

# SKAGIT COUNTY

## ROAD STANDARDS



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REGARDING THE ADOPTION OF THE  
SKAGIT COUNTY ROAD STANDARDS

WHEREAS, good engineering practice calls for the setting of standards for road construction; and

WHEREAS, such standards should be reviewed periodically to insure that they conform to current practices; and

WHEREAS, the public Works Department has reviewed the Road Standards as adopted on June 28, 1983 and all subsequent amendments thereto as adopted by the Board of Skagit County Commissioners, and has identified several revisions for consideration; and,

WHEREAS, the Public Works Department has requested comments from the local development, construction, engineering and surveying community and the general public, and has incorporated those comments as appropriate into the amended Skagit County Road Standards, "Attachment A"; and,

WHEREAS, the Board of Skagit County Commissioners voted to adopt the Skagit County Road Standards, Version 5.2 with the following change to Section 5.03, B, on page 55, remove and replace the first two words of the first paragraph "Regardless of" with "As an alternative to".

NOW THEREFORE, BE IT RESOLVED that the Board of Skagit County Commissioners hereby adopts the amended Skagit County Road Standards, Version 5.2, effective July 17, 2000.

WITNESS OUR HANDS AND THE OFFICIAL SEAL OF OUR OFFICE this 17<sup>TH</sup> day of July, 2000.



BOARD OF SKAGIT COUNTY COMMISSIONERS:  
SKAGIT COUNTY, WASHINGTON

Harvey Wolden  
HARVEY WOLDEN, Chairman

Robert Hart  
ROBERT HART, Commissioner -

\_\_\_\_\_  
TED W. ANDERSON, Commissioner

ATTEST:

Patti J. Chambers  
PATTI J. CHAMBERS, Clerk of the Board

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**SKAGIT COUNTY**  
**ROADS STANDARDS MANUAL**

**1.00 INTRODUCTION**

The purpose of these Standards is to provide standardized road design and construction elements for consistency and to ensure, so far as practical, that minimum requirements of the motoring, bicycling, and pedestrian public are met. These requirements include safety, convenience, drainage, aesthetic values and economical maintenance.

These Standards are not intended to provide for all situations but to be flexible in form or content. They are intended to assist, but not substitute for, competent work by design professionals. It is expected that land surveyors, engineers, architects, and contractors will bring to each project the best of the skills from their respective disciplines and trades.

These Standards are also not intended to unreasonably limit any innovative or creative effort. However, any variances from these road standards are subject to the approval of the County Engineer based on satisfactory evidence that the proposed variance will produce an equivalent facility.

**1.01 Current Edition of the Standards**

The most current edition of these Standards will be available at the Skagit County Planning and Permit Center and at the Skagit County Department of Public Works. In order to remain current with technological changes and public needs, these standards are subject to revisions. This manual is printed in a format that can be easily updated. It is essential for the holder to keep the manual current with revisions to the standards.

**1.02 Amendments**

From time to time it may be necessary to amend these Standards in response to changes in the adopted Skagit County specifications (Sect. 2.06), to the other specifications (Sect. 2.07), or to changes in the policies and procedures of Skagit County regarding road standards and related items as contained in these Standards.

All requests for changes to these Standards shall originate with or be submitted to the County Engineer. Such requests, including supportive documentation, shall be forwarded to the Board of County Commissioners with a recommendation by the County Engineer.

### **1.03 Application of Standards**

#### A. Mandatory Standards

Mandatory Standards are those most essential to the achievement of overall design objectives. Mandatory Standards use the word “shall”.

#### B. Advisory Standards

Advisory Standards allow some flexibility in application to accommodate design constraints or to be compatible with local conditions. Advisory Standards use the word “should”.

#### C. Permissive Standards

All Standards other than the mandatory and advisory, indicated with the work “may”, are permissive with no requirement intended.

## **2.00 GENERAL CONSIDERATIONS**

### **2.01 Short Designation**

These Skagit County Road Standards shall be cited routinely in the manual as the “Standards.”

### **2.02 Definitions**

**AASHTO** - American Association of State Highway and Transportation Officials.

**Acceleration Lane** - A speed change lane, including tapered areas, for the purpose of enabling a vehicle entering a roadway to increase its speed to a rate at which it can more safely merge with through traffic.

**Access** - A trail, driveway or private road that connects to the general public road system.

**ACP** - Asphalt Concrete Pavement.

**ADT** - Average Daily Traffic. The total two-directional volume of traffic passing through a given point during a given time period, divided by the number of days in that time period. When used as a threshold to determine classification (size) of the access point or road, ADT shall be based on the ultimate build out of all land, considering current zoning, that will potentially be served by the access point or road.

**Applicant** - Any person, firm, partnership, association, joint venture, corporation or any other entity responsible for a given project seeking approval from the County for any land use or other related permit or approval referenced in Skagit County Code and which requires utilization of these Standards.

**Approved/Accepted Plans** - Project plans that have been accepted for construction by the County Engineer or designee.

**ATB** - Asphalt Treated Base.



**Auxiliary Lane** - The portion of the roadway adjoining the traveled way for parking, speed change, turning, storage for turning, weaving, truck climbing, and other purposes supplementary to through-traffic movement.

**Breakaway Structure or Breakaway Design** – A structure or installation that has been crash tested in accordance with National Cooperative Highway Research Program procedures.

**Capacity** - The maximum number of vehicles that have a reasonable expectation of passing over a given roadway or section of roadway in one direction during a given time period under prevailing roadway and traffic conditions.

**CF** - Cubic Feet.

**Channelization** - The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands or other suitable means to facilitate the safe and orderly movement of both vehicles and pedestrians.

**Clear Zone** - The total roadside border area, starting at the edge of traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a nonrecoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes, speeds, and the roadside geometry.

**CMP** - Corrugated Metal Pipe.

**County** - Skagit County

**County Engineer** – That person appointed by the County to fulfill the requirements of RCW 36.80. See also Engineer.

**County Road** – Any road which has been accepted by Skagit County for maintenance with public funds.

**CSTC** - Crushed Surfacing Top Course.

**Cul-de-sac** - Short road having one end open to traffic and the other temporarily or permanently terminated by a vehicle turnaround.

**CY** - Cubic Yard.

**Deceleration Lane** - A speed change lane, including tapered areas, for the purpose of enabling a vehicle that is to make an exit turn from the roadway to slow to a safe turning speed after it has left the main stream of faster moving traffic.

**DHV** - Design Hour Volume. Hourly peak traffic volume, in a typical 24 hour period, used for road design and capacity analysis.

**Design Speed** - A speed determined for design and correlation of the physical features of a highway that influence vehicle operation: the maximum safe speed maintainable over a specified section of road when conditions permit design features to govern.

**Director** - The Director of Skagit County Department of Public Works or authorized representative.

**Driveway** - Access to one or two individual lots.

**Easement** - A right to use or control the property of another for designated purposes.

**Edge of Traveled Way** - The face of curb or roadside edge of bike path for roads that are, or will be constructed to urban Standards, or the edge of driving lane (not shoulder) for roads that are, or will be constructed to rural Standards.

**Encroachment** - Occupancy of County right-of-way by non-roadway structures or other objects of any kind. This includes any work within the County right-of- way.

**Engineer** - Shortened designation for County Engineer or authorized representative. This definition shall also be applied to the terms “Director” or “Engineer” as they may appear in the Standard Specifications or the Standard Plans.

**Geometrics** - The arrangement of the visible elements of a road such as alignment, grade, sight distance, widths, and slopes.

**Grade** - Rate or percent of change in slope, either ascending or descending from or along the roadway. It is measured along the centerline of the roadway or access point.

**Hazard** - A side slope, an object, water, or a drainage device which, if impacted, would apply unacceptable impact forces on the vehicle occupants or place occupants in a hazardous position. It may be either natural or manmade.

**Horizon Year(s)** - Estimated year or years in which a project or phases of a project will be complete.

**Intersection** - The general area where two or more roadways join or cross. Minor approaches to roadways such as private driveways are also defined as an intersection.

**Island** - A defined area between traffic lanes for control of vehicle movements and/or for pedestrian refuge.

**Joint Access** - An access onto County right of way which provides access to two or more driveways.

**Land Surveyor** - A professional land surveyor currently licensed by the State of Washington.

**LF** - Linear Feet.

**Median** - That portion of a divided roadway separating the traveled ways for traffic in opposite directions.

**MPH** - Miles Per Hour.

**NGVD** - National Geodetic Vertical Datum

**Operating Speed** - Used for determination of sight distance. Operating speed should be equal to the P85 speed for existing facilities and be equal to the design speed for new facilities.

**Passing Sight Distance** - The minimum sight distance required for the driver of one vehicle to pass another vehicle safely and comfortably.

**Pavement Width** - The distance measured from face of curb to face of curb for curbed sections of roadway or the distance measured from outside edge of pavement to outside edge of pavement sections of non-curbed roadways.

**PC** - Point of Curvature.

**PCC** - Portland Cement Concrete.

**PI** - Point of Intersection.

**Plan/Construction Drawings** - The plans, profiles, cross sections, elevations, details, and supplementary specifications, signed by a licensed professional engineer and accepted by the County Engineer, which show the location, character, dimensions, and details of the work to be performed.

**Posted Speed** - The speed actually signed along the roadway.

**Private Road** - Private vehicular access provided for by an access tract, easement, or other legal means, serving two or more actual or potential dwelling units; privately owned and maintained.

**Project Engineer** - A professional engineer currently licensed by the State of Washington, retained by the applicant, and acting on the applicant's behalf as a project designer and/or project construction administrator.

**PT** - Point of Tangency.

**Public Road** – A road continuously open to general public travel which may or may not be publicly owned and maintained.

**P85 Speed or 85th Percentile (85%) Speed** - Based on speed studies, P85 Speed is that speed at which 85% of the vehicles travel at or below.

**Radius Return Access Point** - The intersection of an access point with a County road delineated by either pavement edges or curbs laid out at each edge in curvilinear fashion between tangents formed by the edge of roadway (or curb face) and the edge of access point (driveway) pavement or curb face.

**ROW/Right-of-Way** - All property in which the County has any form of ownership or title and which is held for public road purposes, regardless of whether or not any road exists thereon or whether or not it is used, improved, or maintained for public travel,

**Road/Roadway** - An open public way for the passage of vehicles, person and animals. Limits include the outside edge of sidewalks, or curbs and gutters, or side ditches, including the appertaining shoulder and all slopes, ditches, channels, waterways, and other features necessary for proper drainage and protection within the right-of-way or easement.

**Separate Turn Lane** - An auxiliary lane for turning traffic in one direction which has been physically separated from the intersection area by a traffic island or stripe. Separate turn lanes may be included within intersections or separated from intersection areas by traffic islands.

**SF** - Square Feet.

**Shoulder** - That portion of the roadway contiguous with the traveled way for accommodating stopped vehicles, for emergency use, and for lateral support of base and surface courses.

**Sight Distance, Stopping** - As defined by AASHTO, the minimum distance along a roadway sufficiently long enough to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path. The Stopping Sight Distance is the sum of the distance a driver travels to perceive and comprehend the object, decide on an appropriate response, react and complete the braking maneuver without hitting the object in its path.

**Speed Change Lane** - A separate lane for the purpose of enabling a vehicle entering or leaving a roadway to increase (acceleration lane), or decrease (deceleration lane) its speed to a rate at which it can more safely merge with or diverge from through traffic.

**SY** - Square yard.

**Traveled Way** - The part of the road made for vehicle travel excluding shoulders and auxiliary lanes.

**Trip** - A one-direction movement which begins at the origin and ends at the destination.

**Trip Distribution** - The process by which the movement of trips between zones is estimated. The data for each distribution may be measured or estimated by a growth factor process or by a synthetic model.

**Trip End** - A single or one-direction vehicle movement with either the origin or the destination (exiting or entering) inside the study area. For trip generation purposes, the total trip ends for a land use over a given period of time are the total of all trips entering plus all the trips exiting a site during a designated time period.

An example of a trip end would be: A site which has over some period of time, 2,000 trips entering and 1,800 trips leaving, has 3,800 trip ends associated with it. The 3,800 total trips to and from the site represent a total of 7,600 trip ends. Of these, 3,800 occur at locations other than the site in question.

**Trip Generation** - A general term describing the analysis and application of the relationships that exist between the trip makers, the traffic study area, and the trip making. It relates to the number of trip ends in any part of the traffic study area.

**Unopened Right-of-Way** - A County right-of-way that exists by dedication or deed, but for which no vehicular roadway has been constructed by the County or other parties.

**Utility** - A business providing public service such as gas, electric power, telephone, telegraph, water, sewer, or cable television, whether or not such business is privately owned or owned by a governmental entity.

### **2.03 Applicability**

Except as noted in Section 2.04, these standards shall govern all design and construction required within county right-of-way, proposed right-of-way, accesses thereto, and utility work within these rights-of-way. These standards shall also govern all design and construction within private easements, as provided herein, or as provided by county ordinance.

Any land development which will adversely impact the level of service, safety, or operational efficiency of abutting or serving roadways or is required by other County code, permit or ordinance to improve such roadways, shall improve those roadways in accordance with these Standards. Within urban growth area boundaries for which the County and the enclosed municipality have entered into an interlocal agreement regarding road standards, the municipality's road standards shall be used as provided for by said agreement.

These Standards are pursuant to Skagit County Code Title 14, “Land Use and Development Regulations”. In all cases, the application of these Standards shall be in conformance with the Critical Areas Ordinance and the Shorelines Ordinance as codified in Skagit County Code Title 14.

#### **2.04 Exemptions**

These standards shall not govern the following:

1. Maintenance work within public rights-of-way by county forces.
2. Temporary repairs made on an emergency basis.
3. Resurfacing, restoration and rehabilitation (“3-R”) projects. See Appendix E.
4. Conversion of gravel roads to paved.
5. New road construction within urban growth boundaries where the County and the municipality have entered into an interlocal agreement to use the municipality’s road standards.

#### **2.05 Interpretation, Enforcement and Appeals**

Interpretation and enforcement of these standards shall be the responsibility of the County Engineer or designated representative.

Failure to comply with these Standards will be cause for withholding or withdrawing acceptance of plans or drawings, withholding of bond, final inspection approval or occupancy certificates and/or other penalties as provided by code, ordinance or law.

All appeals of any decision by the County Engineer in his/her administration, interpretation or enforcement of these standards shall be in writing and within ten working days of said decision. The written appeal, including the recommendations and analyses of the County Engineer, shall

be made to the Skagit County Board of County Commissioners who shall be the final authority in such matters.

## **2.06 Adopted Skagit County Specifications**

Except where these standards provide otherwise, or by contract with Skagit County, all design and construction, including materials, shall be in accordance with the relevant sections of the following publications:

- A. Washington State Department of Transportation “Standard Specifications for Road, Bridge and Municipal Construction”, current edition including the APWA Amendments and any other amendments as adopted by Skagit County, hereinafter “Standard Specifications”
- B. Washington State Department of Transportation “Standard Plans for Road and Bridge Construction,” current edition, hereinafter “Standard Plans”.
- C. U.S. Department of Transportation “Manual on Uniform Traffic Control Devices, as amended and approved by the Washington State Transportation Commission”, current edition, hereinafter “MUTCD”.

## **2.07 Other Specifications**

The following specifications may be followed when specifically cited by these road standards, or in the absence of specific standards when applicable and approved by the County Engineer.

- 1. “Washington Chapter American Public Works Association Standard Specification for Municipal Public Works



- Construction,” current edition, hereinafter referred to as “APWA Standard Specifications.”
2. “Standard Specifications for Highway Bridges,” current edition, adopted by the American Association of State Highway and Transportation Officials, hereinafter referred to as the “AASHTO Bridge Specifications.”
  3. Washington State Department of Transportation “Design Manual,” current edition, hereinafter referred to as the “WSDOT Design Manual.”
  4. Washington State Department of Transportation “Construction Manual”, current edition.
  5. Washington State Department of Transportation “Hydraulic Manual,” current edition, hereinafter referred to as the “WSDOT Hydraulic Manual.”
  6. Washington State Department of Transportation “Local Agencies Guidelines”, current edition, hereinafter referred to as “LAG Manual”.
  7. “A Policy on Geometric Design of Rural Highways 1990,” published by AASHTO, hereinafter referred to as “AASHTO Green Book”.
  8. “Highway Capacity Manual,” current edition published by the Transportation Research Board.
  9. Skagit County “Accommodation of Utilities Within County Road Right-of-Way” policy, current edition.

10. “Trip Generation Manual”, published by the Institute of Transportation Engineers, current edition.
11. “AASHTO Guide for Design of Pavement Structures,” published by AASHTO, current edition.
12. “Uniform Building Code”, current edition as adopted by Skagit County, hereinafter referred to as “UBC”
13. “Uniform Fire Code”, current edition as adopted by Skagit County, hereinafter referred to as “UFC”

## **2.08 Project Acceptance**

The County Engineer shall rely on the certification and approval of the road and drainage plans and calculations by the applicant’s Project Engineer for approval of the Project. The County Engineer’s acceptance of the plans shall not relieve the applicant or the applicant’s Project Engineer from any liability related to portions of the design which are not in conformance with these Standards or do not follow good engineering practice.

Upon receipt of the project plans and calculations, the County Engineer will review the work of the applicant’s Project Engineer for accuracy and completeness. The plans and calculations will either be accepted by the County or returned for revisions. Project acceptance occurs when the County Engineer signs the plans.

The plans, reports, basin maps, and calculations shall be signed, sealed and dated by the applicant’s Project Engineer. The cover sheet of the plan set and the cover sheet of all calculations shall bear the certification which reads:

“The design improvements shown in this set of plans and calculations conform to the current edition of the Skagit County Road Standards and the Skagit County Drainage Ordinance. All design variances have been approved by the Skagit County Engineer. I approve these plans for construction”

## **2.09 Time Limit of Acceptance**

The acceptance of plans shall be valid for a time period of three years from the date of acceptance by the County Engineer. Construction in accordance with the approved plans must be completed within this time period. If not completed within this time period, the plans shall be resubmitted to the County for review and any revisions or modifications necessary to meet the current Standards shall be made. Re-submittal fees equal to new application fees shall be paid before the plans are reviewed by the County.

A Traffic Impact Analysis shall only be valid for a time period of three years from the date of submittal. If the project is not completed within three years from the submittal date, the Traffic Impact Analysis shall be updated and resubmitted to the County for review and concurrence prior to project acceptance.

## **2.10 Alternatives**

- A. These Standards represent reasonable approaches based on past experience in Skagit County and other jurisdictions. These Standards indicate the appropriate practice under most conditions.
  
- B. Engineering design is an endeavor that examines alternative solutions to real world situations and accordingly, these Standards are not provided to hamper the introduction of

new ideas. It is fully expected that creative engineering will continue to take place. Situations will present themselves where alternatives may be preferred to allow conformance with existing conditions, to overcome adverse topography or to allow for more affordable solutions without adversely effecting safety, maintainability or aesthetics. These Standards are intended to provide predictability yet still allow for the flexibility necessary for innovation.

- C. Alternatives to these Standards may be proposed at the pre-application meeting and evaluated and acted upon prior to the application submittal.
  
- D. The alternative request shall be in writing, submitted to the Planning and Permit Center, and address the following points:
  - 1. Specifically outline the reason for the alternative request.
  
  - 2. Specify the chapter and section the alternative request is for.
  
  - 3. Provide supporting evidence demonstrating that an alternative from these Standards is based on sound engineering judgement that the requirements for safety, function, appearance, fire protection and maintainability are fully met and complies with the Skagit County Comprehensive Plan.
  
  - 4. The above information shall be used by the County Engineer and the Director-Planning and Permit Center in evaluating requests for the use of

alternatives to these Standards. Alternative requests that do not meet the Uniform Fire Code shall also require concurrence from the County Fire Marshall. When required by the Director – Planning and Permit Center, a request for an alternative shall follow the procedures specified in Title 14 Skagit County Code Chapters 14.06 and 14.10.

5. Requests for alternatives made during the construction of a project shall be approved by the County Engineer prior to any changes being made in the field. Depending upon the nature of the alternatives and in all cases where there is a conflict with the preliminary plat approval conditions, approval of the Director-Planning and Permit Center will also be required as provided for in Title 14 Skagit County Code Chapters 14.06 and 14.10.

### **2.11 Violations and Penalties**

- A. Failure to comply with these Standards shall be cause for withholding or withdrawing approval of plans, forfeiture of financial security or non-acceptance of the work by the County.
- B. Violation of any provisions of these Standards by any person, firm or corporation shall be pursued and resolved in the same manner as any violation of Skagit County Code Titles 14 and 15 as provided for in Title 14 Skagit County Code Chapter 14.44.
- C. Notwithstanding the existence or use of any other remedy, the Director or County Engineer may seek legal or equitable relief to enjoin any acts or practices and abate any conditions that constitute

or will constitute a violation of these Standards or other regulations herein adopted.

### **2.12 Severability**

If any part of these Standards or its application to any person is, for any reason, declared invalid, illegal, or unconstitutional, in whole or in part by any court or agency of competent jurisdiction, said decision shall not affect the validity of the remaining portions thereof.

### **2.13 Fees**

Fees shall be assessed in accordance with the current development fee schedule as approved by the Skagit County Board of County Commissioners.

### **2.14 Transportation Improvements**

Transportation and frontage improvements, SEPA mitigation, traffic impacts, fees, etc. or the proportionate cost share of the improvements based on peak hour trips and necessary to mitigate impacts of the development (or each phase of development if it is done in phases) shall be in place or paid no later than time of final plat approval or certificate of occupancy, whichever occurs first, for that development or phase. If the improvements are not listed on the County Transportation Improvement Plan, they shall be installed prior to final plat approval.

Frontage improvements will be required for all new development that front on an existing County road (See Section 13). Other transportation improvements that may be required will be identified in the Traffic Impact Analysis (See Section 4.06) and the Safety Analysis (See Section 4.09).

### **2.15 Withdrawal of Approval/Acceptance**

At the discretion of the County, errors and omissions in the approved/accepted plans or information used as a basis for such approvals/acceptances may constitute grounds for withdrawal of any approvals/acceptances and/or stoppage of any or all permitted work. It shall be the responsibility of the applicant to show cause why such work should continue, and make such changes in plans that may be required by the County before the plans are re-approved.

## **2.16 Site Maintenance**

- A. The applicant shall schedule and control the work so as to comply with all applicable provisions of County land use codes and applicable state and federal laws and regulations to prevent any hazards to public safety, health and welfare.
- B. On existing roads, two way and all existing lanes of traffic shall be maintained at all times unless detour and/or traffic control plans have been approved in advance by the County Engineer and the Board of County Commissioners where applicable.
- C. Roads shall be kept free of dirt and debris.
- D. Pedestrian and bicycle facilities shall be kept free of obstructions.
- E. Pedestrian and vehicular access to occupied buildings shall be maintained except where written approval from the building owner has been obtained.
- F. Drainage facilities shall be maintained and fully functional and stormwater, erosion, and sedimentation control devices shall be maintained and fully functional as required by the Skagit County Drainage Ordinance.

## **2.17 Correspondence**

All correspondence, including letters, reports, and plans, shall be clearly labeled with the County project number as assigned by the Planning and Permit Center. Submittals or correspondence without this identification number will not be accepted and will not be reviewed.



### **3.00 ROAD TYPES AND GEOMETRICS**

For the purposes of determining the applicable standard for development, the density and type of land use shall be the maximum density allowed by the applicable zoning classification or the Comprehensive Plan with special emphasis on conformance with the Skagit County Critical Areas Ordinance.

The applicable Standards shall be determined by the location (urban or rural areas), function (public or private), use (residential, industrial, commercial, etc.), functional classification (arterial, collector or access) and projected traffic volumes

#### **3.01 Location**

A primary determination of the applicable portions of these Standards that must be used is based on the location of the proposed road or street. In most cases, the following will govern whether rural, urban or municipality road standards will apply, however, there may be cases where the land development approval process as set forth in Skagit County Code Chapter 14.18 may require the use of urban standards in rural areas.

- A. Rural - Rural area is defined as that area not within a federally designated urban area or a designated Urban Growth Area as established by Skagit County under the Growth Management Act. Appropriate maps showing the boundaries are available from the Skagit County Department of Public Works and the Skagit County Planning and Permit Center.
  
- B. Urban – Urban area is defined as that area within a federally designated urban area or a designated Urban Growth Area as established by Skagit County under the Growth Management Act. Appropriate maps showing the boundaries are available from the Skagit County Department of Public Works and the Skagit County Planning and Permit Center.

- C. Roads and Streets within Urban Growth Areas – The urban portion of these Standards shall apply to all road and street construction within an Urban Growth Area unless an interlocal agreement with the enclosed municipality and the County to use that municipality’s road and street standards, either partially or in full, has been entered into.

**3.02 Function**

- A. Public – Public roads are those that are continuously open to general public travel. Public roads may be put on the county road system for maintenance by the County with public funds in two manners – by dedication or by petition. Roads and streets in long subdivisions which, on the face of the plat, are dedicated to the public shall become county roads upon completion of the construction to County Standards, acceptance of the completed construction by the County Engineer, and approval of the final plat by the County. All others must be put on the county road system by means of the road establishment process as specified in RCW 36.81 and be constructed to County Standards for public roads.
- B. Private – Private roads are all roads not designated as public. A designation of private road within a long plat or long subdivision shall be permitted only by variance as provided for in Title 14 Skagit County Code. All roads accessing more than two lots within short plats or short subdivisions shall be private roads unless successfully petitioned to be public as provided for in RCW 36.81.

**3.03 Use**

On site roads serving business, commercial, ongoing mineral extraction or industrial uses shall be constructed to all-weather standards. Special

requirements regarding access control, turning radiuses and structural sections may be imposed.

### **3.04 Functional Classification and Traffic Volume**

- A. Rural – All county roads in rural areas are classified as Rural Local Access or Rural Collector (Major and Minor). New roads and streets and any modifications to existing connector or frontage roads that may be required as a condition of development approval shall meet the minimum design requirements for rural roads as specified in these Standards. Different standards will apply depending upon the forecasted traffic volumes and functional classification.
  
