet (50') to the edge of the easement. Diverters or bollards shall be installed at the direction of the City Engineer.

- D. All subdivisions and short subdivisions (short plats) will be required to deed additional right-of-way, as a condition of approval of the subdivision, where the existing right-of-way for a public street is not adequate to incorporate necessary frontage improvements for public safety and provide compatibility with area's circulation system and to meet the City's most recent Comprehensive Plan and Transportation Capital Facilities Plan.

All short subdivisions (short plats) will be required to deed additional right-of-way, as a condition of approval of the short plat, under one or more of the following conditions:

- 1. The short plat abuts an existing substandard public street and the additional right-of-way is necessary to incorporate future frontage improvements necessary for public safety, or
 - 2. Additional right-of-way is needed to provide right-of-way for the extension of existing public street improvements necessary for public safety, or
 - 3. Additional right-of-way is needed to provide future street improvements necessary for public safety for planned new public streets.
- E. It is within the authority of the City Engineer to refuse to approve or sign any land partition, partition plat, or subdivision plat that the owner or developer has not obtained the necessary right-of-way and easements for the public infrastructure to serve the proposed and affected existing lots. Such approval may be withheld until it can be verified that the location and width of proposed rights of way and easements are adequate for the required infrastructure.
- F. Easements are subject to the approval of the City Attorney prior to recording. Variation from the City standard form of conveyance shall be allowed only when extraordinary circumstances warrant, as determined by the City Engineer and City Attorney.
- G. Easement Widths
 - 1. Easements for recreational trails shall be 20-feet in width minimum. Easements for multi-modal trails shall be 30-feet in width minimum.
 - 2. In residential subdivisions or residential short plats, panhandle (flag) access driveway

easements may be allowed for access to a maximum of two (2) lots, shall have a minimum easement width of twenty (20) feet and shall not exceed 100 feet in length. A greater easement width may be required to accommodate grading, utility requirements, or to comply with the International Fire Code.

3. In commercial subdivisions or commercial short plats, a private roadway easement or panhandle (flag) access easement may be allowed for access to a maximum of two (2) lots and shall have a minimum easement width of thirty (30) feet. A greater width may be required to accommodate grading, utility requirements, or to comply with the International Fire Code.

- H. All recording costs for easements created by private development shall be borne by the developer.

3.08 Private Streets

- A. Criteria for Authorization. It is the City of Stevenson's policy to discourage private streets and to only permit them under unusual circumstances as applied with small infill developments of a maximum of eight (8) lots. Private streets serving more than eight (8) lots qualify as private communities and must meet the requirements of Section 2.08 Private Communities. When allowed, private streets will only be permitted under the following conditions:
 1. Covenants have been approved, recorded, and verified with the City to provide for maintenance of the private streets and associated parking areas by owners in the development, and
 2. Provision is made for the streets to be open at all times for emergency and public service vehicles, and
 3. The private streets will not obstruct public street circulation, and
 4. The private street has been approved by the Fire Marshal, and
 5. At least one of the following conditions exists:
 - a) The subdivision plat or short plat will serve 8 or fewer lots.
 - b) For streets serving industrial or commercial development, street circulation continuity is not necessary.
 - c) The City Engineer determines that no other access is available and the private street is adequate to serve the development.
- B. The developer or benefiting property owners shall submit a private street maintenance agreement for review by the City Engineer. The private street maintenance agreement shall be recorded with the plat.
- C. Notice. A statement is required on the face of any plat or short plat containing a private street that reads: "The City of Stevenson has no responsibility to improve or maintain private streets and it shall be the sole responsibility of the property owners to improve or maintain the private streets providing access to the property contained within and described in this plat."
- D. Easements. The minimum easement width for private streets shall be the paved width, plus sidewalk width, plus ten (10) feet. A greater width may be required to accommodate utilities.
- E. Design Requirements. Private streets shall conform to public street construction standards with the exceptions noted herein.
 1. The minimum paved width shall be twenty (20) feet (curb face to curb face).

2. Private streets shall be improved with a minimum road section matching City Standard Detail S02.
 3. The maximum grade for private roadways shall be 15%. Roadways that must be used to provide access to fire vehicles, as determined by the Fire District, shall be a maximum of ten (10) percent, unless otherwise approved by the Fire Marshal.
 4. Drainage improvement requirements shall be as specified in Chapter 4 of these Standards.
 5. Provisions shall be made to allow garbage collection for all lots served by the private road.
 6. Street lighting is not required on private streets but shall be provided at the intersection of the private street with a public street.
 7. Turnarounds shall be provided as required in Section 2.13.
- F. The City encourages the use of Low Impact Development (LID) concepts and techniques.
- G. Acceptance of Private Streets as Public Streets. Acceptance of private streets as public streets will be considered only if the street meets all applicable public street standards contained herein.

3.09 Private Communities

- A. Criteria for Authorization. Private communities are allowed only as part of a Planned Unit Development. Where allowed, private communities must meet the following conditions:
1. Covenants have been approved, recorded, and verified with the City which provide for maintenance of the private streets and associated parking areas by owners in the development.
 2. Private communities may be gated, subject to the following conditions:
 - a) Provision shall be made for the streets to be open at all times to emergency and public service vehicles.
 - b) Stacking area. Each access point shall have an area of sufficient length and width to safely stack traffic coming onto the property from the adjacent roadway. The length of the stacking area shall be based on the adjacent roadway type, design configuration, and number of lots accessed through gates, but in no case shall be no less than 40- feet. A parking area shall be provided to the right of the entry lane to accommodate visitors not able to open the gate.
 - c) Entrance/Exit Design. Adequate vision clearance shall be provided so that motorists leaving a gated community have a clear view of the sidewalks at the exit, and so that approaching pedestrians have a clear view of any approaching vehicle. Gated community entrances and exits shall be designed to achieve travel speeds not to exceed 5 miles per hour, and shall require a vehicle stop directly prior to crossing the street sidewalk. Entrance and exit areas shall be designed so that vehicles approaching or leaving the gated community can queue to enter/exit the traffic stream without blocking the sidewalk.
 - d) Turnaround feature. Each gate access point shall have an area that allows traffic to safely maneuver a turnaround when the gate is in closed position.
 - e) Gate Width. Fire and emergency access vehicles require passing room within the entrance to the development. Twenty feet of unobstructed driving surface is required on the interior side of the access point and gate.

- f) No encroachment into publicly owned right-of-way. The gates, operating equipment and fencing shall be located wholly within the private portion of the property. The property line shall be clearly indicated on the site plan. Swing gates are not allowed to encroach into the public right-of-way. The drives, streets and lanes inside a gated community are to remain private.
 - g) Pedestrian Access. Each access point shall have a pedestrian access and walkway that is separate from the driving lanes and links directly to the public sidewalk. Pedestrian walkways shall meet all standards for accessibility required by the Americans with Disability Act and shall not be gated.
 - h) Lighting. Lighting fixtures consistent with Section 2.26 shall be provided for vehicle and pedestrian safety. Lights in private communities shall be metered and electricity costs shall be the responsibility of the HOA or residents.
 - i) Sight Distance. Each access point shall demonstrate adequate sight distance as required by Section 2.16
 - j) Gate Material. The moving portion of the gate shall be constructed of material that is no less than 20% opaque. Typically, wrought iron or other decorative material is used.
 - k) Automatic gates shall have battery backup power. In the event of a power failure, the gates shall open and remain open until power is restored.
- 3. The private streets within the private community will not obstruct public street circulation.
 - 4. The private streets and gate configuration shall be approved by the Fire Marshal.
- B. Easements. The minimum easement or tract width for a private road within a private community shall be forty-eight (48) feet.
 - C. Design Requirements. Private Streets within private communities shall conform to design standards established for public local residential streets.

