

STANWOOD PUBLIC WORKS STANDARDS

CHAPTER 2

2.000 TRANSPORTATION

2A GENERAL CONSIDERATIONS

2A.010 General

The overall goal of this chapter is to encourage the uniform development of an integrated, fully accessible, public transportation system that will facilitate present and future travel demand with minimal environmental impact to the community as a whole.

This chapter provides minimum development standards supplementing the applicable standards as set forth in Chapter 1.

2B STREETS

2B.010 General

Street design must provide for the maximum loading conditions anticipated. The width and grade of the pavement must conform to specific standards set forth herein for safety and uniformity.

2B.020 Design Standards

The design of streets and roads shall depend upon their type and usage. The design elements of City streets shall conform to City standards as set forth in Chapter 1. Standard design structures are shown in the City's Standard Details.

The layout of streets shall provide for the continuation of existing principal streets in adjoining subdivisions or of their proper projection when adjoining property is not subdivided. Minor streets, which serve primarily to provide access to abutting property, shall be designed to discourage through traffic (see the table of the Minimum Street Design Standards).

- A. Alignment. Alignment of arterials, major collectors and minor collectors shall conform as nearly as possible with that shown in the Comprehensive Plan.
- B. Grade. Street grade should conform closely to the natural contour of the land. In some cases the City Engineer may require a different grade. The minimum allowable grade shall be 0.5 percent. The maximum allowable grade shall be 14 percent, depending upon the street classifications.
- C. Width. The pavement and right-of-way width depend upon the street classification. The table of Minimum Street Design Standards show the minimum widths allowed.

Street widths shall be measured from face of curb to face of curb on streets with cement concrete curb and gutter.

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D. The General Notes that follow this page shall be included on any plans dealing with street design in addition to all applicable requirements in Chapter 1.

MINIMUM STREET DESIGN STANDARDS

Design Standard	Arterial	Commercial/Neighborhood Major Collector	Neighborhood Minor Collector	Local Access/Cul-De-Sac
Transportation Standard Detail #	T-2	T-3	T-4	T-5/T-6
ROW Width (minimum)	86-98 ft.	57 ft.	49 ft.	49 ft.
ROW Components Street Width (minimum)	48-60 ft. plus two 5 ft. bike lanes	36 ft.	28 ft.	28 ft.
Curb Requirements	Cement concrete curb (6") & gutter, both sides	Cement concrete curb (6") & gutter, both sides	Cement concrete curb (6") & gutter, both sides	Cement concrete curb (6") & gutter, both sides
Planter Width (minimum)	8.5 ft. wide both sides	5 ft. wide both sides	5 ft. wide both sides	5 ft. wide both sides
Sidewalk Requirements (minimum)	5 ft. wide both sides	5 ft. wide both sides	5 ft. wide both sides	5 ft. wide both sides
Utility Easements	10 ft. both sides	10 ft. both sides	10 ft. both sides	10 ft. both sides
Minimum-Maximum Grade	.50% to 7%	.50% to 12%	.50% to 12%	.50% to 14%
Intersection Curb Radius	30 ft.	30 ft.	30 ft.	25 ft.
Design Speed (MPH)	45	35	35	25
Stopping Sight Distance	360 ft.	250 ft.	250 ft.	155 ft.
Intersection (Entering) Sight Distance	500 ft., driver's eye 15 ft. back from edge of traveled way and 3.5 ft. above pavement	390 ft., driver's eye 15 ft. back from edge of traveled way and 3.5 ft. above pavement	390 ft., driver's eye 15 ft. back from edge of traveled way and 3.5 ft. above pavement	280 ft., driver's eye 15 ft. back from edge of traveled way and 3.5 ft. above pavement
Utility Easements	10' each side of street	10' each side of street	10' each side of street	10' each side of street
Daily Traffic Volume	> 3000 ADT	1001-3000 ADT	250-1000 ADT	< 250 ADT

2B.030 Street Construction General Notes

1. All workmanship and materials shall comply with the Stanwood Public Works Construction Standards and the most current copy of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction.
2. The contractor shall be responsible for all traffic control in accordance with MUTCD. Prior to disruption of any traffic, traffic control plans shall be prepared and submitted to the City for approval. No work shall commence until all approved traffic control is in place.
3. A licensed engineering or surveying firm shall stake all curb and gutter, street grades, sidewalk grades and any other vertical and/or horizontal alignment.
4. Where new asphalt joins existing, the existing asphalt shall be cut to a neat vertical edge and tacked with Asphalt Emulsion type, CSS-1, in accordance with the Standard Specifications. The new asphalt shall be feathered back over existing to provide for a seal at the saw cut location and the joint sealed with grade AR-4000W paving asphalt.
5. Compaction of subgrade, rock and asphalt shall be in accordance with the Standard Specifications.

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6. Form and subgrade inspection by the City is required before pouring concrete. Twenty-four hours notice is required for form inspection.
7. See the Stanwood Public Works Construction Standards for testing and sampling frequencies.
8. The City may provide and install street name and regulatory signs at the contractor's/developer's expense. Signs shall be requested at the time construction begins.