- B. Urban– All county roads in urban areas are classified as Urban Local Access, Urban Minor Arterial or Urban Collector. New roads and streets and any modifications to existing connector or frontage roads that may be required as a condition of development approval shall meet the minimum design requirements for urban roads as specified in these Standards. Different standards will apply depending upon the functional classification.

### **3.05 Typical Roadway Design Standards for New Construction**

To obtain geometric design for rural and urban roads, first determine the traffic generation (see Section 4.00), then see the applicable standards for:

- A. Public Road
  - 1. Road which will meet the requirements to be a rural or urban road or street dedicated or successfully petitioned to Skagit County as a county road to be

maintained with county funds. See Appendix B, Figures B-2 through B-9.

B. Private Road

1. Road serving short subdivisions in rural or urban areas, serving unopened county rights-of-way as provided for in Chapter 15 of these Standards, receiving a variance from the public road requirement, or otherwise not meeting requirements to be dedicated to Skagit County as a public road. See Appendix B, Figure B-1.

Public or private roads within urban growth areas may require the use of a municipality's road standards if an interlocal agreement between the County and the municipality provides for the use of the municipality's standards.

**3.06 Other Road Standards**

A. Grades

Grades exceeding the maximum grades specified in Appendix B shall require approval by the County Engineer. The minimum longitudinal grade for all roads and ditches shall be 0.5% unless otherwise approved by the County Engineer. Access point grades are to be constructed in accordance with Appendix C, Figure C-4.

B. Sight Distance

1. Stopping Sight Distance

All stopping sight distance calculations shall be based on AASHTO Green Book wet pavements criteria with adjustments for downgrades.

2. Intersection Sight Distance

Refer to AASHTO Green Book Chapter IX, Sight Distance, Intersection Control

3. Preservation of Sight Distance

Notes outlining the requirements shown in Figure C-2, Appendix C may be required on all final plats to preserve sight distance with regards to structures, landscaping, fencing, signs and other visual obstructions.

C. Horizontal Curvature and Superelevation

For speeds up to 35 mph in urban areas, use AASHTO Green Book Figure III-18 "Maximum Safe and Comfortable Speed for Horizontal Curves on Low-Speed Urban Streets". In urban areas, for speeds over 35 mph and rural areas, use Table III-6, "Maximum Degree of Curve" and "Minimum Radius Determined for Limiting Values of e and f, rural highways and high-speed urban street." The maximum superelevation rate shall be 6%.

D. Vertical Curves

Both vertical sag and vertical crest curves shall be designed in accordance with AASHTO Green Book Section III based on stopping sight distance.

### **3.07 Private Roads**

Although community road requirements are usually best served by public roads, owned and maintained by the County, private roads may be appropriate for some local access roads for either residential or commercial/industrial property. See Figure B-1, Appendix B.

Private roads are approved only when all of the following conditions are met:

- A. Permanently established by tract or easement providing legal access to each affected lot, dwelling unit, or business and sufficient to accommodate required improvements, to include provision for future use by adjacent property owners when applicable.
- B. Built to County Standards as set forth herein.
- C. Accessible at all times for emergency and public service vehicle use.
- D. Not obstructing, or part of, the present or future public neighborhood circulation plan developed in processes such as the Skagit County Comprehensive Plan, applicable community plan, or Capital Improvement Plan.
- E. Designed for a average daily traffic count (ADT) of 160 or less vehicles per day. Current ITE guidelines indicate that a single family dwelling generates approximately 10 trips per day, thus 16 legal lots with one single family dwelling will generate a total average daily traffic county of 160. This maximum ADT provision shall only apply to new private

roads directly accessing a county road. New private roads directly accessing a county road that will generate more than 160 ADT will be permitted only by variance as provided for in Skagit County Code Chapter 14.10 and will be required to meet the appropriate rural or urban Road Standards contained herein except that the road surface will not require paving. There is no maximum ADT provision if a new development is served by an extension of, or spur off of, an existing private road, however, should such existing private road be less than the Standards considering the current and proposed ADT, the new development may be denied unless a lower level of improvement has been approved by the County Engineer as provided for in Skagit County Code Chapter 14.18.

- F. Maintained in accordance with these Standards by a capable and legally responsible owner or homeowner’s association or other legal entity made up of all benefited property owners. The term “benefited property owners” shall include the owners of record of all properties with frontage, including access rights, on the private road or otherwise have legal access, whether constructed or not, to the private road. A written road maintenance agreement addressing the rights and responsibilities of all benefited property owners shall be provided to the County and approved by the Director – Planning and Permitting Center prior to final approval of the land development.
  
- G. Clearly described as a private road on the face of the plat.
  
- H. Clearly signed at the road location as a private road, the maintenance of which the County is not responsible for.

### **3.08 New Driveways/Emergency Vehicle Access Roads**

- A. Driveway - As adopted by Skagit County, the Uniform Fire Code defines 'driveway' as an access road more than 150 feet in length serving not more than two single-family dwellings.

Unless a separate emergency vehicle access is provided which meets these standards, new driveways are presumed to be emergency vehicle access driveways to all dwellings and shall meet the following standards:

1. A driveway with a minimum 12' driving surface shall be provided to up to two family dwellings when the nearest exterior wall is in excess of 150' from an emergency access road or driveway. For driveways crossing other landowners properties, a minimum access easement of 20 feet must be secured.
2. The driveway shall be constructed with a gravel or paved surface adequate to support proposed loads of emergency vehicles during all types of weather.
3. The maximum grade for a gravel driveway shall be 12%. The maximum grade for paved driveways shall be 14%. An exception in the Uniform Fire Code allows grades in excess of this when approved by the County Fire Marshal provided that NFPA 13D Fire Sprinklers are installed in all dwellings.
4. Turnouts shall be required for driveways in excess of 300 feet in length. Turnouts shall be a portion of the road that is widened to 20' driving surface for a



length of 30' and tapered back into the driveway at a 45-degree angle.

5. All turns shall have an outside turning radius of 50'.
6. An unobstructed clearance of not less than 13 feet, 6 inches in height shall be maintained for the required width of driveway and turnouts.
7. Bridges shall follow the criteria in Section 9.  
Exception: A bridge serving one single family dwelling may have a driving surface width of 8 feet, 6 inches with rub rails or guard rails provided that the road approach to both sides of the bridge are straight for at least 30 feet.
8. The emergency vehicle access driveway shall be shown on the site plan including width, length, turnouts, grades, etc.
9. The emergency vehicle access driveway shall be maintained in accordance with these standards by the property owner.
10. At every dwelling, the driveway shall have an area where emergency vehicles can turn around.
11. The County Fire Marshal is authorized to approve alternate materials or methods or to modify these driveway standards pursuant to provisions of Section 103.1.2 and 103.1.13 of the Uniform Fire Code.

See also Section 7.02 for additional design and construction details. An access permit is required for all driveways connecting to a county road regardless of length.

- B. Emergency Vehicle Access Road- As adopted by Skagit County, the Uniform Fire Code defines ‘emergency vehicle access road’ herein referred to as “access road” as a road more than 150 feet in length serving more than two single family dwellings.

Unless a separate emergency vehicle access is provided which meets these standards, new access roads are presumed to be emergency vehicle access roads serving more than two single family dwellings and shall meet the following standards:

1. An access road shall have a minimum 20’ driving surface. For access roads crossing other landowners properties, a minimum access easement of 25 feet must be secured.
2. An access road shall be constructed with a gravel or paved surface adequate to support proposed loads of emergency vehicles during all types of weather.
3. The maximum grade for a gravel access road shall be 12%. The maximum grade for a paved access road shall be 14%. An exception in the Uniform Fire Code allows grades in excess of this when approved by the County Fire Marshal provided that NFPA 13D Fire Sprinklers are installed in all dwellings.
4. All turns shall have an outside turning radius of 50’.

5. An unobstructed clearance of not less than 13 feet, 6 inches in height shall be maintained for the required width of driveway and turnouts.
6. Bridges shall follow the criteria in Section 9.
7. The emergency vehicle access road shall be shown on the site plan including width, length, turnouts, grades, etc.
8. An emergency vehicle access road shall be maintained in accordance with these standards by the property owner.
9. Turnarounds shall be required for any emergency vehicle access road. Turnarounds shall meet one of the following:
  - a. A looped turnaround providing the required width and turning radius, or
  - b. A cul-de-sac meeting the requirements of Figure C-1, Appendix C.
  - c. A hammer-head or “T” type turnaround meeting the requirements of Figure C – 1a, Appendix C.
10. The County Fire Marshal is authorized to approve alternate materials or methods or to modify these emergency access road standards pursuant to provisions of Section 103.1.2 and 103.1.13 of the Uniform Fire Code.

See also Section 7.02 for additional design and construction details. An access permit is required for all emergency access roads connecting to a county road regardless of length.

### **3.09 Cul de Sacs/Turn Arounds**

- A. Permanent road ends of 150 feet or less in length (measured from the edge of traveled way of the intersecting road to the end of the road) shall have a minimum roadway section as specified in Appendix B, Figures B-1 through B-9 and do not require a cul-de-sac.

Permanent road ends between 150 and 600 feet (measured from the edge of traveled way of the intersecting road to the beginning of cul-de-sac) shall have a minimum roadway section as specified in Appendix B, Figures B-1 through B-9 and be provided with a cul-de-sac as shown in Figure C-1, Appendix C.

Permanent road ends in excess of 600 feet are discouraged but may be allowed in cases where lots are large and/or difficult terrain exists, provided, the number of single family lots served by the road does not exceed 25 or the ADT generated from the properties served by the road does not exceed 250. The roadway shall have a minimum roadway section as specified in Appendix B, Figures B-1 through B-9 and be provided with a cul-de-sac as shown in Figure C-1, Appendix C. Planter maintenance shall be the responsibility of the abutting owner or homeowner's association.

- B. The maximum grade within the cul-de-sac bulb or turnaround shall be 6 percent in any direction,

- C. The County Engineer may require off-road walkways to connect a road end at its terminus with other roads, parks, schools, bus stops, or other pedestrian traffic generators, if a demonstrated need exists. The County Engineer may also require road ends be designed for increased circulation and future vehicle access where connection to an existing road or future road is feasible. A public access easement or tract may be required to the property line.

**3.10 Intersections**

- A. All local access road \* intersections including driveways shall meet the following criteria:
  - 1. The angle of intersection shall be not less than 75° or more than 105°
  - 2. The minimum centerline radius (2 lanes) is 55 feet.
  - 3. The minimum curb radius for curbed sections is 35 feet.
  - 4. The minimum property line radius is 25 feet.

\* Values shown are for local access roads only. All others shall be designed for the specific roadway section in accordance with the AASHTO “A Policy on Geometric Design of Rural Highways 1990.”

- B. Minimum centerline offsets between adjacent intersections shall be as follows:

Principal Arterial	1,000 feet
Minor Arterial	500 feet
Collector	300 feet
Local Access	150 feet

- C. On sloping approaches at an intersection, landings/apron lengths shall be provided with grades as specified in Figure C-4, Appendix C.
- D. Entering sight distances for all intersections shall be provided as specified in the AASHTO “A Policy on Geometric Design of Rural Highways 1990”, Chapter IX, Sight Distances, Intersection Control.

### **3.11 Medians and Planters**

Optional design feature. Median width shall be additional to, not part of, the specified width of traveled way. Edges shall be similar to outer road edges: formed vertical curb or shoulder and ditch, except that median shoulders shall be minimum four feet in width. Medians shall be designed to accommodate pedestrian crossings at intersections, at mid-block crosswalks and bus stops. Median and planters may be grassed, landscaped, or surfaced with aggregate or pavement. They shall be designed so as not to limit turning radii or sight distance at intersections. Maintenance of the medians, planters and planter strips within County right-of-way shall be the responsibility of the homeowners.

### **3.12 One-Way Roads**

Local access roads, including loops, may be designed and designated one-way upon a finding by the County Engineer that topography or other site features make two-way traffic impractical. One-way roads shall meet the minimum fire access requirements. One-way roads less than 20 feet in width shall require approval by the County Fire Marshal.

### **3.13 Right-of-Way Dedications**

- A. Right-of-way dedication at a minimum shall be in accordance with the applicable standard roadway section as set out in Figures B-1 through B-9, Appendix B to accommodate motorized and non-motorized transportation, parking, utility and buffer requirements. Right-of-way widths less than the minimum specified in the applicable roadway sections shall require specific approval of the county commissioners per RCW 36.86.010. Right-of-way widths greater than 60 feet may be required where geometric factors warrant.
- B. Easements shall be provided for all public utility systems as required.
- C. Additional right-of-way may be required to be dedicated as a condition of approval for subdivisions to provide additional widths to conform to minimum standards where plats abut an existing public road or private right-of-way for extension of existing public roads or new roads to provide compatibility with the area's circulation system.
- D. All right-of-way necessary for new development road construction purposes must be dedicated as road right-of-way. The use of slope easements, construction easements and maintenance easements in lieu of dedicated right-of-way is not permitted. Utility easements outside and paralleling the road right-of-way are permitted and encouraged and, in some cases, may permit the use of narrower road rights-of-way.

### **3.14 Railroad Grade Crossings**

All proposed railroad crossings on dedicated right-of-way must be submitted to the County Engineer prior to being processed through the Railroad and the Utilities and Transportation Committee for approval prior to filing plats or

construction. Additional railroad crossings, especially across main line track, will not be allowed if alternate access is available.

### **3.15 Connections of New County Roads to State Highways**

The design of any proposed county road that intersects with a state highway shall be submitted to the County Engineer for approval. Washington State Department of Transportation approval of the proposed design must be received prior to filing of plats or construction. Improvements to the state highway are to be the responsibility of the petitioner and the Washington State Department of Transportation.

### **3.16 Traffic Control**

- A. Any construction proposed within the traveled way shall provide a Traffic Control Plan. All traffic control and traffic control devices shall be as specified in the latest edition of the MUTCD and shall be approved by the County Engineer. The applicant shall implement the approved plan, when necessary, until the project is given final acceptance by the County. If conditions change, the traffic control plan shall also reflect the changes.
- B. During any construction, barriers and warning signs shall be erected, lighted and maintained as necessary or as directed by the County for the protection of the traveling public. The County may hire or use County forces to bring traffic control up to the safety Standards set out in the MUTCD, WSDOT Design Manual and other applicable documents at the applicant's expense when the safety of the traveling public is at risk.
- C. When road closures and detours cannot be avoided, the applicant shall make application to the County Engineer a minimum of 21 days in advance of the requested road closure. For other than



emergency road closures or in situations where the road closure will not exceed twelve hours, all road closures must be approved by the Board of County Commissioners; the 21 days advance notice is necessary to accommodate the required public notice as per RCW 47.48 and other Board of County Commissioners procedural requirements. The application for closure shall include a road closure plan that must be submitted and approved prior to closing any portion of a County roadway,

The road closure plan, as a minimum, shall include a detour route with the location and type of signs to be used, as per the MUTCD. A written statement describing the detour route, length of detour and proposed dates and times of road closure shall also be submitted.

See Section 7.11 for permanent pavement markings and traffic control signing requirements.

### **3.17 Road Network Circulation**

The importance of good road network circulation for the health, welfare and safety of the public cannot be overemphasized. Poor circulation adds unnecessary miles to pedestrian and trail systems, school bus routes, mail delivery and other service deliveries, utility services and most importantly, emergency services such as police and fire. Through good road network circulation, the public will have better emergency access and police and fire safety will be enhanced. See also Section 3.09 Cul-de-Sacs/Turnarounds

- A. All plans will be reviewed for concurrency as provided for in Title 14 Skagit County Code Chapter 14.28. Only those proposed developments that are within areas for which there is a sub-area plan that includes traffic circulation will require a road network circulation review.

- B. The road alignment may necessitate re-alignment in order to foster the long range transportation objectives of the County, This includes greater scrutiny to provide continuity of pedestrian and other trail systems related to the proposed road network.
- C. To facilitate the best possible road network circulation, if it is determined by the County Engineer after making an individualized determination, that the layout of roads are to provide for the continuation of existing roads in adjoining subdivisions, then the roads shall be constructed prior to final plat approval. When adjoining property is not subdivided, the County Engineer shall determine whether roads in the proposed plat are to provide access to such unplatted property. The location for access to unplatted property shall be placed such that the objectives in these Standards can be achieved.
- D. If the roads are to remain private, the above still applies except an easement will be shown on the final plat map and they will not be dedicated to the public. Specific information in the recorded covenants regarding the use of this easement will be required.

### **3.18 On-Site Principles - Engineering**

An integral part of an overall traffic study relates to basic site planning principles. An integrated on-site roadway system should deliver vehicles from the external roadway system in a manner easily understood by typical drivers and that maximizes efficiency, accommodates anticipated traffic patterns and ensures public safety.

#### A. Internal Vehicular Circulation

Internal circulation is the means by which vehicular traffic is delivered between entry points and parking areas, pick-up/drop-off

points, and service areas, and should be planned to accommodate appropriate future traffic volumes.

B. Access points

Refer to Section 7.

C. Parking

Parking shall be provided to meet site-generated demands and be in conformance with the requirements of Skagit County Code Chapter 14.16.

D. Vehicular Queuing and Storage

1. Access drives should provide adequate vehicular exit queuing.
2. Parking areas and access points of small developments should be designed so vehicles waiting to exit are aligned perpendicular to the off-site roadway system.
3. Queuing areas of large developments should be sufficient so vehicles queued at exits do not block internal circulation. Exits shall be signalized if warranted by the MUTCD at build out.
4. Documentation shall be provided to verify queue lengths for signalized intersections, on-site queuing reservoirs, and off-site left and right-turn lanes.

E. Building Service Drives

Building service drives are roadways adjacent to a building and its entrances, and should be designed with sufficient width to serve as one or all of the following:

1. Fire and/or emergency vehicle access
2. Pedestrian pick-up/drop-off points

Pedestrian crossings and pick-up/drop-off points should be signed and striped to identify the vehicular/pedestrian conflict.

3. Internal circulation
4. Recirculation in parking areas

Recirculation aisles shall have sufficient turning radii, clearances, sight distances and signing.

5. Bus passenger pick-up/drop off areas.

F. Pedestrian, Bus, Bicycle, and Handicapped Access Facilities

The overall site plans must consider pedestrians, bus, bicyclists, and handicapped access facilities.

1. Pedestrian Facilities

Pedestrian connections between public transportation facilities and site buildings should be integrated into the overall project design. Pedestrian facilities should be designed to reduce the motor vehicle use for trips within the development and between nearby developments.

2. Bus Facilities

Appropriate public transportation facilities, such as passenger shelters, ride sharing areas and bus staging areas shall be accommodated adjacent to service drive and entrance areas; at key locations along circulation drives; and at major pedestrian focal points along the external roadway system as determined the County and Skagit Transit.

3. Bicycle Facilities

Facilities for parking bicycles should be provided where bicycle use is expected.

4. Handicapped Access Facilities

Handicapped access shall be provided in accordance with federal, state and County requirements as well as the provisions of the Americans with Disabilities Act (ADA).

G. Service and Delivery Vehicles

Service and delivery vehicles require separate criteria for movement to and from the site:

1. Vehicle turning paths shall be sufficient to accommodate the largest vehicles anticipated, a minimum single unit truck (SU).
2. Service vehicle access points shall have turning paths sufficient to allow service vehicles to enter and exit the site without encroaching upon opposing lanes or curbed areas.

3. External and internal roads shall have sufficient separation for large vehicles to be queued on entry or exit without blocking access to parking spaces or internal roadways.

### **3.19 On-Site Principles - Aesthetics**

In addition to the road network circulation requirements in Section 3.17 and the on-site engineering principles in Section 3.18, good site planning also includes road design aesthetics. Where safety and capacity are not significantly compromised, the road alignment should be closely related to the surrounding landscape. For new road and major reconstruction and realignment of existing roads, care should be taken to coordinate the alignment with the natural features of the surrounding landscape

- A. Alignments should be selected which blend with the terrain and adjusts to important scenic features.
- B. In most instances, the appropriate alignment will be characterized by curves that continually adjust to the rolling topography, vegetation boundaries and natural or man-made surface water edges of the natural landform. Such a curvilinear alignment is visually and functionally preferable to long tangents.
- C. Roads that blend with the form and pattern of the surrounding landscape are also desirable from the standpoint of construction and maintenance. Some of the advantages to be gained are the reduction of cuts and fills, more efficient utilization of natural drainage channels, and better control of roadside erosion because natural vegetation is preserved.

### **3.20 Roadside Obstacles**

- A. A minimum clear zone width of 10 feet from the edge of the traveled way shall be maintained for all roads with shoulder sections with a posted speed of 35 MPH or less. For posted speeds over 35 MPH, the WSDOT Clear Zone distances as per the WSDOT Design Manual shall be used for evaluation, placement and relocation of roadside features within the County right-of-way. In urban curbed sections, the minimum clear zone width is 1.5 feet back of the curb face.
- B. Existing or new roadside features which could present a hazard to the public shall be placed outside of clear zone areas unless justified to the County Engineer's satisfaction by suitable engineering studies considering traffic safety, or where shielded by a barrier, placed in an area normally inaccessible to vehicles or utilize a breakaway design. If barriers are required, they shall be designed to AASHTO and WSDOT Standards.
- C. Location of utility poles shall be compatible with driveways, intersections, and other roadside features such as to not interfere with sight distances, roadway signing, traffic signals or culverts. Where possible, utility poles and other above ground appurtenances shall be located outside of sidewalks or walkways.
- D. Costs of relocating utility poles or obstacles to achieve these Standards are the responsibility of the applicant/developer whose project necessitates compliance with these Standards. This is not intended to prevent the applicant/developer from making financial arrangements with an appropriate utility or other owner of the obstacle to accomplish removal or relocation of the utility pole or obstacle.

## **4.00 TRAFFIC ANALYSIS**

All applications for land division and changes of land use shall include sufficient data to determine the amount of additional traffic generated by the development. Such data shall also be used as a guideline for access road and/or driveway requirements.

### **4.01 Traffic Impact Analysis**

The purpose of a Traffic Impact Analysis (TIA) is to:

- A. Determine the safety impacts a particular development will have on the regional road network;
- B. Establish whether the development will meet the County's level of service standards as adopted within the County's Comprehensive Plan;
- C. Determine mitigating measures necessary to alleviate safety issues and to meet the adopted level of service standards;
- D. Developments that are small and generate less than 25 AM or PM peak hour trips may be reviewed for concurrency without an in-depth TIA by identifying influence zones for roads that are approaching or have exceeded their capacity.

### **4.02 Level of Analysis and Warrants**

- A. A Level I TIA (trip generation and distribution study) shall be required if any one of the following warrants are met:
  - 1. The project generates 25 or more PM peak hour trips; or



2. The project is not categorically exempt under the County's SEPA provisions in Skagit County Code Chapter 14.12

A Level I TIA may be required by the County to determine the need and scope of a Level II TIA. A level I TIA shall be expanded to a Level II TIA if any of the Level II warrants are met.

- B. A complete Level II TIA shall be required if the project generates more than 50 peak hour trips and any one of the following warrants is met:
  1. The development is within the Urban Growth Area and there is not an interlocal agreement with the city to use city design standards;
  2. The development is within the Urban Growth Area and a TIA is required by the city where there is an interlocal agreement for the use of city design standards between the city and the County;
  3. The development will generate 100 or more AM or PM peak hour trips within the rural areas as defined by the Urban Growth Boundary;
  4. The County has required that an Environmental Assessment or Impact Statement be prepared;
  5. A rezone of the subject property is being proposed;
  6. If there exists any current traffic problems in the local area as identified by the County or a previous traffic study has

identified high accident locations, poor roadway alignment or capacity deficiencies.

7. The current or projected level of service of the roadway system in the vicinity of the development will exceed County adopted level of service standards.

Study analysis requirements and format are shown in Appendix A.

#### **4.03 Traffic Generation Guidelines**

The Institute of Transportation Engineers (ITE), Trip Generation “Manual”, is a tool for planners, transportation engineers and others to estimate the number of vehicle trip or trip ends generated by a proposed development. Unless otherwise stated, trip generation rates for proposed developments shall be estimated using the most current version of the Institute of Transportation Engineers, Trip Generation “Manual”. The following are guides to determine trip rates for new developments.

- A. The Trip Generation “Manual” provides graphical plots and trip generation rates consisting of average rates or fitted curve equations. To forecast trip generation for proposed developments, the user should pick the method (average rate or fitted curve equation) that most closely represents the data points within the range of the independent variable being used. Guidelines for using the trip generation rates or equations can be found within the ITE, Trip Generation “Manual” and should be consulted if questions persist.
- B. Some ITE Land Use Codes contain a limited number of data points or data points are scattered. Also, not all proposed developments fit the ITE Land Use Code descriptions. Therefore average rates, fitted curve equations and plots may not be truly representative of proposed development. In general, if there are less than 20 data points representing the ITE Land Use Code and/or the proposed

development does not match current ITE Land Use Code descriptions then an independent trip generation study(s) of a site similar to the proposed development shall be submitted.

Trip generation estimates for proposed developments shall require approval of the County.

C. Estimation of Pass-By or other trip generation discounts.

Primary Trips are trips made for a specific purpose of visiting a generator.

Pass-by Trips are those made as intermediate stops on a trip from origin to primary destination.

Trip Generation reductions submitted to the County shall be substantiated by surveys or studies conducted on similar sites. Without, supporting documentation the County reserves the right to deny the use of trip generation discounts and all proposed trip generation discounts shall require approval of the County.

**4.04 Peak Traffic Hours**

For traffic analysis, the PM peak hour conditions shall be used.

Reversed flow at intersections from morning to afternoon, and other unusual conditions, shall require analysis for both AM and PM peak hour conditions, as required by the County.

**4.05 Level of Service**

A. Minimum Levels of Service

There are no minimum level of service standards for roads not functionally classified as a collector or arterial.

