SECTION 4

4. STREET AND ASPHALT CONCRETE PATHS AND/OR BIKEWAYS STANDARDS

4.01 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.

Development of properties on or tributary to substandard or unsafe (safety issues) roadways may, depending on the size and type of development, be cause for "off-site" improvements to the substandard or unsafe corridors, to include road drainage facilities. The City Engineer shall determine when and if such conditions exist. At a minimum "half street improvements" will be required as a condition of development in and along the entire property as it abuts City rights-of-way.

This Chapter provides *minimum* street design standards as well as minimum design standards for "stand alone" pedestrian and/or bike trails/paths. Higher design and construction standards may be warranted due to localized design and construction parameters, and, impacts caused to the existing system.

4.02 Streets

A. General

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

B. Design Standards

The design of streets and roads shall depend upon their type and usage. The design elements of streets shall conform to City standards as set forth herein.

The layout of streets shall provide for the continuation of existing arterial and collector streets in adjoining subdivisions or of their proper projection when adjoining property is not subdivided. Local access streets, which serve primarily to

connect neighborhoods and provide access to abutting property, shall be designed to discourage through traffic. See the table of the Minimum Street Design Standards.

1. Grade. Street profile grade should conform closely to the natural contour of the land. In some cases, a different grade may be required by the City Engineer. Unless otherwise approved by the City, the minimum profile grade shall be 0.5 percent. The maximum allowable grade shall be 15 percent, depending upon the street classification, unless otherwise approved in writing by the City.

2. 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 vertical curb to face of vertical curb on streets with cement concrete curb and gutter, and from centerline of gutter to centerline of gutter or streets without concrete vertical curb and gutter. Vertical concrete curb is the typical City Standard.

3. The developer is required to retain a licensed Geotechnical Engineer to make soils tests and to provide engineering recommendations for design of the sub-base and roadway sections based on “in place” soils, depth of “free draining” structural materials, projected pavement loadings, roadway classification, average daily traffic volume, etc.

4. In special circumstances, as may be specifically approved/required by the City Planning Commission and/or City Council, due to local conditions and/or geometric restrictions, paving widths or improvement standards may be required which are different than those specifically listed herein.

5. There shall be no islands in the center of any cul-de-sac without specific City council approval.

6. The location and alignment of streets shall generally conform to existing streets and to the City’s official street naming policy or ordinance except where, in the

opinion of the City Engineer, topography or some physical features eliminate the possibility of connecting these streets in the future. The City Council shall approve all street names after consultation with the Cowlitz County Emergency Services.

7. Streets and lots shall be placed in relationship to natural topography so that grading and filling and/or other alternations of existing conditions is minimized. Reserve strips or street plugs controlling access to streets will not be approved unless, in the judgment of the City Engineer, such is necessary for the protection of the public welfare or substantial property rights, and in such cases they will be required. The control and disposal of the land comprising such strips or plugs shall be placed within the jurisdiction of the City.

8. If, in the opinion of the City Engineer, it is necessary to give access to, or permit future subdivision of adjoining land, streets shall be extended to the boundary of the subdivision and the resulting dead-end street shall be provided with a temporary cul-de-sac. The cul-de-sac shall be paved, and constructed to City standards.

9. Half streets will only be approved where the City and Fire Marshal's office determine that they are necessary at the boundary of plats to facilitate development on adjacent parcels and where they don't adversely impact public safety.

10. Street layout in residential subdivisions should maintain a minimum intersecting street spacing for local and collector streets of 500 feet. No streets should intersect at intervals closer than 125 feet, unless, in the judgment of the City Engineer, an exception to this rule would be in the public interest.

11. The street system in residential subdivisions should be laid out to limit the number of intersections with arterial streets at intersections closer than 1,320 feet.

12. Streets shall be laid out so as to intersect as nearly as possible at right angles, and in any event, no street shall intersect with any other street at an angle of less than seventy degrees, without specific written City approval.

13. Streets shall conform to all requirements of the latest edition of the International Fire Code adopted by the City.

14. All street construction plans shall be submitted to the City and shall include the following required information:

- Plan and profile;
- Street name;
- Centerline bearings;
- Centerline/baseline stationing;
- Centerline elevations every 50 feet;
- Gutterline elevations every 50 feet if not standard crown;
- Slope shall be in percent;
- Transverse slope: Two percent standard crown (to be used unless approved/required by City;
- Longitudinal slope - see design standard table;
- Horizontal and vertical curves shall be required when a change of centerline grade occurs greater than one percent:
  a. Fifty feet minimum length;
  b. Elevations required at twenty five feet stations and at the P.C., P.I., P.T. and low point or high point;
- Longitudinal gutterline slope - see design standard table;
- Pavement cross sections per City standard detail;
- Accurate locations of monuments at all centerline intersections, cul-de-sacs;
- Length and width of sidewalks and driveways;
- Curb and gutter;
- Wheelchair ramps;
- Illumination. (Illumination not required to be shown on same sheet as on plan/profile, but approval at location of miscellaneous utilities (i.e., gas, power, CATV, cable) as required. Plan shall be submitted to City Engineer for approval prior to installation.)
  a. Luminaries - location, material, height and wattage.
  b. Service cabinet - location and material.

c. Conduits and wire - location, material size and depth.
d. Junction boxes - location and material;

Channelization and Signing:

a. Lane markers - location and type.
b. Pavement markings - location and type.
c. Signs - location and type.

15. Grades (slopes).

a. Grades shall be as shown in the Minimum Street Design Standard Table.
b. Grades of pedestrian ways or crosswalks shall not be more than eight percent (unless otherwise approached in writing by the City Engineer).
c. All vertically aligned profile grade changes shall be connected with a vertical curve, which shall have a minimum k-value as shown in Tables 4-1 and 4-2.

TABLE 4-1

Design Controls for Crest Vertical Curves Based on Stopping Sight Distance

DESIGN SPEED	MINIMUM k
25	20 - 20
30	30 - 30
35	40-50
40	60 - 80
45	80- 120
50	110 - 160
55	150 - 220

$k = \frac{L}{A}$ = feet / Percent

A = Algebraic Difference in grades, percent
L = Length of vertical curve, feet.

TABLE 4-2

Design Controls for Sag Vertical Curves
Based on Stopping Sight Distance

DESIGN SPEED	MINIMUM k
25	30 - 30
30	40 - 40
35	50 - 50
40	60 - 70
45	70 - 90
50	90 - 110
55	100- 130

k = L = feet A = Algebraic Difference in grades, percent
A Percent L = Length of vertical curve, feet.

16. At street intersections, property line corners shall be rounded by an arc, the minimum radii of which shall be twenty feet. In business districts, a chord may be substituted for such arc if specifically approved by the City Engineer.

