

ENGINEERING DESIGN STANDARDS FOR GRADING/ESC PLAN

Drawing submittals

Each sheet shall be clearly labeled as “Grading” or “Grading/Erosion Control”.

Subdivisions & Short Plats (see engineering design submittal requirements)

The required minimum information to be shown on the grading plan shall include existing 2-foot contour intervals screened back with listed elevations. The proposed finished grade 2-foot contour intervals with listed elevations shall also be shown. Sod stripping stockpile locations, proposed street and lot layout configurations, a quantities table listing the total cut, fill and stripping amounts, hatching or shading of the cut and fill locations, any tree removal or preservation and the grading notes shall also be shown.

The required minimum information to be shown on the erosion control plan shall include inlet protection on all proposed catch basins on site and any adjacent existing catch basins off site, sediment trap locations, silt fence locations, gravel construction entrance locations. The details of the required erosion control measures shall be shown. All stream courses and buffer areas shall be identified and protected.

If an NPDES, HPA, FPA, or an Erosion Control Bond are required for the project there shall be a note to that requirement along with the erosion control and grading notes.

ENGINEERING DESIGN STANDARDS FOR STREETS

Drawing submittals

Each sheet shall be clearly labeled as “Street” or “Street/Storm”.

Subdivisions and Short Plats

- Design of the proposed streets shall incorporate the recommendations of the traffic study if one was required and shall meet the requirements of the current AASHTO A Policy on Geometric Design for Highways and Streets manual and the current MUTCD manual.
- Neighborhood Traffic Management (NTM) elements may be required on the existing or proposed streets based on projected traffic volumes.
- The pavement design and structural section shall be based on the soil type and the recommendations of the geotechnical report, but shall not be less than the current City standard minimum.
- Alleys, half-street improvements, and private streets shall meet the minimum City standard structural section.

Commercial, multifamily or Industrial

- The City engineer will give specific recommendations on pavement design, width, geometric requirements, safety, and pavement markings based on the submitted proposal.

TABLE 1 - GUIDELINES FOR GEOMETRY OF PRIVATE ROADWAY

ITEM	ALLEY PRIVATE	ACCESS TO FOUR OR LESS DWELLING UNITS (LESS THAN OR EQUAL TO 150' IN LENGTH) PRIVATE STREET 'A' ³	ACCESS TO FIVE OR MORE DWELLING UNITS (LESS THAN OR EQUAL TO 100' IN LENGTH) PRIVATE STREET 'B'	ACCESS TO FIVE OR MORE DWELLING UNITS (GREATER THAN 100' AND NOT OVER 300' IN LENGTH) PRIVATE STREET 'C'	ACCESS TO FIVE OR MORE DWELLING UNITS (GREATER THAN 300' IN LENGTH) PRIVATE STREET 'D'
TRACT WIDTH (PRIVATE)	20 FEET	20 FEET (TRACT OR EASEMENT)	30 FEET	42 FEET	48 FEET
STREET WIDTH	18 FEET ²	12 FEET	20 FEET	28 FEET	28 FEET
CUL-DE-SAC TURNAROUND RADIUS	N/A	35 FEET	35 FEET	35 FEET	35 FEET
SIDEWALK / PLANTER WIDTH	N/A	OPTIONAL 5-FEET / NO PLANTER STRIP	ONE SIDE 5-FEET WITH 4- FOOT PLANTER STRIP	ONE SIDE 5-FEET WITH 4.5 FOOT PLANTER STRIP	BOTH SIDES 5-FEET WITH 4.5-FOOT PLANTER STRIP
BIKE LANES	N/A	N/A	N/A	N/A	N/A
MIN. CENTERLINE RADIUS	70 FEET	100 FEET	100 FEET	200 FEET	200 FEET
PARKING	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES	PARKING ONE SIDE ONLY	PARKING ONE SIDE ONLY
CLEAR ZONE*	1.5 FEET MIN.	1.5 FEET	1.5 FEET MIN.	1.5 FEET MIN.	1.5 FEET MIN.
ACCESS CONTROL	N/A	N/A ¹	N/A ¹	N/A ¹	N/A ¹
LIGHTING REQUIRED	NO	YES	YES	YES	YES