For all roads that are functionally classified as a collector or arterial, both rural and urban, the minimum level of service is in two parts:

1. The Birdsall Vehicle Miles Traveled (VMT) methodology is the primary means of measuring level of service on county roads. Using this method, Skagit County has adopted the following minimum and maximum planned capacity standards for collectors and arterials:

Functional Classification	Minimum Vehicles/hour	Maximum Vehicles/hour
Rural Minor Collector	100	1400
Rural Major Collector	100	1500
Rural Minor Arterial	600	2000
Urban Collector	100	1500

Any road segment will be determined to be in need of improvement if the projected volume divided by the maximum planned capacity exceeds 1.0.

2. The minimum level of service as calculated by the traditional Highway Capacity Manual method is Level C. Any road segment for which the project traffic volume would result in less than Level C shall be determined to be in need of improvement.

**B. Calculation of Level of Service**

The actual planned capacity for any roads functionally classified as collectors or arterials shall be calculated using the Birdsall Vehicle Miles

Traveled methodology as adapted for Skagit County. Further information on this method is available from the Skagit County Public Works Department.

The traditional Highway Capacity Manual method of calculating the level of service shall be in accordance with the most current version of the Transportation Research Board “Highway Capacity Manual” or Highway Capacity Software. The manual and software contain separate calculations for two-lane and multi-lane free-flow roadways, signalized arterials and signalized and unsignalized intersections. Critical segment links and intersections within an influence area shall be evaluated using two-lane rural highway methods.

#### **4.06 Traffic Impact Contributions**

The County may require developments to make traffic impact contributions if the development significantly adds to a road’s need for capacity improvement, to a roadway safety problem, or to the deterioration of a physically inadequate roadway. Such traffic impact contributions are in addition to transportation and frontage improvements required in the immediate area for access to and from the development. See also Section 2.14.

#### **4.07 Scoping for Traffic Studies**

##### **A. Scoping Meeting**

If it appears that a Level I or Level II Traffic Impact Analysis is required, the study preparer shall establish a scoping meeting with all necessary agencies and impacted jurisdictions to address relevant issues. The method of traffic analysis shall be as directed by the County.

B. Extent of Study Area

The study area shall include all site access drives, adjacent roadways, and major roadways and intersections in all directions from the site that are impacted by 25 or more inbound and outbound PM peak hour trips or less as required by the County. Major roadways and intersections are typically those classified as collectors and/or arterials.

The influence area should be no more than a 5 mile radius from the development center, but may be lower or higher depending on where the project is within the urban or rural areas. The County shall approve the defined influence area prior to commencement with the traffic study.

C. Selection of Horizon Years

Development with several stages of construction activity should select a number of horizon years corresponding with the opening of each phase.

**4.08 Background Study Area Data**

The study preparer shall research and gather the following information. If this information is not available from the County or other jurisdictions, it shall be obtained in the field as required.

A. Land Use

1. Current zoning, land use, densities, and occupancy in vicinity of site;

2. Approved development projects and planned completion dates within study area, including densities and land use types;
3. Other anticipated developments within the study area including an evaluation of potential additional development adjacent to the proposed development that could share the same access(s) to the existing county road system.

B. Traffic Volumes

1. Current and historic daily and hourly traffic counts to verify traffic growth and peak hour times;
2. Recent intersection turning movement counts;
3. Percent of heavy vehicles, including trucks, buses and recreational vehicles;
4. Pedestrian and bicyclist counts when required.

C. Demographics

1. Current and future population and employment within the study area by traffic zone (as needed for use in site traffic distribution and assignment).

D. Transportation System: Existing and Future Conditions, and On and Off Site Conditions

1. Current road system characteristics, including number of lanes, land and shoulder widths, including differences

- between existing geometrics and current Standards, access control and traffic control devices;
2. A description of roadway geometrics, including horizontal and vertical curvature;
  3. Roadway functional classifications;
  4. Posted speed limits and/or free-flow speeds;
  5. Traffic signal location, phasing, coordination and timing;
  6. Existing congested locations within the study area as identified by the County or previous traffic studies;
  7. Accident history for 3 years adjacent to the site, and on major roadway links and intersections within the study area;
  8. Adopted local and regional transportation plans, including any future bicycle, pedestrian and transit plans;
  9. Planned future roadways within the study area;
  10. Planned future roadway improvements within the study area, identifying those with secured funding and those in planning stages;
  11. Location of bus stops, service and usage;
  12. Pedestrian and bicycle linkages and usage;
  13. Available curb and off-site parking facilities;



14. Any temporary anomalies in the current road system that would influence the data or outcome of the analysis, e.g. road construction;
15. Private and public schools in the study area;
16. Hospitals, police and fire stations in the area.

E. Other Data

1. Applicable County codes and policies, including but not limited to development regulations, Standards, and parking space requirements;
2. Origin-destination or trip distribution data as required;
3. Any neighborhood sensitivities.

**4.09 Safety Analysis**

For Type II Traffic Impact Analyses, intersections and road roadway segments within the influence area shall be evaluated to determine if the probability of accidents will increase with the addition of project traffic. Two methods shall be used: Accident Record Research and Conflict Analysis.

- A. For the Accident Record Research method, accident records are to be analyzed to determine whether patterns of accidents are forming within the influence zone and what alternative treatments should be considered to correct the problem.
- B. Conflict Analysis is applicable to locations where accident data is not available or sufficient for analysis. This analysis is used to predict or

measure accident potential at a location. A Conflict Analysis should determine the number of conflict points, frequency of conflicts and severity of conflicts based on expected traffic volumes and mix of traffic. Similar to the manner in which accidents are grouped by type of collision, traffic conflicts are arranged by type of maneuver.

A field study shall be completed and the results evaluated to identify the types of conflicts, roadway/intersection characteristics that contribute to the conflicts, and what alternative treatment(s) should be considered to correct the problem. Identified safety problems shall be corrected as part of the overall development work prior to final plat approval. See also Section 2.14.

#### **4.10 Report Preparation and Certification**

Traffic studies shall be conducted under the direction of a responsible individual or firm acceptable to the County Engineer. Studies involving the use of expert opinion or analysis beyond a cursory compilation of available data and traffic projections shall be conducted under the direction of a Washington licensed Professional Engineer with specialized experience in traffic engineering, membership in the Institute of Transportation Engineers (ITE) as an Associate member or Member, or equivalent qualification, will be acceptable. On more complex projects an ITE member or fellow member will be preferred for supervision of the study.

The Project Engineer shall certify the traffic study document by providing a signature and seal of approval.

#### **4.11 Report Review and Acceptance**

All Traffic Impact Analyses shall be reviewed and approved by both the County Engineer and the Director – Planning and Permit Center. Safety Analyses shall be approved by the County Engineer.

## **5.00 ROADWAY BASES AND SURFACING**

### **5.01 General Requirements**

All base and surfacing materials including paving materials shall be of the specified quality and be placed in accordance with the Washington State Department of Transportation “Standard Specifications”, “Construction Manual” and any amendments thereto as adopted by Skagit County.

### **5.02 Subgrade Requirements**

Any evidence of instability in the subgrade such as standing water, swamp, fine grained or organic soils, slides or uneven settlement (but not limited to the aforementioned) shall require the design and construction of appropriate remedial measures to provide for the support of the roadway base and surfacing. The soil shall be sampled and tested sufficiently to establish load bearing capacities for the proposed construction remedial measures. Both the soils analysis and the resulting proposed remedial measures shall be subject to review and approval by the County Engineer.

### **5.03 Roadway Section and Surfacing Requirements**

#### A. Design

A pavement surfacing design procedure shall be performed for all new and reconstructed County roads. The design life for all roads shall be 20 years with a growth factor as determined by the County Engineer. The design procedure shall be approved by the County Engineer and shall consider the following:

1. Traffic Loading – An estimate of the number and types of loadings the roadway will carry for the design life. This estimate of loading shall be established by a procedure

accepted by the County Engineer and be expressed in 18-Kip Equivalent Single Axle Loads (ESALs).

2. Subgrade Support – A representative value for the stiffness of the native material on which the road will be built. This value shall be established by a procedure accepted by the County Engineer and be expressed as resilient modulus.
3. Analysis – a procedure for establishing the surfacing depth required for a given traffic loading and subgrade resilient modulus. This procedure shall be approved by the County Engineer. One pre-approved procedure is the use of the “Guide for the Design of Pavement Structures”, 1993, AASHTO.

#### B. Minimum Thickness

As an alternative to the thickness computed by the design procedure, the minimum thickness of in-place, compacted surfacing of all public and private roads shall be as follows:

##### Private and Local Access:

2” Asphalt Concrete Pavement Class B except that private roads may be built with no final paved surfacing and rural access roads may be paved by means of a bituminous surface treatment Class A if approved by the County Engineer.

2” Crushed Surfacing Top Course

10” Gravel Base.

Private roads with gravel surfacing serving three or more lots shall have a paved approach or apron to the intersecting county road extending from the right-of-way line to the edge of the existing paved county road. This paved

apron shall be a minimum of 2 inches ACP Class B in thickness and the radius of the apron shall be a minimum of 25 feet.

Collector & Arterial:

- 2" Asphalt Concrete Pavement Class B (3" for ADT's greater than 2000)
- 2" Crushed Surfacing Top Course
- 10" Gravel Base

- C. All plan submittals shall be accompanied by the soils and traffic analysis on which the design was based. All minimum surfacing requirements assume an acceptable, well-drained, stable, compacted subgrade. Additional measures will be required by the County Engineer if evidence exists of unstable subgrade. In all cases, the total base thickness, including crushed surfacing top course and crushed surfacing base course or equivalent, shall not be less than 12 inches. Alternate base materials such as asphalt treated base, cement treated base or gravel base may be used when supported with an approved pavement section design and the total base thickness is not less than 12 inches.
- D. Rural roads outside of long subdivisions with a projected traffic volume less than 200 ADT may be paved by means of a light bituminous surface treatment Class A instead of ACP Class B. The bituminous surface treatment Class A shall consist of no less than two applications of oil and shall meet the requirements of Section 5.02 of the Standard Specifications. The developer shall provide funding in an amount as determined by the County Engineer for an additional application of oil to be placed as a seal coat approximately one year after initial construction. These funds shall be included in the restoration surety as provided for in Section 14 of these Standards.

## **5.04 Restoration**

The intent of this section is to insure the life expectancy, structural integrity and overall safety of the public right-of-way as related to any encroachment into the road right-of-way. This section pertains to existing county roads and those roads proposed to be dedicated to the County as county roads.

### **A. Existing County Roads**

Pavement cuts in existing county roads may be necessary in the course of constructing a development to accommodate access points, frontage improvements or utility connections. Where pavements are to be cut and/or extended to construct access points or frontage improvements, the existing pavement is to be vertically saw cut and the replaced or extended roadway section shall conform to the existing road way thickness or the minimum thicknesses as shown in Section 5.03 whichever is greater.

Pavement cuts to accommodate utility connections shall be done in accordance with the Skagit County “Utility Policy” for the accommodation of utilities within county road right-of-way.

### **B. New County Roads**

All permanent underground features such as utility lines, service connections and drainage items shall be installed prior to the placement of any roadway surfacing and the necessary excavation and backfilling shall result in a uniform subgrade compacted to a minimum of 95% of the maximum density. Service connections shall be extended to the right-of-way line. See Section 10 for additional information.

## **6.00 CONSTRUCTION PLANS AND STAKING**

When construction of roads is required by a subdivision ordinance, plans for the proposed road and drainage facilities shall include a set of road construction plans. The plans shall be signed, sealed, and submitted by the applicant's Project Engineer to the Department of Public Works for review. Final plans and profile drawings must be approved by the County Engineer prior to start of construction and recording of the subdivision. The applicant's Project Engineer shall be a registered professional engineer, licensed in the State of Washington.

### **6.01 Submittal Procedure**

Plan sheets and profile sheets or a combined plan and profile sheet, and detail sheets shall be good quality reproducibles, mylar or equal, all in sheet sizes 24" by 36".

- A. First submittal shall be two complete sets of prints from reproducibles of the plan and profile, showing all utilities, drainage, drainage plan and other related facilities and detail sheets. One set of drainage calculations shall be included with the submittal. Temporary erosion/sedimentation control details may be incorporated with either or both of the road plans and the drainage plans, or may be submitted separately. A grading/erosion sedimentation control plan, as required, may be incorporated in either the road plans or drainage plans, or may be submitted separately in two full sets. If corrections are required, one set of check prints will be returned to the designing engineer.
- B. Subsequent submittal shall be a complete set of original plans, two complete sets of prints of the plans, and one set of calculations, as corrected and a full set of the check prints

and calculations. Upon final design approval by the County Engineer, the original set of plans will be signed and returned to the designing engineer.

- C. Final submittal shall be a complete set of good quality reproducible mylar or equal copies of the approved plans and two complete sets of prints of the approved plans.
- D. The approval of the construction plans shall be effective for three years. It may be extended at the option of the County Engineer. Prior to an extension of approval, the plans shall be revised to comply with current standards.
- E. As-built drawings shall be submitted prior to final acceptance of any road, structure or facility for maintenance by the county, a complete set of good quality reproducible copies with the corrected plans (mylar or equal) shall be submitted to the County Engineer. Such drawings shall describe any and all revisions or additions to the above plans. Additionally, the Project Engineer and/or builder shall submit a letter of certification stating that the work and materials were inspected and were in conformance to the as-built plans submitted.

## **6.02 Plan Elements**

Plan elements shall include the following:

- A. A vicinity map shall be drawn on the cover sheet in an appropriate scale to show the proximity of the project to major roadways or towns.



- B. Road alignments with 100-foot stationing, reading from west to east/south to north, and stationing at points of curve, tangent, and intersections with ties to sections and/or quarter corners surrounding the improvement.
- C. Section, township, and range with breakdown to subdivision or short plat boundaries.
- D. Retraceable bearings and distances on center lines based on the section sub-division.
- E. Curve data, degree of curve, radius, delta, arc length and tangent distances on all horizontal curves.
- F. Right-of-way lines and width for proposed road and intersecting roads.
- G. All topographic features with right-of-way limits and sufficient area beyond to resolve questions of setback, slope, drainage, access onto abutting property, and road continuations. A minimum of 50 feet shall be shown on either side of center line and a minimum of 200 feet shall be shown from the terminus of the road, or such additional terrain as directed by the County Engineer.
- H. All existing and proposed utility locations.
- I. Identification of all proposed roads and adjoining roads and subdivisions.
- J. All traffic control signing, street signing and pavement marking locations.

- K. Existing and proposed drainage features, indicating direction of flow, size, and kind of each drainage channel, pipe, and structure and other requirements as specified by the County Engineer.
- L. Scale one inch equals 50 feet. However, one inch equals 100 feet shall be optional for developments of lots one acre or larger. Details for clarification may be shown on convenient scale.
- M. North Arrow
- N. When the plan view extends over more than one sheet, the first sheet shall show an overall developmental layout, with the relationship of roads, utilities, drainage, lots, and other features clearly indicated, including road names and lot numbers. When more than five sheets, the first sheet shall show a table of contents and an index sheet.
- O. Sidewalk and wheel chair ramp locations shall be shown.
- P. Typical roadway sections of proposed road plus functional road classifications.
- Q. Mailbox locations shall be indicated when concrete sidewalks are to be constructed.
- R. A temporary erosion/sedimentation control plan, showing the location and control measures intended to minimize the effects of erosion due to construction operations shall be submitted with the construction plans.
- S. Other data necessary for the specific project.

- T. The general notes shall list the specification and design standards utilized.

### **6.03 Profile Elements**

Profile elements shall include the following:

- A. Original ground line along center line and right-of-way lines at 100 foot stations and at significant ground breaks and topographic features, with accuracy to within 0.1 feet on unpaved surfaces and 0.02 feet on paved surfaces. When a road extends to the perimeter of the project, ground lines shall be extended at least 200 feet to show any changes in contour which might affect the profile of the proposed road.
- B. Final road, sewer, water and storm drainage profile with stationing, as in the horizontal plan, reading from left to right, to show stationing of points of curve, tangent, and inner section of vertical curves, with elevations to 0.01 feet. Ditch profiles may be required in rural road sections at the discretion of the County Engineer.
- C. Urban road profiles shall be clearly labeled to show both curbs and centerline. Road profiles shall be clearly labeled generally to show only centerline, except as required by the County Engineer. Values for grade and length of vertical curve shall be shown with the profiles on a numbered grid.
- D. Super elevation data shall be required and included for roadways exceeding 35 miles per hour design speed.

- E. A profile of curb returns showing the stations and elevations, the beginning, midpoint, and ending of the curb return.
- F. Vertical datum used on all benchmarks will refer to NGVD 1929 control, i.e., mean sea level unless another vertical datum is approved.
- G. Vertical scale one inch equals five feet, generally. Vertical scale shall be one inch equals ten feet if the optional one inch equals 100 foot horizontal scale is used.

#### **6.04 Typical Cross-Section**

- A. Widths of pavement, curb, walks, ditch and right-of-way.
- B. Type of curb (class).
- C. Depth of gravel base, crushed surfacing, and hard surfacing.
- D. Type of sub-grade soil.
- E. Slope of crown, curb height or ditch design.
- F. Total width from centerline to curb, plus width of new pavement on widening of existing roads.
- G. A separate, full-width roadway typical section for each road or portion of road having a different section.
- H. All other data necessary for a specific project.

### **6.05 Drainage and Drainage Maintenance Plan**

The drainage plan including a drainage maintenance plan when required by the County Drainage Ordinance shall be submitted either integral with the above plan and profile for the road design, if graphic space permits, or on separate plan and data sheets. In either case, the drainage plan shall include runoff calculations keyed to topographic maps, location, specific size, grade, and elevation data on all hydraulic features, and facilities for retention and/or detention. All drainage plans, supporting calculations and drainage maintenance plan shall be in conformance with the Skagit County Drainage Ordinance.

### **6.06 Standard Plan Notes**

All plans shall contain, as applicable, the Standard Plan Notes as shown in Appendix D. Other notes should be added as appropriate and necessary.

### **6.07 Construction Staking**

So as to ensure that design is carried through to the final product, construction staking of the Project Engineer's design by a licensed land surveyor registered in the State of Washington is required. Construction staking will consist of, but not limited to, the following-

- A. Easement/Right-of-Way lines
- B. Slope Stake Sub-Grade
- C. Catch basins prior to Sub-Grade sign off.
- D. Gutter line (curb and gutter sections only)
- E. Top of Sub-Grade
- F. Top of Gravel Base
- G. Top of Crushed Surfacing
- H. Location and inverts of all drainage features
- I. Ditch flow lines (when required)
- J. 100 foot center line stations

K. Quarter points on cul-de-sacs

Alternative staking requirements which are proposed by the Project Engineer and are less than the above list may be approved by the County Engineer on a case-by-case basis.

## **7.00 ROADSIDE FEATURES**

### **7.01 Side Slopes**

- A. Side slopes shall be constructed no steeper than 1-1/2:1 on fill slopes below subgrade and 1:1 on cut slopes. Flatter slopes are preferred where the minimum right-of-way is sufficient and may be required as well as additional right-of-way if there are indications that the soil conditions are unstable and subject to sliding or sloughing. Cut and fill slopes in excess of 10 feet in height shall be benched to provide for ready revegetation. The top of all cut slopes and the toe of all fill slopes shall be rounded to form a smooth transition with the existing topography. Transitions between cut and fill slopes shall be transitioned by flattening the ends of such slopes to avoid the appearance of sharp breaks.
- B. Side slopes shall be stabilized by grass sod or seeding or by other planting or surfacing materials acceptable to the County Engineer. Preference shall be shown to side slope stabilization utilizing native grasses and shrubs.

### **7.02 Driveways and Property Access**

- A. All driveways and accesses to adjacent property from county roads shall have a Skagit County access permit. Driveway construction shall not be allowed before issuance of the permit.
- B. Residential driveways are those serving a single dwelling unit or a joint driveway serving two single dwelling units.

- C. Emergency vehicle access roads are driveways serving more than two single family residences.
- D. Commercial driveways are those driveways not meeting the definition of residential or emergency vehicle access.
- E. Driveway widths and locations are determined at the time of acquisition of access permit. As a rule driveway widths are: Residential - minimum width 12 feet. Emergency Vehicle Access – minimum width 20 feet. Commercial - minimum width 35 feet. All driveways shall be angled a minimum of 75 degrees to the road; 90 degrees is preferred, unless it is designated at right turn only, in which case the angle shall be at least 45 degrees and then only with the approval of the County Engineer.
- F. All constructed driveways accessing a county road shall be inspected by the County. If said driveway, including culvert, is not installed in accordance with these Standards and by access permit, it shall be removed and reinstalled by the applicant to the satisfaction of the County Engineer. A fee shall be charged for each additional inspection. If the applicant does not remove and reinstall the driveway and culvert within 30 days from the date of notice, the County has the right to remove said driveway and culvert at applicant's expense. Upon removal by the County, the access permit shall be void and the applicant shall resubmit an application for a new driveway.
- G. The spacing of access points and their separation from intersections is critical to maintaining access point and roadway flow. Thoughtful spacing of access points can reduce vehicular and pedestrian conflicts while helping to



avoid traffic accidents. As a general rule, access points should be a minimum of 130 feet from an intersection, measuring from the property corner nearest the intersection. An access plan shall be submitted for all proposed land division for review by the County Engineer or his/her designated representative. The following guidelines shall be followed for developments using a county road for access from individual lots:

1. Major and minor collectors. Internal collection of traffic will be achieved wherever possible. The number of access points shall be a function of traffic volume on the county collector, but generally they shall not exceed one access point per 250 feet of frontage, taking into account accesses on both sides of the road and adjoining property. Lots within short and long subdivisions shall be designed so that lots adjacent to a collector are not allowed direct access.

Local access roads. Although internal collection of traffic is desirable, individual driveways will be allowed for roads with 150 ADT or less including projected traffic from land division. For roadways with 150-400 average daily traffic individual driveways may be allowed. Roadways with over 400 ADT will meet the provisions of collectors.

In addition, the number of access points along County roads shall normally be limited to one per parcel, except:

- a. for agricultural access;

- b. when the parcel topography makes a single access point impractical for the entire parcel;
- c. when access is being provided for parking lots with 20 or more parking spaces; or
- d. when additional access points are approved by the County Engineer. In consideration of additional access points, the County Engineer may consider such items as current and projected traffic volumes, traffic speeds, topography, current and project land use, accident history, proposed use of additional access points, and any other factual issues that may bear upon the suitability of permitting additional access points.

Pre-existing accesses will be allowed to remain in use provided that adequate sight distance is provided.

- 2. Access roadways or driveways will be placed to provide the following minimum sight distance:

Existing Speed Limit <u>(MPH)</u>	Sight Distance <u>(feet)</u>
50*	450
40	320
30 or less	200

\* This value shall be used for major and minor collectors regardless of existing speed limit unless prior approval is obtained from the County Engineer.

3. Requests for driveways providing access directly onto arterials or collectors may be denied if alternate access is available. Where a property has frontage on more than one roadway, access shall be limited to the lowest volume roadway where the impacts of the new access are minimized. Access onto other higher volume roads shall be denied in the interest of traffic safety or in order to lessen congestion on the higher volume road.
4. All abandoned driveway areas on the same frontage shall be removed and the curbing and sidewalk, or shoulders and ditch section, shall be properly restored.
5. Maintenance of driveway approaches shall be the responsibility of the owner whose property they serve.
6. Each driveway must provide access to an off-road parking area located on private property, except in urban areas with roadside parking. Each vehicle entering the driveway must be able to park, stand, or load entirely off the road right-of-way, sidewalk or pathway. For any driveway off a collector road, an adequate turnaround area shall be provided so that vehicles exit the property in a forward motion.

7. No driveway shall be allowed to access a public or private parking area in conjunction with industrial, commercial, multiple family dwelling, church, or any like use that requires a vehicle to back out onto any street.
8. No driveway shall be constructed in such a manner as to be a hazard to any existing drainage, street lighting standard, utility pole, traffic control device, fire hydrant, or other public facility. The cost of relocating any such public facility, when necessary to do so, shall be borne by the applicant. Said relocation of any public facility shall be performed only through the agency holding authority for that particular structure involved.
9. The driveway material shall be Portland Cement Concrete where sidewalks, curbs and gutters are also to be constructed as shown in Appendix C, Figure C-8. The driveway material back of the curb or sidewalk when required is not subject to these Standards. When an opening for a driveway or other access point is to be constructed through an existing Portland cement concrete vertical curb, the existing curb, or curb and gutter, shall be saw cut at the limits of work or removed to the nearest construction joint and opening replaced with standard curb and driveway.
10. All surface drainage from driveways must be contained and directed to an open ditch or to the curb and gutter section. No surface drainage shall flow onto a road surface. The surface of the driveway

shall have a slope of 2% toward the ditch from its connection with the county road pavement.

11. Culverts.

- a. Lengths. The length of culvert required for driveway construction is dependent upon the width of the driveway and the ditch depth and shall be determined during the process of issuing an Access Permit. However, no driveway culvert shall be less than 30 feet long including the beveled ends. All driveway culverts shall have a minimum 3:1 beveled end on both ends.
- b. Size. Culvert diameter depends upon the amount of drainage to be handled and will be determined during the process of issuing an Access Permit or, in the case of a new subdivision, by the design engineer. However, the minimum diameter of the driveway culvert shall be 12".
- c. Materials. The following new or like new materials may be used for driveway culverts:
  1. Concrete Pipe
  2. Galvanized Corrugated Steel or Corrugated Aluminum. Minimum gauge, number 16, with reinforced end sections as provided by the pipe manufacturer.

3. Other. Subject to approval by the County Engineer, other pipe materials and methods such as, but not limited to, plastic or cast-in-place concrete pipe may be used provided that the conditions make it feasible and acceptable user experience with a substitute product can be thoroughly demonstrated.

4. Connections to existing culverts. Installation shall be made by using the same kind of material as that in the contiguous culvert. There shall be no mixing of materials in culvert construction. Additional requirements may be made when connecting culverts such as catch basins for clean outs and other considerations.

d. Placement. Culvert pipe shall be laid true to line and grade with a minimum 12" of cover.

