

RIGHTS-OF-WAY INFRASTRUCTURE STANDARDS AND SPECIFICATIONS



2007 Edition

Prepared by

**City of Tenino, P.O. Box 4019, 149 Hodgden Street South,
Tenino, WA 98589**

City of Tenino Rights-of-Way Infrastructure Standards and Specifications

CONTENTS

- Foreword
- Acknowledgments
- Introduction
- Part 1 – Design Requirements
- Part 2 – Construction Specifications
- Part 3 – Standard Details (two sections)
- Part 4 – Drainage Details
- Appendix A – Traffic Calming

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

FOREWORD

The Tenino Planning Commission was tasked by the City Council in December 2005 to review and update the Streets, Sidewalks and Public Places regulations (Tenino Municipal Code [TMC] Title 12) and associated design manuals. The Planning Commission dedicated two meetings a month from January through June 2006 to this task. This document, the City of Tenino Rights-of-Way Infrastructure Standards and Specifications (Standards), was developed as a supporting document to TMC Title 12. These Standards are intended to guide development of the City's infrastructure system in support of the City's vision for the future.

Tenino is a bedroom community of the greater Olympia region, and has potential to rapidly expand once the sewer system is developed. This fact underscores the critical nature of the challenges that face the City's systems. Travel within and through Tenino is heavily dependent on the automobile. A limited arterial system, very limited transit service, and currently limited non-motorized travel facilities characterize much of the City's current transportation system, and the challenges and opportunities for its future betterment. The semi-remoteness of Tenino underscore a significant part of our natural beauty and rich heritage. Born as a sandstone quarry that supplied building materials throughout the region and linked by rail service have been important resources for the community. These Standards are intended to ensure that the City's infrastructure and its management meet the needs of the City's future populace and economy.

The Planning Commission, along with City staff and Tenino citizens, developed the Comprehensive Plan. It contains goals and policies that will guide the City of Tenino in its actions and decisions affecting the City's infrastructure. Many of the Comprehensive Plan elements, such as Land Use, Transportation, Economic Development, and Public Facilities, contain goals and policies that address infrastructure design issues. The Comprehensive Plan also presents a Vision Statement that relays the value that the community places on well-developed City systems. To fulfill the City's Vision Statement, the Community Development Department is charged with developing plans, programs, and regulations to ***“Encourage efficient multi-modal transportation systems that are based on regional priorities and are coordinated with county and city comprehensive plans and ...To produce efficient traffic patterns that promote safety and economic development.”*** These Standards are a specific tool used to carry out the goals and policies of the Comprehensive Plan. By adopting these standards, the City acknowledges the quality of life issues that are supported by a well-managed transportation system.

ACKNOWLEDGMENTS

The City would like to acknowledge those individuals who spent many hours contributing to the development of this manual.

City Council

Kenneth A. Jones, Mayor
John O'Callahan, Councilmember
Dawna Kelley, Councilmember
Frank Anderson, Councilmember
Robert Scribner, Councilmember
Phil Simmons, Councilmember

Planning Commission

Dan Budsberg, Commission Chair
Paul Donohue, Commissioner
Jamie Scibelli, Commissioner
Annette Gearns, Commissioner
Jim Lucas, Commission Vice Chair

City Staff

Dan Carnrite, Senior Planner
Dave DaFoe, Public Works Director
Joyce Bielefeld, Clerk/Treasurer
Denise Nelson, Planning Commission Clerk

Consulted Jurisdictions

Mick Monken, Public Works Director, City of Woodinville, WA

1 In general, development will follow two guidelines. First is that of the current City limits,
2 which is on the most part, developed. Second is the areas within the Urban Growth
3 Areas, which constitute future development of the majority of industrial/commercial and
4 new residential lands. These areas are illustrated at Map Figure 7 of the City's
5 Comprehensive Plan. Therefore, appropriate designs that are unique to each are
6 encouraged.

7 Proposed departures from these Standards will be reviewed in a formal deviation
8 process as defined in this document. A proposed design solution, which varies from
9 these Standards, will be evaluated on the basis that the proposed design will produce a
10 comparable result, in every way optimal for the user, City, and the city residents.

11 These Standards are regularly updated to incorporate and address new technology,
12 changes in policy and procedures, and methods of design and construction. A list of
13 manual holders will be kept, and those desiring updates will be asked to fill out a card to
14 enable a receipt of new chapters or changes as they occur.

15 Please report any errors or suggestions for this document to the Community
16 Development Department, at:

17
18 **MAILING ADDRESS:**

19
20 City of Tenino
21 Community Development Department
22 P.O. Box 4019
23 Tenino, WA 98589

24
25 **PHYSICAL ADDRESS:** 149 Hodgden Street South

26
27 **PHONE:** 360.264.2368

28
29 **FAX:** 360.264.5772

30
31 **CITY WEBSITE:** www.ci.tenino.wa.us

32
33 **EMAIL ADDRESS:** teninocityhall@comcast.net

34
35

36

37

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City of Tenino
Rights-of-Way Infrastructure Standards and Specifications

PART 1 DESIGN REQUIREMENTS

Table of Contents

<u>Section</u>	<u>Page No.</u>
1-1. GENERAL CONDITIONS	1.1
1-1.1 Standards	1.1
1-1.2 Government Adopted Acts, Codes, and Plans	1.1
1-1.3 References	1.2
1-1.4 Definitions and Abbreviations.....	1.2
1-1.5 Guarantees, Bonds, and Insurance.....	1.5
1-1.5.1 Performance Bonds	1.6
1-1.5.2 Maintenance Bonds	1.7
1-1.5.3 Insurance	1.7
1-1.6 Permits	1.8
1-1.6.1 Requirements	1.8
1-1.6.2 Permit Application	1.9
1-1.6.3 Permit Review Process	1.10
1-1.6.4 Performance and Maintenance Bonds Required	1.10
1-1.7 Rights-of-Way and Easements.....	1.10
1-1.7.1 Rights-of-Way	1.10
1-1.7.2 Easements	1.11
1-1.8 Deviation from Standards	1.12
1-2. PLANS AND REPORTS TO SUBMIT FOR APPROVAL.....	1.13
1-2.1 Traffic Studies	1.13
1-2.1.1 Responsibility and Purpose.....	1.13
1-2.1.2 Traffic Impact Analysis Guidelines	1.14
1-2.2 Plans	1.16
1-2.2.1 General Format	1.16
1-2.2.2 Required General Data	1.17
1-2.2.3 Drawing Standards.....	1.18
1-2.3 As-Built (Construction Corrected Record) Drawings	1.25
1-3. GRADING, CONSTRUCTION, AND LAND ALTERATION	1.27
1-4. STREETS AND RELATED WORK.....	1.28
1-4.1 General Requirements	1.28
1-4.2 Street Classification and Geometrics	1.28
1-4.2.1 Street Classification	1.28
1-4.2.2 Street Layout.....	1.28
1-4.2.3 Block Layout.....	1.30
1-4.2.4 Horizontal and Vertical Street Alignment	1.31
1-4.2.5 Street Grades	1.31
1-4.2.6 Sight Distance	1.31
1-4.2.7 Intersections.....	1.32
1-4.2.8 Curb Return Radii	1.32
1-4.2.9 Cul-de-Sacs, Turn Aounds.....	1.32

1	1-4.2.10 Private Streets.....	1.33
2	1-4.2.11 Structural Pavement Section.....	1.34
3	1-4.3 Non-Motorized Travel Facilities	1.34
4	1-4.3.1 Bike Lanes	1.35
5	1-4.3.2 Sidewalks and Trails	1.35
6	1-4.4 Fire Department Access.....	1.35
7	1-4.5 Utilities.....	1.36
8	1-4.5.1 General	1.36
9	1-4.5.2 Joint Trenching.....	1.36
10	1-4.5.3 Standard Utility Locations Within Public Right-of-Way.....	1.37
11	1-4.6 Driveways	1.38
12	1-4.6.1 General	1.38
13	1-4.6.2 Residential Driveways	1.39
14	1-4.6.3 Commercial Driveways.....	1.40
15	1-4.6.4 Driveways Within Areas of Limited Street Improvements	1.42
16	1-4.6.5 City-Required Reconstruction of Approaches	1.43
17	1-4.6.6 Driveway Relocation	1.43
18	1-4.7 Street Illumination.....	1.43
19	1-4.7.1 General	1.43
20	1-4.7.2 Design Standards.....	1.45
21	1-4.8 Traffic Signals.....	1.48
22	1-4.9 Curb Ramps	1.48
23	1-4.10 Mailboxes	1.48
24	1-4.11 Rockeries and Rock Walls	1.49
25	1-4.12 Pedestrian Hand Railings.....	1.49
26	1-4.13 Parking Lots	1.50
27	1-4.13.1 Handicap Requirements.....	1.50
28	1-4.13.2 Illumination	1.50
29	1-4.13.3 Pedestrian Concerns.....	1.50
30	1-4.13.4 Internal Circulation	1.50
31	1-4.13.5 Throat Length Requirements	1.50
32	1-5. STORM DRAINAGE	1.51
33	1-5.1 Goals/Design Criteria	1.51
34	1-5.2 Design Requirements.....	1.51
35	1-5.2.1 Conveyance	1.51
36	1-5.2.2 Catch Basins	1.51
37	1-5.2.3 Detention.....	1.51
38	1-5.2.4 Treatment	1.51
39	1-5.2.5 Pipe Bedding and Trench Compaction	1.51
40	1-6. SANITARY SEWER.....	1.52
41	1-7. WATER.....	1.53
42		
43		
44		
45		
46		
47		
48		
49		
50		

1 **1-1. GENERAL CONDITIONS**

2 **1-1.1 Standards**

3 These *City of Tenino Rights-of-Way Infrastructure Standards and Specifications*,
4 hereinafter referred to as the “Standards”, shall apply whenever any work is performed
5 within the City of Tenino, including, but not limited to work performed by private parties
6 within the public right-of-way at their own expense under the authority granted by
7 ordinance(s) of the City Council. Except where these Standards provide otherwise,
8 design, workmanship, and materials shall conform to the appropriate standards of the
9 most current edition of the Washington State Department of Transportation (WSDOT)
10 and Washington State Chapter of the American Public Works Association (APWA)
11 *Standard Specifications for Road, Bridge, and Municipal Construction*, including the
12 APWA Supplement to Division 1, hereinafter referred to as the “WSDOT/APWA
13 Standard Specifications”, and the *Standard Plans for Road, Bridge and Municipal*
14 *Construction* hereinafter referred to as the “WSDOT/APWA Standard Plans”.
15 In addition to the above, the most current edition of the following manuals and
16 standards shall govern all design, workmanship and materials, unless provided
17 otherwise by the Standards and WSDOT/APWA Standard Specifications and Standard
18 Plans:

- 19 1) *Drainage Design & Erosion Control Manual for Thurston County (TCDD&ECM)*
- 20 2) U.S. Department of Transportation, *Manual on Uniform Traffic Control Devices*
21 (MUTCD), as amended and approved by WSDOT
- 22 3) American National Standards Institute, *Current American Standard for Street*
23 *Tree Care Operations*
- 24 4) American National Standards Institute, *Current American Standard for Nursery*
25 *Stock*

26
27 **1-1.2 Government Adopted Acts, Codes, and Plans**

28 All work done in the City of Tenino shall be in accordance with the various
29 Federal, State, County, and City acts, laws, and ordinances that apply. Specifically,
30 the standards presented herein were developed in consideration of the most
31 currently adopted provisions, as of the date of publication of these Standards, of the
32 following:

- 33
- 34 1) City of Tenino Municipal Codes (TMC)
- 35 2) City of Tenino Comprehensive Plan
- 36 3) State of Washington Shoreline Management Act
- 37 4) State and National Environmental Policy Acts (SEPA), (NEPA)
- 38 5) City of Tenino Tree Ordinance
- 39 6) City of Tenino Shoreline Master Plan
- 40

1 **1-1.3 References**

2
3 The Standards were developed in consideration of the most currently adopted
4 provisions of the following manuals and design guidelines:

- 5 1) WSDOT *Design Manual*
- 6 2) WSDOT *Traffic Manual*
- 7 3) WSDOT *Utilities Manual*
- 8 4) WSDOT *Construction Manual*
- 9 5) WSDOT *Sign Fabrication Manual*
- 10 6) WSDOT *Local Agency Guidelines*
- 11 7) American Association of State Highway and Transportation Officials (AASHTO)
12 *Policy on Geometric Design of Highways and Streets*
- 13 8) AASHTO *Guide for Design of Pavement Structures*
- 14 9) American Water Works Association (AWWA) Standards
- 15 10) The Institute of Traffic Engineers (ITE) *Trip Generation Manual* and design
16 manuals
- 17 11) Illumination Engineering Society (IES) *Design Manual*

18
19 **1-1.4 Definitions and Abbreviations**

20 **Definitions:** For the purpose of this chapter, the terms, phrases, words, and their
21 derivations have the following definitions. When consistent with the context, words
22 used in the present tense include the future tense, words in the plural number include
23 the singular number, and words in the singular number include the plural number. The
24 word “shall” is always mandatory. The word “may” is permissive. Definitions from the
25 Tenino Municipal Code shall also apply to these Standards. The Public Works Director
26 shall have authority to interpret the definitions.

27 **Access easement** – Property interest, usually in a strip, granted by the property owner
28 to the City or other entity for the purpose of allowing access to a facility.

29 **Applicant** – See TMC 18.20 Definitions

30 **Association** – An organization of persons within the same neighborhood who have
31 authority to finance the design, construction, and maintenance of neighborhood
32 infrastructure (i.e., sidewalks, streetlights).

33
34 **Best management practices (BMPs)** – Physical, structural, and/or managerial
35 practices that, when used singularly or in combination, prevent or reduce pollution of
36 water. (See King County Storm Water Pollution Control Manual.)

37 **City** – The City of Tenino, Washington.

38 **Contractor** – Any person, firm, partnership, association, joint venture, or corporation or
39 any other entity responsible for constructing a proposed project.

- 1 **Cul-de-sac** – See TMC 18.20 Definition STREET, Cul-de-sac (See Standard Detail
2 314.)
- 3 **Developer** – Any person, firm, partnership, association, joint venture, or corporation or
4 any other entity who undertakes to improve residential, commercial, or industrial
5 property or to subdivide for the purpose of resale or profit. For the purposes of this
6 document, “improve” means any modifications requiring approval from the City of
7 Tenino.
- 8 **Driveway** – A privately maintained access to residential, commercial, or industrial
9 properties.
- 10 **Franchise area** – The area defined within an individual franchise agreement entered
11 into by the City and other party for a specified purpose. Generally, franchise areas will
12 include street rights-of-way.
- 13 **Grading** – The shaping, excavating, or filling of the ground surface.
- 14 **Half-street** – Street constructed along edge of development, utilizing a portion of the
15 regular width of right-of-way and permitted as an interim facility pending construction of
16 the other half of the street by the adjacent owner.
- 17 **Illicit discharge** – All non-stormwater discharges to stormwater drainage systems that
18 cause or contribute to a violation of state water quality, sediment quality, or ground
19 water quality standards, including but not limited to sanitary sewer connections,
20 industrial process water, interior floor drains, car washing, and gray water systems per
21 Title 13 TMC.
- 22 **Inspector** – The Public Work Director’s representative who inspects contract
23 performance in detail.
- 24 **Permit Center** – The City of Tenino’s Permit Center, located in City Hall.
25
- 26 **Policy** – Adopted action or procedure as outlined in the City of Tenino Comprehensive
27 Plan.
- 28 **Private Street** – See TMC 18.20 Definition Street. The City does not maintain private
29 streets.
- 30 **Professional Engineer** – A civil engineer licensed to practice in the state of
31 Washington.
- 32 **Public Street** – See TMC 18.20 Definition Street. The City maintains public streets.
- 33 **Public utility** – A company or entity engaged in any business or service regularly
34 supplying the public with some commodity or service that is a public need and

1 consequence, such as natural gas, electricity, water, or sanitary sewer, including any
2 business subject to regulation as to rates and service by the Utilities and Transportation
3 Commission under the provisions of Title 81 of the Revised Code of Washington.

4 **Public Works Director** – Individual appointed by the Mayor as the leader of the City’s
5 Public Works Department.

6 **Receiving bodies of water** – Creeks, streams, rivers, lakes and other bodies of water
7 into which surface waters are directed, either naturally or in manmade ditches or piped
8 systems.

9 **Residential street** – Neighborhood or local access street.

10 **Right-of-way** – See TMC 18.20 Definition Right-of-Way.

11 **Sidewalk section** – The portion of the driveway approach lying between the back edge
12 of the sidewalk and the apron, plus the end slopes measured at the front edge of the
13 sidewalk.

14
15 **Stormwater Manual.** *Drainage Design & Erosion Control Manual for Thurston County*
16 (TCDD&ECM) or the City’s most currently adopted stormwater manual.

17
18 **Subdivision** –

19 **SHORT SUBDIVISION.** Any voluntary or involuntary division or redivision of land
20 into four (4) or fewer lots, tracts, parcels, sites or subdivisions for the purpose of
21 sale, lease or transfer of ownership; excluding required lots as necessitated by
22 preservation requirements of critical areas as required by TMC 18D, or to provide
23 for infrastructure needs such as road, stormwater or utility lots for common use
24 within the short subdivision for a total of no more than nine total lots.

25 **FORMAL (LONG) SUBDIVISION.** Any voluntary or involuntary division or
26 redivision of land into five (5) or more buildable lots, tracts, parcels, sites or
27 division for the purpose of sale, lease, or transfer of ownership; excluding any
28 required lots as necessitated by preservation requirements of critical areas as
29 defined by TMC 18D, or to provide for infrastructure such as road, stormwater or
30 utility lots for common use within the subdivision

31
32 **Utility** – A company providing public service such as gas, electric power, telephone,
33 telegraph, water, sewer, or cable television, whether or not such company is privately
34 owned or owned by a governmental entity.

35
36 **Utility easement** – Property interest, usually in a strip, granted by the property owner to
37 the City or other entity for the purpose of providing a utility.

38 **Abbreviations:**

- 1 **AP** Angle Point
- 2 **Comp Plan** City of Tenino Comprehensive Plan
- 3 **DNS** Determination of Non-Significance
- 4 **EIS** Environmental Impact Statement
- 5 **IBC** International Building Code
- 6 **MDNS** Mitigated Determination of Non-Significance
- 7 **NEPA** National Environmental Protection Act
- 8 **PC** Point of Curvature
- 9 **PCC** Point of Compound Curvature
- 10 **PRC** Point of Reverse Curvature
- 11 **PSAPCA** Puget Sound Air Pollution Control Authority
- 12 **PT** Point of Tangency
- 13 **PUD** Public Utility District
- 14 **ROW** Right-of-Way
- 15 **SEPA** State Environmental Protection Act
- 16 **TCDD&ECM** Drainage Design & Erosion Control Manual for Thurston County
- 17 **TIR** Technical Information Report
- 18 **TRC** Technical Review Committee
- 19 **TMC** Tenino Municipal Code
- 20 **WSDOT** Washington State Department of Transportation

21
22
23

24 **1-1.5 Guarantees, Bonds, and Insurance**

25 Performance guarantees in the form of performance and maintenance bonds and
26 insurance will be required for all work within public easements and right-of-way, as well
27 as for public works improvements.

28 Acceptable methods of performance guarantees will be as follows:

29

- 30 1) Performance Bond
- 31 2) Assignment of Funds
- 32 3) Cash Set Aside Agreement
- 33 4) Cash Deposit
- 34 5) Irrevocable Standby Letter of Credit

35

36 Standard forms of the above referenced documents acceptable to the City will be
37 available at City Hall. Changes or substitutions for the above noted forms will require a
38 written request to and approval by the City.

39

40 The developer shall provide a detailed cost of construction estimate to the City,
41 prepared by a Professional Engineer licensed by the state of Washington, for the cost of
42 improvements based on the approved plans. The estimate shall itemize descriptions,
43 quantities, and unit costs. The estimate should be submitted as early as possible during
44 the review process to allow adequate time and avoid delays in the permit issuance
45 process. The submitted data will be reviewed by the Public Works Director for use in

1 establishing the bond amounts. The bond amount will equal 125% of the approved
2 Engineer's cost of construction estimate. The bond shall be submitted before any
3 permits will be approved.

4
5 **1-1.5.1 Performance Bonds**

6 Performance bonds are required for all improvements located in the public rights-of-way
7 pursuant to TMC 18.30.120 Security Mechanisms, including, but not limited to, all
8 utilities and drainage construction as detailed on the approved plans. The following is a
9 summary of typical bond requirements:

10 **STREET/ALLEY** Estimated cost plus 25%; bond improvements prior to building permit
11 issuance; for a plat, bond all improvements prior to recording plat (\$1,000 minimum).

12 **DRAINAGE/GRADING** Estimated cost of temporary erosion control plan installation
13 and maintenance for project plus 25% (\$1,000 minimum).