2B.040 Functional Classifications

City streets are divided into arterials, major collectors, minor collectors, and local access streets in accordance with regional transportation needs and the functional use each serves. Function is the controlling element for classification and shall govern right-of-way, road width and road geometrics. The City of Stanwood Comprehensive Plan provides street category definitions and street classifications. New streets will be classified by the Public Works Director.

2B.050 Street Naming

Streets and roads shall be named according to specific criteria. All streets lying in Stanwood are designated northwest (NW). "Avenues" run north – south and are numbered with the exception of certain long-standing historical names. "Streets" run east – west and are also numbered except for certain historical names. "Drives" are irregular or diagonal streets over two grid blocks in length not conforming to the grid pattern. "Places" shall be east - west streets, parallel to but between "Streets". "Ways" shall be north - south streets parallel to but between "Avenues". "Courts" shall be cul-de-sacs which cannot be extended. Courts are to be named or numbered and carry the number of the preceding street or avenue. "Loops" shall be small loop-type streets to carry the name of the street from which they originate. "Lanes" shall be private streets.

Note that a few exceptions to the "Place" rule exist within the City. "Manor Place", "Village Place" and "Country Place" function like "Ways". They are addressed as such.

An address number will be assigned to all new buildings at the time the building permit is issued. It is then the owner's responsibility to see that the house numbers are placed clearly and visibly at the main entrance to the property or at the principal place of egress.

The developer must check with the Permit Coordinator regarding the naming of streets. This should be done at the time the preliminary plat is submitted and again upon approval of the final plat. The Building Department will insure that the name assigned to a new street is consistent with policies of the City.

2B.060 Signing

The developer is responsible for providing all traffic control signs. Traffic control signing shall comply with the provisions as established by the US Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD).

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2B.070 Right of Way

Right of way widths shall be per the minimum Street Design Standards Table and Transportation Standard Details.

Right-of-way requirements may be increased if additional lanes; pockets; transit lanes; bus loading zones; operational speed; bike lanes; utilities; schools or other factors are required as determined by the Public Works Director.

Right-of-way shall be conveyed to the City on a recorded plat or by right-of-way dedication deed.

2B.080 Private Streets

See definition of private streets in Chapter 1.

- A. Private streets may be allowed under the following conditions:
 - 1. Permanently established by tract providing legal access to serve no more than four dwelling units, and have a minimum 24-foot paved surface with curb and gutter, and have a sidewalk, one side 5 feet in width of such a design that prevents parking upon the sidewalk. All sidewalks will meet ADA requirements.
 - 2. Accessible at all times for emergency and public service vehicle use.
 - 3. Will not result in landlocking of present or future parcels nor obstruct public street circulation.
 - 4. Covenants have been approved, recorded and verified with the City which provide for maintenance of the private streets and associated parking areas by the owner or homeowners association or other legal entity.
- B. Acceptance as Public Streets. Acceptance of private streets as public streets will be considered only if the street(s) meets the conditions set forth in Ordinance 1131.

2B.090 Street Frontage Improvements

- A. All commercial and residential (including multi-family) developments, plats, and short plats shall install street frontage improvements at the time of construction as required by the Department of Public Works. Such improvements may include curb and gutter; sidewalk; street storm drainage; street lighting system; traffic signal modification, relocation or installation; utility relocation; landscaping and irrigation and street widening all per these Standards. Plans shall be prepared and signed by a licensed civil engineer registered in the State of Washington.
- B. All frontage improvements shall be made across full frontage of property, including curb, gutter and sidewalk fronting the property and half street improvements.
- C. Exceptions. When the Public Works Director deems that the above such improvements cannot be accomplished at the time of building construction, a recorded agreement on forms provided by the Department of Public Works

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shall be completed which provide for these improvements to be installed at a later date by the applicant. Financial hardship shall not be considered as a reason for delaying improvements.

2B.100 Cul-de-sac

Streets designed to have one end permanently closed shall be no longer than 400 feet. At the closed end, there shall be a widened “bulb” having a minimum paved traveled radius as shown in the Minimum Street Design Standards Table, or a “Y” or “T” which allows for comparable ease in turning for emergency vehicles.

2B.110 Temporary Dead Ends

Where a street is temporarily dead ended, turn around provisions must be provided where the road serves more than one lot. The turn around may be a hammerhead with a minimum distance on both sides of the centerline intersection of 60 feet to facilitate emergency vehicle turn-around.

2B.120 Half Street

A half street may be permitted subject to approval by the Public Works Director when:

- A. There is a reasonable assurance of obtaining the prescribed additional right-of-way from the adjoining property suitable for completion of a full-section roadway, and
- B. Such alignment is consistent with or will establish a reasonable circulation pattern, and
- C. The right-of-way width of the half street shall equal at least 28.5 feet, or in the case of a local access street, 24.5 feet, and
- D. The traveled way shall be surfaced the same as the designated street classification to a width not less than 24 feet, and
- E. The half street shall be graded consistent with locating centerline of the ultimate roadway section on the property line, and
- F. Property line edge of street shall be finished with permanent curb and gutter to insure proper drainage, bank stability and traffic safety.

2B.130 Medians

A median shall be in addition to, not part of, the specified roadway. Medians shall be designed so as not to limit turning radius or sight distance at intersections. Landscaping and irrigation shall be installed when directed by the Public Works Director.

