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CHAPTER 1

1.000 INTRODUCTION

1.010 General

This document will guide the development of Snoqualmie Ridge II in accordance with the Mixed Use Final Plan approved by the City of Snoqualmie in 2004. These Standards will assist applicants in preparation of specific development applications and guide the City's review of those applications. It builds upon the Development Standards for Snoqualmie Ridge I.

1.020 Project Statement

The Final Plan for Snoqualmie Ridge is intended to harmonize with the historic character and small town appeal of the City of Snoqualmie. The Land Use Plan incorporates the elements which create a sense of community in the City-- such as people oriented neighborhoods, alleys and neighborhood parks. These Snoqualmie Ridge Development Standards establish the design and construction criteria to implement the Land Use Plan.

1.030 Development Standards

These Snoqualmie Ridge II Development Standards shall be cited routinely in the text as the "Standards" or "Development Standards".

1.040 Governing Documents

These Development Standards are among several documents regulating development. Here are some others:

1.041 Development Agreement and Mixed Use Final Plan

Foremost in the Development Standards hierarchy is the Development Agreement for Snoqualmie Ridge II, approved in June, 2004, and the Mixed Use Final Plan approved in July, 2004. These two documents implement goals, policies, and requirements of the Snoqualmie Comprehensive Plan and Mixed Use Ordinance. They are the governing documents for Snoqualmie Ridge II.

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1.042 Snoqualmie Ridge Documents

Development Standards govern street, platting, utility, landscaping and other development standards in Snoqualmie Ridge II in place of any conflicting standards contained in the Snoqualmie Municipal Code. The Snoqualmie Municipal Code however, shall govern all areas not governed by the Snoqualmie Ridge II Development Standards. The Development Standards will be implemented through the subdivision / binding site improvement plan process and any other approvals required to be consistent with the Development Standards.

Snoqualmie Ridge II (SRII) Residential Design Guidelines govern architectural design, materials, homeowner landscaping, and other elements affecting the visual character of the new residential neighborhoods not addressed in the Snoqualmie Ridge II Development Standards. Project review for consistency with the *SRII* Design Guidelines will be implemented through a design review process by the Snoqualmie Ridge New Construction Committee prior to any submittal to the City.

Covenants, Conditions and Restrictions (CC&Rs) established by the developer for Snoqualmie Ridge I and approved by the City will be extended to Snoqualmie Ridge II. The CC&Rs are a private contract between property owners for specific restrictions and internal (non-City) governance.

1.043 Snoqualmie Municipal Code

The Mixed Use Ordinance is intended "to encourage development proposals not constrained by fixed development standards." SMC 17.30.070(C). The ordinance therefore authorizes development standards that depart from those found in the Snoqualmie Municipal Code when different standards would "advance the achievement of the stated purposes and objectives of the mixed use district at the completion of the development." These Snoqualmie Ridge II Development Standards meet this intent and govern future development of Snoqualmie Ridge II in place of any conflicting standards found in the Snoqualmie Municipal Code. To the extent, however, that the Snoqualmie Ridge II Development Standards do not provide specific standards for Snoqualmie Ridge II, the standards of the Snoqualmie Municipal Code govern implementation of the final plan.

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1.50 Design and Construction Standards

The purpose of these requirements is to standardize design and construction elements where necessary for consistency and to assure, so far as practical, that the minimum requirements of the public are met. These requirements address:

- Safety
- Convenience
- Pleasant appearance
- Economical construction and maintenance

The standards also will provide a basis for City review of specific development applications.

These standards are intended to assist, but not to substitute for, competent work by design professionals.

All improvements to be conveyed to the City shall be constructed pursuant to a standard Developer Extension Agreement defining the improvements to be constructed and the terms and conditions under which they will be accepted by the City.

1.051 Standard Specifications

All construction, work and materials shall conform to the standards of the City of Snoqualmie as contained in the "Standard Specifications for Water Work", the "Design Standards for Streets, Plat Road, and Related Construction on the City Right of Way" and the Snoqualmie Municipal Code, hereinafter referred to as the "City Standards", except where Snoqualmie Ridge II Development standards provide otherwise. Construction, workmanship and materials shall conform to the current edition of the Standard Specifications for Road, Bridge and Municipal Construction as prepared by the Washington State Department of Transportation (WSDOT) and the Washington State Chapter of the American Public Works Association (APWA), except where the Snoqualmie Ridge II Development Standards provide otherwise.

1.052 Standard Drawings

The WSDOT/APWA Standard Plans for Road, Bridge and Municipal Construction and the Standard details contained in the City Standards shall be used to supplement but not supersede the standard details contained in the Snoqualmie Ridge II Development Standards, unless required to comply with the requirements of law.

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1.053 Design Standards

The design of public works facilities shall be developed in accordance with the latest edition (except as otherwise noted) and amendments of the following:

A. Snoqualmie Ridge II Development Standards

B. Snoqualmie Ridge II Master Drainage Plan, 2004

C. City Standards

D. Latest Edition of AASHTO, "A Policy of Geometric Design of Highways and Streets"

E. Washington State Department of Transportation, "Design Manual."

F. FHWA and Washington State Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD)

G. Highway Research Board's Manual entitled "Highway Capacity"

H. WSDOT/APWA, "Standard Plans for Road, Bridge, and Municipal Construction" shall be used as a guide in cases where they fit design conditions.

1.054 Final Drawings

A. Subdivision Electronic File of Drawings.
All final subdivision drawings shall be submitted to the City in an electronic image file and GIS-readable format (readable by the latest version) consistent with specifications adopted by the City at the time the drawings are submitted. This information shall be supplied to the City prior to recording of the final subdivision.

B. Infrastructure As-Built Drawings.
After completion of construction, the developer/contractor shall furnish the City Engineer with the original approved and signed Mylar plan set of all right of way improvement drawings, all parks improvement drawings, all commercial, industrial, or multi-family improvement drawings. The plan set shall be certified as "As-Built" and shall be neatly and legibly marked showing any and all changes in the final locations of all significant, permanent items of work. These items of work shall include, but not be limited to,

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curb and gutter, storm drain lines, water lines, sewer lines, catch basins, manholes, fire hydrants, valves, and new and existing utilities. Marking of the drawings shall represent all changes, vertical and horizontal, and shall be done while the work is being completed.

It is recommended that an As-Built set of prints be submitted to the City Engineer for review prior to submitting the originals.

In addition to providing the Mylar plans, electronic media of the As-Built drawings shall be submitted in an image file and GIS-readable format. The electronic media must be received at the same time as the Mylar plans. The drawings shall be submitted prior to City acceptance of the right-of-way improvements, or prior to issuance of occupancy permits, whichever is applicable; provided that the City may accept the improvements with a bond to secure completion of the As-Built drawings within 30 days of acceptance.

All final subdivision drawings and As-Built drawings shall become property of the City of Snoqualmie.

1.060 Applicability

These standards shall govern all new construction and upgrading of facilities for Snoqualmie Ridge II both in the right-of-way and on-site for transportation and transportation-related facilities, storm drainage facilities, sewer and water improvements, residential and commercial development, and park, recreation, and open space facilities.

1.070 Definitions and Terms

"Architect" – Any Washington State licensed professional architect or landscape architect who represents the developer.

"Average Daily Traffic" or ADT – The average number of vehicles passing a specified point during a 24-hour period. Annual average daily traffic (AADT) denotes that daily traffic that is averaged over one calendar year.

"Building Coverage" – That portion of a lot contained within the foundation of any structure(s) including the foundation.

"City Engineer" – See SMC 12.16.060

"Easement" – See SMC 16.04.050

"Encouraged" – means that the action must be investigated for implementation at the request of the City, but is not mandatory.

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"Engineer" – Any Washington State licensed professional engineer who represents the developer. See also "Professional Engineer" in SMC 12.16.150.

"Height" – "Height" as applied to a building or structure means the vertical distance measured from the average elevation of the proposed finished grade around the building or structure to the highest point of a flat roof and to the mean height between eaves and ridge of a peaked roof. (SMC 17.10.020(4)). Special height restrictions apply to Parcels N-1 and N-2; see Final Plan Condition 3.6.

"Hollywood Driveways" – A single lane driveway where the driving surface (i.e. pavement) is separated in the middle by a landscape strip, usually consisting of grass.

"Interceptor" – A sewer that receives flow from a number of main or trunk sewers, force mains, etc.

"Lateral" – See SMC 13.04.010(11)

"Lot Street Frontage" – The distance between the two points where the lot lines intersect the boundary of public street right-of-way.

"May" – means that the action can be taken at the discretion of the developer but is not required.

"New Construction Committee" – A committee composed of representatives of the developer and/or property owners that reviews and approves architectural, landscaping and plat configurations as described in the Design Guidelines and elsewhere in these Development Standards prior to any submittal to the City.

"Parcel" – The parcels identified in the Mixed Use Final Plan for Snoqualmie Ridge II.

"Plans" – The plans, profiles, cross sections, elevations, details, and supplementary specifications, signed by a professional engineer or architect (licensed to practice by the State of Washington) and approved by the City Engineer, which show the location, character, dimensions, and details of the work to be performed.

"Planter Strips" – landscaped area between a sidewalk and curb or bordering an alley.

"Private Sewer" – See SMC 13.04.010(16)

"Private Street" – Private vehicular access provided for by an access tract, easement, or other legal means to serve property that is privately owned and maintained.

"Project" – General term encompassing all phases of the work to be performed

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and is synonymous to the term "improvement" or "work".

"Public Sewer" – See SMC 13.04.010(19)

"Public Street" – Publicly owned and maintained street.

"Right-of-Way" – A general term denoting public land, property, or interest therein (e.g., an easement) acquired for or devoted to a public street, public access or public use. See also SMC 16.04.050(P).

"Road" – Used interchangeably with street.

"Setback" – a The distance buildings or structures must be removed from a lot line, and in the case of a building, is measured from a property boundary to a building's closest vertical wall.

"Sewer Main" or "Trunk" – A sewer that rec[illegible]s flow from one or more laterals.

"Shall" – means that the action is mandatory and must be performed.

"Should" – means that the action must be performed unless the City determines that in a particular instance the overall intent and objectives of the Standards would be furthered by excusing performance in that instance.

"Side Sewer" – See SMC 13.04.010(27)

"SMC" – City of Snoqualmie Municipal Code.

"Street" – Used interchangeably with road. (See also "Public Street" SMC 12.18.020(c)).

"Use of Pronoun" – As used herein, the singular shall include the plural, and th[illegible] plural the singular; any masculine pronoun shall include the feminine or neuter gender and vice versa; and the term "person" includes natural person or persons, firm, co-partnership, corporation or association, or combination thereof.

"Utility" – A company providing public service including, but not limited to, gas, oil, electric power, street lighting, telephone, telegraph, water, sewer, stormwater control, or cable television, whether or not such company is privately owned or owned by a governmental entity.

1.80 Changes to Standards.

Changes to standards may be granted for specific approvals or permits, affordable housing, or project wide applications, as follows.

1.081 Adjustments to Standards for Specific Approvals or Permits.

Minor adjustments to these Development Standards may be requested for specific approvals or permits in furtherance of the Flexibility Objectives set forth in section 1.5 of the Development

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Agreement, and are subject to approval by the planning director. Such adjustments are intended to be the exception rather than the rule, and may be approved only when necessary for circumstances not anticipated by these Development Standards. Variances from the provisions of the Snoqualmie Municipal Code may be requested for specific approvals or permits, following the process set forth the applicable section of the Snoqualmie Municipal Code.

1.082 Amendments to Standards

From time to time, amendments may be needed to add, delete, or modify the provisions of these Standards. These Standards may be amended upon approval of the City Council, and thus shall become effective immediately and incorporated into the existing provisions, provided that during the term of the Snoqualmie Ridge II Development Agreement all amendments to these Standards require the agreement of Quadrant except when such an amendment is required to address a serious threat to public health or safety or as otherwise provided in Section 4.1 of the Development Agreement.

1.090 Land Division

For subdivisions, binding site plans, or other land division applications refer to SMC Title 16.

1.100 Plan and Submittal Format

Detailed plans, prepared by a licensed engineer or architect, must be submitted to the City for plan review and approval prior to the commencement of any construction. Applicant's engineer and/or architect shall be registered as such in the State of Washington. All plans must be signed and stamped by the applicant's engineer and/or architect prior to submittal for plan review. Final plans shall be approved by the City Engineer prior to the start of construction.

Plans and profile drawings are required for all proposed transportation related improvements; street illumination; traffic signalization; storm drainage facilities; and sewer and water improvements. Profiles for water plans are only required at potential vertical conflicts with other utilities. On occasion, the scope of a project (i.e., relocating one hydrant) may not require engineered plans and can instead be handled through the building permit process.

All equipment, materials, and articles incorporated into the permanent work shall be approved in conformance with the requirements of Section 1-06 of the current "English unit" edition of the *Standard Specifications for Road, Bridge, and Municipal Construction* prepared by the Washington State Department of Transportation and the American Public Works Association, Washington State Chapter.

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1.101 Construction Plans

All construction projects submitting for grading or building permits must include engineering drawings stamped, signed, and dated by a professional engineer licensed in the State of Washington.
The plans must include the applicable requirements outlined below:

Final submittal of original plans shall be ink on Mylar prepared on 22-inch x 34-inch sheets. The minimum allowable scale shall be 1 inch = 50 feet.

Standard Plans need not be repeated on the plans unless required for plan clarification for the contractor, if being modified to suit a specific design, or as required by the City. However, standard plans shall be clearly referenced on the drawings.

Each submittal shall include a project information/cover sheet with the following information:

Title: Project name.
Table of Contents.
Vicinity map.
Legal description.
Name and phone number of utility field contacts, if known.
One-Call number, 1-800-424-5555.
Name and phone number of design surveyor.
Name and phone number of owner/agent.
Name and phone number of applicant.
Name and phone number of engineering firm preparing plans.
City of Snoqualmie pre-construction notification requirements.

A title block shall be provided on each sheet. The title block shall list as a minimum the project or development title, the name, address, and phone number of the firm or individual preparing the plan, a revision block, date, page (of pages) numbering, and sheet title (e.g. Road and Drainage, Water and Sanitary Sewer, etc.)

All sheets shall have an outlined approval box 4½ -inches x 1¼ inches in the lower right corner. The box shall layout matching the direction of text on the sheet. The word Approved shall be printed in the top left corner of the box. Space shall be provided for an approval signature and date over the printed words City of

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Snoqualmie and Date.

All plans must have a NORTH arrow and drawing scale bar in the upper right corner. Acceptable plan scales are 1"=10', 1"=20', 1"=30', 1"=40', 1"=50', and 1"=100'. The drawing scale in text form does not need to be included with the scale bar. For profiles, the vertical scale shall be 1"=5' unless otherwise approved by the City Engineer.

Each plan sheet shall contain a table indicating the coordinates of all horizontal control points including PC, PT, and PI of curves.

Plans shall describe and show the locations of temporary or permanent benchmarks used in the design survey, if required by the City.

Sensitive areas and buffers, including Parkway and perimeter buffers, shall be shown on the plans.

Existing features shall be shown with dashed lines, and/or half-toned (screened).

Plan revisions shall be highlighted with clouds, numbered, and titled with date in the revision block.

Plan sheets shall show all property lines, right-of-way lines, and easements. Coordinates for all easement angle points and curves shall be shown.

In all cases where water, sewer or storm drain lines are to be placed in an easement, the easement shall be shown with sufficient measurement information to accurately lay out the easement prior to construction. If approved in advance by the City Engineer, easements may be "As-Built" but must be accurately shown on the record drawings for the project. All publicly maintained lines and appurtenances within private property must be contained within easements.

Each utility plan set shall contain the appropriate construction notes as shown in the Development Standards.

Existing and proposed contours must be shown on all plan sheets, unless otherwise approved in advance by the City Engineer. Contours shall be shown at 2-foot intervals. Contours shall be field verified for roadway and stream centerlines, floodplains and

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conveyance systems. Contours shall extend 50 feet beyond property lines to resolve questions of setback, cut and fill slopes, drainage swales, ditches, and access or drainage to adjacent property.

All existing utilities, structures, pavement, etc. that will be removed shall be labeled as "Existing to be removed".

Specifications shall be submitted with the plans if the General Notes and Special Notes do not adequately cover the project requirements.

Water and sanitary sewer may be designed on the same plan and profile sheets. Roadway and storm drainage may be designed on the same plan and profile sheets. All project utilities shall be highlighted for location on all utility design sheets and shown on profile sheets where crossings occur.
Four copies of the plans shall be submitted for first review. Review comments will be forwarded either by letter, marked-up plans, or a combination thereof.

Re-submittals shall include the reviewed marked-up drawings and written responses to the previous review. All previous review comments must be addressed in the re-submittal. Any changes to the plans not required by the previous review shall be highlighted and titled in the revision block.

1.102 Plan Review – New Construction Committee

All plans associated with Preliminary Plats and Final Plats shall be reviewed and approved by the New Construction Committee prior to submission to the City. Refer to the Design Guidelines for submittal requirements.

The City shall be provided by Quadrant or its successor with an agenda for all scheduled meetings of the New Construction Committee (NCC). The City Planning Department shall have an official role as a participant on the Snoqualmie Ridge II NCC for residential plan review and shall have ultimate authority to approve basic plans and elevations for consistency with the façade variation requirements of the Snoqualmie Ridge II Design Guidelines.

1.103 Plan Review – City

All plans are to be submitted to the City for review. The language and form of any necessary offsite easements or dedications shall be submitted for review along with the plans. All plan review fees must

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be paid before the engineering plan review process will begin. If the Applicant has established a Memorandum of Understanding (MOU) with the City, then the payment provisions of the MOU shall apply.

The initial turnaround time for the first review of plans submitted is normally two weeks. The engineer is then requested to submit the original drawings for approval or is notified of additional required revisions. Additional review time will be required if revisions are necessary.

Approved plans will be returned to the engineer only after the construction inspection fees have been paid.

1.104 Construction Control

Work performed for the construction or improvement of City roads and utilities whether by or for a private developer, by City employees, or by a City contractor, shall be in accordance with approved plans. It is emphasized that no work shall be started until such plans are approved. Any revision to such plans shall be approved by the City before being implemented. Failure to receive the City's approval can result in removal or modification of construction at the contractor's or developer's expense to bring it into conformance with approved plans. Minor plan modifications such as service location changes may be made in the field with approval by the City. Such changes shall be shown on the as-built drawings.

1.110 Inspection

All work performed within the public right-of-way or easements, or as described in these standards, whether by or for a private developer, by City employees, or by a City contractor, shall be in accordance with the WSDOT/APWA Standard Specifications, any approved plans and these standards. Unless otherwise approved, any revision to construction plans must be approved by the City before being implemented.

It is the responsibility of the developer, contractor, or their agents to notify the City in advance of the commencement of any authorized work. A preconstruction meeting and/or field review shall be required before the commencement of work. Inspection fees shall be paid on or before the preconstruction meeting, or at the time of final plan approval, whichever is sooner. Any necessary offsite easements or dedications are required before plan approval.

It is the responsibility of the developer, contractor or their agents to have an approved set of plans and any necessary permits on the job site whenever work is being accomplished.

The City shall have authority to enforce these standards as well as other

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referenced or pertinent specifications. The City will appoint project engineers, assistants and inspectors as necessary to inspect the work.

All specific inspections, test measurements or actions required for all work and materials are set forth in their respective chapters herein. Tests shall be performed at the developer's or contractor's expense. (See also SMC 12.16.680).

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 ordinance.

A project is considered final when a letter of acceptance is issued by the City to the party responsible for the project.

No water meters shall be released for any lot or building served by a project until final acceptance of the water extension has been granted, unless specifically approved in writing by the City Engineer or until satisfactory purity and pressure testing have been demonstrated.

1.120 Fees

Fees, charges or bonding requirement are established by the City Council by the passage of a resolution adopting a fee, charge, and bonding requirement schedule except where specifically set forth in the City of Snoqualmie Municipal Code (SMC).

All plan review fees are due upon submittal of plans for review.

All inspection fees are due before final, approved plans are released.

In addition, there are various miscellaneous service and connection fees and charges. All applicants are urged to request an estimate of these fees and charges from the City as soon as practical.

1.130 Bonding

RESERVED

1.140 Public Improvements

Improvements to be conveyed to the City shall be constructed pursuant to a Developer Extension Agreement.

1.150 Utility Locations

Utilities as defined in Section 1.070, within a right-of-way or easement on new roads or in roadways where existing utilities are not in conflict, shall be located as shown in typical sections on Drawings 2-03 through 2-07 (located at the end of Chapter 2). When practical, utilities are encouraged to be located in alleys. Where existing utilities are in place, new utilities shall conform to these standards

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as nearly as practical, yet be compatible with the existing installations. Deviations of location shall be approved by the City Engineer. Existing utilities shall be shown using the best information available. This verification may require exploration/excavation (potholing) if utilities are in conflict with proposed design. All new utilities other than regional power transmission lines or those located on private property owned by the utility shall be installed underground by the utility owning said facility and new and existing facilities shall comply with provisions as set forth in franchise agreements between the City and the utility when applicable. Determination of the location/placement of regional power transmission lines will be subject to a separate approval process in accordance with Condition 95.

1.160 Easements

Where public utilities and/or their conveyance systems cross private lands, an easement must be granted to the City. The applicant will generally process, record and file all easements, subject to approval of the Public Works Director and City Attorney. If the property is platted, any easements not shown on the plat may be conveyed when the short plat or final plat is recorded. All easements not shown on a plat must be prepared by a licensed land surveyor or engineering firm capable of performing such work.

Minimum easement widths shall be 10 feet for a single utility and 15 feet for dual utilities. Temporary construction easements shall be 30 feet minimum in total width, including the permanent easement. When trench depths exceed five feet or where pipe diameter or vault widths exceed four feet, a wider easement may be required by the City Engineer. Narrower easements may be approved by the City Engineer when they accomplish the purpose of the easement.

Offsite easements are required to be submitted in draft, unsigned for review and approval prior to plan approval. Signed copies are required prior to plan approval. Any change in design which places an amenity, e.g., water, sewer, sidewalk, etc., outside of the easement may necessitate stopping of construction until plan and easements can be resubmitted and approved. Plan review fee shall be based on the rate as established for third submittal fee.

1.170 Traffic Control

The developer/contractor shall be responsible for interim traffic control during construction on or along traveled roadways. Traffic control shall follow the guidelines of the WSDOT/APWA Standard Specifications. All barricades, signs and flagging shall conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD).

City utilities constructed within King County right-of-way shall follow all traffic control requirements as set forth by King County Department of Public Works and the MUTCD.

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When road closures and detours cannot be avoided the contractor/developer shall notify the City's Construction Inspector. The City may require a detour plan to be prepared, submitted and approved prior to closing any portion of a City roadway.

1.180 Call Before You Dig

All developers/contractors are responsible for timely notification of all utilities work in advance of any construction in right-of-way or utility easements. The utilities one-call Underground Location Center phone number is 1-800-424-5555.

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CHAPTER 2

2.000 STREETS

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CHAPTER 2

2.000 STREETS

2A GENERAL CONSIDERATIONS

The overall goal of this chapter is to provide a foundation for the development of an integrated, fully accessible transportation system that addresses the goals and vision of the Snoqualmie Ridge II community and the City as a whole. This chapter includes street standards for Snoqualmie Ridge II. Specific requirements for the Snoqualmie Parkway are not included in these Development Standards since it was designed and processed as an independent development proposal separate from the Mixed Use Plan.

The tendency of many communities to equate wider streets with better streets and to design traffic and parking lanes as though the street were a "microfreeway" is a highly questionable practice. Certainly the provision of two 11- or 12-foot clear traffic lanes is an open invitation to increased traffic speeds.

Residential Streets, American Society of Civil Engineers,
National Association of Home Builders, Urban Land Institute; 1990

Excessive street width requirements, based on outdated design concepts for local streets, add significantly to the cost of housing. While neighborhood streets are not intended to function as major thoroughfares, they should provide convenient access to homes and enhance neighborhood appearance and pedestrian safety.

Land Development
December, 1988

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These new neighborhoods of Snoqualmie parallel the historic city not only in architecture. The small town, low key atmosphere you find in the existing city is a model for Snoqualmie Ridge II. The new neighborhoods will be pedestrian friendly, where people can walk or bike comfortably along narrow, low-speed streets and interconnecting sidewalks.

Snoqualmie Ridge II will have roadways that may be narrower than those normally seen in subdivisions. Alleys in some areas will provide access to rear garages, making for an uncluttered streetscape at the front of the house. Sufficient room will be provided for safe, slow driving and on-street parking. Sidewalks and planting strips will create a comfortable separation between moving cars and people.

Some normally recognized development standards for street width have been modified to achieve these objectives. For example, the 1994 *Uniform Fire Code*, which provides standards for fire department access, is based on providing wider streets to accommodate fire trucks at all times. Snoqualmie Ridge recognizes the need for fire department access and strives to create a balance between fully unobstructed access (wide streets) and more comfortable, pedestrian friendly, low-speed, narrow streets. As such, care should always be taken to provide fire department access and plans will be reviewed with this in mind.

2B STREET CLASSIFICATIONS

2B.010 General

The functional classification of streets allows specific standards to be applied based on access needs, volumes, development type, and other street functions. There are two functional street classifications for Snoqualmie Ridge II. In general, the higher classification streets (neighborhood collectors and neighborhood connectors) are intended to provide more through traffic movement between neighborhoods and the Snoqualmie Parkway and less local access while the lower classification streets (local and minor access streets and alleys) are intended to provide more local access while discouraging through traffic movements.

Transitions between street types should be at intersections or a physical break in the street section should be provided on both sides of the street in order to provide a visual transition between the two road sections (see Street Classification Plans – Figures 2-01 and 2-02).

A general description of each classification is given in the following sections. Following each description are the typical design parameters that should be used for roadways within Snoqualmie Ridge II. These parameters are those used to establish the typical roadway sections found at the end of this chapter (Figures 2-03 through 2-07).

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2B.020 **Major Arterial (Snoqualmie Parkway)** will carry the majority of trips between major activity centers – in this case, I-90 and downtown Snoqualmie – as well as most traffic passing activity centers. Direct access to major arterials is limited to reduce traffic conflicts and to accommodate smooth through travel. Specific requirements for the Snoqualmie Parkway are not included in these Street Standards since it was designed and processed as an independent development proposal separate from the Mixed Use Plan.

2B.030 **Neighborhood Collectors** provide both land use access and traffic circulation within residential and commercial areas. Neighborhood collectors distribute trips from the principal and collector arterials to their ultimate destination, and collect traffic from local streets in neighborhoods and channel it into the larger arterial system.

From Figure 2-03

- 60-foot minimum right-of-way. The 60-foot right of way may be increased at intersections with the Snoqualmie Parkway to accommodate additional turning lanes.
- 28-34 feet of pavement, consisting of two 10-foot travel lanes, one 8-foot parking lane if parking on one side or two 7-foot parking lanes if parking on both sides, to be determined by the City during preliminary review.
- Parking is allowed on one or both sides
- 8-foot planter strips on each side if parking on one side only
- 6-foot planter strips on each side if parking on both sides
- 7-foot sidewalks on each side if parking on one side only
- 6 foot sidewalks on each side if parking on both sides

2B.040 **Neighborhood Connectors** provide added circulation, connectivity, and public safety by connecting parcels otherwise separated by sensitive areas or natural topography. The traffic is two-way with no parking allowed. Sidewalk is required on one side; however, the City may alternatively approve a paved or soft-surface trail connection to provide pedestrian circulation. The pedestrian connection shall be located either within the road right-of-way or within an easement in close proximity to the right-of-way. The planter strip between the sidewalk and the roadway may be eliminated, if necessary to minimize sensitive areas impacts.

From Figure 2-07

- 18-foot pavement width
- Two-way traffic with no parking
- Curb and Sidewalk one side only or, alternately; 2-foot hardened shoulder of gravel or pervious surface on each side if curb & sidewalk are eliminated.
- 32-foot right-of-way width with planter strip and sidewalk, 27-foot right-of-way width without planter strip, 22-foot right-of-way width without planter strip or sidewalk.

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Figures 2-01 and 2-02 show the approximate locations and classifications for the collector and connector streets currently anticipated in the Mixed Use Final [illegible]. The locations and classifications of those streets internal to each specific parcel (i.e. local and minor access streets and alleys) will be defined during the platting and/or development process associated with each parcel.

2B.050 Local Access Streets

2B.051 **Residential Local Access** (See Figure 2-04). Primary function is to provide for direct access to individual lots and connections to the larger roadway system. Local access streets offer the lowest levels of mobility.