14 **UTILITIES (PUBLIC)** Estimated cost plus 25%; bond improvements prior to occupancy;
15 for a plat, bond prior to recording plat (\$1,000 minimum).

16 **LANDSCAPES** Estimated cost plus 25%; bond improvements prior to building permit
17 issuance; for a plat, bond all improvements prior to recording plat (\$1,000 minimum).

18 **STREET TREES (PUBLIC)** Estimated cost plus 25%; bond improvements prior to
19 building permit issuance; for a plat, bond all improvements prior to recording plat
20 (\$1,000 minimum).

21 The initial guarantee and subsequent extensions will be limited to two-year increments.
22 If time extensions are approved by the Community Development Director or Public
23 Works Director, the bond amount shall be revised to reflect inflation and/or other cost
24 impacts. Utilities under Franchise Agreement with the City are exempt from providing
25 Performance Bonds.

26 **1-1.5.2 Maintenance Bonds**

27 Maintenance bonds will be required at the time of final acceptance of the constructed
28 public improvements and/or improvements required by the City. The maintenance bond
29 amount will normally be equal to 20% of the documented final cost of the improvements.
30 The maintenance bond must be in place prior to City release of the performance bond.
31 Methods of posting maintenance bond shall be the same as for performance bond and
32 shall be for the lengths of time as listed below:

Street/Alley	Drainage	Utilities (Public)	Landscape
Two Years	Two Years	Two Years	Two years

36
37 **1-1.5.3 Insurance**

38
39 The applicant and/or contractor shall procure and maintain for the duration of the

1 Agreement insurance against claims for injuries to persons or damage to property which
2 may arise from, or in connection with, the performance of the work hereunder by the
3 applicant and/or contractor, their agents, representatives, employees or subcontractors.
4 The applicant and/or contractor shall provide a Certificate of Insurance evidencing:

- 5 1) Automobile Liability insurance with limits no less than \$1,000,000 combined
6 single limit per accident for bodily injury and property damage.
- 7 2) Commercial General Liability insurance written on an occurrence basis with limits
8 no less than \$1,000,000 combined single limit per occurrence and \$2,000,000
9 aggregate for personal injury, bodily injury, and property damage. Coverage
10 shall include, but not be limited to, blanket contractual, products/completed
11 operation, broad form property damage, explosion, collapse and underground
12 (XCU), if applicable, and employer's liability.

13 Any payment of deductible or self-insured retention shall be the sole responsibility of the
14 applicant and/or contractor.

15 The City shall be named as an additional insured on the Commercial General Liability
16 insurance policy, as respect to work performed by or on behalf of the Contractor, and a
17 copy of the endorsement naming the City as additional insured shall be attached to the
18 certificate of insurance. The City reserves the right to receive a certified copy of all
19 required insurance policies.

20 The applicant and/or contractor's insurance shall contain a clause stating that coverage
21 shall apply separately to each insured against whom claim is made or suit is brought,
22 except with respects to the limits of the insurer's liability.

23
24 The applicant and/or contractor's insurance shall be primary insurance as respect to the
25 City and the City shall be given thirty (30) days prior written notice of any cancellation,
26 suspension or material change in coverage.

27 **1-1.6 Permits**

28 29 **1-1.6.1 Requirements**

30 Permits, approvals, or agreements are required by the City, and sometimes other
31 jurisdictions, prior to beginning any construction or demolition work described within
32 these Standards.

33 Most of the work covered under the Standards will require multiple permit authority
34 review and approvals. Several types of permits and approvals require prior approval
35 from the authority before a building or other permit of substance can be issued.

36 The applicant is responsible for submitting all necessary forms, documentation, and
37 supporting data according to the requirements established for each permit.

1 Any questions regarding permits, approvals, and agreements should be directed to the
2 appropriate code authority in the City's Permit Center.

3 The following is a list of the typical permits types required for various projects and is
4 only listed here for informational purposes. There may be additional permits required;
5 these should be coordinated at a Pre-Development meeting (see Section 1.6.3), or with
6 appropriate City departments.

- 7 1) Right-of-Way
- 8 2) Land Surface Modification (Grading)
- 9 3) Site Development – Public/Private
- 10 4) Building
- 11 5) Electrical
- 12 6) Plumbing/Mechanical
- 13 7) Landscaping

14
15 The following general categories describe the major permits, approvals, and
16 agreements, along with the issuing permit/code authority (in parentheses).

- 17 1) Environmental Review. For most projects, including clearing and grading activity,
18 an Environmental Checklist must be completed by the applicant and submitted
19 along with plans, specifications, and other information when approval or permits
20 are being requested for a project. The Planning Department conducts the
21 Environmental Review and makes a SEPA Threshold Determination for the City.
- 22 2) Construction Permits:
 - 23 a) Clearing and Grading Permit (Building Department): A Clearing and Grading
24 Permit is required for all significant land alterations, including plats. A Clearing
25 and Grading Permit is typically issued in conjunction with other permits.
 - 26 b) Building Permit (Building Department): A Building Permit is required for all
27 construction work including alteration, repairs, and demolition. Demolition
28 Permits for structures greater than four thousand square (4,000 sq. ft.) require
29 the submittal of an Environmental Checklist.
 - 30 c) Right-of-Way Permit (Building Department and Public Works Department): A
31 Right-of-Way Permit is required for any work within the street right-of-way
32 which is not covered by other permits and agreements. Such work may
33 include utilities work, land closures, driveways, curbs, sidewalks, and haul
34 routes. Permission to temporarily close a street or portion thereof for
35 construction activities or special events is obtained through the Right-of-Way
36 Permit.
 - 37 d) Utilities Work (Planning Department and Public Works Department): Permits,
38 service requests, and applications are required for water and sewer-related
39 items, including side sewers, fire hydrant use permits, and water meters.
- 40 3) Approvals and Other Permits. Several other permits or approvals may be required
41 and referred to in these Standards: Developer Extension Agreements; plat and
42 short plat approvals; and Certificate of Occupancy.

1 In addition, there are several other City approvals (land use) which may be required
2 and obtained prior to the above listed permits, which may affect the Standards as
3 contained in this document: Reclassification; Condition Use; Design Review;
4 Planned Unit Development; and Substantial Development Permit.

5 The approved applicant's copy of the permit(s), together with a set of plans approved by
6 the City, shall be available on the job site at all times.

7 **1-1.6.2 Permit Application**

8 No permit(s) shall be issued unless a complete and appropriate written application for
9 the issuance of applicable permit(s) is submitted to the Permit Center. The complete
10 application must be legible, in pen or typed, and signed by the applicant.

11 **1-1.6.3 Permit Review Process**

12 The City has established a pre-application meeting wherein applicants may meet with
13 City staff in order to exchange information on proposed projects. City staff from Public
14 Works, Planning, Permit Center, Fire, Building, and the City Contract Engineer may
15 attend. Applicants are encouraged to schedule and attend meetings with Public Works
16 and Permit Center staff prior to formal submission of application. Pre-application
17 meetings may be scheduled through City Hall by calling (360) 264-2368. The fee for a
18 pre-application meeting is established by Resolution of the City Council.
19

20 **1-1.6.4 Performance and Maintenance Bonds Required**

21 Before any permit(s) as provided in this section can be issued, the applicant must
22 comply with all provisions of Section 1-1.5, Guarantees, Bonds, and Insurance

23 **1-1.7 Rights-of-Way and Easements**

24 Utility and roadway improvements, that are to be a part of the public system and
25 represent a part of the City's capital improvements, shall be constructed in public rights-
26 of-way or easements.

27 All necessary new rights-of-way and easements must be obtained by the applicant,
28 approved by the City of Tenino, and recorded with the County prior to beginning any
29 new construction.

30 **1-1.7.1 Rights-of-Way**

31 The City's Comprehensive Plan has a policy of identifying rights-of-way for and planning
32 completion of missing portions of the local roadway system, including neighborhood
33 collectors. When new developments are proposed, completion of these missing
34 roadways will be studied and may be required as alternatives for access (Policy T-4.5).

35 The City also has a policy of identifying and requiring as conditions of development
36 approval: needed rights-of-way, strategies to reduce demand, and off-site

1 improvements to the extent that such conditions are directly related to impact mitigation
2 and will benefit the community (Policy T-4.2).

3 Deeded or dedicated right-of-way is required for all public street and roadway
4 improvements. All portions of the traveled way, curbs, gutters, sidewalks, medians, bike
5 lanes, drainage facilities, landscaping, and other required improvements shall be
6 located within the right-of-way.

7
8 Where existing right-of-way width is not sufficient to construct the required
9 improvements, the applicant shall obtain the necessary additional right-of-way and
10 arrange for dedication to the City in a form prescribed by the City. A statutory warrantee
11 deed or other document (i.e., plat recording) will be required and must be accompanied
12 by a current title report for the property in question.

13 **1-1.7.2 Easements**

14 Additional permanent and/or temporary easements for the purpose of construction,
15 access, maintenance, sight distance preservation, roadway slopes, utility line, and
16 storm drain installation may be required. A license to use land is not acceptable.

17 Permanent easements for access, maintenance, and construction are required for all
18 driveways and private street systems serving more than one property located outside of
19 public right-of-way. When easements are required, legal descriptions shall be prepared
20 by a professional land surveyor (licensed in the state of Washington) and stamp
21 thereon. A current title report(s) covering the properties to be encumbered by the
22 easements shall accompany said description.

23 For projects that require new roadway construction or widening of existing roadways,
24 the applicant shall provide dedicated rights-of-way or easements to accommodate
25 utilities. This shall include subdivisions, short plats, planned unit developments, binding
26 site plans and certain building projects. Tenino Municipal Codes may establish
27 additional requirements for right-of-way dedications, setbacks, and site improvements.

28 A non-exclusive easement shall be reserved for and granted to all private utilities
29 serving the subject project and their respective successors and assigns. This easement
30 shall be a minimum of 10' wide, located parallel to and contiguous to the street right-of-
31 way and frontage of all lots and common areas as shown in Standard Plan 100. The
32 utilities may use the easement to install, lay, construct, renew, operate, and maintain
33 underground conduits, cables, pipes, and wires, together with other necessary facilities
34 and equipment. The easement shall provide right-of-entry upon the property at all times
35 for the purposes herein stated.

36 Easements granted to the City of Tenino for the placement of public utilities shall be in a
37 form acceptable to the City. The following information shall be provided for all
38 easements:

- 1) All legal descriptions shall be certified by a Professional Land Surveyor licensed in the state of Washington.
- 2) A scaled drawing on an 11"x17 sheet showing the easement in a clear legible manner shall accompany all legal descriptions.
- 3) A separate plan shall show the following plan information:
 - a) Easement limits, easement centerline, centerline stationing, bearings and distances.
 - b) Location of the utility within the easement.
 - c) Distance from the utility line to the easement centerline.
 - d) Centerline stationing and offset for all valves, fittings, meters, hydrants, vaults, manholes, blow-off assemblies, bends, outfall structures, utility crossings, intersection with street centerlines, and property lines.
 - e) Storm drain lines shall normally be located 2.5' off of the easement centerline.
 - f) Easements for public utilities shall be 15' in width or greater if required by the Public Works Director to accommodate larger pipe sizes, access needs, or other special requirements.

The easements shall be recorded with the County Recorder's office for Thurston County after acceptance of the dedication is acknowledged on the face of the document by the Public Works Director. The applicant shall provide copies of the recorded easements to the Public Works Department.

1-1.8 Deviation from Standards

Permissible alternatives different from these Standards may be approved by the Public Works Director upon review of evidence submitted by the applicant that such modifications are in the public interest, that they are based upon sound engineering judgment, and that requirements for safety, function, appearance, and maintainability are fully met. Requests for proposed alternatives should be submitted as soon as possible during the permit process to allow time for the Public Works Director's decision. A minimum of ten working days shall be permitted for a determination of acceptance, denial, or request for additional information. Upon receiving additional requested information, a minimum of ten days shall be permitted for further review and comment. Requested alternatives must be reviewed and approved prior to construction. The Public Works Director will decide if a requested alternative is permissible.

All others will be considered as a variance and will be reviewed according to the process established in the Tenino Municipal Code. Such request may require the applicant to sign an agreement to extend the permit processing time frame if it is subject to the regulatory reform process.

Periodically, the City may modify these Standards in order to make corrections, clarify procedures, and to revise the standards and/or specifications to conform to municipal practice and new technology or state or federal standards. Proposed substantive changes will be submitted by the Public Works Director to the City Council for adoption as amendments to the approved Standards.

1 **1-2. PLANS AND REPORTS TO SUBMIT FOR APPROVAL**

2 **1-2.1 Traffic Studies**

3 The impact of a development on the City and the need for infrastructure improvements
4 will be considered in light of the City's goals, one of which is:

5 Provide a well-maintained transportation system providing safe and cost-effective
6 movement of goods, services, and people. (Comprehensive Plan Goal T-2). To achieve
7 that goal:

- 8 1) The City shall adopt and maintain level of service D for Minor Arterials for two-
9 hour traffic flows. (Policy T-2.1).
- 10 2) The City shall classify Tenino's streets according to federal, state, regional, and
11 local guidelines. (Policy T-2.2).
- 12 3) A highly interconnected street network shall be provided for ease and variety of
13 travel throughout the City and the UGA. (Policy T-2.3).
 - 14 a) The City will investigate alternatives to service the new UGA area.
 - 15 b) Thurston County will ensure implementation of this policy through its review of
16 conversion plans associated with clustered development proposals within the
17 unincorporated UGA.
 - 18 c) The City will get updated information from TRPC and the regional travel
19 demand model periodically to calibrate its congestion calculations and
20 incorporate background regional traffic growth, and to ensure consistency
21 with the adopted regional modeling assumptions.
- 22 4) The City shall maintain the transportation system at a level comparable with
23 design standards applied to new facilities. (Policy T-2.4).
 - 24 a) The City will establish programs and schedules for the level and frequency of
25 roadway, bikeway, and sidewalk maintenance.
- 26 5) The City shall encourage travel by means other than the automobile and provide
27 for pedestrian and bicycle safety throughout the City.
 - 28 a) The City will look for ways to leverage investments in the Yelm-to-Tenino trail
29 to increase local circulation opportunities for bicycle and pedestrian travel.
 - 30 b) The City will work to develop the trailhead of the Yelm-to-Tenino trail into a
31 gateway to the regional network, providing linkages for Tenino citizens to that
32 bigger network as well as opportunities for those arriving in the city to access
33 local streets and businesses.
- 34 6) Explore opportunities for freight mobility and use of the rail line for transporting
35 products originating in Tenino, in accordance with the 2025 Thurston Regional
36 Transportation Plan goal 8: Freight Mobility. (Policy T-2.6).
 - 37 a) Develop policies and design standards that minimize conflicts caused by the
38 potential growth of freight movement into and out of individual areas.
- 39 7) In the unincorporated UGA, Thurston County's Capital Facilities Plan and any
40 applicable levels of service shall govern. (Policy T-2.7).
- 41 8) Ensure roads are adequate to meet transportation needs. (Goal CF-8).
 - 42 a) Evaluate and possibly implement transportation impact fees to ensure

1 continued levels of service. (Policy CF8-1).

2
3 **1-2.1.1 Responsibility and Purpose**

4 All developments require a Transportation Impact Analysis, the extent of which is
5 dependent on the type of development. The primary responsibility for assessing the
6 traffic impacts associated with a proposed development rests with the applicant, with
7 the City serving in a review capacity. The study is the responsibility of the applicant and
8 must be prepared by, or under the supervision of, a Professional Engineer, licensed in
9 the state of Washington, with experience in traffic engineering and/or transportation
10 planning.

11 The applicant's transportation professional shall contact the Public Works Director to
12 arrange for discuss the proposal prior to submitting a traffic study. Scoping the
13 requirements for the study is intended to identify key issues early in the project planning
14 and development stage and assist the applicant and City during the review and
15 approval process. A checklist will be prepared by City staff, documenting the
16 requirements of the study. Three copies of the traffic study must be submitted with the
17 application for permits discussed in Section 1.6. The applicant will be notified if
18 additional copies are needed. A copy of the completed checklist must also be
19 submitted with the application. Studies submitted without the completed checklist will
20 be considered incomplete. Where there is the potential for impacts to state or county
21 routes, additional coordination may be necessary between the applicant and the
22 Washington State Department of Transportation (WSDOT) and King County. The
23 applicant will be required to submit two copies of the study to WSDOT with a copy of the
24 transmittal to the City.

25 Traffic Impact Analysis must show how the proposed development will affect the
26 existing transportation network. If the final use(s) of the proposed development is not
27 determined at the time of the study, the land use with the greatest overall traffic impact
28 must be assumed for the study. Once the City has reviewed the traffic study and
29 comments have been returned to the applicant, all required changes must be
30 incorporated into the study, and a revised study must be submitted to the City for final
31 review and approval.

32 Adjustments related to traffic mitigation based on actual use of the proposed
33 development may be made prior to Certificate of Occupancy as the project becomes
34 more defined.

35
36 **1-2.1.2 Traffic Impact Analysis Guidelines**

37 While individual reports may vary in style and format, certain information must be
38 included. The amount of detail required, as well as the overall extent of the study, will
39 be detailed during the scoping discussion on project specific basis. Typical information
40 required is included below.

- 1 1) Project Description
- 2 a) Project type and size.
- 3 b) Project location, with vicinity map.
- 4 c) Proposed site access, with site plan.
- 5 d) Horizon planning year.
- 6 2) Existing Conditions
- 7 a) Existing traffic volumes.
- 8 b) Daily and peak hour intersection turning movement counts completed within one
- 9 year prior to the application date.
- 10 c) Roadway network, including traffic control.
- 11 d) Level of service calculations for peak hour at intersections impacted by the
- 12 project and at site entrances, if applicable. Calculation shall conform to the
- 13 procedures outlined in the current Highway Capacity Manual.
- 14 e) Parking supply.
- 15 3) Accident/Safety Conditions
- 16 a) Accident history at intersections and access points.
- 17 b) Sight distance analysis at intersections and access points. Minimum stopping
- 18 sight distance as defined by AASHTO is required.
- 19 c) Clear zone analysis.
- 20 4) Trip Generation and Distribution
- 21 a) Daily and peak hour trip generation using the latest ITE Trip Generation Manual or
- 22 other approved method.
- 23 b) Trip distribution map showing daily and peak hour turning movements assigned
- 24 to the roadway network. The proposed development's trips are to be distributed
- 25 through the street network to a level of three peak hour trips.
- 26 c) Parking generation analysis using the latest Tenino codes and ordinances, ITE
- 27 Parking Generation Manual, or other approved method.
- 28 5) Public Transit and Non-Motorized Facilities
- 29 a) Identification of existing transit service.
- 30 b) Identification of existing trails, bicycle lanes, and other non-motorized facilities.
- 31 6) Future Conditions
- 32 a) Annual growth rate determined by actual data or other approved source. This
- 33 shall include approved traffic estimates from other projects within the City.
- 34 b) Future conditions, with and without the project with commentary on compliance
- 35 with concurrency requirements as needed.
- 36 c) Level of service calculations sheets for peak hour traffic at all intersections
- 37 impacted by the project and site access points, with and without the proposed
- 38 project.
- 39 d) Parking demand analysis.
- 40 e) Effect of proposed development on public transit and non-motorized facilities.
- 41 Any transportation facilities proposed by the Comprehensive Plan which may
- 42 affect the development.
- 43 7) Mitigation Measures
- 44 a) All developments are subject to the City's Traffic Mitigation Ordinance and
- 45 mitigation payments are calculated accordingly.
- 46 b) Proposed mitigation to correct any deficiencies not addressed through the Traffic

- 1 Mitigation Ordinance.
- 2 c) Dedication of right-of-way and associated frontage improvements.
- 3 d) Evaluation of change in accident potential with proposals to correct safety
- 4 deficiencies.
- 5 8) Other
- 6 a) Analysis of internal site circulation for vehicles, transit, non-motorized users, and
- 7 handicap access.
- 8

9 **1-2.2 Plans**

10 **1-2.2.1 General Format**

11 When construction plans for improvements, including but not limited to water, sewer,
12 storm drainage, and transportation improvements, are prepared and are to be
13 constructed within the Tenino City Limits or service area, then the project plans must
14 meet the standards and requirements shown below.