3.10 Horizontal Alignment

Horizontal street alignments shall meet the following requirements:

- A. Center line alignment of improvements should be parallel to the center line of the right-of-way.
- B. Center line of a proposed street extension shall be aligned with the existing street center line.
- C. Horizontal curves in alignments shall meet the minimum radius requirements as shown in Table 2.09A or the low-speed curve table at the end of this section for residential local streets.
- D. Except on residential local streets, reversing horizontal curves shall be separated by no less than 50 feet of tangent. On arterials, the separation shall be no less than 100 feet.
- E. The angle between two intersecting roadways shall be as close to 90° as practical.
- F. Low speed curves may be used on residential local streets. Minimum centerline and curb radius for low speed curves shall be as follows:

	<u>Up to 75°</u>	<u>75° & Over</u>
Minimum Centerline Radius (2-lane)	100'	55'
Minimum Curb Radius	80'	35'

Table 2.09A
Design Speed / Center Line Radius - Minimums
Arterial Streets and Commercial/Industrial Collectors

Design	Friction	Cross-Slope / R min.					
Speed (mph)	Factor (F)	(e)-4%	(e)-2.5%	(e) 0%	(e)2.5%	(e)4%	(e)6%
25	0.165	335'	300'	255'	220'	205'	185'
30	0.160	500'	445'	375'	325'	300'	275'
35	0.155	710'	630'	530'	455'	420'	380'
40	0.150	970'	855'	710'	610'	560'	510'

Collector and Residential Streets

Design	Friction	Cross-Slope / R min.					
Speed (mph)	Factor (F)	(e)-4%	(e)-2.5%	(e) 0%	(e)2.5%	(e)4%	(e)6%
25	0.252	195'	185'	165'	150'	145'	135'
30	0.221	330'	305'	270'	245'	230'	215'
35	0.197	520'	475'	415'	370'	345'	320'

NOTES:

1. Off right-of-way runoff shall be controlled to prevent concentrated cross flow in super-elevated sections.
2. Super elevations may only be used when approved the City Engineer. Where super elevation is used, street curves should be designed per AASHTO guidelines except that the maximum super elevation rate of 0.04 shall be used. If terrain dictates sharp curvature, a maximum super elevation of 0.06 is justified if the curve is long enough to provide an adequate super elevation transition.
3. On local streets, requests for design speeds less than 25 miles per hour shall be based on topography, right of way, or geographic conditions which impose an economic hardship on the applicant. Requests must show that a reduction in center line radius will not compromise safety. There will be posting requirements associated with designs below 25 miles per hour.
4. Off-set crown cross-sections are not acceptable as super elevation sections.
5. Super elevation transitions shall be designed to not allow concentrations of storm water to flow over the travel lanes.

3.11 Vertical Alignment

Vertical street alignments shall meet the following requirements:

- A. Minimum tangent street gradients shall be one-half (0.5) percent along the crown and curb.
- B. Maximum street gradients shall be fifteen (15) percent for residential streets, and ten (10) percent for all other streets.
- C. Local streets intersecting with a collector or greater functional classification street or streets intended to be posted with a stop sign shall provide a landing averaging five (5) percent or

less. Landings are that portion of the street within twenty (20) feet of the projected curb line of the intersecting street at full improvement.

- D. Grade changes of more than one (1) percent shall be accomplished with vertical curves.
- E. At street intersections, the crown of the higher classification street shall continue through the intersection. The roadway section of the minor street will flatten to match the longitudinal grade of the major street at the projected curb line.
- F. Street grades, intersections, and super elevation transitions shall be designed to not allow concentrations of storm water to flow across the travel lanes.
- G. Off-set crowns shall be allowed only with the specific prior approval of the City Engineer.
- H. Slope easements shall be dedicated or obtained for the purposes of grading outside of the right-of-way.
- I. Streets intersected by streets not constructed to full urban standards shall be designed to match both present and future (as much as practicable) vertical alignments of the intersecting street. The requirements of this manual shall be met for both present and future conditions.
- J. When new streets are built adjacent to or crossing drainage ways, the following standards shall govern the vertical alignment:

Functional Classification	Vertical Standard
Arterial Streets	Travel lanes at or above the 50 year flood elevation but not lower than 6 inches below the 100 year flood elevation
All other streets	Travel lanes at or above the 25 year flood elevation but not lower than 6 inches below the 50 year flood elevation

- K. Crest and sag vertical curves shall conform to the values found in Tables 2.10A and 2.10B. At controlled intersections, the K-value for crest vertical curves may be reduced, if approved by the City Engineer.

Table 2.10A
Design Controls for Crest Vertical Curves
Based on Stopping Sight Distance

Design Speed	Minimum k
25	12
30	19
35	29
40	44

$$k = L/A$$

L = Length of Vertical Curve (ft.)

A = Algebraic Difference In Grades (percent)

Table 2.10B
Design Controls for Sag Vertical Curves
Based on Stopping Sight Distance

Design Speed	Minimum k
25	26
30	37
35	49
40	64

AASHTO provides the designer of sag vertical curves the option of using shorter curves with the installation of street lighting. These "comfort" designs can also be slightly modified by providing a one (1) percent grade break at each end of the curve. Table 2.10C compares sag curve lengths using these criteria.

Table 2.10C - Design Controls for Lighted Sag Vertical Curves
25 Miles per Hour

Algebraic Difference in Grades	Standard (k)	Comfort (k)	Comfort with Grade Breaks (k)
5.00%	26	13.4	8
7.50%	26	13.4	9.9
12.50%	26	13.4	11.3
17.50%	26	13.4	11.9

At the intersection of a local street with another local street or a minor collector street, a minimum design speed of 15 MPH is allowed on the intersecting street. Minimum k factors for lighted sag curves are shown in Table 2.10D.

Table 2.10D - Design Controls for Lighted Sag Vertical Curves
15 Miles per Hour

Algebraic Difference in Grades	Comfort (k)	Comfort with Grade Breaks (k)
5.00%	4.8	3
7.50%	4.8	3.6
12.50%	4.8	4.1
17.50%	4.9	4.3

3.12 Transitions

- A. Street width transitions from a narrower width to a wider width shall be designed with a minimum 3 to 1 taper. Delineators, as approved by the City Engineer, shall be installed to define the configuration.
- B. For street width transitions from a wider width to a narrower width, the length of transition taper shall be determined as follows:

$$L = S \times W \text{ (for } S = 45 \text{ MPH or more)}$$

$$L = \frac{W \times S^2}{60} \text{ (for } S = \text{less than 45)}$$

Where L = minimum length of taper (feet)

S = Design speed (MPH)

W = EP to EP offset width

- C. Delineators shall be installed to define the configuration. Maximum spacing of delineators shall be the numerical value of the design speed, in feet (i.e. 35- foot spacing for 35 MPH).
- D. In situations where a tapered transition cannot be provided, a barricade shall be installed at the end of the wider section of the street and a taper shall be appointed and delineated as approved by the City Engineer. The barricade shall conform to WSDOT Type III. If the wider section does not provide an additional travel lane, only a barricade without the transition is required.