- 50-foot right-of-way
- 2 travel lanes, 28-foot total pavement width
- 8-foot on-street parking allowed on one side only
- 5-foot sidewalks and planter strips on both sides (see Sections 2C.060 and 2C.090 for exceptions)

2B.052 **Minor Access** streets are a sub-classification under local access streets. Their primary function is to provide direct access to individual lots and connection to local access streets. Minor Access streets typically create a circular traffic pattern around a traffic island/green space or small park. The traffic is two-way with no parking allowed. Sidewalk is required on one side (the lot side of the street). A 5-foot wide planter strip is required between the sidewalk and street. Parking on one side only can be provided by adding an 8-foot parking bay where appropriate, or a 20-foot deep parking bay for perpendicular parking where additional right-of-way is provided, as approved by the City.

From Figure 2-05

- Two 10-foot travel lanes
- 8-foot parking lane optional
- Two-way traffic with no parking except as noted
- 32-foot right-of-way width
- 40-foot right-of-way with parking bay
- 5-foot planter strip required.
- 5 –foot sidewalk required.

2B.053 **Alleys** are a sub-classification under local access streets. Alleys provide very low speed access between land uses and local streets or collectors. The geometry of alleys discourages through traffic movements and usually restricts travel to only those land uses directly abutting the alley. Alleys can allow driveways, garages and utilities to be removed from the front of houses, thus creating a

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less cluttered landscape. Removing driveways can allow for more on-street parking. For efficient access for all residences on an alley, alleys shall connect to streets at both ends. Franchised utilities shall be placed in alleys when practical. See Development Standard Chapters 3 (Storm Drainage), 4 (Water) and 5 (Sanitary Sewer) for other information. In general, dead-end alleys should only be used where appropriate to site houses to take advantage of public open spaces or to address other site constraints and shall provide a turnaround where the dead end distance exceeds 150 feet.

From Figure 2-06

- 11-foot pavement width for residential alleys
- 2-foot planter strips both sides for residential alleys
- 18-foot right of way width
- 3-foot thickened edge asphalt curb on one side for drainage control

Where alleys meet any other street classification, the following signage and demarcation features shall be installed to enhance sight distance and improve safety (See Figure 2-21).

- Install 8" wide white extruded MMA or thermoplastic rumble strip demarcations per detail at a distance 15 feet behind sidewalk (or intersecting street if no sidewalk)
- Paint curbs on intersecting street for a distance of 20 feet in both directions from the alley intersection. Use high visibility industrial enamel safety yellow.
- Limit the height of fences and vegetation on the corner lots of the alley per SR II Residential Design Guidelines to enhance sight distance.

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TABLE 2-1
STREET STANDARDS

Design Standard	Neighborhood Connector	Neighborhood Collector	Residential Local Access	Minor Access	Alleys
Figure No.	2-07	2-03	2-04	2-05	2-06
Access considerations[1]	no residential	some limited access	driveway access allowed	driveway access allowed	driveway access
Connectivity (See Section 2C.030)		yes	yes	n/a	n/a
Cul-de-sacs (See Section 2C.050)	n/a	no (see text)	700 feet max. length 40 feet radius[10, 11]	no	no
Curb (See Section 2C.060)	optional	vertical concrete curb and gutter:	vertical concrete curb And gutter:	vertical concrete curb & gutter: see 2C.050[11]	none[11]
Design Speed	25 mph	30 mph	See Note 8 below	See Note 8 below	n/a
Driveway Widths[9] (See Section 2C.080)	n/a	Residential: up to 10 feet for single bay garages; up to 16 feet for double or triple bay garages.	Residential: up to 10 feet for single bay garages; up to 16 feet for double or triple bay garages.	Residential: up to 10 feet for single bay garages; up to 16 feet for double or triple bay garages.	n/a
Grades[2]	0.5%-15%	0.5%-15%	0.5%-15%	0.5%-15%	0.5%-15%
Intersection curb radii[11]	20 feet	30 feet	20 feet	20 feet	20 feet
Intersection spacing[4]	n/a	250 feet	125 feet[6]	125 feet	n/a
Laneage	2 travel lanes	2 travel lanes	2 travel lanes (includes parking)	2 travel lanes	1 travel lane
Lane width (travel)	9 feet	10 feet	shared lanes; see Total Pavement Width	10 feet	11feet
Lane width parking (See Section 2C.160)	no parking	7-8 feet	included in travel lane width	no parking (unless approved by City)	no parking
Total pavement width (See Section 2C.140)	18 feet (See Fig. 2-7)	28-34 feet	28 feet for 2 lane street w/ parking on one side	20 feet	14 feet
On-Street Parking	Not allowed	allowed on both sides in retail area. 1 side residential	allowed on one side, see pavement width	no parking	no parking
Medians (see 2B.030 & .070)	n/a	No	where appropriate at entry points	no	no
Planter strips	5 feet on one side [12]	6-8 feet on both sides	5 feet on both sides	5 feet on lot side	2 feet on both sides
ADT Capacity	n/a	8000-10,000	8000- 10,000	50-200	50-200
Right-of-way	22 to 32 feet [12]	60 feet (min)	50 feet (min.)[6]	32 feet	18 feet
Sidewalks	5 feet one side[12]	6-7 feet both sides	5 feet both sides[5]	5 feet on lot side	no
2 Lane width (travel)	18'	Varies	shared lanes; see Total Pavement Width	18'	na

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Footnotes to Table 2-1

1. Access, including right-of-way width and cul-de-sac length, may be varied at the discretion of the City Engineer.
2. The maximum grade shown may be exceeded for short distances of 300 feet or less, upon showing that no practical alternative exists.
3. Bulb outs are required at all neighborhood collector intersections, unless the City Engineer determines that bus and emergency vehicle turn movements require a bulb out to be eliminated or reduced in width. The bulb outs shall extend from the planter the width indicated above and shall be 60 feet long as measured from the curb of the intersecting street, if extended, to the transition point of the bulb out back to the full pavement width. (See Figure 2-20).
4. Intersections with alleys may occur more frequently subject to approval by the New Construction Committee and the City Engineer.
5. Local access streets in low density residential neighborhoods (1-2 du/acre) are expected to have low pedestrian volumes. Some local access streets encircle "island" miniparks that do not border residential lots. These streets may be constructed with sidewalks on one side only.
6. Right-of-way width may be reduced to 45 feet in low density residential neighborhoods if sidewalk is constructed on one side only. See Note 5 above.
7. Where lots front on neighborhood collectors, but are served by alleys, garage setbacks shall be a minimum of 27 ft. from centerline of alley to provide for additional off-street parking (See Section 11A.030 (C)). As an alternative, a clustered parking arrangement off of the alley may be provided.
8. Refer to Section 2.10 of the King County Road Standards (1993) for horizontal geometrics of Intersections and Low Speed Curves for streets classified as local access and below. Curb radii shall be in accordance with Table 2.1 of these Development Standards.
9. Driveway widths at the street for side-loaded single, double or triple bay garages may be up to 10 feet.
10. In situations where a portion of the property can only be served by a single access, the cul-de-sac may exceed 700 feet as determined by the City.
11. The curb radii at bulb-outs shall be increased to accommodate bus and emergency vehicle turning movements where necessary.
12. Planter strip and/or sidewalk may be eliminated with City approval when to do so would lessen impacts to sensitive areas. Sidewalk may also be eliminated when an alternative trail scheme is provided.

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2C STREET CLASSIFICATION STANDARDS

2C.010 General

Street design and layout should be based on the function of the street, the loadings on the street, the general terrain, the type of development being served, and the goals and vision of Snoqualmie Ridge II and the City. As such, street construction plan submittals to the City should include the following information.

- Street classifications
- Design speed
- Cross section
- Pavement section
- Street plantings/street side facilities
- Traffic control and street name plan
- Number of lots to be served by the street
- Average lot width to be served by the street
- Proposed lot loading (from street or alley)
- Forecasted travel demand volumes (vehicular and non-motorized)
- Emergency vehicle access plan
- Parking prohibitions or limitations
- Sidewalk/trail plan
- Other pertinent information

At the discretion of the City Engineer, some of the above information may not be required to be shown on street construction plans if it was included as part of the review process for an approved preliminary plat or other development proposal (i.e. number of lots to be served, average lot width, forecasted travel demand volumes, etc.).

The standards listed in this chapter by street classification are shown in Table 2-1. These standards may include a range of allowable values. The actual design values used must fall within these ranges and be supported by an evaluation of the above features. This requires design and engineering study for each street. Additional design criteria relevant to all streets are included in Section 2D of this chapter.

2C.020 **Access Considerations** – Access will be limited based on the street classification in accordance with the Mixed Use Final Plan. Access is prohibited on the neighborhood connector streets. Access is less restricted on neighborhood collectors and is least restricted on local and minor access streets and alleys. On neighborhood collector streets, access to homes should be provided by alleys or intersecting local access streets rather than driveways off the collector.

Along neighborhood collectors, no driveway access will be allowed within 150 feet of the nearest right-of-way of an intersecting street.
Access may be varied at the discretion of the City Engineer.

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2C.030 **Connectivity** – Street layout and plat design shall create efficient well-connected streets and alleys. The alignment of neighborhood collectors and connectors shall conform as nearly as possible with that shown in the Mixed Use Final Plan. The alignment of local access streets should provide for the connection of these streets within and between adjoining parcels within Snoqualmie Ridge II, with four-way intersections encouraged. The alignment of neighborhood collectors should provide for their continuation into other existing, proposed or potential adjoining parcels. Alleys shall connect to streets on both ends.

2C.040 **Alleys** – Alley-accessed lots provide for a better street-front pedestrian environment than streets with front-load driveways, because with alleys driveways do not cut across the sidewalk. The use of alleys is encouraged in higher density single family detached and attached housing (i.e. 6 units/acre net and greater). In evaluating the extent to which alleys can be provided, the following factors shall be considered:

- pedestrian and vehicular circulation
- logical layout of street system
- the creation of a cohesive sense of neighborhood
- topography
- location of sensitive areas
- anticipated traffic volumes on frontage roads

2C.050 **Cul-de-sacs** – In most neighborhoods, cul-de-sacs will be allowed only for physical constraints such as wetlands, excessive natural grade differential between parcels, emergency vehicle access needs, or to efficiently serve difficult-to-access areas of land that could not otherwise be served by a connected street.

Where cul-de-sacs are used, they should be the shortest possible length to adequately address the constraint within the neighborhood. Cul-de-sacs will have a maximum length of 700 feet unless a secondary Emergency Vehicle Access (EVA) is provided. In situations where a portion of the property can only be served by a single access, the cul-de-sac may exceed 700 feet, as determined by the City.

The bulb radius shall be 40 feet for a residential cul-de-sac and 40-45 feet for commercial cul-de-sacs. Larger radii create large expanses of pavement which may be unsightly and increase impermeable area. The use of an island may be considered, but adequate room should be left for maneuvering. (See Total Pavement Width Standard (2C.130) for one-way streets).

Cul-de-sac bulbs should not exceed 6% cross-slope grades. Temporary cul-de-sacs may be allowed on neighborhood collectors and local access streets when future extensions of streets are anticipated (See Figure 2-18). A cul-de-sac is considered a vehicle turnaround, which differs from a parking court. Parking courts may be allowed in multi-family lots.

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To promote pedestrian connectivity, walkways are encouraged from cul-de-sac bulbs to adjacent streets, trails, cul-de-sacs, or undeveloped parcels. The exact location and design of the walkways will be determined during the preliminary plat or binding site plan approval process.

2C.060 **Curb** – Vertical face cement concrete curb and gutter is required except as follows: Alleys, local access streets in residential neighborhoods with gross densities under 3.5 homes per acre, and road may have thickened edge asphalt curb as a substitute for the vertical curb requirement. (See Figure 2-19.) Curb cuts for access should be constructed to avoid grade changes on sidewalks when sidewalks are set back from street.

Curbs shall be constructed per the curb standard drawing at the end of this chapter (Figure 2-08). At driveway locations, refer to the driveway curb standard drawing at the end of this chapter (Figures 2-09 and 2-10).

2C.070 **Design Speeds** are given in Table 2-1. Design speed is a function of classification, terrain and development. Design speeds affect actual traffic speeds, roadway curvature, capacity and safety. Lower design speeds should be used in areas where steeper grades and/or curvilinear roadways are expected, in areas where pedestrian activity is greater, and in areas of higher density development.

Design speeds shall be used to determine the various design features of a street, such as horizontal and vertical curvature. Geometric design for streets classified as local access and below shall be based on Section 2.10 (Intersection and Low Speed Curves) of the King County Road Standards (1993) except for curb radius which shall be per Table 2-1 of these Development Standards.

2C.080 **Driveways** reduce street frontage available for parking and planter strip landscaping. Street frontage affected by driveways may be reduced by sharing driveways and reducing driveway width. Driveway locations should also be reviewed for sight distance and general operations before approval.

Residential driveway widths are based on the number and orientation of garage bays. For front-loaded garages, residential driveways may be up to 10 feet wide for single bay garage, and up to 16 feet wide for double and triple bay garages. To minimize disruption of the sidewalk, these maximum widths should be reduced where due to lot width, lot depth, house location, building type, and/or topography a reduced driveway width would allow vehicles to easily and safely maneuver from the garage to the street. Driveway widths at the street for single, double and triple bay garages that are side-loaded and for garages at the rear of the lot may be up to 10 feet wide. Shared driveways between adjoining lots are encouraged and should be used on cul-de-sacs and other locations where lot frontage is narrower than standard lots in a plat, but should not be used to create lots with no street frontage. Hollywood Driveways are allowed. Commercial

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driveways shall not exceed a width of 30 feet. No commercial driveway will be approved where backing onto the sidewalk or street will occur.

2C.090 **Grades** – To ensure adequate drainage, a minimum road grade of 0.50% should be maintained, unless a lesser grade is approved by the City Engineer. Maximum grades shown in Table 2-1 should be used only if necessary due to terrain. Maximum grades shown in Table 2-1 may be exceeded for short distances of 300 feet or less, upon showing that no practical alternative exists. For steeper grades where no other access is permitted, fire department regulations may require residences to have sprinkler systems. Grade transitions shall be constructed as smooth vertical curves except at intersections where the difference in grade is one percent or less. For grade changes, vertical curves consistent with guidelines in "A Policy on Geometric Design of Highways and Streets," 1990 (AASHTO) should be used.

2C.100 **Intersection curb radii** – Curb radii are given in Table 2.1 for different street classifications. Generally, when pedestrians and slow speeds are more desirable, smaller radii should be used, and when higher traffic flow is more desirable, larger radii should be used. At intersections with streets of different classifications, the curb radii of the street with the higher classification shall be used.

Larger curb radii may be required to accommodate fire apparatus needs, particularly at the intersection of alleys and narrow streets. Alternatively, smaller curb radii may be allowed and still accommodate fire apparatus needs by providing sufficient parking restrictions adjacent to intersections. A typical parking restriction would prohibit parking within a distance of 30 feet from the extended curb line of the intersecting street. Before smaller curb radii are approved, other design factors that affect available turning radius for fire apparatus needs such as roadway width, intersection angle and parking allowed must be considered.

2C.110 **Intersection Spacing** – Minimum distances between intersections is needed to allow for adequate queuing and access control. Distances shown in Table 2-1 are between centerlines of adjoining intersections. All intersection locations should also be reviewed for sight distance and general operations before approval.

2C.120 **Lane configurations** are primarily determined by traffic volumes, parking needs and street classification. Neighborhood collectors may share their two travel lanes with parking. Turn lanes may also be allowed. Local and minor access streets are two lanes. Residential local access may share their travel lanes with parking. Alleys are one lane only.

2C.130 **Lane widths** are associated with roadway classification, parking needs, travel demand and development type.
Wider lanes are appropriate when parking is allowed, when higher travel volumes are anticipated, or when office or commercial land use predominates.

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Narrower lanes are more appropriate when it is important to reduce speeds, reduce accident severity, reduce noise, reduce storm water runoff and create a village-scaled streetscape.

See Table 2-1 and Figures 2-03 through 2-07.

2C.140 **Total Pavement Width** depends upon the number of lanes, parking requirements and street classification.

Local access streets share travel lanes and parking lanes. Local access street pavement width for a two-lane street is 28 feet.

Total pavement width for a minor access street is 20 feet.

Total pavement width is measure from face of curb to face of curb for minor arterials, collectors and local access streets with vertical curbing and between edges of asphalt on streets with thickened edge asphalt (see Section 2C.050).

2C.150 **Medians** may be included where appropriate for entry points and as shown for specific street sections. (See Figures at the end of this chapter). The entry point medians would be for decorative purposes only but could concurrently be used to help channelize traffic flow. Medians are not allowed in alleys.

2C.160 **On-Street Parking** – On-street parking is allowed as provided in the descriptions for the individual street sections (See Section 2B). The sides of the streets on which parking will occur shall be shown on the roadway design plans.

2C.170 **Planter Strips** are 5 to 8 feet wide (see section 2B.), except in residential alleys where they are 2 feet wide. Wider planter strips may be used on neighborhood collectors to promote pedestrian orientation and safety (See Figure 2-03). Planter strips are required on minor access street adjacent to lots that front the street (see Figure 2-05). Street trees will be located in planter strips of five or more feet (see Landscape Standards – Chapter 8).

2C.180 **Recommended Average Daily Traffic (ADT)** – Recommended average daily traffic volumes can be used as guidelines, but should not be the primary consideration of street classification. For local streets with lower travel speeds, resident's expectations, driveway access, pedestrian activity, land use, and travel speeds are the primary street classification considerations. It is reasonable that while some streets may not fall within their ADT range, they may still satisfy the classification based on their function.

2C.190 **Right-of-Way** is generally located as shown on Figures 2-03 through 2-06. For commercial alleys, right-of-way is located at the back of roadway pavement and for residential alleys it is located at the back of the planter strip. Street right-of-ways may contain sidewalks, planter strips, utilities and signage.

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2C.200 **Sidewalks** are a minimum of 5 feet wide for local, minor access streets, and from 6 to 8 feet on neighborhood collectors depending on whether parking is provided on one or both sides of the street. Sidewalks are a minimum of 5 feet wide on neighborhood connector roads unless the City approves a separated trail in lieu of a sidewalk within the right-of-way. The City shall receive an access easement for any sidewalks located outside dedicated public rights-of-way.

2C.210 **Solar Orientation** should be considered in designing local access street layouts. Within the limitations of traffic circulation, topography and efficient land planning, local access streets with an east-west orientation should be emphasized over north-south orientations to allow individual homes to benefit from southern exposure.

2D GENERAL DESIGN CRITERIA

2D.010 **General**
In addition to the street classification standards, other general design criteria apply to all streets and transportation facilities, regardless of classification.

2D.020 **Bollards** may be used when necessary to deny motor vehicle access to an easement, tract or trail. Spacing should not exceed 50" on centers and should be constructed to be removable and locking to allow passage of maintenance and emergency vehicles. They may be constructed per the standard drawing at the end of this chapter (Figure 2-13) or may use an alternative design if approved by the New Construction Committee

2D.030 **Construction Activities** – A pre-construction meeting shall be held with the City and any designated representatives of the New Construction Committee. This meeting will identify construction inspections, construction coordination needs and construction testing requirements. All required testing will be done, at the developer's or contractor's expense, in accordance with the latest English edition of the *Standard Specifications for Road and Bridge Construction of the Washington State Department of Transportation (WSDOT)* or the *American Public Works Association (APWA) Standard Specifications.*

2D.040 **Construction Specifications** - Construction shall meet the latest English edition of the *Standard Specifications for Road and Bridge Construction of the Washington State Department of Transportation (WSDOT)* or the *American Public Works Association (APWA) Standard Specifications.*

2D.050 **Engineering and Surveying** - Street plans shall be prepared and signed by a licensed civil engineer registered in the State of Washington. All street grading shall be staked by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed by the State of Washington.

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2D.060 **Handicap Ramps** must be provided in accordance with the standards of state and federal law. Handicap ramps shall be constructed per the handicap ramp standard drawings at the end of this chapter.

2D.070 **Horizontal Curvature** should be based in accordance with the design speed for the roadway. Minimum horizontal curve radii must conform to: "A Policy on Geometric Design of Highways & Streets, 1990 AASHTO" except for roads classified as local access and below. These streets shall be designed in accordance with Section 2.10 (Intersections and Low Speed Curves) of the King County Road Standards (1993). Super elevation is not recommended for use on roads with design speeds of 30 mph or less. Refer to section 2C.090 and Table 2-1 for allowable intersection curb radii.

2D.080 **Lateral Clearance** between edge of street (i.e. face of curb) and any fixed object (excluding traffic control signs and break away supports) shall be 3 feet except for local and minor access streets where the clearance shall be 2 feet.

2D.090 **Mailboxes**

A. During construction, existing mailboxes shall be accessible for the delivery of mail or, if necessary, moved to a temporary location. Temporary relocation shall be coordinated with the U.S. Postal Service. The mailboxes shall be reinstalled at the original location, or if construction has made it impossible, to a location as outlined below and approved by the U.S. Postal Service.

B. Location shall be as follows unless otherwise specified by U.S. Postal Service regulations:
   1. Bottom or base of box shall be 36 inches to 42 inches above the road surface.
   2. Front of mailbox 18 inches behind vertical curb face or outside edge of pavement
   3. Mail boxes should be placed on the same side of the street with "no parking" signs wherever possible.

C. Mailboxes shall be set on posts strong enough to give firm support but not to exceed 4 x 4 inch wood or one 1-1/2 inch diameter pipe, or material and design with comparable breakaway characteristics.

2D.100 **Private Streets** – Private streets may be allowed for road classifications of local access and below if approved by the New Construction Committee and the City of Snoqualmie. Such streets shall be permanently established by right-of-way, 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. The street sections shall be built in accordance with these Development Standards and accessible at all times for emergency and public service vehicle use. Easements shall be provided

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to the City of Snoqualmie and/or other agencies for the purpose of maintenance of any public utilities within the private street.

Private streets shall be clearly described on the face of the plat, short plat, or other development authorization and clearly signed at street location as a private street. The City of Snoqualmie is not responsible for maintenance of any private street. Such streets shall be maintained by a capable and legally responsible owner or homeowner's association or other legal entity made up of all benefited property owners.

2D.110 **Side Slopes** shall generally be constructed no steeper than 2:1 on both fill slopes and cut slopes. Steeper slopes may be approved by the City Engineer upon showing that the steeper slopes, based on soils analyses, will be stable. Side slopes shall be stabilized by grass sod or seeding, or by other planting or surfacing materials acceptable to the New Construction Committee and the City.

2D.120 **Sight Distance** must be considered for vertical curvature and intersection design. Sight distance must be adequate to satisfy the requirements of: "A Policy on Geometric Design of Highways & Streets," 1990 (AASHTO). Refer to Chapters III and IX in AASHTO for more information. This requirement applies to all physical structures, plantings or ground-lines located adjacent to intersections.

2D.130 **Street Names** – All streets shall be named and not numbered. Names should be determined at the time of preliminary plat approval. All street names are subject to review by the City and the New Construction Committee. In general, streets and courts should run east/west, avenues and places should run north/south, and loops are small loop type streets which carry the name of the street from which they originate. Street signs shall be placed at all intersections (except alleys).

2D.140 **Street Section** (pavement design and subgrade depth) – The minimum paved section, with alternative combinations of materials, for local and minor access streets and alleys shall be as indicated below. These sections are acceptable only on visually good, well-drained, stable compacted subgrade. Any proposed exception to these materials will be subject to soils strength testing and traffic loading analysis and subject to review and approval by the City Engineer as outlined in Section 2D.142 below.

2D.150 **Local and Minor Access Streets and Alleys**
Alternative I: Asphalt Concrete (AC) – 2" Asphalt Treated Base (ATB) – 4"
Alternative II: Asphalt Concrete (AC) – 2"
Crushed Surfacing Top Course (CSTC) – 1-1/2"
Crushed Surfacing Base Course (CSBC) – 5"

Note: All depths are minimum compacted depths

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2D.160 **Requirements for Local and Minor Access Street and Alleys on Poor Subgrade**

The minimum material thicknesses indicated in Section 2D.141 are not acceptable if there is any evidence of instability in the subgrade. This includes free water, swamp conditions, fine-grained or organic soil, slides or uneven settlement. If there are any of these characteristics, the soil shall be sampled and tested sufficiently to establish a pavement design that will support the proposed construction. Any deficiencies, including an R value of less than 55 or a CBR of less than 20, shall be fully considered in the design. Remedial measures may include, but are not limited to a stronger paved section, a strengthening of subgrade by adding or substituting fractured aggregate, asphalt treated base, installing a geotextile, more extensive drainage or a combination of such measures. Both the soils test report and the resulting pavement design will be subject to review and approval by the City Engineer.

2D.170 **Neighborhood Collectors** – Any pavement for neighborhood collector streets shall be designed using currently accepted methodology that considers the load bearing capacity of the soils and the traffic-carrying requirements of the roadway. Plans shall be accompanied by a pavement thickness design based on soil strength parameters reflecting actual field tests and traffic loading analyses. The analysis shall include the traffic volume and axle loading, the type and thickness of roadway materials and the recommended method of placement.

2D.180 **Structural Design** procedures shall conform to accepted engineering practices approved by a registered professional engineer.

2D.190 **Traffic Calming** is a planning approach that, in general, integrates traffic mobility with a pedestrian-friendly environment. Traffic calming techniques, such as narrow traffic lanes, interrupted sight lines, neck-downs, and protected parking bays are encouraged.

Speed bumps and speed humps are prohibited in public rights-of-way and may be used in other areas only with approval of the New Construction Committee.

2D.200 **Traffic Control** is needed to insure street safety by providing for the orderly and predictable movement of traffic, both motorized and unmotorized. It is also used to provide guidance and information. The Manual on Uniform Traffic Control Devices (MUTCD) as modified by the Washington State Transportation Commission shall be followed in providing required signage, pavement markings and other traffic control. The MUTCD should also be followed for any traffic control needed for construction activities.

The following information in this section supplements the MUTCD. Consideration should be given to providing additional traffic control such as stop signs, yield signs or traffic circles on local access streets to clarify rights-of-way for drivers and pedestrians.

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The length of left turn tapers when used should be at least equal to the width of the left turn lane multiplied by the posted speed divided by three. For tapers channelized with pavement marking, either a reverse curve or straight configuration may be used.

Crosswalks should be marked when there is substantial conflict between vehicle and pedestrian movements but should not be used indiscriminately.

All long line markings (center line, edge line, lane line, etc.) shall be reflectorized hot or cold applied paint either extruded or sprayed. All other pavement markings (crosswalk, stop line, turn lane, traffic arrow, traffic letter, railroad markings, etc.) shall be reflectorized Type A – Liquid Hot Applied Thermoplastic. All markings shall include glass beads that provide and maintain reflectance as the material wears.

Center lines and lane channelization are required for (although not necessarily limited to) arterial streets only.

2D.210 **Utility Easements** may extend beyond the street right-of-way.

2D.220 **Vertical Clearance** above the paved roadway surface shall be a minimum of 15 feet. Vertical clearance of structures above a walkway surface should be a minimum of 8 feet.

2D.230 **Top Lift Timing** - Before the final lift of asphalt concrete pavement (wearing course) can be placed; all utilities, crossings, adjustments, etc shall be performed. Developer/builder shall inspect curb and gutter and ATB or base material with City's field representatives prior to paving and perform all repairs to damage of those improvements before wearing course placement. It is strongly recommended that developers/builders delay placement of wearing course as long as possible to finish lot grading, home-building, and planter strip construction activities where damage to curb & gutter and wearing course is most likely.

2D.240 **Overlay Requirements** - If roads are open cut or if damage to asphalt concrete pavement wearing course occurs as a result of Developer/builder activities, then grinding and overlaying of the entire street width within 25 feet of either side of the damaged section, as determined by the City, may be required. Continuous grinding and overlay beyond 25 feet of either side of the damaged section may be required depending on the extent and number of damages to avoid conditions such as, checkerboarding of the road surface, uneven driving conditions, or similar conditions. This section shall not be interpreted to mean that patching is not allowed nor that damage to pavement requires overlay, as determined by the City.