- 15 1) All public works plans for street improvements and utility systems shall be
16 prepared in a mylar plan/profile format either with sheets printed in half plan and
17 half profile or with separate sheets for plan view and profile views. For all Capital
18 Improvement Projects, all plans shall be prepared on standard City of Tenino
19 mylar sheets (or permanent photo mylars of these sheets), which shall be
20 obtained from the Permit Center information counter. No “sticky-back” or pasted
21 pieces are allowed. The standard sheet size is 11" x 17". If AutoCAD is used,
22 City of Tenino title block, etc., shall be incorporated into the AutoCAD drawings.
- 23 2) Scales: Use Horizontal Scale of 1" = 20', and Vertical Scale of 1" = 5' unless
24 otherwise required or approved by the Public Works Director. (Note: Complex
25 utility locations may require a larger scale plan to show the necessary detail.)
- 26 3) Plans shall include a key for abbreviations, a legend for symbols where such are
27 used, and a North arrow where appropriate. Draw the plan so the North arrow
28 points to the right or to the top of the sheet.
- 29 4) Control line distances and features shall have no dimension variations greater
30 than 0.2' (scaled distance) on a 20-scale drawing.
- 31 5) Use of a lettering guide is preferred, but very neat, legible, free-hand lettering is
32 acceptable. The minimum lettering size is 0.10". This is to ensure the plan is
33 legible after microfilming or reduction to one-half size. Existing features shall be
34 screened to one-half tone.
- 35 6) Use the standard Washington State Chapter of the American Public Works
36 Association symbols as supplemented by these Standards.
- 37 7) Match lines with matched sheet number shall be provided where plan is drawn

1 on two or more sheets. Where plan is shown on three or more sheets, include a
2 total site plan index map at scale 1" = 100' or 1" = 200' to cross reference
3 portions of the project with their corresponding plan sheet location.

4 8) Label all streets by their City of Tenino names.

5 9) All existing and proposed improvements shall be located and dimensioned with
6 ties to King County survey monuments, monument lines or street centerlines.
7 Dimensioning must be done by stationing and offset from these control lines.

8 10) All elevations and grades on public works construction plans shall be to Thurston
9 County Aerial Survey datum NAVD 1988. In addition, the survey Control
10 Network shall be based on NAD 1983/1991.

11 11) The Professional Engineer's seal, signature, address, and phone number shall
12 appear in the lower right portion of each sheet.

13 12) In addition to mylar plan and profile sheets, all plans for major city or developer
14 projects should be submitted with a floppy disc computer file that can be
15 imported to AutoCAD. Within two weeks after the City has signed the approved
16 construction plans, the Project Engineer shall provide an electronic format disk
17 (AutoCAD or ArcView and to a scale of one-to-one) of the plans.

18
19 **1-2.2.2 Required General Data**

20 All division or phase lines shall be indicated showing proposed limits of construction,
21 rights-of-way, and limits of clearing and grading.

22 1) Existing and proposed topography contours shall cover the entire site and extend
23 a minimum of 50' beyond the site boundary. Existing topography shall be
24 screened. Topography contours shall be shown at 2' intervals (5' intervals for
25 slopes greater than 15%, 10' intervals for slopes greater than 40%). Elevation
26 labeling shall be shown at 10' intervals maximum.

27 2) Show and clearly label property lines (with distances and bearings), right-of-way
28 lines, sensitive areas and set backs, and all existing easements with their
29 recording numbers, and proposed easements. Show existing and proposed
30 building footprints.

31 3) Show the existing and proposed right-of-way and channelization of all streets that
32 front the proposed development. Show contours, street improvements, including
33 all curb cuts within 200' of the subject property, on both the adjacent properties
34 and the properties across the streets that front on the proposed development.

35 4) Show complete data for curb radii, utility locations (new and existing), curb
36 elevations, street stationing, street widths, existing adjacent improvements,

1 elevations of existing street improvements, utilities, super-elevation, curve data,
2 vertical curve data, and all other data necessary to construct the project.

3 5) Plans shall be prepared with all utilities, both new and existing, shown on all sets
4 of plans. For example, on the storm drainage plans, the water and sanitary
5 sewers shall be shown half toned with the storm drainage portions being heavily
6 highlighted. Other utilities shall also be shown in profile views where crossings
7 occur. Provide a legend of existing and proposed improvements on the first sheet
8 of each drawing type (i.e., drainage).

9 Whenever possible, use notes specifying Thurston County or WSDOT standard item
10 numbers for common items such as catch basins, restrictors, fire hydrant assemblies,
11 etc.

12 **1-2.2.3 Drawing Standards**

13 In addition to the formatting and required data listed above, the following drafting
14 standards shall be included within the storm drainage and transportation plans as
15 applicable. Plan and profile drawings are required for all proposed transportation-
16 related improvements; proposed storm drainage facilities and stream channel
17 improvements; and sewer and water improvements.

18 Five (5) sets of plans for public works improvements and utilities along with two (2)
19 copies of the Storm Drainage Technical Information Report (TIR) shall be submitted
20 with the appropriate permit application, which shall include the following items as a
21 minimum. (Additional elements may be required dependent on project requirements.)

22 1) Title Sheet with Vicinity Map, Index Map (if appropriate) and references to Tenino
23 Public Infrastructure Standards and Details.

24 2) Site Topographic and Horizontal Control Plan.

25 3) Temporary Erosion and Sedimentation Control Plan.

26 4) Grading Plan.

27 5) Street Improvement Plan.

28 6) Storm Drainage Collection/Conveyance/Water Quality Treatment and Detention
29 Plan and Profile (Drainage and Street Plans may be combined together).

30 7) Landscaping Plan (within right-of-way and buffer areas), including Street Tree
31 Plan.

32 8) Composite Utility Plan. Include a composite utility plan sheet showing existing
33 utilities (half tone) and all new utilities. Scale should be 1" = 50'. The composite

1 utility plan shall show all underground utilities and all associated surface
2 improvements that include the locations of the sewer and storm drain laterals,
3 water meters, fire hydrants, street lighting standards, traffic signal poles, mail
4 boxes, transformers, telephone risers, utility vaults, etc. to establish clearances.
5 Underground utilities of concern include sewer, storm drain, water, power, cable
6 TV, telephone, street lighting, traffic signal wiring, gas, and overhead
7 electric/telephone/cable facilities.

8 9) Traffic Control Plan (detouring and/or construction sequencing, and temporary
9 Signing Plan where necessary). The applicant shall submit a proposed Traffic
10 Control Plan for construction to the Public Works Director for review and approval
11 prior to initiating the work. The Traffic Control Plan often will be part of an
12 approved Right-of-Way Use Permit and shall be coordinated with the Public
13 Works Department and the Permit Center. All traffic control devices, signing,
14 striping and other pavement delineation shall be in accordance with the most
15 current version of the *Manual on Uniform Traffic Control Devices* (MUTCD).
16 Standard Details 100 through 112 show typical lane configurations.

17 10) Cross-sections of existing and proposed construction as may be required by
18 Public Works Director. (Note: Separate cross-section work sheets are required
19 for street construction. Distance between cross-section locations shall be
20 typically at 50' stations or as determined by the Public Works Director based on
21 site topography.)

22 11) Details and Specifications for the above improvements, including duplicate
23 copies of all standard drawings referenced on the plan and in the notes.

24 12) Other applicable drawings that may include but not be limited to: driveway
25 schedule, signing and channelization, signalization, and illumination.

26 13) Drainage Technical Information Report (TIR). Design calculations for storm and
27 surface water systems (e.g., conveyance, runoff control, runoff treatment) shall
28 bear the signature and seal of the responsible Engineer. A thorough list of
29 assumptions used shall also be included.

30 1. TITLE SHEET Each submittal shall contain the following project information on the
31 title sheet or first sheet:

- 32 a) Title: Project name (add explanatory note if project name has changed) and type
33 of project.
- 34 b) Developer and Agency names.
- 35 c) Table of Contents (if more than 3 sheets).
- 36 d) Vicinity Map (scale sufficient to cover project limits on one sheet or 1" = 200',
37 whichever is greater).
- 38 e) General description of site, including Quarter Section, Township and Range.
- 39 f) Name and phone number of engineering firm preparing plans.
- 40 g) Index map to sheets, as appropriate.

- 1 h) City of Tenino Conditional Use and/or Shoreline Permit number; DNS or MDNS
- 2 number.
- 3 i) Approvals blocks.
- 4 j) Legend.

5

6 **2. SITE TOPOGRAPHIC AND HORIZONTAL CONTROL PLAN** Show all existing

7 underground, surface improvements, and topography within a minimum of 50' of

8 the project. The information must be shown for the full width of the right-of-way or

9 the easement and for a sufficient distance on either side of the right-of-way or

10 easement to show possible impacts on adjacent properties and/or the relationship

11 to related facilities (typically 200'). Information on existing surface and underground

12 City of Tenino facilities may be obtained from the Public Works Department. Other

13 utility information may be obtained from the respective utility owners (i.e., Puget

14 Sound Energy, U.S. West, TCI Cable, etc.).

- 15 a) Label each section or detail in the plans. Section and detail labels should be
- 16 shown on both the plan and the section detail, and should include assigned
- 17 section/detail numbers and plan sheet location number.
- 18 b) Sewer, Water and Drainage Improvements: Provide profiles of all proposed
- 19 sewer, water and drain lines. Show existing underground improvements within
- 20 10' of where they cross or connect to the new improvements. Show the
- 21 stormwater drainage discharge point to a public system or natural water course.
- 22 Provide drainage system details whether or not detention of stormwater is
- 23 required. Label all private facilities.
- 24 c) Grades: All profile and cross-sections must show the proposed as well as the
- 25 existing grade. Utility plans shall indicate invert elevations of pipelines at all
- 26 crossing points.
- 27 d) Public storm drain lines not within street right-of-way shall be within easements
- 28 granted to the City of Tenino in a form acceptable to the City. The easement
- 29 widths will vary according to pipe diameter, but shall not be less than 15' wide.
- 30 Easements shall be shown on the storm drainage plan sheets. (See Easement
- 31 Criteria, Section 1-1.7).
- 32 e) Stationing shall be provided on all centerlines and reference lines. All
- 33 intersection street centerlines, utility crossings, right-of-way lines, property lines,
- 34 railroad crossings, drainage structures and signal and light poles shall be
- 35 referenced by station and offset. Curve data shall be provided for roadway
- 36 centerline and right-of-way curves. All PC's, PT's, PRC's, PCC's and AP's shall
- 37 be stationed and offset.

38

39 **3. TEMPORARY EROSION AND SEDIMENT CONTROL PLAN** The Temporary

40 Erosion and Sedimentation Control (TESC) Plan shall show the following:

- 41 a) Existing and proposed topography.
- 42 b) Clearing limits.
- 43 c) Location and details for construction entrance.
- 44 d) Construction sequence.
- 45 e) Provisions for perimeter runoff control at property boundaries.
- 46 f) All cut and fill slopes, indicating the top and bottom of slope catch lines.

- 1 g) All necessary details to illustrate the intent of the TESC plan.
- 2 h) Interim catch basin sedimentation protection.
- 3 i) All drainage pipes and ditches. Include pipe inverts, minimum slopes and cover,
- 4 with ditch grades and dimensioning.
- 5 j) Specify areas to receive special treatment such as jute matting, rock lining, sod,
- 6 mulching and seeding.
- 7 k) Provide all necessary dimensioning and details for sediment traps, berms, pond
- 8 storage, pond outlet structure, filtering devices, inlet/outlet stabilization
- 9 techniques, control/restrictor devices, rock check dams, silt fabric fences, pond
- 10 inlet baffles, and other design elements.
- 11 l) In addition, the plan shall comply with the regulations listed in the most recently
- 12 adopted edition of the TCDD&ECM, Appendix B, "Erosion Control Standards".
- 13

14 4. GRADING PLAN

15 The site grading work shall show all existing and proposed grades, and may be
16 incorporated or combined with the "Site Topographic and Horizontal Control Plan."

17 Show all off-site trees (private and public) that could be adversely affected by the
18 proposed activity (TMC 18B.30.120).

19 Show surveyed locations of perimeters of groves of significant trees and individual
20 significant trees to preserve (TMC18B.30.120 and TMC 18E).

21 5. STREET IMPROVEMENT PLAN Roadway improvements include but are not limited
22 to paving, curbs, gutters, sidewalks, driveways, curb ramps, storm drainage
23 structures, street lighting, traffic signals, signing, and channelization.

- 24 a) Establish baseline or centerline adequately dimensioned from at least two known
- 25 reference points or monuments approved by the City of Tenino.
- 26 b) Dimension all improvements off of established baseline or centerline.
- 27 c) Station all plans, with true point of origin for stationing dimensioned from
- 28 monument. If 10+00 stationing point does not coincide with monument, tie in
- 29 with station equation. Stationing should increase from left to right or bottom to
- 30 top.
- 31 d) When possible, street improvements in right-of-way should have profile drawing
- 32 beneath plan view.
- 33 e) Provide cross-sections at adequate intervals (50' maximum spacing) to assure
- 34 that proposed improvements will correspond with existing conditions, and with
- 35 City ordinance requirements for improvements.
- 36 f) Provide adequate information on roadway geometry, including PC, PT, PRC,
- 37 PCC, AP, radius, curve angle, tangent length, curve length and all other
- 38 information required to adequately establish the horizontal geometry. Provide
- 39 adequate information on roadway profile, including vertical curve approach
- 40 grades and length of vertical curve and all other information required to
- 41 adequately establish the profile.
- 42 g) Provide spot elevations and slope call-outs where improvements abut with
- 43 existing pavement. Show top of curb elevation at suitable intervals along

- 1 curbline, and all break in grades. If the plan is separate from the profile, show top
 2 of curb elevation at all curb returns at intersections and at back of cul-de-sacs.
- 3 h) Provide profile drawings for all private roads, and for driveways where slope
 4 exceeds 5%.
- 5 i) Include all appropriate City of Tenino standard details and specifications in plans.
- 6 j) Show bearings for all new roadway alignments.
- 7 k) Clearly call out existing and proposed right-of-way, with dimensions, within 50' of
 8 the project limits.
- 9 l) Show all existing and proposed easements on plans within 50' of the project
 10 limits.
- 11 m) Show location of all existing and proposed driveways. A "Driveway Schedule"
 12 which lists all of the driveways, both residential and commercial, being
 13 constructed and shall include the following information pertaining to each
 14 driveway, in tabular form:
- 15 1) Location of driveway
 16 2) Width
 17 3) Length
 18 4) Surface type
 19 5) Profile grade (may require separate sketch)
- 20 n) Design street lighting, signals, signing (both traffic control and street name signs)
 21 and channelization, per these Standards, and including appropriate City of
 22 Tenino standard details and specifications. Also include table of wiring schedule,
 23 wiring schematic, pole schedule, table of luminaire schedule, notes and details.
- 24 o) All dimensions shall be shown on plans for special structures, with complete
 25 construction elevations and loading diagrams when applicable. All plans shall
 26 provide the necessary detail required for preparation of bar schedules and bar
 27 placement without the necessity of making separate shop or placement
 28 drawings. Structural steel use shall include such detail that shop drawings can be
 29 prepared without additional design.
- 30 p) Each submittal shall include on the first or second sheet of the Transportation
 31 Plans a "Summary of Quantities", describing the items to be removed, relocated,
 32 or installed, and their quantities.

33

34 **6. STORM DRAINAGE/WATER QUALITY TREATMENT/DETENTION PLAN AND**
 35 **PROFILE**

- 36 a) Label all cleanouts, manholes, and catch basins in sequential number indicating
 37 size, location, and type on the plans. In profiles, label rim and invert elevations as
 38 well as catch basin or manhole size and type.
- 39 b) Include flow direction arrows on all storm drain pipes.
- 40 c) Label pipe size, length, material and slope in plan or profile.
- 41 d) Include horizontal and vertical datum and benchmark information on each plan
 42 and/or profile sheet.
- 43 e) Show spot elevations of pavement in parking lots, and runoff flow direction
 44 arrows.
- 45 f) Show roof leaders and footings drains connecting into conveyance system.
- 46 g) Show all stub-out locations for future connections.

- 1 h) Show location of rockeries and include section details for rockeries in grading or
- 2 street improvement plans.
- 3 i) Show and label 25-year hydraulic grade line.
- 4 j) Show and label the following for all stormwater facilities:
- 5 1) At least two cross-sections through detention pond. One cross-section shall
- 6 show the control structure.
- 7 2) Location and detail of emergency overflows and spillways.
- 8 3) Invert elevations of all pipes, inlets, tanks, vaults and spot elevations of the
- 9 pond bottom. Call out pond volume and dimensions, and design surface
- 10 elevation.
- 11 4) Plan and section views and details of all rock protection and energy
- 12 dissipaters.
- 13 5) Section and plan view on restrictor/control structure; detailed, including size
- 14 and elevation of orifices.
- 15 6) Show length, width, and bottom width dimensions for all bio-filtration and
- 16 water quality swales and stormwater conveyance swales. Include sectional
- 17 view, showing side slopes and design depth of flow.
- 18 7) Include seeding material information.
- 19 k) Submit two (2) copies of the drainage TIR in accordance with the adopted
- 20 stormwater manual, Section 2.3.1.1.

21 7. LANDSCAPING PLAN

22 The development of landscaping and erosion control is to conform to the basic concepts
23 and principles set forth in the City of Tenino Zoning Code and Standards. A copy of the
24 Zoning Code is available for review from the Planning Department.

25 The landscaping plan shall include street trees required as part of TMC 12.65. It should
26 include the following information:

- 27 a) Location, size, and species of trees to be planted as required by TMC
- 28 18.B.30.110.
- 29 b) Description and detail showing site preparation, installation, and maintenance
- 30 measures.
- 31 c) Timeline for site preparation, installation, and maintenance of landscaping
- 32 (including street trees).
- 33 d) Cost estimate for the purchase, installation, and maintenance of landscaping
- 34 (including street trees).
- 35 e) The description and location of all underground and overhead utilities within the
- 36 right-of-way or near proposed trees.
- 37 f) Design Standards TMC Section 18B.30.140.
- 38 g) Details: Construction and planting details shall be included on the site plan. See
- 39 Tenino Standard Details 341 and 342.
- 40 h) Construction notes describing the required soil materials and planting preparation
- 41 shall be included on the landscaping plan.
- 42 i) Show all off-site trees (private and public) that could be adversely affected by the

1 proposed activity on the grading, erosion control, and site plans (TMC
2 18B.30.110).

- 3 j) Show surveyed locations of perimeters of groves of significant trees and
4 individual significant trees to be preserved on the grading, erosion control and
5 site plans (TMC 18B.30.110 and TMC 18D.40).

6 7 8. COMPOSITE UTILITY PLAN

8 Include a composite utility plan sheet showing existing utilities (half tone) and all new
9 utilities. Scale should be 1" = 50'. The composite utility plan shall show all underground
10 utilities and all associated surface improvements that include the locations of the sewer
11 and storm drain laterals, water meters, fire hydrants, street lighting standards, traffic
12 signal poles, mail boxes, transformers, telephone risers, utility vaults, etc. to establish
13 clearances. Underground utilities of concern include sewer, storm drain, water, power,
14 cable TV, telephone, street lighting, traffic signal wiring, gas, and overhead
15 electric/telephone/cable facilities.

16 9. TRAFFIC CONTROL PLAN

17 The applicant shall submit a proposed Traffic Control Plan for construction to the Public
18 Works Director for review and approval prior to initiating the work. The Traffic Control
19 Plan often will be part of an approved Right-of-Way Use Permit and shall be
20 coordinated with the Public Works Department and the Permit Center.

21 All traffic control devices, signing, striping and other pavement delineation shall be in
22 accordance with the most current version of the *Manual on Uniform Traffic Control*
23 *Devices* (MUTCD).

24 Standard Details 100 through 112 show typical lane configurations

25 **1-2.3 As-Built (Construction Corrected Record) Drawings**

26 Prior to the final acceptance of any site work, the applicant shall furnish the Public
27 Works Director two neatly and legibly marked sets of 11x17 drawings of the approved
28 construction plans showing any and all changes in the final locations of all items within
29 the public right-of-way and public access easements of work including, but not limited
30 to, curb and gutter, storm drain lines, water lines, sewer lines, catch basins, manholes,
31 fire hydrants, valves, street trees, and new and existing utilities and their appurtenances
32 included in the work. In addition the construction plans must show all storm, sanitary
33 sewer, and potable water system work on private property including, but not limited to,
34 storm drain lines, water lines, sewer lines, catch basins, manholes, fire hydrants, valves,
35 clean outs, water quality systems, storm detention/retention systems, and their
36 appurtenances included in the work.

37
38 Marking of the drawings shall accurately represent all changes, both vertical and
39 horizontal, as recorded at the time the material and equipment are installed. Include the
40 words "Drawings of Record" with the current date on each sheet of the plans. A

1 computer file of the drawings of record (construction corrected record) shall be
2 submitted in conjunction with the drawings. The computer file shall be capable of being
3 imported to AutoCAD (check with City for current version) or ArcView. Please refer to
4 Section 1-2.2.1 of these Standards for information on plan format.

5
6 Drawings of Record shall be required for private and public construction in accordance
7 with the following:

8
9 **Private Development (submit to Permits Center)**

- 10
11 1) *Subdivisions, Short Subdivisions, and Utilities Extensions* – Final acceptance of the
12 improvements within the public right-of-way will be withheld until after the Drawings
13 of Record have been submitted and approved.
14
15 2) *Commercial* – Final acceptance of the improvements within the public right-of-way
16 and the Certificate of Occupancy will be withheld until the Drawings of Record have
17 been submitted and approved.