H. See also Section 3.08 for special driveway requirements as per the Uniform Fire Code and the County Fire Marshal.

### **7.03 Curbs and Gutters**

A. Cement Concrete Barrier Curb and Gutter (See Figure C-6, Appendix C) shall be utilized for street edges under the following conditions:

1. In areas where urban road standards are to be used;
  2. On frontages with commercial usage.
- B. Rolled edge, thickened edge or mountable curbs are not permitted as a substitute for curbs and gutters. Rolled edge, thickened edge or mountable curbs may be used in rural areas when approved by the County Engineer.
- C. On all sections constructed with curb and gutter, rolled edge, thickened edge or mountable curb a closed drainage system consisting of catch basins, storm sewer pipes and manholes shall be required. See also Section 7.12.

#### **7.04 Curb Ramps**

On all roads with vertical curbs, ramp sections to facilitate passage of handicapped persons shall be constructed through curbs and sidewalks at road intersections and other crosswalk locations in compliance with the requirements of the Americans with Disabilities Act. Where a ramp is constructed on one side of the road, a ramp shall be provided at a corresponding location on the opposite side of the road. See Appendix C for curb ramp details.

#### **7.05 Survey -Monuments**

- A. All existing survey control monuments which are disturbed, lost, or destroyed during construction shall be replaced by a registered surveyor at the expense of the developer. A legal survey shall be filed with the County Auditor and the County Engineer showing methods used to establish the monument's position with references tying the monument's location.

- B. Survey control monuments shall be placed or replaced in accordance with recognized good practice of land surveying, and in conformance with all applicable state and local regulations.
- C. Survey monuments shall be placed at all exterior boundary corners of plats and on all lot corners and shall consist of a one-inch galvanized pipe or one-half inch reinforcing bar with identifying cap embedded no less than two feet into the ground and flush with the ground.
- D. All paved road monumentation shall use county type monuments, available through private distributors or Skagit County Public Works at the applicant's expense. A monument case with a brass disk embedded in concrete shall be placed in paved roads at all points of curves, points of tangent, intersections and as needed for inter-visibility and at the intersection of road centerlines and at the center of cul de sacs within plat boundaries. No monumentation is required for unpaved roads except at the intersection with a paved road.
- E. A signed and sealed statement from the applicant's land surveyor that all monuments and corners indicated on the subdivision plat have been set and are in good condition will be required before a final approval of road can be made.

#### **7.06 Mail Boxes**

- A. Mailboxes, in the general case, shall be set as follows:
  - 1. U.S. Postal Service approval is required.



2. Mailbox supports will be of breakaway design.
3. In the case of new road construction or reconstruction requiring mailboxes to be moved back or rearranged, the builder shall coordinate with the U.S. Postal Service. Regular U.S. Postal Service access to any moved or rearranged mailbox shall be provided at all times.

### **7.07 Landscaping**

The following guidelines shall be utilized in evaluating and administering proposed or existing landscape areas within county road rights-of-way.

- A. All landscaping within County right-of-way shall be subject to approval of the County Engineer. The use of native plants and shrubs is preferred.
- B. Landscaping shall be of the type and placement to achieve and maintain the sight distance requirements in Section 3.06.
- C. Any plantings or other improvements encroaching upon the right-of-way by abutting property owners are subject to removal when the right-of-way is needed for public use.
- D. Installation and maintenance of all landscaping shall be the responsibility of the applicant or homeowner's association.
- E. No landscaping shall be allowed within a drainage ditch or drainage swales. In no case shall an approved drainage swale be replaced with continuous culvert. Drainage ditches may be replaced with continuous culvert provided that an approved catch basin is installed at the property corner, at the inlet end of pipe, or at a minimum of

one every 300 lineal feet of pipe. Such installation of continuous culvert shall be at the applicant's expense and will require obtaining an access permit.

#### **7.08 Bollards**

- A. When necessary to deny motor vehicle access to an easement, tract or trail, except for maintenance or emergency vehicles, the point of access may be closed by a line of bollards.
- B. The placement of bollards shall consist of one or more fixed bollards placed on each side of the traveled way and removable, locking bollards shall be placed across the traveled way and outside of the roadway clear zone. Spacing shall provide one bollard on centerline of the traveled way and other bollards spaced at intervals not to exceed 50 inches on center.
- C. No fire apparatus access roads shall be blocked in this manner without approval of the County Fire Marshall and the local Fire District Chief.

#### **7.09 Guardrail**

Roads that do not meet the minimum roadway clear zone and recovery area criteria, to include slopes, may require the installation of guardrail. The AASHTO "Roadside Design Guide" and the WSDOT Design Manual shall be used as a guide to determine the need for guardrail and for the design.

#### **7.10 Road Name Signs**

- A. Road name signs are required for all public and private roads providing access to 4 or more legal lots.

- B. Requirements for size, color, lettering and materials are available from the Skagit County Department of Public Works.
- C. Road names shall be approved by the Skagit County Department of Public Works.
- D. Placement of private road name signs in County right-of-way shall require a County access permit.
- E. Any sign constructed in County right-of-way not in conformance with these Standards may be removed by County forces and any liability incurred by the County due to non-conformance by the applicant shall be transferred to the applicant.

**7.11 Roadway Pavement Markings and Permanent Traffic Control Signing**

- A. In new plats or commercial developments, pavement markings may be required to enhance roadway safety. All required markings shall be installed in conformance with the MUTCD and the Standard Specifications and the costs of such markings shall be included in the construction costs borne by the applicant.
- B. All permanent traffic control signing shall conform to the MUTCD and the costs of such traffic control signing shall be included in the construction costs borne by the applicant.

**7.12 Drainage**

- A. All project submittals shall be in compliance with the Skagit County Drainage Ordinance. In addition, drainage facilities within current or future County right-of-way must be of the type and nature that can be easily maintained by County forces. This typically includes as a

minimum, 12-inch diameter storm sewer pipe, standard catch basins and manholes for curb and gutter roadway sections and roadside ditches and swales of a minimum depth of 12 inches (measured from the top of the subgrade – see figures in Appendix B) for shouldered roadway sections. All other facilities, such as french drains, curtain drains, drywells and stormwater detention ponds shall be installed outside the County right-of-way and be maintained by the applicant or homeowner's association.

- B. All cross culverts and ditch channelizations shall be first evaluated for the presence of fish and, should it be determined by the County that the culvert or channelization be designed to accommodate fish passage including stream bed and/or stream bank enhancement, the culvert or channelization shall be constructed to meet current Washington State Department of Fish and Wildlife standards.
- C. Stormwater facilities shall also be designed to accommodate the stormwater from the addition of frontage improvements including tributary area.
- D. Projects requiring an agreement for the operation and maintenance by the County of the stormwater facilities shall be required to provide the County with a Project Engineer's Certification of the facilities prior to release of the financial security. The financial security shall not be released until all facilities are completed and repaired as per the approved plans.
- E. The maximum spacing on surface drainage courses between inlets or catch basins shall be 150 feet on road grades less than 1.0% and 200 feet on grades from 1.0% to 3.0%. When the road grade is greater than 3.0%, the maximum spacing shall be 300 feet. Additional catch basins shall be installed as needed to confine drainage to the gutter and prevent road drainage from sheet flowing across

roadways or intersections. Maximum spacing on main storm sewers between access structures, whether catch basins or manholes, shall be 300 feet.

- F. All materials used shall conform to the requirements of the Standard Specifications

## **8.00 RETAINING WALLS**

### **8.01 Design Criteria**

Retaining walls on public or private roads shall be designed and constructed to meet the minimum requirements of the AASHTO Bridge Specifications. Retaining walls with a height of four feet or greater shall be designed by a registered professional engineer licensed in the State of Washington, and shall be submitted by the applicant for approval by the County Engineer.

## **9.00 BRIDGES**

### **9.01 Principal References**

Except as specified below, Skagit County bridges, whether on public roads or private roads, shall be designed and constructed to meet minimum requirements set forth in the AASHTO Bridge Specifications. All new bridges shall be designed to carry an AASHTO HS 20-44 Live Load or greater. Bridge design shall be prepared by a professional structural engineer licensed by the State of Washington. Final approval shall be made by the County Engineer.

### **9.02 Bridge Geometrics**

- A. In the general case, the bridge roadway shall comprise the full width and configuration of the road being served, to include the traveled way plus curbs, shoulders, sidewalk, walkway, and/or bike lane. Bridge roadway widths shall be measured between curbs or between faces of rails, whichever is less, but in no case will the width be less than 26' curb-to-curb for two-lane traffic. Requirements of utilities shall be duly incorporated into the design.

Bridges to be dedicated to the County for public use shall be constructed of concrete unless otherwise approved by the County Engineer.

- B. Where typical speeds are 35 mph or greater and significant pedestrian, bicycle and/or horseback traffic can be expected, the County Engineer may require that the lanes for these other modes of traffic be separated from motor vehicle traffic by use of a bridge traffic rail and further protected by a rail at the outer edge.

- C. Approach railings shall be made continuous with the bridge railings and shall meet AASHTO specifications.
- D. Overhead vertical clearances for motor traffic on the traveled roadway or under overpasses shall be 16.5 feet minimum. Vertical clearance of structures above a walkway or sidewalk shall be eight feet minimum.

### **9.03 Other Requirements**

- A. Approach slabs shall be required for all bridges. New bridges plans shall provide pavement seats for approach slabs unless otherwise approved by the County Engineer. Approach slabs shall be constructed in accordance with the Standard Plans.
- B. New concrete bridge decks and approach slabs shall be designed with a protective system to prevent corrosion of the reinforcing steel.
- C. Criteria under other recognized road bridge classifications, such as those of 3-R projects as set forth in the LAG Manual, may be applied under conditions deemed appropriate by the County Engineer.



## **10.00 UTILITIES**

### **10.01 Franchising and Permitting Policy**

Utilities to be located within the county road right-of-way shall be constructed in accordance with current franchise and permit procedures and in compliance with these standards. In their use of right-of-way, utilities shall be given consideration after the traffic carrying requirements of the roadway which are, namely, to provide safe, efficient and convenient passage for motor vehicles, pedestrians, and other traffic. Use of road right-of-way for utility installation will be granted on a case-by-case basis and in no case will a utility be allowed to create an adverse effect on the roadway or public using the roadway. Aesthetics shall be a consideration. As a matter of policy, underground utilities will be strongly encouraged, particularly in urban development.

Any utility working within a county right-of-way for an accumulated distance of 1,200 feet or more in any 12-month period must secure a utility franchise from the Board of Skagit County Commissioners.

### **10.02 Utility Location and Installation Requirements**

All utilities to be located and installed with the county road right-of-way shall be in accordance with the current adopted version of the Skagit County Accommodation of Utilities on County Road Right-of-Way policy.

## **11.00 PEDESTRIAN FACILITIES AND BIKEWAYS**

### **11.01 Pedestrian Facilities in Urban Areas**

- A. Sidewalks shall be provided on both sides of all major collectors, minor collectors and access roads, and commercial streets in urban areas.
  
- B. Sidewalks shall be provided on one side of the road in the following cases:
  - 1. On all minor access streets, cul de sacs and loop roads serving ten dwelling units or more, or with a future development potential of ten dwelling units or more.
  
  - 2. On all perimeter major and minor collectors or half-width roads of a development.
  
- C. Alternatives to requirements A and B may be approved under the provisions of Section 2.10 of these Standards. Typical conditions that may warrant approval of an alternative or waiver of the requirements include existing streets where it would be unduly difficult or impractical to construct sidewalks due to grade or steep slope problems or in developments where the basic design allows for an off-road walkway system provided that said walkway is an improved surface and provision for maintenance of the walkway is guaranteed.

- D. Sidewalks shall be constructed with Portland Cement Concrete. Sidewalks shall be at least five feet in width and four inches in depth. In commercial or industrial areas where buildings are closer than ten feet to the edge of right-of-way, the sidewalks shall be at least eight feet in width. Sidewalk configuration shall be in accordance with the APWA Standard Specifications except that planting strips may be deleted if consistent with adjoining sidewalks and approved by the County Engineer. Construction of joints and other details for Portland Cement Concrete sidewalks shall conform to APWA Standard Specifications. See Figures C-5 through C-9, Appendix C.
  
- E. Curb ramps are required. See Section 7.04 and Figures C-10 through C-17 in Appendix C.

### **11.02 Non-Motorized Transportation**

Non-motorized transportation includes travel by bicyclists, pedestrians, and equestrians. Section 1020 of the Washington State Department of Transportation design manual will be followed for design of bicycle paths, trails and other non-motorized transportation.

## **12.00 CONSTRUCTION AND INSPECTION**

### **12.01 Basis for Control of the Work**

- A. Work performed in the construction or improvement of County roads or subdivision roads, whether by or for a private developer, by County forces, or by a contractor shall be done to the satisfaction of the County Engineer and in accordance with approved construction plans.

It is emphasized that no work may be started until such plans are approved, except for emergency repairs and regularly scheduled maintenance. Any revision to such plans shall be approved by the County Engineer before being implemented. A set of “as built” drawings will be required at the completion of the project, prior to final acceptance.

- B. The County Engineer shall have authority to enforce the standards as well as other referenced or pertinent specifications. The County Engineer will appoint such personnel as necessary to inspect the work on public roadway and drainage projects undertaken by the County and on all access permits, and they will exercise such authority as the County Engineer may delegate. On all other projects including all subdivision construction work and improvements on unopened County right-of-way, the Project Engineer shall be responsible for all inspections outlined in this section.
- C. It is the responsibility of the applicant, contractor or their agents to notify the County in advance of the commencement of any work on all projects.

- D. Failure to comply with the provisions of these Standards may result in stop work orders, removal of work accomplished, or other penalties as established by law.
- E. Prior to commencing work on the project, the Project Engineer shall prepare and submit a traffic control plan to the County Engineer for review and approval. From time to time, as progress of the work indicates, as conditions change, or as required by the County Engineer, the Project Engineer shall revise the traffic control plan to conform with the existing conditions.

The applicant or their contractor shall provide, place and maintain all Washington certified flaggers, flagger protective apparel, barricades, lights, standard signs, cones and other devices, equipment, and personnel necessary for the protection of the public and maintenance of traffic through the limits of the project at the applicant's expense.

If the County finds an unsafe condition, the applicant, contractor, and Project Engineer, if warranted, shall be notified and shall be required to correct the situation immediately. In some circumstances involving an immediate hazard to public safety, the County may make the appropriate corrections. The applicant shall be responsible for all costs incurred by the County.

- F. In addition to the requirements contained in the Standard Specifications, the following will be required:
  - 1. The applicant shall maintain at least one-way traffic through the limits of construction at all times and

shall open the roadway to two-way traffic during periods when actual work is not in progress.

2. Unless otherwise directed by the County Engineer, the roadway shall be open to two-way traffic at all times except between the hours of 8:00 am to 4:00 pm weekdays.
3. Access to side roads and private driveways shall be maintained at all times unless otherwise authorized by the County Engineer.
4. When it becomes necessary to restrict access to private driveways for construction purposes, as approved by the County Engineer, the applicant shall advise affected residents at least 24 hours in advance and cooperate to the fullest extent to minimize inconvenience to residents of the area.

#### **12.02 Project Engineer Certification of Inspections.**

For all road and drainage work, other than that performed by the County on County road and drainage projects and access permits, the County requires the applicant to obtain certification from the Project Engineer to document and certify all inspections and testing during the construction process. It is also the responsibility of the applicant and Project Engineer to provide the day-to-day inspection of such work, perform such inspections and testing of materials and their placement as may be required, and to certify all such inspections and testing including compliance with the approved plans and these Standards. A daily activity diary shall be kept by the Project Engineer or his/her designee for all days that there is road or drainage work performed on the site. Copies of all test records, inspection records and the daily diary shall be furnished to the County Engineer within 3 working days of occurrence. At the time of each of the inspections as set

forth in Section 12.03, the County Engineer or his/her designee will visit the project site to review the work related to the required inspection. Such site visits do not relieve the applicant, the contractor or the Project Engineer of any responsibilities for performing all work in accordance with the approved plans and these Standards. The County Engineer or his/her designee may also visit the project site from time to time to monitor the overall progress of the project.

### **12.03 Inspection Criteria**

On all road construction by subdivision ordinance and work performed within the county right-of-way, inspection of the work will be done by the Project Engineer or his/her designees under the overall authority of the County Engineer. Unless otherwise instructed by the County Engineer, the inspections will be made by and certified by the Project Engineer as follows:

Inspection #1. Temporary sedimentation and erosion control in accordance with approved plans.

Inspection #2. Underground storm drainage, at the stage that trenching and placing of pipe are completed but prior to cover. If the scope of the project is such that there is more than one trenching, placing and covering is required, each such sequence shall be inspected separately.

Inspection #3. Underground utilities within the right-of-way, including sewers and storm drainage, shall be inspected during backfilling for compliance with the Standard Specifications and the requirements of the utility permit issued in conformance with the Skagit County “Accommodation of Utilities Within County Road Right-of-Way”.

Inspection #4. General roadway at the stage that the subgrade has been completed. If the scope of the project is such that the subgrade is completed in stages and is ready for surfacing materials, each such stage shall be inspected separately.

Inspection #5. General roadway at the stage that the gravel base has been placed and compacted and the curbing, if required, has been formed. If the scope of the project is such that the gravel base is completed in stages and is ready for additional surfacing materials, and the curbing, if required, has been formed for that section, each such stage shall be inspected separately.

Inspection #6. General roadway at the stage that crushed surfacing top course has been placed and compacted.

Inspection #7. General roadway, at the beginning of paving.

Inspection #8. Overall roadway, final, after paving, monument inspection, cleaning of drainage systems, and all necessary clean up.

Structural Inspections. Structural inspections shall be at critical stages of foundation, placement and assembly of components and final completion and tests, as directed by the County Engineer.

#### **12.04 Notification Requirements**

- A. The County shall be notified not less than 72 hours before construction is started. The applicant is responsible for scheduling a pre-construction conference with the County. Other jurisdictions, the Project Engineer, utility companies, subcontractors and other necessary parties to the project shall be present at the pre-construction conference.
- B. The applicant or the Project Engineer shall notify the County Engineer's office at least one working day in advance of each required inspection. Failure to comply with inspection requirements may necessitate appropriate or additional testing and certification as



directed by the County Engineer. Costs of such testing and certification shall be borne by the contractor, and for subdivision roads, it shall be the developer. At the time that such action is directed by the County Engineer, no further work will be permitted on the road or subdivision until all tests have been completed and all corrections have been made to the satisfaction of the County Engineer.

#### **12.05 Revisions to Inspection Sequence**

If the contractor believes that the inspection sequence indicated above does not fit the requirements of a particular project, he/she should make a request to the County Engineer in sufficient time to permit revision to the inspection schedule.

#### **12.06 Materials Sampling and Testing**

Materials sampling and testing shall be at the frequency and magnitude as set forth in the WSDOT Construction Manual. In the case of plat roads, testing and sampling shall be performed by a private testing laboratory. Certified test reports shall be furnished for all tests performed by private testing laboratories.

#### **12.07 Final Acceptance**

Upon completion of all work, the applicant shall request acceptance by the Skagit County Public Works Department. As part of the acceptance process, the County Engineer shall review all documents including test reports, inspection certifications, daily diaries, and any notes made by the County Engineer or his/her designee during all site visits. The County Engineer, the applicant and the Project Engineer shall conduct an on-site review of the project to ascertain the level of completeness of the project including cleanup. If the County Engineer is satisfied that the project has been completed in conformance with the approved plans, these Standards, and all other requirements that may have been imposed by means of the

General Construction Notes or approved change orders, he/she shall provide the applicant with a written acceptance.

#### **12.08 General Construction Notes**

For each project to be constructed by the applicant or their contractor, the applicant will be furnished a set of General Construction Notes which shall apply to all work. These Notes are supplementary to these Standards and contain additional information regarding responsibilities to locate and protect existing utilities, general site conditions, materials disposal, requirements to obtain all permits, clearing and grubbing, unsuitable materials, stockpiling of materials, compaction testing, materials testing, and any other items that may be required by the County Engineer. In instances where there is a conflict between these Standards and the supplementary General Construction Notes, the Notes shall govern.

#### **12.09 Posting of Site**

For all new subdivision work, the applicant shall post one or more signs showing both the names or business names of the applicant and the Project Engineer along with a contact telephone number for each. The signs shall show the names and telephone numbers in suitably contrasting text not less than 2 inches in height. The signs shall be placed at the access point(s) from the County road to the new development and not more than 25 feet from the near edge of the County road.

## **13.00 FRONTAGE IMPROVEMENTS**

### **13.01 General Requirements**

Frontage improvements may be required for all improvement and development projects that have frontage on a public road. Frontage improvements when required shall consist of, but not limited to, dedication of right-of-way, road widening, turn lanes, traffic signals, bus stop pads, bus shelter pads, passenger shelters, bus pullouts, pedestrian facilities, bike paths where designated in the current County Comprehensive Plan and safety and drainage improvements, including all tributary runoff. Frontage improvements for new short plats will be limited to the dedication of right-of-way where the existing right-of-way of the adjacent public road is prescriptive or otherwise less than that required by these standards. The need for frontage improvements will be determined by the County based upon the traffic impact analysis as described in Section 4.00 of these Standards when required, the safety analysis as described in Section 4.09 of these Standards, and the recommendations and requirements of the Planning and Permit Center developed as part of the overall development review process as described in Title 14 Skagit County Code. The Skagit County Department of Public Works will also review the right-of-way status of abutting and adjoining county roads to determine if additional right-of-way is needed to meet the current road standards as set forth in these Standards.

Frontage improvements, including the dedication of right-of-way, shall be installed at the time of development.

The developer shall coordinate the design and construction with County and Skagit Transit when frontage improvements include bus stop pads, shelter pads and bus shelters. Where a bus passenger shelter is identified by the County as a mitigation measure, the measure shall also include payment to Skagit Transit for its assembly and installation. Prescription of a passenger

shelter shall also incorporate the condition that the shelter meet Skagit Transit's standard passenger shelter specifications.

### **13.02 Exceptions**

The County Engineer may approve an alternative as set out in Section 13.03 to the installation of frontage improvements, not including dedication of right-of-way, if one or more of the following conditions apply:

- A. The design grade and alignment of the abutting roads cannot be determined at the time of construction of the development.
- B. The installation of frontage improvements required for the development would create or intensify a hazard to public safety.
- C. The installation of frontage improvements required for the development could be more safely, efficiently, and effectively implemented if done concurrently with the installation of improvements required for other developments along the same road frontage.

### **13.03 Alternatives**

#### A. Deferral of Frontage Improvements

Any deferred frontage improvement shall be secured for installation at a later date by an agreement and covenant between the County and the property owner whereby the property owner agrees to two methods of installation of the deferred frontage improvements. This agreement and covenant shall be executed before the issuance of any improvement and development permits. The County Engineer shall select which method to enforce against the property owner at the

time when the deferred frontage improvements are required to be installed. Two methods the property owner shall agree to are:

1. Commitment to Participate in an Improvement District

The property owner shall execute and record an agreement and covenant running with the land that ensures the participation of the subject property owner in any local improvement district, road improvement district, transportation benefit district or other similar type of district formed for the construction of such frontage improvements. Said document shall be in a form acceptable to the County Prosecuting Attorney's Office and shall be effective for a period of ten years from the date of recording. This document shall bind the owner and its designees, heirs, transferees, donees, and/or successors in interest.

2. Agreement to Participate in Improvement Project

The property owner shall execute and record an agreement and covenant running with the land that ensures the participation of the subject property owner in an improvement project not supported by an improvement district which encompasses the said deferred frontage improvements by paying their share thereof. Such share shall be equal to the County's costs for installing the deferred frontage improvements. A contract shall be developed at the time the improvement project is developed outlining the level of participation by the subject property owner in said project and the manner in which payment is to be made; provided that the financial responsibility of the subject property owner shall not exceed the cost of said deferred frontage improvements at the time of the

improvement project. Such an agreement and covenant shall bind the owner and its assignees, heirs, transferees, donees, and/or successors in interest. The agreement and covenant document shall be effective for a period of ten years from the date of recording.

B. Voluntary Payments

See RCW 82.02.020 as hereinafter amended.

## **14.00 SURETY AND BONDS**

### **14.01 Performance Surety**

All proposed improvements shall be completed by the applicant and accepted by Skagit County Public Works Department prior to acceptance of the development by the County. The posting of a performance surety to guarantee the completion of required roadway and/or drainage improvements is not an option.

### **14.02 Maintenance and Restoration Surety**

After satisfactory completion of the facilities and acceptance by the Skagit County Public Works Department, the developer responsible for constructing the roadways and drainage facilities shall commence a two (2) year period of satisfactory maintenance of the facility. In addition, a restoration surety bond or cash bond to cover the cost of remedying defects or failures of the roadway and drainage facilities shall also be posted and maintained throughout the two (2) year maintenance period. The amount of such surety or cash bond shall be ten percent of the original construction cost or \$10,000, whichever is greater. If the road was constructed with a Light Bituminous Surface Treatment (LBST), an additional amount to place the third 'seal' coat after one year shall be added to the surety and subsequently be removed from the surety when the third 'seal' coat is placed by the developer. Such surety, less any amounts deemed necessary by the County Engineer to restore the roadway and drainage facilities to their original design condition, shall be released by the County at the end of the two-year period.

## **15.00 UNOPENED COUNTY RIGHT-OF-WAY**

In various locations throughout the County there are portions of dedicated or deeded public road right-of-ways that have not been officially opened and established as county roads by the County or vacated by the County. From time to time, there is a desire by individuals or corporations to utilize said unopened County right-of-way for road access to private property. The County has provided for such use by the adoption of Ordinance 15443 which has been subsequently codified as Skagit County Code Chapter 11.16.

The Standards and information contained within this section are to provide assistance and clarification of Skagit County Code Chapter 11.16; should there be any conflict between the Code and these Standards, the Code shall prevail.

Nothing in this section should be construed as to allow other than road purpose access to private lands on unopened county right-of-way.