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LIST OF STANDARD DRAWINGS

CHAPTER 2 – STREETS

TITLE	DRAWING
Street Classification Plan – North	2-01
Street Classification Plan – South	2-02
Neighborhood Collector	2-03
Residential Local Access Street	2-04
Minor Access Street	2-05
Alley	2-06
Neighborhood Access Connector	2-07
Cement Concrete Curb and Gutter	2-08
Driveway Curb and Gutter Section	2-09
Reverse Slope Driveway	2-10
Sidewalk	2-11
Sidewalk Spacing	2-12
Bollard Detail	2-13
Curb Ramp Collector #1	2-14
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Hammerhead Turnarounds w/Fire Access	2-16
Hammerhead Turnarounds without Fire Access	2-17
Temporary Cul-de-Sac	2-18
Thickened Edge Asphalt Curb	2-19
Typical Bulb-Out Intersection	2-20
Alley Exit Restrictions	2-21
City Monument Detail	2-22
Asphalt Patch Detail	2-23
Mailbox Pad Detail	2-24
Street Sign Detail	2-25

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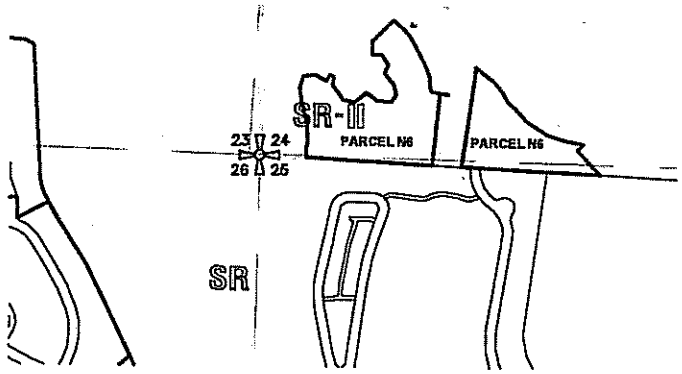

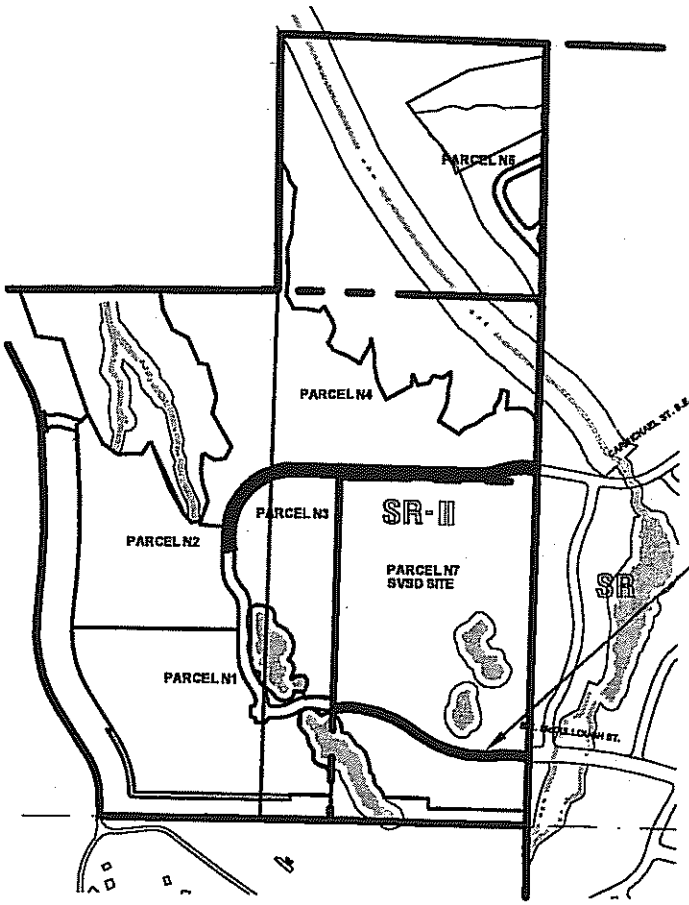

STREET CLASSIFICATION PLAN, NORTH

NO SCALE

LEGEND

NEIGHBORHOOD COLLECTOR

SNOQUALMIE RIDGE II

STREET CLASSIFICATION PLAN NORTH

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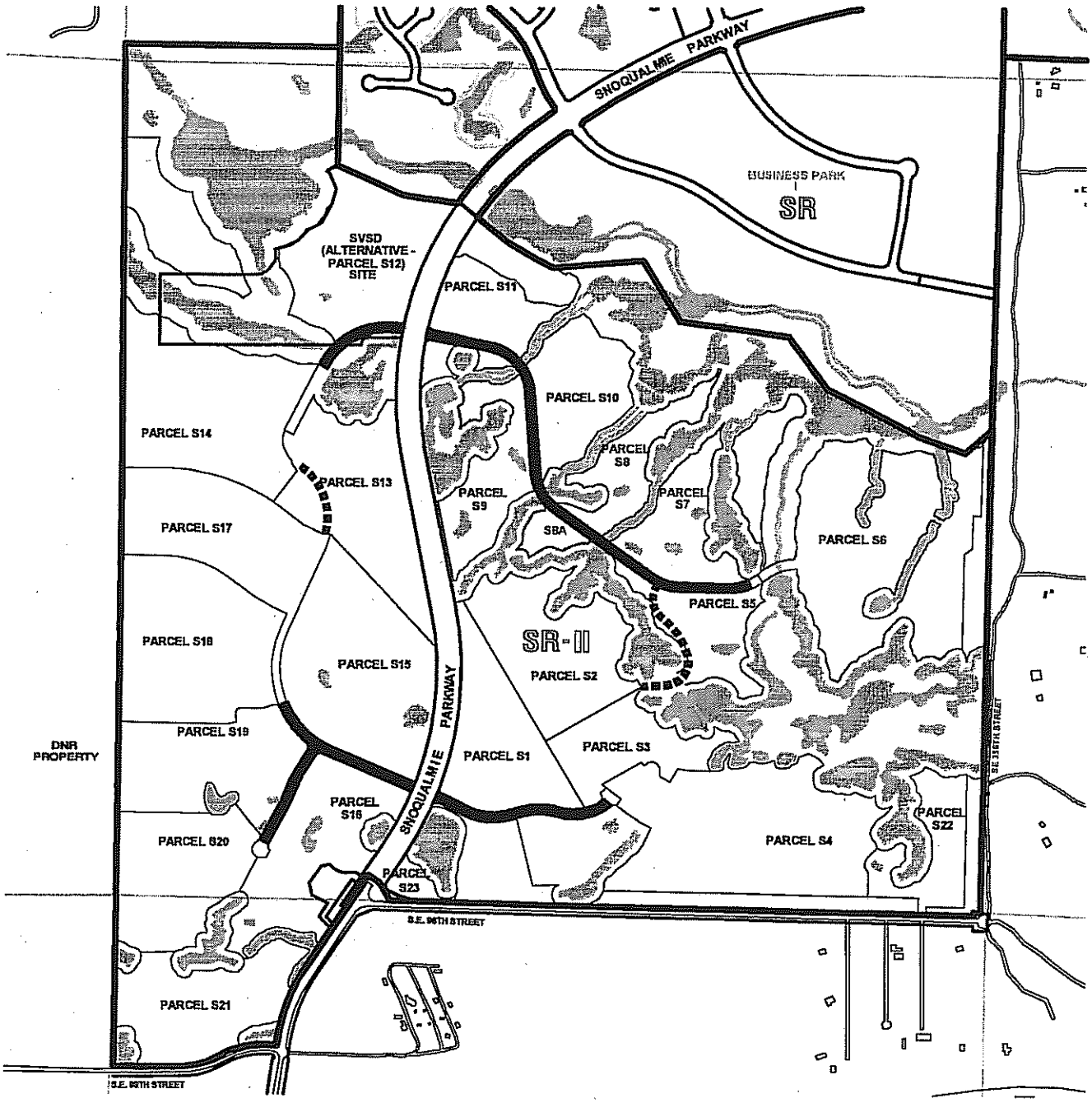

STREET CLASSIFICATION PLAN, SOUTH

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NEIGHBORHOOD COLLECTOR

NEIGHBORHOOD ACCESS CONNECTORS

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STREET CLASSIFICATION PLAN SOUTH

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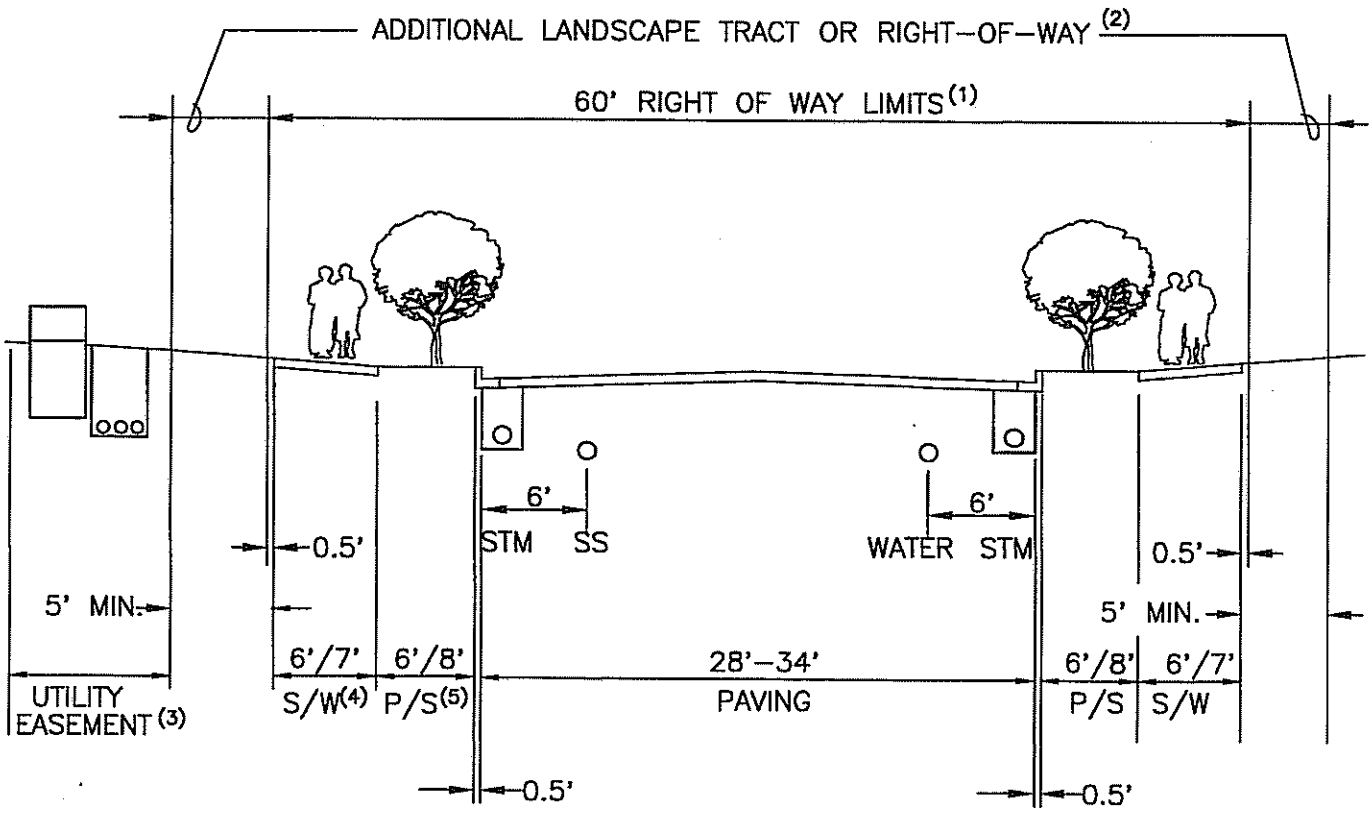

1. THE 60-FOOT RIGHT OF WAY MAY BE INCREASED AT INTERSECTIONS WITH THE SNOQUALMIE PARKWAY TO ACCOMMODATE ADDITIONAL TURNING LANES.
2. WHERE REAR OF LOTS/HOMES FACE COLLECTORS, A SIGNIFICANT LANDSCAPE TRACT NOT LESS THAN 15 FEET DEEP BETWEEN PUBLIC RIGHT-OF-WAY AND LOT LINES, PLANTED WITH TYPE II LANDSCAPING, SHALL BE PROVIDED.
3. WATER, GAS, PHONE, CATV, POWER MAY BE ON EITHER SIDE OF THE STREET. PUBLIC UTILITY SERVICES AND APPURTENANCES WILL TAKE PRECEDENT OVER PRIVATE UTILITIES.
4. 6 FOOT SIDEWALKS ON EACH SIDE IF PARKING ON BOTH SIDES, 7 FOOT SIDEWALKS ON EACH SIDE IF PARKING ON ONE SIDE ONLY.
5. 6 FOOT PLANTER STRIPS ON EACH SIDE IF PARKING ON BOTH SIDES, 8 FOOT PLANTER STRIPS ON EACH SIDE IF PARKING ON ONE SIDE ONLY.

NEIGHBORHOOD COLLECTOR

NO SCALE

	SNOQUALMIE RIDGE II			
	NEIGHBORHOOD COLLECTOR			
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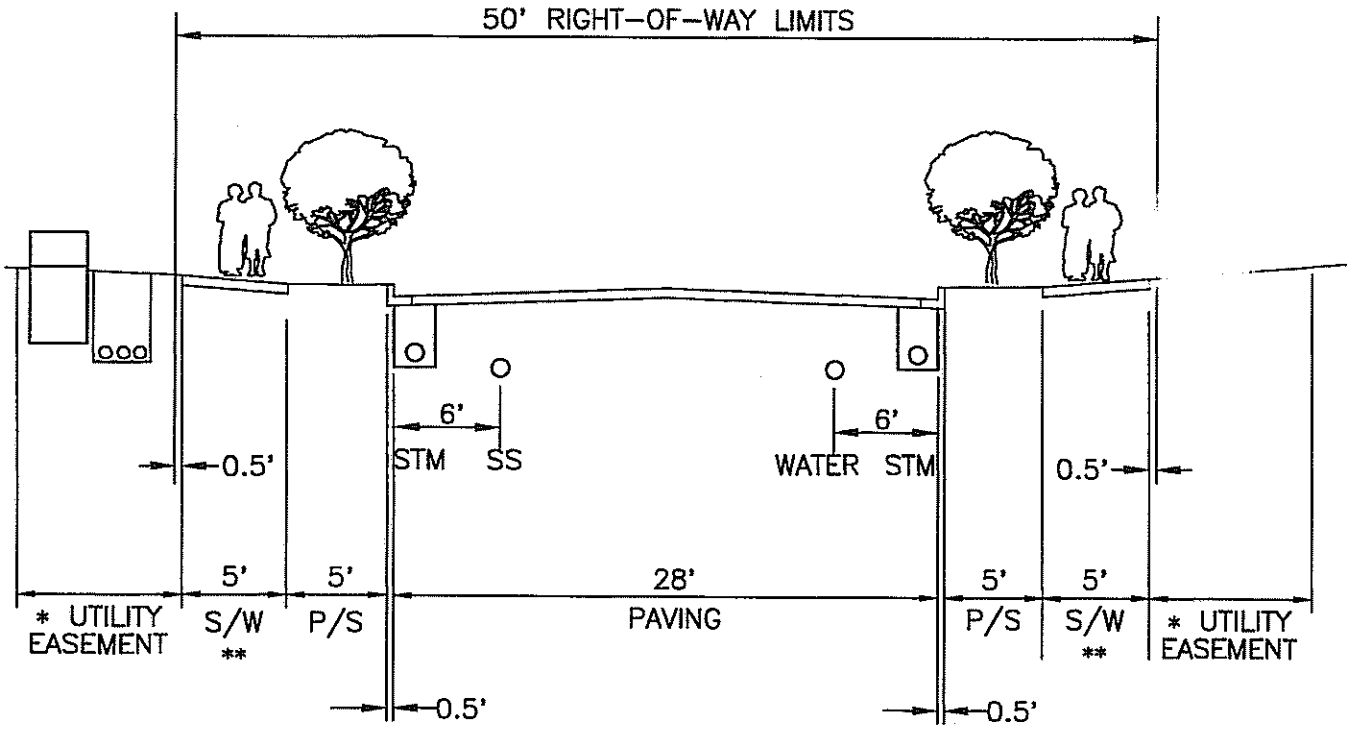

* GAS, PHONE, CATV, POWER MAY BE ON EITHER SIDE OF STREET. PUBLIC UTILITY CONNECTIONS AND APPURTENANCES WILL TAKE PRECEDENT OVER PRIVATE UTILITIES. PARKING IS ALLOWED ON ONE SIDE ONLY.

** SIDEWALK MAY BE CONSTRUCTED ON ONE SIDE ONLY IN LOW DENSITY RESIDENTIAL DEVELOPMENTS, AND LOCAL ACCESS STREETS THAT ENCIRCLE "ISLAND" MINIPARKS THAT DO NOT BORDER RESIDENTIAL LOTS. (SEE TABLE 2.1 AND SECTION 2C.190)

SNOQUALMIE RIDGE II

RESIDENTIAL LOCAL ACCESS STREET

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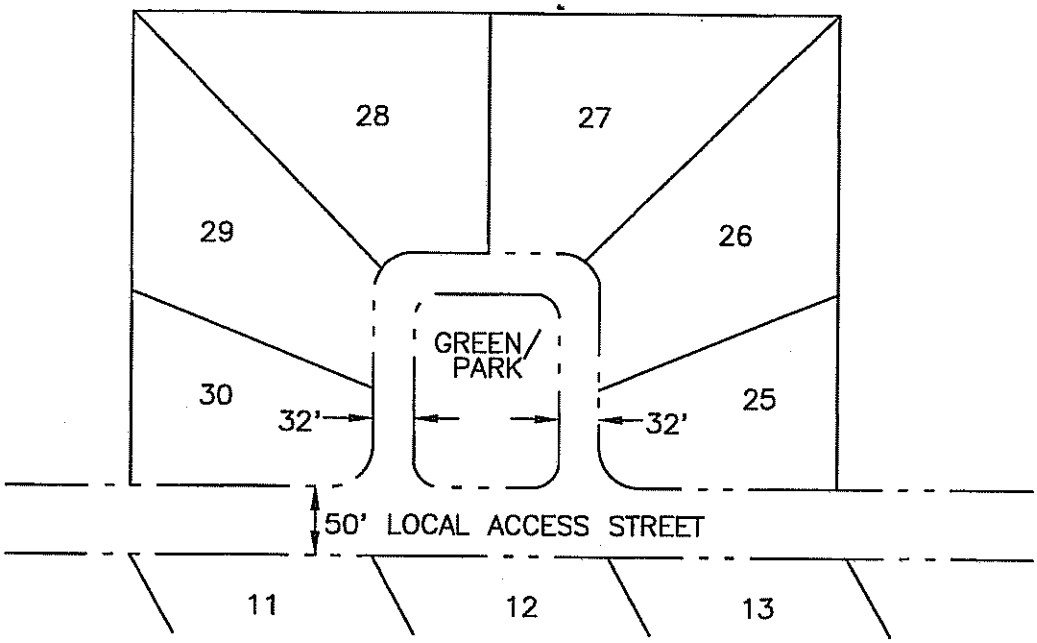

MINOR ACCESS STREET

PLAN VIEW EXAMPLE

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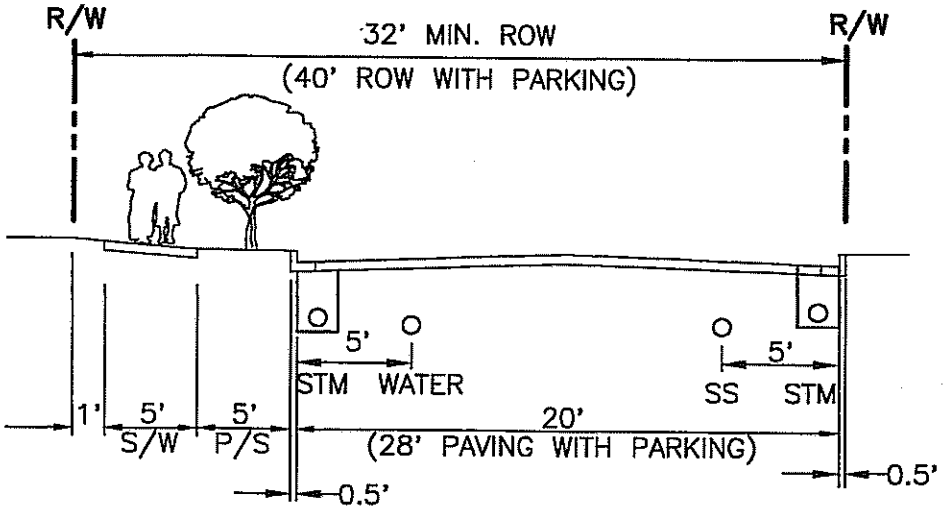

MINOR ACCESS

NO SCALE

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MINOR ACCESS STREET				
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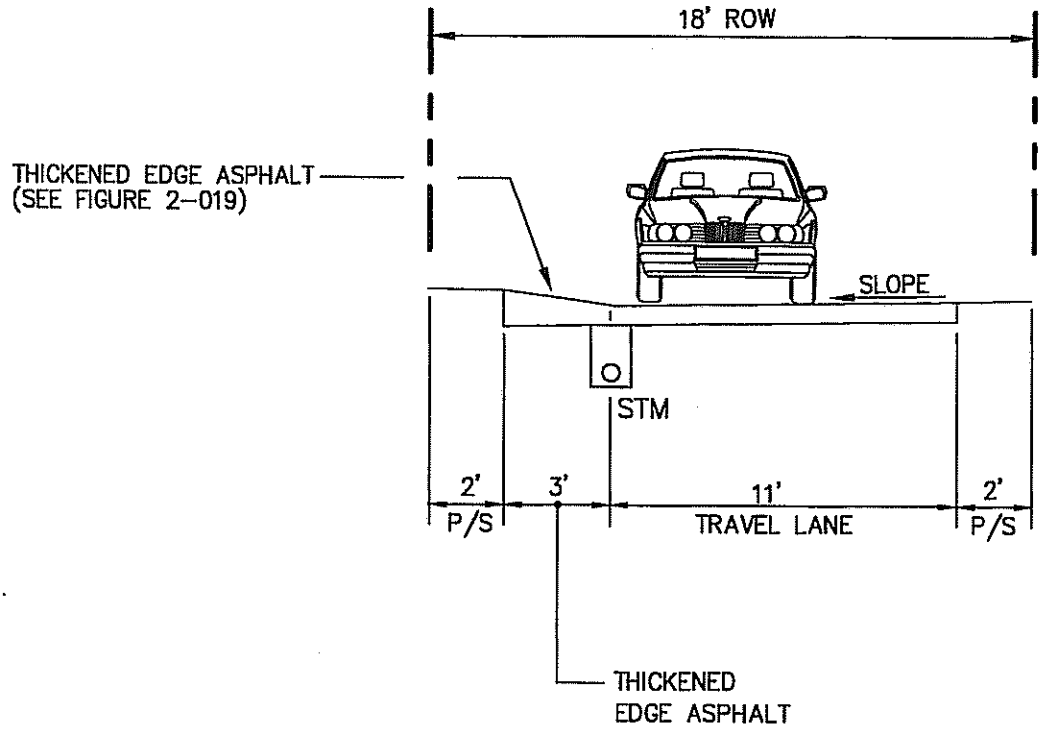

SNOQUALMIE RIDGE II			
ALLEY			
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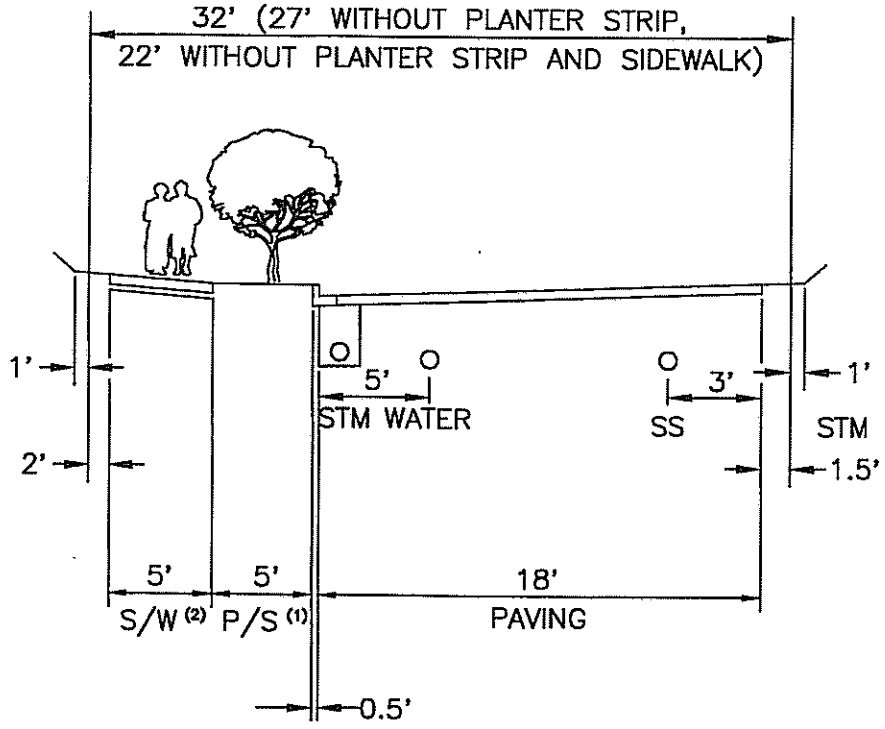

1. THE PLANTER STRIP AND SIDEWALK MAY BE ELIMINATED TO MINIMIZE SENSITIVE AREA IMPACTS.
2. THE SIDEWALK MAY BE REPLACED BY A HARD OR SOFT SURFACE TRAIL, OR ELIMINATED IF A TRAIL IS IN CLOSE PROXIMITY.
3. ROADWAY MAY HAVE A SUPERELEVATION OF UP TO 4.00%
4. IF SIDEWALK AND CURB ARE ELIMINATED, 2' GRAVEL SHOULDER IS REQUIRED ON BOTH SIDES.

SNOQUALMIE RIDGE II			
NEIGHBORHOOD CONNECTOR			
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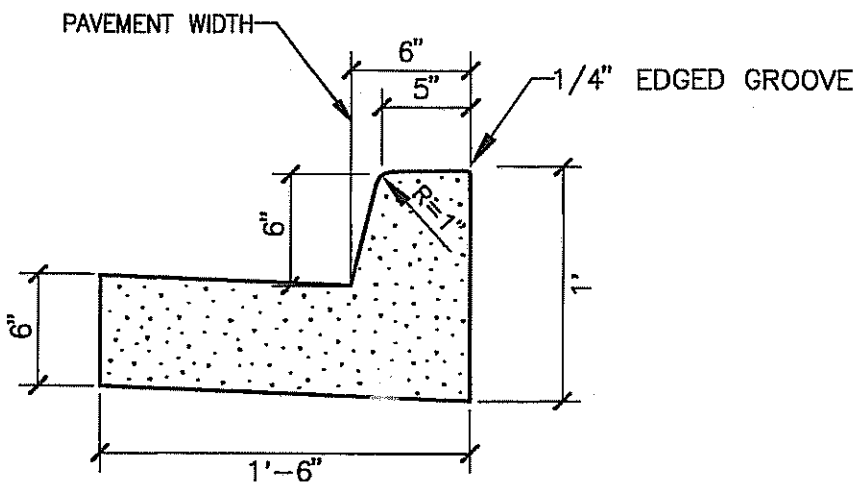

NOTES:

1. CONSTRUCTION OF CURB DETAILS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION AS PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND THE AMERICAN PUBLIC WORKS ASSOCIATION. (WSDOT/APWA SPECIFICATIONS) UNLESS OTHERWISE MODIFIED BELOW.
2. ALL CONCRETE SHALL BE AIR ENTRAINED CONCRETE CLASS 3000.
3. FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED. STEEL FORMS ONLY SHALL BE USED ON TANGENT SECTIONS. WOOD FORMS MAY BE USED ON CURVED SECTIONS. AS AN ALTERNATIVE EXTRUDED CEMENT CONCRETE CURB AND GUTTER MAY BE USED PER WSDOT SECTION 8-04.3(1)A.
4. FULL DEPTH EXPANSION JOINTS CONSISTING OF 3/8" INCH MINIMUM PRE-MOLDED JOINT MATERIAL SHALL BE PLACED ADJACENT TO CATCH BASINS, INLETS AND AT POINTS OF TANGENCY ON STREETS AND DRIVEWAY RETURNS. MAXIMUM SPACING SHALL BE 15 FEET.
5. CONTRACTION JOINTS (DUMMY JOINTS) CONSISTING OF 3/8" INCH MINIMUM x 2" OF PRE-MOLDED JOINT MATERIAL SHALL BE CONSTRUCTED AT INTERVALS OF 15 FEET.
6. ALL JOINTS SHALL BE CLEAN AND EDGED.
7. FINISH SHALL BE A LIGHT BROOM FINISH.
8. FINISHED CURBS AND GUTTERS SHALL BE SPRAYED WITH A CLEAR CURING COMPOUND.
9. MINIMUM REPLACEMENT SECTION LENGTH FOR DAMAGED CURB BEING REMOVED AND REPLACED SHALL BE 5 FEET.