18
19 **Public Works Projects (submit to Public Works Department)**

20
21 Drawings of Record shall be considered an item on the contractor's punch list. Until all
22 items on the punch list are completed, the project will not be approved. Final
23 acceptance and payment will be withheld until the as-built drawings are submitted and
24 approved.

25
26
27 **1-3. GRADING, CONSTRUCTION, AND LAND ALTERATION**
28

29 Design for all public improvement projects shall comply with the following:

- 30 1) Tenino Municipal Code 18B.30.100 requires all streetscape utility extensions to
31 be underground.
- 32 2) Tenino Municipal Code 18.30.090 – 120 requires that a permit may prescribe
33 conditions for the issuance thereof. Fees for the underground utilities, paving,
34 sidewalks, curb and gutters, parking, and landscaping, etc., by private
35 individuals, contractors, corporations, and/or developers on public and/or private
36 property are established by Resolution.
- 37 3) All local, state, and federal regulations.

38 No grading shall be steeper than 3:1, unless approved by the Public Works Director and
39 supported by a geotechnical report prepared, sealed, and signed by a licensed
40 Professional Engineer certifying that a steeper slope will not pose a landslide or erosion
41 hazard.

1 **1-4. STREETS AND RELATED WORK**

2 **1-4.1 General Requirements**

3 All work performed in the design and preparation of plans for new, or improvements to,
4 City streets and all appurtenances, whether public or private, shall be the responsibility
5 of the applicant/contractor and done to the satisfaction of the Tenino Public Works
6 Director in accordance with the plans and specifications approved by the City for the
7 work.

8 No permits will be issued to start work until plans for that work are approved, and
9 necessary bonds have been provided. Any revisions to the approved plans shall first be
10 reviewed by the Public Works Department and then submitted for approval to the City of
11 Tenino Permit Center before being implemented. A set of as-built (construction
12 corrected record) drawings will be required at the completion of the project and prior to
13 final acceptance of the work.

14 City of Tenino Ordinances, Comprehensive Plan, and applicable portions of the
15 Standards, establish policy for the installation of street improvements. Specific
16 requirements may be reviewed with the applicant at a scheduled pre-application
17 meeting or will be determined at the time of permit application and/or issuance.

18
19 **1-4.2 Street Classification and Geometrics**

20 ***1-4.2.1 Street Classification***

21 City of Tenino roadways are classified in the City of Tenino Comprehensive Plan.
22 Criteria for minimum right-of-way, roadway widths and other geometrics is listed for
23 each classification in the Standard Details 100 through 112. Additional right-of-way and
24 traffic lanes may be required to accommodate turning movements at intersections and
25 as determined by the Transportation Impact Analysis.

26 ***1-4.2.2 Street Layout***

27 The overall goal of street placement in the City is as stated in the Comprehensive Plan
28 GOAL T-2: Provide a well-maintained transportation system providing safe and cost-
29 effective movement of goods, services, and people.

30 To accomplish that goal, street layouts should be in accordance with the following
31 Comprehensive Plan policies:

32 Policy T-1.1: The City shall encourage public participation in the transportation planning
33 and design process through open workshops and public hearings.

34 Policy T-1. 2: The City's planning, construction, and operations of transportation
35 facilities and programs shall support and complement the transportation functions of the

1 State, Thurston Regional Planning Council, adjacent counties, neighboring cities,
2 Tenino School District, and other entities responsible for transportation services in the
3 Tenino urban growth area.

4
5 *Policy T-2.3.A highly interconnected street network shall be provided for ease and
6 variety of travel throughout the City and the UGA.

7 Policy T-2.5: The City shall encourage travel by means other than the automobile and
8 provide for pedestrian and bicycle safety throughout the City.

9
10 Policy T-3.2: The City shall employ guidelines to:

- 11
- 12 ▪ Control access to roads from adjacent facilities where appropriate
- 13 ▪ Route arterials and major collectors around neighborhoods to minimize traffic
- 14 impacts on residential areas;
- 15 ▪ Prevent new residential areas from fronting on arterials;
- 16 ▪ Provide landscaping and noise buffers along major roadways; and,
- 17 ▪ Provide facilities for bicyclists and pedestrians.

18
19 Policy T-3.4: Transportation improvements in Tenino and the UGA shall be encouraged
20 that allow efficient provision of transportation services such as park-and-ride lots, park-
21 and-pool lots, vanpools and carpools.

22
23 Policy T-3.5: City and County participation shall continue with state government and
24 Intercity Transit in maintaining an ongoing regional program to promote and facilitate
25 ridesharing by the general public and commuters.

26
27 Policy T-3.6: Encourage pedestrian and bicycle access to and from residential and
28 commercial areas by improving and adding sidewalks throughout the city.

29
30 Policy T-3.7: Require new commercial developments that border Sussex to put in
31 sidewalks and curbs.

32 Street layouts for new developments shall take into consideration the following:

- 33 1) The arrangement of streets in a subdivision shall either:
 - 34 a) Provide for the continuation or appropriate projection of existing streets in
 - 35 surrounding areas; or,
 - 36 b) Conform to a plan for the neighborhood approved by the Public Works Director to
 - 37 meet a particular situation where topography or other conditions make
 - 38 continuance or conformance to existing streets undesirable.
 - 39
- 40 2) Where a subdivision abuts or contains an existing or proposed arterial street, the

- 1 Public Works Director may require the following:
- 2 a) Marginal access streets,
 - 3 b) Reverse frontage lots with screen planting contained in a non-access reservation
4 along the rear property line,
 - 5 c) Deep lots with rear service alleys, or
 - 6 d) Other treatment as may be necessary for adequate protection of residential
7 properties and to afford separation of through and local traffic.
- 8 3) Residential streets are required to have sidewalks on one side (generally on the
9 South and East sides of streets) and storm drainage infiltration ditches on the other
10 side (generally on the North and West of streets). Residential streets include the
11 following zones, SF-ES, SF, SFD, and Industrial zones. All other zones are
12 considered Non-residential and are required to have sidewalks on both sides of the
13 street. Where residential and non-residential zones abut, sidewalks are required on
14 both sides of the street with stormwater infiltration systems within the right-of-way.
15 Refer to the adopted Sidewalk Plan map (figure 1).
- 16 4) Non-arterial streets shall be laid out and designed in a manner that discourages their
17 use by through traffic.
- 18 5) Easements controlling access to streets shall be prohibited except where the control
19 is definitely placed with the City under conditions approved by the Public Works
20 Director.
- 21 6) A tangent at least 100' long is required between reverse horizontal curves on arterial
22 and collector streets, and a tangent of 50' for local streets.
- 23 7) Street intersections with centerline offsets of less than 300' for arterials and
24 collectors and 125' for local streets shall not be allowed unless specifically approved
25 by the Public Works Director.
- 26 8) Streets shall be laid out so as to intersect within 5° of perpendicular.
- 27 9) Property lines at street intersections shall be rounded with a radius of 25', or of a
28 greater radius where the Public Works Director may deem it necessary. The Public
29 Works Director may permit comparable cutoffs or chords in place of rounded
30 corners.
- 31 10) Street right-of-way widths shall be as shown in the Standard Details, or as approved
32 by the Public Works Director.
- 33 11) New residential streets may require traffic calming measures as determined by the

1 Public Works Director. Traffic calming measures may include speed humps, “neck-
2 downs”, traffic circles, and/or bulbs, which can be incorporated into new subdivision
3 design as determined by the Public Works Director.

4
5 **1-4.2.3 Block Layout**

- 6 1) Block lengths shall not exceed 1,320’ and each block shall be a minimum of 660’
7 long. Modification of these requirements by the Public Works Director may be
8 approved in areas with topographic limitations and in multiple family residential,
9 commercial, and industrial developments.
- 10 2) Cross-block lengths shall not be less than 200’ to provide for two rows of lots with a
11 utility easement, except that the Public Works Director may approve a single row of
12 lots where the lots abut a major arterial or collector street, a drainage course, a
13 railroad right-of-way or a single row of lots in an abutting subdivision of record.
- 14 3) Where blocks are longer than 660’ long, and where access to school, park, or
15 shopping is considered necessary, a pedestrian walk with a wheelchair ramp
16 approximately mid-block, with a minimum right-of-way width of 10’, may be required
17 by the Public Works Director with surfacing, fencing, and barriers.
- 18 4) Cross-connecting pedestrian and or bicycle paths shall be required between cul-de-
19 sacs and adjacent streets to provide pedestrian connectivity, as determined by the
20 Public Works and Planning Departments.

21 **1-4.2.4 Horizontal and Vertical Street Alignment**

22 Alignment of streets within the City shall be in conformance with the guidelines of the
23 American Association of State Highway and Transportation Officials (AASHTO) *Policy*
24 *on Geometric Design of Highways and Streets* and the Washington State Department of
25 Transportation *Design Manual*. The Public Works Director or City contract Engineer
26 shall approve final project geometric requirements.

27 **1-4.2.5 Street Grades**

28 Street grades shall conform to the AASHTO Policy on Geometric Design of Highways
29 and Streets. Street grades shall be as level as is consistent with the surrounding
30 terrain. Minimum tangent street grades shall be 0.5% along the crown line and curb.

31

Maximum street grades shall be as follows:	
Type of Street	Maximum Grade
Private Street	
Residential	15
Commercial	10
Residential Street	15
Collector	

Residential	12
Commercial	10
Minor Arterial	10
Principal Arterial	10

1
2 **1-4.2.6 Sight Distance**

3 Providing adequate sight distance from a street or driveway is of utmost importance for
4 ensuring safe streets and driveway operation. Intersection sight distances shall be
5 evaluated based upon the most current adopted edition of the *AASHTO Policy on the*
6 *Geometric Design of Highways and Streets*. Sight distance requirements for each
7 approach shall be based upon the criteria for stopping site distance for the 85-
8 percentile speed. The posted speed limit plus 8 mph may be used if actual speed data
9 is not available.

10
11 Standard Detail 316 shows the sight distance triangle. The area within this triangle shall
12 be subject to restrictions necessary to maintain a clear view on the intersection
13 approaches. Driveways shall also observe the sight triangle restrictions, including
14 landscaping and placement of view obstructions.

15
16 Other factors such as vertical and horizontal curves and roadway grades also shall be
17 taken into account. Such factors may allow necessary modification to the intersection
18 sight distance requirements.

19
20 Sight distance shall be measured using the methods described in the AASHTO “Policy
21 Manual” from a point on the minor road pavement (or nearest traffic lane if parking is
22 permitted) and measured from a height of eye at 3.50’ on the minor road to height of
23 object .50’ on the major road.

24
25 The vertical clearance area within the sight distance triangle shall be free from
26 obstructions to a motor vehicle operator’s view between a height of 3’ and 10’ above the
27 existing surface of the street (TMC 12.12.010).

28
29 **1-4.2.7 Intersections**

30 Every intersection shall be designed to accommodate the design vehicle appropriate for
31 the highest classified street forming the intersection. All elements of the intersection,
32 including turning lanes and channelizing islands, shall be designed so that a design
33 vehicle will not encroach onto curbs, sidewalks, traffic control devices, channelizing
34 islands, center divisional medians, or into the travel lanes of opposing flow traffic.

35 **1-4.2.8 Curb Return Radii**

36 For the intersection of two local streets, the minimum allowable curb radius shall be 25’,
37 which is to be measured from the radius point to the face of curb. For the intersection of
38 a local street with any collector or arterial, the minimum radius shall be 30’.

1 On streets with bus and truck flows, radii of 40' or more shall be provided. Radii of 40'
2 or more should be designed to fit the paths of appropriate design vehicles.

3 On all other street intersections, the minimum allowable radii shall be 30'.

4 Larger radii may also be required where speed reductions would cause delays to
5 emergency response vehicles.

6 **1-4.2.9 Cul-de-Sacs, Turn-Arounds**

7 Cul-de-sacs shall be provided at all permanent street ends, and/or on any temporary
8 dead-end location when the length of the street is more than 150' in length. Cul-de-
9 sacs shall be per Standard Detail No. 314. Cul-de-sacs shall not be longer than 660',
10 unless written approval is granted by the Fire Marshall and the Public Works Director.
11 Street ends serving fewer than three lots, and less than 150' long, do not require a
12 turnaround.

13 On dead-end streets, where the street is less than 150' long, the required turnaround
14 area may be a hammerhead type design subject to review and approval of the Fire
15 Marshal and Public Works Director.

16 **1-4.2.10 Private Streets**

17 Community street requirements are usually best served by public streets, owned and
18 maintained by the City. However, private streets may be appropriate for some local
19 access and commercial streets. Usually these are minor residential or commercial
20 access streets.

- 21 1) Private streets may be approved only when they:
- 22 a) Are permanently established by easement or public right-of-way providing legal
23 access to each affected lot, dwelling unit, or business, and
 - 24 b) Are sufficient to accommodate the required improvements, and
 - 25 c) Include provision for future use by adjacent property owners when appropriate,
26 and
 - 27 d) Are built to City Standards, and
 - 28 e) Are accessible at all times for emergency and public vehicle use, and
 - 29 f) Do not obstruct, or are not part of, the present or future public neighborhood
30 circulation plan as contained in the City's Transportation Plan, Comprehensive
31 Plan, Capitol Improvement Program, or other such document, and
 - 32 g) Are not going to result in land-locking of present or future parcels, and
 - 33 h) Are not needed as public roads to meet the minimum street spacing
34 requirements of these standards, and
 - 35 i) Are designed to serve a maximum potential of four residential lots or dwelling
36 units or two commercial lots or buildings when the entire length of the private
37 road and all adjacent parcels are considered. The maximum potential is the total
38 number of lots, dwelling units, or commercial buildings that could possibly be
39 served by the street when physical barriers, zoning, or other legal constraints are

- 1 considered, and
- 2 j) Are maintained by a legally responsible owner or homeowners association or
- 3 other legal entity made up of all benefited property owners, and
- 4 k) Is clearly described on the long plat, short plat, or other development
- 5 authorization document, and
- 6 l) Is clearly signed at the street entrance as a private street.
- 7

8 The City of Tenino will not accept private streets for maintenance as public streets until
9 such streets are brought into conformance with current City street standards and the
10 right-of-way is dedicated to the City.

11 The City of Tenino will not accept private streets within short plats when the street
12 providing access to the plat is currently private, and the street already has the potential
13 to serve more than the number of lots, dwelling units, or commercial buildings specified
14 in these standards. Proposed short plats on properties to which the access is proposed
15 over private streets that do not meet these standards shall be denied.

16 **1-4.2.11 Structural Pavement Section**

17 Structural sections and street appurtenances shall be in accordance with Tenino
18 Standard Details 100 through 112. The pavement sections shown are allowable
19 minimums only. A geotechnical study and pavement analysis recommendation will
20 normally be required for any proposed new road construction, widening of existing
21 streets, or major repair and overlay work. The applicant shall be responsible for
22 providing such reports, prepared by a Professional Engineer licensed in the state of
23 Washington, for review and approval by the Public Works Director. Modifications to the
24 minimum road structural sections may be required to address site-specific soil
25 conditions, drainage considerations, and vehicle loads. Where higher than normal truck
26 traffic is projected, the applicant's traffic and geotechnical engineers shall evaluate the
27 adequacy of the proposed section and recommend any additional specific measures
28 necessary to provide a minimum 20-year design life for the new pavement section. The
29 Public Works Director may require the final lift of asphalt to be bonded for and delayed
30 for up to one year due to weather and other considerations.

31 **1-4.3 Non-Motorized Travel Facilities**

32 The City has a goal to provide a transportation system with minimal environmental
33 impact and energy consumption for a high quality of life to be enjoyed by Tenino's
34 residents (GOAL T-3). To reach that goal, the Comprehensive Plan states several
35 policies, including:

36 Policy T-3. 1: In order to minimize adverse environmental impacts resulting from the
37 construction and operation of transportation facilities, the city of Tenino shall:

- 38
- 39
 - 40
 - Consider environmental costs of development and operation of the transportation system;

- 1 ▪ As much as possible align and locate transportation facilities away from
- 2 environmentally sensitive areas;
- 3 ▪ Mitigate unavoidable environmental impacts where possible; and
- 4 ▪ Solicit and incorporate the concerns and comments of interested parties.

5
6 Policy T-3.2: The City shall employ guidelines to:

- 7
- 8 ▪ Control access to roads from adjacent facilities where appropriate
- 9 ▪ Route arterials and major collectors around neighborhoods to minimize traffic
- 10 impacts on residential areas;
- 11 ▪ Prevent new residential areas from fronting on arterials;
- 12 ▪ Provide landscaping and noise buffers along major roadways; and,
- 13 ▪ Provide facilities for bicyclists and pedestrians.

14
15 Policy T-3.3: Transportation Demand Management programs of the City, County, State,

16 Intercity Transit, and other agencies should work to decrease auto dependence, shall

17 be well coordinated, and shall be consistent with Regional Transportation Plan goals.

18
19 Policy T-3.4: Transportation improvements in Tenino and the UGA shall be encouraged

20 that allow efficient provision of transportation services such as park-and-ride lots, park-

21 and-pool lots, vanpools and carpools.

22
23 Policy T-3.5: City and County participation shall continue with state government and

24 Intercity Transit in maintaining an ongoing regional program to promote and facilitate

25 ridesharing by the general public and commuters.

26
27 Policy T-3.6: Encourage pedestrian and bicycle access to and from residential and

28 commercial areas by improving and adding sidewalks throughout the city.

29
30 Policy T-3.7: Require new commercial developments that border Sussex to put in

31 sidewalks and curbs.

32
33 **1-4.3.1 Bike Lanes**

34 Exact locations of bike lanes with respect to sidewalks and road lanes will be

35 determined on a project-specific basis and in coordination with the City's Parks Master

36 Plan. The Public Works Department will coordinate with the Planning Department to

37 determine final locations, widths, and related requirements. If the required bike lane will

38 not fit within the existing right-of-way, then the applicant shall obtain, at the applicant's

39 cost, and dedicate to the City the additional right-of-way and easements necessary. All

40 bicycle facilities shall conform to WSDOT Standards for bike lanes, trails, and paths.

41 Principal arterials, minor arterials, and collectors, when required, shall include a Class I

42 bike lane with a minimum width of 5'.

1 **1-4.3.2 Sidewalks and Trails**

2 Exact locations of sidewalks will be determined on a project-specific basis and in
3 conjunction with the adopted Sidewalk Plan map. The exact location of trails will be
4 determined on a project-specific basis and in conjunction with the City's Parks Master
5 Plan. The Public Works Department will coordinate with the Planning Department to
6 determine final locations, widths, and related locations. If the required sidewalk or trail
7 will not fit within the existing right-of-way, then the applicant shall obtain, at the
8 applicant's cost, and dedicate to the City the additional right-of-way necessary.

- 9 1) Pedestrian and pathway signing will be provided in accordance with the Manual of
10 Uniform Traffic Control Devices, and the Washington State Department of
11 Transportation Pedestrian Facilities Guidebook.
12 2) Pedestrian and pathway lighting levels and luminaires will be in accordance with the
13 Illumination Engineering Society of North America (IES) Roadway Lighting Manual.
14

15 **1-4.4 Fire Department Access**

16 As required by the Fire Marshall, every building constructed shall be accessible to the
17 Fire Department, both during and after construction, by way of fire apparatus access
18 roadways approved by the Fire Department. A fire access roadway shall have at least
19 20' of unobstructed width, shall have adequate roadway turning radius, and be capable
20 of supporting the imposed loads of fire apparatus.

21 The minimum allowable vertical clearance shall be 13' 6".

22 All required fire access roadways must be in service prior to commencement of
23 combustible construction.

24 The maximum allowable grade on any fire lanes, fire access roads, fire access
25 easements, and fire access within subdivisions shall be 15% per the City of Tenino
26 amendments to the IFC. An Application for Variance may be submitted for review and
27 approval by the City Fire Marshall and the Public Works Director.

28 The required 20' of fire access roadway shall consist of a paved surface. The type,
29 location, and width of the access roadway surfacing is subject to approval of the Fire
30 Marshal and Public Works Director. The applicant's Soils Engineer shall verify the
31 adequacy of the proposed pavement section for access to fire trucks.

32 **1-4.5 Utilities**

33 **1-4.5.1 General**

34 Utilities to be located within existing and proposed City rights-of-way shall be
35 constructed in accordance with current utility franchise agreements and/or current
36 permit procedure, and in compliance with these Standards. In their use of the right-of-
37 way, utilities will be given consideration in concert with the traffic carrying requirements

1 of the road which are, namely, to provide safe, efficient, and convenient passage for
2 motor vehicles, pedestrians, and other transportation uses. Aesthetics shall be a
3 consideration. As a matter of policy, undergrounding of new electric and telephone
4 utilities will be required. Also, utilities are subject to City policies relating to drainage,
5 erosion/sedimentation control, and sensitive areas as set forth in City codes and
6 ordinances, and Section 5, Storm Drainage, of these Standards.