3.13 Street Frontage Improvements

All residential subdivisions, commercial developments and short plats shall install street frontage improvements at the time of development as detailed in their subdivision or short plat approval, as detailed in their approved engineering plans, or as directed by the City Engineer. Such improvements shall commence from the centerline of the right-of-way and shall include: sawcut and replacement of existing pavement and road section to the centerline of the traveled way or the centerline of right-of-way; curb and gutter; sidewalk; street storm drainage; street lighting system; traffic signal modification, relocation or installation; utility relocation and undergrounding; landscaping and irrigation; and street widening all per these Standards.

Any modification to the requirement for half-street improvements must be approved by the City Engineer before preliminary land use approval with the approved modification to be set forth in a "Condition of Approval" for the specific project.

If the existing pavement in the remaining half street opposite the project frontage is found to be in substandard condition as determined by a geotechnical engineer for the traffic generated by the project, and/or if any additional longitudinal utilities are to be installed with the frontage improvements within the existing paved width opposite the project frontage, an additional grind and overlay may also be required over the that half of the street for the extent of the frontage improvements as determined by the City Engineer. All pavements damaged during construction shall be repaired to pre-construction conditions or better.

Plan Preparation shall be as specified in Chapter 1 of these Standards.

Street Frontage design shall incorporate all applicable sections of these Standards and other standard reference materials. The designer shall utilize good engineering practice in any situation not specified in these Standards.

3.14 Street Ends

- A. Cul-de-sacs shall be provided at all public and private street ends.
- B. Cul-de-sac lengths shall be measured from the face of curb of the intersecting street to the center of the turnaround.
- C. Hammerheads may be used in lieu of a cul-de-sac provided that the street serves six (6) or less lots and the street is less than two hundred feet (200') in length. Hammerheads shall be constructed in accordance with Standard Detail S17.
- D. Temporary Dead Ends.

Where a street is temporarily dead ended, turnaround provisions must be provided where the road serves more than four lots or is longer than 200 feet in length. The turnaround may be a hammerhead in accordance with Standard Detail S17 if the dead end is less than two-hundred feet (200') in length. If over two-hundred feet (200') long, a cul-de-sac with a minimum radius of forty-one feet (41') is required. All temporary turnarounds shall have an asphalt pavement surface.

In the event a temporary turnaround is installed on a street that will be extended in the future, the party responsible for extending the road shall also be responsible for removing the temporary turnaround and installing all necessary curbing, sidewalk, landscaping, etc. within the removal area to meet current City standards.

E. Design Requirements.

1. Cul-de-sacs shall have a minimum outside curb radius forty-eight (48) feet for all streets.
2. Cul-de-sacs, eyebrows, and turnaround areas shall be allowed only on local and commercial/industrial streets.
3. Cul-de-sacs shall not be more than six-hundred (600) feet in length unless serving a topographically isolated area (such as a narrow ridge).
4. The minimum curb radius for transitions into cul-de-sac bulbs shall be twenty-five (25) feet.
5. The right-of-way radius for the cul-de-sac shall be sufficient to maintain the same right-of-way to curb spacing as in the adjacent portion of the road.
6. An eyebrow corner may be used on a local street where expected ADT will not exceed 500 vehicles per day or as otherwise approved by the City Engineer. The minimum curb radius on the outside of an eyebrow corner is 36 feet; minimum right-of-way radius is 45 feet. Eyebrow geometry shall be evaluated on the basis of turning requirements for Fire Department vehicles.
7. The turnaround shall be posted and painted "Fire Lane - No Parking".

3.15 Medians

- A. A median shall be in addition to, not part of, the specified roadway width. Medians shall be designed so as not to limit turning radius or sight distance at intersections.
- B. Where raised medians are allowed, the following criteria must be met:
 1. Edges shall be vertical curb.
 2. Landscaping and irrigation are required. Plans shall be prepared by a Landscape Architect.
 3. Pedestrian refuges shall be provided where crosswalks intersect medians.
 4. Pedestrian crossing flashing beacons shall be at the discretion of the City Engineer. When approved or required, the flashing beacon shall be:
 - a) Rectangular Rapid Flashing Beacon (RRFB);
 - b) Internally Illuminated Flashing Beacon; or
 - c) In high traffic, high speed situations, Pedestrian Hybrid Beacon.
 5. Raised medians shall be designed so as not to limit turning radius or sight distance at intersections.
 - a) The raised median shall be set back at least 1 foot from the median lane on both sides.

- b) Street lighting shall be sufficient to provide illumination of the raised median.
- c) Objects, such as trees, shrubs, signs, and light poles shall not physically or visually interfere with traffic control devices, vehicular traffic or pedestrian traffic in the travel way.
- d) The style and design of the raised median shall be site specific. The raised median shall be safe for the design speed, and shall be subject to City approval.

3.16 Intersections and Curb Returns

- A. Traffic control will be as specified in the MUTCD or as modified by the City Engineer as a result of appropriate traffic engineering studies.
- B. Traffic signal modification, relocation or installation is required when roadway or driveway geometrics interfere with existing signal facilities, or would result in an unsignalized approach or intersection that meets signal warrants.
- C. Angle between intersections. The interior angle at intersecting streets shall be kept as near to 90 degrees as practical and in no case shall it be less than 75 degrees. A tangent section shall be carried a minimum of 25 feet each side of intersecting right-of-way lines.
- D. Minimum centerline offset to adjacent streets.
 - 1. Local access - 160 feet
 - 2. Collectors or Arterials - 300 feet
- E. Sloping approaches. On sloping approaches, including commercial driveways, garage entrances, and private street openings, landings are not to exceed two (2) feet difference in elevation for a distance of thirty (30) feet approaching an arterial or twenty (20) feet approaching a local collector or industrial or commercial street, measured from the back of sidewalk or the back of curb if no sidewalk exists.
- F. Curb returns. Curb radii at intersections shall be in accordance with Table 2.15A for the various functional classifications. The right-of-way radii at intersections shall be sufficient to include the entire sidewalk and ramp within the public right-of-way and shall have a minimum radii of 20-feet.

Table 2.15A
Turning Return Radii (Feet)
Edge of Pavement/Curb -Minimums

Street Classification	Principal Arterial	Major Collector	Minor Collector	Local
Principal Arterial Street	55	40	30	25
Major Collector Street	40	30	30	25
Minor Collector Street	30	30	25	25
Local Street	25	25	25	20

- * If bike lane or on-street parking exists, above radii may be reduced by five (5) feet.
- * The radii of the major street will be used for all intersection curb returns.

3.17 Sight Obstruction Requirements

- A. Sight distance should be maintained at all driveways, building or garage entrances where structures, wing walls, etc. are located adjacent to or in close proximity to a pedestrian walkway.
- B. Sight lines to traffic control devices (signs, signals, etc.) should not be obscured by landscaping, street furniture, marquees, awnings or other obstructions. Refer to the MUTCD for required sightlines.
- C. Sight Distance. It is the policy of the City to have the developer's engineer evaluate safe sight distance using the principles and methods recommended by AASHTO. The following minimum standards shall apply.

Table 2.16A - Intersection and Driveway Sight Distance

Design Speed (MPH)	Minimum Sight Distance (Feet)
20	225
30	335
40	445

Notes:

- 1. The sight distances in table 2.16A assume a stopped passenger car turning left onto a two lane road with no median and grades of 3-percent or less. For other conditions, the time gap must be adjusted.
- 2. Sight distance shall be measured from a driver's eye height of 3.5 feet and 15 feet from the near edge of the nearest lane, to an object height of 3.5 feet.
- 3. Stopping sight distances must also be checked on the actual vertical and horizontal values of the proposed improvement.
- 4. There shall be nothing to block observation of objects between the driver's eye height of 3.5 feet and an object height of 2.0 feet above grade in both directions. The only exceptions should be for luminaire or utility poles, conforming traffic control devices, and fire hydrants.
- 5. Cumulative effects must be considered, and all efforts taken to minimize sight obstructions.