SNOQUALMIE RIDGE II			
CEMENT CONCRETE CURB AND GUTTER			
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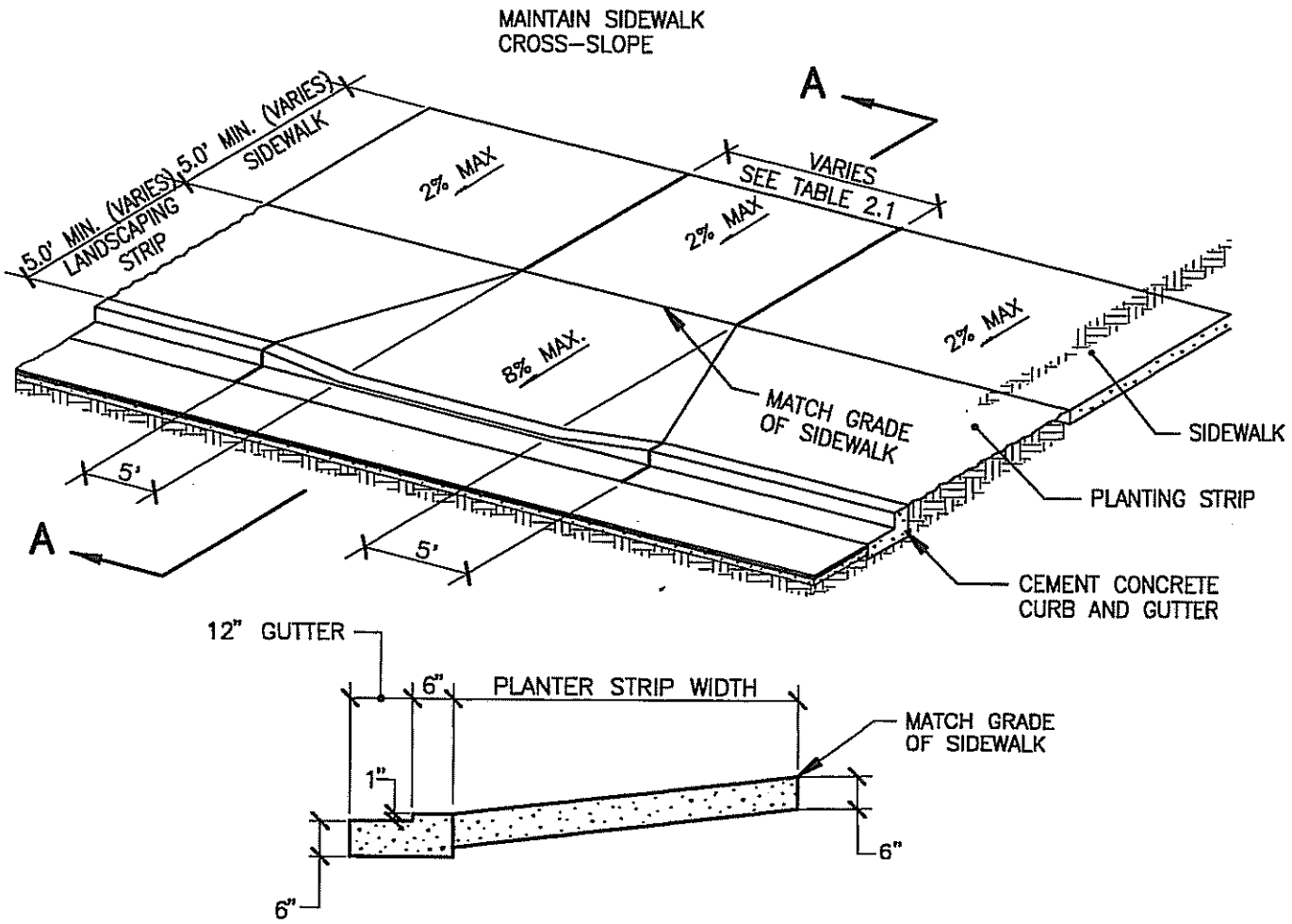

SECTION A–A

NOTES:

1. FULL DEPTH EXPANSION JOINT, 3/8" MINIMUM THICKNESS.
2. DRIVEWAY IS TO BE SURFACED WITH ASPHALT OR CONCRETE.
3. DRIVEWAY CEMENT CONCRETE SHALL BE A MINIMUM OF 6" THICK AND PLACED ON COMPACTED GRADE. DEPENDING ON VEHICLE LOADING, A STRUCTURAL DESIGN OF THE DRIVEWAY MAY BE REQUIRED BY THE ENGINEER.
4. CONCRETE SHALL BE AIR ENTRAINED CLASS 3000.
5. CLEAN AND EDGE ALL JOINTS.

SNOQUALMIE RIDGE II			
DRIVEWAY CURB AND GUTTER SECTION			
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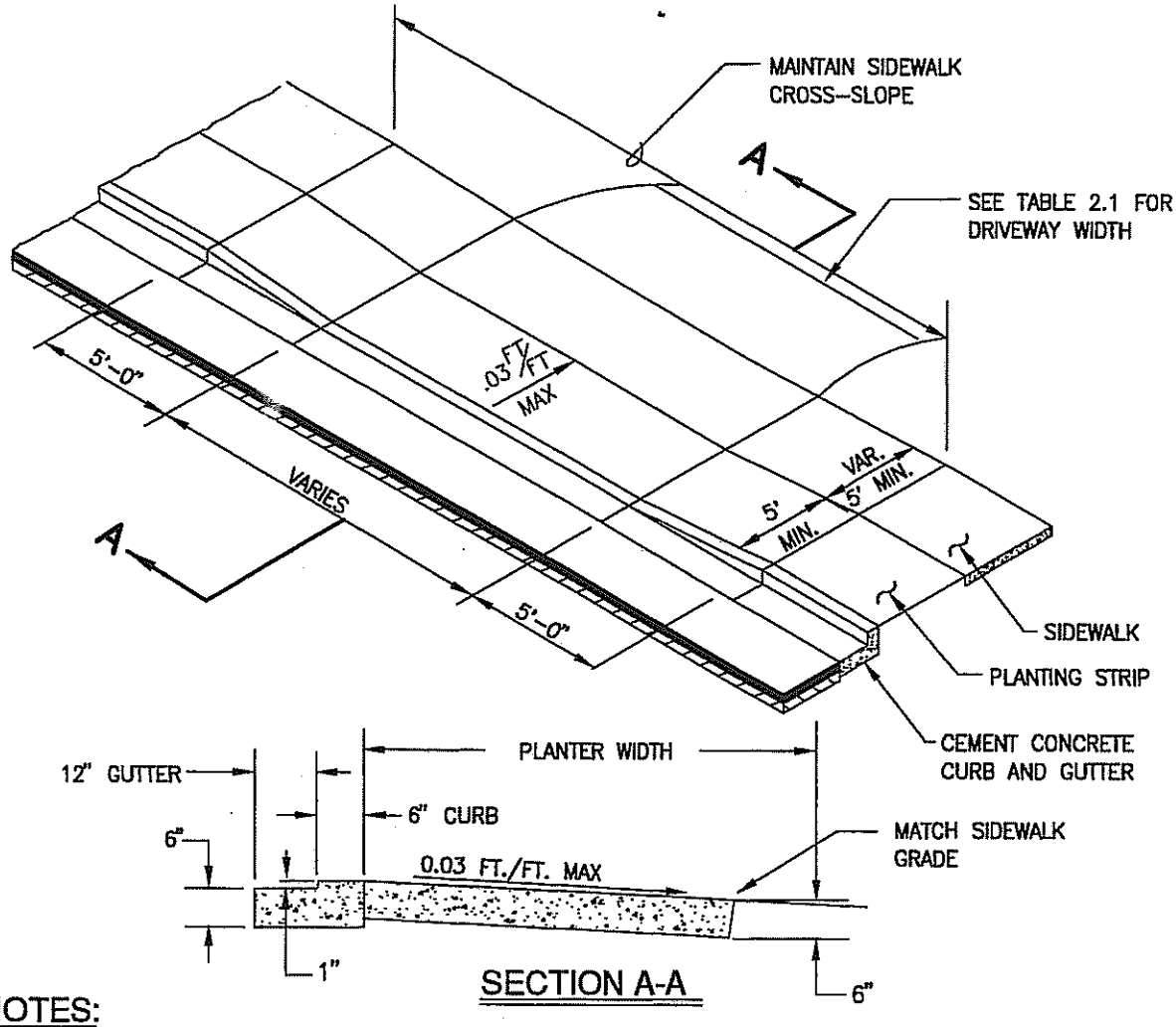

NOTES:

1. FULL DEPTH EXPANSION JOINT, 3/8" MINIMUM THICKNESS.
2. DRIVEWAY IS TO BE SURFACED WITH ASPHALT OR CONCRETE.
3. DRIVEWAY CEMENT CONCRETE SHALL BE A MINIMUM OF 6" THICK AND PLACED ON COMPACTED GRADE. DEPENDING ON VEHICLE LOADING, A STRUCTURAL DESIGN OF THE DRIVEWAY MAY BE REQUIRED BY THE ENGINEER.
4. CONCRETE SHALL BE AIR ENTRAINED CLASS 3000.
5. CLEAN AND EDGE ALL JOINTS.

SNOQUALMIE RIDGE II			
REVERSE SLOPE DRIVEWAY			
I:\library\DETAILS\Sr II\Chapter 02 - Streets\2-10.DWG	DWN ER/DLS	CKD AJM	DATE 10/18/04	DWG 2-10

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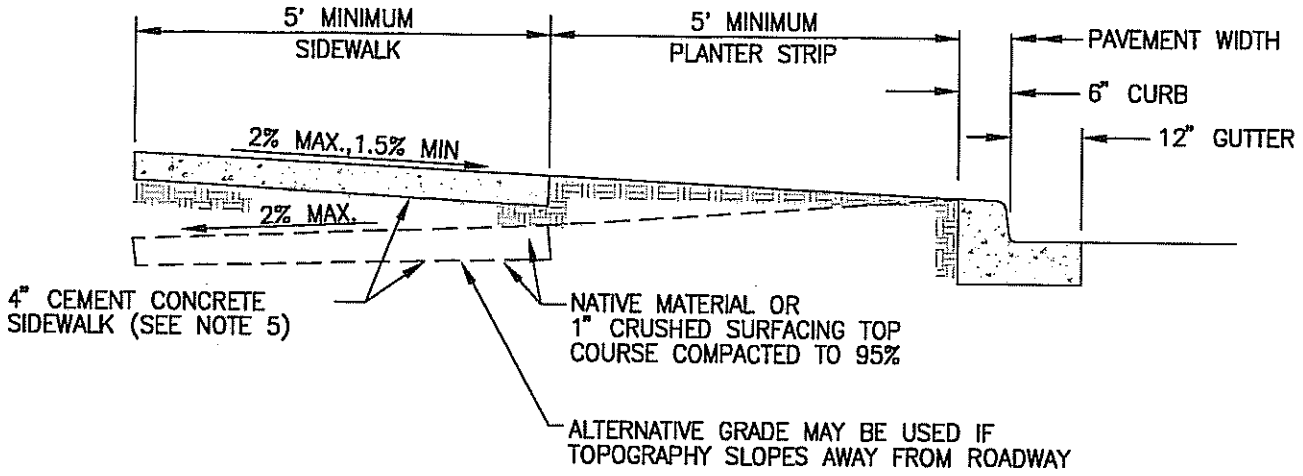

NOTES:

1. CONSTRUCTION OF SIDEWALKS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION AS PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OR TRANSPORTATION AND THE AMERICAN PUBLIC WORKS ASSOCIATION. (WSDOT/APWA SPECIFICATIONS) UNLESS OTHERWISE MODIFIED BELOW.
2. ALL CONCRETE SHALL BE AIR ENTRAINED CONCRETE CLASS 3000.
3. FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED. STEEL FORMS ONLY SHALL BE USED ON TANGENT SECTIONS. WOOD FORMS MAY BE USED ON CURVED SECTIONS.
4. ALL JOINTS SHALL BE CLEAN AND EDGED.
5. CEMENT CONCRETE SIDEWALKS SHALL BE A MINIMUM OF 4 INCHES THICK EXCEPT IN DRIVEWAY AREAS WHERE A MINIMUM OF 6" IS REQUIRED.
6. ADDITIONAL WIDTH TO MAINTAIN A MINIMUM OF 5 FEET OF CLEAR SIDEWALK SHALL BE PROVIDED WHEN OBSTRUCTIONS SUCH AS UTILITIES EXIST.
7. FINISH SHALL BE A LIGHT BROOM FINISH.

SNOQUALMIE RIDGE II			
SIDEWALK			
I:\library\DETAILS\Sr II\Chapter 02 - Streets\2-11.DWG	DWN ER/DLS	CKD AJM	DATE 10/01/04	DWG 2-11

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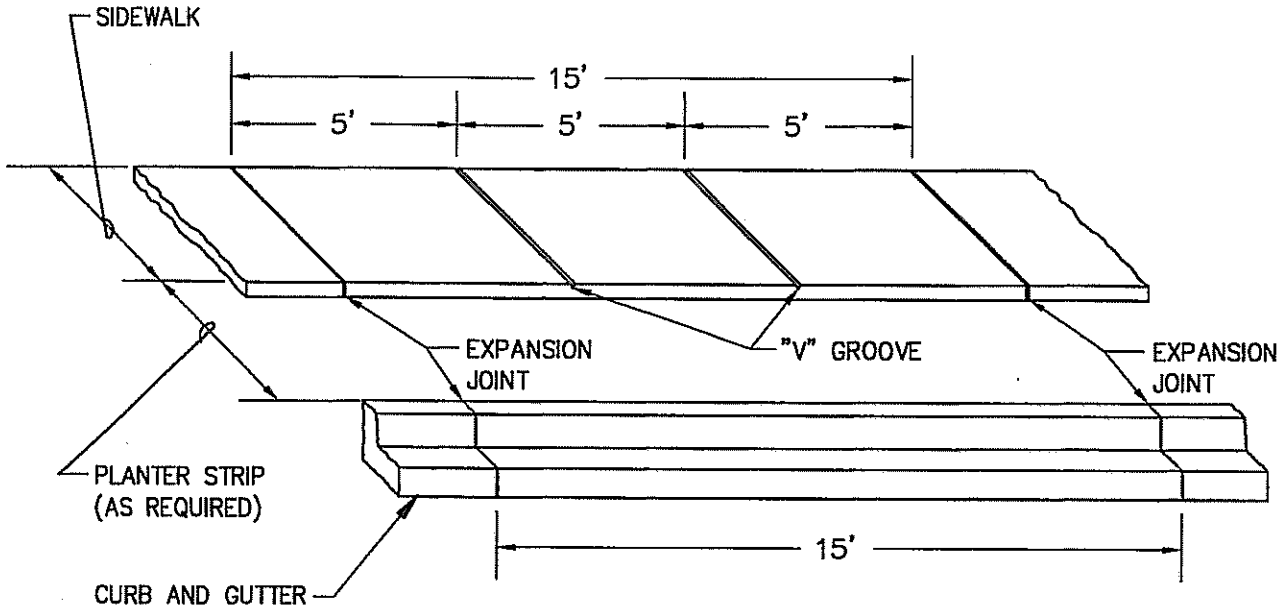

NOTES:

1. EXPANSION JOINTS CONSISTING OF 3/8" FULL DEPTH PREMOLDED JOINT MATERIAL SHALL BE PLACED AROUND FIRE HYDRANTS, POLES, METER BOXES AND OTHER OBSTRUCTIONS AND ALONG WALLS OR STRUCTURES IN PAVED AREAS. EXPANSION JOINTS SHALL ALSO BE PLACED AT THE BEGINNING AND THE END OF EACH CURVE, ON EACH SIDE OF STRUCTURES, DRIVEWAYS AND CURB RAMPS, BETWEEN SIDEWALK AND BACK OF CURB AND AT OTHER LOCATIONS AS DIRECTED BY THE CITY ENGINEER. FULL EXPANSION JOINTS SHALL GENERALLY BE PLACED TO MATCH THOSE PLACED IN ADJACENT CURB WITH A MAXIMUM SPACING OF 15 FEET.

2. CONTRACTION JOINTS (DUMMY JOINTS) CONSISTING OF 3/8" x 2" OF PREMOLDED JOINT MATERIAL SHALL BE CONSTRUCTED AT INTERVALS NOT TO EXCEED 10 FEET. WHEN SIDEWALKS ARE PLACED BY SLIP-FORMING, A PREMOLDED STRIP OF 3/8" THICK AND UP TO FULL DEPTH MAY BE USED. CONTRACTOR JOINTS (DUMMY JOINTS) IN SIDEWALKS SHALL BE LOCATED SO AS TO MATCH THE JOINTS IN THE CURB WHETHER SIDEWALK IS ADJACENT TO CURB OR SEPARATED BY A PLANTING STRIP. JOINT SEALANTS FOR SAWED CONSTRUCTION JOINTS SHALL MEET THE REQUIREMENTS OF SECTION 9-04.2 OF THE WSDOT/APWA SPECIFICATIONS.

3. SCORE MARKS, 1/4" DEEP, ARE TO BE PLACED ON 5 FOOT CENTERS, AND TO CORRES-POND TO THE MARKINGS IN EXISTING SIDEWALKS AND CURB AND GUTTER.

SNOQUALMIE RIDGE II			
SIDEWALK SPACING			
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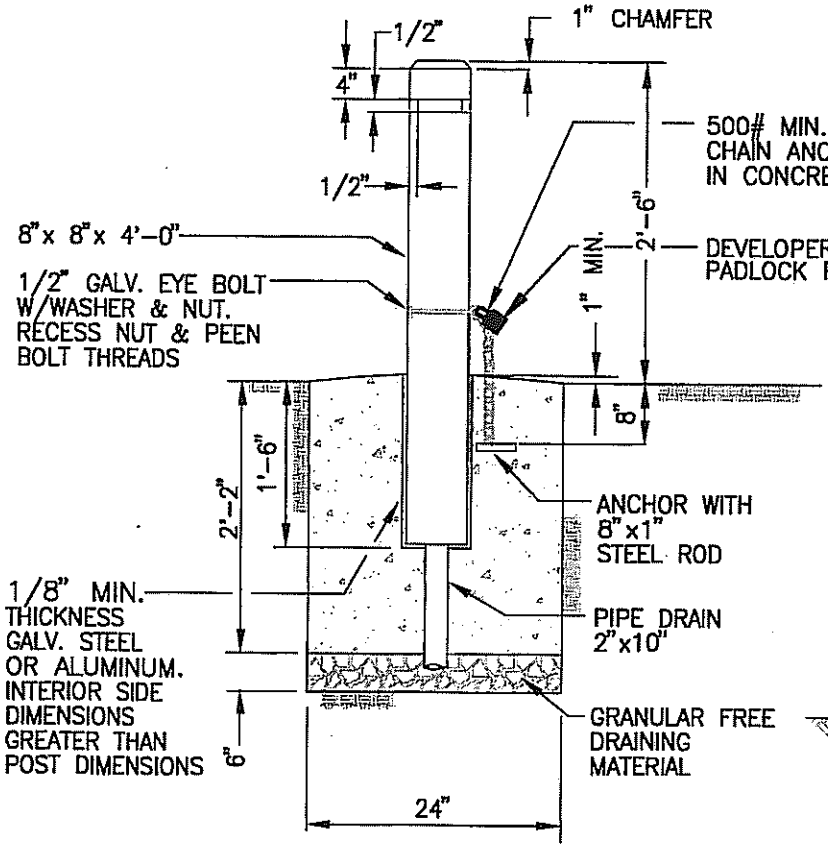
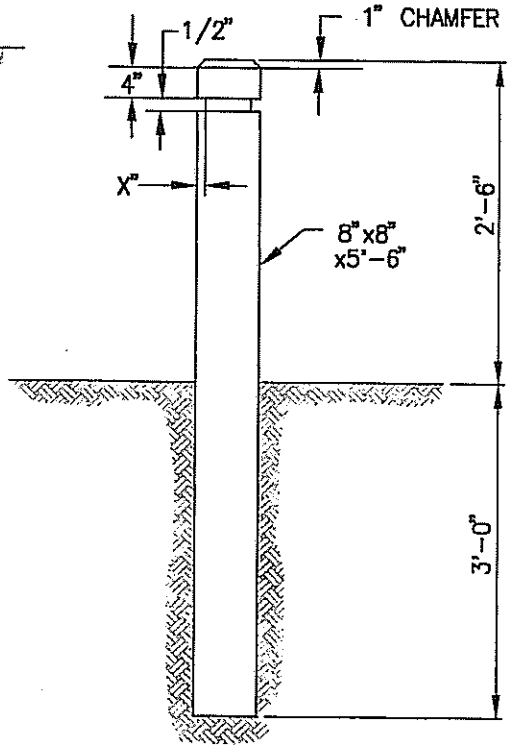


REMOVABLE BOLLARD



FIXED BOLLARD

NOTES:

1. ALL WOOD SHALL BE PRESSURE TREATED.
2. STEEL TUBE SHALL CONFORM TO ASTM A53 OR ASTM A53 GRADE A.
3. NUTS, BOLTS & WASHERS SHALL CONFORM TO ASTM A307.
4. ALL STEEL PARTS SHALL BE GALVANIZED.
5. CONCRETE SHALL BE CLASS 3000 WITH AIR-ENTRAINMENT.
6. ALTERNATE DESIGNS MAY BE APPROVED BY THE CITY ENGINEER.

SNOQUALMIE RIDGE II				
BOLLARD DETAIL				
I:\library\DETAILS\Sr II\Chapter 02 - Streets\2-13.DWG	DWN ER/DLS	CKD AJM	DATE 10/08/04	DWG 2-13

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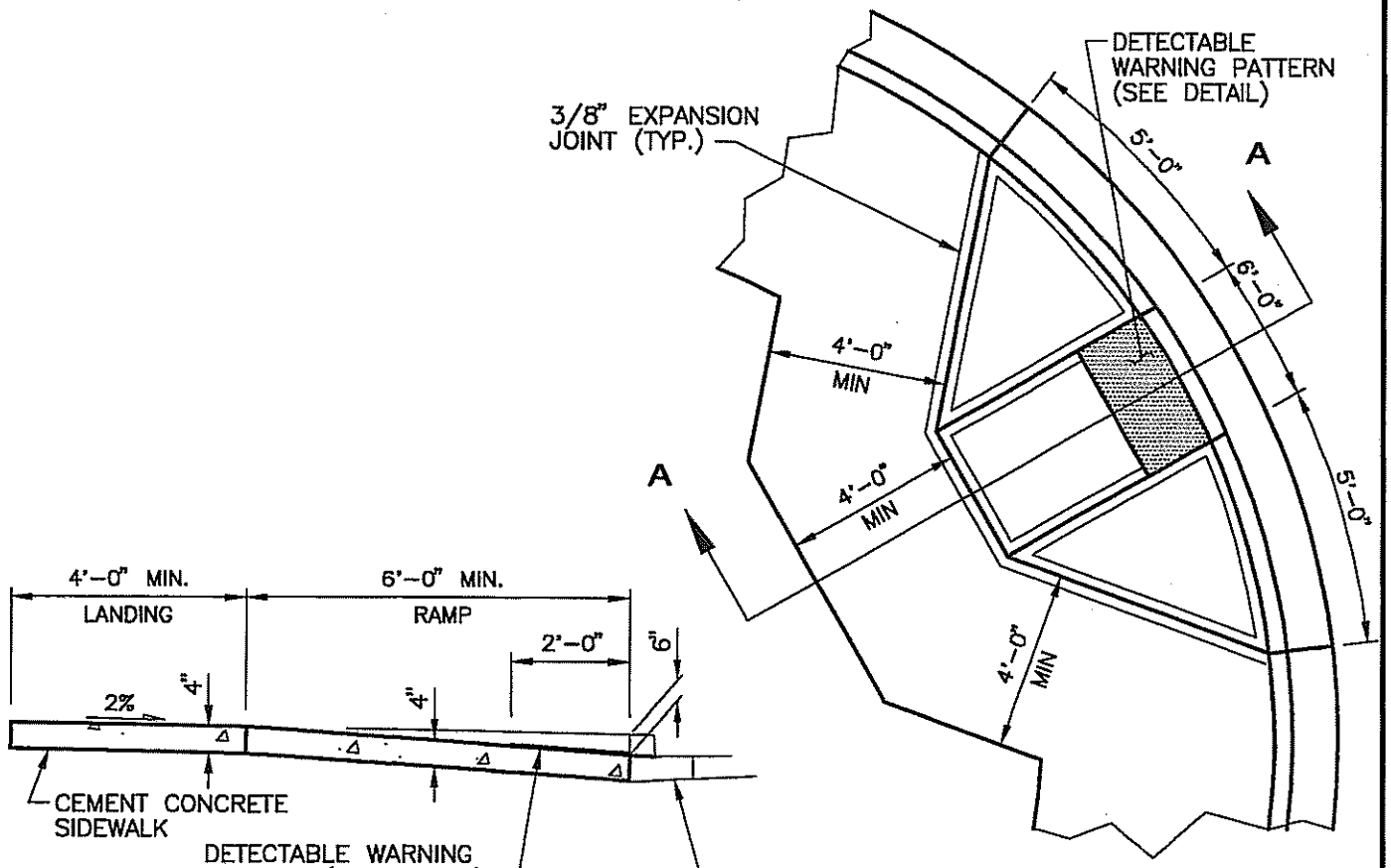


SECTION A-A

NOTES:

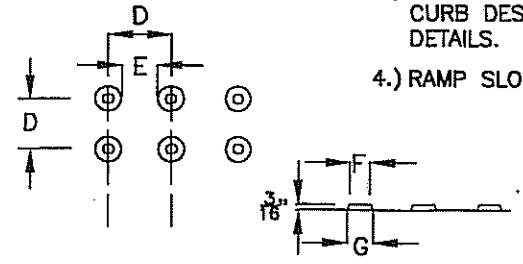
1.) AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

2.) DETECTABLE WARNING PATTERNS CREATED FROM YELLOW PRE-FORMED POLYMER PER DIMENSIONS AND SPACING SHOWN.

3.) CURB AND GUTTER SHOWN, SEE THE CONTRACT PLANS FOR THE CURB DESIGN SPECIFIED. SEE STD. DWG. 2-08 FOR CURB DETAILS.

4.) RAMP SLOPES SHALL NOT BE STEEPER THAN 12H:1V.