7 All permits for new placement and replacement of existing utility poles and other utility
8 structures above grade shall be accompanied by written certification from a Professional
9 Engineer or from an agent authorized by the utility to certify that the installations
10 conform to these Standards and that the proposed work is in conformity with sound
11 engineering principles relating to highway safety.

12 Requests for deviations from these Standards will be processed in accordance with the
13 City's variance procedure as referenced in Section 1-1.8.

14 **1-4.5.2 Joint Trenching**

15 Recognizing that trenching and excavation within public rights-of-way can significantly
16 degrade the quality and longevity of street surfacings and seriously inconvenience the
17 public, all public and private utilities shall share in the use of their excavations and
18 trenches within public rights-of-way whenever feasible.

19 In the event that the City, a telecommunications carrier, or a public utility desires to
20 share in an excavation, it shall provide a written request to do so. Joint use of
21 excavations shall be subject to the following conditions:

22 1) Such joint use shall not unreasonably delay the work of the party causing the
23 excavation to be made.

24 2) A utility owner or agency desiring to share in an excavation may be required to pay
25 the fair and reasonable pro-rata cost of said excavation. Such joint use shall be
26 arranged and accomplished on terms and conditions satisfactory to both parties.
27

28 3) Either party may deny such request for safety reasons.

29 **1-4.5.3 Standard Utility Locations Within Public Right-of-Way**

30 Utilities within the right-of-way on new roads or on roads where existing topography,
31 utilities, or storm drains are not in conflict, shall be located as shown on Standard Detail
32 302 and as indicated below. Where existing utilities or storm drains are in place, new
33 utilities shall conform to these Standards as nearly as practicable, and yet be
34 compatible with the existing installations. Above-ground utilities located within
35 intersections shall be placed so as to avoid conflict with placement of curb ramps.

36 1) Water Lines:

- 1 a) Location: 6' north or east of street centerline;
2 b) Depth: 48" minimum cover from finished grade.
- 3 2) Individual water service lines shall:
4 a) Be placed with minimum 36" cover from finished grade;
5 b) Use road right-of-way only as necessary to make service connections;
6 c) Connections shall be as close to 90° from street centerline as practical;
7 d) Water meter boxes, when placed or replaced, shall be located outside the right-
8 of-way, on the right-of-way line immediately adjacent to the property being
9 served, unless otherwise approved by the Public Works Director. Meter box
10 locations within the right-of-way may be approved by the Public Works Director
11 based on site conditions, which make routine service access difficult or
12 impractical.
13
- 14 3) Sanitary Sewer:
15 a) Location: 6' south or west of centerline;
16 b) Depth: 36" minimum cover from finished grade;
17 c) Sanitary and water lines shall be separated in accordance with good engineering
18 practice such as the Criteria for Sewage Work Design, Washington State
19 Department of Ecology, latest edition.
20
- 21 4) Electric Utilities, Power, Telephone, and Cable:
22 a) Location: within utility easement adjacent to right-of-way;
23 b) Depth: 36" minimum cover, either side of road, at plan location and depth
24 compatible with other utilities and storm drains.
25
- 26 5) Utility Poles: Every replacement of existing utility poles above grade shall conform to
27 the following:
28 a) Utility poles or other obstacles placed within the right-of-way shall be as far back
29 from the traveled way or auxiliary lane as practicable.
30 i) On shoulder type roads, poles or obstacles shall be located at the back of
31 ditches and a minimum of 10' from the edge of the traveled way, unless
32 protected by concrete barrier, suitable impact attenuating device or placed
33 more than 3.5' behind the face of a guardrail.
34 ii) On vertical curb type roads, poles shall be placed clear of sidewalks and at
35 least 2' from the face of the curb.
36 b) Notwithstanding the other provisions regarding pole locations described in these
37 standards, no poles shall be located so that it poses a hazard to the general
38 public. Utilities shall place and replace poles with primary consideration given to
39 public safety.
40 c) Deviations from these pole and obstacle clearance criteria may be allowed by an
41 approved variance when justified by a suitable engineering study considering
42 traffic safety. Only the utility owner may request a variance from pole and
43 obstacle clearance criteria. Up to three contiguous damaged or weakened poles
44 may be replaced at existing locations under permit in accordance with
45 emergency procedures. Sequential permits resulting in continuous replacement

1 of a pole line shall not be allowed. A pole or other obstacle which incurs
2 repeated damage from errant vehicles shall be relocated or protected.

3 d) Locations of poles shall also be compatible with driveways, intersections, and
4 other road features (i.e., they shall not interfere with sight distances, road
5 signing, traffic signals, culverts, etc.). To the extent possible, utilities shall share
6 facilities so that a minimum number of poles is needed.

7 e) Notwithstanding other provisions, underground systems shall be located at least
8 5' away from road centerline and where they will not otherwise disturb existing
9 survey monumentation.

11 **1-4.6 Driveways**

12 **1-4.6.1 General**

13 1) Encroachments on public property are prohibited except as specified in TMC
14 Chapter 12.25. City street rights-of-way may not be used for private residential
15 or commercial purposes. A permit for the construction of driveway approaches
16 shall not be issued unless vehicles to be served or serviced can be parked
17 entirely within the private property lines.

18 2) The Public Works Director shall have the authority to restrict the number, size,
19 and location of access driveways.

20 3) In areas where the volume of on-street parking is critical to the City, additional
21 off-street parking space(s) will be required to replace all on-street spaces
22 eliminated by any driveway(s).

23 4) No driveway approach shall be permitted to encompass any municipal facility
24 (fire hydrant, signal pole, signal cabinet, etc.). Permit conditions may require the
25 applicant to relocate such municipal facilities, including any within the limits of a
26 curb return.

27
28 5) The Public Works Director may require joint use of driveways by more than one
29 property.

30 6) Driveways directly giving access onto arterials may be denied if alternate access
31 is available.

32 7) Permits for new driveways shall require all abandoned driveway areas on the
33 same frontage shall be removed and the curbing and sidewalk, or shoulder and
34 ditch section, shall be properly restored.

35 8) Maintenance of driveway approaches shall be the responsibility of the owner
36 whose property they serve.

37 9) For driveways crossing an open ditch section, culverts shall be adequately sized

to carry anticipated stormwater flows and in no case be less than 12" in diameter. The property owner making the installation shall be responsible for determining proper pipe size. The City may require the owner to verify the adequacy of pipe size by preparing a drainage study and report.

10) For design speeds less than 35 mph, driveways must be a minimum of 125' away from an adjacent intersection.

1-4.6.2 Residential Driveways

1) General

- a) A single driveway can serve:
 - i) A maximum of two lots with one dwelling unit on each lot; or
 - ii) A maximum of two dwelling units, as defined in the IBC, on a single lot.

2) Width:

- a) Each single ownership shall be entitled to one 14' wide driveway approach.
- b) Where a driveway approach in excess of 14' is requested for a single ownership, the maximum approach width which the Public Works Director may approve are as follows:

Maximum Width of Residential Driveways		
Frontage	One Driveway Approach	Two Driveway Approaches
Under 30'	50% of frontage	Not allowed
30 to 60'	20'	Not allowed
60 to 80'	30'	22'
Over 80'	35'	30'

- c) There must be at least 20' between driveways serving any one property frontage.
- d) No driveway approach, including end slopes, shall be allowed within 5' of the side property line, unless a written request is made to and approved by the Public Works Director, and the owner of the adjacent property is a cosigner of the driveway permit.
- e) In cases where driveway approaches are constructed on corner lots, no driveway approach, including side slopes, shall be constructed closer than 4' from the end of any curb return at the curb line.

3) Grade:

- a) The maximum allowable grade for a residential driveway is 10%.
- b) Grades up to 15% may be allowed subject to advance administrative approval of the Fire Marshal and Public Works Director. Grade changes that exceed 8% shall require vertical curves to connect tangents.

1-4.6.3 Commercial Driveways

1) General

- a) Each lot shall be entitled to one access point per street frontage.
- b) Access driveways for parking areas shall be located so as to cause the least possible conflict with vehicular and pedestrian traffic on public rights-of-way.
- c) For commercial or industrial driveways with heavy traffic volumes or significant numbers of trucks, the City may require construction of the access as a private road intersection. This requirement will be based on traffic engineering analysis submitted by the applicant that considers, among other factors, intersection spacing, sight distance, and traffic volumes.
- d) Private road intersection type driveway openings requested by the applicant will be considered in lieu of conventional driveways in commercial areas when criteria 1 through 4 below are met. Meeting the criteria is not a guarantee that an intersection type driveway will be allowed.
 - i) Projected driveway usage is greater than 1,000 vehicles per day;
 - ii) The opening is at least 160' from any other street intersection;
 - iii) The opening is at least 160' from any other driveway on the property frontage under control of the applicant;
 - iv) A minimum 100' storage area is provided between the curb line on the street and any turning or parking maneuvers within the development;
 - v) Where driveways intersect with state route rights-of-way, the applicant shall also obtain approval from the WSDOT Access Management Department.

2) Width:

- a) The minimum width of a commercial driveway shall be 20'.
- b) Where a driveway approach in excess of 20' is requested, the maximum approach widths which the Public Works Director may approve are as follows:

Maximum Width of Commercial Driveways	
Street Posted Speed(mph)	Driveway Maximum Width a (feet)
25	30
26-45	35
Over 45	40

a. Dimension (1) on Standard Details 322, 323, and 324

3) Grade:

- a) The maximum grade for a commercial driveway is 8%.
- b) Grades up to 15% may be allowed subject to the approval of the Fire Marshal and Public Works Director.
- c) Vertical curves shall be used for smooth transitions at grade changes that exceed 6%, excluding the tie to the roadway.

4) Spacing:

- a) The minimum spacing for commercial driveways is as shown below. Deviations from the minimum spacing requirements must be approved in writing by the Public Works Director. When allowed, commercial driveways located closer than 100' from the approach to a principal or minor arterial intersection shall be signed and marked "Right Turn Only" unless otherwise approved by the Public Works Director.

Minimum Driveway Spacing as a Multiple of Posted Speed(in feet)			
Street Functional Classification	Minimum Use¹	Minor Generator²	Major Generator³
Principal Arterial	4–5	7–8	9–10
Minor Arterial	3–4	5–6	7–8
Commercial Collector	2–3	4–5	5–6
1. Fewer than 50 vehicle trips per day or 5 trips in the peak hour (two-way total). 2. About 51 to 5,000 vehicle trips per day or fewer than 500 trips in the peak hour (two-way total). 3. Over 5,000 vehicle trips per day or over 500 trips in the peak hour (two-way total).			

1
2
3

1-4.6.4 Driveways Within Areas of Limited Street Improvements

- 4 1) Where standard gutters and curbs have not been installed, the apron length shall
 5 be measured along the property line and there shall be not less than 20' of
 6 frontage between driveway approaches serving any one property. Permits shall
 7 not be issued for any surface improvement or paving on the street right-of-way
 8 between driveway approaches unless a concrete curb or other physical
 9 obstruction of a design satisfactory to the Public Works Director is constructed
 10 and maintained by the applicant along his property line. The entrance and exit of
 11 vehicles to and from applicant's property will be restricted to the established
 12 driveway approaches. Pursuant to the permit conditions, the applicant may
 13 surface the driveway approaches or other areas within the right-of-way,
 14 extending the same type of paving used on the applicant's premises so that it
 15 merges with the street pavement, provided the applicant's paving is adequate
 16 and suitable for the traffic to be carried. Such extended paving between the
 17 property line and the street pavement shall be to established grade or other slope
 18 as designed by the Project Engineer and approved by the Public Works Director
 19 to provide for proper runoff.
- 20 2) Such paving between the property line and the street pavement may meet the
 21 street pavement at a point ahead of the curb opening in order to provide for safe
 22 deceleration of vehicles turning into the applicant's premises. If applicant's
 23 paving is extended beyond the property line into a street right-of-way at an
 24 intersection or crossroad, the Public Works Director may require the applicant to
 25 construct a suitable traffic island or curb to provide for the protection of such
 26 municipal facilities as may be necessary.

27 **1-4.6.5 City-Required Reconstruction of Approaches**

- 28 1) Reconstruction:
 29 a) All driveway approaches heretofore constructed or installed shall meet these

standards. Those driveway approaches now in use, which exceed the allowable width per these Standards, shall be reconstructed by the owners of the property served by such approaches to conform to the provisions of this section as a condition to any land development permit or application. In reconstructing and remodeling the driveway approaches to conform to the provisions of this chapter, curbs shall be replaced according to the ordinance of the City and in accordance with the specifications given by the Public Works Director.

2) Removal and Restoration:

- a) When driveway approaches have been heretofore constructed or installed and are no longer in use, the Public Works Director, by order of the City Council, shall notify the owners of the abutting property to restore the curb and sidewalk to conform to the adjacent curb and sidewalk. If the owner fails to obtain a right-of-way permit or fails to complete the work within six months from the date of Notice from the City, the Public Works Director shall proceed to restore the curb, with costs being a lien upon the property until paid in the same manner as other City improvement liens.

1-4.6.6 Driveway Relocation

As a condition of approval of a right-of-way permit to relocated a driveway, the existing curb depression in the gutter, and the abandoned driveway shall be removed and the curb, gutter, and sidewalk shall be reconstructed to City Standards.

1-4.7 Street Illumination shall require cutoff optics.

1-4.7.1 General

Street lighting systems design shall conform to the applicable portions of the ILLUMINATION ENGINEERING SOCIETY RP-8-00 (IES). Puget Sound Energy (PSE) owns and maintains many of the streetlights for the City of Tenino. Therefore, any street illumination system elements proposed by the applicant shall be reviewed and supported by the City and PSE.

- 1) Streetlights shall be provided with the development of all new subdivisions, short plats, and for commercial, industrial or institutional property development based on deficiencies in proper spacing of streetlights.
- 2) All new streetlight wiring, conduit and service connections shall be located underground. The applicant will be responsible for providing or obtaining necessary easements for underground power for street lighting systems designed and constructed as part of an approved development permit.
- 3) Existing streetlight systems that extend along the frontage of a new development project or within the limits of a roadway improvement project will not be generally required to be brought into conformance with these street lighting standards. If the Public Works Director determines that existing street light systems should be brought into conformance with these requirements due to special circumstances,

1 the applicant will be notified of this requirement during the City's development
2 review process.

- 3 4) For all new street light installations, the applicant shall coordinate jointly with
4 Puget Sound Energy and the Public Works Department to prepare a street
5 lighting plan for submittal to and approval by the Public Works Department. The
6 type of installation shall be as set forth by PSE or ISE Standard Specifications
7 and as directed by the City.
- 8 5) All new public streetlight plans, specifications, and calculations shall be prepared
9 by an engineering firm, Puget Sound Energy, or individual licensed in the state of
10 Washington capable of performing such work. All new developments shall
11 submit the lighting plan on a separate drawing to the City for review and
12 approval. All streetlight plans, specifications, and calculations, including pole
13 locations, types, and heights shall be reviewed and approved by the Public
14 Works Director.
- 15 6) The applicant shall supply streetlights required to be located within the public
16 right-of-way. The applicant is responsible for the installation of streetlights and
17 all accessories necessary to energize the streetlight system consistent with
18 Standards. If approved, the installation of special luminaires shall be the
19 responsibility of the applicant.
- 20 7) Maintenance of the completed lighting systems is provided by Puget Sound
21 Energy.
- 22 8) Private lighting systems shall be maintained by the property owner or
23 homeowners association.
- 24 9) The applicant shall coordinate with PSE for the availability and location of power
25 sources for new street light systems.

26
27 **1-4.7.2 Design Standards**

- 28
29 1) Illumination Levels. The light illumination levels shall conform to the levels listed in
30 the table below.

31

Illumination Standards Average				
Maintained Horizontal Illumination (foot-candles)				
Area Class				
Road Class	Residential	Intermediate	Industrial	Commercial
Local Access	0.4	0.65	N/A	N/A
Major Collectors	0.6	0.8	1.0	1.2
Minor Arterials	0.8	1.2	1.4	1.6

Streetlights shall be placed in accordance with Standards below.

- 32 Uniformity Ratio: 6:1 average to minimum for local
33 4:1 average to minimum for collector
34 3:1 average to minimum for arterial
35

36 Average illumination levels at intersections shall be 1.5 times the illumination required
37 on the more highly illuminated street. Exception: Local residential and collector streets
38 intersecting other local residential and collector streets shall not require 1.5 times the

1 illumination at other intersections, provided that one luminaire is placed at the
2 intersection.

3
4 At signalized intersections, all signal poles shall include a streetlight. Lighting levels at
5 these locations may be higher than the criteria listed above.

6
7 2) Luminaires shall be cut off optics:

8
9 a) The following luminaires have been approved for use in the City of Tenino:

10
11 Minor Arterials and Commercial Zones

12 GE Lighting Systems M-250 R2 cutoff optics

13 GE Lighting Systems M-400 with cutoff optics

14 Cooper Concourse III - UCS Series (shoe box) cutoff optics

15
16 Major Collectors

17 GE Lighting Systems M-250 R2 cutoff optics

18 GE Lighting Systems M-400 with cutoff optics

19 Cooper Concourse III - UCS Series (shoe box) cutoff optics

20
21 Local Access

22 GE Lighting Systems M-250 R2 cutoff optics

23 GE Lighting Systems M-400 with cutoff optics

24 Cooper Concourse III - UCS Series (shoe box) cutoff optics

25 Cooper Lighting Dayform Traditionaire cutoff optics

26 Cooper Lighting Dayform Lexington cutoff optics

27
28 b) All luminaires shall have clear lamps.

29
30 c) All luminaires shall be high-pressure sodium or metal Halide for Arterial Streets
31 only.

32 400 watt lamp = 50,000 initial lamp lumens

33 250 watt lamp = 29,000 initial lamp lumens

34 200 watt lamp = 22,000 initial lamp lumens

35 150 watt lamp = 16,000 initial lamp lumens

36 100 watt lamp = 9,800 initial lamp lumens

37 Lamp Dirt Depreciation factor (LDD) = 0.90

38 Lamp Lumen Depreciation factor (LLD) = 0.85

39 Combined LDD + LLD = 0.76

40
41 3) Light Standards:

42
43 a) Light standards shall be located on one side of the roadway only or shall be
44 located opposite each other when placed along both sides of the roadway.
45 Staggered spacing will be allowed, upon approval of the Public Works Director,
46 where there is an established staggered pattern and it is necessary to continue

1 this pattern, or when site or safety conditions prevent locating luminaires on only
2 one side of the roadway.

3
4 b) In areas where the street width differs from the City Standard, or there are other
5 factors influencing the location of the street lights, the Public Works Director will
6 provide input to the applicant on acceptable options.

7
8 c) The following light standards have been approved for use in the City of Tenino.

9
10 Minor Arterials and Major Collectors

11 Concrete poles or fiberglass break-a-way luminaire per City Standards

12 Fiberglass poles come in several colors luminaire per City Standards

13
14 Commercial Zone

15 Concrete pole or fiberglass break-a-way luminaire per City Standards

16 Fiberglass poles come in several colors luminaire per City Standards

17
18 Special luminaires and poles not consistent with these standards must be
19 approved in writing by the Public Works Community Development Director.

20
21 Local Access

22 Concrete poles or fiberglass break-a-way poles luminaire per City Standards

23
24 Ameron Victorian Style V

25 Ameron Washington Series

26 Ameron Victorian 1 or 2

27 Ameron several other bases available

28
29 Luminaire mounting heights:

Recommended Mounting Heights		
Number of Lanes	Wattage	Mounting Height
3 to 5	400	35 to 40'
2 to 3	200	30'
2	100	25'
Residential	100	12 to 15'

30
31 d) Street light poles shall be direct buried as specified by PSE.

32 e) Permits are required for installation of streetlight foundations.

33
34 4) Line Loss. Line loss calculations shall show that no more than 5% voltage drop
35 occurs in any circuit. Branch circuits shall serve a minimum of four luminaires.

36
37 5) Conductors. The minimum wire size for any illumination circuit shall be No. 6
38 aluminum. Number 10 wire will be acceptable for the pole and bracket cable within
39 the light standard only.

1 6) Conduit. Conduits shall be sized to provide 26% maximum fill and minimum 1-1/2"
2 conduits shall be installed.

5 **1-4.8 Traffic Signals**

6 1) When a proposed street or driveway design interferes with existing traffic signal
7 facilities, traffic signal modification or relocation must be provided.

8 2) To mitigate the traffic impacts of a development, modification of an existing signal
9 or installation of a new signal may be required.

10 3) All traffic signal modification designs shall be prepared by a Professional
11 Engineer licensed in the state of Washington experienced in traffic signal design.

12 4) All signals, whether temporary or permanent, shall be equipped with pre-
13 exemption that is compatible with the equipment used by the fire department
14 (500 Series 3M Opticom).