18. All public streets, sidewalks and alleys shall conform to one of the herein referenced minimum construction standards and shall be adjusted as necessary to match existing facilities, serve the proposed development, and meet the needs of anticipated future development;

19. All topsoil and unsuitable soils shall be removed from below the proposed street between the back of sidewalks.

20. In addition to the above requirements, street design shall incorporate the following minimum requirements:

    a. **All new utility systems such as power, gas, cable TV and telephone shall be buried,** except where topography or site conditions prohibit reasonable installation. Design and installation of the system shall be done by the franchised utility company. Design shall be submitted to the City Engineer for review and approval prior to installation;

    b. **Any project of sixteen dwelling units or more, accessing off of an arterial road requires a center turn lane and right hand turn lanes unless a traffic**

study shows that such lanes are not warranted;

c. Roads are to be saw cut before permanent patch is made or new AC pavement is tied into existing road;

22. The General Notes numbered 1 through 7, as shown and further referenced herein, shall be included or referenced on any plans submitted to the City for construction approval dealing with street design.

GENERAL NOTES (STREET CONSTRUCTION)

1. All workmanship and materials shall be in accordance with current City of Castle Rock Standards and current amendments thereto and the 2006 State of Washington Standard Specifications for Road, Bridge, and Municipal Construction, and any current amendments thereto, amended as per City Standards.

2. The contractor shall be responsible for all traffic control in accordance with the MUTCD manual. Prior to disruption of any traffic, traffic control plans shall be prepared and submitted to the City for possible approval. No work shall commence until all approved traffic control is in place. Work shall cease when traffic control fails to meet minimum requirements.

3. All curb and gutter, street grades, sidewalk grades, and any other vertical and/or horizontal alignment shall be staked by an engineering or surveying firm capable of performing such work. Such firms shall be currently licensed in the State of Washington to perform such work.

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. A sand blanket shall be applied to the surface to minimize “tracking” of same.

5. Compaction of subgrade, rock, and asphalt shall be in accordance with the WSDOT Standard Specifications.

6. Form and subgrade inspection by the City is required before pouring concrete. A minimum 48-hours notice is required to be provided to the Public Works Director for form inspection.

7. See City of Castle Rock Standards for testing and sampling frequencies.

4.03 Functional Classification

City streets are divided into major (or principal) arterial, minor (or secondary) arterial, collector, local access, minor access, and half street 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 proponent/developer shall request information on the functional classification of existing streets from the Public Works Director. New streets will be classified by the City.

Generally speaking, the functional classification of streets are defined as follows:

a. Major arterials are defined as streets connecting two or more arterials together or serving industrial areas.

b. Minor arterials are defined as streets connecting two or more collector streets.

c. Collector streets are defined as streets currently serving or anticipated to serve more than 64 dwelling units or connecting to an arterial.

d. Local access streets currently serving or anticipated to serve in the future up to 64 dwelling units.

e. Alley is defined as a strip of land dedicated for public use which is 20 feet in width between property lines and which is intended to provide driveway access to adjacent properties. Alleys shall not be the only access to a parcel. All lots should front on a public street.

MINIMUM STREET DESIGN STANDARDS

Design Standard	Major Arterial	Minor Arterial	Collector	Local Access	Alley
Minimum Right-of-Way	100'	80'	60'	50'	20'
Minimum Pavement Width*	52'	40'	36'	36'****	20'
Travel Lanes and Minimum Width	4 – 12'	2 – 12'	2 – 10'	2 – 10'	2 – 10'
Center Turn Lane**	No	Yes (12')	No	No	No
Parking Lane	None	None	Both Sides	Both Sides	None
Minimum / Maximum Grade	0.5%-10%	0.5%-10%	0.5%-15%	0.5%-15%	0.5%-15%
Curb	Cement Concrete Curb and Gutter Both Sides	Cement Concrete Curb and Gutter Both Sides	Cement Concrete Curb and Gutter Both Sides	Cement Concrete Curb and Gutter Both Sides	None: Center Gutter
Sidewalks	6' Both Sides: (commercial areas may require up to 10' widths at discretion of planning commission)	6' Both Sides: (commercial areas may require up to 10' widths at discretion of planning commission)	5' Both Sides	5' Both Sides	None
Planter Strip	5'	5'	5	5'	N/A
Intersection Curb Radius	30'	30'	30'	25'	15'
Design Speed (MPH)	35	35	25	25	25
Minimum Centerline Radius for Normal Crown***	520'	520'	205'	205'	NA
Stopping Site Distance	250'	250'	155'	155'	155'

NOTES:

* Pavement Section for arterials includes 2 foot shoulder on each side

** Center turn lane may be required based on Traffic Impact Analysis.

*** Low speed horizontal curve design as shown in Table 4-3 may be used on Local Access Streets.

**** Upon approval by the City, Residential Local Streets may be reduced in width to 28 feet, with only one parking lane, if developments provide at least 4 off street parking spaces for each lot.

TABLE 4-3

Minimum Centerline And Curb Radius For Low Speed Curves

		Up to 75°	75° & Over
A.	Minimum Centerline Radius (2-lane)	100’	55’
B.	Minimum Curb Radius	80’	35’

4.04 Street Names

The City shall review all proposed street names to insure that the name assigned to a new street is consistent with City policies.

An address number will be assigned to all new buildings at the time the building permit is issued by the City. 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 ingress.

4.05 Signing

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

Street designation signs, including poles and hardware, will be paid for by the developer. Street designation signs shall display street names or grid numbers as applicable. The City shall approve locations, numbers, size and type of street signs.

4.06 Right-of-Way

Required right-of-way is determined by the functional classification of a street. See Minimum Street Design Standards Table for specific additional information. At the time of site plan approval or land use approval, the City may require additional right-of-way to be dedicated to bring existing streets to current street standards.

Additional roadside easements will be required to facilitate future roadway widening at the discretion of the City.

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 proposed and/or required by the

City.

Right-of-way shall be conveyed to the City on a recorded plat or by a right-of-way dedication deed. All costs of same to be borne by the property owner/developer.

4.07 Street Frontage Improvements

A. All commercial and residential development, plats, and short plats shall install street frontage improvements at the time of construction as required by the City. Such improvements may include curb and gutter, sidewalk, street storm drainage, street lighting system, utility relocation, landscaping and irrigation, and street widening all per these Standards. Plans shall be prepared and signed by a licensed civil engineer currently registered in the State of Washington.

B. All frontage improvements shall be made across full frontage of property from centerline to right-of-way line.

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 City shall be completed which provide for these improvements to be installed at a later date by the applicant or by the applicant's signing of a waiver of protest in a Local Improvement District (L.I.D.), or Utility Local Improvement District (U.L.I.D.).

4.08 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 of 45 feet for residential streets and 50 feet for industrial commercial streets. Right-of-way radius shall be 10 feet greater than the paved radius.