	MIN.	MAX.
D	1 5/8"	2 3/8"
E	5/8"	1 1/2"
F	7/16"	3/4"
G	7/8"	1 7/16"



RAMP TEXTURE DETAIL

NOT TO SCALE

ELEVATION

SNOQUALMIE RIDGE II

CURB RAMP

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	ER/DLS	AJM	10/18/04	2-14

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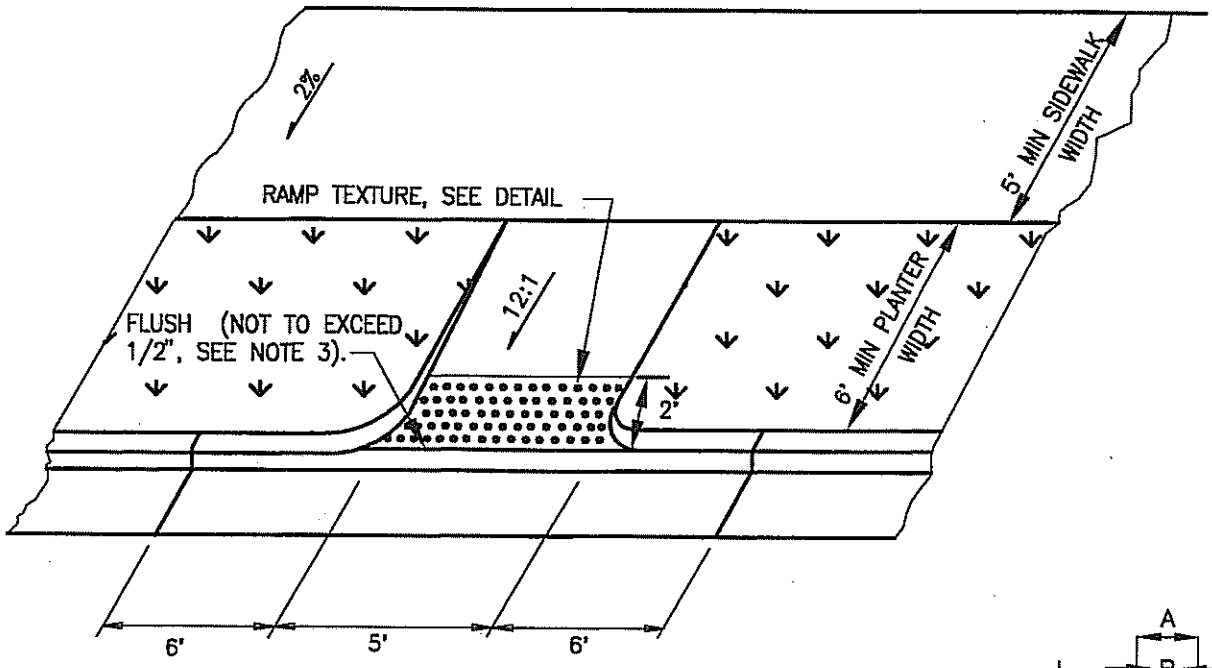
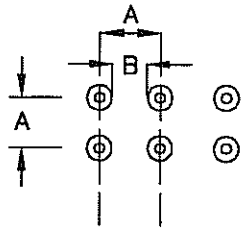
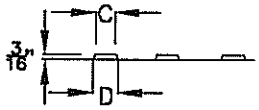




	MIN.	MAX.
A	1 5/8"	2 3/8"
B	5/8"	1 1/2"
C	7/16"	3/4"
D	7/8"	1 7/16"



ELEVATION

NOTES:

1.) AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

2.) DETECTABLE WARNING PATTERNS CREATED FROM YELLOW PRE-FORMED POLYMER PER DIMENSIONS AND SPACING SHOWN.

3.) CURB AND GUTTER SHOWN, SEE THE CONTRACT PLANS FOR THE CURB DESIGN SPECIFIED. SEE STD. DWG. 2-08 FOR CURB DETAILS.

4.) RAMP SLOPES SHALL NOT BE STEEPER THAN 12H:1V.

RAMP TEXTURE DETAIL

SNOQUALMIE RIDGE II

MIDBLOCK CURB RAMP (ALTERNATE CURB RAMP)

I:\library\DETAILS\Sr II\Chapter 02 - Streets\2-15.DWG	DWN	CKD	DATE	DWG
	CMH	AJM	10/18/04	2-15

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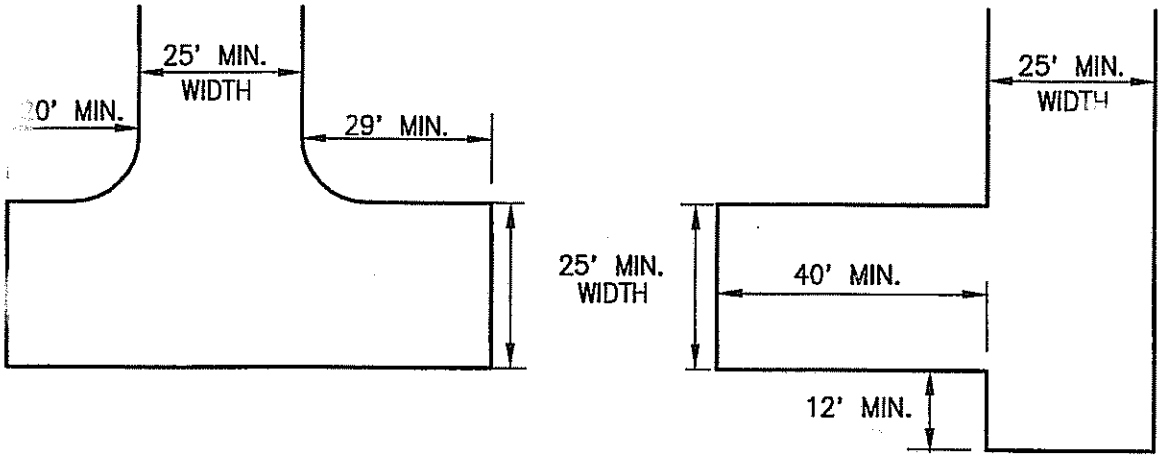

SNOQUALMIE RIDGE II			
HAMMERHEAD TURNAROUNDS W/ FIRE ACCESS			
I:\library\DETAILS\Sr II\Chapter 02 – Streets\2-16.DWG	DWN ER/DLS	CKD AJM	DATE 09/16/04	DWG 2-16

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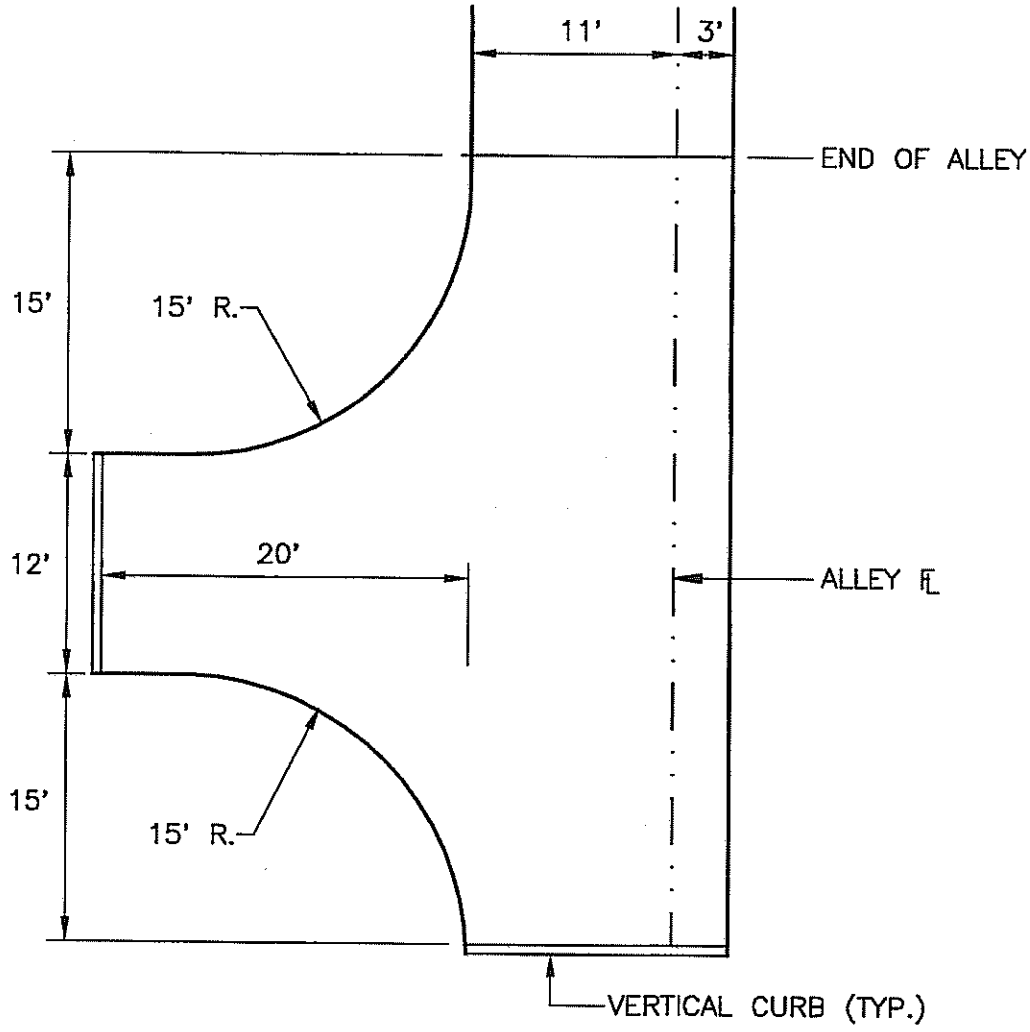

NOTE:
SLOPE TO PREVENT ANY WATER FROM LEAVING ASPHALT TO SOIL.

ALLEY TURNAROUND WITHOUT FIRE ACCESS

NO SCALE

	SNOQUALMIE RIDGE II			
	HAMMERHEAD TURNAROUNDS WITHOUT FIRE ACCESS			
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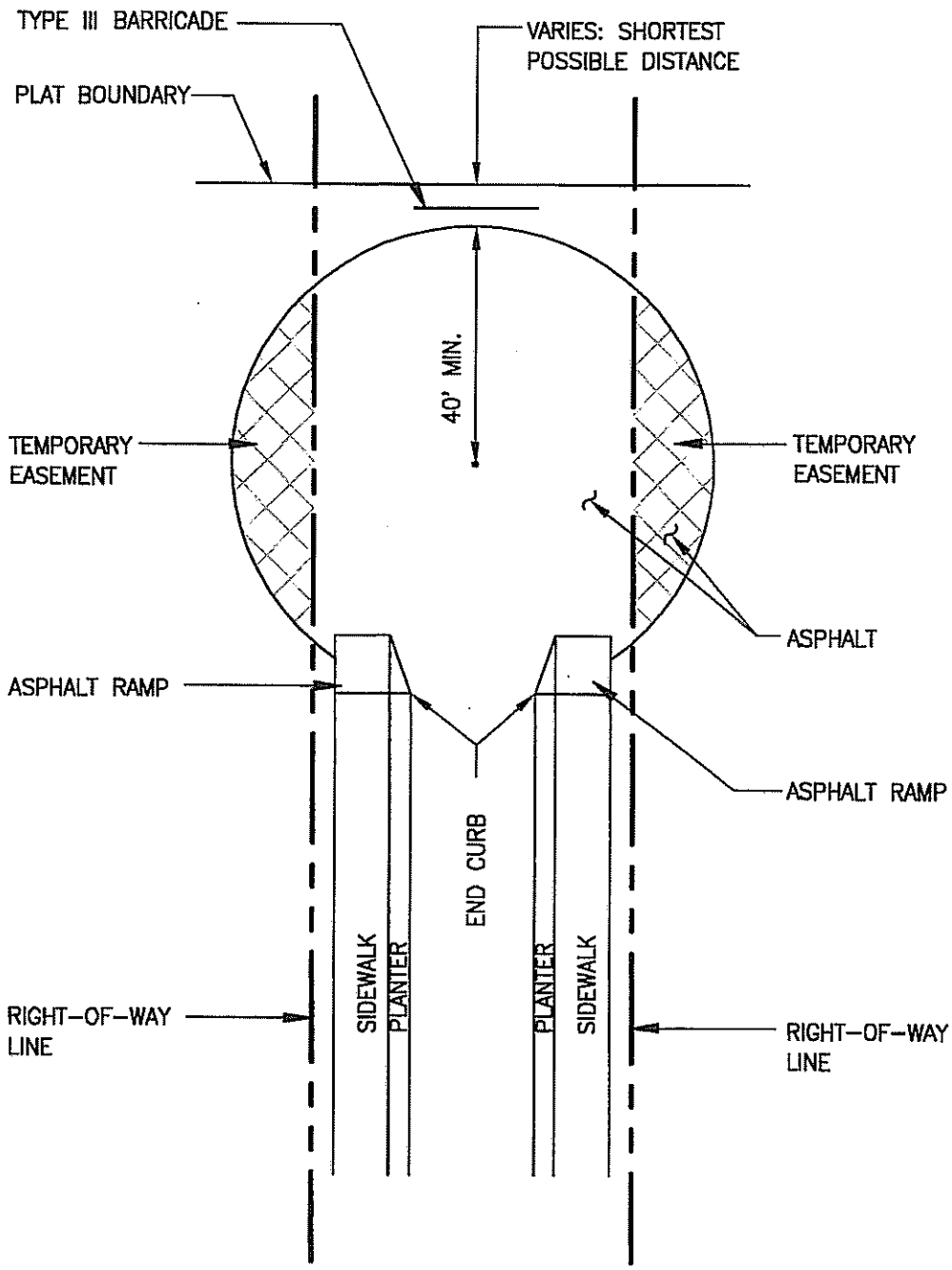

SNOQUALMIE RIDGE II

TEMPORARY CUL-DE-SAC

I:\library\DETAILS\Sr II\Chapter 02 - Streets\2-18.DWG	DWN	CKD	DATE	DWG
	ER/DLS	AJM	09/16/04	2-18

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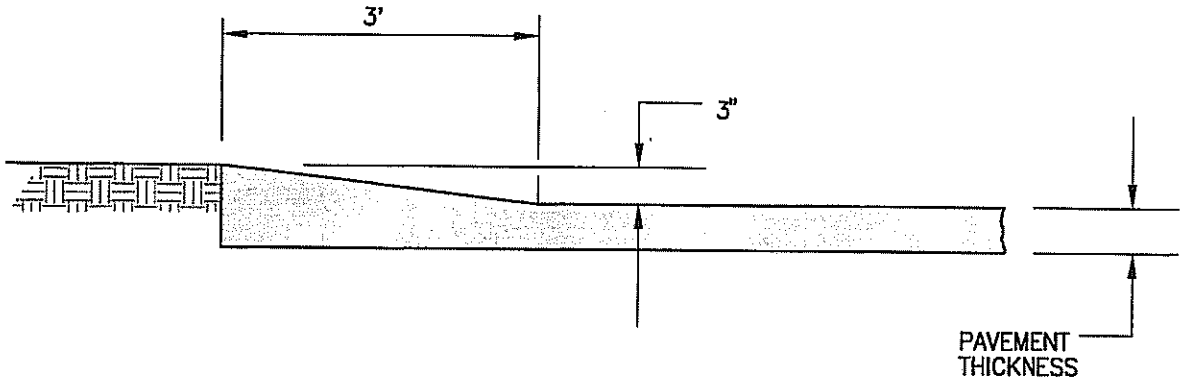

SNOQUALMIE RIDGE II

THICKENED EDGE ASPHALT CURB

I:\library\DETAILS\Sr II\Chapter 02 – Streets\2-19.DWG	DWN	CKD	DATE	DWG
	ER/DLS	AJM	09/16/04	2-19

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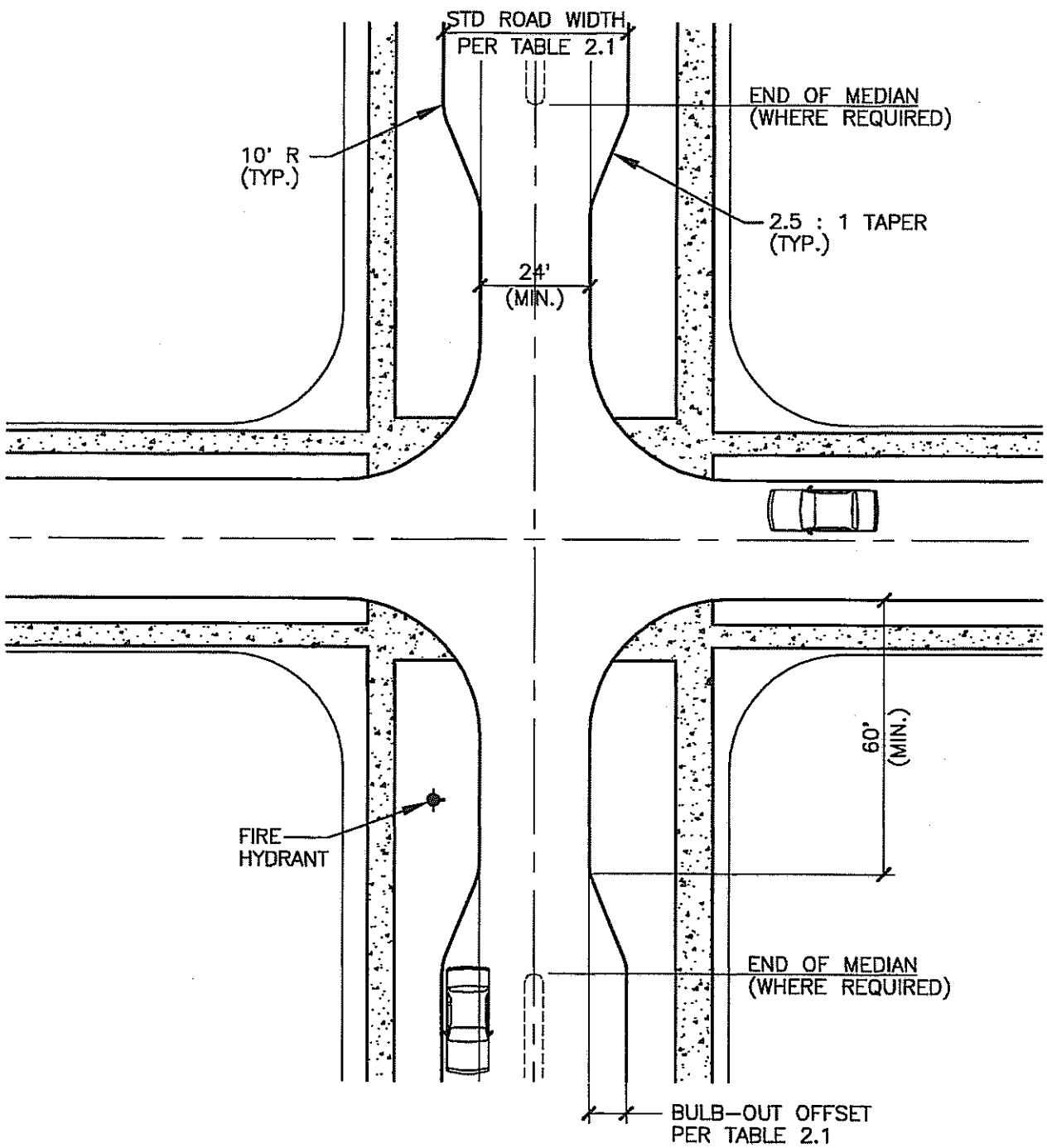

SNOQUALMIE RIDGE II

TYPICAL BULB-OUT INTERSECTION

I:\library\DETAILS\Sr II\Chapter 02 - Streets\2-20.DWG	DWN	CKD	DATE	DWG
	ER/DLS	AJM	09/30/04	2-20

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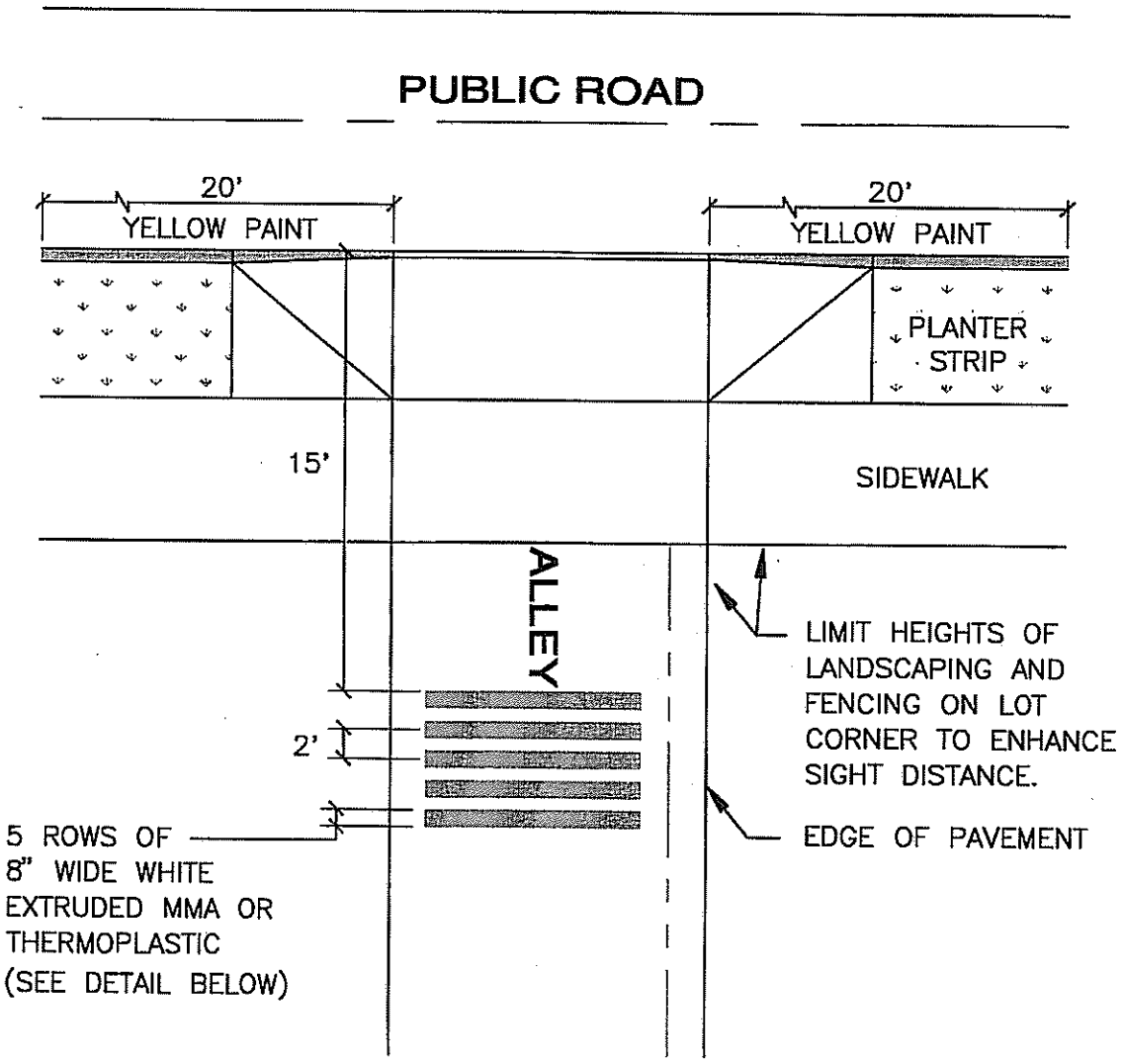

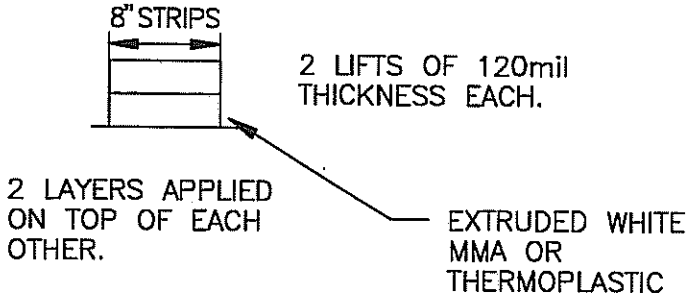

SNOQUALMIE RIDGE II

ALLEY EXIT RESTRICTIONS

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	BRB	JSF	09/30/04	2-21

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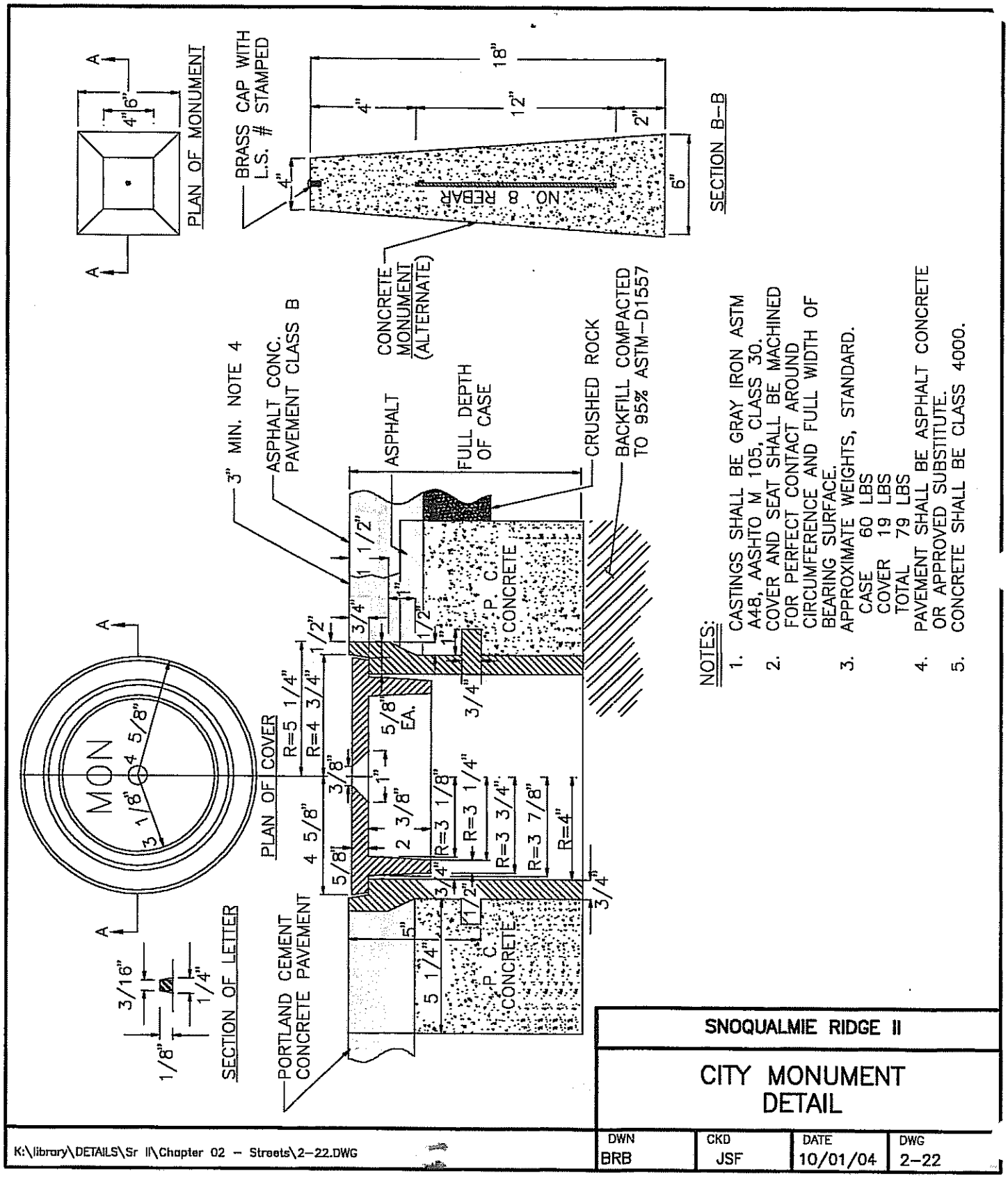

NOTES:

1. CASTINGS SHALL BE GRAY IRON ASTM A48, AASHTO M 105, CLASS 30.
2. COVER AND SEAT SHALL BE MACHINED FOR PERFECT CONTACT AROUND CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.
3. APPROXIMATE WEIGHTS, STANDARD.
   CASE 60 LBS
   COVER 19 LBS
   TOTAL 79 LBS
4. PAVEMENT SHALL BE ASPHALT CONCRETE OR APPROVED SUBSTITUTE.
5. CONCRETE SHALL BE CLASS 4000.