* LAG MANUAL, WSDOT DESIGN MANUAL

¹ POSSIBLE BY COUNCIL MANDATE LIMITING CERTAIN LOTS DURING DEVELOPMENT REVIEW

² OR GREATER IF REQUIRED BY FMO

³ ROADWAYS IN EXCESS OF 150' IN LENGTH WITH FOUR OR FEWER DWELLING UNITS ARE SUBJECT TO ADDITIONAL REQUIREMENTS FROM THE FIRE MARSHALL

NOTES:

1. ACCESS TO TWO OR LESS LOTS MAY BE DESIGNED AND ESTABLISHED AS AN EASEMENT RATHER THAN A TRACT. GARBAGE AND RECYCLING CONTAINERS SHALL BE PLACED AT THE PUBLIC RIGHT-OF-WAY.
2. OFF-STREET PARKING:
 - a. STANDARD SIZE SPACES: MINIMUM 9-FEET WIDE; MINIMUM 18-FEET LONG
 - b. SMALL CAR SPACES: MINIMUM 8-FEET WIDE; MINIMUM 15-FEET LONG; MARKED 'COMPACTS ONLY'
 - c. AISLE DIMENSIONS: ONE-WAY AISLE MINIMUM 15-FEET WIDE; TWO-WAY AISLE MINIMUM 24-FEET WIDE
 - d. INGRESS AISLES SETBACK FROM BACK OF SIDEWALK: COLLECTORS MINIMUM 40-FEET; ARTERIALS MINIMUM 50-FEET
3. DEAD-END ROADS IN EXCESS OF 150-FEET, AS MEASURED FROM THE CENTERLINE OF THE ADJACENT ROAD, REQUIRE A DEAD-END TURNAROUND.
4. A DEAD-END TURNAROUND MAY BE REQUIRED ON ROADS LESS THAN 150-FEET WHEN ADJACENT ROAD IS A COLLECTOR OR ARTERIAL.
5. CONFIGURATION OF DEAD-END TURNAROUNDS SHALL BE PER STREET DETAIL ST36A 'DEAD-END TURNAROUND ON PRIVATE STREETS'; OR AS APPROVED BY ENGINEERING AND THE FIRE MARSHAL.



TABLE 2 - GENERAL GUIDELINES FOR GEOMETRY OF ROADWAY

ITEM	COMMERCIAL/ INDUSTRIAL (PRIVATE)	2 LANE LOCAL SPRINKLERED ⁴	2 LANE LOCAL - NEIGHBORHOOD	2 LANE ² COLLECTOR / ARTERIAL	3 LANE COLLECTOR / ARTERIAL	5 LANE ARTERIAL
R.O.W. WIDTH	40 FEET (TRACT)	52 FEET	60 FEET	60 FEET	74 FEET	100 FEET
STREET WIDTH	24 FEET	28 FEET	36 FEET	36 FEET	46 FEET / INCLUDES 12 FOOT MEDIAN	74 FEET / INCLUDES 14 FOOT MEDIAN
CUL-DE-SAC RADIUS	N/A	35 FEET	35 FEET	N/A	N/A	N/A
SIDEWALK / PLANTER WIDTH	ONE SIDE 5-FEET WITH 4.5-FOOT PLANTER STRIP	BOTH SIDES 5-FEET WITH 4.5-FOOT & 7.5- FOOT PLANTER STRIPS	BOTH SIDES 5-FEET WITH 4.5-FOOT & 7.5- FOOT PLANTER STRIPS	BOTH SIDES 6-FEET WITH 4.5-FOOT & 5.5- FOOT PLANTER STRIPS	BOTH SIDES 6-FEET WITH 5.5-FOOT & 7.5 FOOT PLANTER STRIPS	BOTH SIDES 6-FEET WITH 4.5-FOOT & 6.5- FOOT PLANTER STRIPS
BIKE LANES	N/A	N/A	N/A	5-FEET	5-FEET	6-FEET
MIN. CENTERLINE RADIUS	42 FEET FIRE ACCESS	70 FEET	70 FEET	200 FEET	300 FEET ³	300 FEET ³
PARKING	NO PARKING BOTH SIDES	PARKING ONE SIDE ONLY	PARKING BOTH SIDES	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES
CLEAR ZONE*	1.5 FEET MIN.	1.5 FEET	1.5 FEET MIN.	1.5 FEET MIN.	1.5 FEET MIN.	AS DIRECTED
ACCESS CONTROL	YES	N/A ¹	N/A ¹	YES	YES	YES
LIGHTING REQUIRED	YES	YES	YES	YES	YES	YES
CURB RADII	30 FEET MIN.	25 FEET MIN.	25 FEET MIN.	35 FEET MIN. ⁵	35 FEET MIN. ⁵	35 FEET MIN. ⁵
OFF-STREET PARKING SETBACKS	N/A	N/A	N/A	INGRESS AISLES 40' FROM BACK OF SIDEWALK	INGRESS AISLES 50' FROM BACK OF SIDEWALK	INGRESS AISLES 50' FROM BACK OF SIDEWALK