15 **1-4.9 Curb Ramps**

16 In accordance with State law, curb ramps shall be provided at all pedestrian crossings
17 with curb sections. It is required that when a ramp is constructed giving handicap
18 access to the roadway area, the corresponding ramp at the opposite side of the
19 roadway will also be required. Exact locations of each curb return shown on the project
20 plans will be verified in the field by the City's inspector prior to construction.

21 **1-4.10 Mailboxes**

22 New developments shall include mailboxes of the type, number, and locations
23 determined by the Tenino Postmaster. The applicant shall provide the Postmaster with
24 two copies of the preliminary project site plans for use in establishing locations, types
25 and numbering of the mailboxes. The Postmaster will retain one copy and return the
26 other redlined set to the developer for use in preparing final plan.

27 In the case of new road construction or reconstruction requiring mailboxes to be
28 relocated or rearranged, the applicant shall coordinate through the Tenino Postmaster
29 for acceptable box locations and to ensure uninterrupted mail service. Approved
30 locations for mailboxes shall be shown on the street construction plans.

31 For new construction where existing sidewalks are located adjacent to the curb, the
32 sidewalk shall be widened to provide a clear width of not less than 5' from the back of
33 mailbox structure to the back of the sidewalk per Standard Detail 338.

34 Mailboxes shall be installed per Standard Details 338 and 339. Gang boxes shall be
35 installed per Standard Detail 340.

1 **1-4.11 Rockeries and Rock Walls**

2 Rockeries over 4' in height must be designed by a Structural Engineer licensed in the
3 state of Washington.

4 Additional geotechnical analysis and recommendations shall be required to permit the
5 use of rockeries over 4' in height.

6 Surfaces reasonably accessible to pedestrians above and adjacent to rockeries over
7 30" in height shall be protected by a pedestrian handrail conforming to Section
8 311.2.3.5 and Table 16-B of the International Building Code (IBC) and to Section 4.11 of
9 these Specifications.

10 Use of ecology blocks may be approved on a case-by-case basis. All ecology block
11 walls shall be designed by a Structural Engineer licensed in the state of Washington.

12 A Right-of-Way Permit is required for all rock walls within the public right-of-way. All
13 rockeries exceeding 4' in height on public or private property require a separate building
14 permit.

15 **1-4.12 Pedestrian Hand Railings**

16 Pedestrian handrails shall be provided where necessary to conform to requirements of
17 the Americans with Disabilities Act (ADA).

18 Sidewalks, trails and other pedestrian accessible areas which are adjacent to cut or fill
19 slopes steeper than 1-1/2 horizontal to 1 vertical (1-1/2H:1V) with a vertical grade
20 separation of 30" or greater shall be protected with pedestrian hand rails unless a
21 horizontal clearance of 2' is provided to protect pedestrians.

22 *Surfaces reasonably accessible to pedestrians above or adjacent to rockeries or walls in excess
23 of 30" in height shall be separated by an approved handrail system.
24
25

26 **1-4.13 Parking Lots**

27 ***1-4.13.1 Handicap Requirements***

28 Handicap parking stalls shall meet the requirements of Washington State Regulations
29 for Barrier Free Facilities (WAC 51-10), RCW 19.27, State Building Code and RCW
30 70.92, Public Buildings - Provisions for Aged and Handicapped. Refer to Tenino
31 Municipal Code; safe, convenient handicap access is required from the street to all
32 buildings on site, in addition to safe, convenient handicap access between buildings.
33 Sidewalks constructed adjacent to City streets/roadways shall provide handicap access,
34 including ramps, landings and handrails as necessary.

1 **1-4.13.2 Illumination**

2 The applicant shall submit separate illumination plans and calculations to the Permit
3 Center for review and approval.

4 **1-4.13.3 Pedestrian Concerns**

5 Pedestrian walkways and sidewalks shall conform to requirements of the TMC 12
6 Streets, Sidewalks and Public Places.

7 **1-4.13.4 Internal Circulation**

8 The Community Development Director and Public Works Director shall approve the
9 internal vehicle and pedestrian circulation for parking lots. Parking lot circulation shall
10 allow for access so pedestrians and wheelchairs can easily gain access from public
11 sidewalks and bus stops to building entrances through the use of pedestrian paths
12 which are physically separated from vehicle traffic and maneuvering areas. In shopping
13 center parking lots containing more than 100 spaces, such pedestrian/wheelchair paths
14 shall be a minimum of 5' wide and constructed in a manner that they cannot be used as
15 a holding area for shopping carts.

16 **1-4.13.5 Throat Length Requirements**

17 The throat length is the unobstructed storage length requirement measured from the
18 inside face of curb to the first driveway or parking stall. The minimum throat length shall
19 be 25' for all land uses unless it is determined by the Public Works Director that greater
20 throat length is required, based upon project specific traffic volumes, site conditions,
21 and adjacent roadway classifications.

22 The Public Works Director may reduce the throat length requirement when multiple
23 driveway entrances are required.

24

25 **1-5. STORM DRAINAGE**

26

27 **1-5.1 Goals/Design Criteria**

28 Storm drainage design criteria shall be from the latest edition of the adopted stormwater
29 manual unless otherwise noted below.

30 **1-5.2 Design Requirements**

31 **1-5.2.1 Conveyance**

32 See currently adopted stormwater manual for requirements.

33 **1-5.2.2 Catch Basins**

1 Maximum catch basin spacing will be 300' on arterials and collectors and 500' on all
2 other street classifications. No surface water will cross above any roadway to private
3 property.

4 Catch basins located in "low points" will have a through curb inlet.

5 **1-5.2.3 Detention**

6 See currently adopted stormwater manual for requirements.

7 **1-5.2.4 Treatment**

8 See currently adopted stormwater manual for requirements.

9 **1-5.2.5 Pipe Bedding and Trench Compaction**

10 See Standard Plans 470 and 471 for pipe bedding and trench compaction requirements.
11
12

13
14

13 **1-6. SANITARY SEWER**

14

15 Sanitary sewer improvements shall be designed in accordance with the rules and
16 guidelines of the City of Tenino Sewer Department.
17

17

18 **1-7. WATER**

19 Water infrastructure improvements shall be designed in accordance with the rules and
20 guidelines of the City of Tenino Water Department.
21

21

1 **City of Tenino Rights-of-Way Infrastructure Standards and**
2 **Specifications**

3
4 **PART 2 CONSTRUCTION SPECIFICATIONS**

5 **Table of Contents**

6 <u>Section</u>	7 <u>Page No.</u>
7 2-1. GENERAL CONDITIONS	2.1
8 2-1.1 Standards	2.1
9 2-1.2 General Requirements	2.1
10 2-1.3 Preconstruction Meeting.....	2.1
11 2-1.4 Surveying and Monumentation.....	2.2
12 2-1.4.1 Monumentation	2.2
13 2-1.4.2 Construction Staking and Post-Construction Survey	2.2
14 2-1.5 Control and Inspection of Work	2.3
15 2-1.5.1 General	2.3
16 2-1.5.2 Inspection, Materials Sampling, and Testing	2.3
17 2-1.5.3 Final Inspection of Work.....	2.4
18 2-1.6 Permits	2.4
19 2-1.7 Legal Relations and Responsibilities.....	2.4
20 2-1.8 Public Convenience and Safety	2.5
21 2-1.9 Asbestos Control	2.6
22 2-1.10 Utilities.....	2.6
23 2-1.10.1 Utility Location.....	2.6
24 2-1.10.2 Utility Relocation	2.6
25 2-1.11 Hours of Construction.....	2.6
26 2-1.12 Traffic Control.....	2.7
27 2-1.12.1 General	2.7
28 2-1.12.2 Detours, Lane and Street Closures	2.7
29 2-1.12.3 Flaggers, Barricades, and Signs	2.7
30 2-1.13 Fire Department Temporary Access Roads	2.8
31 2-2. CONSTRUCTION REQUIREMENTS	2.8
32 2-2.1 Asphalt Concrete Pavement and Pavement Patching	2.8
33 2-2.1.1 Description	2.8
34 2-2.1.2 Materials.....	2.8
35 2-2.1.3 Construction Requirements.....	2.9
36 2-2.2 Off-Street Parking.....	2.11
37 2-2.3 Cement Concrete Driveway Approach	2.11
38 2-2.3.1 Description	2.11
39 2-2.3.2 Materials.....	2.11
40 2-2.3.3 Construction Requirements.....	2.11
41 2-2.4 Street Illumination.....	2.12
42 2-2.4.1 General	2.12
43 2-2.4.2 Materials.....	2.12
44 2-2.4.3 Construction Requirements.....	2.12
45	

1	2-2.5 Underground Trenching	2.13
2	2-2.5.1 Trench Excavation	2.13
3	2-2.5.2 Trench Backfill.....	2.15
4	2-2.5.3 Compaction	2.16
5	2-2.5.4 Testing	2.16
6	2-2.5.5 Notification and Inspection	2.16
7	2-2.5.6 Trenching Longitudinal to Roadway.....	2.16
8	2-2.5.7 Trenching Transverse to Roadway	2.17
9	2-2.5.8 Drain Pipe	2.17
10	2-2.5.9 Jacking, Auguring, or Tunneling.....	2.17
11	2-2.5.10 Pavement Restoration.....	2.18
12	2-2.5.11 Final Utility Adjustment.....	2.18
13	2-2.6 Cement Concrete Curb and Gutter Sections.....	2.18
14	2-2.6.1 Description	2.18
15	2-2.6.2 Materials.....	2.19
16	2-2.6.3 Curing and Protection of Concrete.....	2.19
17	2-2.7 Guardrails.....	2.19
18	2-2.8 Cement Concrete Sidewalks	2.19
19	2-2.8.1 Description	2.19
20	2-2.8.2 Materials.....	2.20
21	2-2.8.3 Construction Requirements.....	2.20
22	2-2.9 Mailboxes	2.21
23	2-2.10 Rockeries and Rock Walls	2.21
24	2-2.10.1 Description	2.21
25	2-2.10.2 Materials.....	2.21
26	2-2.10.3 Construction Requirements.....	2.22
27	2-2.11 Pedestrian Hand Railings.....	2.23
28	2-2.11.1 Fabrication	2.23
29	2-2.11.2 Installation	2.23
30	2-3. MATERIALS	2.24
31	2-3.1 Controlled Density Fill (CDF).....	2.24
32	2-3.2 Gravel Borrow	2.24
33	2-3.3 Non-Shrink Cement Sand Grout	2.24
34	2-3.4 No. 2 Washed Coarse Sand.....	2.25
35	2-3.5 Spawning Gravel	2.25
36	2-3.6 Quarry Rock	2.25
37		

1 **2-1. GENERAL CONDITIONS**

2
3 **2-1.1 Standards**

4 Part 2, Construction Specifications, of the Standards shall apply whenever any work is
5 performed within the public right-of-way in the City of Tenino, including, but not limited
6 to, work performed by private parties at their own expense under authority granted by
7 ordinance(s) of the City Council. Except where these Standards provide otherwise,
8 design, construction, and materials shall conform to the appropriate standards of the
9 most current edition of the following publications, in this order of precedence:

- 10
11 1) WSDOT/APWA *Standard Specifications for Road, Bridge and Municipal*
12 *Construction*, hereinafter referred to as the “WSDOT/APWA Standard
13 *Specifications*”.
- 14
15 2) WSDOT/APWA *Standard Plans for Road, Bridge and Municipal Construction*,
16 hereinafter referred to as “WSDOT/APWA Standard Plans”.
- 17
18 3) Thurston County Road Standards.

19
20 **2-1.2 General Requirements**

21 All work performed in the construction of new city streets or the improvement of existing
22 city streets, including all appurtenances funded, whether by a public or private party,
23 shall be the responsibility of the contractor and completed to the satisfaction of the
24 Public Works Director in accordance with the plans and specifications approved by the
25 City for the work.

26
27 **2-1.3 Preconstruction Meeting**

28 For private developer-funded projects, a preconstruction meeting is held at the
29 applicant’s request. Prior to the preconstruction meeting, the applicant and/or their
30 contractor should have in their possession construction plans for review by the City.
31 The contractor should also be prepared to discuss any and all possible permits and
32 approvals required by outside agencies.
33 The applicant and/or contractor shall schedule the preconstruction meeting at a
34 minimum of five (5) days before construction, unless otherwise approved by the Public
35 Works Director. The person responsible for completion of the work shall be present
36 during the entire preconstruction meeting.

37
38 **2-1.4 Surveying and Monumentation**

39 This work shall consist of all the surveying and monumentation required to construct the
40 project as described in the project plans and specifications.

41 **2-1.4.1 Monumentation**

42 Monuments shall be located at all centerline intersections of intersecting streets. Curved
43 streets shall be monumented at PC (point of curvature) and PT (point of tangency) of
44 the curve.

45 It shall be the responsibility of the contractor to furnish all materials and install
46 monuments and castings in accordance with the drawings and where directed by the

1 Public Works Director. All survey work shall be performed by a Professional Land
2 Surveyor (PLS) licensed in the State of Washington. The monument disk shall be
3 furnished and installed by the contractor in accordance with Standard Detail 336.
4 It shall be the contractor's responsibility to provide the surveying required to establish
5 and/or perpetuate land corner monumentation required on the project.
6 All land corner surveying shall conform to the requirements of RCW 58.09. If the
7 contractor's surveyor replaces or restores an existing or obliterated "General Land
8 Office" (GLO) corner(s), it shall be their responsibility to file "Land Corner Records" for
9 these monuments with the County Auditor's Office. When all land corners have been
10 established, replaced or restored and monumented as described herein, the surveyor
11 shall certify this information with a letter to the Public Works Director and transmit
12 copies of any recorded surveys and documents. This certification letter shall include the
13 location of the monumented corner(s) and that all land corner(s) have been
14 monumented as described herein.
15 The contractor's surveyor shall provide the City with a copy of the recorded survey on
16 11x17 paper, survey notes, and a disk of the drawing in CADD or ArcView shall also be
17 provided to the City (if available).

18 19 **2-1.4.2 Construction Staking and Post-Construction Survey**

20 Surveying, as required to construct a given project per the approved plans, shall be
21 furnished by the contractor at no expense to the City.

22 At a minimum, construction survey stakes shall be set at 50' intervals for new curb and
23 gutter construction, for both horizontal and vertical control. The City may require a
24 shorter internal spacing due to specific site characteristics.

25 All water, storm drain, and sanitary sewer mains which are to be constructed in
26 easements, are to have survey offset stakes set prior to starting work.

27 Any utility installation within an easement, which deviates from the staked line, must be
28 left uncovered and resurveyed. If the Public Works Director determines that the
29 deviation exceeds acceptable limits, the contractor will be required to either a) remove
30 and reconstruct the utility, or b) realign the easement. As-built "construction corrected
31 record" information shall be provided to the City upon completion of the work.

32 The City reserves the right to check survey points and/or the locations and elevations of
33 new construction. These spot-checks will not change the requirements for normal
34 checking and testing as described elsewhere in these Standards, and do not relieve the
35 contractor of the responsibility of producing a finished product that is in accordance with
36 the contract. If errors are found in the locations and/or elevations of the improvements,
37 then the contractor shall correct these errors, including removing and replacing
38 improvements, and shall pay all expenses incurred by the City, including any re-survey.

39 40 **2-1.5 Control and Inspection of Work**

41 **2-1.5.1 General**

42 All construction of public improvements within the city limits, whether by a private
43 developer, a City-hired contractor, or City forces, shall be done in accordance with the
44 approved plans and specifications for the project and to the satisfaction of the Public
45 Works Director, and in accordance with all appropriate codes and ordinances.

46 No work may be started until construction plans are approved by the City. Any revision

1 to such plans shall be submitted by the developer's engineer to the Permit Center for
2 approval, prior to performance of the work.

3 The Public Works Director has, by ordinance, authority to enforce these Standards as
4 well as other referenced or pertinent specifications and will appoint project engineers,
5 assistants and inspectors as necessary to inspect the work for compliance. For
6 inspections required on private property due to issuance of permits by the City, the City
7 retains the right to enter the subject property at reasonable times for purposes of
8 inspection for compliance with permit conditions. The contractor shall provide access
9 for the inspector.

10 Inspection by the City does not relieve the contractor of the obligation to furnish
11 satisfactory material and workmanship.

12 13 **2-1.5.2 Inspection, Materials Sampling, and Testing**

14 Sampling and testing shall be at a frequency and magnitude described in the WSDOT/
15 APWA *Standard Specifications* and WSDOT *Construction Manual*.

16 1. PRIVATE CONTRACTORS It shall be the responsibility of the applicant to provide
17 test reports certified by a professional engineer licensed in the State of Washington to
18 verify compliance of materials used in the construction of all public improvements.

19 Copies of all test reports shall be furnished to the Public Works Director. All costs
20 incurred for testing or sampling, as required, shall be the responsibility of the applicant.

21 2. CITY-HIRED CONTRACTORS Construction work performed by City contractors shall
22 be inspected by City inspectors. Sampling and testing shall be performed by an
23 independent professional testing laboratory, selected by the City.

24 3. NOTIFICATION OF INSPECTION The applicant and/or contractor shall notify the
25 City of inspection needs in a timely manner. A minimum of 24 hours advance notice will
26 be required. Failure to provide adequate advance notification will oblige the City to
27 arrange appropriate sampling and testing after-the-fact, with certification by a qualified
28 private testing laboratory. All costs of such testing and certification shall be borne by
29 the contractor.

30 31 **2-1.5.3 Final Inspection of Work**

32 All completed public improvements, including all materials, shall be subject to final
33 inspection by the City prior to final acceptance of the work.

34 Prior to final acceptance, all items as identified by the City as needing additional work
35 shall be completed and re-inspected to the satisfaction of the City.

36 37 **2-1.6 Permits**

38 It is unlawful for any person to:

- 39 • Dig up, break, excavate, tunnel, undermine or in any manner break up any street
40 or public right-of-way, or to make or cause to be made any excavation in or under the
41 surface of any street for any purpose; or to
- 42 • Place, deposit or leave upon any street or right-of-way, any earth or other
43 excavated material obstructing or tending to interfere with the free use of the street
44 unless such person has first obtained the necessary permit(s) and other approvals.

45
46 All permits shall be displayed in a conspicuous place on the job site. It is unlawful for

1 any person to exhibit a permit at or about any project not covered by such permit, or to
2 misrepresent the number of the permit or the date of expiration of the permit.

3 4 **2-1.7 Legal Relations and Responsibilities**

5 The applicant and/or contractor shall at all times comply with all Federal, State, and
6 local laws and ordinances, and any regulations, which in any manner affect the project.
7 The applicant and/or contractor shall execute an indemnification agreement in a form
8 approved by the City Attorney before any construction may begin.
9

10 **2-1.8 Public Convenience and Safety**

11 The contractor shall schedule and control the work so as to prevent all hazards to public
12 safety, health, and welfare.

13 The contractor shall conduct his/her operations so as to offer the least possible
14 obstruction and inconvenience to the public, and shall have under construction no
15 greater length or amount of work than can properly be managed with regard to the
16 rights of the public. The contractor shall not open up sections of the work and leave
17 them unfinished, but shall finish the work insofar as practicable.

18 1) The contractor shall keep existing roads and streets adjacent to and within the
19 limits of the project open to, and maintained in a good and safe condition for,
20 traffic at all times.

21 2) The contractor shall repair all damage resulting from his/her operations.

22 3) Streets shall be maintained clean and free of dirt and debris on a continuous
23 basis. Sweeping with a power pick-up broom is required. Cleaning by water
24 flushing will not be allowed.

25 4) Pedestrian facilities shall be kept free of obstruction, and shall be maintained
26 continuously unless otherwise approved by the City.

27 5) On existing streets, two-way traffic shall be maintained at all times unless
28 otherwise approved by the Public Works Director. See also Section 2-1.13 of
29 these Specifications.

30 6) Construction shall be conducted so as to cause as little inconvenience as
31 possible to abutting property owners.

32 7) Convenient pedestrian and vehicular access to driveways, houses, and buildings
33 along the line of work shall be maintained at all times. The City may allow the
34 contractor to close driveways for limited times when approval from the building
35 owner has been obtained.

36 8) Access to mail boxes shall be provided during construction. The contractor shall
37 coordinate with the Postmaster as needed.

38 9) City-owned infrastructure (i.e., manholes, valve boxes, meters, etc.) shall be

1 accessible at all times.

2 10) Access compatible with ADA requirements to transit service shall be maintained
3 at all times.
4

5 **2-1.9 Asbestos Control**

6 The contractor shall refer to Puget Sound Air Pollution Control Authority Guidelines for
7 identification, inspection, reporting, handling, and removal of materials containing
8 asbestos. Asbestos containing material (ACM) may be encountered during a
9 construction project in the form of asbestos cement pipe, pipe insulation, or as
10 insulation in a structure that is being demolished. It can be found in pipe for water and
11 sewer mains, electrical conduits, drainage pipe, and vent pipes, etc. It is imperative that
12 asbestos fiber release be controlled. Citations by regulatory agencies for an asbestos
13 fiber release carry substantial fines.