SNOQUALMIE RIDGE II

CITY MONUMENT DETAIL

K:\library\DETAILS\Sr II\Chapter 02 – Streets\2–22.DWG	DWN	CKD	DATE	DWG
	BRB	JSF	10/01/04	2–22

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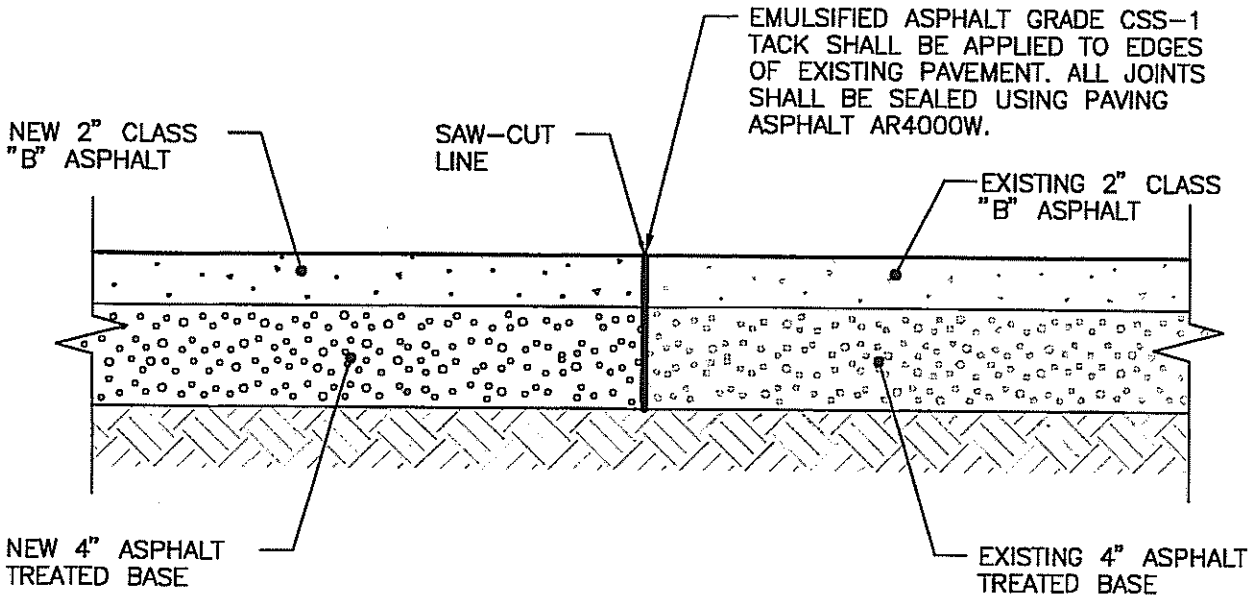

SNOQUALMIE RIDGE II				
ASPHALT PATCH DETAIL				
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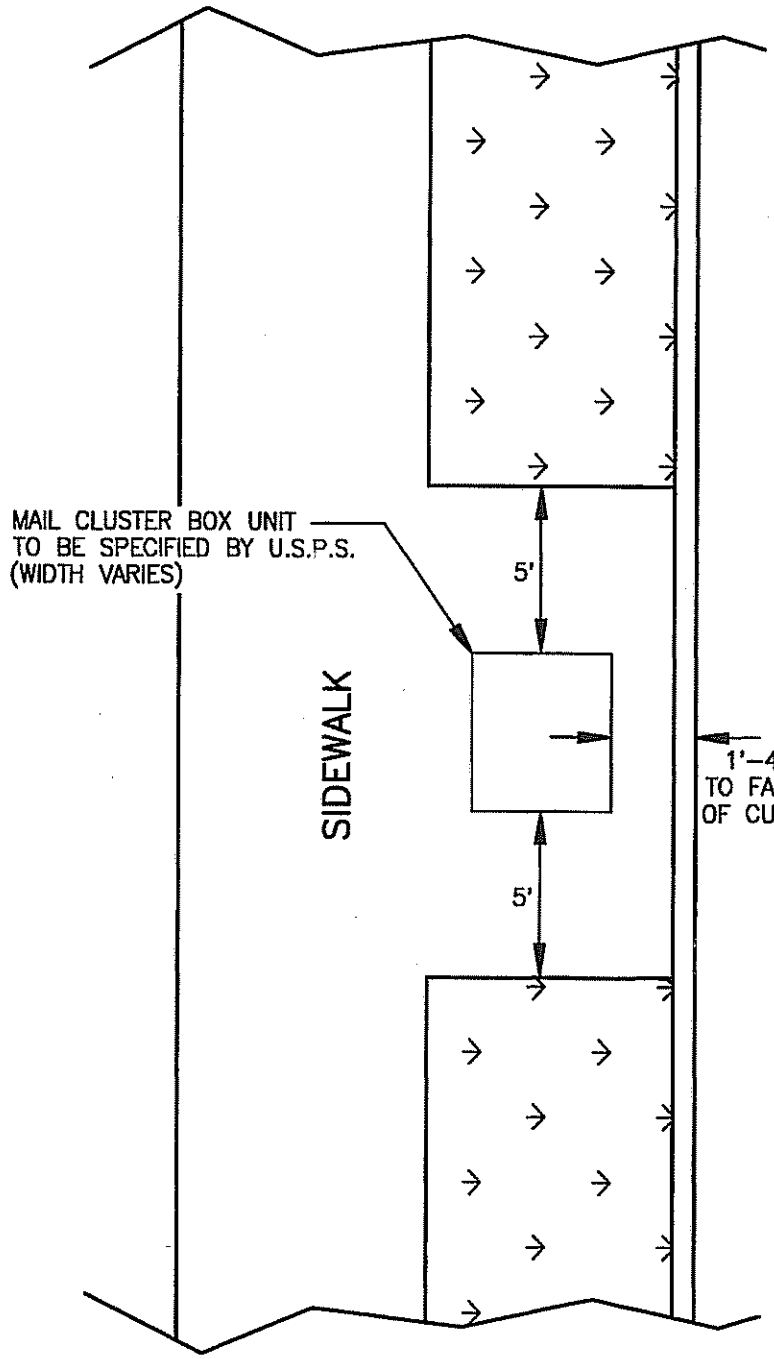

SNOQUALMIE RIDGE II

MAILBOX PAD DETAIL

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	CMH	JSF	10/04/04	2-24

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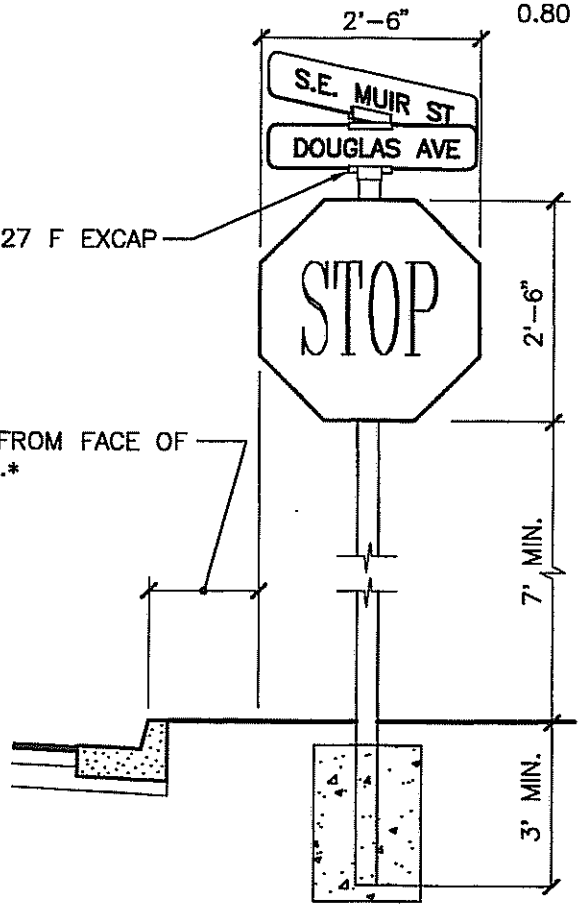
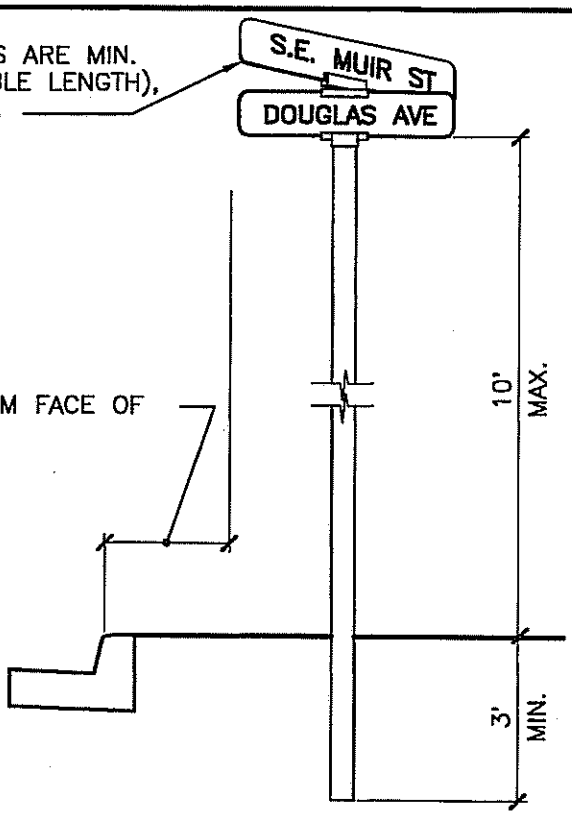


VEHICULAR CONTROL SIGNS

NOT TO SCALE



TYPICAL STREET NAME SIGN

NOT TO SCALE

NOTES:

1. ALL SHEETING REQUIREMENTS FOR STOPS, STREET SIGNS, NO PARKING SIGNS ARE ENGINEER GRADE.
2. POST: 4"x4" PRESSURE TREATED WOOD
3. PANELS TO BE STANDARD ALUMINUM WITH REFLECTIVE LETTERS COLOR TO BE DETERMINED BY REGULATORY INFORMATION
4. ALL VEHICULAR CONTROL SIGNS SHALL MEET THE CITY REQUIREMENTS OF THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.)
5. STOP SIGN MOUNTING: 2" GALVANIZED BOLTS SCREWS WITH NYLON WASHERS.
6. STREET SIGN MOUNTING: 827 EXCAP, 827 F PLATE 90 DEGREE OR CROSS PLATE
7. STREET SIGN COLORS, DIMENSIONS, FONT SIZE AND TYPE AS DETERMINED (AND PREVIOUSLY USED) BY THE PUBLIC WORKS AND PLANNING DEPARTMENT.

* SETBACKS FOR NO PARKING SIGNS OF ANY TYPE ARE 18" FROM FACE OF CURB TO EDGE OF SIGN.

SNOQUALMIE RIDGE II

STREET SIGN DETAIL

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	CMH	JSF	10/18/04	2-25

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CHAPTER 3

3.000 STORM DRAINAGE

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CHAPTER 3

3.000 STORM DRAINAGE

3.010 Specifications

These Technical Specifications shall be used for all storm drainage construction in the Snoqualmie Ridge II Development.

The current "English unit" edition of the *Standard Specifications for Road, Bridge, and Municipal Construction,* prepared by the Washington State Department of Transportation and the American Public Works Association, Washington State Chapter, herein referred to as the Standard Specifications, shall be used to supplement these Standards. The general requirements of the Standard Specifications shall apply unless they are inconsistent with any of the provisions of these Standards. Should inconsistencies occur, these Standards shall have precedence.

References to sections in the Standard Specifications are based on the latest published edition of the Standard Specifications. If section references in future editions of the Standard Specifications are changed, these Standards will be deemed to be revised accordingly without re-issuance.

3.020 General

Design details, workmanship, and materials shall be in accordance with the King County *1998 Surface Water Design Manual*, the *Snoqualmie Ridge II Master Drainage Plan,* and the "Standard Specifications," except as they may be modified by this chapter.

Standard Plans need not be repeated on the plans unless required for plan clarification for the contractor, if being modified to suit a specific design, or as required by the City. However, standard plans shall be clearly referenced on the drawings.

The installation of all storm drainage facilities shall be done in accordance with plans which have been approved by the City Engineer. Plans shall be prepared in accordance with Chapter 1.

3.030 Access

Vehicle access for maintenance vehicles is required to all storm drainage structures and ponds, unless otherwise approved by the City Engineer. The configuration and construction of the access shall be as approved by the City Engineer.

3.040 Easements

All storm drains not in the public right-of-way shall be in easements granted to the

City of Snoqualmie.

In general, minimum drainage easement width shall be 15 feet for publicly maintained open channel or closed system installations. In special circumstances, the easement width may be reduced to 10 feet with the approval of the City Engineer and may be increased because of pipe size and/or depth as required by the City Engineer.

No permanent structures are allowed to be constructed in the easement area. No additional building setback line from the edges of easements is required. Access to easements for maintenance and/or repair of the utility by the City shall not be restricted or prohibited by fences, rockeries, plantings and other improvements.

In general, all easements shall be located within single lots rather than being split by a lot line. In special circumstances, easements may be located on two adjacent lots with the approval of the City Engineer.

3.050 System Design

Publicly maintained underdrains shall be PVC, minimum diameter of 4 inches. Privately maintained underdrains may be ABS, minimum diameter of 3 inches. Pipe bends shall be a minimum of 3 feet radius to allow use of jet rodding or cleaning equipment.

Minimum storm drain pipe size shall be 12-inch diameter. Eight-inch diameter pipe may be permitted on cross street laterals less than 66 feet long to avoid utility conflict or meet shallow gradient.

A catch basin or manhole will be required at all changes in storm drain diameters and changes in grade or alignment. Lot drainage outlets may be connected with a tee to the storm drain mainline.

Debris barriers (trash racks) are required on all culvert pipes and storm drain outfalls larger than 12-inch diameter unless otherwise approved by the City Engineer.

All pipe joints shall be rubber gasketed.

The minimum velocity in any pipe or culvert at the design storm flow shall be 3 feet per second, except for pipe installed as equalizers or as an integral element of a detention system. This requirement may be waived at the upstream end of a pipe run at the discretion of the City Engineer.

Where velocities greater than 15 feet per second are expected, special design features such as energy dissipation structures, thrust blocking, pipe anchors, and specific piping materials shall be included to protect against erosion of pipe and structures and displacement by erosion and shock.

In general, minimum cover shall be two feet from top of pipe to finish grade, and

shall be increased as required to provide protection from construction traffic. In all cases, a minimum of one foot of cover shall be provided to construction subgrade.

Minimum cover for PVC pipe shall be three feet from top of pipe to finish grade.

In general, the maximum spacing between access structures, whether catch basins or manholes, shall be 300 feet. For pipes 24-inch and larger the spacing may be up to 500 feet upon approval by the City Engineer.

Catch basins shall be spaced at intervals no greater than 150 feet for roadway grades less than one percent, 200 feet for roadway grades between one and three percent; and 300 feet for roadway grades three percent and greater.

Generally, grates used at low points should be the thru-curb type. All other grates in roadways shall be vaned grates. See Standard Drawings.

Drainage outlets (stub-outs) shall be provided for each individual lot, unless otherwise approved by the City Engineer. Drainage outlets shall be connected directly into the storm drainage system at a catch basin or inlet.

Outfalling of the drainage outlet under the sidewalk and through the curb will be allowed only if specifically approved by the City Engineer.

The following notes shall be included on each plan set:

1. All workmanship and materials shall be in accordance with the latest "English" unit edition of the *"Standard Specifications for Road, Bridge and Municipal Construction"* (WSDOT/APWA). The "Standard Specifications," except as they may be modified or superseded by the Snoqualmie Ridge Development Standards and/or these plans, shall govern all phases of work.

2. Temporary erosion/water pollution control measures shall be in accordance with *Snoqualmie Ridge II Master Drainage Plan,* City of Snoqualmie Municipal Code (SMC 15.18) and the 1998 King County Surface Water Design Manual (KCSWDM) and Department of Ecology NPDES Requirements.

3. Storm drain pipe shall meet the following requirements:

   A. Plain concrete pipe shall conform to the requirements of AASHTO M86, Class 2.

   B. Reinforced concrete pipe shall conform to the requirements of AASHTO M170.

C. PVC pipe conforming to ASTM: D-3034 SDR 35 for pipe up to 15-inch diameter and ASTM: F-789 Type 1 for pipe sizes 18-inch to 27-inch diameter. PVC pipe joints shall conform to ASTM: D-3212 with restrained gaskets conforming to ASTM: F-477.

D. Ductile iron pipe conforming to the requirements of AWWA C 151, thickness class as shown on the plans.

E. Corrugated high density polyethylene pipe with smooth interior, conforming to AASHTO designation M-294S.

F. Profile wall PVC (Ribbed PVC) pipe conforming to ASTM: F-794 and AASHTO M304. Pipe joints shall conform to ASTM: D-3212 with restrained gaskets conforming to ASTM: F-477.

G. High Density Polyethylene Pipe (HDPE pipe): HDPE pipe shall comply with the requirements of AWWA C906 for pipe materials and pressure rating as follows:

Standard PE Code Designation – PE 3408
Standard Dimension Ratio – maximum 32.5
Pressure Class – minimum 50 psvg

H. All pipe joints shall be rubber gasketed. Joints for HDPE pipe shall be either heat-fusion butt-joint or flanged joint.

All storm drain pipe shall be bedded. Bedding material shall conform to "Bedding Material for Rigid Pipe" as specified in Section 9-03.15 of the "Standard Specifications" or pea gravel. Bedding shall be placed to a minimum depth of 6 inches under the barrel of the pipe and up to the following levels:

- PVC and corrugated polyethylene pipe – one (1) foot above the crown of the pipe.

- Concrete, ductile iron, high density polyethylene and corrugated steel pipe – springline of the pipe.

As an option the contractor may use controlled density fill.

5. Trench backfill shall be excavated native material or Bank Run Gravel for Trench Backfill conforming to Section 9-03.19 of the "Standard Specifications," depending on the suitability of the native material to compaction. Suitable native material shall be free from mud, muck, organic matter, broken pavement, rocks greater than 6-inch dimension, and other deleterious material, and must be capable of compaction to meet the

required density at the time of placement. If the native material cannot be readily compacted to the specified density, only Bank Run Gravel shall be utilized and any insufficiently compacted native material shall be removed and replaced with Bank Run Gravel. The native material shall only be used and remain in place if in situ compaction testing provides sufficient evidence that the specified compaction is uniformly attained.

Backfill shall be placed in lifts not to exceed 12 inches in loose depth, and each lift shall be mechanically compacted to the following densities

- Along and over the pipe to a depth of one foot above the crown of the pipe – 90 percent of maximum density.
- Above one foot above the crown of the pipe in unimproved areas – 90 percent of maximum density.
- Above one foot above the crown of the pipe in areas to be paved (roadway and/or sidewalk) – 95 percent of maximum density.
- Maximum density to be determined by ASTM: D-1557.

6. Open-cut transverse crossings of roadways after final paving are not to be permitted unless it can be shown that alternatives such as jacking, auguring or tunneling are not feasible or unless the utility can be installed just prior to reconstruction or an overlay of the road. Should an open cut be approved, all transverse trenches shall be backfilled with controlled density fill. Transverse crossings in roadway under construction with ATB applied may be backfilled with crushed rock.

7. Special structures, oil/water separators and outlet controls shall be installed per plans and manufacturer's recommendations.

8. Call underground locate line 1-800-424-5555 a minimum 48 hours prior to any excavations.

9. Before any construction or development activity, a preconstruction meeting must be held between contractor, the City's Inspector, and other appropriate parties.

10. The City Engineer must be notified at least 24 hours prior to commencing construction. No part of the drainage system shall be put into use until it has been inspected by the City. The City may waive this requirement on a case by case basis if continued evidence of sound construction practice by the contractor so warrants. In any event, installations which do not meet the requirements of these standards shall be removed and replaced at the

contractor's sole expense.

11. A copy of these approved plans must be on the job site whenever construction is in progress.

12. All drainage structures shall have locking lids or grates. All drainage structures that do not collect surface water runoff shall have solid locking lids.

13. Culvert pipes shall have the ends mitered to conform to the slope. Plastic pipes will not be allowed to project from slopes or into ditches when the slope is flatter than 3:1 to prevent crushing during mowing or maintenance activities.

14. Prior to final inspection and acceptance, pipes and structures shall be cleaned and flushed.

Storm drain stubs shall be located as shown on the approved construction plans. Each outlet shall have free-flowing positive drainage to an approved stormwater conveyance system or to an approved outfall location. A cleanout is required at the house or structure, but is not required at the edge of the right-of-way. Storm drain stub-outs shall be marked as follows:

A. If one storm drain stub is shown servicing a single lot on the plans it is intended to pick up all storm drain runoff from the lot, including roofs. Stub-outs on each lot shall be located by a 2x4 stake. The stub-out shall be marked "STORM" or "DRAIN" in black letters, and the pipe shall be connected to the road runoff conveyance system. The stakes shall extend above surface level, be visible and located at the end of the stub-out. The stub-out shall not be connected to the stake in any manner.

B. In the event two storm drain stubs are shown servicing a single lot on the plans, one outlet is specifically for the roof drain connection only. The other outlet is for the footing drain, yard drain and rockery drain (where applicable). Stub-outs on each lot shall be located by 2x4 stakes. One stub-out shall be marked "STORM" or "DRAIN" in black letters, and the pipe shall be connected to the road runoff conveyance system. The other stub-out shall be marked "ROOF" in black letters and connected to the secondary conveyance system which runs parallel to (and in the same trench as) the roadway runoff conveyance system in most locations. The stub-out shall not be connected to the stake in any manner on any lot. The footing drainage system and the roof downspout system shall not be interconnected on any lot.

3.060 Testing

The storm drain system will be inspected by the City. Any departures from the best construction practices, such as pipeline misalignment, presence of foreign matter in the catch basins or manholes, poor manhole or catch basin construction, etc., shall be corrected.

Continuous poor construction practice shall be cause to require complete testing of the storm drain system in accordance with Section 7-04 of the "Standard Specifications."

3.070 Existing Utility Removal

Where it is feasible and practical, as determined by the City Engineer, all abandoned pipes and appurtenances shall be removed. If it is decided by the City Engineer that the pipes can be abandoned in-place, then ends of abandoned pipes shall be plugged for a distance of 2 pipe diameters with commercial concrete.

3.080 Trench Excavation and Backfill

The maximum permissible trench width between the foundation level and up to 12 inches above the pipe shall be 40 inches for pipe 15 inches or smaller inside diameter or 1 1/2 times the inside diameter plus 18 inches for pipe 18 inches or larger. If the maximum trench width is exceeded without written authorization of the City Engineer, the contractor will be required to provide pipe of higher strength classification or to provide a higher class of bedding, as required by the City Engineer.

Trench backfill shall be excavated native material or Bank Run Gravel for Trench Backfill conforming to Section 9-03.19 of the "Standard Specifications," depending on the suitability of the native material to compaction. Suitable native material shall be free from mud, muck, organic matter, broken pavement, rocks greater than 6-inch dimension, and other deleterious material, and must be capable of compaction to the required density at the time of placement. If the native material cannot be readily compacted to the specified density, only Bank Run Gravel shall be utilized and any insufficiently compacted native material shall be removed and replaced with Bank Run Gravel. The native material shall only be used and remain in place if in situ compaction testing provides sufficient evidence that the specified compaction is uniformly attained.

Backfill shall be placed in lifts not to exceed 12 inches in loose depth, and each lift shall be mechanically compacted to the following densities:

- Along and over the pipe to a depth of one foot above the crown of the pipe – 90 percent of maximum density.
- Above one foot above the crown of the pipe in unimproved areas – 90 percent of maximum density.

- Above one foot above the crown of the pipe in areas to be paved (roadway and/or sidewalk) – 95 percent of maximum density.

Compaction of trench backfill material shall be accomplished with mechanical tampers, vibratory compactors, or other equipment suitable to the characteristics of the soils. Water settling shall not be employed. The use of compaction equipment directly over the pipe shall be controlled and limited in accordance with installation instructions and recommendations provided by the manufacturer of the pipe.

In-place density testing of compacted backfill material shall be in accordance with ASTM: D-1556 (sand cone device) or ASTM: D-2922 (nuclear density gauge). Laboratory maximum density testing of fill material shall be performed in accordance with ASTM: D-1557.

A minimum of one compaction test is required for each 200 feet of trench or as may be directed by the City Engineer. Trenches failing the required test shall have the backfill removed, replaced, and re-compacted. Compaction testing shall be done only by an approved testing laboratory at the contractors/developers expense. All test results and analyses shall be promptly given to the City Engineer. The City reserves the right to contract with an independent testing laboratory for testing of trench backfill. This testing shall also be done at the contractors/developers expense.

When, after excavating for pipes to the foundation level, the material remaining in the trench is unsuitable, as determined by the City Engineer, excavation shall be continued to such additional depth as may be required by the City Engineer. Unsuitable foundation material shall be replaced with foundation gravel conforming to Section 9-03.17 of the "Standard Specifications."

The developer/contractor shall furnish, install, and operate all necessary equipment to keep excavations above the foundation level free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property or nuisance to the public.

Sufficient pumping equipment in good working condition shall be available at all times for all emergencies, including power outage, and shall have available at all times competent workmen for the operation of the pumping equipment.

3.090 Pipe Bedding

All storm drain pipe shall be bedded. Bedding material shall conform to "Bedding Material for Rigid Pipe" as specified in Section 9-03.15 of the "Standard Specifications" or pea gravel. Bedding shall be placed to a minimum depth of 6 inches under the barrel of the pipe and up to the following levels:

- PVC and corrugated polyethylene pipe – one (1) foot above the crown of the pipe.

- Concrete, ductile iron, high density polyethylene and corrugated steel pipe – springline of the pipe.

As an option the contractor may use controlled density fill.

3.100 Trenching Transverse to Existing Roadway

Open-cut transverse crossings of roadways after final paving are not to be permitted unless it can be shown that alternatives such as jacking, auguring or tunneling are not feasible or unless the utility can be installed just prior to reconstruction or an overlay of the road. Should an open cut be approved, all transverse trenches shall be backfilled with controlled density fill. Transverse crossings in roadway under construction with ATB applied may be backfilled with crushed rock.

3.110 Jacking, Auguring, or Tunneling

Tunneling may be ordered by the City Engineer under pavements, buildings, railroad tracks, etc. The developer/contractor shall install the pipe by jacking, auguring or tunneling, or installing the pipe in a casing pipe by a combination of these methods.

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

The annular space between the casing and the pipe shall be filled with controlled density fill or as otherwise approved.

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

3.120 Shoring

The requirements of the Occupational Safety and Health Act (OSHA) and the Washington Industrial Safety and Health Act of 1973 (WISHA) shall apply to all excavation, trenching, and ditching operations on this project. All trenches over four (4) feet in depth shall be shored, braced, and shielded in compliance with applicable Federal and/or State regulations. Shoring, bracing, or shielding shall be

required in all street area excavations, including those areas where all existing pavement is being removed. Sloping to the angle of repose will be permitted only in non-critical, off-street areas.

Shoring and cribbing of excavations and trenches shall be provided in accordance with the provisions of Section 2-09 of the "Standard Specifications."

The shoring system shall be a commercially available shoring system designed for the depths anticipated on the project. The shoring system shall meet all requirements of the Washington State Safety and Health Act (WISHA) and United States Federal Occupational Safety and Health Act (OSHA).

Construction safety is the developer's/contractor's responsibility and all persons on site are subject to the safety direction of developer/contractor personnel. The City of Snoqualmie and its representatives do not have either control or authority on site safety issues and therefore assume no responsibility for the safety of others.

3.130 Controlled Density Fill

Controlled Density Fill (CDF) shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures proportioned to provide a non-segregating, self-consolidating, free-flowing, and excavatable material which will result in a hardened dense, non-settling fill. Slump shall be 3 inches to 6 inches.

CDF shall be discharged from the mixer by any reasonable means into the area to be filled. The CDF shall be brought up uniformly to the elevation shown on the plans.

CDF shall not be placed on frozen ground.

CDF patching, mixing, and placing may be started if weather conditions are favorable, when the temperature is at 34 degrees F and rising. At the time of placement, CDF must have a temperature of at least 40 degrees F. Mixing and placing shall stop when temperature is 38 degrees F or less and falling. Each filling stage shall be as continuous an operation as is practicable.

Trench section to be filled with CDF shall be contained at either end of trench section by bulkhead or earth fill.

Contractor shall provide steel plates to span utility trenches and prevent traffic contact with CDF for at least 24 hours after placement or until CDF is hard enough to prevent rutting by construction equipment or traffic.
Controlled Density Fill shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures which have been batched and mixed in accordance with Section 6-02.3 of the WSDOT/APWA Standard Specifications.

Materials	

1. Portland Cement	AASHTO M 85 or WSDOT 9-01
2. Fly Ash	Class F
3. Aggregates	WSDOT 9-03.1(2)B
4. Admixtures	WSDOT 9-23.6

3.140 Sawcutting Existing Pavement

The contractor shall make a vertical sawcut to the full depth of existing asphalt or concrete pavement for all crossings of the existing pavement.

Where necessary to remove existing curbs, gutter, driveways and sidewalk, full panels shall be removed. Care shall be taken during removal to protect adjacent sidewalk panels, concrete curbs and existing utilities from damage. In no case shall any segment of sidewalk or curb and gutter be shorter than 5' in length.

3.150 Pavement Patching

This work shall consist of the reconstruction and patching of existing pavement that is scheduled to remain. The following provisions shall apply regardless of the condition or type of roadway base and pavement types encountered. Asphalt pavements shall be patched with asphalt, and concrete pavements shall be patched with concrete.

Pavement patching shall be scheduled to accommodate the demands of traffic and shall be performed as rapidly as possible to provide maximum safety and convenience to public travel.

Before the patch is constructed, all pavement cuts shall be trued so that the marginal lines of the patch will form a rectangle with straight edges and vertical faces. The patch shall be flush with the surrounding surface and shall provide a smooth riding surface for passing traffic.