* LAG MANUAL, WSDOT DESIGN MANUAL

¹ POSSIBLE BY COUNCIL MANDATE LIMITING CERTAIN LOTS DURING DEVELOPMENT REVIEW

² LEFT TURN LANES REQUIRED AT INTERSECTIONS

³ MUST MEET AASHTO GUIDELINES FOR SPEED AND SIGHT DISTANCE

⁴ STREET SECTION REQUIRES APPROVAL FROM THE CITY ENGINEER.

⁵ LARGER RADII MAY BE REQUIRED AT THE DIRECTION OF THE CITY ENGINEER

FOR INTERSECTION SPACING AND SETBACK, SEE ACCESS SPACING STANDARDS – TABLE 3 (NEXT PAGE)

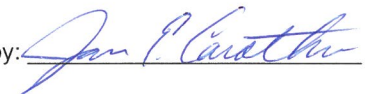


TABLE 3 - ACCESS SPACING STANDARDS

RESOLUTION 17-005

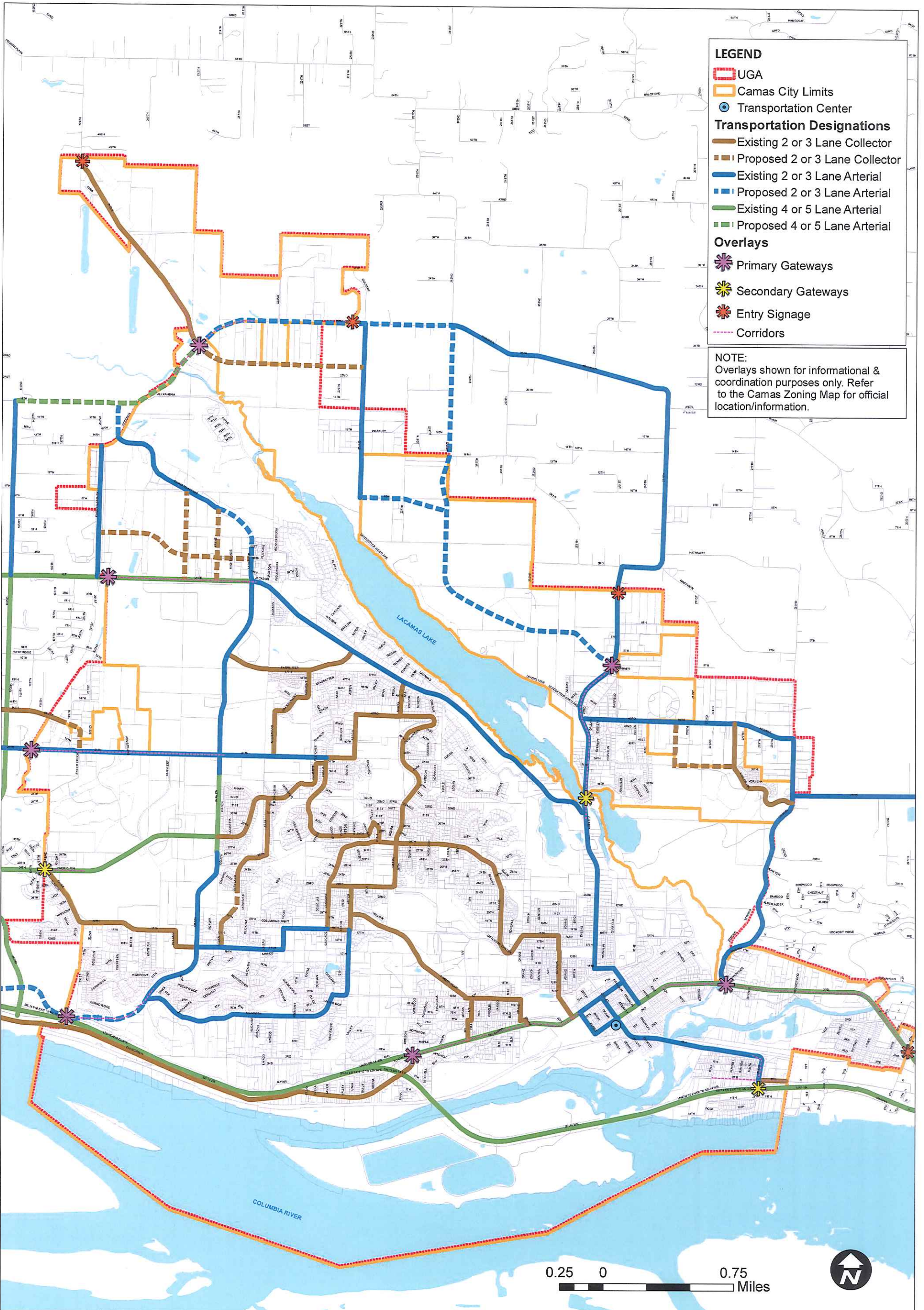
ROADWAY CLASS	MINIMUM ACCESS SPACING***	MAXIMUM ACCESS SPACING	MINIMUM INTERSECTION & DRIVEWAY SETBACK	NEW RESIDENTIAL ACCESS PERMITTED
ARTERIAL	660-FEET	1,000-FEET****	300-FEET	NO**
COLLECTOR	330-FEET	600-FEET	110-FEET*	NO**
LOCAL	110-FEET	600-FEET	N/A	YES