2B.140 Intersections

- A. Traffic control will be as specified in the Manual on Uniform Traffic Control Devices (MUTCD) or as modified by the City Engineer as a result of appropriate traffic engineering studies.
- B. Street intersections shall be laid out so as to intersect as nearly as possible at right angles. Sharp angled intersections shall be avoided. For reasons of

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traffic safety, a “T” intersection (three-legged) is preferable to the crossroad (four-legged) intersection for local access streets. For safe design, the following types of intersection features should be avoided:

1. Intersections with more than four intersecting legs;
 2. “Y” type intersections where streets meet at acute angles;
 3. Intersections adjacent to bridges and other sight obstructions.
- C. Spacing between adjacent intersecting streets, whether crossing or “T” should be as follows:

Arterial	300 feet
Major Collector	200 feet
Minor Collector	200 feet
Local Access Street	150 feet

When different class streets intersect, the higher standard shall apply on curb radii and intersection spacing. Deviations to this may be allowed at the direction of the City Engineer.

- D. On sloping approaches at an intersection, landings shall be provided with grade not to exceed one foot difference in elevation for a distance of 30 feet approaching any arterial, or 20 feet approaching a collector or local access street, measured from nearest right-of-way line (extended) of intersecting street.

2B.150 Driveways

A. General

1. All abandoned driveway areas on the same frontage shall be removed and the curbing and sidewalk or shoulder and ditch section shall be properly restored.
2. All driveways shall be constructed of portland cement concrete (PCC) or of asphalt cement concrete (ACC) and shall be subject to the same testing and inspection requirements as curb, gutter, and sidewalk construction.
3. Joint-use driveways serving two adjacent parcels may be built on their common boundary upon formal written agreement by both property owners and approval of the City. The agreement shall be a recorded easement for both parcels of land specifying joint usage.
4. Grade breaks, including the tie to the roadway, shall be constructed as smooth vertical curves. The maximum change in driveway grade shall be 8 percent within any 10 feet of distance on a crest and 12 percent within any 10 feet of distance in a sag vertical curve.
5. No commercial driveway shall be approved where backing onto the sidewalk or street will occur.

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6. Driveway access shall not be allowed within 100 feet of a collector intersection or within 50 feet of a local access intersection. This distance shall be measured from nearest edge of proposed driveway access to edge of intersecting road pavement or to the point at which the sidewalk curves at the intersection.
 7. Driveways shall be aligned wherever possible with existing driveways on the opposite side of the street on two or three lane streets. Where the driveways can not be aligned, the driveways shall be separated in accordance with the standard details.
 8. Driveways shall be offset a minimum of 100 feet from existing driveways on the opposite side of streets with four or more lanes wherever possible.
 9. Driveways constructed in areas where vertical curb and gutter frontage improvements are required shall be constructed as drop curb driveways.
 10. Residential driveways shall have a minimum separation of ten feet between the nearest edges of the access points.
- B. Width
1. Residential driveways for single-family dwellings or duplexes shall have a minimum width of 10 feet and a maximum width of 30 feet.
 2. One-way commercial driveways shall have a minimum width of 15 feet and maximum width of 30 feet.
 3. Two-way commercial driveways shall have a minimum width of 25 feet and a maximum width of 40 feet.
 3. A road approach or wider driveway width may be approved by the City Engineer where a substantial percentage of oversized vehicle traffic exists, where divisional islands are desired, or where multiple exit or entrance lanes are needed.
 4. Parking lot circulation and signing needs shall be met on site. The public right-of-way shall not be utilized as part of a one way parking lot flow.
 5. Road approaches and/or ingress and egress tapers may be required in industrial and commercially zoned areas as directed by the Public Works Director. Tapers shall be designed per Institute of Transportation Engineers specifications.

2B.160 Sight Obstruction

The following sight clearance requirements take into account the proportional relationship between speed and stopping distance.

The sight distance area is a clear view triangle formed on all intersections by extending two lines of specified length (A) and (B) as shown below from the center of the intersecting streets along the centerlines of both streets and connecting those endpoints to form the hypotenuse of the triangle. The area within the triangle shall be subject to said restrictions to maintain a clear view on the intersection approaches. See Transportation Standard Details for more information.

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Sight Distance Triangle:

A. Stop or Yield Controlled Intersection

Speed Limit	Sight Distance (Feet)	
	(A)	(B)
	Major Street	Minor Street
20 mph	200	*
25 mph	250	*
30 mph	300	*
35 mph	350	*
40 mph	400	*

*Sight distance measured from a point on the minor road 15 feet from the edge (extended) of the major road pavement and measured from a height of eye at 3.50 feet on the minor road to height of object at 4.25 feet on the major road.

B. Uncontrolled Intersection

Speed Limit	Sight Distance (Feet)	
	(A)	(B)
	Major Street	Minor Street
20 mph	90	90
25 mph	110	110
30 mph	130	130
35 mph	155	155
40 mph	180	180

C. The vertical clearance area within the sight distance triangle shall be free from obstructions to a motor vehicle operator's view between a height of 3 feet and 10 feet above the existing surface of the street.

D. Exclusions. Sight obstructions that may be excluded from these requirements include: fences in conformance with this chapter; utility poles; regulatory signs; trees trimmed from the base to a height of 10 feet above the street; places where the contour of the ground is such that there can be no cross visibility at the intersection; saplings or plant species of open growth habits and not in the form a hedge which are so planted and trimmed as to leave at all seasons a clear and unobstructed cross-view; and buildings constructed in conformance with the provisions of appropriate zoning regulations and preexisting buildings.