4.09 Temporary Dead Ends

Where a street is *temporarily* dead ended, turn around provisions must be provided where the road serves more than two lots. If pre-approved by the local fire marshal and the City the turn around may be a hammerhead with a minimum inside turning radius of 35 feet and a minimum distance on both sides at the centerline intersection of 60 feet to facilitate emergency vehicle turn-around.

4.10 Intersections

A. Traffic control will be as specified in the Manual on Uniform Traffic Control Devices (MUTCD) or as may be specifically modified by the City Public Works Director as a result of appropriate traffic engineering studies. Intersection traffic control devices may include stop signs, signals, or roundabouts.

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 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 streets;

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:

When highest classification involved is:	Minimum centerline offset should be:
Major Arterial	350 feet
Minor Arterial	300 feet
Collector	300 feet
Local Access	150 feet

When different class streets intersect, the higher standard shall apply on curb radii. 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 1 foot difference in elevation for a distance of 30 feet approaching any arterial or collector or 20 feet approaching a local access street, measured from nearest right-of-way line (extended) of intersecting street.

4.11 Driveways

A. General

1. Driveway details are located at the end of these Standards.

2. 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, at the Property Owner's expense.

3. All driveways shall be constructed of Portland Concrete Cement, and shall be at least 6 inches thick, over a 4-inch crushed surfacing (5/8" minus) top course. Driveways shall be subject to the same testing and inspection requirements as curb, gutter, and sidewalk construction.

4. Joint-use driveways serving two adjacent parcels shall be considered and 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.

5. 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. The grades of all driveway approaches are to be approved by the City.

6. No commercial driveway shall be approved where backing onto the sidewalk or street will occur.

7. No driveway aprons shall extend into the street further than the face of the curb.

8. The angle between any driveway and the street shall be not less than 45°.

9. The two edges of each driveway shall be parallel.

10. Every driveway must provide access to a garage, carport, parking apron or other structure on private property requiring the entrance of vehicles. No public curb shall be cut unless a driveway is installed.

11. Maintenance of driveway approaches shall be the responsibility of the owners whose property they serve.

12. A driveway permit shall be required. No person shall begin work on the construction, alteration, repair or removal of any driveway or the paving of any parking strip on and/or adjacent to any street, alley or other public place in the City without first obtaining a permit from the City. Exceptions to permit acquisition requirements may be granted at the discretion of the Public Works Director and/or Building Official.

13. Driveway Location:

    No driveway shall be located as to create a hazard to pedestrians, bicyclists or motorists or to invite or compel illegal or unsafe traffic movements.

14. No driveway shall be constructed in such a manner as to be a hazard to any existing street lighting standard, utility pole, traffic regulating device or fire hydrant. The cost of relocating any such street structure when necessary to do so shall be paid by the abutting property owner. The relocation of any street structure shall be allowed with the specific written approval of the Owner of the structure involved.

15. Driveway approach to City streets to be paved, unless otherwise approved by the Public Works Director. In no case shall a concrete sidewalk be paved over with asphalt.

16. Driveway Size and Number:

    a. Except as otherwise provided, the width of any residential driveway shall not exceed 24 feet (exclusive of the radii of the returns). The maximum width for any commercial driveway shall be thirty feet unless a large percentage of large truck traffic uses the driveway. The City Engineer may authorize additional residential

driveway widths for three-car garages or for access driveways necessary for off-street parking or recreational vehicles.

b. The width of any driveway shall not be less than 12 feet, exclusive of the radii of the returns.
c. The total width of all driveways for any one ownership on a street shall not exceed 40 percent of that ownership along the street.
d. The length of any driveway shall not exceed 150 feet.
e. There shall not be more than two driveways on one street for any one ownership except where a single ownership is developed into more than one unit of operation, each sufficient in itself to meet the requirements of off-street parking and loading as required by the zoning ordinance and where the necessity for separate access to the street is evident. In such cases, there shall not be more than two driveways on the street for any one unit of operation.

17. Driveway Slopes:

Driveway slopes or grades shall not exceed fifteen (15%) percent unless otherwise authorized/approved by the City Engineer in writing. The City Engineer will consider authorizing driveway slopes exceeding fifteen percent, if it is determined that:

a. The steeper driveway is the only reasonably economical and environmentally reasonable alternative.
b. The driveway will not present a traffic, pedestrian, bicycle or safety hazard.
c. The police and fire chief concur in allowing the increased driveway slope.
d. The public health, safety and general welfare will not be adversely affected.

18. Driveway Access:

a. No driveway may access an arterial street within 75 feet (measured along the arterial) of any other such arterial street access on either side of the street; provided, that such access may be located directly opposite another access.

b. No driveway access shall be allowed onto an arterial street within 150 feet of the nearest right-of-way line of an intersecting street. No driveway shall be located within 20 feet of a crosswalk.

c. Within the limitations set forth above, access to arterial streets within the City shall be limited to one driveway for each tract of property separately owned, except that automobile service stations may be allowed two driveways as further stated herein.

d. Driveways giving direct access onto arterials may be denied if alternate access is available. Deviations of these standards may be permitted by the City Engineer.

e. In general, residential and commercial driveways, except automobile service stations, shall not exceed the following maximum widths:

PRIVATE OR COMMERCIAL DRIVEWAYS
(EXCEPT AUTOMOBILE SERVICE STATIONS)

PROPERTY FRONTAGE	MAXIMUM DRIVEWAY WIDTH
<16'	8'
16' to 30'	8' or 30% of frontage
>30' to 50'	12' or 30% of frontage
>50' to 75'	22'
>75' to 100'	24'

In general, service station driveways shall not exceed the following maximum widths.

AUTOMOBILE SERVICE STATIONS

MAXIMUM DRIVEWAY FRONTAGE	NUMBER OF DRIVEWAYS	MAXIMUM PROPERTY WIDTH
<16'	1	8'
16' to 30'	1	50% of frontage
>30' to 50'	1	22'
>50' to 75'	1	26'
	or 2	18'
>75' - 1,000'	1	30'
	or 2	22'

f. 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 required/desired, or where multiple exit or entrance lanes are needed.

g. Parking lot circulation and signing needs shall be met on site. The public right-of-way shall not be utilized as part of a parking lot flow.

h. Road approaches and/or ingress and egress tapers may be required in industrial and commercially zoned areas as directed by the City Engineer.

4.12 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. See detail at the end of these Standards. The area within the triangle shall be subject to restrictions to maintain a clear view on the intersection approaches.

Sight Distance Triangle:

Stop or Yield Controlled Intersection:

		Sight Distance (Ft.) (A) (B)
Speed Limit	Major Street	Minor Street
20 mph	225	*
25 mph	280	*
30 mph	335	*
35 mph	390	*
40 mph	445	*

* 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.

Uncontrolled Intersection:

		Sight Distance (Ft.) (A) (B)
Speed Limit	Major Street	Minor Street
20 mph	90	90
25 mph	115	115
30 mph	140	140
35 mph	165	165
40 mph	195	195

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.