* BASED ON TURN DESIGN SPEED OF 20 MPH

** TEMPORARY ACCESS MAY BE PERMITTED OR COMBINED FOR LANDLOCKED PARCELS

*** INCLUDES NON-RESIDENTIAL DRIVEWAYS

**** BLOCK LENGTHS IN EXCESS OF 600-FEET SHALL PROVIDE A MID-WAY PEDESTRIAN CONNECTION



CAMAS TRANSPORTATION COMPREHENSIVE PLAN MAP

CAMAS, WA | Ordinance 16-010 Adopted June 2016

ENGINEERING DESIGN STANDARDS FOR ADA ACCESSIBILITY

Policy

It is City of Camas policy to provide appropriate pedestrian facilities along and across sections of City roadways. It is City of Camas, FHWA and WSDOT policy that pedestrian facilities be given full consideration in the planning and design of new construction and reconstruction projects.

Drawing submittals

Each sheet shall be clearly labeled as “Street” or “Street/Storm”.

The appropriate sidewalk and ADA Ramp details shall be included on a sheet labeled as “Details”, “Street Details” or “Accessibility Details.” Only City of Camas details from the most current Design Standard Manual (DSM) shall be used. In the case where the Camas DSM does not contain an appropriate detail, current WSDOT Standard Plan Details or site specific details may be used.

Accessibility Design

Design of proposed sidewalks shall meet the requirements of the USDOJ’s *ADA Standards for Accessible Design*; the USDOT’s current *ADA Standards for Transportation Facilities*; the FHWA’s current MUTCD; the current Americans with Disabilities Act requirements, the US Access Board’s current *Public Rights-of-Way Accessibility Guidelines* (PROWAG), and the current WSDOT Design Manual, Chapter 1510 and any referenced documents therein.

ADA Accessibility Triggers

All new construction, reconstruction, or alteration of existing transportation facilities shall be designed and constructed to be accessible and useable by those with disabilities. Existing facilities shall be retrofitted to be accessible when required per the WSDOT Design Manual, Chapter 1510.