### **15.01 Permits Required**

There are three different possible permits required for the use of unopened County right-of-way for road purposes: right-of-way permits, trail permits and temporary use permits. An access permit application, on forms provided by the Skagit County Department of Public Works, shall be required to receive approval to use unopened County rights-of-way.

#### **A. Right-of-Way Permit**

1. A Right-of-Way permit shall be required for opening public right-of-way when the anticipated use or actual use exceeds serving more than four lots, parcels, or tracts and/or when an existing, privately utilized and privately maintained County right-of-way is desired to be upgraded. Roads fully meeting the public road standards as set forth in Sections 3.05 and 3.06 shall, upon completion of construction and approval of



the County Engineer, be proposed to the Board of County Commissioners for formal establishment.

2. Requirements

- a. The roadway section shall meet the requirements for public roads as set forth in Section 3.05 and 3.06 of these Standards. If more than 16 lots, parcels or tracts are to be served, the County Engineer will evaluate each request on a case by case basis. Evaluation by the County Engineer may require submittal by the applicant of traffic data and other information. If the width of the unopened right-of-way and the terrain prevent the proposed road from meeting the public road standards, the permit shall be denied.
- b. The applicant shall pay for all signing required by the County and the first time installation. Subsequent to the initial installation, signing will be maintained by the County. Signing requirements shall be furnished to the applicant.
- c. Upon completion of the required improvements, the County Engineer shall indicate approval on the permit application and make the appropriate notification to the Board of County Commissioners and, upon establishment by the Board of County Commissioner, enter the appropriate information into the official County right-of-way records.
- d. The permit application shall include:

- i. A legal description of the lot(s), tract(s) or parcel(s) to be served by the permit.
- ii. A statement regarding the purpose of access to subject lot(s), tract(s) or parcel(s).
- iii. Proof of appropriate subdivision ordinance approval or, if exempt from platting, an assessor's map showing the lots served.
- iv. If there is no official road name, three choices for road name shall be submitted for approval at the time of permit application submittal.
- v. Three (3) sets of engineered roadway and drainage plans for the planned improvements as per Skagit County Road Standards and Skagit County Drainage Ordinance requirements, including a vicinity map.

B. Trail Permit

1. A Trail Permit shall be required for opening public right-of-way when the anticipated use or actual use is to provide access to not more than four lots, tracts or parcels.
2. Requirements
  - a. For service to two to four lots, tracts or parcels, the roadway section shall meet the requirements for private roads as set forth in Sections 3.07 and 3.08 of these Standards. For a single lot, tract or parcel, the roadway section shall consist of a minimum twelve feet of width, be surfaced with a minimum of six inches of gravel base, and have a gradient of not more than 12%.

- b. The applicant shall supply, maintain and pay for all signing required by the County. Signing requirements shall be furnished to the applicant.
- c. Upon completion of the required improvements, the County Engineer shall indicate approval on the permit application and make the appropriate notification to the Board of County Commissioners and enter the appropriate information into the official County right-of-way records.
- d. Maintenance of the road shall be the responsibility of the applicant
- e. The permit application shall include:
  - i. A legal description of the lot(s), tract(s) or parcel(s) to be served by the permit.
  - ii. A statement regarding the purpose of access to subject lot(s), tract(s) or parcel(s).
  - iv. Proof of appropriate subdivision ordinance approval or, if exempt from platting, an assessor's map showing the lots served.
  - v. If there is no official road name, three choices for road name shall be submitted for approval at the time of permit application submittal.
  - vi. If required by the County Engineer, three (3) sets of engineered roadway and drainage plans for the planned improvements as per Skagit County Road Standards and Skagit County Drainage Ordinance requirements, including a vicinity map.

C. Temporary Use Permit

1. A Temporary Use Permit shall be required for opening public right-of-way for all uses to provide access to not to exceed a period of two years. Maintenance and Restoration Surety may be required to insure proper restoration. See Section 14 for surety requirements.
2. Requirements
  - a. The road design requirements will vary depending upon the nature of the proposed use. Applicants shall consult with the Skagit County Department of Public Works
  - b. The applicant shall supply, maintain and pay for all signing required by the County. Signing requirements shall be furnished to the applicant.
  - c. Upon completion of the required improvements, the County Engineer shall indicate approval on the permit application and make the appropriate notification to the Board of County Commissioners and enter the appropriate information into the official County right-of-way records.
  - d. Maintenance of the road shall be the responsibility of the applicant.
  - e. Upon termination of the permitted use, the permittee shall be required to abandon the right-of-way and perform any restoration as may be required by the County Engineer.

- e. The permit application shall include:
  - i. A legal description of the lot(s), tract(s) or parcel(s) to be served by the permit.
  - ii. A statement regarding the purpose of access to subject lot(s), tract(s) or parcel(s).
  - iii. An assessor's map showing the lots served.
  - iv. If required by the County Engineer, three (3) sets of engineered roadway and drainage plans for the planned improvements as per Skagit County Road Standards and Skagit County Drainage Ordinance requirements, including a vicinity map.

D. Additional Requirements

1. Detailed engineering and drainage plans may be required by the County Engineer. Cost for the development and preparation of such plans shall be borne by the permit applicant. When required, such plans shall be prepared in accordance with the requirements of these Standards and the Skagit County Drainage Ordinance .
2. When determined necessary by the County Engineer to adequately define the limits of the unopened right-of-way, the applicant shall cause the right-of-way to be surveyed by a licensed land surveyor at the applicant's expense. Such survey shall be recorded in accordance with the Survey Recording Act.
3. An applicant shall be required to deed additional right-of-way across property under his/her authority when necessary

to fulfill the minimum road right of way as required by these Standards.

4. An applicant shall provide certification that all owners of the property abutting on each side of the unopened right-of-way have been provided written notification of the permit application. Any objections of such property owners shall be stated along with the manner in which the applicant proposed to resolve said objections.
5. Restoration sureties may be required by the County Engineer in the manner provided for in Section 14 of these Standards.

SKAGIT COUNTY ROAD STANDARDS

**APPENDIX A**

**TRAFFIC IMPACT ANALYSIS FORMATS**

LEVEL I ANALYSIS 1 page

LEVEL II ANALYSIS 2 pages

# **TRIP GENERATION AND DISTRIBUTION STUDY REPORT FORMAT**

## **LEVEL I ANALYSIS**

- I Introduction and Summary**
  - 1. Report Certification
  - 2. Purpose of Report and Study Objectives
- II Proposed Development**
  - 1. Description
  - 2. Location and Vicinity Map
  - 3. Site Plan
  - 4. Proposed Zoning
  - 5. Proposed Land Use and Intensity
  - 6. Phasing and Timing of Project
- III Existing Conditions**
  - 1. Study Area
    - a. Limits of traffic study
    - b. Existing Zoning
    - c. Existing land uses
  - 2. Site Accessibility
    - a. Area roadway system
    - b. Transit service
    - c. Pedestrian and bicycle facilities
- IV Trip Generation and Distribution**
  - 1. Trip Generation
  - 2. Trip Distribution
- V Appendices**
  - 1. Definitions
  - 2. Trip Generation Sources
  - 3. Passer-by and Origin-Destination Studies
  - 4. References



# TRAFFIC IMPACT ANALYSIS REPORT FORMAT

## LEVEL II ANALYSIS

- I Introduction and Summary
  - 1. Report Certification
  - 2. Purpose of Report and Study Objectives
  - 3. Executive Summary
    - a. Site location and study area
    - b. Proposed development description
    - c. Findings
    - d. Recommendations and mitigation
- II Proposed Development
  - 1. Description
  - 2. Location and Vicinity Map
  - 3. Site Plan
  - 4. Proposed Zoning
  - 5. Proposed Land Use and Intensity
  - 6. Phasing and Timing of Project
- III Existing Conditions
  - 1. Study Area
    - a. Limits of traffic study
    - b. Existing Zoning
    - c. Existing land use
    - d. Anticipated future development in area
  - 2. Site Accessibility
    - a. Area roadway system
    - b. Traffic volumes and conditions
    - c. Existing safety and capacity deficiencies
    - d. Transit service
    - e. Pedestrian and bicycle facilities
- IV Projected Traffic
  - 1. Background Traffic
    - a. Base-year traffic volumes
    - b. Method of traffic volume projection
    - c. Projected 20-year traffic volumes
    - d. Traffic volumes from other proposed developments
    - e. Total background traffic
  - 2. Site Traffic
    - a. Trip generation
    - b. Trip distribution
  - 3. Total Network Traffic
- V Traffic Analysis
  - 1. Site Access
  - 2. Capacity and Level of Service

- a. Signalized intersections
    - b. Signalized arterials
    - c. Unsignalized intersections
    - d. Unsignalized roadway segments
  - 3. Traffic Safety
  - 4. Site Circulation and Parking
- VI Improvement Analysis
  - 1. Improvements to accommodate background traffic
  - 2. Additional improvements to accommodate site traffic
  - 3. Alternative improvements
  - 4. Status of improvements already funded, programmed or planned
- VII Findings
  - 1. Site Accessibility
  - 2. Traffic Impacts
  - 3. Compliance with Level of Service Standards
  - 4. Needed Improvements
- VIII Recommendations and Mitigation
  - 1. Site Access and Circulation Plan
  - 2. Roadway and Intersection Improvements
  - 3. Transportation System Management Actions
- IX Appendices
  - 1. Definitions
  - 2. Trip Generation Sources
  - 3. Passer-by and Origin-Destination Studies
  - 4. Volume and Turning Movement Count Sheets
  - 5. Level of Service Calculations
  - 6. Signal Warrant, Timing and/or Progression Calculations
  - 7. Access Configuration Drawings
  - 8. References

# SKAGIT COUNTY ROAD STANDARDS

## APPENDIX B

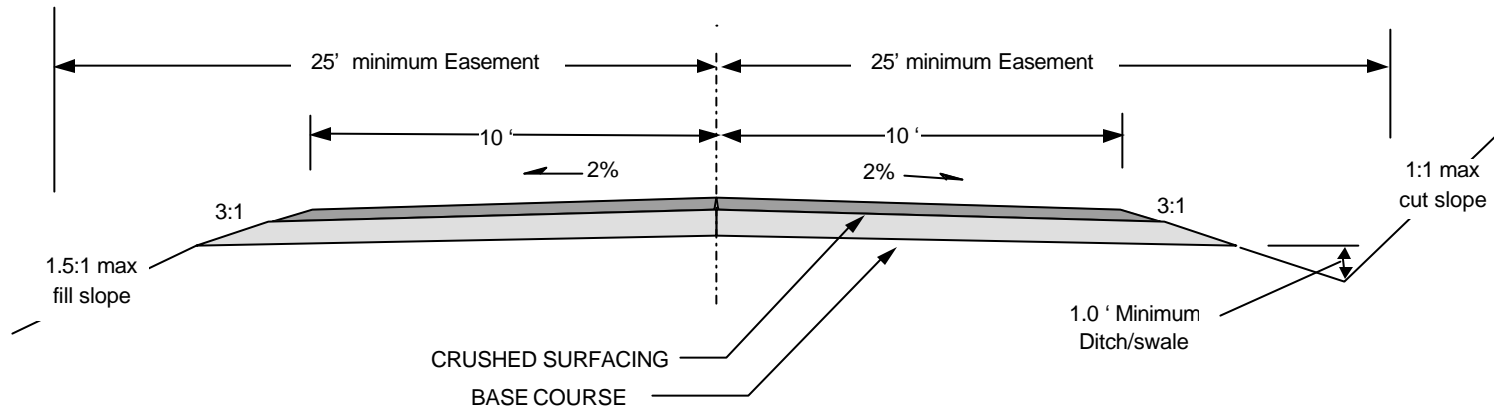
### ROADWAY SECTIONS

<b>Figure</b>	<b>Description</b>
B – 1	Private
B – 2	Rural Local Access – ADT Under 251
B – 3	Rural Local Access – ADT 251 - 400
B – 4	Rural Local Access – ADT Over 400
B – 5	Rural Major & Minor Collector – ADT Under 401
B – 6	Rural Major & Minor Collector – ADT 401 - 2000
B – 7	Rural Major & Minor Collector – ADT Over 2000
B – 8	Urban Local Access
B – 9	Urban Collector

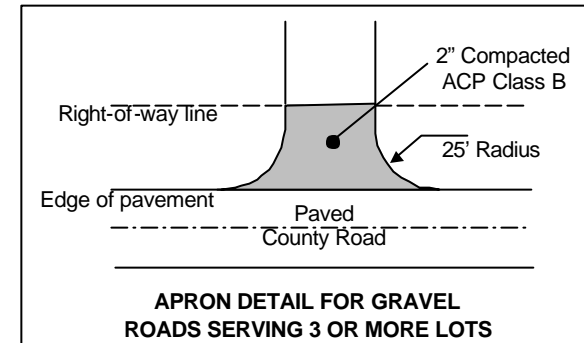
# RURAL AREA ROADWAY DESIGN STANDARDS

## ROADWAY CLASSIFICATION: PRIVATE ROAD 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): LESS THAN 160

For ADT greater than 160, see Figures B-2 through B-4 for requirements and Section 3.07 of the Road Standards Manual



DESIGN SPEED (MPH)	Flat=40; Rolling=30; Mountainous=20
MAXIMUM ROAD GRADE (Percent)	Flat=7; Rolling=9; Mountainous=12
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	20
MINIMUM SURFACING WIDTH (Ft)	20
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM EASEMENT WIDTH (Ft)	50
MINIMUM REQUIRED SURFACING:	
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.



PrivateRoad.doc



SKAGIT COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

REVISIONS	DATE

ROADWAY  
STANDARDS

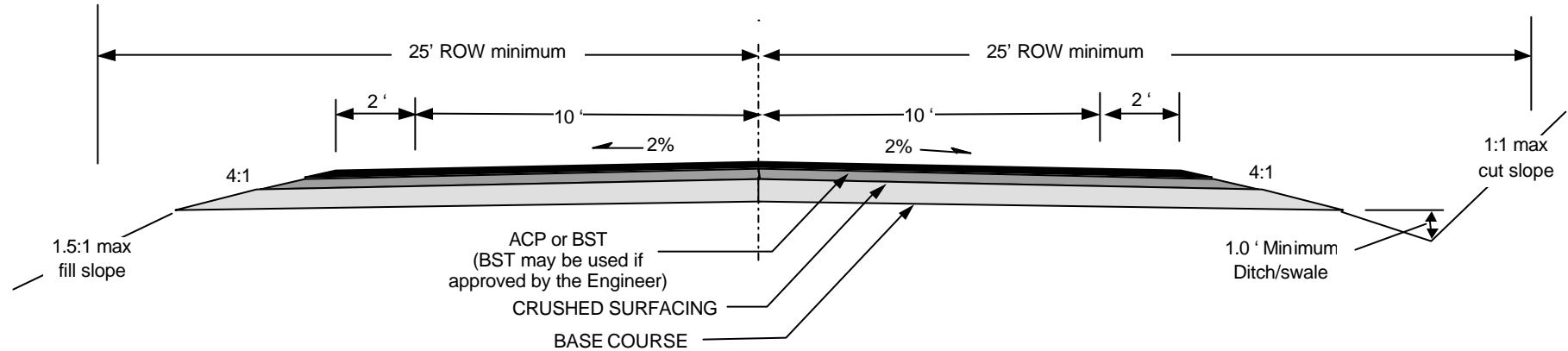
PRIVATE ROADWAY SECTION

FIGURE B - 1

6/26/2000

# RURAL AREA ROADWAY DESIGN STANDARDS

ROADWAY CLASSIFICATION: LOCAL ACCESS  
 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): UNDER 251



DESIGN SPEED (MPH)	Flat=40; Rolling=30; Mountainous=20
MAXIMUM ROAD GRADE (Percent)	Flat=7; Rolling=9; Mountainous=12
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	24
MINIMUM SURFACING WIDTH (Ft)	24
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	50
MINIMUM REQUIRED SURFACING:	
ACP or BST	ACP = 2" compacted depth or BST if approved
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

LocalAccessUnder251.doc



SKAGIT COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

REVISIONS	DATE

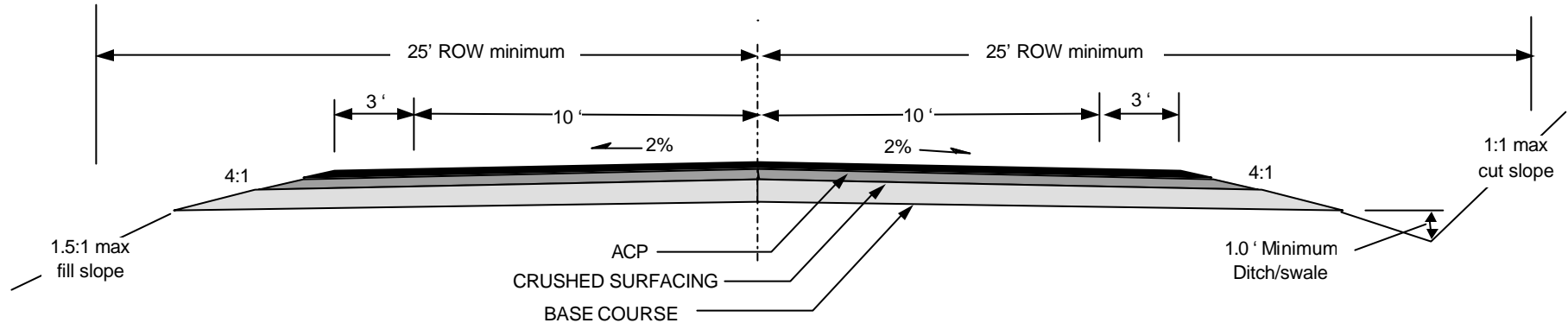
ROADWAY  
 STANDARDS

RURAL LOCAL ACCESS  
 ROADWAY SECTION  
 ADT UNDER 251  
 FIGURE B - 2

6/26/200

# RURAL AREA ROADWAY DESIGN STANDARDS

ROADWAY CLASSIFICATION: LOCAL ACCESS  
 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): 251 - 400



DESIGN SPEED (MPH)	Flat=50; Rolling=40; Mountainous=20
MAXIMUM ROAD GRADE (Percent)	Flat=6; Rolling=8; Mountainous=12
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	26
MINIMUM SURFACING WIDTH (Ft)	26
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	50
MINIMUM REQUIRED SURFACING:	
ACP or BST	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

LocalAccess251-400.doc



SKAGIT COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

REVISIONS	DATE

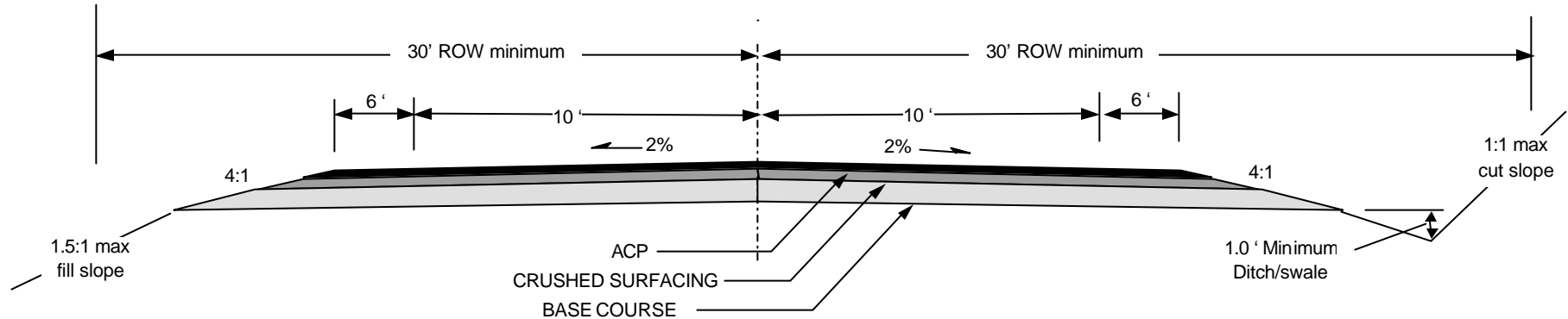
ROADWAY  
 STANDARDS

RURAL LOCAL ACCESS  
 ROADWAY SECTION  
 ADT 251 - 400  
 FIGURE B - 3

6/26/200

# RURAL AREA ROADWAY DESIGN STANDARDS

ROADWAY CLASSIFICATION: LOCAL ACCESS  
 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): OVER 400



DESIGN SPEED (MPH)	Flat=50; Rolling=40; Mountainous=30
MAXIMUM ROAD GRADE (Percent)	Flat=6; Rolling=8; Mountainous=10
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	32
MINIMUM SURFACING WIDTH (Ft)	32
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	60
MINIMUM REQUIRED SURFACING:	
ACP	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

LocalAccessOver400.doc



SKAGIT COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

REVISIONS	DATE

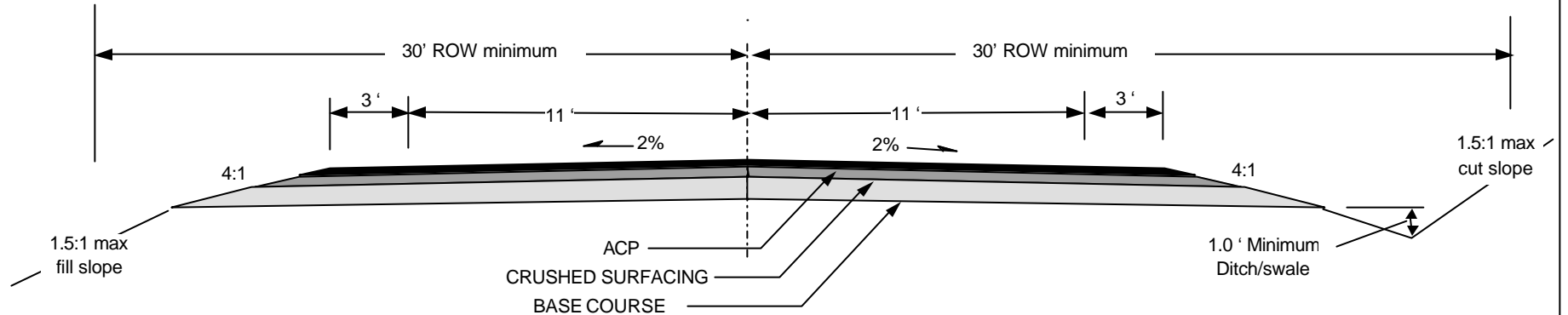
ROADWAY  
 STANDARDS

RURAL LOCAL ACCESS  
 ROADWAY SECTION  
 ADT OVER 400  
 FIGURE B - 4

6/26/200

# RURAL AREA ROADWAY DESIGN STANDARDS

ROADWAY CLASSIFICATION: MAJOR & MINOR COLLECTORS  
 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): UNDER 401



DESIGN SPEED (MPH)	Flat=50; Rolling=40; Mountainous=30
MAXIMUM ROAD GRADE (Percent)	Flat=6; Rolling=8; Mountainous=10
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	28
MINIMUM SURFACING WIDTH (Ft)	28
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	60
MINIMUM REQUIRED SURFACING:	
ACP	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

CollectorUnder401.doc



SKAGIT COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

REVISIONS	DATE

ROADWAY  
 STANDARDS

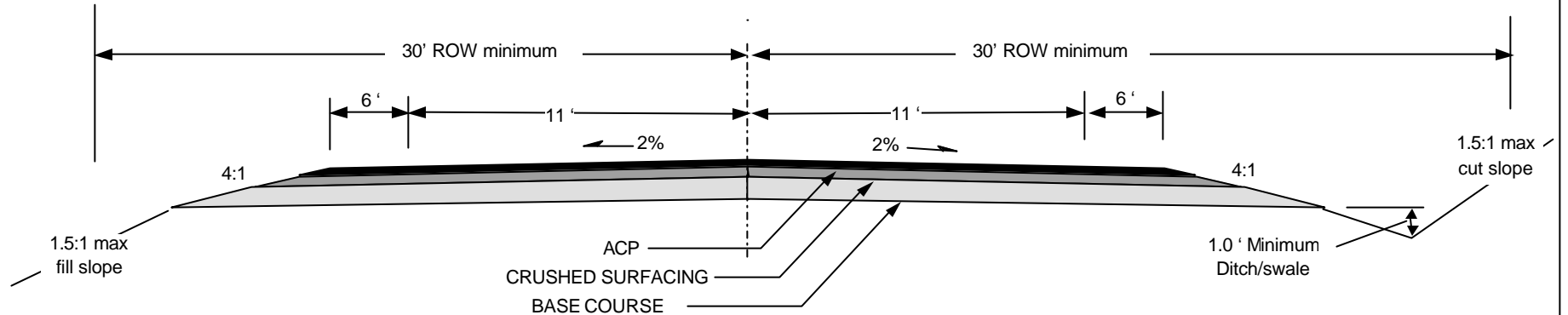
RURAL MAJOR & MINOR  
 COLLECTOR ROADWAY  
 SECTION - ADT UNDER 401  
 FIGURE B - 5

6/26/200



# RURAL AREA ROADWAY DESIGN STANDARDS

ROADWAY CLASSIFICATION: MAJOR & MINOR COLLECTORS  
 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): 401 - 2000



DESIGN SPEED (MPH)	Flat=50; Rolling=40; Mountainous=30
MAXIMUM ROAD GRADE (Percent)	Flat=6; Rolling=8; Mountainous=10
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	34
MINIMUM SURFACING WIDTH (Ft)	34
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	60
MINIMUM REQUIRED SURFACING:	
ACP	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