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2B.170 Surfacing Requirements

Surfacing requirements shall be determined by a geotechnical investigation of the existing soils and pavement design by a licensed engineer. The pavement cross-section shall meet the following minimum requirements.

A. Collector Streets

Surfacing: 4" Class B asphalt concrete

Top course: 2" crushed surfacing top course

Base: 16" ballast

Alternate:

Surfacing: 4" Class B asphalt concrete

Top course: 4" asphalt treated base

Base: 2" crushed surfacing base course

B. Local Access Street

Surfacing: 3" Class B asphalt concrete

Top course: 2" crushed surfacing top course

Base: 8" ballast

Alternate:

Surfacing: 3" Class B asphalt concrete

Top course: 3" asphalt treated base

Base: 2" crushed surfacing base course

C. Parking Lot General

Surfacing: 3" Class B asphalt concrete

Top course: 2" crushed surfacing top course

Base: 8" ballast

Alternate:

Surfacing: 3" Class B asphalt concrete

Top course: 2" asphalt treated base

Base: 2" crushed surfacing base course

D. Sidewalks

Surfacing: 4" commercial concrete

Base: 4" crushed surfacing top course

Asphalt sidewalks will not be permitted unless otherwise approved by the Public Works Director.

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- E. Class I Bikeway
- | | |
|------------|---------------------------------|
| Surfacing: | Commercial concrete |
| Base: | 2" crushed surfacing top course |
| Alternate: | |
| Surfacing: | 2" Class B asphalt concrete |
| Base: | 4" ballast |

2B.180 Temporary Street Patching

Temporary restoration of trenches shall be accomplished by using 0.17 feet Class B Asphalt Concrete Pavement when available or 0.17 feet medium curing (MC-250) Liquid Asphalt (cold mix), 0.17 feet Asphalt Treated Base (ATB), or steel plates.

ATB used for temporary restoration may be dumped directly into the trench, bladed and rolled. After rolling, the trench must be filled flush with asphalt concrete pavement to provide a smooth riding surface.

All temporary patches shall be maintained by the contractor until such time as the permanent pavement patch is in place.

Temporary patches will be completed within the same day as opened unless the Public Works Director has approved other arrangements.

If the contractor is unable to maintain a patch for whatever reason, the City will patch it at actual cost plus overhead and materials.

2B.190 Trench Backfill and Restoration

Trench restoration shall be patch plus overlay meeting the following requirements:

- A. All trench and pavement cuts shall be made by spade bladed jackhammer or sawcuts. The cuts shall be a minimum of 1 foot outside the trench width.
- B. All trenching shall be backfilled with bank run gravel for trench backfill conforming to the WSDOT/APWA Standards. The trench bedding and backfill shall be compacted to 95 percent maximum density, as determined by ASTM D1557.

Existing material may be used for backfill only outside of the roadway section if it is determined by the City to be suitable for backfill. The contractor may use the native material except that the top 8 inches of trench shall be 2-1/2 inches minus ballast. All trench backfill materials shall be compacted to 95 percent density as determined by ASTM D1557.

Backfill compaction shall be performed in 6 inch lifts.

Replacement of the asphalt concrete or Portland Concrete Cement shall be of existing depth plus 1 inch or 3 inches total, whichever is greater.

- C. Tack shall be applied to the existing pavement and edge of cut and shall be emulsified asphalt grade CSS-1 as specified in the WSDOT/APWA Standards. Tack coat shall be applied as specified in the WSDOT/APWA Standards.

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- D. Asphalt concrete Class B shall be placed on the prepared surface by an approved paving machine whenever available or as directed by the DPW and shall be in accordance with the applicable requirements of the WSDOT/APWA Standards, except that longitudinal joints between successive layers of asphalt concrete shall be displaced laterally a minimum of 12 inches unless otherwise approved by the City Engineer. Fine and coarse aggregate shall be in accordance with WSDOT/APWA Standards. Asphalt concrete over 2 inches thick shall be placed in equal lifts not to exceed 2 inches each.

All street surfaces, walks or driveways within the street trenching areas affected by the trenching shall be feathered and shimmed to an extent that provides a smooth-riding connection and expeditious drainage flow for the newly paved surface. Shimming and feathering as required by the City Engineer shall be accomplished by raking out the oversized aggregates from the Class B mix as appropriate or by using Class G mix.

Surface smoothness shall be per the WSDOT/APWA Standards. The paving shall be corrected by removal and repaving of the trench only.

- E. All joints shall be sealed using paving asphalt AR4000W.
- F. When trenching within the roadway shoulder(s), the shoulder shall be restored to its original or better condition.
- G. The final patch shall be completed as soon as possible however no longer than 30 days after first opening the trench. This time frame may be adjusted if delays are due to inclement paving weather, or other adverse conditions that may exist. However, delaying of final patch or overlay work is allowable only subject to the City Engineer's approval. The City Engineer may deem it necessary to complete the work within the 30 days time frame and not allow any time extension. If this occurs, the Contractor shall perform the necessary work as directed by the City Engineer.