The following are some examples that are considered alterations, which can potentially trigger the need to improve accessibility to meet ADA requirements:

- HMA overlay or inlay
- Traffic signal installation or retrofit
- Realignment of a roadway (vertical or horizontal)
- Sidewalk improvements
- Bridge replacement
- Concrete panel repair/replacement
- Raised channelization

The following are not considered alterations:

- Spot pavement repair
- Liquid asphalt sealing, chip seal, or crack sealing
- Lane restriping that does not alter the usability of the shoulder

Matching Facilities

In the case where a new development installation ends with a sidewalk and curb ramp at an intersection, a matching curb ramp installation shall be required at the other end of the crosswalk. A third ramp will not be required across from the second ramp.

Crosswalk Accessibility

Design consideration shall be made such that not only curb ramps meet ADA requirements, but street crossings shall also meet the above requirements. For retrofit situations where existing street crossings will be out of compliance with ADA requirements, an MEF submittal shall be required.

Design slopes

Designs shall not be based on design standard maximum limits. Allow for field adjustment based on actual conditions when specifying ramp lengths and slopes.

Maximum Extent Feasible (MEF)

Design deviation allowances will be considered on a case-by-case basis for retrofit situations, or when new construction meets existing facilities. The MEF memo shall be submitted to the City Engineer for approval when an element of a design will not meet the accessibility requirements. The MEF memo is required:

- Prior to Engineering plan approval.
- When unanticipated field issues arise during the construction phase.

Use of WSDOT's MEF Template or an abbreviated version with the following elements shall be used to formally request of deviation of the standards noted above:

- Project description;
- Existing pedestrian / road conditions;
- Applicable design standards that apply;
- Justification of design constraints;
- **Cost is not a justification for not meeting accessibility criteria;**
- Proposal, including details;
- Stamped and signed by an Engineer.

ENGINEERING DESIGN STANDARDS FOR STORM SYSTEM

Drawing submittals

Each sheet shall be clearly labeled as “Street” or “Street/Storm”.

Subdivisions & Short Plats (see engineering design submittal requirements)

- For application construction standards, see *Section IV Engineering Details: Storm Detail SD1*.
- Design of the proposed stormwater treatment and detention system shall be in accordance with the latest edition of the Washington State Department of Ecology’s Stormwater Management Manual for Western Washington.
- All main line locations shall be located within the proposed or existing street right-of-way where ever possible, unless otherwise approved.
- All roof drainage shall be directed to the stormwater facility for detention, except as follows: Lots adjacent to streams, wetlands, and wetland/stream management zones are to be evaluated on the basis of aquifer recharge and fish and wildlife issues. When considered necessary roof drains, french drains, and foundation drains are to be directed, by approved means, back into the wetland or stream.
- If runoff from the proposed building envelope is not directed to the stormwater facility, an approved house connection plan for roof drains and foundation drains will be required. Method and location of discharge must have prior approval.
- When required along proposed roadways, based on site conditions, french drains shall be located behind sidewalks and shall be owned and maintained by the home owner or Homeowner’s Association.
- Spacing between catch basins shall be a maximum of 400-feet and shall be located at all intersections. Roadways in excess of 10% slope shall require a reduced spacing. Catch basins shall be tied into manholes at a minimum slope of 1%. Flow calculations may be required to analyze curb flow depths and widths.
- Spacing between manholes is to be a minimum of 400-feet; min. 48-inch dia.
- Stormwater main lines shall not be laid flatter that 0.4% slope. Slopes over 18% will require pipe anchors.
- Stormwater mains are to be 12-inch min. and laterals are to be 10-inch min.
- The stormwater design report shall include a project overview stating any assumptions made. Requests to deviate from the stormwater manual shall be fully stated and the reasons clearly outlined. The pervious and impervious acreage totals, site maps, soil maps, and full size basin maps showing the actual basin; even if beyond the project limits shall be included. Isopluvial charts for the 2, 10, and 100 year 24-hour storm events, runoff curve numbers, and downstream impact analysis shall be included.

ENGINEERING DESIGN STANDARDS FOR WATER SYSTEMS

Drawing submittals

Each sheet shall be clearly labeled as “Water” or “Water/Sewer”.