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 of a hedge which are so planted and trimmed as to leave at all seasons a clear and unobstructed cross view, buildings constructed in conformance with the provisions of appropriate zoning regulations and preexisting buildings.

4.13 Subgrade Preparation

The subgrade area of the street right-of-way shall be cleared of brush, weeds, vegetation, grass and debris, per Section 2-01 of the aforementioned Washington State Standard Specifications. All cleared and grubbed material shall be satisfactorily disposed of. All depressions, or ruts, which contain water will be drained.

The subgrade shall then be bladed and dragged to remove inequalities and secure a uniform surface. The existing subgrade will be compacted to a minimum density as defined in the Washington State Standard Specifications and as witnessed by the City Inspector. Compaction tests may be required to be conducted at the discretion of the City to verify same.

4.14 Crushed Surfacing (Base and Top Course)

Surfacing shall consist of the construction of two or more courses of crushed stone upon an existing roadway surface, or upon a subgrade properly prepared as outlined above. Crushed surfacing material shall be uniform in quality and substantially free from wood, roots, bark and other extraneous material. It will compact into a dense and unyielding mass which will be true to line, grade and cross-section. It shall meet the following test requirements:

Los Angeles Wear, 500 Rev. (ASTM Designation C 131) 35% Max.
Grading Requirement (% by weight)

Percent Passing	Base Course	Top Course
1-1/4" square sieve	100	
5/8" square sieve	50 to 80	100
U.S. No. 4 sieve	30 to 50	50 to 65
U.S. No. 40 sieve	3 to 18	8 to 23
U.S. No. 200 sieve (wet sieving)	7.5 Max.	10 Max.
Sand equivalent	40 Min.	40 Min.

Base courses and top courses shall be placed in accordance with the approved cross-section. Compaction shall be a minimum of 95 percent standard density as determined by the compaction control test for granular materials. Base course rock may be composed of larger fractured rock if recommended by the developer's engineer and approved by the City Engineer.

4.15 Surfacing Requirements

All streets in the City will be paved with either Hot Mix Asphalt or Cement Concrete, in strict compliance with these standards.

The pavement design shall meet the requirements in the latest publication of the AASHTO Guide for Design of Pavement Structures. The pavement section shall be designed and stamped by an engineer currently licensed in the State of Washington.

One soil sample per each 500 LF of centerline with 3 minimum per project representative of the roadway subgrade shall be taken by the Developer and delivered to a City approved soils lab in order to determine a statistical representation of the existing soil conditions.

Soil tests shall be performed by an engineering firm specializing in soils analysis and currently licensed in the State of Washington.

The soils report, signed and stamped by a soils engineer licensed by the State of Washington, shall be based on actual soils tests and submitted with the plans. All depths indicated are a minimum compacted depth.

Construction of streets paved with Hot Mix Asphalt shall conform to Section 5-04 of the Standard Specifications. Pavement material will be HMA Class B PG 58-22 and be constructed at least 2 inches thick (minimum compacted thickness) over the prepared crushed surface, top course, or asphalt treated base. Mechanical spreading and finishing will be as described in Section 5-04.3(9) of the Standard Specifications. Compaction will be performed by the equipment and methods presented in Section 5-04.3(10) of the Standard Specifications, and Surface Smoothness shall satisfy the requirement of Section 5-04.3(13) of the Standard Specifications.

Cement concrete streets will be constructed as specified in Section 5-05 of the Standard Specifications.
Permanent pavement patching will be performed as described in the pavement repair detail listed herein, and in compliance with Section 5-04 of the Standard Specifications. All fill material will be placed in lifts no thicker than six inches and mechanically compacted to 95 percent of standard density, as described in Section 2-03 of the Standard Specifications and to the satisfaction of the City Inspector.

4.16 Temporary Street Patching

Temporary restoration of trenches shall be accomplished by using 2-inch HMA Class B PG 58-22 when available or 4-inch medium-curing (MC-250) liquid asphalt (cold mix), 3-inch Asphalt Treated Base (ATB), or steel plates suitable for H-20 traffic loading conditions. Steel plates shall be provided with a cold mix "lip" to accommodate a smooth transition from pavement to steel plate.

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. All temporary patch materials shall be loaded and hauled to waste by the Developer, in compliance with applicable governmental regulations.

If the contractor is unable to maintain a patch for whatever reason, the City will patch it at actual cost plus overhead and materials. The property owner/developer/permittee shall be invoiced for any City expenses incurred to comply with this Contractor requirement.

Adequate signage per MUTCD shall be provided.

4.17 Trench Backfill and Restoration

Trench restoration shall be either by a patch or patch plus overlay as required by the City. This section along with Section 7 – Sanitary Sewer Standards, provides pavement restoration requirements.

A. All trench and pavement cuts shall be made by sawcuts. The cuts shall be a minimum of 1 foot outside the trench width.

B. All trenching shall be backfilled with gravel base, Class B, or crushed surfacing materials conforming to Section 4 of the WSDOT Standard Specifications. The trench shall be compacted to 95 percent maximum density, as described in Section 2-03 of the WSDOT Standard Specifications. The City will be the sole judge of approving materials to be utilized for backfill. Typically, crushed rock (5/8-inch minus) shall be placed and compacted in the trench sections for all street crossings.

   If the existing material is determined by the City to be suitable for backfill, the contractor may use the native material except that the top 12 inches of trench shall be 5/8-inch minus crushed rock. Exceptions may be granted by the City based on site

evaluation of excavated materials. All trench backfill materials shall be compacted to 95 percent density.

Backfill compaction shall be performed in 6-inch lifts, unless otherwise approved by the City.

Replacement of the asphalt concrete or Portland concrete cement shall match existing asphalt concrete or Portland concrete cement depth, except asphalt shall be a minimum compacted thickness of 2 inches and concrete cement shall be a minimum compacted thickness of 6 inches.

C. Tack shall be applied to the existing pavement and edge of cut and shall be emulsified asphalt grade CSS-1 as specified in Section 9-02.1(6) of the WSDOT Standard Specifications. Tack coat shall be applied as specified in Section 5-04 of the WSDOT Standard Specifications.

D. HMA Class B PG 58-22 shall be placed on the prepared surface by an approved paving machine and shall be in accordance with the applicable requirements of Section 5-04 of the WSDOT Standard Specifications, 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. Fine and coarse aggregate for asphalt concrete shall be in accordance with Section 9-03.8 of the WSDOT Standard Specifications. Asphalt concrete over 2 inches thick shall be placed and compacted 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 Inspector shall be accomplished by raking out the oversized aggregates from the HMA mix as appropriate.

Surface smoothness shall be per Section 5-04.3(13) of the WSDOT Standard Specifications. 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 and shall be completed within 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 of overlay work is allowable only subject to the Public Works Director's approval. The Public Works Director 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 required by the City.