3.18 Curbs - Types and Application

- A. Curb and gutter shall be utilized on all streets. Vertical curb may be used instead of curb and gutter and on islands and medians.
- B. The following specifies the requirements for curbs for streets:
 - 1. All streets shall include curbs on both sides, except in the situations of interim width improvements. Interim designs, where approved in writing by the City Engineer, shall have shoulders and ditches.
 - 2. Interim width streets shall have 2-foot side shoulders adjacent to the street at a 2 percent cross-slope and roadside ditches with a maximum side-slope of 2 horizontal to 1 vertical. The 2-foot shoulder area may consist of a section of pavement and/or a section of crushed rock. The pavement section shall be a minimum of 2 feet wide and a maximum of 6 feet wide.

3.19 Grading Outside of Improved Areas

- A. Arterials shall have a maximum 2 percent upward grading to the right-of-way line, and no steeper than 3:1 horizontal to vertical outside the public right-of-way.
- B. Local and Collector Street functional classifications shall have a maximum 2 percent upward grading to the right-of-way line, no steeper than 5:1 horizontal to vertical within the public utility easement, and no steeper than 2:1 horizontal to vertical outside the public utility easement.
- C. Retaining walls shall be used if slopes are greater than provided in the paragraphs above or where slope stability is a problem.
- D. If slopes are to be maintained (mowed) by the City, a maximum of 4:1 slope shall be provided.

3.20 Survey Monuments

As a minimum standard for monumenting City right of ways, survey monuments shall be located at each street intersection; intersection points of the extension of the project perimeter boundary lines and the centerline of frontage streets; right of way PC, PT, and bends; and all property line intersections including the perimeter boundary lines of all subdivisions and short plats. Additional monumentation may be required by the City Engineer.

3.21 Concrete Sidewalks

Cement concrete sidewalks shall be provided on both sides of the street, with the following exceptions:

A. Exceptions

Sidewalk(s) may be omitted under the following conditions if approved by the City Engineer:

- 1. For permanent dead-end local streets less than 300 feet in length and for private roads serving more than four lots, a sidewalk may be omitted from one side of the street.
- 2. Where development design provides an acceptable surfaced and maintained internal walkway system, as determined by the City Engineer, sidewalk(s) may not be required adjacent to the street.
- 3. Alleys do not require sidewalks.
- 4. Where roadways abut sensitive lands, the sidewalk may be omitted from one side of the street, provided that an alternative pedestrian route acceptable to the City Engineer is provided.
- 5. Asphalt sidewalks may be allowed in lieu of cement concrete sidewalks where the sidewalk is deemed to be of a temporary nature (such as during construction activities) or due to future construction considerations

B. Width

- 1. As specified in Table 2.03A
- 2. The width of sidewalk does not include the curb.
- 3. Meandering sidewalks shall maintain the full design width around obstructions that cannot be relocated. Additional Right-of-Way (or easement) may be required to either relocate the obstruction or meander the sidewalk.
- 4. Sidewalk widening behind a mailbox or other obstruction, if required for the minimum ADA clearance, shall be no less than five (5) feet long with a ten to one (10:1) taper to the

standard sidewalk section.

C. Material

All permanent sidewalks shall be cement concrete and shall be constructed in accordance with the Standard Plans..

D. Depth

Sidewalks shall be thickened at driveways.

E. Landscape/Separation

Where planter strips are provided or required, the back of sidewalk should be placed 6-inches from the right-of-way line, unless approved by the City Engineer. Meandering sidewalks may be allowed where they provide an attractive planned alternative to straight sidewalks. A minimum three (3) foot separation between the back of the curb and sidewalk is required for landscaping and appurtenance locating purposes unless no practicable alternative exists and when approved by the Engineer. Sidewalks shall meander no more than six (6) feet from the curb at all pedestrian crossings and at driveways.

The Planning Commission has the authority to control the design of sidewalks with respect to their connection directly to a curb or require a separation for a landscape strip.

F. Curb Ramps

1. In accordance with State law, curb ramps meeting current ADA requirements shall be provided at all pedestrian crossings with curb sections. The edge of the sidewalk shall merge into curb ramps. One ramp is to be used on each curb return on residential streets and uncontrolled intersections. At controlled intersections, a curb ramp shall be aligned with each crosswalk.
2. All curb ramps at curb returns and ramps connecting to public facilities shall be individually detailed. Details shall include ramp lengths, widths, elevations, grade breaks and surface slopes so as to indicate how the ramp is to be constructed in order to comply with ADA requirements.

G. Defective Sidewalks

All construction, repair, upkeep, reconstruction and maintenance of sidewalks and curbs is the responsibility of the abutting property owner.

All sidewalks shall be maintained in a level, nonhazardous condition. Sidewalks shall be deemed to be "defective" and require repair when deficiencies are identified which include:

1. Improper placement
2. Placement of sidewalk on unstable areas of uncompacted soil
3. Tree roots raising sidewalk panels leading to jagged and uneven surfaces exceeding ADA allowances
4. Wear and tear having led to cracks and holes in the sidewalk

3.22 Trails

A. Multi-Use Trails

1. Trail widths shall be as follows:
 - a) Type 1 trail 10-12 feet

- b) Type 2 trail 8-10 feet
 - c) Type 3 trail 6-8 feet
 - 2. Materials shall be per the requirements of Section 2.32 Surfacing Requirements.
 - 3. Multi-use trails shall be a minimum of four (4) feet from the edge of the vehicular travel way unless no practicable alternative exists and when approved by the Engineer.
 - 4. Maximum grade is 15%. Minimum curve radius is ten feet (10').
 - 5. Type II barricades shall be provided at the end of trail sections.
 - 6. Trails may be used as a substitute for concrete sidewalks or bike lanes in planned unit developments where the City Engineer deems that non-motorized transportation goals of the City are being met.
- B. Off-Road Trails

All City Trail Systems are to meet the multi-use standards above as reasonably possible. For Trail Systems that cannot meet the multi-use standards above, as determined by the City Engineer, the minimum standards for the design and construction shall generally follow as a practical guide for trail work the 2007 Edition of the "Trail Construction and Maintenance Notebook" and the 2007 Edition of the "Wetland Trail Design and Construction", Forest Service Publication List Document Numbers 0723-2806-MTDC and 0123-2833-MTDC respectively. These guides can be located on the Federal Highway Administration (FHWA) website at:

http://www.fhwa.dot.gov/environment/recreational_trails/publications/fs_publications/index.cfm

3.23 Bikeways/Bike Lanes

- A. Bikeway construction is required in conjunction with commercial development, plat or short plat approval, when the need for such a bikeway is established by the Community Development Director.
- B. Separated bikeways (bicycles only) shall be a minimum of five (5) feet wide for one way and ten (10) feet wide for two (2) way flow. Separated bikeways combined with pedestrian facilities shall be a minimum of ten (10) feet wide.
- C. Where joint vehicular and bicycle facilities (bike lanes) are constructed, the curb lane shall be fourteen (14) feet wide.
- D. Surfacing requirements for separated bikeways shall be as specified in Section 2.32.
- E. Maximum grade for separated bikeways shall be ten percent (10%). Minimum curve radius is 100 feet. Curves should be minimized.
- F. Bump outs. A "bump out" at street intersections per Standard Drawings shall be installed on all routes with bike lanes using the following criteria:
 - 1. Two-lane roadway - not applicable.
 - 2. Three-lane roadway - "bump out" at all signalized intersections only.
 - 3. Four- to five-lane roadway - "bump out" at all signalized intersections and at major side street intersections where the right turn volume onto the minor street exceeds 600 ADT.