2B.200 Staking

- A. All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed as a Professional Engineer or Professional Land Surveyor by the State of Washington. A pre-construction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.
- B. The minimum staking of streets shall be as directed by the City Engineer as follows: Stake top back of curb every 50 feet in tangent sections and 25 feet in curved sections plus grade breaks, PVCs, PVTs, high point and low points, with cut or fill to finished grade.

2B.210 Testing

Testing shall be required at the developer's or contractor's expense on all materials and construction as specified in the WSDOT/APWA Standards.

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At a minimum, one slump test and two test cylinders shall be taken once per day for concrete construction. Asphalt compaction tests are required as follows:

Under 50 square feet = one

50 - 100 square feet = two

100 - 300 square feet = three

Over 300 square feet = one every 200 sq feet or every 100 lineal feet of trench if applicable

2C SIDEWALKS, CURBS AND GUTTERS

2C.010 General

All properties within commercial zones of the City, properties abutting arterial streets or collector streets and properties upon which there are to be public buildings, shall, in conjunction with new construction on such properties or alterations or improvements which constitute 25 percent or more of the value of the existing structures on the property, have sidewalks constructed along abutting streets. Curbs and gutters must also be constructed along the abutting street when the Public Works Director determines that the conditions of drainage require curbs and gutters.

2C.020 Design Standards

Plans for the construction of sidewalks, curbs and gutters are to be submitted as part of the street plans when applicable.

The City has set forth minimum standards as outlined in Chapter 1 which must be met in the design and construction of sidewalks, curbs and gutters. Because these are minimum standards, they may be modified by the Public Works Director should the Director feel circumstances require increased or decreased widths.

2C.030 Sidewalks

Sidewalks shall be constructed of commercial concrete four inches thick. When the sidewalk, curb and gutter are contiguous, the width of the sidewalks shall be measured from back of curb and gutter to back of sidewalk. Concrete mix for sidewalks, curb and gutters shall be no less than Class 3000 as outlined in WSDOT/APWA Standards.

- A. Arterial Streets. Sidewalks, curbs and gutters shall be required on both sides of all arterial streets interior to the development. Sidewalks, curbs and gutters shall also be required on both sides of streets contiguous to said development, with provisions made for latecomer agreements. Arterial streets for purposes of this subsection shall include major arterials, secondary arterials and collector streets and defined in the SMC.
- B. Local Access Streets. Sidewalks shall be required on both sides of local access streets interior to the development and on the development side of local access streets abutting the exterior of said development including cul-de-sacs.
- C. The design and construction of all sidewalks, curbs, gutters and walkways shall meet the following minimum standards:

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The width of sidewalks shall be as shown in the street design illustrations. Those walkway and bike trails designated in the bike plan of the City as bike paths shall, in addition, meet the minimum width requirements established for said bike paths. The Public Works Director shall require that the design of all sidewalks provides for a gradual rather than an abrupt transition between sidewalks of different widths or alignments.

- D. Form and subgrade inspection by the City are required before sidewalk is poured.
- E. Monolithic pour of curb, gutter and sidewalk will not be allowed.

2C.040 Curb and Gutter

Cement concrete curb and gutter shall be used for all street edges unless otherwise approved by the Public Works Director. All curbs and gutters shall be constructed of Class 3000 Concrete as shown in the Standard Details. No rolled curb will be allowed.

Concrete extruded curb and gutter per WSDOT/APWA Standards is allowed.

Form and subgrade inspection by the City are required before curb and gutter are poured.

2C.050 Handicap Ramps

All sidewalks must be constructed to provide for handicap ramps in accordance with the Federal American Disability Act Requirements.

Handicap ramps shall be constructed of Class 3000 Concrete. Form and subgrade inspection by the City are required before handicap ramp is poured.

2C.060 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed as a Professional Engineer or Professional Land Surveyor by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of curb, gutter and sidewalk shall be as directed by the City Engineer or as follows:

Stake top back of curb every 50 feet in tangent sections and 25 feet in curved sections plus grade breaks, PVCs, PVTs, high point and low points, with cut or fill to finished grade.

2C.070 Testing

Testing shall be required at the developer's or contractor's expense on all materials and construction as specified in the WSDOT/APWA Standards.

At a minimum, one slump test and two test cylinders shall be taken once per day.

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In addition, the City shall be notified before each phase of sidewalk, curb and gutter construction commences.

2D BIKEWAYS

2D.010 Urban Trail

Bikeway or Urban Trail construction is required in conjunction with any new development or redevelopment where the estimated cost of improvements on such properties exceeds 25 percent of the value of the existing structures, or plat or short plat approval, when the need for such a bikeway is indicated in the Stanwood Urban Trails Plan and the Snohomish County Area Bicycle Plan.

2D.020 Design Standards

The design of bicycle paths shall depend upon their type and usage.

All minimum design standards as set forth in Chapter 1 shall apply.