Asphalt shall be Asphalt Concrete Pavement, Class B. The depth of asphalt shall be a minimum of four inches in all areas, and shall be increased as necessary to match the existing thickness. Asphalt Concrete Pavement shall be laid over four inches of crushed surfacing.

Cement Concrete Pavement shall be a 3-day mix conforming to the requirements of Section 5-05 of the "Standard Specifications." The thickness of concrete shall be a minimum of 6 inches, and shall be increased as necessary to match the existing thickness.

Until such time as the permanent patch placed, the contractor shall install a temporary patch over unfinished portions of work that will affect traffic in any way. Temporary pavement patch shall be accomplished by using 3 inches of cold mix (MC 250), or 3 inches of ATB.

3.160 Submittals

All fixtures, structures, and materials data must be submitted for review and approval by the City Engineer prior to installation. Certification and cut sheets will be required.

3.170 Approval of Alternate Materials

The City Engineer shall be the sole judge of whether other types and materials of pipe, drainage structures, drainage hardware, etc. qualify as suitable for use on City of Snoqualmie storm drainage systems. As a minimum, submit information proving that specifications are available to control quality, and that acceptable user experience with the product can be shown in uses similar to those proposed. The developer/contractor shall have the full burden of proof in proving adequacy. Incomplete submittals will be rejected. Allow 20 working days after receipt of all required information for the approval process. See Chapter 1 for submittal requirements.

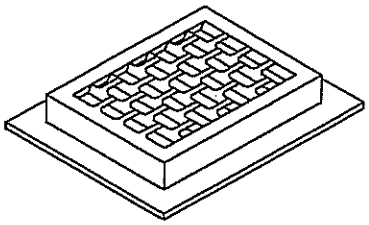
LIST OF STANDARD DRAWINGS

CHAPTER 3 – STORM DRAINAGE

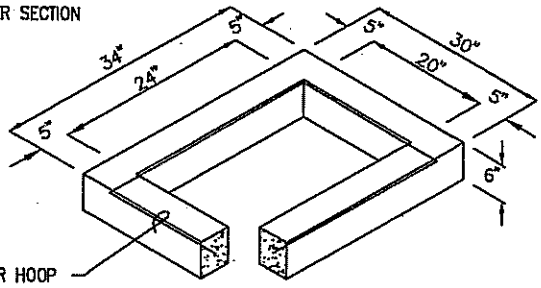
TITLE	DRAWING
Concrete Inlet	3-01
Catch Basin Type 1	3-02
Catch Basin Type 1-L	3-03
Catch Basin Type 2, 48-, 54-, 60-, 72-, 84- and 96-inch	3-04
Miscellaneous Catch Basin Details	3-05
Locking Vaned Grate	3-06
Standard Grate	3-07
Standard Frame Details	3-08
Through-Curb Inlet Frame and Grate Installation	3-09
Through-Curb Inlet Frame	3-10
Type 2 Catch Basin with Tee Type Oil Separator	3-11
Cleanout Gate	3-12
Type 2 Catch Basin with Oil/Water Separator	3-13
Manhole Ring and Cover	3-14
Sidewalk Drain - Residential	3-15
Yard Drain (new detail)	3-16
Debris Cage Detail	3-17
Catch Basin Collar	3-18
Stub-Out Stake Detail	3-19
PRV Connection to Catch Basin	3-20
Type 2 Catch Basin w/Baffle Oil Separator	3-21
Storm Clean-Out	3-22

Approved: AB#04-172 11/8/04 Attest: Jodi Warren/CMC City Clerk

FRAME AND LOCKING VANED GRATE

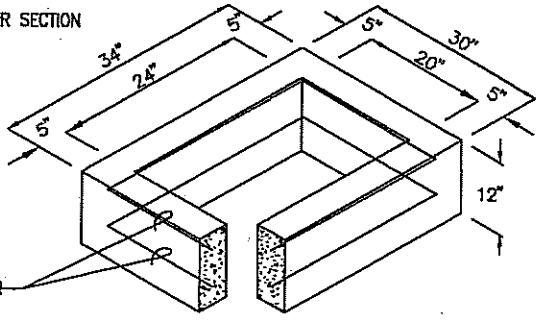


6" RISER SECTION

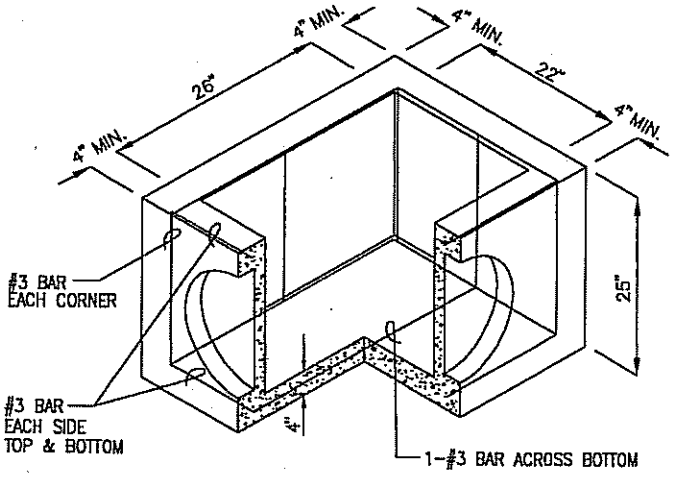


1 #3 BAR HOOP

12" RISER SECTION



2 #3 BAR HOOPS



#3 BAR EACH CORNER

#3 BAR EACH SIDE TOP & BOTTOM

1-#3 BAR ACROSS BOTTOM

PRECAST BASE SECTION (MEASUREMENT AT THE TOP OF THE BASE)

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIA. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
12. GROUT IN BETWEEN ALL JOINTS AND ADJUSTMENT SECTIONS.

PIPE ALLOWANCES

PIPE MATERIAL	MAXIMUM INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP * (STD. SPEC. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. 9-05.12(1)	15"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2)	15"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE

SNOQUALMIE RIDGE II

CONCRETE INLET

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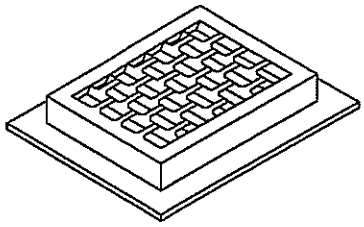
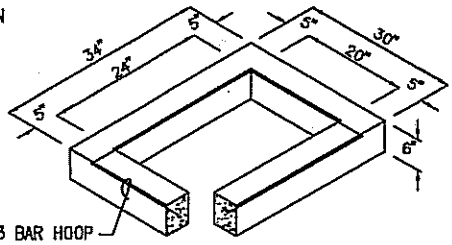
	ER		09/16/04	3-01

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

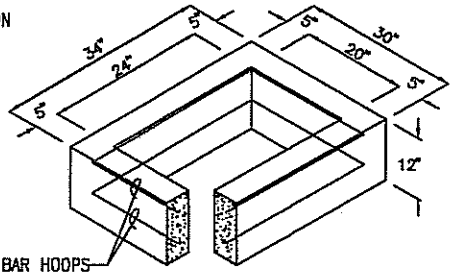
FRAME AND LOCKING VANED GRATE



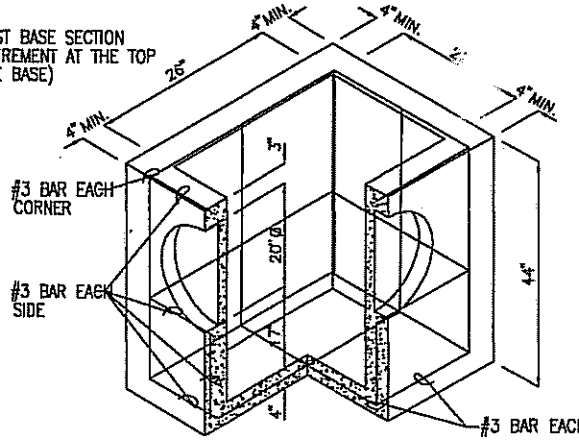
6" RISER SECTION



12" RISER SECTION



PRECAST BASE SECTION (MEASUREMENT AT THE TOP OF THE BASE)



NOTES:

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3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
12. GROUT IN BETWEEN ALL JOINTS AND ADJUSTMENT SECTIONS.

PIPE ALLOWANCES

PIPE MATERIAL	MAXIMUM INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP * (STD. SPEC. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	15"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE

SNOQUALMIE RIDGE II

CATCH BASIN TYPE 1

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	ER		09/16/04	3-02

Approved: AB#04-172 11/8/04
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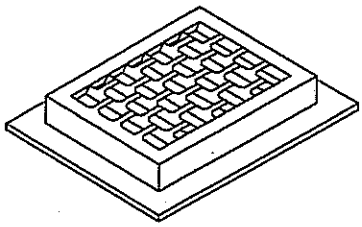
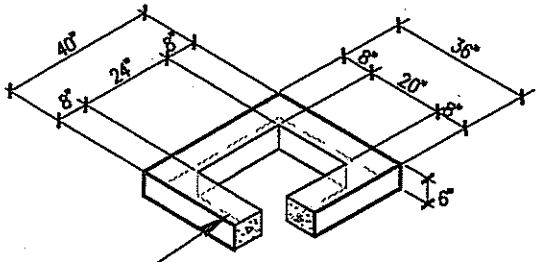
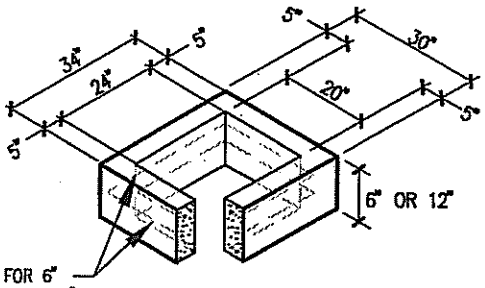


FRAME AND LOCKING VANED GRATE



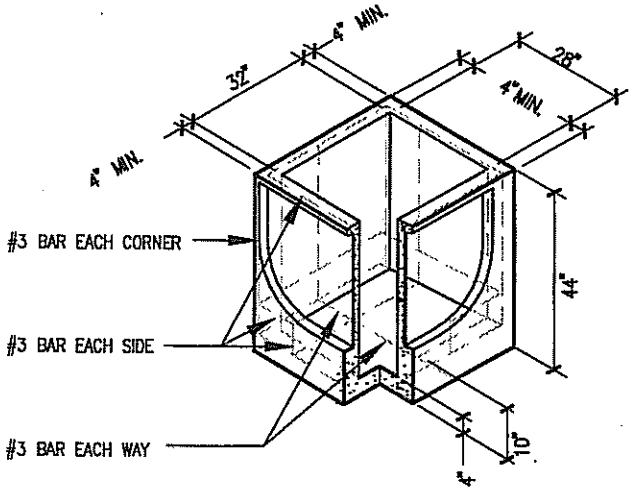
2 – #3 BAR HOOPS

6" REDUCING SECTION



1 – #3 BAR HOOP FOR 6"
2 – #3 BAR HOOPS FOR 12"

RISER SECTION



PRECAST BASE SECTION
(MEASUREMENT AT THE TOP OF THE BASE)

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIA. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
12. GROUT IN BETWEEN ALL JOINTS AND ADJUSTMENT SECTIONS.

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	18"
ALL METAL PIPE	21"
CPSSP * (STD. SPEC. 9-05.20)	18"
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	21"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	21"

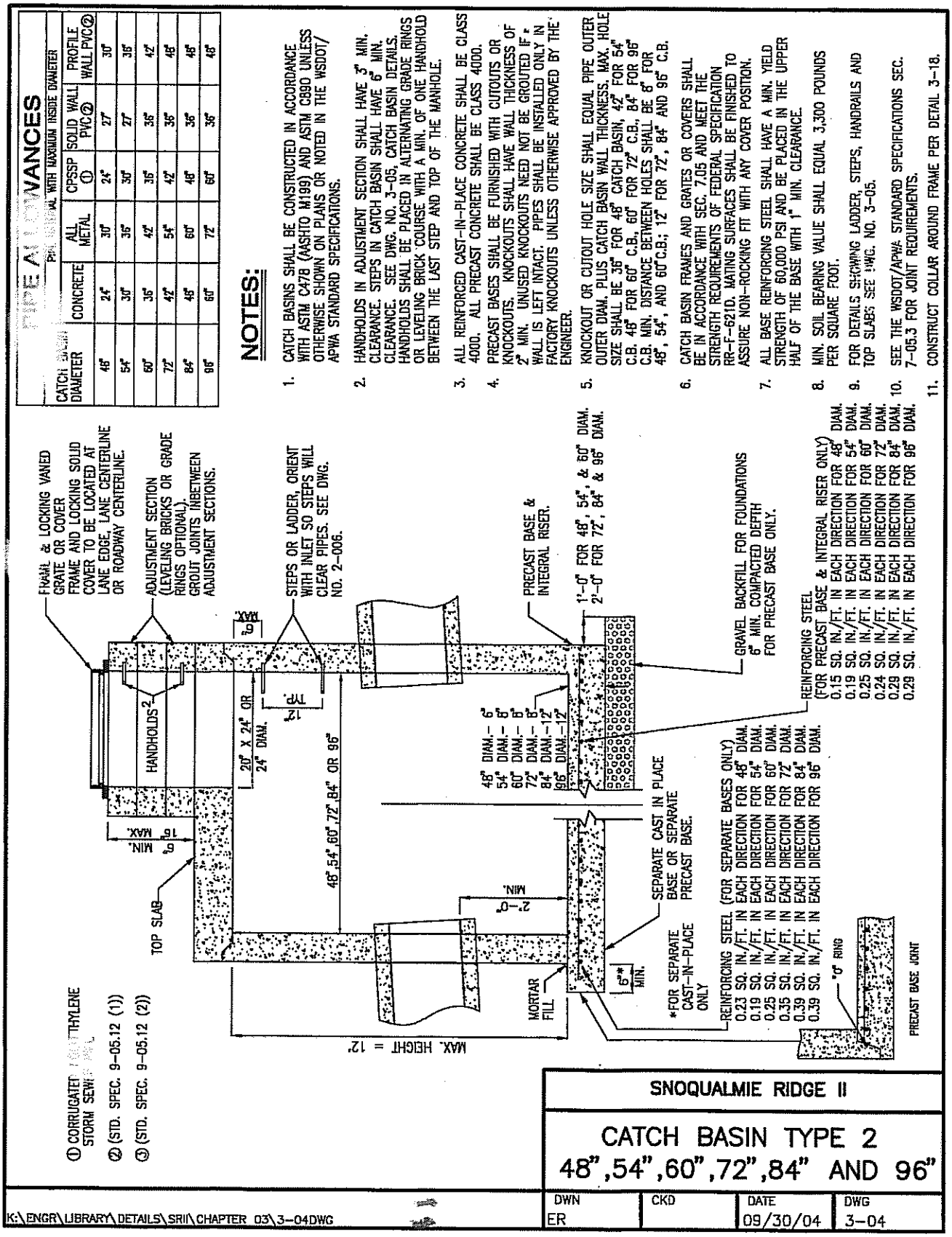
* CORRUGATED POLYETHYLENE STORM SEWER PIPE

SNOQUALMIE RIDGE II

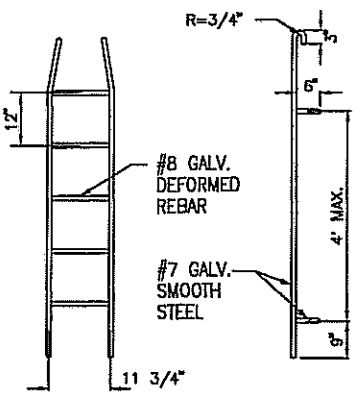
CATCH BASIN TYPE 1-L

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-03.DWG	DWN	CKD	DATE	DWG
	ER		09/16/04	3-03

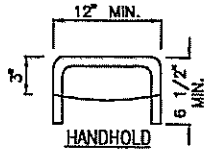
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



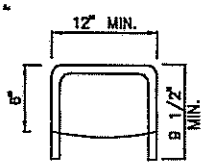
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



PREFABRICATED LADDER

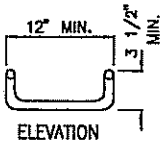


HANDHOLD

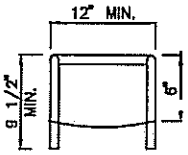


CATCH BASIN STEP

*ALL STEPS & RUNGS #8 GALV. DEFORMED REBAR OR COPOLYMER PROPYLENE.

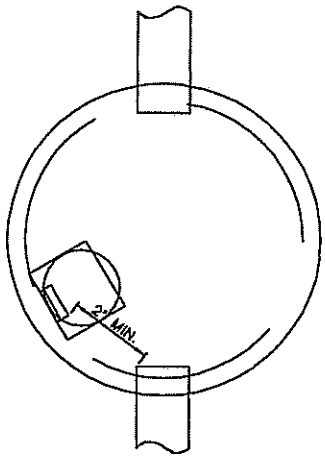


ELEVATION

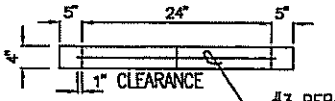


PLAN

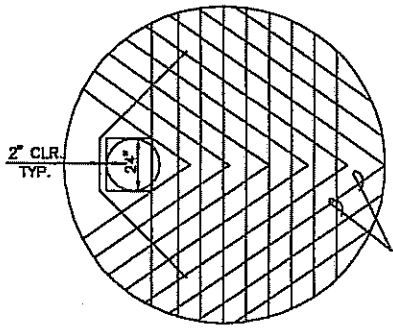
DROP RUNG CATCH BASIN STEP



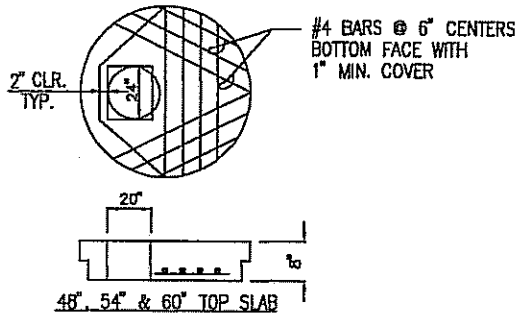
TYPICAL ORIENTATION FOR ACCESS AND STEPS



GRADE RING



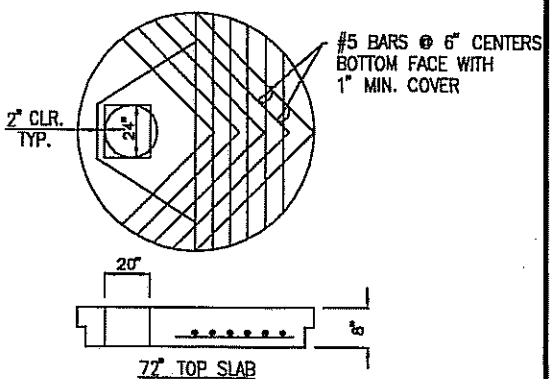
96" TOP SLAB



48", 54" & 60" TOP SLAB

NOTES:

1. USE POLYETHYLENE COATED STEPS AND LADDER RUNGS. PROPRIETARY CATCH BASIN HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M-199 AND MEET ALL WISHA REQUIREMENTS.
2. CATCH BASIN STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL TEPS IN ANY CATCH BASIN SHALL BE SIMILAR. PENETRATION OF OUTER WALL BE A LEG IS PROHIBITED.
3. HANDHOLDS AND STEPS SHALL HAVE "DROP" RUNGS AS SHOWN ON DETAIL OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. SLAB OPENING MAY BE 24" X 20" OR 24" DIAM.
5. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED BE WIRE FABRIC SHALL COMPLY TO ASTM A497.
6. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF CATCH BASIN.
7. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE, OR BOLTED TO STRUCTURE WALL.
8. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED IN VERY DEEP OR UNUSUAL STRUCTURES.
9. DEFORMED AND PLAIN REINFORCING BAR SHALL CONFORM TO ASTM A 615, GRADE 60.
10. STEEL LADDERS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 123.



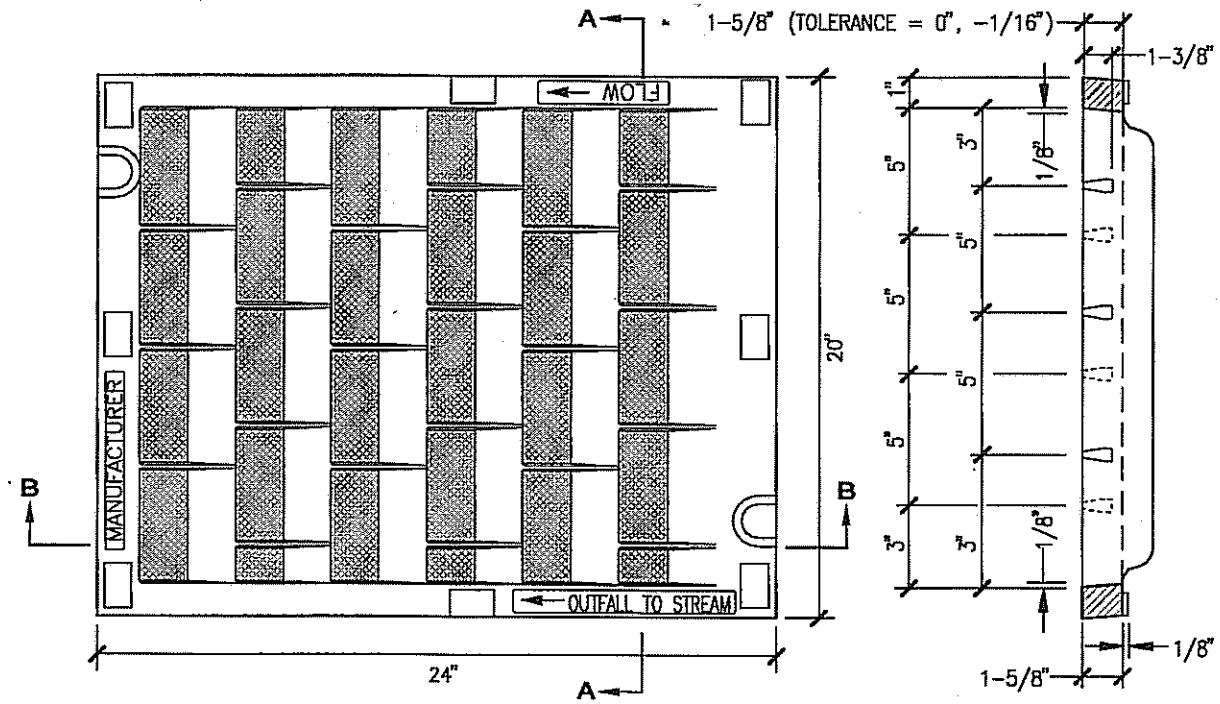
72" TOP SLAB

SNOQUALMIE RIDGE II

MISCELLANEOUS CATCH BASIN DETAILS

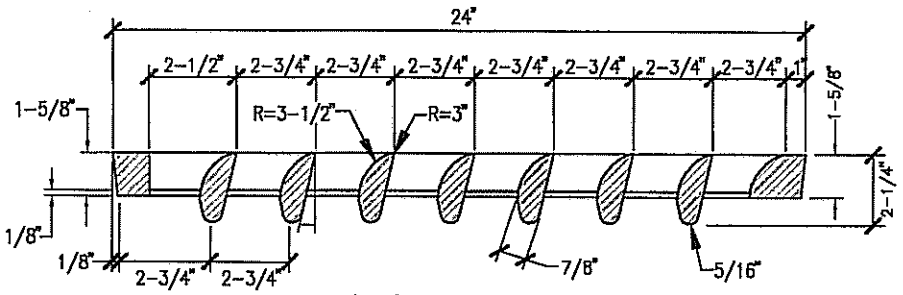
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-05.DWG	DWN	CKD	DATE	DWG
	ER		09/16/04	3-05

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

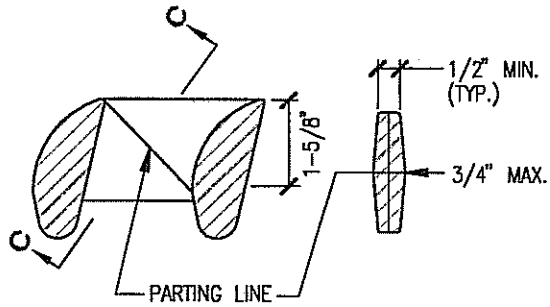


PLAN

SECTION "A-A"



SECTION "B-B"



VANE DETAIL

NOTES:

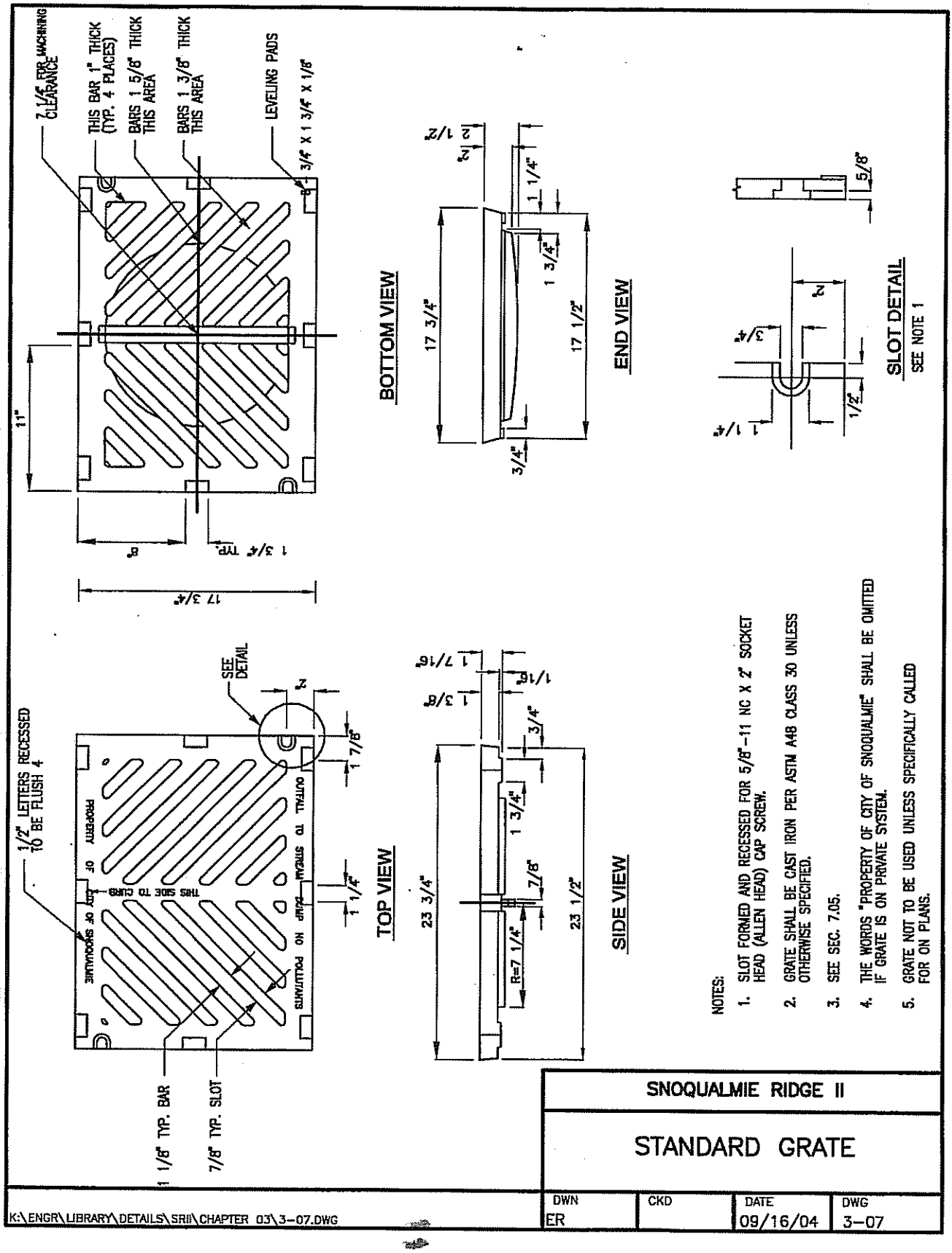
1. THE NAME OF THE MANUFACTURER, DIRECTION OF FLOW AND "DUMP NO POLLUTANTS" AND "OUTFALL TO STREAM" SHALL BE EMBOSSED ON THE TOP SURFACE OF EACH GRATE. LETTERING TO BE RECESSED 1/16".
2. THE MATERIAL USED FOR THE GRATE SHALL BE DESIGNATED BY EMBOSSING D.I. (DUCTILE IRON) NEAR THE NAME OF THE MANUFACTURER.
3. DIMENSIONS SHALL HAVE A ±1/16" TOLERANCE, EXCEPT AS NOTED.
4. EDGES SHALL HAVE 1/8" RADIUS, 1/8" CHAMFER OR COMPLETE DEBURRING.
5. THE FRAME SHALL BE IN ACCORDANCE WITH THE STANDARD PLAN "METAL FRAME AND GRATE FOR CATCH BASIN AND INLET".
6. WELDING IS NOT PERMITTED.
7. AS AN ALTERNATE, EIGHT PADS 1-1/2"x1/8"x3/4" INTEGRALLY CAST WITH THE GRATE MAY BE USED.