3.24 Driveways

A. General Requirements

1. Standard residential or commercial driveways shall be required for all developments.
2. In new residential subdivisions or residential short subdivisions, panhandle and flag lot driveways shall be less than 150 feet in length and shall provide access to no more than two (2) lots. Private road standards shall be used for access to more than two lots.
3. Only one driveway access per residential lot shall be allowed unless approved by the City Engineer.
4. A private intersection opening shall be used in lieu of a conventional driveway in commercial areas where the following criteria are met:
 - a) Projected driveway usage is greater than two-thousand (2,000) vehicles per day.
 - b) In any case where traffic signalization is approved and provided.
 - c) A minimum 100 feet storage area is provided between the street and any turning or parking maneuvers within the development.
 - d) The opening is at least 150 feet from any other intersection opening.
 - e) The opening is at least 150 feet away from any other driveway on the property frontage under control of the applicant.
 - f) Easement dedication is provided for traffic control devices.
5. Along unimproved frontages with roadside ditches, new driveway approach construction shall include a minimum 30' length of culvert installation, size as required, minimum 8-inch diameter.

B. Conditions of Approval

1. Driveways giving access onto any roadway may be denied, if in the opinion of the City Engineer, they create a potentially unsafe or hazardous condition. Driveways accessing directly onto arterials or collectors may be denied if alternate access is available.
2. All abandoned driveways on the street frontage shall be removed and curb, gutter, and sidewalk shall be installed.
3. No commercial driveway shall be approved where backing onto the sidewalk or street will occur.
4. Left turns from and to a driveway may be restricted as a development condition or in the future if such maneuvers are found by the City Engineer to be unduly hazardous.
5. Driveways onto arterials and collectors shall be aligned wherever possible with existing driveways on the opposite side of the street. If driveways cannot be aligned directly across from a driveway on the opposite side of the street, they shall be offset a minimum of 100 feet from driveways on the opposite side of the street whenever possible.
6. All driveways shall be angled ninety-degrees (90°) to the street, unless designated as right turn only with the approval of the City Engineer.
7. A shared driveway serving 2 lots will be approved subject to compliance with the width and surfacing criteria and the recording of a roadway maintenance agreement.
8. Parking lot circulation needs shall be met on site. The public right-of-way shall not be utilized as part of a one-way parking lot flow.

9. Driveways providing access onto collectors shall be a minimum of 100 feet from any intersection, and a minimum of 150 feet for access onto arterials. All distances shall be measured from the centerline of the street or driveway.
10. Driveway modification requests will be reviewed under the Design Modification Process in Section 1.17 except for the following, which can be reviewed through a written request to the City Engineer, prior to construction:
 - a) Where two or more parcels or tax lots have been previously combined into a single lot.
 - b) Requests for circular driveways (one way in and out) where lot configuration, topography or other site conditions affect the ability to build one driveway.
 - c) All requests for driveway modifications in residential zoning will be reviewed for conformance to applicable Codes, Covenants and Restrictions (CC&R's) for the residential location.

C. Design Criteria

1. Width.

- a. Residential driveways shall be a minimum width of 10 feet and a maximum width of 24 feet. Panhandle or flag lots shall have a minimum width of 12 feet.
- b. For residential lots more than 75 feet wide, driveways may be up to 30 feet in width. Driveways shall be located to provide adequate curb space between driveways for on-street parking, location of water meters, landscaping, and streetlights.
- c. For residential driveways for lots less than 75'-wide the City Engineer may approve a driveway width up to 30' wide provided there is adequate curb space between driveways for on-street parking, location of water meters, landscaping, and streetlights.
- d. Residential duplex and triplex driveways shall be a maximum of 24 feet for a single driveway or a maximum of twelve feet for separate driveways, provided the driveways are spaced at least 20 feet apart.
- e. Commercial and industrial driveways shall be a minimum width of twenty-four (24) and a maximum width of thirty-five (35) feet. A turning diagram shall be provided with all commercial and industrial driveway submittals showing adequate driveway turning width for the largest vehicle. A wider commercial or industrial driveway width may be approved by the City Engineer where a substantial percentage of oversized vehicle traffic exists. In this case the driveway should be sized to accommodate the largest vehicles. Where intersection openings are approved the width shall be as determined by the Director.

2. Clearance from structures. No object (including fire hydrants, light or power poles, street trees) shall be placed or allowed to remain within 15 feet of the driveway edge.

Where the building facade or other design element is less than ten (10) feet behind the sidewalk, both pedestrian and vehicular sight distance shall be maintained. Vehicular sight distance shall be per Section 2.17.

3. Pedestrian Sight Distance. For sight distance to pedestrians on sidewalks, the driver of an exiting vehicle shall be able to view a one (1) foot high object fifteen (15) feet away from either edge of the driveway throat when the driver's eye is fourteen (14) feet behind the

back of the sidewalk.

4. Driveways shall be designed with a maximum slope of 15%. Grade changes of more than two percent (2%) shall be accomplished with a vertical curve, with the minimum length of the vertical curve being equal to the algebraic difference in grade.
5. Approach grades and configuration shall accommodate future street widening to prevent major driveway reconstruction.
6. Surfacing. All portions of a driveway within a public right-of-way and within 30' of a public right-of-way shall be surfaced with cement concrete or asphaltic concrete.

3.25 Bridges

- A. A bridge shall be defined as a structure spanning twenty (20) feet or more.
- B. Design Principles. All bridges, whether on public or private roadways, shall meet the minimum requirements set forth in the latest addition of "Standard Specifications for Highway Bridges", adopted by AASHTO. All new bridges shall be designed to carry an AASHTO HS-20-44 live load or greater.
- C. Geometrics. In the general case, the bridge shall comprise the full width and configuration of the road being served (traveled way plus curb, sidewalk, walkway, bike lane, and/or shoulder on one or both sides). Provision of utilities shall be considered. Traffic and pedestrian railings or combination traffic-pedestrian railings shall meet AASHTO specifications. Overhead vertical clearances on the traveled street or under overpasses shall be sixteen and one-half (16.5) feet minimum.

3.26 Landscaping in the Right-Of-Way, Easements and Access Tracts

- A. Plantings established in the right-of-way shall be maintained by the abutting property owner.
- B. Any existing planting areas within the right-of-way that are disturbed by construction activity shall be restored to their original condition.
- C. Any plantings or other improvements placed within the right-of-way (by abutting property owners) are subject to removal when the right-of-way is needed for public use. The property owner is responsible for removing any landscaping or other improvements upon official notice. The property owners shall be responsible for survival of the relocated plantings.
- D. Measures shall be taken by the developer to provide groundcover in areas within the right-of-way which have been stripped of natural vegetation or have a potential for erosion. Native plants shall be used whenever possible.
- E. Plantings within the right-of-way shall comply with the following provisions:
 1. All landscaping shall comply with the sight distance provisions of these standards.
 2. Where existing landscaping maintained by the City exists every effort shall be taken to protect and preserve the existing vegetation during construction. Plants shall be relocated or removed only upon approval of the Public Works Department. Damaged landscape areas shall be restored prior to issuing a final occupancy permit.
 3. In areas where an existing landscaping concept or pattern has been established or approved, all new landscaping shall conform to the intent of the concept. Plantings shall be of a similar variety, size, and spacing to those already established and/or approved for the area.
 4. All trees planted in areas with adjacent pedestrian usage shall maintain a seven (7) foot clearance to the lowest branches.