14 Only employees certified by the State of Washington as Certified Asbestos Workers
15 may work on ACM during construction, demolition, repair, maintenance, renovation,
16 salvage, or disposal of ACM.

17 When required by applicable laws and regulations, the contractor shall have all
18 asbestos legally removed from the site and properly disposed of by a state licensed
19 asbestos contractor in accordance with the practices specified by the State of
20 Washington Department of Ecology, the King or Snohomish County Solid Waste
21 Division and all other pertinent State and Federal Regulations. See WAC 296-62-077.
22

23 **2-1.10 Utilities**

24 Utility providers including telephone, cable TV, gas, water, and sewer districts may
25 operate under agreement with the City and shall be included in the coordination of all
26 planning, installation, operation, and maintenance of improvements.

27 **2-1.10.1 Utility Location**

28 Before beginning any excavation, the contractor shall request location, coordinate
29 construction activity with the utility owners, and provide notice of commencement to all
30 owners of underground facilities through the one number locator service at 1-800-424-
31 5555. If the utilities are not on the "one-call" system, the contractor shall give written
32 notice to each individual utility owner. Such written or phone notice shall not be less
33 than two nor more than ten business days before the scheduled date of excavation.
34

35 **2-1.10.2 Utility Relocation**

36 The Contractor shall coordinate his/her work with utility companies whose facilities need
37 to be relocated as a part of the improvement project.
38

39 **2-1.11 Hours of Construction**

40 Allowed project hours of construction are 7:00 a.m. to 10:00 p.m., Monday through
41 Friday; and 9:00 a.m. to 5:00 p.m., Saturday. No construction is allowed on Sundays
42 and legal holidays (TMC 8.72.100). Exceptions may be considered upon written
43 request to the City.
44

45 Construction contractors are responsible for notifying subcontractors of the City's work

1 hour restrictions and noise regulations.

2 Additional restrictions on the allowable hours of construction within public right-of-way
3 may be imposed by the Public Works Director due to specific site issues such as traffic
4 volumes.

6 **2-1.12 Traffic Control**

7 **2-1.12.1 General**

8 Traffic control for all projects shall comply with Chapter 6 of the *Manual of Uniform*
9 *Traffic Control Devices (MUTCD)* and with the approved Traffic Control Plan for the
10 project.

11 The contractor shall be responsible to plan, furnish, and maintain all required labor,
12 equipment, and materials necessary to protect the public and workers during the course
13 of construction.

14 All equipment and materials required for traffic control shall be furnished, installed and
15 maintained by the contractor to the satisfaction of the Public Works Director.

17 **2-1.12.2 Detours, Lane and Street Closures**

18 Approval must be received from the Public Works Director in advance for all proposed
19 detours, lane, and street closures. If a closure or detour is not already in the approved
20 Traffic Control Plan, a formal traffic control plan supplement complying with the MUTCD
21 shall be submitted to Public Works for review at least ten working days prior to
22 scheduled closure. Approval by the Public Works Director is required prior to any work
23 proceeding. Written notification shall also be given to the police, fire, postmaster,
24 Tenino School District, and solid waste providers five days before any detour or lane
25 closure to allow advance planning of travel routes.

26 All road closures shall require special fabricated signs to notify the public of the closure.
27 These signs shall clearly indicate dates of closure, location, and purpose. Signs shall
28 be posted a minimum of ten days prior to the closure.

29 Unless an emergency exists, lane closures shall be limited to non-peak hours of traffic.

31 **2-1.12.3 Flaggers, Barricades, and Signs**

32 If any deviation from or additions to the approved Traffic Control Plan is needed, the
33 contractor shall prepare a signing plan supplement showing the required construction
34 signing, barricades, and flagger(s) for the project and submit the plan(s) to the Public
35 Works Department for review and approval at least ten working days in advance of the
36 time the signing and barricades will be required.

37
38 During construction activity at signalized locations, an off-duty, uniformed police officer
39 shall be required at all times when the signal or beacon is turned off and when the traffic
40 signal indicator is countermanded, and at any other time that the Public Works Director
41 determines that a uniformed police officer is necessary for traffic control. Officers are
42 also required for new traffic signal work. A uniformed police officer shall be provided at
43 the expense of the contractor. For information on police officer availability, call the City
44 of Tenino Police Department at (360) 264-2626.

45

1 **2-1.13 Fire Department Temporary Access Roads**

2 As required by the Fire Marshall, every building shall be accessible to the Fire
3 Department both during and after construction, by way of a fire apparatus access
4 roadway approved by the Fire Department. The fire apparatus access roadway shall
5 have at least 20' of unobstructed width, shall have adequate roadway turning radius for
6 fire vehicles, and be capable of supporting the imposed loads of fire apparatus.
7 The minimum allowable vertical clearance shall be 13' 6".

8 All required fire access roadways must be in service prior to commencement of
9 combustible construction.

10 Temporary access roads in use during building construction shall be constructed for all
11 weather driving conditions. At no time during the construction of the project should the
12 roadway surface consist primarily of dirt, mud, sand, or other material that, in the
13 opinion of the Fire Marshall, may impair fire fighting or rescue operations. The required
14 20' width must be maintained so that the driving surface is recognizable day and night
15 and shall not be obstructed in any manner, including parking of vehicles. The Fire
16 Marshall or Public Works Director may stop construction any time the condition of the
17 access road has deteriorated or is not adequate for providing emergency services.

18 **2-2. CONSTRUCTION REQUIREMENTS**

19
20 **2-2.1 Asphalt Concrete Pavement and Pavement Patching**

21 **2-2.1.1 Description**

22 This work shall consist of asphalt concrete paving and the patching of various types of
23 pavement cuts, in accordance with Standard Details 101 through 112, 300A, and 300B.

24
25 **2-2.1.2 Materials**

26 The following materials shall be as defined in the WSDOT/APWA Standard
27 Specifications unless otherwise noted:

- 28 1) Paving asphalt – Grade AR-4000W.
- 29 2) Asphalt concrete for permanent pavement patch – asphalt concrete Class A.
- 30 3) Asphalt for temporary patch – asphalt treated base (ATB).
- 31 4) Tack coat – emulsified asphalt grade CSS-1 [Section 9-02.1(6)].
- 32 5) Geotextile fabric for pavement reinforcement – needle-punch nonwoven 100%
33 polypropylene products such as “Petromat” or “Supac”, as manufactured by
34 Phillips Fiber Corporation, are acceptable. Other products may be submitted by
35 the contractor to the Public Works Director for review and approval as “equal”
36 substitutions.
- 37 6) Asphaltic binder for use with geotextile fabric shall conform to the manufacturer's
38 recommendations for the fabric used. Cutback asphalts cannot be used with
39 polypropylene fabrics due to reactions with solvents at high temperatures.
- 40 7) Cement concrete pavement patch – 3-day mix (Section 5-05).

41
42 **2-2.1.3 Construction Requirements**

43 **PAVING**

44 Compaction of the subgrade shall be completed prior to the required asphalt work or
45 patching as determined in the WSDOT/APWA Standard Specifications.

46 Pavement patching shall be scheduled to accommodate the demands of traffic and shall

1 be performed as rapidly as possible to provide maximum safety and convenience to
2 public traffic.
3 Before the pavement patch is to be constructed the pavement shall be sawcut so that
4 the marginal edges of the patch will form a rectangular shape with straight edges and
5 vertical faces.
6 When required by the Public Works Director, cold planing along the edge of existing
7 roadways and at interfaces with existing pavements, shall be completed to the widths
8 and depths established in the plans and specifications. The cold planing shall be
9 completed prior to trenching, when feasible, so that remaining pavement patching and
10 overlays can be completed in a uniform manner.
11 Geotextile fabric materials, when required in the plans and specifications, shall be
12 placed and constructed according to the manufacturer's recommendations. Only
13 contractors experienced in the placement of the material shall be responsible for
14 placement. A manufacturer's representative shall review with the contractor and the City
15 Inspector the project conditions, proposed placement methods, and equipment to be
16 used.

17
18 After the crushed surfacing top (or base) course subgrade has been leveled and
19 compacted, asphalt concrete pavement shall be placed of the class and to the thickness
20 shown on the plans. Asphalt shall be compacted to 91% of maximum density as
21 determined by WSDOT Test Method 705.

22 **[Verify Thurston County pavement marking standards. See Standard Details**
23 **350A -350G.]**

24 TEMPORARY PAVEMENT PATCHING

25 Temporary asphalt patching shall be required where roadway or walkway is needed for
26 vehicular or pedestrian traffic during the construction period, until permanent pavement
27 and sidewalks can be constructed.

28 The contractor shall furnish, place and maintain temporary pavement patching, at
29 locations as directed by the City, until such time as a permanent pavement patch can be
30 made. The permanent pavement shall be completed within seven working days of the
31 completion of trenching and road repairs.

32 Temporary pavement patch shall consist of asphalt treated base (ATB) compacted to at
33 least 90% of maximum density as determined by WSDOT Test Method 705.

34 In the event that the temporary surface subsides after the initial placement, additional
35 ATB shall be applied to maintain the surface.

36 CEMENT CONCRETE PAVEMENT PATCHING

37 Streets which have cement concrete pavements surfaced with asphalt concrete shall be
38 patched as shown on Standard Detail 110. The crushed surfacing shall be 1" thicker
39 than the adjacent crushed surfacing or 6", whichever is greater. After the crushed
40 surfacing top course subgrade for the pavement has been constructed and compacted
41 to line and grade, the cement concrete pavement patch shall be placed and struck off to
42 a thickness of 1" greater than the existing pavement or 6" minimum, whichever is
43 greater.

44 The top surface of the concrete patch shall match the top surface of the adjacent
45 pavement. Joints shall be placed to match existing.

46 Through joints and dummy joints shall be placed to match existing. The surface of the

1 concrete patch shall be finished and brushed transversely with a fiber brush to improve
2 bonding with the asphalt overlay. Approved curing compound shall be placed on the
3 finished concrete immediately after finishing.

4 Asphalt concrete plant mix shall not be placed until three days after the cement
5 concrete base has been placed or otherwise permitted by the City. The asphalt
6 concrete plant mix shall not be placed until the concrete base has received a tack coat
7 of CRS-2 at a rate of 0.12 to 0.20 gal/yd². The edges of the existing asphalt and
8 castings shall also be painted with the tack coat. The asphalt concrete pavement shall
9 then be placed, leveled, and compacted to conform to the surface of the existing asphalt
10 pavement. Immediately thereafter, all joints between the new and original asphalt
11 pavement shall be painted with AR4000W CSS-1 asphalt emulsion and covered with
12 dry sand before the asphalt solidifies.

14 **2-2.2 Off-Street Parking**

15 All parking lot construction shall be inspected for conformance to plans for size, layout,
16 drainage control, and structural section.

17 The minimum acceptable structural section for parking lots shall be 2" of asphalt
18 concrete Class "A" placed over 4" of crushed surfacing top course, or 2" of asphalt
19 concrete Class "A" placed over 2" of asphalt treated base, unless otherwise approved
20 by the Public Works Director. Heavier pavement sections may be required for truck
21 traffic, vehicle storage or as determined by the applicant's soils Engineer due to soil
22 conditions.

23 Prior to placing any surfacing material on the parking lot, it will be the responsibility of
24 the applicant to provide density test reports of the subgrade certified by a licensed
25 engineer or testing laboratory registered in the State of Washington documenting that
26 the subgrade had been compacted to 95% maximum dry density.

27 Crushed surfacing top course shall be compacted to 95% maximum dry density.

28 Density testing for asphalt pavement, including the necessity and frequency of core
29 samples, will be determined by the Public Works Director on a case by case basis.

31 **2-2.3 Cement Concrete Driveway Approach**

32 **2-2.3.1 Description**

33 This work shall consist of constructing cement concrete driveway approach at the
34 locations shown on the plans and where directed by the Public Works Director, in
35 accordance with Standard Details 322, 323 and 324.

37 **2-2.3.2 Materials**

38 The concrete mix shall be as specified for Class 3000 structural. The slump of the
39 concrete shall not exceed 3".

41 **2-2.3.3 Construction Requirements**

42 1) Excavation and Subgrade:

- 43 a) Where directed by the City, unsuitable material in the subgrade shall be removed
44 to a specific depth and backfilled with Gravel Borrow conforming to Section 3.2 of
45 these Specifications.
- 46 b) Before any concrete is placed, the contractor shall bring the subgrade to the

1 required line, grade and cross-section. The contractor shall maintain the
2 subgrade in the required condition until the concrete is placed. Compaction shall
3 be to 95% maximum dry density.

4 c) In all cases, subgrade and rock grade shall be approved by the City prior to
5 concrete being placed.

6 2) All Driveways:

7 a) In locations where a new driveway is to be constructed and sidewalk and/or curb
8 and gutter is already existing, the existing improvements must be totally removed
9 and replaced to new driveway standards. It is not permissible to “knock-off”
10 existing curb and install driveway apron. The total curb and gutter section must
11 be removed, either by sawcutting or removing to the nearest expansion joint, and
12 replaced to new driveway standards.

13 b) New driveways installed in areas where curb and gutter improvements are not
14 existing, and not required to be installed, shall be paved with asphalt concrete or
15 cement concrete from the existing edge of pavement to the property line
16 regardless of whether the remainder of the driveway on the private property is
17 paved.

18 c) In areas not fully improved with curbs and sidewalks, the elevation of the
19 driveway at the point where it crosses the property line shall not be more than 3”
20 higher than the elevation of the centerline of the existing paved street, if the
21 driveway is rising on the private property side and no lower than level with the
22 elevation of the centerline of the existing street if the driveway is sloping down on
23 the private property side.
24

25 **2-2.4 Street Illumination**

26 **2-2.4.1 General**

27 Street lighting systems installation shall conform to the applicable portions of the
28 APWA/WSDOT Standard Specification Section 8-20, except as modified by the City of
29 Tenino herein. The contractor shall install and maintain street lighting as requested by
30 the City. Requests for installation, maintenance and repair of such street lighting shall
31 receive the utility’s prompt attention. Upon completion of the work the utility shall
32 transmit to the City notice of completion and summary of any problems found.

33 **2-2.4.2 Materials**

34 Street light poles shall be aluminum with a concrete base.
35

36 **2-2.4.3 Construction Requirements**

37 1) Safety and Restoration: The contractor shall at all times during
38 construction post and maintain proper barricades and comply with all
39 applicable regulations as required by the ordinances of the City and
40 the laws of the state, including RCW 39.04.180 for trench safety
41 systems.
42

43 2) Dangerous Conditions, Authority for City to Abate: Whenever construction,
44 installation or excavation of facilities authorized by agreement with the City has
45 caused or contributed to a condition that appears to substantially impair the
46 lateral support of the adjoining street or public place, or endangers the public, an

1 adjoining public place, street utilities, or City property, the Public Works Director
2 may direct the appropriate utility company(s), at the utility's expense, to take
3 actions to protect the public, adjacent public place, City property, or street
4 utilities. Such action may include compliance within a prescribed time.
5

- 6 3) Site Restoration and As-Builts: Disturbed areas and pavements within the
7 franchise area shall be restored to the preconstruction condition to the
8 satisfaction of the Public Works Director. Within ten days following construction,
9 the utility shall provide to the City as-built "construction corrected record"
10 drawings of the completed work.
11

12 **2-2.5 Underground Trenching**

13 **2-2.5.1 Trench Excavation**

- 14 1) When trenching through existing pavement, the open cut shall be a neat line made
15 by saw cutting a continuous line.
- 16 2) Where trench excavation equals or exceeds a depth of 4', the contractor shall
17 provide, construct, maintain and remove, as required, safety systems that meet the
18 requirements of the Washington Industrial Safety and Health Act, RCW 49.17,
19 including WAC 296-155. The trench safety systems shall be designed, sealed, and
20 signed by a licensed engineer, and meet accepted engineering requirements (see
21 WAC 296-155-650-66411).
- 22 3) The contractor shall furnish, install, and operate all necessary equipment to keep
23 excavations above the foundation level free from water during construction, and
24 shall dewater and dispose of the water so as not to cause injury to public or private
25 property or nuisance to the public. Sufficient pumping equipment in good working
26 condition shall be available at all times for all emergencies, including power outage,
27 and shall have available at all times competent workmen for the operation of the
28 pumping equipment.
29
- 30 4) Dimensions: The length of trench excavation in advance of conduit/pipe laying shall
31 be kept to a minimum, and in no case shall exceed 200' unless specifically
32 authorized by the Public Works Director. The maximum permissible trench width
33 between the foundation level to the top of the conduit/pipe shall be 40" for
34 conduit/pipe 15" or smaller inside diameter; or 1.5 times the conduit/pipe inside
35 diameter plus 18" for conduit/pipe 18" or larger. If the maximum trench width is
36 exceeded without written authorization of the Public Works Director, the contractor
37 will be required to provide conduit/pipe of higher strength classification or to provide
38 a higher class of bedding, as required by the Public Works Director.
- 39 5) Interferences: The contractor shall not interfere with any existing utility without the
40 written consent of the Public Works Director and the utility company or person
41 owning the utility. If it becomes necessary to remove an existing utility, this shall be
42 done by its owner. The contractor shall support and protect by timbers or other
43 means all pipes, conduits, poles, wire or other apparatus, which may be in any way
44 affected by the excavation work, and do everything necessary to support, sustain

1 and protect them under, over, along or across the work. In case any of the pipes,
2 conduits, poles, wires or apparatus should be damaged, they shall be repaired by
3 the agency or person owning them, and the expense of such repairs shall be
4 charged to the contractor, and their bond shall be liable therefore. The contractor
5 shall be responsible for any damage done to any public or private property by
6 reason of the breaking of any water pipes, sewer, gas pipe, electric conduit, or other
7 utility, and its bond shall be liable therefore. The contractor shall inform itself as to
8 the existence and location of all underground utilities and protect the same against
9 damage.

10 6) Protection of Adjoining Property: The contractor shall prevent injury to any adjoining
11 property by providing proper foundations and taking other measures suitable for the
12 purpose. Where in the protection of such property it is necessary to enter upon
13 private property for the purpose of taking appropriate protective measures, the
14 contractor shall obtain a license from the owner of such private property for such
15 purpose, and if the contractor cannot obtain a license from such owner, the Public
16 Works Director may authorize the contractor to enter the private premises solely for
17 the purpose of making the property safe. The contractor shall at its own expense
18 shore up and protect all buildings, walls, fences, or other property likely to be
19 damaged during the progress of the excavation work and shall be responsible for all
20 damage to public or private property or highways resulting from the contractor's
21 failure to properly protect and carry out the work. Whenever it may be necessary for
22 the contractors to trench through any lawn area, the sod shall be carefully cut and
23 rolled and replaced after ditches have been backfilled as required in this chapter. All
24 construction and maintenance work shall be done in a manner calculated to leave
25 the lawn area clean of earth and debris and in a condition as nearly as possible that
26 which existed before such work began. The contractor shall not remove, even
27 temporarily, any trees or shrubs which exist in parking strip areas or easements
28 across private property without first having notified and obtained the consent of the
29 property owner, or in the case of public property, the appropriate city department or
30 city official having control of such property.

31 7) Fences, Barriers: The contractor shall erect such fence, railing, or barriers about the
32 site of the work as shall prevent danger to persons using the city street or sidewalks,
33 and such protective barriers shall be maintained until the work is completed or the
34 danger removed. At twilight there shall be placed upon such place of excavation and
35 upon any excavated materials or structures, or other obstructions to streets, suitable
36 and sufficiently lighted barricades which shall be maintained throughout the night for
37 the entire construction period. It is unlawful for anyone to remove or tear down the
38 fence, railing, or other protective barriers or any lights provided there for the
39 protection of the public.

40 8) Removal of Attractive Nuisance: It is unlawful for the contractor to suffer or permit to
41 remain unguarded, at the place of excavation or opening, any machinery, equipment
42 or other device having the characteristics of an attractive nuisance likely to attract
43 children and be hazardous to their safety or health.

1
2 **2-2.5.2 Trench Backfill**

- 3 1) Trenches parallel to the roadway centerline:
4 a) Trench backfill above the pipe zone shown on Standard Detail 471, to within 4' of
5 the finish surface, shall be controlled density fill (CDF), gravel borrow, or crushed
6 surfacing top/base course.
7 b) Native material will be considered suitable for trench backfill within this zone if it
8 is:
9 i. Capable of attaining the degree of compaction specified in Section 2.5.3
10 Below;
11 ii. Within reasonable tolerance of optimum moisture content; and
12 iii. Free of organic material, clay, frozen lumps, rocks, or other deleterious
13 matter.
14 c) Trench backfill within the top 4' shall be controlled density fill (CDF).
15
16 2) Trenches perpendicular to the roadway centerline
17 a) All trench backfill above the pipe zone shown on Standard Detail
18 471 shall be controlled density fill (CDF).
19 b) The use of gravel borrow or crushed surfacing top/base course
20 for backfill above the pipe zone shown on Standard Detail 471,
21 to within 4' of the finished surface, may be approved by the
22 Public Works Director on a case-by-case basis.