Subdivisions & Short Plats (see engineering design submittal requirements)

- All main line locations shall be located within the proposed or existing street right of way where ever possible unless otherwise approved.
- Each lot shall have a water meter box location shown on the plan. Meter boxes shall be located in the right-of-way, near or at lot lines, in the planter strip or located behind the sidewalk in curb tight situations, and shall maintain 10-feet of horizontal separation from sewer services.
- Irrigation service meter box locations and backflow prevention devices shall be shown on the plan for all landscape islands, open space tracts or other areas as identified on the plan.
- Fire hydrant locations shall be shown on the plan and shall be located as nearly as possible at lot lines or as directed by the Fire Marshal.
- AARV's, low point blowoffs, valve cluster locations and dead end blowoffs shall be called out on the plans and profile sheets.
- The system design may require sizing analysis for fire flow capacity, pressure zones and or pressure reducing valve vault locations upstream or downstream of the project site at the City's discretion.
- Possible line upsizing may be required for future extensions at the City's discretion. Upsizing will be based on the City's latest *Water System Plan Update*.
- Any existing services not used or existing main lines that will be replaced or relocated may require abandonment and or removal at the City's discretion.

Commercial, Multifamily, or Industrial

In addition to the above requirements, the following requirements may apply for these types of uses.

- Fire flow calculations/analysis for fire sprinkler systems.
- The locations of fire department connection (FDC) ports shall be shown.
- Separate domestic water main lines and fire system main lines may be required.
- Each unit of a duplex shall have its own water service.
- Multifamily units shall have one service for each building.
- Fire lines are to be shown for informational purposes only. NFPA 24 fire permit application is to be submitted to the Fire Marshal for review and approved, prior to construction.

ENGINEERING DESIGN STANDARDS FOR PRESSURE REDUCING VALVE STATIONS

When a water system PRV station is required as part of a residential development, the following minimum components shall be included with the PRV submittal.

1. An existing water system area plan shall be submitted by the developer's engineer. The area plan shall show the elevation and location of existing PRV's adjacent to the development site. High side and low side pressures shall be included. The plan shall also show the proposed development layout with elevation of all street intersections, lots, and other high and low points within the site.
2. The PRV station shall be a pre-assembled, pre-tested, and packaged system from G.C. Systems or approved equal.
3. The PRV station shall include a catch basin located adjacent to the station and tied to the stormwater system for the 3" pressure relief bypass flows.
4. There shall be a minimum 9" air gap from the bypass pipe to the catch basin. And acceptable bug screen shall be included on the end of the bypass pipe.
5. A vault drain or sump pump tied into the storm system will be required.
6. The valve vault access shall be a rated H-20, a spring assisted 36" x 72" double door, lockable, diamond plated hatch with safety grate, centered over the largest PRV.
7. The PRV station shall be located within the right-of-way in a widened planter strip or located outside of the right-of-way in an easement dedicated to the City.
8. The City of Camas reserves the right to determine the size of the PRV devices and the vault.
9. All interior piping shall be schedule 40, 306 stainless steel with flanges, and Victaulic coupling as required for disassembly.

ENGINEERING DESIGN STANDARDS FOR SANITARY SEWERS

Drawing submittals

Each sheet shall be clearly labeled as “Sewer” or “Water/Sewer”.

Subdivisions & Short Plats (see engineering design submittal requirements)

- For application construction standards, see *Section IV Engineering Details: Gravity Sewer Detail SG1; STEF Sewer Detail SF1; or STEP Sewer Detail SP1.*
- Detached units shall have their own sewer service and STEP or STEF or conventional gravity system as required.
- Duplex units may have up to two sewer services at the discretion of the engineering and public works departments.
- Multifamily units shall have one sewer lateral per building.
- All main line locations shall be located within the proposed or existing right of way where ever possible unless otherwise approved.
- Service lateral locations shall be located in the planter strip for STEP systems and 8-feet past the right of way line for gravity or STEF systems.
- Main line grades shall not be designed flatter than 0.5% slope. Slopes over 18% will require pipe anchors.
- AARV, cleanout, valve, odor control, and manholes shall be shown on the plan and profile sheets.
- The system design may require sizing analysis for line size and capacity. The system may also require a pump station based on the type of sewer system being proposed, the location of the project, or other factors. Future pump station upsizing may also be required.
- There may be downstream capacity analysis required for the project depending on project location and the type of sewer system proposed.
- Design shall take into account the capacity and grade to allow for desirable extension beyond the development.
- Additional odor control analysis and/or measures may be required.
- Septic tank sizing if required shall be based on the proposed use and in conformance with the CC&R's. If pools are allowed then tank sizes may increase.