5. No low growing vegetation is to extend beyond the curb. Trees must have no limbs or other vegetation extending beyond the curb line or edge of asphalt for a distance of seven and one half (7 1/2) feet above the road surface.
 6. Approval from the Public Works Department must be received before trees are planted in or adjacent to sidewalk sections.
 7. Landscaping in public right of way with low maintenance, drought tolerant ground cover is encouraged.
- F. Street trees shall be selected from the City's approved tree. If overhead utilities are present, street trees shall be selected to avoid interference.
 - G. Street trees shall provide a minimum of 10-ft of separation from water meters. This standard shall also apply to onsite improvements.
 - H. Street trees shall have root barriers installed adjacent to the curb and sidewalk.
 - I. Street trees shall not obstruct visibility of intersections, signs, or other critical roadside elements. The following are minimum clearances that shall be met:
 1. 20-ft from the front of stop and street name signs.
 2. 20-ft from the front and 5-ft from the back of other directional, traffic control or safety signs, such as yield, pedestrian crossing, school, speed limit, etc.
 3. 15-ft from street lights for narrow-growing tree species. Otherwise, 25-ft from street lights.
 4. 25-ft from traffic signals.

3.27 Mailboxes

- A. Mailboxes shall be placed as shown in the City's Standard Detail.
- B. Mailboxes should be clustered together when practical and when reasonably convenient to the houses served.
- C. In the case of road construction or reconstruction requiring mailboxes to be moved or rearranged, mailbox locations shall be coordinated with the Postmaster. Mailbox locations approved by the Post Office shall be shown on approved road construction plans.

3.28 Street Illumination

Streetlighting is required for all public streets and at the intersections of public and private streets. Streetlighting designs shall be submitted, reviewed, and approved by the Skamania County Public Utility District (PUD) prior to final plat approval. The installation cost of all street lighting shall be paid for by the Developer.

Luminaires shall be located two and one half (2.5) feet from face of curb to the face of the light pole.

A. Plats and Short Plats

The City will accept maintenance and power cost responsibility for the public streetlight system when public improvements have been fully accepted by the City and the subdivision final plat has been recorded. Prior to City acceptance the developer is responsible for the maintenance and energy charges for the streetlighting system.

Streetlighting is not required on private streets within a plat. The City does not install or

maintain private street lighting systems. On private streets, all streetlighting and power costs shall be paid by the developer, homeowner, or homeowners association.

B. Commercial

Street lighting is required on all public street frontages. The developer is responsible for design, installation or relocation of new or existing lighting. Commercial development shall replace existing lighting systems on power poles with a new lighting system serviced by underground power.

C. General Considerations

If a resident or group of residents desires the installation of a streetlight they must contact the Skamania County Public Utility District.

Streetlight designs shall be prepared by a licensed engineer experienced in lighting design. The design plans and calculations should indicate luminaire type, conductor and conduit sizes, foundation design, luminaire locations, illumination levels, uniformity ratio, line losses, and the electrical and physical layout of the system, including its connection to the existing system.

Streetlights shall be "night sky friendly" and shall be provided with a shield to minimize stray light. Luminaires shall be accessible for maintenance by a wheeled vehicle weighing twenty thousand pounds (20,000 lbs.).

Electrical conductors shall be located underground. Exception: existing residential areas with existing above ground utilities may have street lighting installed on the existing utility poles as approved by the City Engineer.

Streetlights shall be on 120 volt single phase systems. The location of the power source should be indicated together with the remaining capacity of that circuit. System continuity and extension should be considered.

Electrical cabinets equipped with electrical meters, time clocks, circuit breakers and other required components are required on commercial installations of five (5) or more streetlights.

All metered streetlights shall have a metered main on a stand-alone galvanized steel frame with an outside disconnect attached to the meter, in accordance with the Stand-Alone Meter Post detail provided in the PUD's New & Altered Service Handbook.

D. Approved Street Lighting Fixtures and Poles

All lighting projects shall use the products listed below or an approved equal. Contact the City Engineer to request approval for products not listed below (approved equal) or for a list of approved equals. Part numbers listed for fixtures and poles are based on current catalogs, which are subject to change by manufacturers at any time. The developer shall be responsible to verify part numbers with the appropriate vendors to ensure the correct lighting, poles, colors, and mounting hardware are received. Streetlight requirements including type, wattage, and pole height will be established by City of Ridgefield staff.

All lighting to meet current version of ANSI C136.15 for Field Wattage Identification and must have a label attached from an OSHA accredited Nationally Recognized Testing Lab. All light fixtures shall be warrantied for 5 years from the date of installation. All light poles shall be warrantied for 1 year from the date of installation.

1. Local Streets

For local streets, including new subdivisions and short plats, all streetlights shall be decorative acorn single fixtures on cast aluminum decorative poles. The luminaire shall be

LED in 3000K with minimum output of 5000 lumens. Optic shall meet Municipal Code requirements. Fixture shall be DLC listed.

The light fixtures shall be the following or approved equivalent:

Name: Holophane AWDE3 Acrylic Washington Postilite Utility LED3 Performance Package: 5,884 Lumens, 40 Watts, 147 LPW

Description: Acrylic Washington Postilite Utility LED3 Fixture, P20 Performance Package, 3000K CCT, Auto-Sensing 120-277V 50/60HZ, Modern Style Swing Open Design, Acrylic Type III, Black Housing, Full Cover with Medallions and Band, Cross Finial, Dimming Photocontrol Receptacle - 7 PIN, Field Adjustable Output, Long Life DTL Twistlock Photocontrol for Solid State, MVOLT. Custom Vertical Slotted Band and Cross Finial Painted Gold, Medallions and Full Cover Painted Black.

The light poles shall be the following or approved equivalent:

Name: Holophane WDA Wadsworth Aluminum Pole

Description: WDA Wadsworth Aluminum Pole, 14 Feet Height, 4" Diameter Fluted, .125 Wall, 17" Base, Diamon Pattern Bolt Circle, 3X3 Tenon, Black Finish, 3/4" Anchor Bolt Set Galvanized Steel.

Pole foundations shall be per WSDOT Standard Plan J-28.30-04, or shall be designed by a licensed structural engineer for site specific conditions.

2. Roundabouts, Collectors and Arterials

For roundabouts, collectors and arterials, all streetlights shall be cobra head fixtures on aluminum poles. The luminaire shall be LED 4000K with a minimum output of 9450 lumens. Fixture shall be DLC listed.

The light fixtures shall be the following or approved equivalent:

Name: American Electric Lighting Autobahn Series ATB0 Roadway Lighting Performance Package: 10,260 Lumens, 70 Watts, 148 LPW

Description: Autobahn LED Roadway Series Fixture, P203 Performance Package, Multi-volt 120V-277V, Roadway Type III Optics, 4000K CCT, Black Paint, Nema Label, 7 Pin Photocontrol Receptacle, Field Adjustable Output, Solid State Long Life Photocontrol.

The light poles shall be the following or approved equivalent:

Name: HAPCO Arlen Style Special 34' Light Pole

Description: B86264-P1 with textured black finish, 20" diameter base with 22" base height. ASTM F1554 Grade 55 x 42" length all thread rod anchor bolts.