Collector401-2000.doc



SKAGIT COUNTY  
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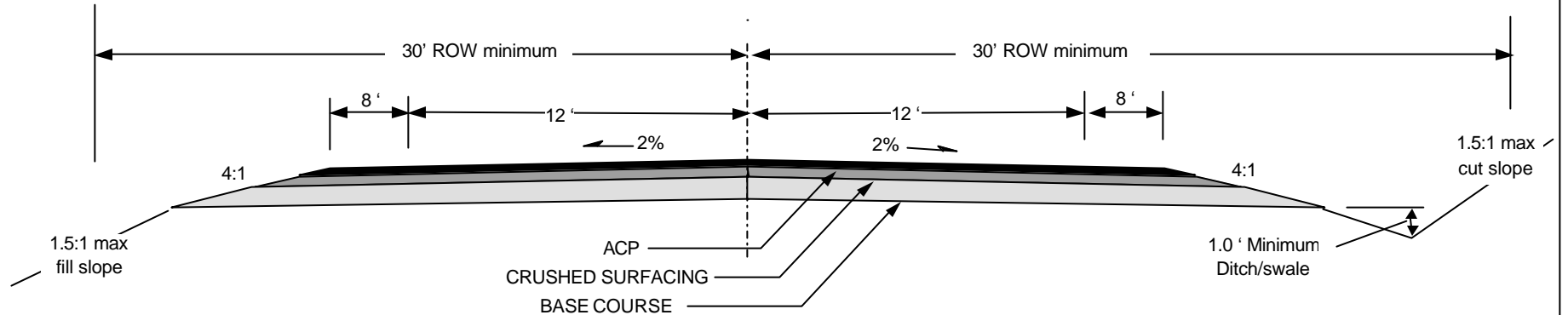
ROADWAY  
 STANDARDS

RURAL MAJOR & MINOR  
 COLLECTOR ROADWAY  
 SECTION ADT 401 - 2000  
 FIGURE B - 6

6/26/2000

# RURAL AREA ROADWAY DESIGN STANDARDS

ROADWAY CLASSIFICATION: MAJOR & MINOR COLLECTORS  
 20-YR PROJECTED AVERAGE DAILY TRAFFIC (ADT): OVER 2000



DESIGN SPEED (MPH)	Flat=50; Rolling=50; Mountainous=40
MAXIMUM ROAD GRADE (Percent)	Flat=6; Rolling=7; Mountainous=10
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft)	40
MINIMUM SURFACING WIDTH (Ft)	40
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	60
MINIMUM REQUIRED SURFACING:	
ACP	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

CollectorOver2000.doc



SKAGIT COUNTY  
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 PUBLIC WORKS

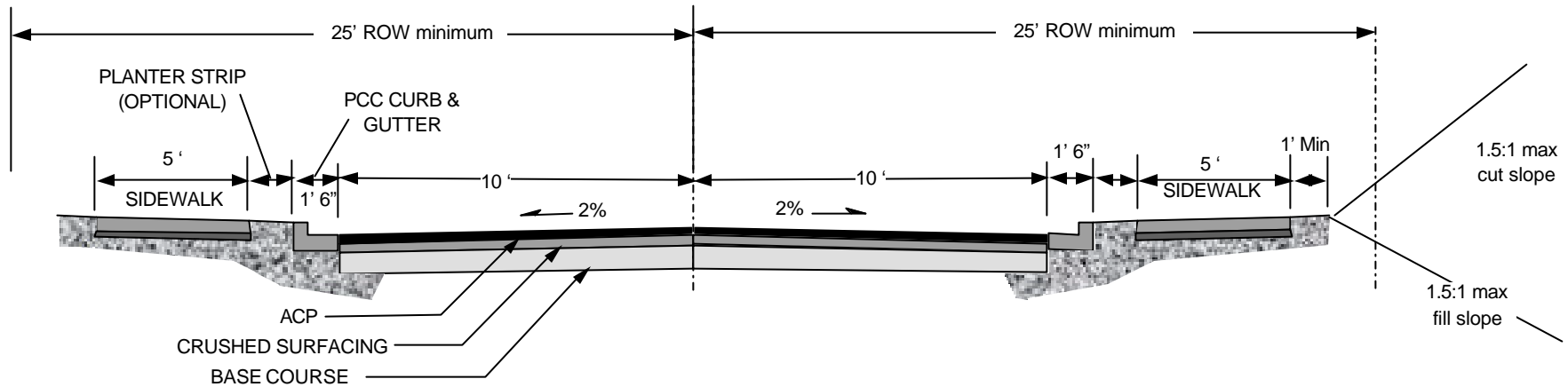
REVISIONS	DATE

ROADWAY  
 STANDARDS

RURAL MAJOR & MINOR  
 COLLECTOR ROADWAY  
 SECTION ADT OVER 2000  
 FIGURE B - 7

6/26/200

## URBAN AREA ROADWAY DESIGN STANDARDS ROADWAY CLASSIFICATION: LOCAL ACCESS



DESIGN SPEED (MPH)	20 to 25 MPH
MAXIMUM ROAD GRADE (Percent)	12
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft) *	22 curbed section
MINIMUM SURFACING WIDTH (Ft) *	20 curbed
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	50
MINIMUM REQUIRED SURFACING:	
ACP	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

\* 2-lane without parking data shown. Additional lanes and parking will require additional width.

UrbLocAccess.doc



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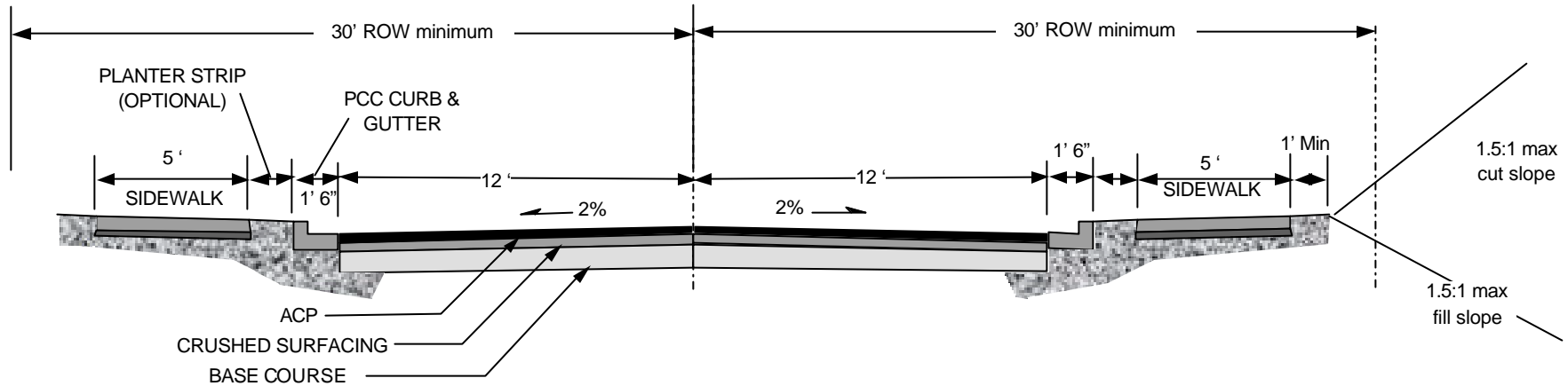
ROADWAY  
STANDARDS

URBAN LOCAL ACCESS  
ROADWAY SECTION

FIGURE B - 8

6/26/200

## URBAN AREA ROADWAY DESIGN STANDARDS ROADWAY CLASSIFICATION: COLLECTOR



DESIGN SPEED (MPH)	25 to 35 MPH
MAXIMUM ROAD GRADE (Percent)	12
MINIMUM ROAD GRADE (Percent)	0.5
MINIMUM ROADWAY WIDTH (Ft) *	26 curbed section
MINIMUM SURFACING WIDTH (Ft) *	24 curbed
MINIMUM DESIGN LOAD	HS 20-44
MINIMUM RIGHT-OF-WAY WIDTH (Ft)	60
MINIMUM REQUIRED SURFACING:	
ACP	ACP = 2" compacted depth
CRUSHED SURFACING TOP COURSE	2" compacted depth
GRAVEL BASE	10" compacted depth
VERTICAL CLEARANCE	16.5 ft.

\* 2-lane without parking data shown. Additional lanes and parking will require additional width.

UrbCollector.doc



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REVISIONS	DATE

ROADWAY  
STANDARDS

URBAN COLLECTOR  
ROADWAY SECTION

FIGURE B - 9

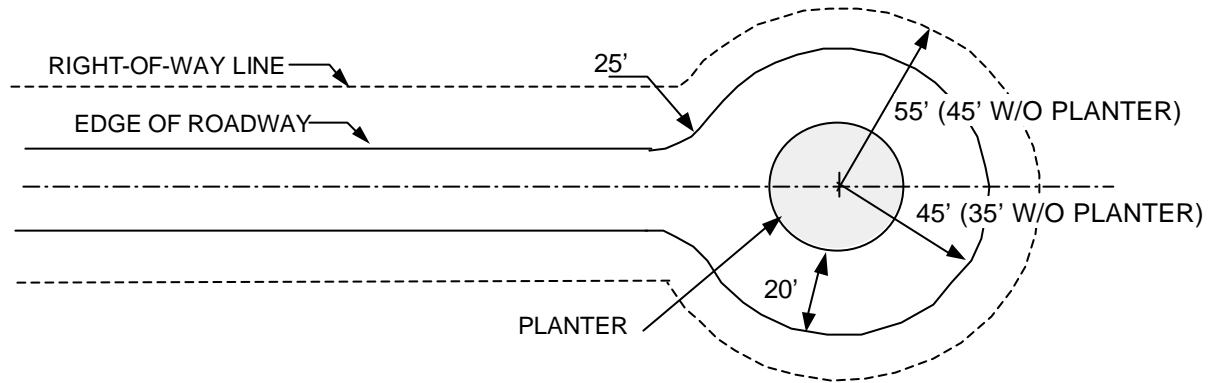
6/26/200

## SKAGIT COUNTY ROAD STANDARDS

### APPENDIX C

#### DETAILS

<b>Figure</b>	<b>Description</b>
C – 1	Cul-de-Sac
C – 1a	Hammerhead Turn-Arounds
C – 2	Vision Clearance Triangle
C – 3	County Road Accesses
C – 4	Access Point Grades
C – 5	Expansion Joint and Marks
C – 6	Cement Concrete Curb and Gutter
C – 7	Cement Concrete Curb, Gutter and Walk
C – 8	Cement Concrete Driveway
C – 9	Cement Concrete Sidewalk
C – 10	Curb Ramp Samples
C – 11	Curb Ramps Type “A” & “B”
C - 12	Curb Ramp Type “C”
C - 13	Curb Ramp Type “D1”
C – 14	Curb Ramp Type “D2”
C – 15	Curb Ramp Type “E”
C – 16	Curb Ramp Type “F”
C – 17	Curb Ramp Type “G”
C – 18	Driveway



### CUL – DE - SAC

See Roadway Section drawings for Road Section requirements

Cul-de-sac.doc



SKAGIT COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

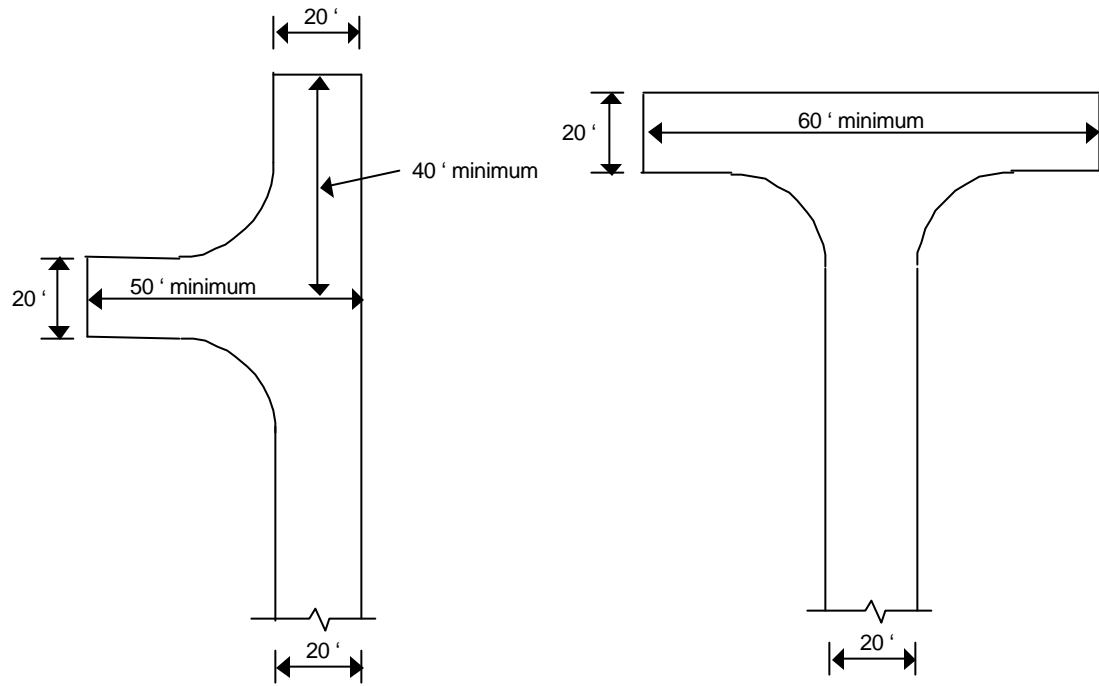
REVISIONS	DATE

ROADWAY  
STANDARDS

CUL-DE-SAC DETAIL

FIGURE C - 1

6/26/200



ALTERNATE A

ALTERNATE B

### HAMMERHEAD TURN-AROUND

Hammerhead turn-arounds may only be used on Emergency Vehicle Access roads as per Section 3.08 or for temporary work area turn-arounds.

Hammerhead.doc

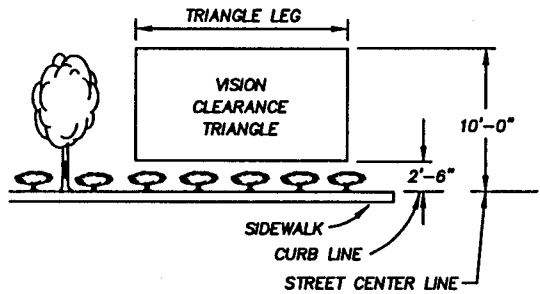


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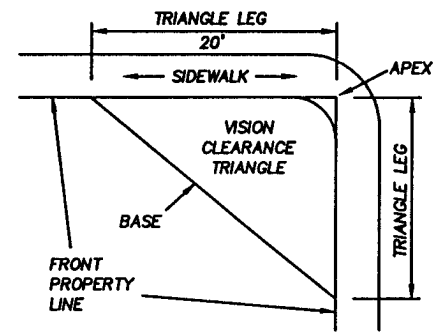
REVISIONS	DATE

ROADWAY  
STANDARDS

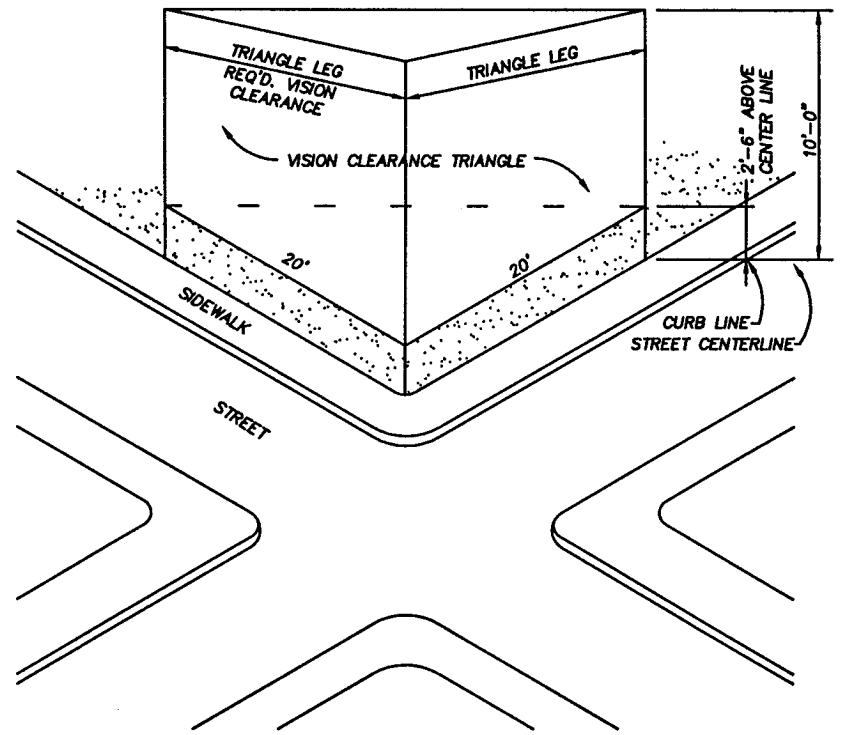
HAMMERHEAD DETAIL  
  
FIGURE C – 1a  
  
6/26/200



SIDE VIEW



PLAN VIEW



PERSPECTIVE

VisionClearanceTriangle.doc



SKAGIT COUNTY  
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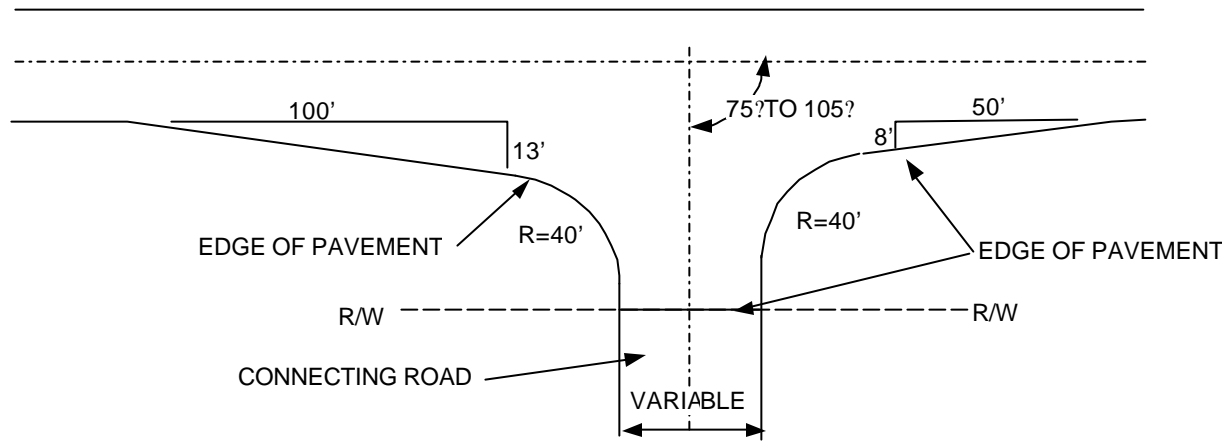
REVISIONS	DATE

ROADWAY  
STANDARDS

VISION CLEARANCE TRIANGLE  
  
FIGURE C - 2  
  
6/26/200

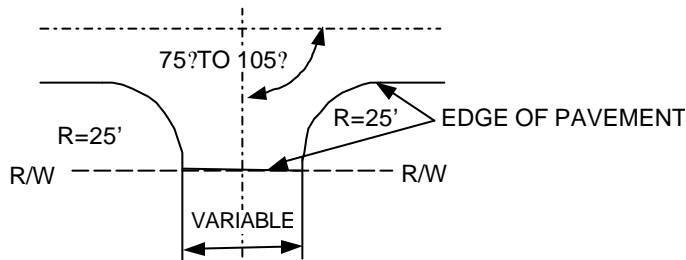


COUNTY ARTERIAL/COLLECTOR ROAD



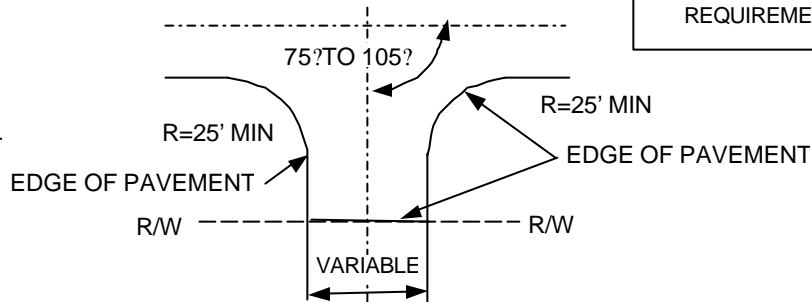
ARTERIAL/COLLECTOR ROAD ACCESS

COUNTY ROAD



PRIVATE DRIVEWAY

COUNTY LOCAL ACCESS ROAD



LOCAL ROAD ACCESS

**GENERAL NOTES**

1. ALL APPROACHES ARE SYMMETRICAL ABOUT CENTERLINE UNLESS OTHERWISE NOTED.
2. WHERE LARGER TRUCK TURNING MOVEMENTS ARE ENCOUNTERED, LARGER RETURN RADII AND RIGHT TURN TAPERS MAY BE REQUIRED BY THE COUNTY ENGINEER.
3. WHERE REQUIRED, CULVERTS SHALL BE PLACED AT INTERSECTIONS TO MAINTAIN DRAINAGE FLOW. ALL CULVERTS AND STORMWATER PIPES SHALL BE A MINIMUM 12" DIA. AND BE OF AN APPROVED MATERIAL. COVER REQUIREMENTS SHALL MEET WSDOT AND MANUFACTURERS SPECS.
4. EXCEPT FOR APPROACHES TO EXISTING GRAVEL ROADS, ALL APPROACHES SHALL BE PAVED AS DIRECTED BY THE ENGINEER.
5. SEE FIGURE C-4 FOR GRADE REQUIREMENTS.

AccessPlan.doc



SKAGIT COUNTY  
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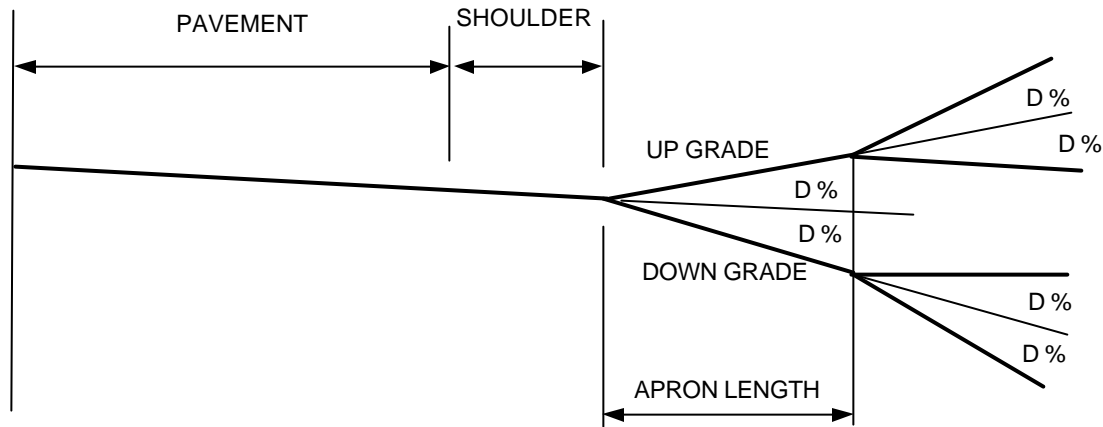
REVISIONS	DATE

ROADWAY  
STANDARDS

COUNTY ROAD ACCESSSES

FIGURE C - 3

6/26/2000



**ACCESS POINT GRADES AND APRON LENGTHS  
FOR ROADWAYS AND DRIVEWAYS**

**DESIGN VALUES**

ROADWAY CLASSIFICATION	APRON LENGTH (A)	GRADE CHANGE (D)	
		DESIRABLE	MAXIMUM
ARTERIAL	MIN. 20 FEET	4% OR LESS	5%
COLLECTOR	MIN. 15 FEET	5% OR LESS	6%
LOCAL ACCESS	MIN. 10 FEET	6% OR LESS	7%

**GENERAL NOTES**

1. PIVOT POINT SHALL BE AT THE EDGE OF SHOULDER
2. DESIRABLE WIDTHS SHOWN WILL BE THE REQUIREMENT, UNLESS THE APPLICANT DEMONSTRATES TO THE ENGINEER'S SATISFACTION THAT THEY CANNOT BE OBTAINED.
3. VERTICAL CURVES ARE NOT TO EXCEED A 3-1/4" HUMP OR A 2" DEPRESSION IN A 10 FOOT CHORD.
4. IN CASES OF FUTURE LAND WIDENING AND ADDITIONAL LANES, THE APRON LENGTH SHALL BE INCREASED TO ACCOMMODATE FUTURE WIDENING.

AccessGrades.doc



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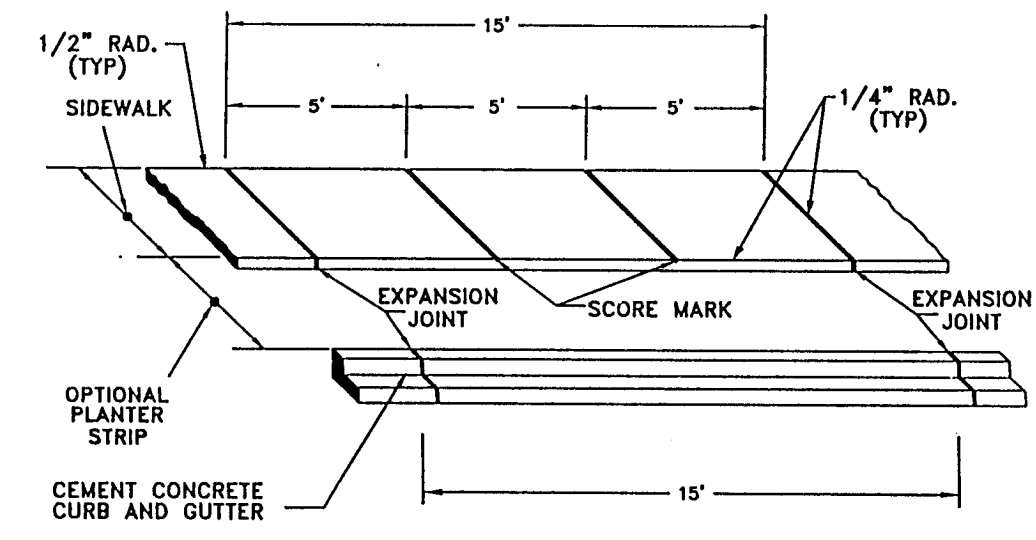
REVISIONS	DATE

**ROADWAY  
STANDARDS**

**ACCESS POINT GRADES**

**FIGURE C - 4**

6/26/2000



**GENERAL NOTES:**

1. EXPANSION JOINT MATERIAL TO BE 3/8" THICK PREMOLDED JOINT FILLER FULL THICKNESS OF CONCRETE.
2. FORM AND SUBGRADE INSPECTION REQUIRED BEFORE POURING CONCRETE.
3. SCORE MARKS SHALL BE ±1/8" WIDE BY ±1/4" DEEP. FOR SIDEWALKS OVER 8' IN WIDTH, A LONGITUDINAL SCORE MARK SHALL BE MADE ALONG CENTER OF WALK.
4. EXPANSION JOINTS SHALL BE INSTALLED IN CURB AND GUTTER AND IN SIDEWALK AT PC AND PT AT ALL CURB RETURNS. EXPANSION JOINTS SHALL BE PLACED IN SIDEWALK AT SAME LOCATIONS AS THOSE IN CURB AND GUTTER WHEN SIDEWALK IS ADJACENT TO CURB AND GUTTER, UNLESS OTHERWISE DIRECTED BY THE COUNTY ENGINEER.
5. PLANTER STRIP TO BE MAINTAINED BY ADJACENT PROPERTY OWNER.