4.18 Survey Staking

All surveying and staking shall be performed by an engineering or surveying firm employed by the Developer and capable of performing such work. The engineer or surveyor performing and directing such work shall be currently licensed by the State of Washington to perform said task.

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 streets shall be as follows:

A. Stake centerline alignment every 25 feet (50 feet in tangent sections) with cuts and/or fills to subgrade.

B. Stake top of ballast and top of crushed surfacing at centerline and edge of pavement every 25 feet.

C. Stake top back of curb at a consistent offset for vertical and horizontal alignment.

4.19 Material and Construction Testing

Testing shall be required at the developer's or contractor's expense. The testing shall be ordered by the developer or contractor and the chosen testing lab shall be preapproved by the City. Testing shall be done on all materials and construction as specified in the WSDOT Standard Specifications and with frequency as required by the City engineer up to the maximum frequency as specified herein.

In addition, the City shall be notified before each phase that street

construction commences (i.e., staking, grading, subgrade, ballast, base, top course, and surfacing).

CITY OF CASTLE ROCK
TESTING AND SAMPLING FREQUENCY GUIDE

ITEM	TYPE OF TESTS	MIN. NO.	FREQUENCY
GRAVEL BORROW	GRADING & SE	1 EACH	1-4000 TON
SAND DRAINAGE BLANKET	GRADING	1 EACH	1-4000 TON
CSTC	GRADING, SE & FRACTURE	1 EACH	1-2000 TON
CSBC	GRADING, SE & FRACTURE	1 EACH	1-2000 TON
BALLAST	GRADING, SE & DUST RATIO	1 EACH	1-2000 TON
BACKFILL/SAND DRAINS	GRADING	1 EACH	1-2000 TON
GRAVEL BACKFILL FOR:			
FOUNDATIONS	GRADING, SE & DUST RATIO	1 EACH	1-1000 TON
WALLS	GRADING, SE & DUST RATIO	1 EACH	1-1000 TON
PIPE BEDDING	GRADING, SE & DUST RATIO	1 EACH	1-1000 TON
DRAINS	GRADING	1 EACH	1-100 TON
PCC STRUCTURES: (Sidewalk, Curb and Gutter, Foundations)			
COARSE AGGREGATE	GRADING	1 EACH	1-1000 TON
FINE AGGREGATE	GRADING	1 EACH	1-500 TON
CONSISTENCY	SLUMP	1 EACH	1-100 CY
AIR CONTENT	AIR	1 EACH	1-100 CY
CYLINDERS (28 DAY)	COMPRESSIVE STRENGTH	2 EACH	1-100 CY
CEMENT:	CHEMICAL & PHYSICAL CERTIFICATION	1	1-JOB
HOT MIX ASPHALT:			
BLEND SAND	SE	1 EACH	1-1000 TON
MINERAL FILLER	S.G. & PI, CERTIFICATION	1	1-JOB
COMPLETED MIX	FRACTURE, SE, GRADING, ASPHALT CONTENT	1 EACH	1-1000 TON
	COMPACTION	2 EACH	5-400 TON
ASPHALT TREATED BASE:			
COMPLETED MIX	SE, GRADING, ASPHALT CONTENT	1 EACH	1-1000 TON
	COMPACTION	1 EACH	5-Control Lot*
ASPHALT MATERIALS	CERTIFICATION	1	1-JOB
RUBBERIZED ASPHALT:	CERTIFICATION	1	1-JOB
COMPACTION TESTING:			
EMBANKMENT	COMPACTION	1 EACH	1-500 LF
CUT SECTION	COMPACTION	1 EACH	1-500 LF
CSTC	COMPACTION	1 EACH	1-500 LF
CSBC	COMPACTION	1 EACH	1-500 LF

BALLAST	COMPACTION	1 EACH	1-500 LF
TRENCH BACKFILL	COMPACTION	1 EACH	1-500 LF

SE = Sand Equivalency

* A control lot shall be a normal day's production. For minor quantities 200 tons or less per day, a minimum of two gauge readings shall be taken.

4.20 Sidewalks, Curbs And Gutters

A. General

All properties within commercial zones of the City, properties abutting arterial streets, collectors or local access streets shall, in conjunction with new construction on such properties or alterations, reconstruction, or improvements, where the total cost of construction, reconstruction or remodeling in the opinion of the City warrants frontage improvements, shall be required to provide sidewalks, curbs and gutters along abutting streets. See Details provided herein. Single-family residences, not associated with short plats or long plats, shall be exempt from this requirement.

B. 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 shown in details 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 City should the City Engineer feel circumstances require variances to minimum design standards.

C. Sidewalks

Sidewalks shall be constructed of Portland Cement Concrete, 4 inches thick (6 inch thick at driveway sections) per Section 8-14 of the WSDOT Standard Specifications. When the sidewalk, curb and gutter are contiguous, the width of the sidewalk shall be measured from back of curb to back of sidewalk.

Sidewalks will be constructed on a compacted gravel base (Class B), or 5/8-inch minus crushed rock of suitable thickness to provide a firm and unyielding base. Sidewalks will be

constructed of Portland Cement Concrete as described in Section 8-14 of the Standard Specifications and be designed and constructed in compliance with those Details as shown herein. Typically, in downtown commercially zoned areas the sidewalks shall abut the curb. The Planning Commission and/or City Council shall be at liberty to vary sidewalk dimensional characteristics and location to meet localized or existing conditions.

The sidewalk thickness shall be as follows:

SIDEWALK LOCATION	SIDEWALK THICKNESS
Typical sidewalk	4" thick
Driveway sections	6" thick

The sidewalks will be divided into 5-foot lengths by contraction joints, and expansion joints will be at intervals of no more than 15 feet. Joints shall be filled with an asphalt mastic material.

1. Arterial Streets. Sidewalks, curbs and gutters shall be required on both sides of all major and minor arterial streets. Sidewalks, curbs and gutters shall also be required on the development side of streets abutting the exterior of said development.

   The sidewalks shall be a minimum of 6 feet in width. At discretion of Planning Commission and/or City Council, in commercial corridors sidewalks up to 10 feet wide may be required. See Detail.

2. Collector and Local Access Streets. Sidewalks shall be required on both sides of collector and local access streets interior to the development and on the development side of collector and local access streets abutting the exterior of said development including cul-de-sacs.

   The sidewalks on collector and Local Access Streets shall be a minimum of 5 feet wide. See Detail.

3. The design and construction of all sidewalks, curbs, gutters and walkways shall meet the following minimum standards:

The width of sidewalks shall be as shown in details. The City Public Works Department shall require that the design of all sidewalks provides for a gradual rather than an abrupt transition between sidewalks of different widths or alignments.