Pole foundations shall be per WSDOT Standard Plan J-28.30-04, or shall be designed by a licensed structural engineer for site specific conditions.

3.29 Traffic Control and Signing

- A. Traffic Control Devices. All traffic control devices shall conform to the "Manual on Uniform Traffic Control Devices" (MUTCD) and be approved by the City Engineer.
- B. Signing. In new plats the developer shall install all traffic control signs which shall include but not be limited to street name, parking, stop, dead end, and pedestrian signing. Signs shall be located two and one half (2.5) feet from face of curb.
- C. Pavement Marking. In new plats and commercial developments pavement markings,

including buttons, paint, thermoplastics and delineators will be required for roadway safety. Such markings shall be provided and installed by the developer.

D. Design Requirements

1. Traffic Control Devices. All traffic control devices shall conform to the "Manual on Uniform Traffic Control Devices" (MUTCD) as adopted by the Washington State Department of Transportation (WDOT).
2. Signing. See WDOT Standard Drawings for typical installations and details.
3. Pavement Marking. All markings shall conform to the current "Manual on Uniform Traffic Control Devices" (MUTCD) as adopted by the Washington State Department of Transportation (WDOT).
4. Temporary Traffic Control. All traffic control devices shall conform to the "Manual on Uniform Traffic Control Devices" (MUTCD) as adopted by the Washington State Department of Transportation (WDOT) or as modified by the City Engineer.
5. Speed Humps. Speed humps are approximately three inches (3") in height with a length of at least twelve feet (12') at base. See City of Ridgefield Standard Detail T-3.2.
6. Traffic Signal Modification. The developer's engineer shall use the standard specifications developed by the City Engineer in conjunction with the current edition of the WSDOT Standard Plans. Traffic Signal plans shall be submitted on 22" x 34" mylar.
7. Amenity, destination, and directional signage shall be designed and installed as identified in the Stevenson Wayfinding Master Plan, as amended.

3.30 Clear Zone and Appurtenances

An appurtenance shall be considered to be any fixed object located adjacent to the roadway and deemed to be a possible safety hazard.

- A. All non-breakaway appurtenances shall be located a minimum of three (3) feet behind the face of the curb to the face of the object. Where no curb exists the distance from the edge of the travel way to the face of the object shall be at least six (6) feet.
- B. All breakaway objects shall be located a minimum of two (2) feet behind the face of curb to the face of the object. All objects having properties up to that of a 4" x 4" wooden post shall be considered breakaway.
- C. Appurtenances shall be located outside of the sidewalk area except when the sidewalk is widened around the appurtenance to the satisfaction of the City Engineer.

3.31 Franchise Utilities

- A. Non-City owned franchise utilities located within City-owned right-of-way or easements are required to relocate their existing facilities at their own expense when a conflict results between their facilities and public street improvements, provided relocation of a utility's existing facilities are necessary for the City project to be completed and the public street improvement is a City project, not a project for a developer, person or other entity.
- B. All non-City owned franchise utility distribution or collection systems including power, telephone, natural gas, and T.V. cable in new plats or short plats shall be installed underground and shall be installed prior to paving, provided it is technically and financially feasible to do so, as determined by the City Engineer and PUD General Manager.

- C. If more than one non-City owned franchise utility is required to be relocated, each utility shall be financially responsible for only its proportionate share of the relocation cost.
- D. Non-City Owned franchise utility shall not be required to move its facilities at its own expense more than once every 5 years unless an emergency or unforeseen circumstances, such as a natural disaster, makes it clear that the required facility relocation cannot be avoided.

3.32 As a minimum on all new single-family plats and short plats, a minimum five (5) foot wide common or individual non-exclusive utility easement shall be provided connecting any lots without public street frontage to a public street. Easements for existing or future utility lines which do not lie along rear or side lot lines shall be of a width specified by the serving utility.

- Safety Railing**
 - A. Where a sidewalk or other non-motorized transportation facility is to be constructed above a slope or adjacent to a rock wall or retaining wall where the lowest finished elevation of the slope, rock wall or retaining wall is to be thirty (30) inches or more below the finished elevation of the sidewalk or other facility, a safety railing shall be required when:
 1. The plane of a wall face is less than four (4) feet in horizontal distance from the near side face of the sidewalk or other facility.
 2. The plane of the wall face is greater than four (4) feet horizontal distance to the near side face of the sidewalk or other facility but the slope down to the wall top exceeds three to one (3H:1V).
 3. The slopes adjacent to the sidewalk or other facility average greater than two to one (2H:1V).
 - B. Safety railings or other approved devices (such as walls, high curbs, landscape features or guard rails) shall be required where grading operations will produce a parking area, service yard or other vehicle area which has a drop-off grade separation in relation to adjoining properties or streets.
 - C. Safety railings shall be constructed of 2-inch galvanized steel pipe or aluminum with vertical supports ten (10) feet on center and 3 horizontal railings fourteen (14) inches on center, the lowest railing center being fourteen (14) inches above finished grade. All joints shall be welded, cold galvanized if welded after galvanizing, and the entire safety railing painted or vinyl coated to assure corrosion protection and a pleasing appearance. Railings shall be erected and adjusted, if necessary, after initially set to assure a continuous line and grade.

3.33 Guard Rails

For purposes of warrants, design, and location, all guard rails along roadways shall conform to the criteria of the WSDOT Design Manual as may be amended or revised. The decision of whether to install a guardrail or not shall be based on information found in AASHTO publication, Guide for Selecting, Locating, and Designing Traffic Barriers.

3.34 Surfacing Requirements

All materials and workmanship shall be in accordance with the Standard Specifications, these Standards, and as approved by the City Engineer.

- A. Minimum Structural Section.

The following are the minimum requirements for surfacing for specific facilities as described elsewhere in these Standards.

Facility	HMA	Crushed Surfacing
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Arterials	5" depth, Class ½" HMA PG 58V-22	14" depth
Collectors	4" depth, Class ½" HMA PG 58V-22	12" depth
Local Access	3" depth, Class ½" HMA PG 58V-22	10" depth
Concrete Sidewalks	4" depth, Portland Cement Concrete	4" depth
Multi-Use Trail and Bikeway	2-1/2" depth, Class ½" HMA PG 58V-22	4" depth

Notes:

- 1) All minimum surfacing requirements assume an acceptable, well drained, stable, compacted subgrade. Additional requirements may be imposed at the discretion of the City Engineer if suitable subgrade conditions are not met.

B. Alternative Sections

Streets may be constructed of any of the following:

1. Asphaltic concrete with crushed rock base
2. Asphaltic concrete with cement treated base. Design of cement treated bases, where proposed, shall be approved by the City Engineer prior to Final Engineering plan approval. Design shall have geotechnical investigation performed to obtain samples and determine cement percentage required to obtain 3,000 psi, 30-day compressive strength, in addition to optimal moisture content.
3. Full depth asphaltic concrete.
4. Portland cement concrete with cushion course of crushed rock or on a base of crushed rock or treated base.

Alternative sections may be approved by the City Engineer following submission of calculations by a licensed engineer and per the design requirements described herein. Soil testing to obtain the strength of the soil is required for all roads and streets in order to analyze and design the structural section. Soil tests are needed on undisturbed samples of the subgrade materials that are expected to be within three (3) feet of the planned subgrade elevation. Samples are needed for each five hundred (500) feet of roadway and for each visually observed soil type. Soil tests are required from a minimum of three (3) locations.