ExpansionJointScoreMarks.doc



SKAGIT COUNTY  
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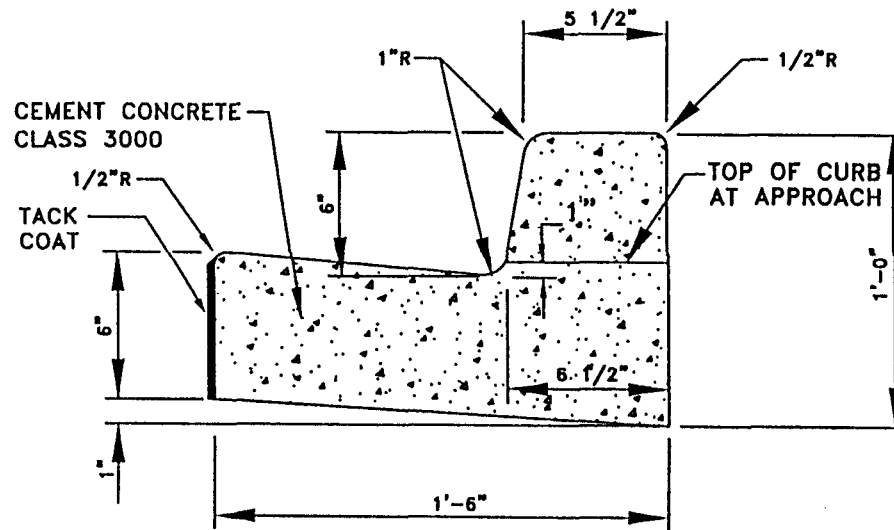
REVISIONS	DATE

ROADWAY  
STANDARDS

EXPANSION JOINT AND  
SCORE MARKS

FIGURE C - 5

6/26/200



**NOTES:**

- EXPANSION JOINT MATERIAL TO BE 3/8" THICK PREMOLDED JOINT FILLER FULL THICKNESS OF CONCRETE SPACING.
- FORM AND SUBGRADE INSPECTION REQUIRED BEFORE POURING CONCRETE.

PCCCurb&Gutter.doc



SKAGIT COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

REVISIONS	DATE

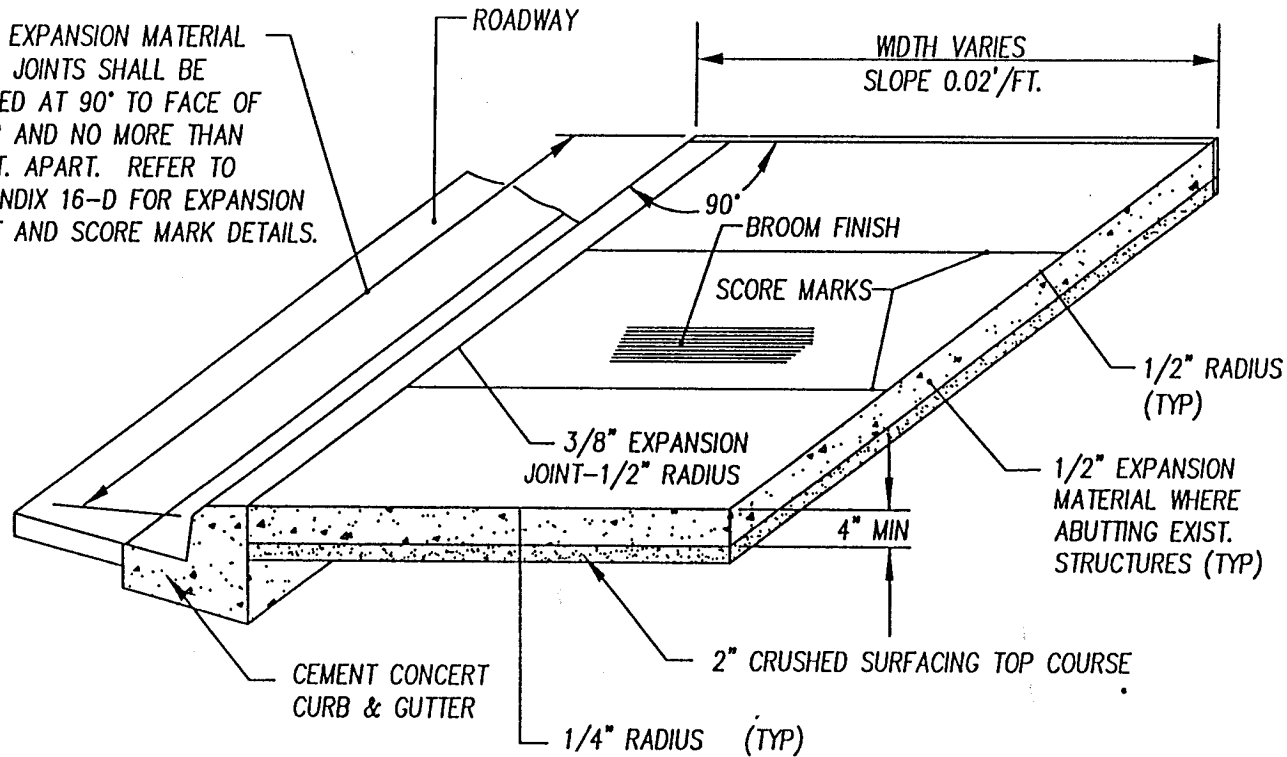
ROADWAY  
STANDARDS

CEMENT CONCRETE  
CURB AND GUTTER

FIGURE C - 6

6/26/200

3/8" EXPANSION MATERIAL THRU JOINTS SHALL BE PLACED AT 90° TO FACE OF CURB AND NO MORE THAN 15 FT. APART. REFER TO APPENDIX 16-D FOR EXPANSION JOINT AND SCORE MARK DETAILS.



NOTES:

1. FORM AND SUBGRADE INSPECTION REQUIRED BEFORE POURING.
2. CONCRETE SHALL BE AIR ENTRAINED TYPE II PORTLAND CEMENT CLASS 3000.
3. BROOM FINISH SHALL BE PERPENDICULAR TO FACE OF CURB.
4. JOINTS SHALL BE TROWEL FINISHED, AFTER BROOMING.
5. ALL EDGES AND JOINTS SHALL BE FINISHED.
6. WHEN CHECKED WITH A 10 FOOT STRAIGHTEDGE, GRADE SHALL NOT DEVIATE MORE THAN 1/8 INCH, AND ALIGNMENT SHALL NOT VARY MORE THAN 1/4 INCH.

PCCurbGutterWalk.doc



SKAGIT COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

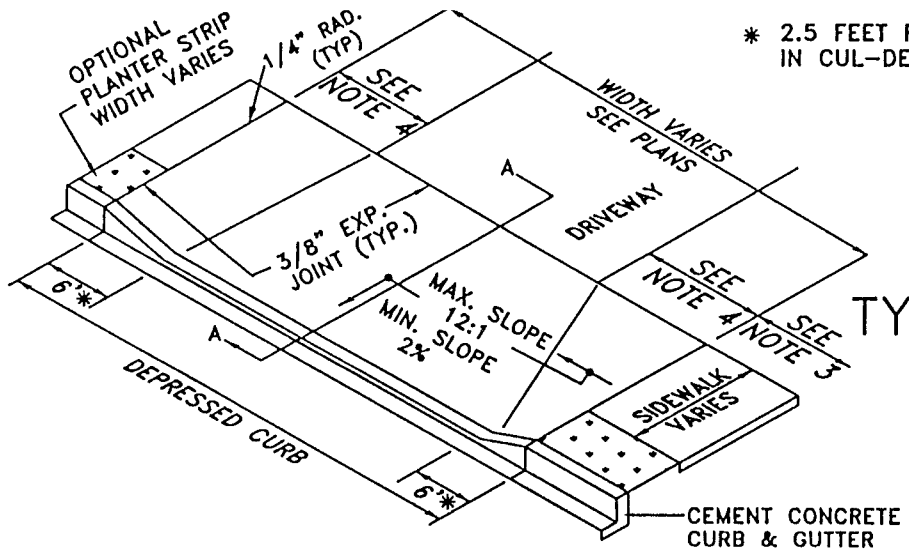
REVISIONS	DATE

ROADWAY  
STANDARDS

**CEMENT CONCRETE CURB,  
GUTTER AND WALK**

**FIGURE C - 7**

6/26/200

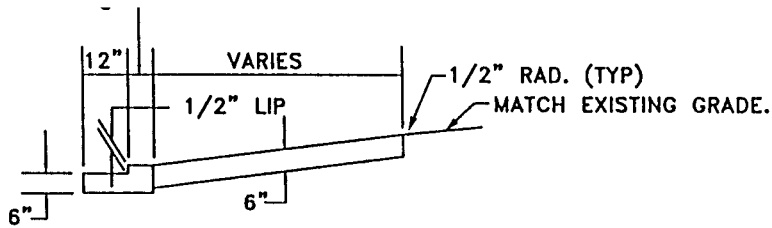


\* 2.5 FEET FOR DRIVEWAYS IN CUL-DE-SACS.

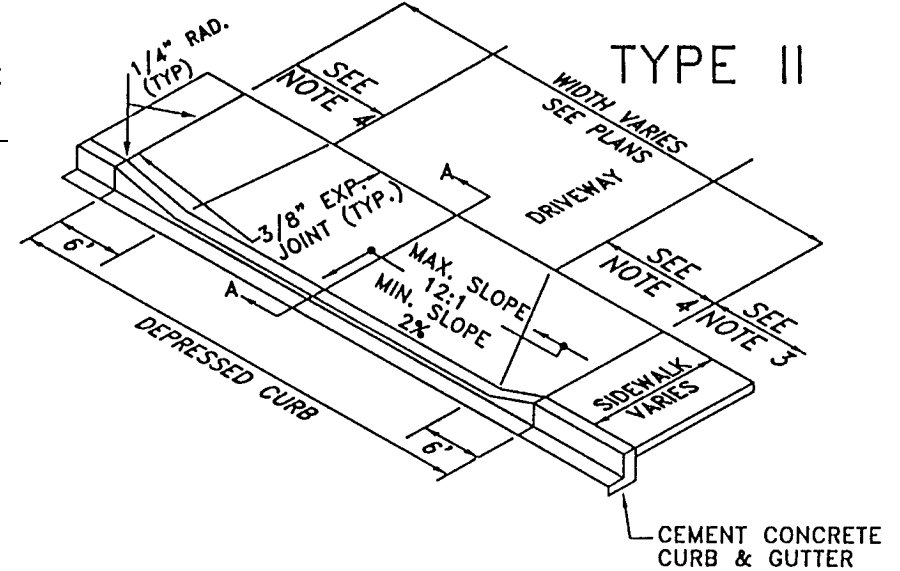
TYPE I

NOTES:

1. WHERE D/W EXCEEDS 16' WIDTH AN EXPANSION JOINT SHALL BE PLACED TRANSVERSLY, CENTERED IN DRIVEWAY.
2. EXPANSION JOINT MATERIAL TO BE 3/8" THICK PRE MOLDED JOINT FILLER FULL THICKNESS.
3. FORM AND SUBGRADE INSPECTION ARE REQUIRED BEFORE PLACING CONCRETE.
4. TRANSITION WIDTH WILL VARY DEPENDING ON DRIVEWAY SLOPE. MAINTAIN 12:1 TRANSITION SLOPE
5. 6' MIN. SPACING REQUIRED TO NEXT DRIVEWAY
6. DRIVEWAY WIDTH AT THE THROAT SHALL NOT EXCEED 11' WIDE IN CUL-DE-SACS.
7. WHEN CHECKED WITH A 10 FOOT STRAIGHTEDGE, GRADE SHALL NOT DEVIATE MORE THAN 1/8 INCH, AND ALIGNMENT SHALL NOT VARY MORE THAN 1/4 INCH.
8. BROOM FINISH LONGITUDINALLY WITH LIGHT BROOM FINISH INCLUDING CURB FACE.
9. MINIMUM GUTTER LINE GRADE SHALL BE 0.50%.



SECTION A-A



TYPE II

PCCDriveway.doc



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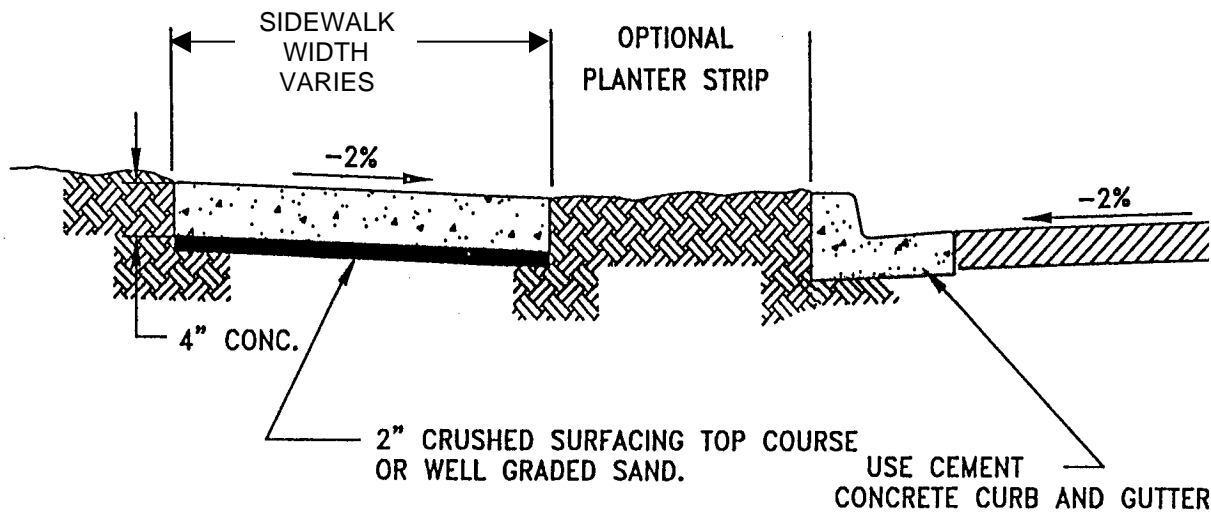
REVISIONS	DATE

ROADWAY  
STANDARDS

CEMENT CONCRETE  
DRIVEWAY

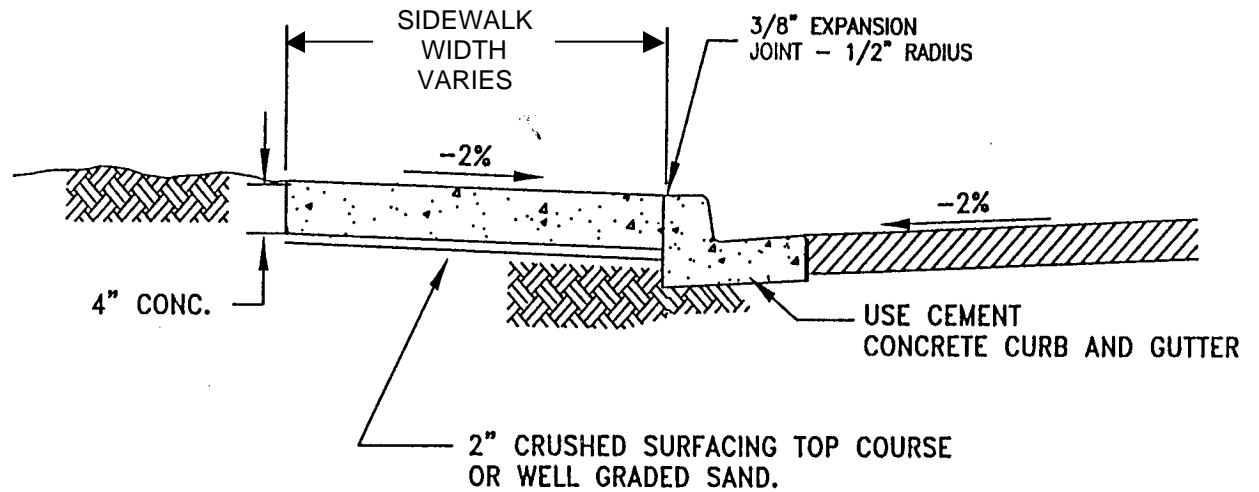
FIGURE C - 8

6/26/200



**GENERAL NOTES:**

1. FOR JOINTS AND SCORING, SEE STANDARD FOR SIDEWALK SPACING, EXPANSION JOINTS, AND SCORE MARKS.
2. AT CONCRETE DRIVEWAYS, SIDEWALKS SHALL BE A MINIMUM DEPTH OF 6".
3. WHEN CHECKED WITH A 10 FOOT STRAIGHTEDGE, GRADE SHALL NOT DEVIATE MORE THAN 1/8 INCH, AND ALIGNMENT SHALL NOT VARY MORE THAN 1/4 INCH.



Sidewalk.doc



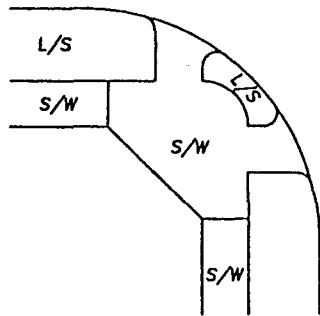
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PUBLIC WORKS

REVISIONS	DATE

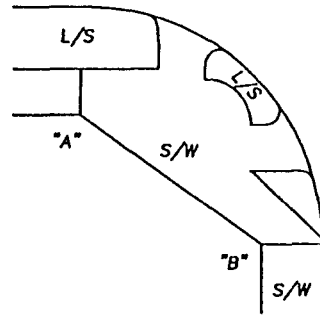
ROADWAY  
STANDARDS

SIDEWALK  
FIGURE C - 9

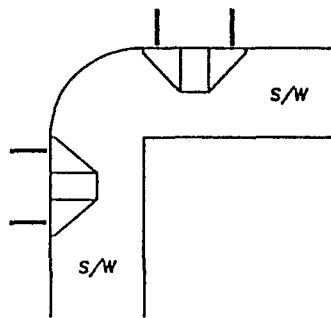
6/26/200



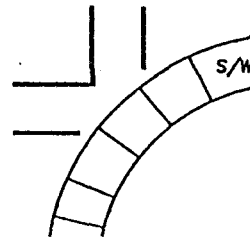
TYPE "A"  
see Figure C-11



TYPE "A" & "B"  
see Figure C-11



TYPE "C"  
see Figure C-12



TYPE "D"  
see Figures C-13 and C-14

LEGEND

S/W = SIDEWALK  
L/S = OPTIONAL LANDSCAPE

CurbRampSamples.doc



SKAGIT COUNTY  
DEPARTMENT OF  
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REVISIONS	DATE

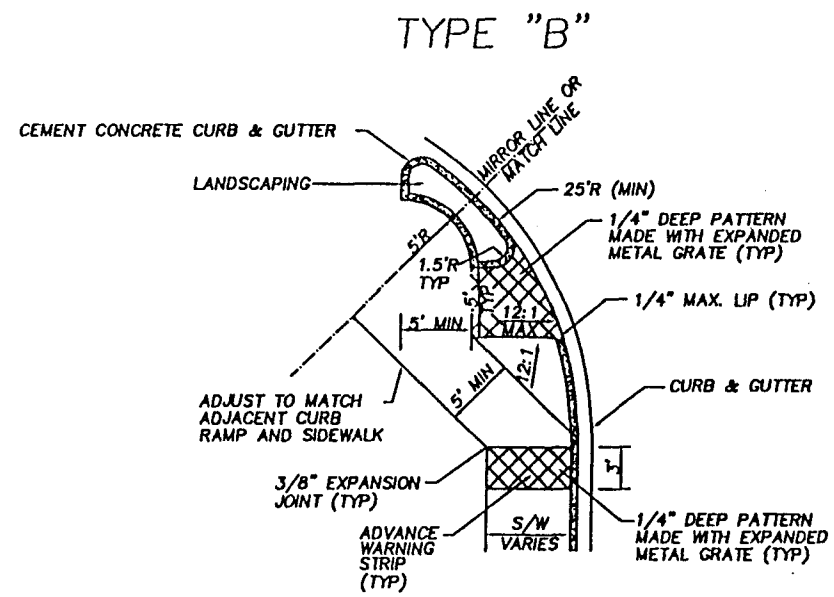
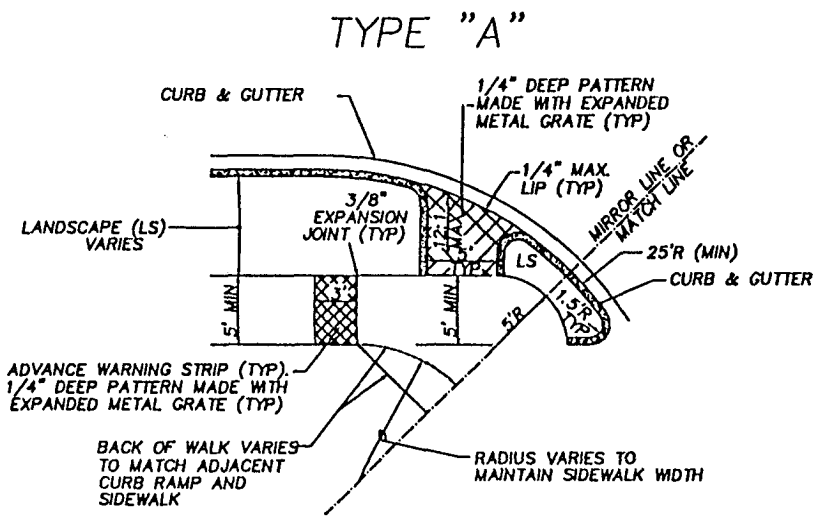
ROADWAY  
STANDARDS

**CURB RAMP SAMPLES**

**FIGURE C - 10**

6/26/200





- NOTES:**
1. SEE SIDEWALK DETAIL FOR THICKNESS, EXPANSION JOINTS AND SCORE MARKS.
  2. CROSS WALKS SHALL BE CENTERED ON CURB ACCESS RAMPS.