4. Form and subgrade inspection by the City, are required before sidewalk is poured.

5. Monolithic pour of curb, gutter and sidewalk will not be allowed.

6. For driveway requirements, see Section 4.11 herein.

D. 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 Cement Concrete in accordance with Section 8-04 of the Standard Specifications. Curbs shall be of the vertical face type. No rolled curb and gutter profile will be allowed without specific approval of the Public Works Director. When rolled curbs are approved, all sidewalks within the Plat shall be a minimum 6 inches thick.

Extruded curb and gutter per WSDOT Standard Specifications is allowed only with the specific approval of the City Engineer.

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

Forms, wood or steel, shall be staked securely in place, true to line and grade.

Sufficient support shall be given to the form to prevent movement in any direction, resulting from the weight of the concrete or the concrete placement. Forms shall not be set until the subgrade has been compacted within 1 inch of the established grade. Forms shall be clean and well oiled prior to setting in place. When set, the top of the form shall not depart from grade more than 1/8 inch when checked with a 10-foot straightedge. The alignment shall not vary more than 1/4 inch in 10 feet. Immediately prior to placing the concrete, forms shall be carefully inspected for proper grading, alignment and rigid construction. Adjustments and repairs as needed shall be

completed before placing concrete.

The subgrade shall be properly compacted and brought to specified grade before placing concrete. The subgrade shall be thoroughly dampened immediately prior to the placement of the concrete. Concrete shall be spaded and tamped thoroughly into the forms to provide a dense, compacted concrete free of rock pockets. The exposed surfaces shall be floated, finished and brushed longitudinally with a fiber hair brush approved by the City's inspector and/or engineer.

The face form of the curb shall be stripped at such time in the early curing as will enable inspection and correction of all irregularities that appear thereon.

Forms shall not be removed until the concrete has set sufficiently to retain its true shape. The face of the curb shall be troweled with a tool cut to the exact section of the curb and at the same time maintain the shape, grade and alignment of the curb. The exposed surface of the curb shall be brushed with a fiber hair brush.

White pigmented or transparent curing compounds shall be applied to all exposed surfaces immediately after finishing. Transparent curing compounds shall contain a color dye of sufficient strength to render the film distinctly visible on the concrete for a minimum period of 4 hours after application.

When the curb section is to be placed separately, the surface of the gutter directly underneath the curb section shall be covered with a protective cover to protect that area from the curing agent when the gutter is sprayed. This cover must remain in place until the curb is placed. Care shall be taken in the placing of this cover to prevent the steel dowels from puncturing the cover.

If, at any time during the curing period any of the forms are removed, a coat of curing compound shall be applied immediately to the exposed surface. The curing compound shall be applied in sufficient quantity to obscure the natural color of the concrete. Additional coats shall be applied if the City Inspector determines that the coverage is not adequate. The concrete shall be cured for the minimum period of 72 hours time set forth in Section 8-04 of the Standard Specifications.

Joints shall be constructed in the manner and at the locations shown in Details SW-1 and SW-2. They shall be cleaned and edged as shown on the drawings. All expansion and contraction joints shall extend entirely through the curb section above the pavement surface. Joint filler in the curb shall be normal to the pavement and in full but contact with pavement joint filler.

E. Handicap Ramps

All sidewalks must be constructed to provide for handicap ramps in accordance with the current standards of applicable state law. Ramps shall be provided at each corner of every intersection. Details provided herein are minimum and subject to change.

Handicap Ramps shall be constructed of Portland Cement Concrete. Form and subgrade inspection by the City are required before handicap ramp is poured.

F. Survey Staking

All surveying and staking shall be performed by an engineer or surveying firm employed by the Developer and capable of performing such work. The engineering or surveyor directing and/or performing such work shall be currently licensed by the State of Washington to perform said task.

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 follows:

Stake top back of curb at a consistent offset for vertical and horizontal alignment every 25 feet (50 feet in tangent sections).

G. Testing

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

At a minimum, one slump test and two test cylinders shall be taken once per day. All other testing frequencies shall be as

specified in the Testing and Sampling Table.

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

4.21 Illumination

A. General

All new commercial or residential subdivisions, short plats or property development requiring review shall provide street lights in accordance with these standards.

B. Design Standards

A street lighting plan submitted by the applicant and approved by the City shall be required for all street light installations. All public street light designs shall be prepared by an engineering firm capable of performing such work. The plans must be prepared in accordance with Cowlitz County PUD Standards as well as the City's Standards contained herein. All developments shall submit the lighting plans on separate sheet. Street light layout plans shall be on separate drawings from the street plan/profile sheets. The final locations shall be approved by the City and comply with these Standards.

Street lighting plans shall include:

a. Street light: location, type, height, and wattage
b. Service Cabinets: location and type
c. Conduits and Wire: location, type, size and length
d. Junction Boxes: locations and types

C. General Material Requirements

a. Conduit

All conduit shall be buried a minimum of 24 inches deep. All roadway crossing shall be Schedule 80 PVC. Conduit shall conform to Section 9-29 of WSDOT Standard Specifications. Schedule 40 PVC may be used in locations other than roadway crossings.

b. Junction Boxes (when required):

Junction boxes shall be installed at locations as shown on the Plans. They will conform to WSDOT Standard J-11a, Type I. They shall be installed within the landscape strip and firmly to prevent future settlement.

c. Conductors, Wire, Etc.:

Wire conductors for underground feeders runs and for circuitry from the in-line fuse in the poles to the Junction Box shall be 600 volt, single conductor stranded copper and insulated with USE grade polyvinyl chloride compound or approved equal in accordance with the Insulated Power Cable Engineer's Association Specifications. An AWG 10 bare solid copper wire or green insulated stranded copper wire will be run from the service ground rod to the safety ground lug on each pole. Feeders shall be sized in accordance with the National Electrical Code. Wires inside pole between ballast and in-line fuses shall be Rome 2C AWG 10 stranded pole and bracket wire or approved equal. Splices will be allowed in junction boxes and poles based only.

d. Fuses:

Luminaire Fusing and Electrical connections at Light Standard Base shall conform to Section 9-29.7 of the State of Washington Standard Specifications. In-line fuse holders shall be SEC mode 1791-SF with FNM-5 fuses or approved equal.

e. Safe Wiring Labels:

The Contractor is advised that Safe Wiring Labels as required by Labor and Industries shall apply on all projects.

f. Location and Spacing:

In general, poles and luminaries shall be spaced as described below to provide average illumination of 0.4-foot candles on the roadway with a Uniformity Ratio of 6 to 1 (average/minimum), as prescribed for a Local-Residential classification with R 2/3 surface in IES Standard RP 8, "Roadway Lighting."

1. Poles shall be spaced 36 inches from the face of the curb.

2. Poles shall be spaced to provide the specified illumination. Locate poles on alternate sides of residential streets wherever possible. Calculations supporting the selected spacing shall be provided.