Normally, bikeways are shared with other transportation modes, although they may be provided exclusively for bicycle use. Bikeways are categorized as follows:

- A. Class I Bike Path. A separate trail for use principally by bicyclists, but may be shared with pedestrians. These facilities are separated from motor vehicle roadways.
- B. Class II Bike Lane. A portion of a road that is designated by signs and/or pavement markings for bicycle use. These facilities are usually adjacent to the motor vehicle roadway.
- C. Class III Bike Route. A road that is designated with signs as a bicycle route, where bicycle usage is shared with motor vehicles on the street or, less desirable, with pedestrians on a sidewalk or walkway.
- D. Class IV Shared Roadway. A facility within commercial and high-density urban centers where sidewalk bicycling is not permitted. No special designations or design criteria are directed toward bicycle use. A 14-foot outside travel lane is required when a roadway is designated a shared bikeway.
- E. Class I, II, III, or IV Bikeways, as appropriate, shall be provided when traffic analysis or traffic planning indicates substantial bicycle usage which would benefit from a designated bicycle facility as determined by the City except where noted herein.

2D.030 Staking and Testing

Staking and testing shall be done in accordance with street staking and testing requirements.

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2E ILLUMINATION

2E.010 General

All new commercial or residential subdivisions, short plats or property development requiring review by the Public Works Director and Community Development Director shall provide street lights in accordance with the Standards for such improvements of the City and they shall be owned and operated by the City. Illumination is required on frontage streets as well as within developments.

2E.020 Design Standards

A street lighting plan submitted by the applicant and approved by the Public Works Director shall be required for all street light installations. Type of installation shall be as set forth in WSDOT/APWA Standards and as directed by the City except where noted herein. Period lighting is required and must be approved by the City.

All public street light designs shall be prepared by an engineering firm capable of performing such work. The engineer shall be licensed by the State of Washington. All developments shall submit the lighting plan on a separate sheet. After system is completed and approved, a set of "as built" mylars or reproducibles shall be submitted to the City as a permanent record.

Calculations should include illuminaire spacing; illumination level; uniformity ratio; line losses; power source; and other necessary details for the electrical and physical installation of the street lighting system. The lighting engineer shall use the WSDOT/APWA Standards and the following table regarding Illumination Levels.

Illumination Levels

Street Classification	Horizontal Foot Candles	Uniformity Ratio (average to minimum)
Arterials	1.5 FC	3:1
Commercial/Industrial Collectors	1.0 FC	3:1
Residential Collectors	0.7 FC	3:1
Local Access Residential Streets	0.3 FC	None; 300-foot maximum spacing

All street lights shall be on two hundred forty volt (240v), single phase systems. The exact location of the power source should be indicated together with the remaining capacity of that circuit. System continuity and extension should be considered.

Contractor cabinets equipped with electrical meters, time clocks, circuit breakers, and other required components are required on commercial installations of five or more street lights.

All street lighting, wiring and service connectors shall be located underground except in residential areas where power distribution poles exist.

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Particular attention shall be given to locating luminaries near intersections, at all street ends and at pedestrian, bicycle, and/or equestrian crossings.

Period lighting may be required by the Public Works Director.

The following General Notes shall be included on any plans dealing with street design in addition to all applicable requirements as set forth in Chapter 1.

2E.030 Street Light Construction General Notes

1. All workmanship, materials and testing shall be in accordance with the most current Washington State Department of Transportation/American Public Works Association Standard Specifications for Road, Bridge, and Municipal Construction, National Electrical Code and Public Works Construction Standards unless otherwise specified below. In cases of conflict, the most stringent guideline shall apply. When the most stringent guideline is not clear, the City Engineer will make the determination. The Electrical Contractor shall be familiar with all above stated publications and guidelines as they will be strictly enforced by the City.
2. All safety standards and requirements shall be complied with as set forth by the State of Washington, Department of Labor and Industries.
3. The contractor shall be responsible for all traffic control in accordance with the Manual on Uniform Traffic Control Devices. Prior to disruption of any traffic, traffic control plans shall be prepared and submitted to the City for approval (See WSDOT/APWA Standards Plans K2-K21). No work shall commence until all approved traffic control is in place.
4. A pre-construction meeting shall be held with the City of Stanwood construction inspectors prior to the start of construction.
5. All approvals and permits required by the City of Stanwood shall be obtained by the contractor prior to the start of construction.
6. It shall be the responsibility of the contractor to have a copy of an approved set of plans on the construction site at all times.
7. All surveying and staking shall be done by a surveying or engineering firm licensed in the State of Washington.
8. Temporary erosion control/water pollution measures shall be required in accordance with the WSDOT/APWA Standards and the Puget Sound Stormwater Technical Manual. At no time will silts and debris be allowed to drain into an existing or newly installed facility.
9. If construction is to take place in the County right-of-way, the contractor shall notify the County and obtain all the required approvals and permits.
10. The contractor shall be fully responsible for the location and protection of all existing utilities. The contractor shall verify all utility locations prior to construction by calling the Underground Locate Line, at 1-800-424-5555, a minimum of 48 hours prior to any excavation. The contractor will also be responsible for maintaining all locate marks on the utilities lines that have been located.

Stanwood Public Works Standards

11. Electrical permits and inspections are required for all street lighting installations within the City. The contractor is responsible for obtaining said permits prior to any type of actual construction. These permits are available from the Department of Labor and Industry which is also responsible for inspection.
12. Prior to installation of any materials, the Electrical Contractor shall submit for approval by the City, two copies of material catalog cuts, specifications, shop drawings and/or wiring diagrams. Any materials purchased or labor performed prior to such approval shall be at the contractor's risk.
13. Any modification to approved lighting plans shall be reviewed and approved by the City prior to installation. Any approved modifications shall be shown on a mylar as-built supplied to the City after the lighting installation is completed and before final acceptance. It shall be the responsibility of the Electrical Contractor to ensure these as-builts are provided to the City.