The selected design structural strength of the soil shall be consistent with the subgrade compaction requirements. The strength and compaction moisture content, at optimum to slightly over optimum, shall be specified. The soils report shall address subgrade drainage and ground water considerations for year-round conditions.

The required density of treated and untreated subgrade materials shall not be less than 95% maximum density as determined by AASHTO T-99.

C. Aggregate Base

Aggregate base shall meet WSDOT specifications for crushed surfacing.

D. Asphalt Pavement Design

HMA for streets shall be WSDOT "Superpave" Hot Mix Asphalt (HMA) Class 1/2-inch, PG 58H-22.

The compaction shall be at least 92% based on a Rice theoretical maximum density, as

determined in conformance with AASHTO T 209, as modified by WSDOT. In addition, for each mix used, a 50 blow Marshall (AASHTO T 245) shall be performed and all related test data shall be provided to the City Engineer. The minimum stability shall be 1,800 pounds, the flow shall be between 8.0 and 16.0 hundredths of an inch, and the voids shall be between three (3) and five (5) percent. The Marshall requirement may be waived by the City Engineer on a case-by-case evaluation.

Asphalt pavement shall be designed by the Asphalt Institute Method, or an approved equivalent method provided it is a nationally recognized procedure.

Design of asphalt concrete pavement structures by the Asphalt Institute Method shall conform to the guidelines of The Asphalt Institute Publication, Thickness Design Asphalt Pavements for Highways and Streets Manual Series No. I.

1. AASHTO T-193 (CBR Method), or
2. AASHTO T-190 (R-Value Method), or
3. If the CBR value of the subgrade exceeds twenty (20) or the R value of the subgrade exceeds sixty (60), then CBR and R-value methods shall not be used.

E. Portland Cement Concrete Pavement

The design of Portland cement concrete streets shall be governed by the guidelines and requirements of the Portland Cement Association (PCA) design procedures found in the following publications:

1. Concrete Streets: Typical Pavement Sections and Jointing Details
2. Thickness Design for Concrete Highway and Street Pavements
3. Joint Design for Concrete Highway and Street Pavements

The subgrade shall be tested to determine the Modulus of Subgrade Reaction, k, in order to design the street structure. A correlation of CBR to k may be made using Figure 2, Thickness Designs for Concrete Highway and Street Pavements. In addition, the City requires that the following be incorporated into the design and construction specifications:

4. Use a minimum twenty (20) year design period.
5. Minimum thickness of Portland cement concrete shall be five (5) inches.
6. The minimum concrete specifications shall be 5,000 psi (compressive) and 650 psi (flexural) in 28 days. The minimum cement content will be 660 pounds per yard, with a maximum water / cement ratio of 0.48. Slump shall range from 3-inch to 4-1/2-inch. Entrained air shall be from four (4) to six (6) percent.
7. A joint design plan shall be prepared and incorporated into the street construction plans. Longitudinal and transverse joint locations shall be clearly delineated. Transverse joints shall be skewed forward two (2) feet per lane with right and left curb street stationing noted for each end. Joint spacing (in feet) should not exceed 1.5 to 1.75 times the slab thickness (in inches). For example, an 8-inch thick slab would have a maximum joint spacing of 12 to 14 feet. The maximum length to width ratio shall be 1.25: 1.0 for any panel unless there are other constraints that the City Engineer will examine on a case-by-case basis.

3.35 Utilities

A. Curb Markings

When new curbing is being placed, a stamp shall be placed to mark where each water and sanitary sewer service crosses the curb line. The method of marking the curb shall be approved by the City Engineer and noted on the approved construction plans. If an imprinting stamp is used, the impression left for a water service shall be the letter "W"; for a sanitary sewer service, it shall be the letter "S". These impressions shall be two (2) inches high, placed on the face of the curb.

B. Trench Restoration

Trench restoration shall be either by a patch or overlay method as determined by the City Engineer. Unless otherwise approved, trenches cut in the travel lane parallel to the roadway will require a grind and overlay of the entire travel lane from the centerline to the edge of pavement. When a patch method is used, the trench limits shall be sawcut prior to the final patch.

All trench and pavement cuts shall be made by saw cuts. The saw cuts shall be a minimum of one (1) foot outside the trench width. If the permit requires an overlay, the contractor may use a zipper or other approved method for the cutting of the existing pavement.

C. Utility Locations

Utilities shall be located horizontally within the right-of-way in accordance with Standard Detail.

3.36 Traffic Calming

Traffic calming measures shall be used by the developer on all Collector streets to reduce traffic speeds as required by the City Engineer and/or Community Development Director to mitigate traffic impacts. Coordinate with the City Engineer on acceptable traffic calming measures.

3.37 Commercial Cross Circulation

Pedestrian, bicycle and vehicular cross circulation shall be maintained between adjacent commercial developments to reduce or eliminate the use of the City's arterial and collector system for trips between adjacent uses. Access shall be no greater than 750 feet in length away from another access point or public connection unless approved otherwise by the City Engineer. A minimum of one cross connection shall be provided. Cross connection shall be designed to accommodate emergency services.

In the event of a secured site or other instances where providing commercial cross circulation may negatively impact public health and safety, requests to waive or modify this requirement shall be submitted through a design modification for review and action by both the City Engineer, or designee, and Community Development Director.

3.38 Roundabout Design

Roundabouts shall be designed following the guidance from the National Cooperative Highway Research Program (NCHRP) Research Report 1043 published by the Transportation Research Board and the WSDOT Design Manual. Design information provided to City shall include the following:

A. Fastest Path

As part of the engineering submittals, exhibits showing the fastest paths for all movements shall be provided including calculations of the radii and speeds. Offsets for path alignment shall follow guidance from the WSDOT Design Manual.

B. Vehicle Turning

As part of the engineering submittals, exhibits showing the vehicular turning movements for all legs and movements originating from each leg of the roundabout. Vehicles used shall be those of the design vehicles for the roundabout. Additionally, movements shall be shown for other vehicles that are intended to use the roundabout less frequently but will be accommodated (i.e. fire truck).

C. Signage

Signage for the roundabout and approaches shall follow MUTCD standards.

D. Central Island

The central island shall include a 20-24" tall "knee wall" to protect workers and the interior features from vehicles which may attempt to encroach in the roundabout. That knee wall feature is included in Figure xx-x in the standard details.

The central island for the roundabout shall be designed flat and consist of low maintenance ground covers. The design shall provide irrigation sleeves and power conduit sleeves under the roadway to the island for future services.

E. Pedestrian Crosswalks

All new roundabouts shall include pedestrian crosswalks. All new multilane roundabouts shall include an actuated pedestrian crossing flashing beacon system. Under guidelines adopted by the United States Access Board that took effect September 7, 2023, the Public Right-Of-Way Accessibility Guidelines (PROWAG) require that all roundabouts with flashing beacon indications shall have accessible pedestrian systems (APS)^{2 3}. These APS systems shall include a locator tone that repeats every second, audible 6-12 ft from the button or to the building line, with intensity responsive to ambient sound.

3.39 Street Cut Restrictions (Reserved Pending Adoption of Municipal Code Revision)

A street cut prohibition will be in effect for five (5) years after a street receives final acceptance for construction, reconstruction, pavement rehabilitation or pavement preservation treatments. Streets constructed with permeable materials shall have a street cut prohibition for the life of the street. Pavement cuts may be allowed if a more reasonable alternative for service delivery does not exist.

Requests for cutting a street under a street cut prohibition shall be considered design modifications. The design modification request shall include reasons why a pavement cut(s) is necessary and why alternatives to a street cut are not feasible.