3. Locate extra luminaires on corners if more than 50 feet from another luminaire.

4. Locate an extra luminaire at the end of a cul-de-sac shorter than 50 feet.

5. Street light conduit for wiring shall be located in the utility easement form power, gas, telephone, and cable TV wherever possible.

For all streets other than "local-residential," please refer to the I.E.S. Standards and provide photometric calculations.

D. Poles and Luminaire

Shall be per the City's standard detail.

4.22 Street Lighting Specifications

Street lighting for all subdivision, commercial and industrial development shall be designed and provided by the developer's engineer. The design plans shall be stamped and signed by a Washington State licensed engineer. The design plans shall be stamped and signed by a Washington State licensed professional electrical engineer. The installation shall be in accordance with the National Electric Code. The installation shall be inspected by the Washington State Department of Labor and Industries Electrical Inspection Division. The design shall meet the following design criteria.

A. Lamp

Lamp shall be Holophane Granville, 150 Watt, HPS, Type II Distribution, Lunar Optics, IES Cutoff, with Asymmetric Refractor. Globe Material shall be Acrylic. IES Classification shall be Type II. Line voltage shall be 240 V (Multi-Tap). Ballast shall be HX-HPF as manufactured by Magnetek/Advance.

B. Pole

Pole shall be 16-foot direct burial Valmont Lexington Aluminum Pole #1508-30505TE. Pole shall be dark green.

C. Conduit

All conduit shall be buried a minimum of 24 inches deep. All roadway crossing shall be rigid metallic or schedule 80 PVC. Conduit shall conform to Section 9-29 of WSDOT Standard Specifications. Schedule 40 PVC may be used in locations other than roadway crossing.

D. Junction Boxes (when required)

Junction boxes shall be installed at locations as shown on the Plans. They will conform to WSDOT Standard J-11a, Type I. They shall be installed within the landscape strip and firmly to prevent future settlement. The cover shall be galvanized and

grounded. The letters "LT" and "ELECTRIC" shall be etched on the cover.

E. Conductors, Wires, etc.

Wire conductors for underground feeders runs and for circuitry from the in-line fuse in the poles to the Junction Box shall be 600 volt, single conductor stranded copper and insulated with USE grade polyvinyl chloride compound or approved equal in accordance with the Insulated Power Cable Engineer's Association Specifications. An AWG 10 bare solid copper wire or green insulated stranded copper wire will be run from the service ground rod to the safety ground lug on each pole. Feeders shall be sized in accordance with the National Electrical Code. Wires inside pole between ballast and in-line fuses shall be Rome 2C AWG 10 stranded pole and bracket wire or approved equal. Splices will be allowed in junction boxes and poles based only. No more than two conduits will be allowed inside street light pole.

F. Fuses

Luminaire Fusing and Electrical connections at Light Standard Base shall conform to Section 9-29.7 of the State of Washington Standard Specifications. In-line fuse holders shall be SEC mode 1791-SF with FNM-5 fuses or approved equal.

G. Electrical Services

- All electrical services shall be Tesco service cabinet catalog #26-000, skyline service cabinet series 47700-pl or approved equivalent.
- Contractor is to verify that detail specifications and equipment locations meet with servicing utility's requirements and City of Castle Rock engineering requirements.
- Conduit size and quantity as required by plans of N.E.C.
- It shall be the contractor's responsibility to coordinate the installation of the street light system with all utilities, private and public, to avoid schedule and location conflicts.

- For residential street lighting the contractor shall be responsible to install one meter for the plat lighting system per Cowlitz County PUD requirements. On very large plats Cowlitz County PUD may require more than one meter.

- Base of service cabinet shall be sealed with silicone or approved equivalent and have a half inch drain hole.

H. Luminaires and Lamps

The city will energize the individual street lights when a home is occupied adjacent to the street light or immediately across the street. At the developer's request, any or all streetlights may be energized prior to the occupancy of homes. However, the developer shall assume full responsibility for electrical power costs and repair costs due to damage from vandalism.

I. Photo cells/shorting caps

Each luminaire shall be supplied with one photo cell and one shorting cap, to be installed at the direction of the City of Castle Rock. Photo cell shall be Fisher Pierce PE Cell Model #7790B.

J. Safe Wiring Labels

The contractor is advised that Safe Wiring Labels required by Labor and Industries shall apply on this project. (Electrical inspection sticker.)

K. Guarantee

The contractor shall surrender to the City of Castle Rock any guarantee of warranty acquired by him as normal trade practice in connection with the purchase of any materials or items used in the construction of the illumination.

L. Location

In general, streetlights shall be located on the highest corner of the intersection. One streetlight will be placed at all new intersections. One streetlight will be placed at all four corners of any new signalized intersection. If less that four streets light approval must be given by Traffic Engineer. One street light will be placed at the entrance of new straight road plats and at the following distances:

- Collector Roadway width 36 feet – 140 feet staggered/one side system.

- Local Roadway width 28 feet – 200 feet staggered/one side system.

The streetlight will be placed near the end of all new cul-de-sac 200 feet of distance from another light location, as determined by the City Engineer an additional streetlight may be added. Streetlight shall be located 16 inch from back of curb unless directed otherwise by the City Engineer. Prior to any work on the streetlight system, the electrical contractor shall review the system with the City Engineer of his approved representative. A streetlight shall not be energized until such time that the residence adjacent to it is occupied.

M. Installation

It shall be the contractor's responsibility to coordinate the installation of the street light system with all utilities, private and public, to avoid schedule and location conflicts. The contractor shall provide written permission from Cowlitz County PUD for the electrical service location, and a copy of the load calculations to the City of Castle Rock.

N. Meter

For residential street lighting the contractor shall be responsible to install one meter for the plat's lighting per Cowlitz County PUD requirements. On very large plats, Cowlitz County PUD may require more than one meter.

4.23 Signals

A. General

Signalization will be required if warranted as determined by an existing study and/or transportation study performed at the request of the City by the Developer.

4.24 Roadside Features

A. General

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

B. Design Standards

The design and placement of roadside features included herein shall adhere to the specific requirements as listed for each feature.

C. Survey Staking

All surveying and staking shall be performed by an engineering or surveying firm employed by the Developer and capable of performing such work. The engineer or surveyor directing and/or performing such work shall be currently licensed by the State of Washington to perform said tasks.

A preconstruction meeting shall be held with the City prior to commencing staking. All staking shall be inspected by the City prior to construction, and subject to the City's approval.

D. Testing

Testing shall be required at the developer’s or contractor’s expense on all materials and construction as specified in the WSDOT Standard Specifications and with a frequency as specified in the WSDOT Construction Manual.

E. Survey Monuments

1. All existing (or new) survey control monuments and/or markers which are disturbed, lost, or destroyed during surveying or building shall be replaced with the proper monument as outlined in B or C below by a land surveyor currently registered (licensed) in the State of Washington at the expense of the responsible contractor, builder or developer.