23
24 Unsuitable backfill material shall be removed from the site and hauled to an approved
25 disposal site. The contractor shall provide the Public Works Director with the location of
26 all disposal sites to be used and also copies of the permits (including fill permit) and
27 approvals for such disposal sites.

28 Imported material shall meet the requirements of gravel borrow, as specified in Section
29 2-3.2 of these Specifications, or crushed surfacing top/base course, as specified in
30 Section 9-03.9(3) of the WSDOT/APWA Standard Specifications.

31
32 **2-2.5.3 Compaction**

33 Trench backfill (when materials other than CDF are allowed) shall be spread in layers
34 and compacted by mechanical tampers of the impact type approved by the Public
35 Works Director in accordance with Standard Detail 471. The backfill material shall be
36 placed in successive layers with the first layer not to exceed 2' above the pipe, and the
37 following layers not exceeding 12" in loose thickness, with each layer being compacted
38 to the density specified below:

- 39 1) Improved areas such as street and sidewalks shall be compacted to at least 95% of
40 maximum dry density for the entire depth.

41 2) Unimproved area or landscape areas shall be compacted to at least 90% of
42 maximum dry density.

43 Water jetting or settling of backfill in trenches is not permitted.
44

1 **2-2.5.4 Testing**

- 2 1) Consistent with the above and prior to placing any surface materials on the roadway,
3 it shall be the responsibility of the applicant to provide density test reports certified
4 by a professional engineer. A minimum of one test shall be taken within every 500'
5 of trench length and at depths up to 50% of trench depth, or as directed by the
6 Public Works Director. Compaction of laterals or service line trenches shall be
7 tested where directed by the Public Works Director. Testing of CDF shall be in
8 accordance with ASTM D4832.
- 9 2) Whichever compaction method the installer elects, the backfill must test not less
10 than the density specified in Section 2-2.5.3. Where testing shows that this has not
11 been achieved, all affected backfill shall be removed, replaced, and retested.

12 **2-2.5.5 Notification and Inspection**

- 13 1) Any applicant, utilities, or others intending to trench in existing or proposed City
14 streets shall notify the City Permit Center not less than one working day prior to
15 beginning any work.
- 16 2) Failure to notify may necessitate testing or retesting by the City at the expense of
17 the applicant or utility. Furthermore, the work may be suspended pending
18 satisfactory test results.

19
20 **2-2.5.6 Trenching Longitudinal to Roadway**

21 Sewer, water, gas, telephone, power, cable TV, and storm lines that are within the
22 roadway section and longitudinal to the roadway shall be backfilled to the pavement
23 patch level or subgrade, whichever applies. Native material shall only be used when
24 approved by the Public Works Director.

25
26 **2-2.5.7 Trenching Transverse to Roadway**

27 Utility trenching that crosses transversely to the roadway alignment will not be permitted
28 unless it can be shown that alternatives such as jacking, auguring, or tunneling are not
29 feasible, or unless the utility can be installed just prior to reconstruction or an overlay of
30 the road. Should an open cut be approved, the trench shall be backfilled with CDF. One
31 lane shall remain accessible to emergency vehicles at all times unless previous
32 arrangements with the Public Works Department have been approved. On crossings
33 required to be opened to traffic prior to final trench restoration, steel plates may be used
34 as approved by the engineer.

35
36 **2-2.5.8 Drain Pipe**

37 When groundwater levels are encountered within 3' of finished grade, a 6" diameter,
38 rigid, PVC, perforated drain pipe shall be installed parallel to all proposed storm mains.
39 This perforated pipe shall be bedded in a minimum 6" depth of pea gravel. This pea
40 gravel back fill shall further be placed to a minimum height of 6" above the pipe. The
41 pipe shall be installed a minimum of 3' below finished grade. Drain pipes shall connect
42 to the City storm system at their low point. If no City storm system is available for
43 connection, in lieu of installing the drain pipe system described above, the entire trench
44 section shall be backfilled with crushed surfacing base course.

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2-2.5.9 Jacking, Auguring, or Tunneling

Tunneling shall be required as a condition of permit approval, in certain situations, by the Public Works Director, under pavements, buildings, railroad tracks, etc. The contractor shall install the pipe by jacking, auguring, or tunneling, or installing the pipe in a casing pipe by a combination of these methods. The contractor shall be liable for damage to any existing facilities as a result of the jacking, auguring, or tunneling installation work. Approvals from other agencies or companies may be required for the proposed work.

The contractor shall obtain all necessary permits, approvals and easements as may be necessary and shall provide copies to the City during the permit review process.

When use of a casing pipe is required, the contractor shall be responsible to select the gauge and size required, unless otherwise indicated on the plans, and consistent with his/her jacking or auguring operation, and shall be set to line and grade. During jacking or auguring operations, particular care shall be exercised to prevent caving ahead of the pipe, which will cause voids outside the pipe. When the carrier pipe is installed within a casing pipe, the carrier pipe shall be skidded into position in an acceptable manner and to the line and grade as designated. The annular space between the casing and the pipe shall be filled with controlled density fill or as otherwise approved.

The faces of the jacking pit shall be constructed by driving steel sheets, or installing timber lagging, as the excavation proceeds. The sheets or lagging shall extend a minimum of 5' below the bottom of the pit except at the entrance of the utility. Prior to jacking or auguring activities, shop drawings describing these activities, including dimensioning of pit length and size of underground borings and complete description of shoring, shall be submitted to the City for approval.

2-2.5.10 Pavement Restoration

Pavement restoration of longitudinal trenching for all underground utilities including water, sewer, power, gas, etc., shall be in accordance with Standard Detail 300A. The limits of paving shall be as determined by the Public Works Director on a project specific basis. Final paving shall be placed within seven working days after utility line installation and testing are complete.

2-2.5.11 Final Utility Adjustment

- 1) All utility covers that are located on proposed roadways shall be temporarily placed at subgrade elevation prior to placing crushed surfacing material.
- 2) Final adjustment of all covers and access entries shall be made following final paving, as shown in Standard Details 300B and 420.
- 3) In addition to restoration of the road as described above, the responsible utility shall care for adjacent areas in compliance with Sections 1-04.11, Final Cleanup, and 8-01, Roadside Seeding, in the WSDOT/APWA Standard Specifications. In particular:
 - a) Streets and roads shall be cleaned and swept both during and after the installation work.

- b) Disturbed soils shall be final graded, seeded and mulched after installation of utility. Seeding and mulching by hand, using approved methods, will be acceptable for small areas.
- c) Ditch lines with erodible soil and subject to rapid flows may require seeding, jute matting, netting, or rock lining to control erosion.
- d) Any silting of downstream drainage facilities, whether open ditches, pipes, and catch basins, which results from the utility installation, shall be cleaned out and the work site restored to a stable condition as part of site cleanup.

2-2.6 Cement Concrete Curb and Gutter Sections

2-2.6.1 Description

The standard curb and gutter section shall be Type A-1 per Standard Detail 320A. Type A-1 standard curb and gutter are intended for use on both public and private roadways. Curb sections conforming to Standard Detail 320B is intended for use in parking lot areas, temporary road sections, and other locations subject to the review and approval of the Public Works Director.

2-2.6.2 Materials

Concrete mix for curbs shall be Class 3000 structural air entrained. Slump of the concrete shall not exceed 3.5".

White pigment curing compounds shall not be used on curb and gutter.

2-2.6.3 Curing and Protection of Concrete

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 four hours after application.

The contractor shall have readily available sufficient protective covering, such as waterproof paper or plastic membrane, to cover the pour of an entire day in event of rain or other unsuitable weather.

The curb shall be protected against damage or defacement of any kind until it has been accepted by the engineer. Sidewalk which is not acceptable to the engineer because of damage or defacement shall be removed and replaced by the contractor at his/her own expense.

2-2.7 Guardrails

Surfaces which are reasonably accessible to vehicles that are located above or adjacent to rockeries or walls in excess of 30" in height shall be protected by an approved guardrail system.

Roadway guardrails shall be provided at locations determined during the project design and plan review process and shall conform to WSDOT/APWA Standard Plan C-1, Beam Guardrail Type 1. End anchors shall conform to WSDOT/APWA Standard Plan C-6, Beam Guardrail Anchor Type 1.

Alternative methods proposed by the applicant and/or contractor for providing roadway vehicle and pedestrian protection will be considered by the Public Works Director on a

1 case by case basis.
2

3 **2-2.8 Cement Concrete Sidewalks**

4 **2-2.8.1 Description**

5 This work shall consist of constructing cement concrete sidewalks, thickened edge for
6 sidewalks, curb ramps, and bus shelter pads, including excavation for the depth of the
7 sidewalk and subgrade preparation, in accordance with Standard Details 321, 321A,
8 326A, 326B, 326C and 327.

9 Sidewalk drains shall be provided according to Standard Detail 328.

10 Cement concrete steps shall be provided where indicated on the plans and according to
11 Standard Details 331 and 332.

12 Sidewalk Excavations – Footbridge: Any excavation made in any sidewalk or under a
13 sidewalk shall be provided with a substantial and adequate footbridge over the
14 excavation on the line of the sidewalk. The bridge shall be at least 5' wide and securely
15 railed on each side so that pedestrians can pass over safely at all times.

16 **2-2.8.2 Materials**

17 Cement concrete shall be Class 3000. Slump of the concrete mix shall not exceed 3.5".
18 The use of calcium chloride as an admixture is prohibited.
19
20

21 **2-2.8.3 Construction Requirements**

22 1) General:

- 23 a) The curb and gutter section shall be placed prior to the placement
24 of the sidewalk section unless otherwise directed by the City.
- 25 b) Subgrade shall be approved by the City prior to concrete being
26 placed. Generally, 0.25" deep V-grooves are to be placed on 5'
27 centers, but at the discretion of the City this may be changed to
28 make for a better match with the surrounding area.
- 29 c) A minimum clear distance of four feet is required from the face of
30 curb to any obstruction on or within the sidewalk in order to meet
31 the requirements of the American Disabilities Act (ADA) unless
32 otherwise noted.
- 33 d) Mailboxes shall be set at locations approved by the Postmaster
34 and may be adjacent to the curb in residential areas. Refer to
35 Section 3-15 and Standard Detail 338.
- 36 e) When there is insufficient suitable native material on the project
37 site to fill low areas in the sidewalk subgrade and planting strip
38 area, the contractor shall furnish, place, and compact Gravel
39 Borrow for subgrade base.
- 40 f) All sidewalks shall be constructed over a minimum of 4" of
41 crushed surfacing top course compacted to 95% of maximum
42 density.

- 43 2) Placing and Finishing Concrete: The concrete shall be spread
44 uniformly between the forms and thoroughly compacted with a steel
45 shod strikeboard. Through joints and dummy joints shall be located
46 and constructed in accordance with the Standard Detail 321 and

1 these Standards. In construction of through joints, the premolded joint
2 filler shall be adequately supported until the concrete is placed on
3 both sides of the joint.

- 4 3) Through and Contraction Joints: Standard locations for through joints
5 for sidewalks are
- 6 a) At street margins produced and at 20' intervals.
 - 7 b) To separate concrete driveways, stairways, curb ramps and their
8 landings from sidewalks.
 - 9 c) Around the vertical barrel of fire hydrants, around utility poles, sign
10 posts, and large diameter underground utility cover castings when
11 located in the sidewalk area.
 - 12 d) Longitudinally between concrete walks, curbs, paved planting
13 strips, and solid masonry or concrete walls where they abut. e) To
14 match as nearly as possible, the through joints in the adjacent
15 pavement and curb when sidewalk abuts curb.

16 Transverse contraction joints (dummy joints) shall be constructed with premolded
17 material 0.5" width by 2" depth, and set at 15' intervals, or as decided by the City. At no
18 time will dummy joint spacing exceed 15'.

19 4) Curb Ramps:

- 20 a) Curb ramps shall be constructed in accordance with WSDOT Standard Detail F-
21 3. Curb ramps shall be constructed where shown on the plans or where directed
22 by the City. This work shall include curb ramps installed in new sidewalks and
23 curb ramps to be installed in existing sidewalks. Existing sidewalks shall be
24 neatly saw-cut full depth prior to construction of curb ramps.
 - 25 b) Curb ramps shall be constructed separately from the sidewalk to produce a
26 definite break line between the ramp and the sidewalk. A 0.5" non-extruded
27 through joint material shall be installed between the curb ramp and both the
28 sidewalk and curb with edging.
 - 29 c) Ramp texturing shall be done with an expanded metal grate placed and removed
30 from wet concrete to leave a diamond pattern as shown on Standard Details
31 referenced above.
- 32
33

34 **2-2.9 Mailboxes**

35 Mailboxes shall be constructed in accordance with Standard Details 338, 339, and 340,
36 and these Standards. Gang boxes supplied by the U.S. Postal Service shall be installed
37 per Standard Detail 340.

38

39 **2-2.10 Rockeries and Rock Walls**

40 **2-2.10.1 Description**

41 This work shall consist of constructing rockeries with rock facing height of 4' or less
42 used for erosion control or the containment of cuts and embankments. Work shall be
43 performed in accordance with Standard Detail 333.

44

46 **2-2.10.2 Materials**

1 Rock for constructing new rock facings shall be large broken pieces of igneous rock
 2 obtained from a commercial quarry. Rock material shall be rectangular, selected pieces
 3 or rock sound and resistant to weathering. Rock shall be free of soft, weathered
 4 material and seams of soft rock susceptible to deterioration.
 5 Perforated drain pipe shall be rigid PVC smooth interior pipe.
 6 No. 2 coarse aggregate to be used around the perforated drain pipe behind the wall
 7 shall conform to Section 9-03.1(3)C of the WSDOT/APWA Standard Specifications.
 8 Concrete for rockery cap shall be Class 3000. Lamp black coloring agent to match the
 9 color of the rockery shall be added to the cement concrete during mixing in an amount
 10 not to exceed 1.5 lbs/yd³ of concrete.
 11 Quarry rock shall be as specified in Section 3.8 of these Specifications.
 12 The density of rock material shall be a minimum of 160 lbs/ft³. The size categories for
 13 rock shall be as follows:

Approx. Size & Volume	Approx. Weight (lb)	Minimum Dimension (inches)	Minimum Volume (cf)
One-man rock	160 to 400	12	1.75
Two-man rock	500 to 800	13	4
Three-man rock	900 to 1,200	16	6.6
Four-man rock	1,300 to 1,600	18	9

14 *Rocks less than 1 ft³ in volume or weighing less than 160 lbs shall not be used.*

15
 16 **2-2.10.3 Construction Requirements**

17 The first course of rock shall be placed on firm unyielding soil. There shall be full
 18 contact between the rock and soil, which may require shaping of the ground surface or
 19 slamming or dropping the rocks into place so that the soil foundation conforms to the
 20 rock face bearing on it.

21 As the rockery is constructed, the rocks shall be placed so that there are no continuous
 22 joint planes in either the vertical or lateral direction. Each rock shall bear on at least two
 23 rocks below it. Rocks shall be placed so that there is some bearing between flat rock
 24 faces rather than on joints.

25 Joints between courses shall slope downward towards the material being protected
 26 (away from the face of the rockery).

27 Voids in the rockery face shall not be greater than 50 in² for rocks over 3' high and 36 in²
 28 under 3' high. The maximum through void area will be 15 in² over 3' high and 10 in²
 29 under 3' high. Any large voids existing between each course of rock as it is placed shall
 30 be filled by wedging smaller rock of the same quality into the voids in the back side of
 31 the rockery.

32
 33 Backfill material shall not be allowed to spill freely between the voids in the rockery. The
 34 rockery shall be backfilled in uniform layers as construction proceeds.

35
 36 **2-2.11 Pedestrian Hand Railings**

37 Pedestrian handrails shall be galvanized steel or aluminum and shall be constructed in
 38 accordance with Standard Details 329 and 330.

39 **2-2.11.1 Fabrication**

1 Before fabricating the railing, the contractor shall submit six copies of the shop drawings
2 for the City's approval. The applicant and/or contractor may substitute other rail
3 connection details for those shown in the project plans if details of these changes are
4 indicated as such in the shop drawings and if the City approves the details. In reviewing
5 the shop drawings, the City will indicate only that they appear complete and address the
6 basic project requirements. Such review does not indicate a check on dimensions.
7 Welding shall conform to the requirements of the *Structural Welding Code AWS D1.1*
8 for steel, and to the requirements of the *Specifications for Aluminum Structures* of the
9 Aluminum Association, for aluminum alloys. All exposed welds shall be ground flush
10 with adjacent surfaces.
11 Railing panels shall be straight and true to dimensions. Adjacent railing panels shall
12 align with each other with a variation not to exceed 1/16". Joints shall be matchmarked.
13 When railing is constructed on a curved surface, either horizontal or vertical, the railing
14 shall conform closely to the curvature of the surface by means of a series of short
15 chords. The lengths of the chords specified in the shop drawings shall be the distance
16 center to center of rail posts.
17 Zinc used for galvanizing shall be grade Prime Western conforming to ASTM B6.
18 Ornamental railing shall be painted with a rust proof metal primer and one coat of
19 ornamental iron metal paint.

20

21 **2-2.11.2 Installation**

22 The railing shall be erected in accordance with the plans on anchor bolts, or in holes
23 formed by inserts provided in the concrete railing base to receive the railing posts.
24 Sheet metal inserts shall be removed before the erection of the railing.
25 No railing shall be erected until the sidewalk or structure to which it is to be attached is
26 completed and all falsework supporting the system is released.
27 The railing shall be carefully erected, true to line and grade. Posts and balusters shall
28 be vertical, not exceeding 1/8" from the vertical for the full height of the panel.
29 Slip joints shall be as shown on Standard Details 329 and 329A. Railing installed
30 without slip joints will be rejected and the applicant and/or contractor shall install new
31 railing at his/her own expense.

32 **2-3. MATERIALS**

33 **2-3.1 Controlled Density Fill (CDF)**

34 CDF shall conform to the following:

- 35 1) Portland Cement: Type I-II AASHTO M85.
- 36 2) Mineral Filler Admixtures: pozzolans or fly ash (ASTM C-618, Class F).
- 37 3) Aggregate: TENINO washed coarse sand No. 2.

38

39 CDF shall be used in the following proportions for 1 yd³. Batch weights may vary
40 depending on specific weights of aggregates.

41 Portland Cement

42 Fly Ash

43 No. 2 Washed

1 Coarse Sand (SSD)
2 Water 50 lbs/yd³ 250 lbs/yd³
3 3,200 lbs/yd³ 50 gals/yd³ (Max.)
4

5 Add sufficient water to provide a 6" to 8" slump delivered in place at the job site.
6

7 **2-3.2 Gravel Borrow**

8 Gravel borrow shall conform to the following:

9 U.S. Standard Percent Passing Sieve Size by Dry Weight

10 3" 100 1.25" 80-100 No. 4 20-70

11 No. 40 0-25 No. 200 0-5 Sand Equivalent 50 minimum
12

13 **2-3.3 Non-Shrink Cement Sand Grout**

14 Non-shrink cement sand grout shall be proportioned as follows:

15 1 part high early strength (H.E.S.) cement.

16 2 parts clean fine-grained sand by weight and well-mixed with sufficient water to
17 obtain a stiff consistency.

18 Unpolished aluminum powder shall be added to the dry cement in the proportion of one
19 heaping teaspoonful per sack of cement no more than 30 minutes before the grout
20 mixture reaches its final in-place position.

21 The required strength of the non-shrink concrete or grout shall be $f_c=4,000$ psi and be
22 verified by the cube strength test. The strength shall be confirmed by Schmidt
23 hammering of the pads.

24 Prior to placing the grout, the contact surface shall be thoroughly cleaned, roughened
25 and wetted with water. The grout shall be covered with burlap sacks after the initial
26 concrete set and wetted at regular intervals until the required strength is obtained.

27 **2-3.4 No. 2 Washed Coarse Sand**

28 No. 2 washed coarse sand shall be a clean mixture free from organic matter and
29 conforming to the following gradation:

U. S. Standard Sieve Size	Percent Passing By Weight
0.5" inch	100
#4	65-100
#50	0-10
#200	0-3
All percentages are by weight	

30 **2-3.5 Spawning Gravel**

31 Spawning gravel shall be clean, well-rounded, uniformly graded, and shall conform to
32 the following gradation:
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Sieve Size (in2)	Percent Passing
4	100
3	85 - 95
1-1/2	65 - 75
1/2	0 - 50
1/4	2 maximum
All percentages are by weight.	

2-3.6 Quarry Rock

Quarry rock shall meet the following requirements:

U. S. Standard Sieve Size (inches)	Percent Passing By Weight
4	100
2	40 maximum
3/4	10 maximum
All percentages are by weight.	