CurbRampA&B.doc



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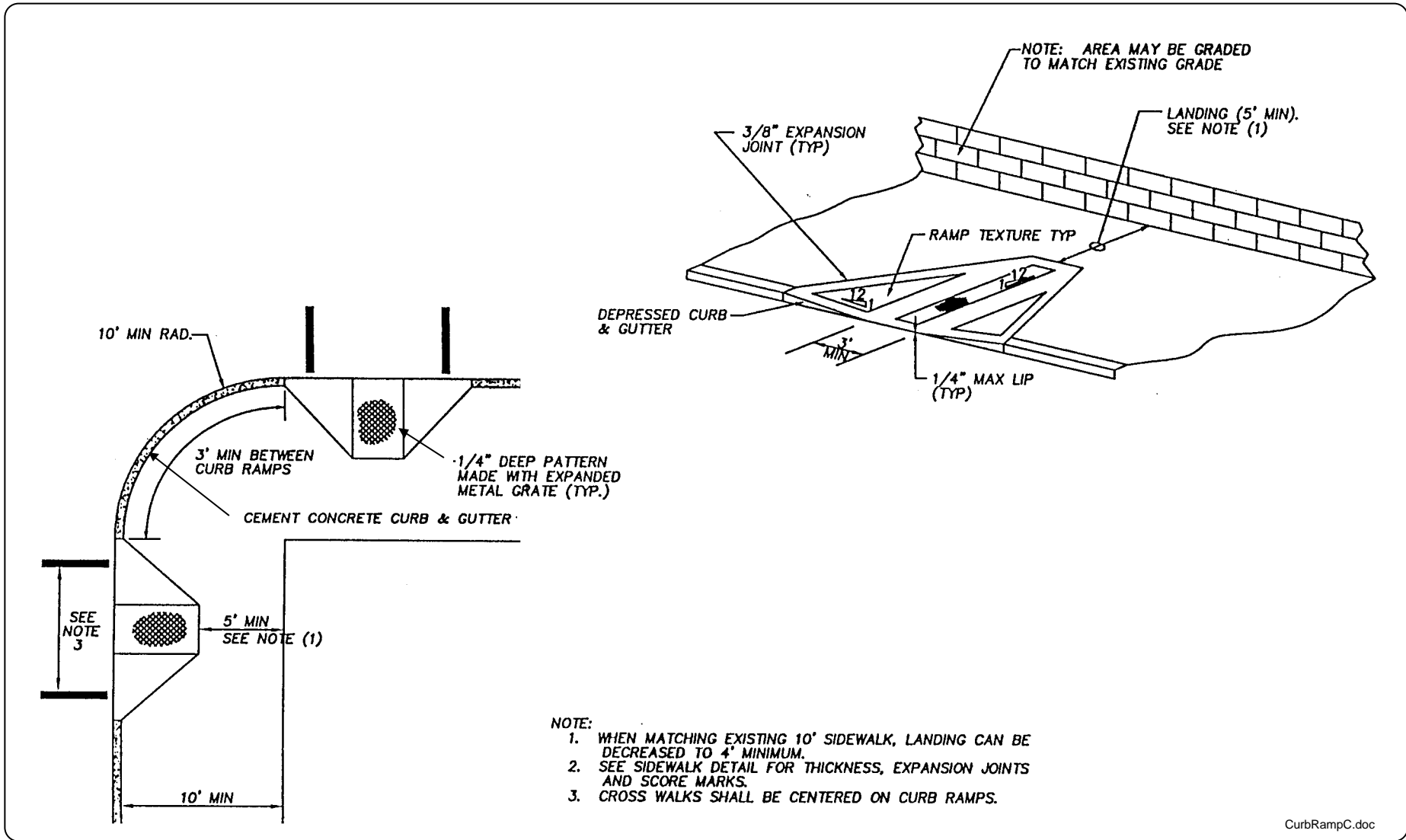
REVISIONS	DATE

ROADWAY  
STANDARDS

CURB RAMPS TYPE "A" & "B"

FIGURE C - 11

6/26/200



CurbRampC.doc



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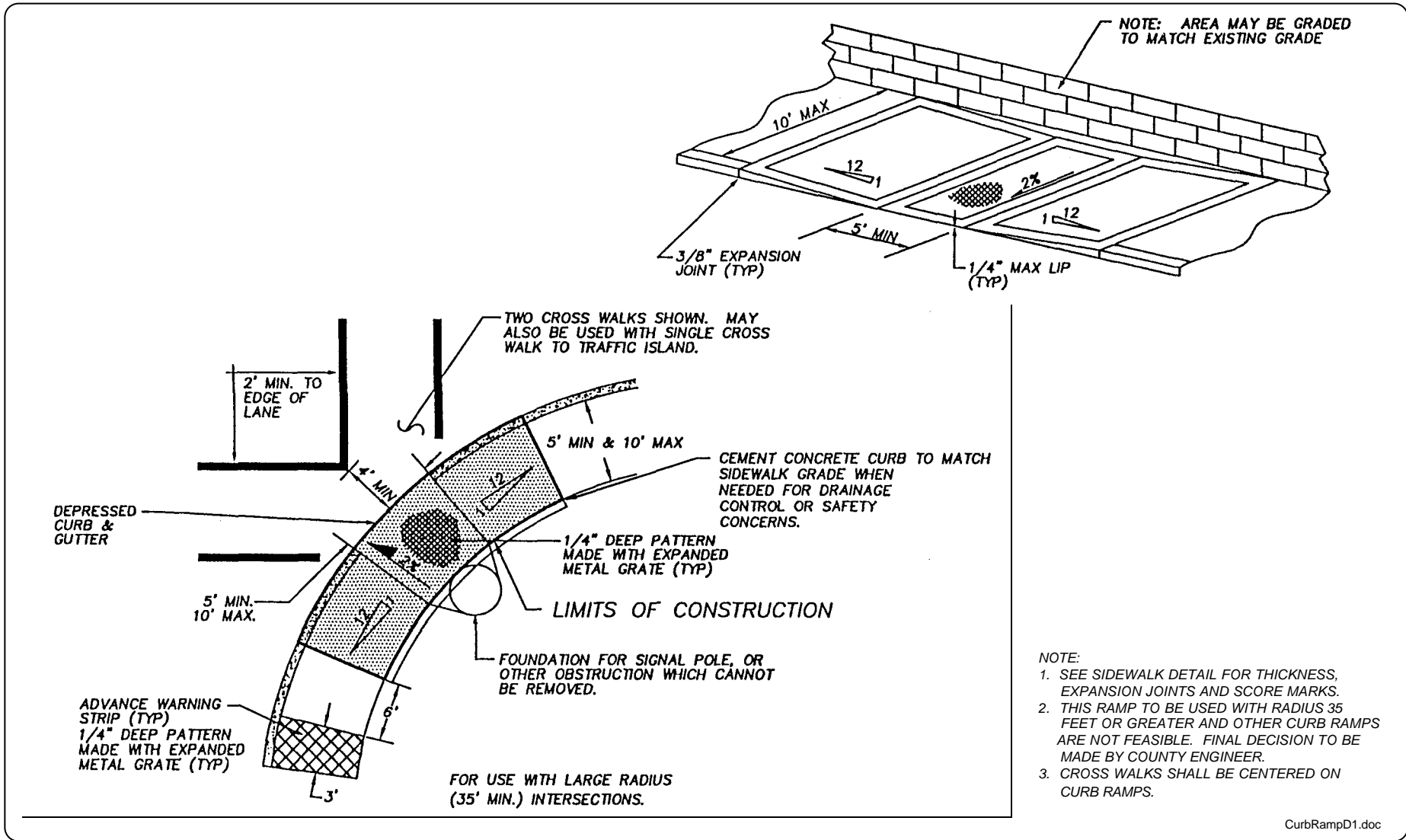
REVISIONS	DATE

ROADWAY  
STANDARDS

**CURB RAMP TYPE "C"**

**FIGURE C - 12**

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CurbRampD1.doc



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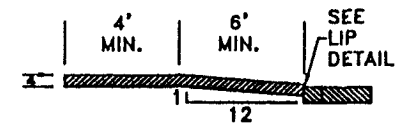
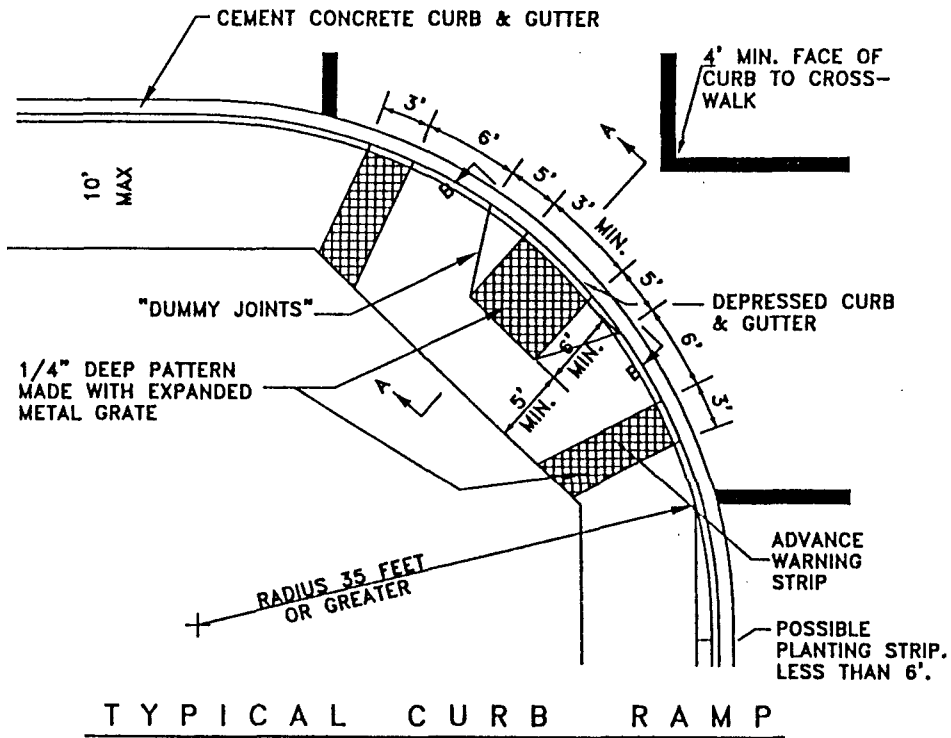
REVISIONS	DATE

ROADWAY  
STANDARDS

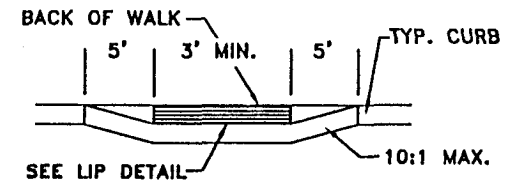
**CURB RAMP TYPE "D1"**

**FIGURE C - 13**

6/26/200

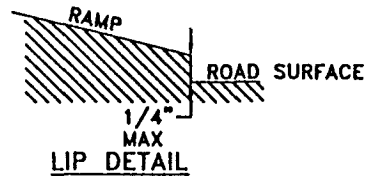


SECTION A-A



SECTION B-B

NOTE: SEE SIDEWALK SPACING, EXPANSION JOINTS & SCORE MARK DETAIL FOR ADDITIONAL NOTES.



CurbRampD2.doc



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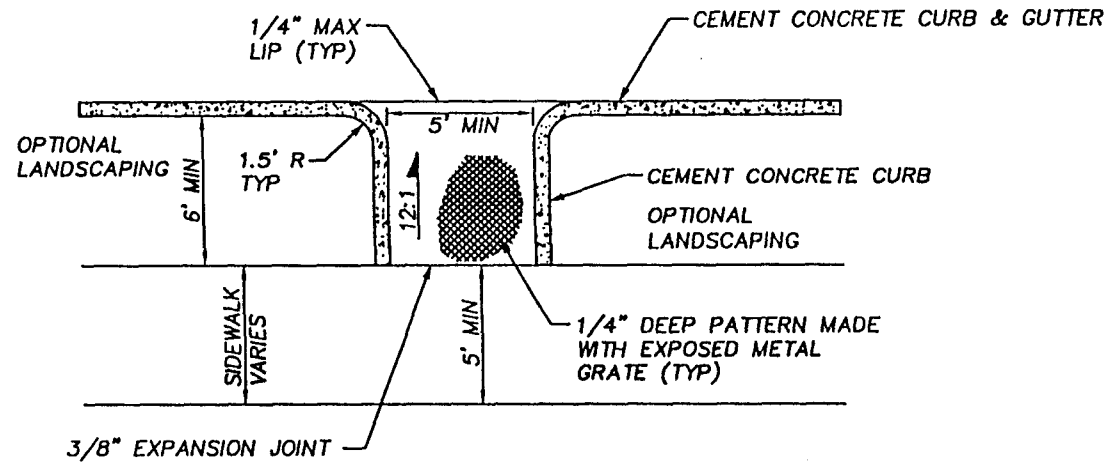
REVISIONS	DATE

ROADWAY  
STANDARDS

CURB RAMP TYPE "D2"

FIGURE C - 14

6/26/200



**NOTE:**

1. SEE SIDEWALK DETAIL FOR THICKNESS, EXPANSION JOINTS AND SCORE MARKS
2. THIS RAMP TO BE USED AS DESIGNATED ON THE PLANS AND WHEN OTHER TYPES ARE NOT FEASIBLE. FINAL DETERMINATION TO BE MADE BY THE COUNTY ENGINEER.

CurbRampE.doc



SKAGIT COUNTY  
DEPARTMENT OF  
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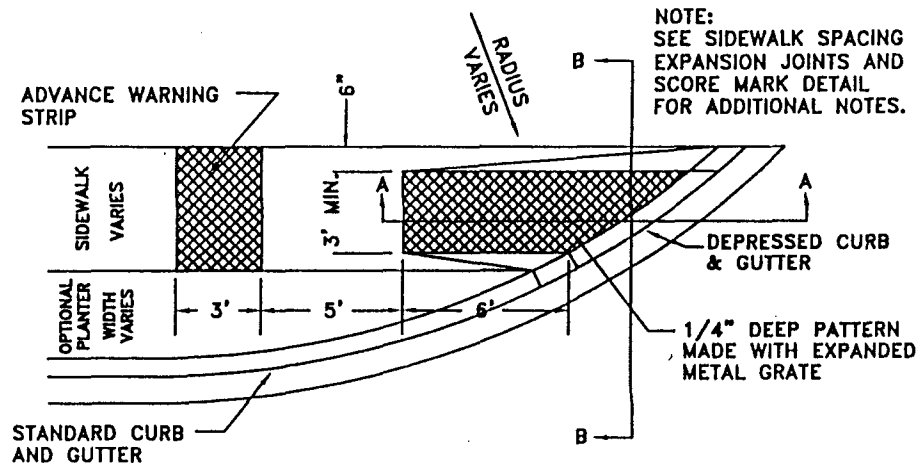
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ROADWAY  
STANDARDS

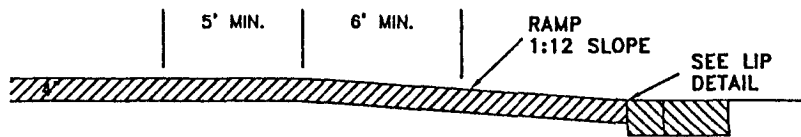
**CURB RAMP TYPE "E"**

**FIGURE C - 15**

6/26/200

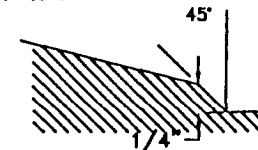


TYPICAL CURB RAMP

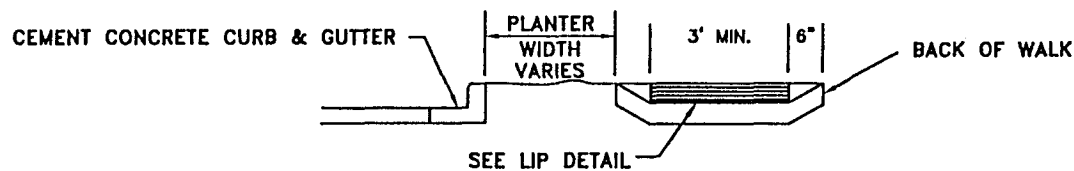


SECTION A-A

BOTTOM OF RAMP SHALL HAVE MAX. 1/4" LIP AT 45°.



LIP DETAIL



SECTION B-B

NOTE:  
THIS RAMP MAY BE USED AS DESIGNATED ON THE THE PLANS AND IN AREAS WHERE OTHER RAMP DESIGNS ARE NOT FEASIBLE. FINAL DETERMINATION IS TO BE MADE BY THE COUNTY ENGINEER.

CurbRampF.doc



SKAGIT COUNTY  
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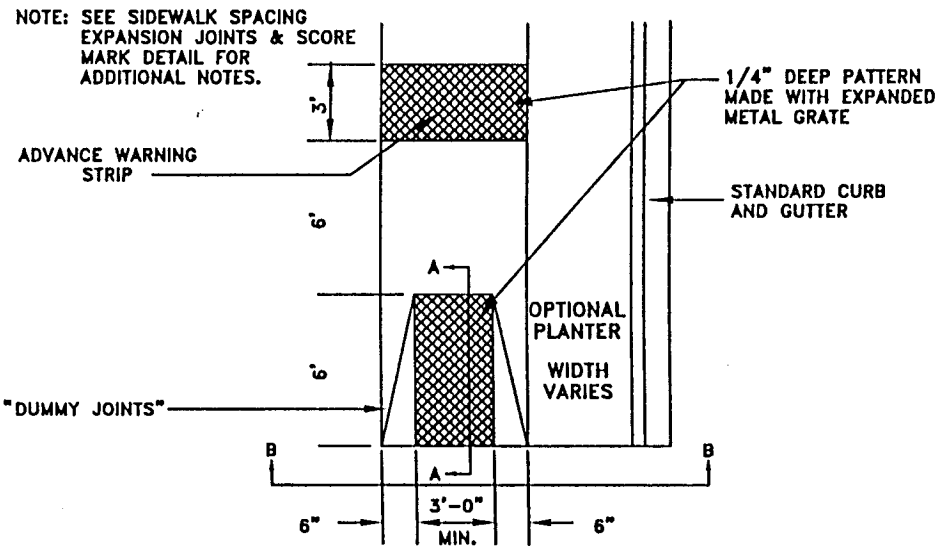
REVISIONS	DATE

ROADWAY  
STANDARDS

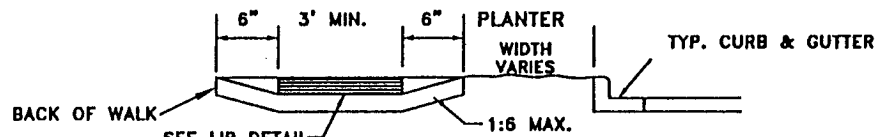
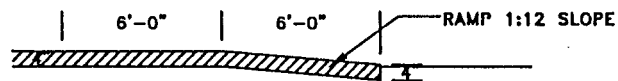
CURB RAMP TYPE "F"

FIGURE C - 16

6/26/200



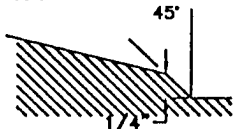
**TYPICAL SIDEWALK RAMP**



**SECTION B-B**

NOTE:  
THIS RAMP MAY BE USED AS DESIGNATED ON THE PLANS AND IN AREAS WHERE OTHER RAMP DESIGNS ARE NOT FEASIBLE. FINAL DETERMINATION IS TO BE MADE BY THE COUNTY ENGINEER.

BOTTOM OF RAMP SHALL HAVE MAX. 1/4" LIP AT 45°.



**LIP DETAIL**

CurbRampG.doc



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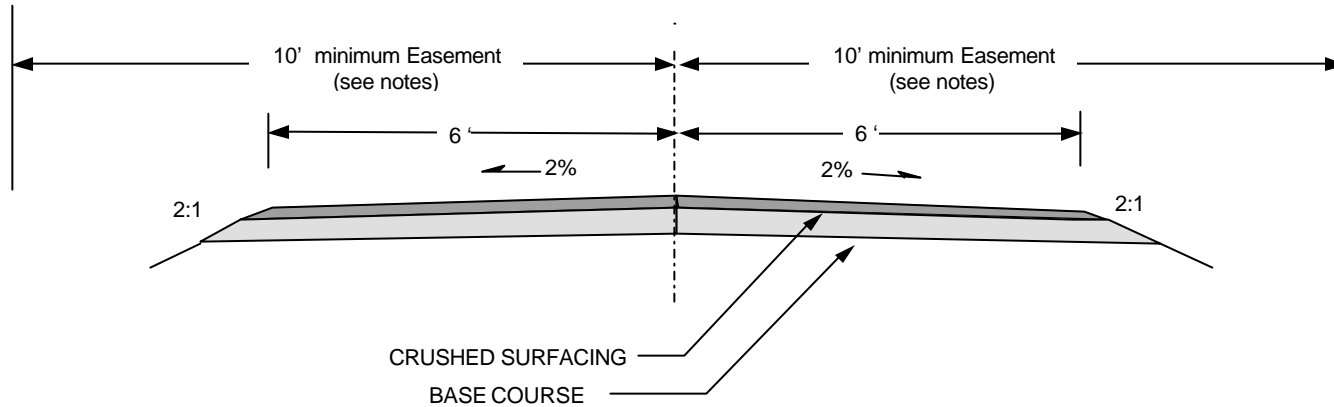
REVISIONS	DATE

ROADWAY  
STANDARDS

**CURB RAMP TYPE "G"**

**FIGURE C - 17**

6/26/200



DESIGN SPEED (MPH)	Not applicable
MAXIMUM ROAD GRADE (Percent)	12% unpaved, 14% paved
MINIMUM ROAD GRADE (Percent)	0.5% recommended
MINIMUM ROADWAY WIDTH (Ft)	12
MINIMUM SURFACING WIDTH (Ft)	12
MINIMUM DESIGN LOAD	HS 20-44 (bridges)
MINIMUM EASEMENT WIDTH (Ft)	20 off of owner's property
MINIMUM REQUIRED SURFACING:	
CRUSHED SURFACING TOP COURSE	2" compacted depth recommended
GRAVEL BASE	8" compacted depth recommended
VERTICAL CLEARANCE	13.5 ft.

**NOTES:**

1. A 20' minimum easement must be secured for driveways crossing other landowner's properties.
2. Turnouts are required for driveways in excess of 300 feet in length. Turnouts shall be a portion of the road that is widened to a 20' driving surface for a length of 30' and tapered back into the driveway at a 45-degree angle.
3. All turns shall have an outside turning radius of 50'.

Driveway.doc



SKAGIT COUNTY  
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**ROADWAY  
STANDARDS**

**DRIVEWAY  
(Over 150 feet in length)  
FIGURE C - 18**

6/26/2000



## SKAGIT COUNTY ROAD STANDARDS

### APPENDIX D

#### STANDARD PLAN NOTES

- A. All materials and workmanship shall be in accordance with the requirements of the most current edition of the State of Washington, Department of Transportation Standard Specifications for Road and Bridge Construction and Skagit County Road Standards.
- B. Inspection of the storm drain system must be called for before any backfill is placed for the drain system.
- C. Catch basins shall be Type 1 or Type 2, WSDOT Standard Plans, frame and grate unless otherwise noted. The outside edge of the catch basin shall be placed at the intersection of the curb and gutter and 0.010' to 0.015' below finished grade, or in the gutter line of the rolled edge section.
- D. If adequate inspection is not called for before completion of the roadway construction, it may be necessary for core drilling and testing to be performed to assure an acceptable quality of roadway. When core drilling is found to be necessary, the applicant will be held responsible for all costs incurred.
- E. It will be the applicant's responsibility to contact all utility companies in order to assure that all lines, pipes, poles and other appurtenances are properly located and their installation is coordinated with the road construction. All utility relocation work shall be at the expense of the applicant and must be in accordance with Skagit County Road Standards prior to road acceptance.
- F. Culvert pipe shall be concrete, aluminum or plastic 12-inch diameter minimum pipe with beveled ends unless otherwise noted. Beveled ends shall be a minimum of 3:1 in the ditch line or match the slope in a cut or fill section.
- G. Buried utilities are shown in their approximate location. The applicant shall have the utilities verified on the ground prior to any construction.
- H. Onsite erosion control measures shall be the responsibility of the applicant and be in place prior to construction. Any problems occurring before final acceptance by Skagit County and within 24 months thereafter shall be corrected by the applicant.

## SKAGIT COUNTY ROAD STANDARDS

### APPENDIX E

## Resurfacing, Reconstruction and Rehabilitation (“3-R”) Projects

### Definitions

**Resurfacing.** The addition of a layer or layers of paving material to provide additional structural integrity or improved serviceability and rideability.

**Restoration.** Work performed on pavement or bridge decks to render them suitable for an additional stage of construction. This may include supplementing the existing roadway by increasing surfacing and paving courses to provide structural capability, widening up to a total of 10 feet, and installing localized safety improvements. Restoration will generally be performed within the existing right-of-way.

**Rehabilitation.** Similar to “Restoration” except the work may include, but is not limited to, the following:

- ?? Reworking or strengthening the base or subbase.
- ?? Recycling or reworking existing materials to improve their structural integrity.
- ?? Adding underdrains.
- ?? Replacing or restoring malfunctioning joints.
- ?? Substantial pavement under-sealing when essential for stabilization.
- ?? Pavement grinding to restore smoothness, providing adequate structural thickness remains.
- ?? Removing and replacing deteriorated materials.
- ?? Crack and joint sealing but only when the required shape factor is established by routing or sawing.
- ?? Improving or widening shoulders.

Rehabilitation may require acquisitions of additional right-of-way.

**Safety Improvements.** Safety improvements include:

- ?? Upgrading existing substandard roadway design elements — roadway design elements are the physical characteristics of the highway such as alignment, grades, widths, sight distance, clearances, bridges, and the pavement structure including surface texture.
- ?? Improving existing operational features — operational features include traffic control devices, left and right turn lanes, lighting, and pedestrian

accommodations that provide for the safe and efficient movement of vehicles and pedestrians.

- ?? Reducing the potential hazard of existing roadside features — roadside features include sideslopes, ditches, drainage facilities, barrier systems, sign supports, luminaires, trees, utility poles, and other features adjacent to the roadway.
- ?? Upgrading bridge safety features — bridge rails, approach rails, connections, and terminals are considered bridge safety features.

### **General Discussion**

Funding restrictions and other considerations do not always allow improvement of all existing roads and streets to the standards desirable for new construction. Therefore, when pavement condition deteriorates to the level of minimal standards, a cost-effective pavement improvement is needed. A project becomes 3-R when the proposed improvement consists of resurfacing, restoration, or rehabilitation to preserve and extend the service life of the roadway, or enhances the safety of the traveling public. 3-R projects primarily involve work on an existing roadway surface and/or subsurface. Their purpose includes extending the service life, providing additional pavement strength, restoring or improving the original cross-section, increasing skid resistance, decreasing noise, improving the ride of the roadway, and enhancing safety.

Many factors influence the scope of 3-R projects, including:

- ?? Roadside conditions.
- ?? Funding constraints.
- ?? Environmental concerns.
- ?? Changing traffic and land use patterns.
- ?? Deterioration rate of surfacing.
- ?? Accidents or accident rates.

Normally, all 3-R improvements are made within the existing right-of-way, although acquiring right-of-way and/or easements should be considered when practical. Each 3-R project should be considered in context with the entire route between logical termini and within the constraints imposed by limited funding and other considerations.

- I. Any revisions to plans must be made by the Project Engineer and approved by the Engineer prior to any implementation in the field.
- J. All pavement markings shall conform to the requirements of the MUTCD.
- K. Before striping takes place the applicant shall contact the Skagit County traffic office for coordination of the striping.
- L. A copy of the approved plans must be on the job site whenever construction is in progress.
- M. Skagit County shall be notified 72 hours before construction is started. The applicant shall be responsible for scheduling a pre-construction conference with the County. Other jurisdictions, Project Engineer, utility companies, subcontractors and other necessary parties to the project shall be present at the pre-construction conference.
- N. Slopes shall be stabilized to prevent erosion. In case erosion occurs in ditches, ditch lining is to be provided as requested and specified by the County.
- O. Where newly constructed paving meets existing paving, the applicant shall overlay and feather new pavement to provide a smooth transition from existing to proposed paving. Application of a thin paint coat of emulsified asphalt shall be applied to insure proper bonding.
- P. The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than 1/8 inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than 1/4 inch in 10-feet from the rate of transverse slope shown on the plans.
- Q. Materials sampling and testing shall be at a frequency and magnitude as specified in the Standard Specifications or determined by the County Engineer. In the case of plat roads, a private testing laboratory shall perform testing and sampling. Certified test reports shall be furnished for all tests performed by private testing laboratories.
- R. All utility work within existing pavement requires a minimum roadway reconstruction from the centerline, to include grinding the existing pavement and replacing it with a minimum 0.17' pavement.