2E.040 Staking

An engineering or surveying firm capable of performing such work shall perform all surveying and staking. The engineer or surveyor directing such work shall be licensed by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of luminaries shall be as follows:

- A. Location and elevation to the center of every pole base.
- B. Location and elevation of each service disconnect.

2E.050 Testing

All illumination systems shall be subject to an electrical inspection which shall include megger testing and functional test. Lamp, photocell and fixture shall be under warranty for a period of one year.

2F SIGNALS

2F.010 General

Signals shall be installed per the requirements set forth herein. This work shall consist of furnishing and installing a complete and functional traffic control system of controllers, signals and appurtenances as required by the City and additional signal plans must be approved by Snohomish County.

2F.020 Design Standards

Signal systems shall be designed in accordance with the specifications as set forth in the WSDOT/APWA Standards and WSDOT Design Manual unless otherwise authorized by the City.

Stanwood Public Works Standards

All public signal designs shall be prepared by an engineering firm capable of performing such work. The Engineer shall be licensed by the State of Washington. All applicable requirements shall be set forth in the Public Works Construction Standards.

2F.030 Induction Loops

Induction loops shall be constructed per WSDOT/APWA Standards Specifications and the following:

- A. Loops shall not be cut into final lift of new asphalt.
- B. Loops shall be preformed in crushed surfacing top course (CSTC) before paving or shall be cut in existing asphalt or leveling course to subbase before intersection is overlaid.

2F.040 Staking

An engineering or surveying firm capable of performing such work shall perform all surveying and staking. The State of Washington shall license the engineer or surveyor directing such work.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

A minimum staking of signals shall be as follows:

- A. Location, with cut or fill to center of all pole bases.
- B. Location of junction box.
- C. Location of all corners of controller base.
- D. Location of service disconnect.

2F.050 Testing

All signals shall be subject to any necessary electrical inspections as well as requirements as set forth in the WSDOT/APWA Standards and WSDOT Design Manual.

A signal system shall not be approved or accepted by the City until the signal has performed correctly to the City's satisfaction for a 30-day "check out" period as outlined below.

WSDOT District 1 laboratory and/or the City of Stanwood may require controller and cabinet testing. All specifications and material samples shall be submitted to the City for review and approval prior to installation.

2F.060 Check-Out Procedure

The contractor shall call for an intersection check-out after completing the controller cabinet installation along with all other signal equipment, complete with wiring connections. All parts and workmanship shall be warranted for one year from the date of acceptance.

New signals shall operate without any type of failure for a period of 30 days. The contractor shall have a person available to respond to system failure within 24 hours during the 30-day check-out period.

Stanwood Public Works Standards

Failure of any control equipment or hardware within the check out period shall restart the 30-day check-out period.

2G ROADSIDE FEATURES

2G.010 General

Miscellaneous features included herein shall be developed and constructed to encourage the uniform development and use of roadside features wherever possible.

2G.020 Design Standards

The design and placement of roadside features included herein shall adhere to the specific requirements as listed for each feature, and when applicable, to the appropriate standards as set forth in Chapter 1.

2G.030 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed as a Professional Engineer or Professional Land Surveyor by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction shall be inspected by the City prior to construction.

2G.040 Testing

Testing shall be required at the developer's or contractor's expense on all materials and construction as specified in the WSDOT/APWA Standards and with a frequency as specified in the WSDOT Construction Manual.

2G.050 Survey Monuments

- A. All existing survey control monuments which will be disturbed or destroyed during construction shall be referenced prior to construction and replaced after construction by a professional land surveyor licensed by the State of Washington. All applicable RCWs and WACs will be complied with. The monuments shall be replaced with the proper type; as outlined in B, or C, below, at the expense of the responsible builder or developer.
- B. Street type: arterial, bus routes and truck routes.
A pre-cast concrete monument with cast iron monument case and cover, installed per Public Works Construction Standards, is required.
- C. Street type: commercial collector, neighborhood collector and local.
A poured-in-place concrete surface monument, per Public Works Construction Standards, is required.
- D. Monument Locations.

Stanwood Public Works Standards

Appropriate innervisible monuments as outlined in B or C above shall be placed:

1. At all street intersections.
 2. At the PC and PTs of all horizontal curves or at the PI if it lies in the traveled roadway.
 3. At all DLC corners, section corners, quarter corners and sixteenth corners that fall within the subdivision. Where these points fall outside of the pavement or sidewalks, a poured-in-place monument per Public Works Construction Standards shall be set so that the top of the monument is one foot below the surface of the ground.
- E. The monument case shall be installed after the final course of surfacing has been placed.

2G.060 Bus Shelter and Amenities

For all new developments, the developer shall coordinate with the City, the Stanwood School District and Community Transit, regarding locations of new bus stops and bus shelters.