Commercial, Multifamily or Industrial

- Tank sizing submittal documentation and material submittals will be required.
- Material submittals, materials list and supplier information will be required prior to construction.
- Required as-built information shall include the depth of service, location of main lines, AARV's, odor control, cleanouts, manholes, and valve locations.

ENGINEERING DESIGN STANDARDS FOR SANITARY SEWER PUMP STATIONS

For design of sanitary sewer pump stations, see '***Sanitary Sewer Pump Station Design Manual***' located under the Engineering Standards section of this document.

ENGINEERING DESIGN STANDARDS FOR COMMUNITY STEF TANKS

When a community STEF tank system is proposed for a residential development to retain sanitary sewer solids, the following minimum requirements shall apply.

1. The community tanks will only be allowed if lot sizes are 4,000 S.F. or less. For lots over 4,000 S.F. an individual 1,500 gallon minimum tank will be required on each individual lot.
2. The community tank(s) shall be a fiberglass reinforced single walled Xerxes tank or approved equal. The tank submittal shall include buoyancy calculations with minimum factor of safety of 1.5 for dead man sizing.
3. An approved odor control system is required for the tanks. If the development includes a pump station, a vent line from the tank(s) to the odor control system will be required. If no pump station is proposed, chemical injection, soil filter beds, or other odor control systems acceptable to the City shall be included in the design.
4. A minimum of one permanent ground water monitoring and dewatering well(s) acceptable to the City shall be included in the design and site construction.
5. An Orenco liquid level alarm, AMAHW or AMLAHW series, high level alarm and float system, or approved equal, will be required on each tank that contains bio tube filters. A 12" wide by 18" tall sign shall be included to read as follows:

THIS BOX IS THE PROPERTY OF THE CITY OF CAMAS PUBLIC WORKS DEPARTMENT. IT IS TO BE OPENED BY AUTHORIZED PERSONNEL ONLY. ALARM – IF THE ALARM SOUNDS, PRESS THE RED LAMP COVER TO SILENCE, THEN CALL CAMAS OPERATIONS CENTER AT (360) 817-1563 (DAYS) OR (360) 737-0592 (NIGHTS, WEEKENDS OR HOLIDAYS).

The sign and alarm panel shall be mounted at the tank location in accordance with the City requirements.

6. Tank sizing requirements shall be as determined by the City of Camas.
7. The tank(s) shall be located in such a fashion as to allow for the future excavation and replacement of the tank(s) if necessary. Building foundation, infrastructure main line utilities, and other facilities including streets and street intersections, stormwater facilities, retaining walls or other improvements shall not be located within the future excavation zone of the installed tank(s).
8. A water service with an approved backflow protection device is required at the tank location as directed by the City.
9. The tank location shall include an area light if no street light is within 50 feet.
10. The tank(s) shall be accessible for future solids pumping and maintenance.

ENGINEERING DESIGN STANDARDS FOR STREET LIGHTING

ALL INFORMATION IS INTENDED TO PRODUCE A LIGHTING DESIGN WITH LUMINANCE LEVELS AND LUMINANCE UNIFORMITY WHICH MEETS OR EXCEEDS THOSE IN THE I.E.S. "RECOMMENDED MAINTAINED LUMINANCE FOR ROADWAYS" FROM THE I.E.S. LIGHTING HANDBOOK. INSTALLATION OF ADDITIONAL LIGHTS MAY BE NECESSARY TO MEET THE INTENT OF THIS STANDARD.