2. Street type: Major Arterial or Minor Arterial; Collector Street;

   A precast concrete monument with cast iron monument case and cover installed per City Standards is required.

   If the monument case and cover are placed in cement concrete pavement, the precast base will not be necessary.

3. Street type: Local Access;

   A cast-in-place concrete surface monument with sufficient ferrous metal embedded to allow for detection by a magnetic detection device per City standards is required.

4. Monument Locations

   Appropriate monuments shall be placed:

   a. At all street intersections;

   b. At the PC and PT's of all horizontal curves;

   c. At all section corners, quarter corners, and sixteenth corners that fall within the right-of-way.

F. Mailboxes

1. 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 local U.S. Postal Service. The mailboxes shall be reinstalled at the original

location or to a new location as may be required by the local Postmaster, as further outlined below and approved by the U.S. Postal Service.

2. Location

   a. Bottom or base of box shall be 36 inch to 42 inch above the road surface.

   b. Front of mailbox 18 inches behind vertical curb face or outside edge of shoulder.

   c. New developments. Clustered mailboxes will, in all likelihood, be required. Contact the City not the U.S. Postal Service for details. Sidewalks shall be constructed to facilitate same. Aluminum traffic friendly mounting required.

   d. Buck-outs in sidewalks and sidewalk realignment may be required per the City Engineer and/or Planning Commission.

3. Mailboxes shall be per WSDOT Standard Plans H-12 or material and design with comparable breakaway characteristics. Deviations may be allowed only with the written approval of the City.

G. 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.

H. Rock Walls

1. Rock walls may be used for erosion protection of cut or fill embankments up to a maximum height of 6 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 structural engineer currently licensed in the State of Washington shall be used. Design and construction

shall be per the Association of Rockery Contractors (ARC) Specifications and/or applicable geotechnical recommendations. Rock walls over 6 feet high shall be subject to inspection by a geotechnical engineer as outlined in the following paragraph.

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.

In the absence of such a rock wall design, walls having heights over 6 feet or walls to be constructed in conditions when soil is unstable require a structural wall having a design approved by the City. The design of structural walls shall be by a professional engineer currently licensed in the State of Washington qualified in retaining wall design.

2. 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.

3. 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).

4. Rock selection and placement shall be such that there will be minimum voids and, in the exposed face, no open voids over 6 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.

5. 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.

6. Perforated drainage pipe and filter fabric shall be installed as required by the City.

I. Street Trees & Landscaping Items

Street trees and/or landscaping items (including irrigation if appropriate) shall be furnished and installed as may be specifically required by the City's Planner and/or Planning Commission, and as further approved by the City. If such is required, landscaping shall be of one of the referenced types as specified herein and/or as otherwise may be approved by the Public Works Director. These landscaping items, including trees and irrigation, shall be furnished and installed at the City's sole discretion, direction, and approval. Exact size, spacing, type, location, and quantity to be as specified by the City's Planner and/or Planning Commission, and as approved by the City Public Works Director.

4.25 Parking Lots

A building permit is required prior to surfacing any unsurfaced designated parking area.

Storm water detention shall be provided and shall follow the criteria as set forth in these standards.

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. 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.

4.26 Utilities

Utilities shall be furnished and installed within the right-of-way beneath new roads, or in existing roadways and rights-of-way so as to provide minimal interference with existing utilities and shall be located as generally shown in Standard Details listed herein. Where existing utilities are in place, new utilities shall conform to these Standards as nearly as practical and yet be compatible with the existing installations. Exceptions may be approved by the City when necessary to meet special or localized requirements. Utilities shall be sized and designed to serve adjacent and tributary areas. Typically, utilities will be required to be extended to “far” property lines. Easements shall be procured and provided by the developer to facilitate same.

A. Water Lines

Water lines shall be located as follows:

1. Shoulder-and-Ditch Section (on existing "standard" street sections):

   If practical: Outside of ditch line (existing roads). Otherwise: In shoulder 3 feet minimum from edge of travel lane (existing roads).

2. Curb and Gutter Section: Under sidewalk on one side. Mains and service connections to all lots should be completed prior to placing of surface materials. A

location outside of existing roadway improvements will be considered by the City Engineer based on local conditions. This location, however, must be approved by the City Engineer.

3. Designated side of centerline: North and East.

4. Depth: Per City standards.

B. Sanitary Sewers

Sanitary sewers shall be located 5 feet south and west of centerline; depth approximately 8 feet minimum from finished grade, unless otherwise required and/or approved by the City Engineer. Greater depths may be required to serve adjacent properties and tributary properties. Easements shall be provided to facilitate same.

Where subdivisions are provided with alleys, sewer may be installed in the alley instead of the roadway section if approved by the Public Works Director.

Sanitary and water lines shall be horizontally and vertically separated per Washington State Department of Ecology minimum requirements unless otherwise approved by the City Engineer.

Gravity systems, whether sanitary or storm drainage, shall have precedence over other systems in planning and installation.

C. Other Utilities

Other utilities (gas, power, telephone, and cable TV) shall be located as follows:

Preferable: Underground, either side of road, at horizontal location and depth compatible with other utilities and storm drains.

Otherwise: On poles (as applicable) set back of ditchline or sidewalk, at locations compatible with driveways, intersections, and other essential road features. To extent practical, utilities should share facilities so that a minimum of poles are needed, and preferably on only one side of road.

Notwithstanding other provisions, “private” underground

systems shall be located at least 5 feet away from road edge and where they will not otherwise disturb existing survey monumentation.

D. Utility Crossings in Existing Streets

For smaller diameter pipes and wires the crossing shall be made without surface cut of the traveled portion where the street is of oil mat or better. The crossing shall be made by pushing or boring a pipe under the road. Where rock is known or expected in the area of the crossing, the attempt need not be first, open cutting will be permitted, but prior approval of the City is required.

4.27 HMA Pedestrian Paths and/or Bikeways

a. Minimum Easement or Right-of-Way Width: Ten feet minimum. Fifteen feet preferred.
b. Construction Width. Six feet *minimum.* Greater widths may be required by City.
c. Subgrade. Prepared per Section 2.06 of APWA.
d. Bankrun Gravel, Class A. As required.
e. Crushed Rock Base Course one and one-half inch minus. One and one-half inch minimum depth. Greater depths may be required by City Engineer based on use and local ground conditions.
f. Crushed Rock Top Course five-eights inch minus. One and one-half inch minimum depth. Greater depths may be required by City Engineer based on use and local ground conditions.
f. Paving Course. One and one-half inch (minimum) HMA Class B PG 58-22. Greater depths may be required by City Engineer based on use, location, and local ground conditions.
g. The maximum cross slope for pedestrian paths and bikeways shall be 1% unless a greater slope is approved by the City Engineer due to specific topographic constraints.