2G.070 Mailboxes

- A. During construction, existing mailboxes shall be accessible for the delivery of mail or, if necessary, moved to a temporary location. Temporary relocation shall be coordinated with the US Postal Service. The mailboxes shall be reinstalled at the original location or, if construction has made it impossible, to a location as outlined below and approved by the US Postal Service.
- B. Location
1. The bottom or base of the box shall be 36 to 42 inches above the road surface.
 2. The front of the mailbox shall be 6 inches behind the vertical curb face or the outside edge of shoulder.
 3. New developments. Clustered mailboxes are required. Contact the US Postal Service for details.
- C. Mailboxes shall be set on posts strong enough to give firm support, but not to exceed 4 x 4-inch wood or one 1 ½-inch diameter pipe, or material and design with comparable breakaway characteristics.

2G.080 Guard Rails

For purposes of design and location, all guard rails along roadways shall conform to the criteria of the “Washington State Department of Transportation Design Manual” as may be amended or revised.

Stanwood Public Works Standards

2G.090 Retaining Walls

- A. Rock walls may be used for erosion protection of cut or fill embankments up to a maximum height of eight feet in stable soil conditions which will result in no significant foundation settlement or outward thrust upon the walls. For heights over 6 feet or when soil is unstable, structural wall of acceptable design stamped by a licensed structural engineer shall be used.
- B. Any rock wall over 30 inches high in a fill section shall require an engineered design by a geotechnical engineer. The geotechnical engineer shall continuously inspect the installation of the wall as it progresses and shall submit inspection reports, including compaction test results and photographs taken during the construction, documenting the techniques used and the degree of conformance to the geotechnical engineer's design.
- C. In absence of such a rock wall design, walls having heights over six feet or walls to be constructed in conditions when soil is unstable require a structural wall having a design approved by the Public Works Department or the Building Department if outside the right-of-way. The design of structural walls shall be by a professional engineer qualified in retaining wall design. Structural walls require issuance of a building permit prior to construction.
- D. The rock material shall be as nearly rectangular as possible. No stone shall be used which does not extend through the wall. The rock material shall be hard, sound, durable and free from weathered portions, seams, cracks and other defects. The rock density shall be a minimum of 160 pounds per cubic foot.
- E. The rock wall shall be started by excavating a trench having a depth below subgrade of one-half the base course or one foot (whichever is greater).
- F. Rock selection and placement shall be such that there will be minimum voids and, in the exposed face, no open voids over six inches across in any direction. The final course shall have a continuous appearance and shall be placed to minimize erosion of the backfill material. The larger rocks shall be placed at the base of the rockery so that the wall will be stable and have a stable appearance. The rocks shall be placed in a manner such that the longitudinal axis of the rock shall be at right angles or perpendicular to the rockery face. The rocks shall have all inclining faces sloping to the back of the rockery. Each course of rocks shall be seated as tightly and evenly as possible on the course beneath. After setting each course of rock, all voids between the rocks shall be chinked on the back with quarry rock to eliminate any void sufficient to pass a 2-inch square probe.
- G. The wall backfill shall consist of quarry spalls with a maximum size of 6 inches and a minimum size of 4 inches or as specified by a licensed engineer. This material shall be placed to a 12 inch, minimum thickness between the entire wall and the cut or fill material. The backfill material shall be placed in lifts to an elevation approximately 6 inches below the top of each course of rocks as they are placed, until the uppermost course is placed. Any backfill material on the bearing surface of one rock course shall be removed before setting the next course.

Stanwood Public Works Standards

H. Perforated drainage pipe and filter fabric shall be installed as directed by staff at plan review. This pipe requirement may be waived by the engineer upon a showing by the developer that no subsurface water problem exists.

2G.100 Street Trees

Street trees shall be planted in accordance with the Stanwood Municipal Code.

2G.110 Parking Lots

A parking lot construction permit is required prior to surfacing any unsurfaced designated parking area not covered by the site plan review process.

Storm water retention shall be provided and shall follow the criteria as set forth in the Storm Chapter of these Public Works Standards. Parking lot construction done in conjunction with a project covered by the site plan review process shall be exempt from a parking lot construction permit. Requirements for construction of such a lot will be determined through the site plan review process.

Four sets of plans and specifications shall be required to be submitted for review and approval by the City with respect to storm drainage discharge and on-site retention or detention; matching street and/or sidewalk grades; access locations; parking layout; and to check for future street improvement conformity and City zoning regulations.

Parking lot surfacing materials shall satisfy the requirement for a permanent all weather surface. Asphalt concrete pavement and cement concrete pavement satisfy this requirement and are approved materials. The parking lot section for heavy traffic and general traffic areas shall be specified in detail. Gravel surfaces are not acceptable or approved surface material types. Combination grass/paving systems are approved surface material types; however, their use requires submittal of an overall parking lot paving plan showing the limits of the grass/paving systems and a description of how the systems will be irrigated and maintained. If the City Engineer determines the grass/paving system is not appropriate for the specific application, alternate approved surfacing materials shall be utilized.

Minimum requirements for parking lot capacity shall be determined at site plan review. The configuration of the stalls shall be as outlined by the City Planner. Remodels of existing buildings or remodels of existing residential units can improve their existing parking lots and drainage systems by an agreement with the property owner and owner of the business. This agreement will allow for the construction of the drainage system within 90 days and completion of the paving within one year's time. Such agreements will be signed before the issuance of a temporary business license.