1. WHERE THE AVERAGE RESIDENTIAL DENSITY IS GREATER THAN 12 DWELLING UNITS PER ACRE, USE COMMERCIAL OR INTERMEDIATE FOR LAND USE.
2. AVERAGE MAINTAINED LUMINANCE IS MEASURED IN FOOT CANDELAS PER SQUARE METER.
3. AT SIGNALIZED INTERSECTIONS, THE AVERAGE MAINTAINED LUMINANCE SHALL BE OF THE AVERAGE FOR THE TWO INTERSECTING STREETS.
4. LUMINANCE UNIFORMITY IS THE RATIO OF AVERAGE OR MAXIMUM MAINTAINED LUMINANCE TO MINIMUM LUMINANCE. LUMINANCE VALUES OUTSIDE THE ROADWAY SHALL NOT BE INCLUDED IN THE RATIO. ALL SIDEWALK AREAS AND THE AREA BETWEEN THE SIDEWALK AND THE STREET CURB SHALL BE INCLUDED WHEN DETERMINING THE MAINTAINED LUMINANCE.
5. ALL LIGHTING FIXTURES SHALL BE LIGHT EMITTING DIODE (LED). LIGHTING CIRCUITS SHALL BE 120 VOLTS.
6. THE MOUNTING HEIGHT OF THE FIXTURE IS MEASURED FROM THE ROADWAY SURFACE TO THE CENTER OF THE LIGHT SOURCE WITH THE FIXTURE LOCATED OVER THE BIKE LANE LINE OR SIX FEET FROM THE FACE OF CURB.
7. ALTERNATIVE LIGHTING LAYOUTS MAY BE SUBMITTED FOR REVIEW. WHERE LIGHTING IS REQUIRED ON BOTH SIDES, DESIGNS SHALL BE "OPPOSITE LIGHTING" ON MAJOR ROADWAYS 46 FEET OR GREATER IN WIDTH. THE USE OF STAGGERED LIGHTING SHALL ONLY BE USED WHERE "OPPOSITE LIGHTING" IS NOT PRACTICAL. LIGHTING LAYOUTS ON LOCAL RESIDENTIAL STREETS WITHIN A SUBDIVISION MAY VARY FROM SIDE TO SIDE.
8. COBRA STYLE LIGHT POLES ARE REQUIRED ON ALL COLLECTOR AND ARTERIAL ROADWAYS.
9. MAXIMUM POLE HEIGHT SHALL BE LIMITED TO 34 FEET.
10. LIGHTING LAYOUTS WILL REQUIRE APPROVAL AND POSSIBLE ADJUSTMENT TO MEET THE CITY OF CAMAS LIGHTING OBJECTIVES AND I.E.S. STANDARDS. THIS MAY INCLUDE ADJUSTMENT TO THE POLE SPACING AS LISTED AND MAY RESULT IN ADDITIONAL OR FEWER LIGHTS.
11. A LIGHTING DESIGN CONSISTENT WITH THESE REQUIREMENTS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE CITY, PRIOR TO SUBMITTAL TO CLARK PUBLIC UTILITY DISTRICT (CPU) FOR APPROVAL.
12. STREET LIGHTS ON LOCAL AND NEIGHBORHOOD LEVEL STREETS SHALL BE LOCATED AT PROPERTY LINES.
13. THE STREET LIGHTS SHALL BE LOCATED IN THE PLANTER STRIP UNLESS OTHERWISE APPROVED BY THE CITY.

14. STREET LIGHT SPACING:

LAND USES	ARTERIAL ROADWAY		COLLECTOR ROADWAY		NEIGHBORHOOD ROADWAY		LOCAL ROADWAY	
	COMMERCIAL INDUSTRIAL	RESIDENTIAL	COMMERCIAL INDUSTRIAL	RESIDENTIAL	COMMERCIAL INDUSTRIAL	RESIDENTIAL	PUBLIC	PRIVATE
MAX. POLE SPACING (A)	170	160	130	160	150	170	N/A	N/A
MAX. POLE SPACING (B)	N/A	N/A	N/A	N/A	150	150	150	150

(A) STANDARD COBRA STYLE

(B) POLE TOP STYLE

15. PEDESTRIAN CROSSINGS AND VERTICAL SAG CURVES SHALL BE ILLUMINATED.

16. STREET LIGHTING IS REQUIRED ON ALL PRIVATE STREETS OVER 100 FEET IN LENGTH AND SERVING MORE THAN FIVE DWELLING UNITS.

17. PRIVATE STREETS WITH STREET LIGHTING SHALL HAVE A SEPARATE METER THAT THE HOME OWNERS ASSOCIATION WILL BE RESPONSIBLE FOR.