SNOQUALMIE RIDGE II

LOCKING VANED GRATE

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-01.DWG	DWN	CKD	DATE	DWG
	ER		09/16/04	3-06

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

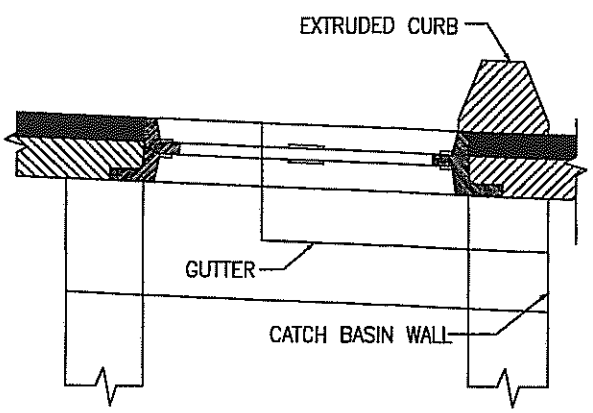


NOTES:

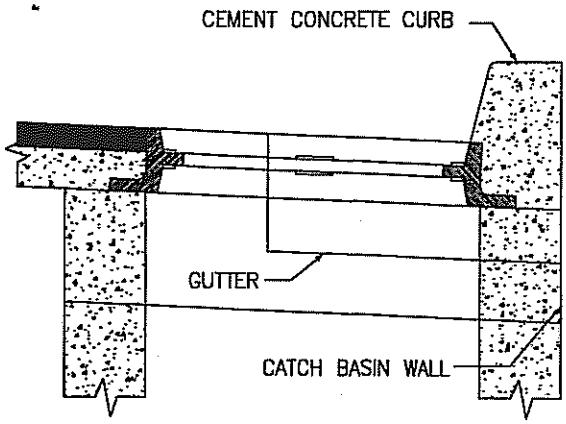
1. SLOT FORMED AND RECESSED FOR 5/8"-11 NC X 2" SOCKET HEAD (ALLEN HEAD) CAP SCREW.
2. GRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.
3. SEE SEC. 7.05.
4. THE WORDS "PROPERTY OF CITY OF SNOQUALMIE" SHALL BE OMITTED IF GRATE IS ON PRIVATE SYSTEM.
5. GRATE NOT TO BE USED UNLESS SPECIFICALLY CALLED FOR ON PLANS.

SNOQUALMIE RIDGE II			
STANDARD GRATE			
K:\ENGR\LIBRARY\DETAILS\SR8\CHAPTER 03\3-07.DWG	DWN ER	CKD	DATE 09/16/04	DWG 3-07

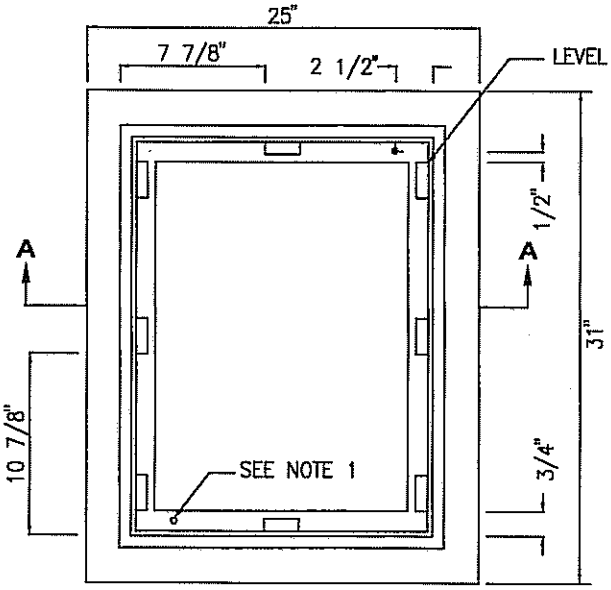
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



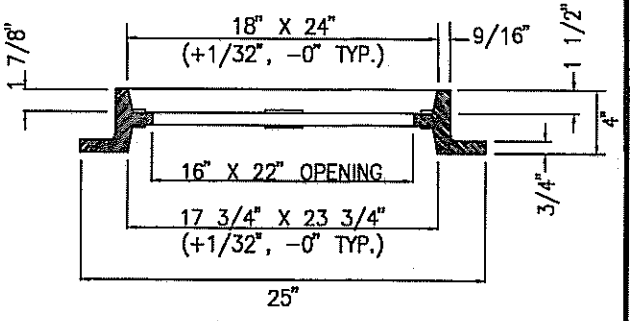
EXTRUDED CURB
SEE NOTE 4



VERTICAL CURB
SEE NOTE 4



PLAN



SECTION A-A

NOTES:

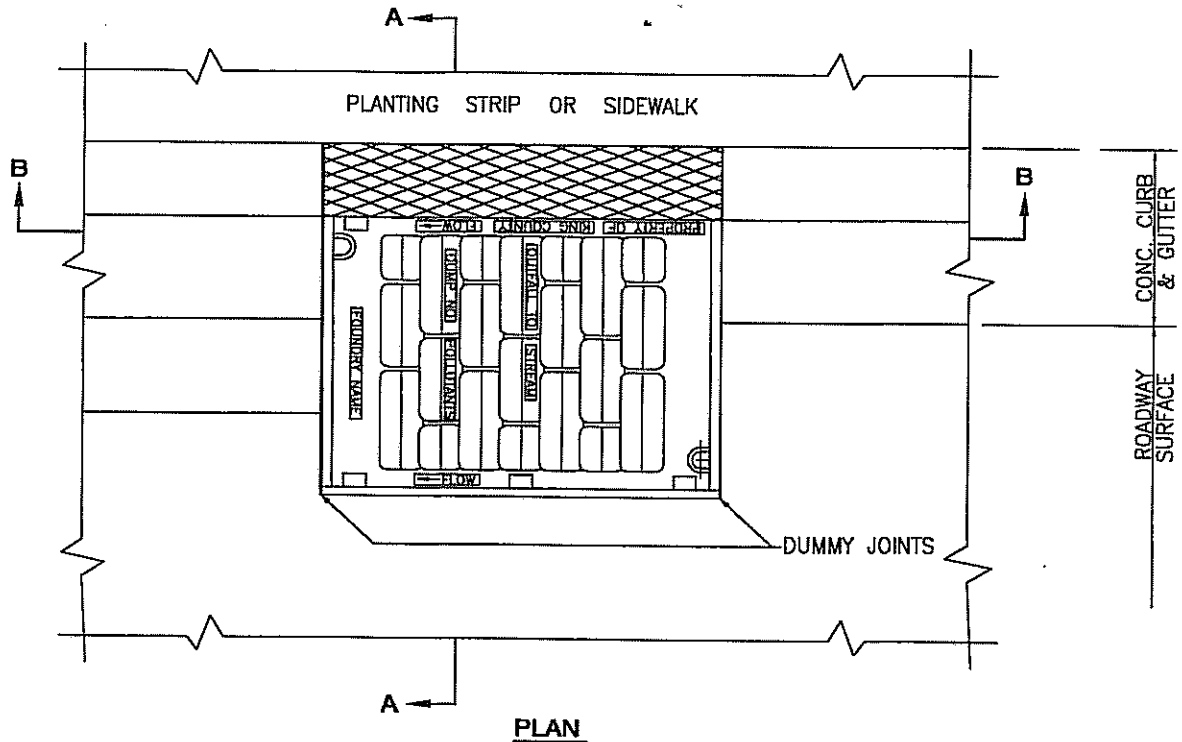
1. DRILL AND TAP FOR, AND PROVIDE, TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG WHEN USED WITH SOLID COVER (DWG. NO. 2-015) OR WHEN SPECIFIED BY ENGINEER.
2. FRAME MATERIAL IS DUCTILE IRON PER ASTM A48 CLASS 30.
3. SET FRAME TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
4. SEE SEC. 7.05.

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-08.DWG	DWN ER	CKD	DATE 09/16/04	DWG 3-08

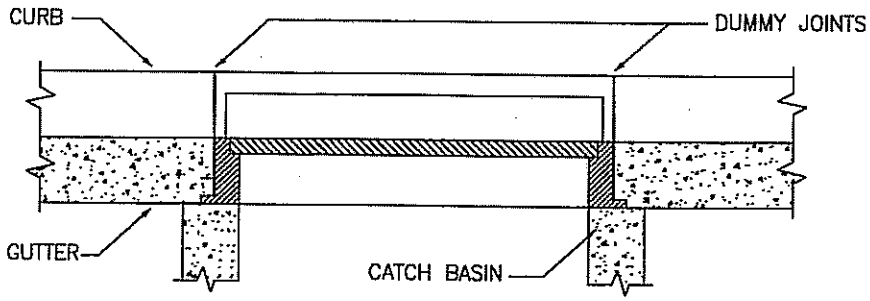
SNOQUALMIE RIDGE II

STANDARD FRAME DETAILS

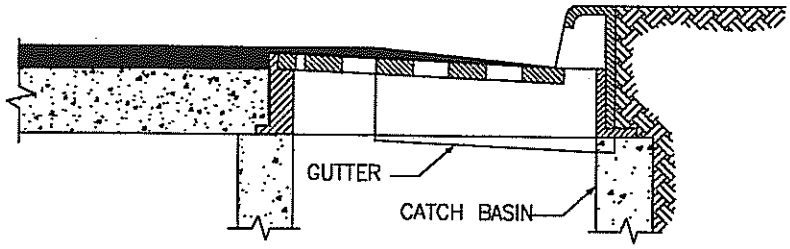
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



PLAN



SECTION B-B



SECTION A-A

NOTES:

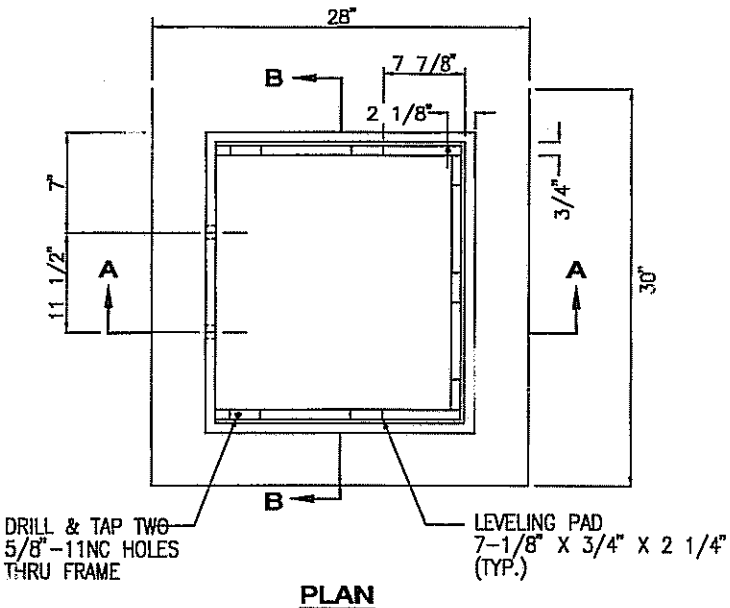
1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. SEE SEC. 3.04 FOR JOINT REQUIREMENTS.

SNOQUALMIE RIDGE II

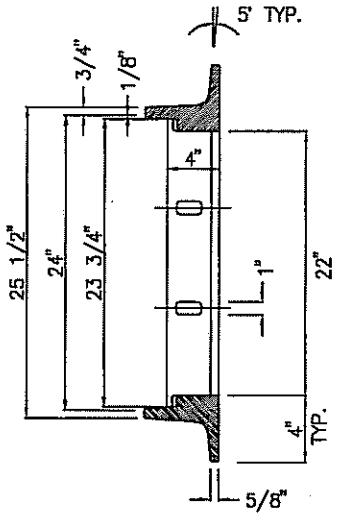
THROUGH–CURB INLET FRAME AND GRATE INSTALLATION

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3–09.DWG	DWN	CKD	DATE	DWG
	ER		09/16/04	3–09

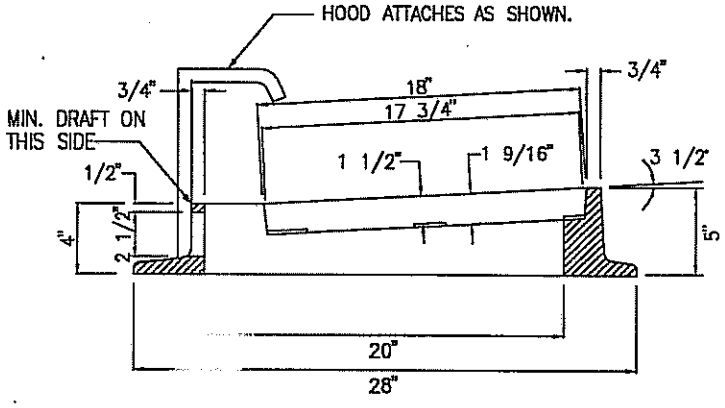
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



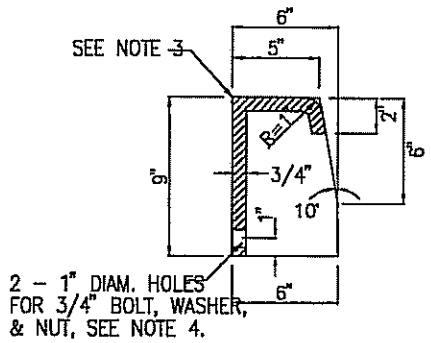
PLAN



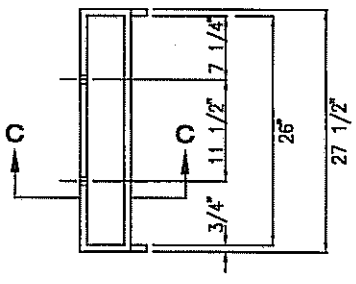
SECTION B-B



SECTION A-A



SECTION C-C



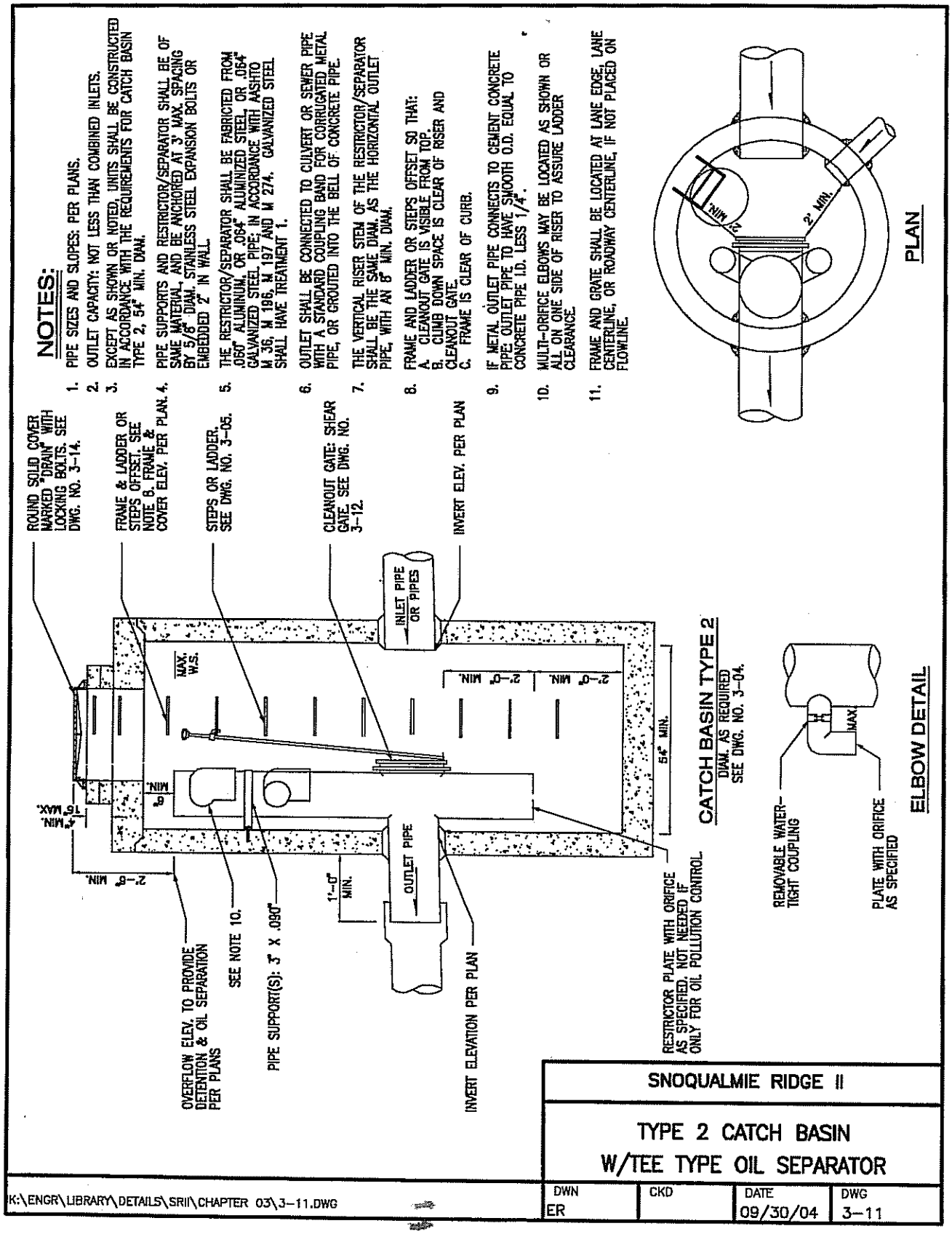
HOOD DETAIL

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
   SEE DWG. NO. 3-06 FOR VANED GRATE.
   PATTERN ON TOP SURFACE OF HOOD SHALL BE 3/16" NON-SKID DIAMOND.
4. BOLT, WASHER, AND NUT SHALL BE GALV. OR CORROSION RESISTANT.
5. SEE SEC. 7.05.

SNOQUALMIE RIDGE II				
THROUGH-CURB INLET FRAME				
K:\ENGR\LIBRARY\DETAILS\SRI\CHAPTER 03\3-10.DWG	DWN ER	CKD	DATE 09/16/04	DWG 3-10

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

NOTES:

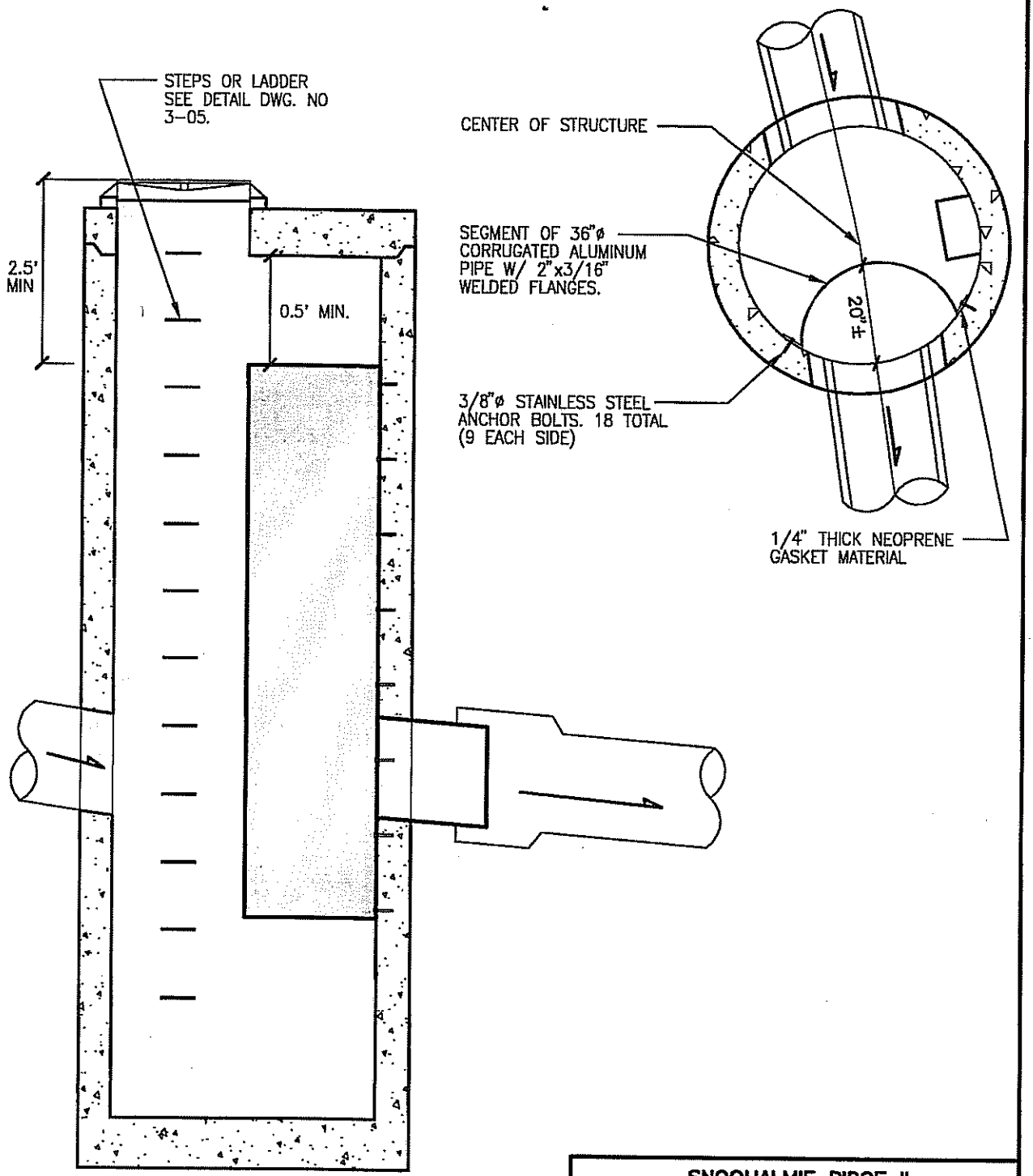
1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED.
2. GATE SHALL BE 8" DIAM. UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE), WELDING, OR OTHER SECURE MEANS.
4. LIFT ROD: AS SPECIFIED BY MFR. WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8" DIAM. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS AND HAVE A SIX BOLT, 10 3/8" BOLT CIRCLE FOR BOLTING CONNECTION.

SNOQUALMIE RIDGE II

CLEANOUT GATE

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-12.DWG	DWN	CKD	DATE	DWG
	ER		09/16/04	3-12

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

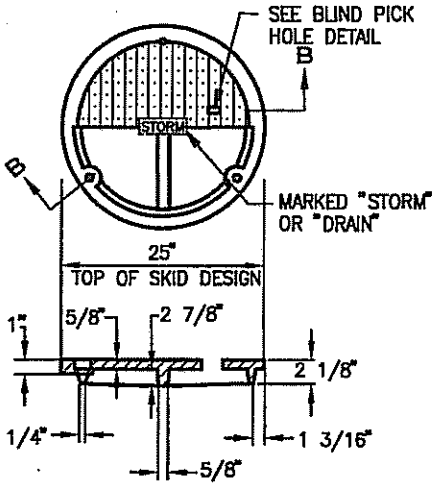


SNOQUALMIE RIDGE II

TYPE II CATCH BASIN WITH OIL / WATER SEPARATOR

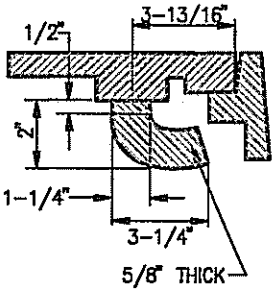
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-13.DWG	DWN	CKD	DATE	DWG
	ER		09/30/04	3-13

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

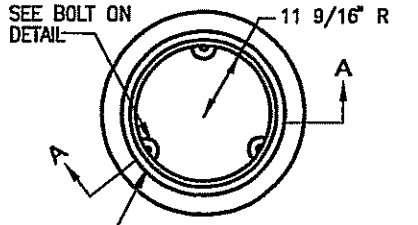


SECTION B-B

TYPE 2
BOLT-DOWN/WATERTIGHT

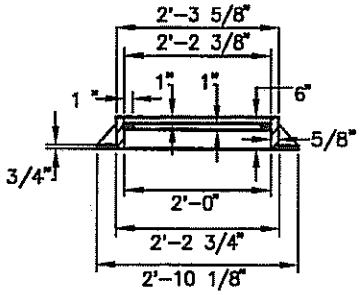


BOLT ON CAM TYPE
LOCKING DEVICE-SECTION D

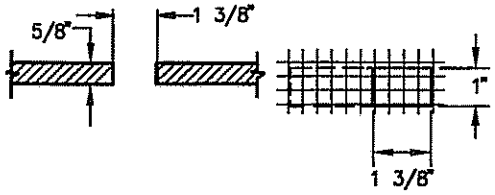


FRAME PLAN

DRILL AND TAP 5/8"x11 HOLE FOR 1 1/2"x5/8" STAINLESS STEEL SOCKET HEAD CAP SCREW

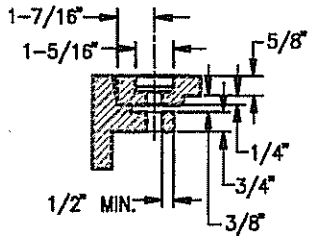


SECTION A-A

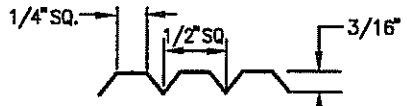


TOP VIEW

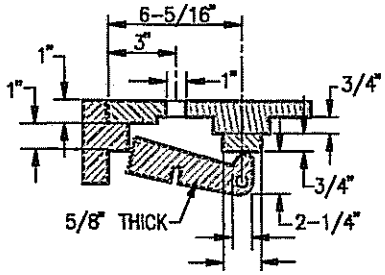
BLIND PICK HOLE DETAIL



BOLT-DOWN DETAIL



COVER SKID DESIGN DETAIL



BOLT ON CAM TYPE
LOCKING DEVICE-SECTION C

NOTES:

1. GASKET AND GROOVE MAY BE IN THE SEAT OR UNDERSIDE OF COVER.
2. WASHER SHALL BE LEAD OR NEOPRENE.
3. TYPE 2, STD. MANHOLE RINGS AND COVERS SHALL BE USED, UNLESS OTHERWISE SHOWN ON THE PLANS, OR SPECIFIED IN THE SPECIAL PROVISIONS.
4. IN LIEU OF BLIND PICK NOTCH FOR STORM SEWER MANHOLE COVERS, DRILL THREE 1" DIAMETER HOLES AT 120° SPACING.
5. PROPRIETARY MANHOLE COVERS WITHOUT BOTTOM RIBS ARE ACCEPTABLE PROVIDED THEY MEET THE STD. SPECIFICATIONS REQUIREMENTS FOR "METAL CASTINGS."

SNOQUALMIE RIDGE II

MANHOLE RING AND COVER

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	ER		10/19/04	3-14

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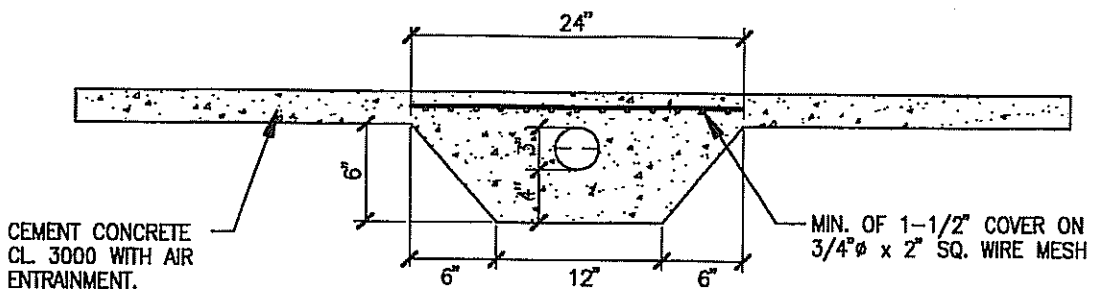
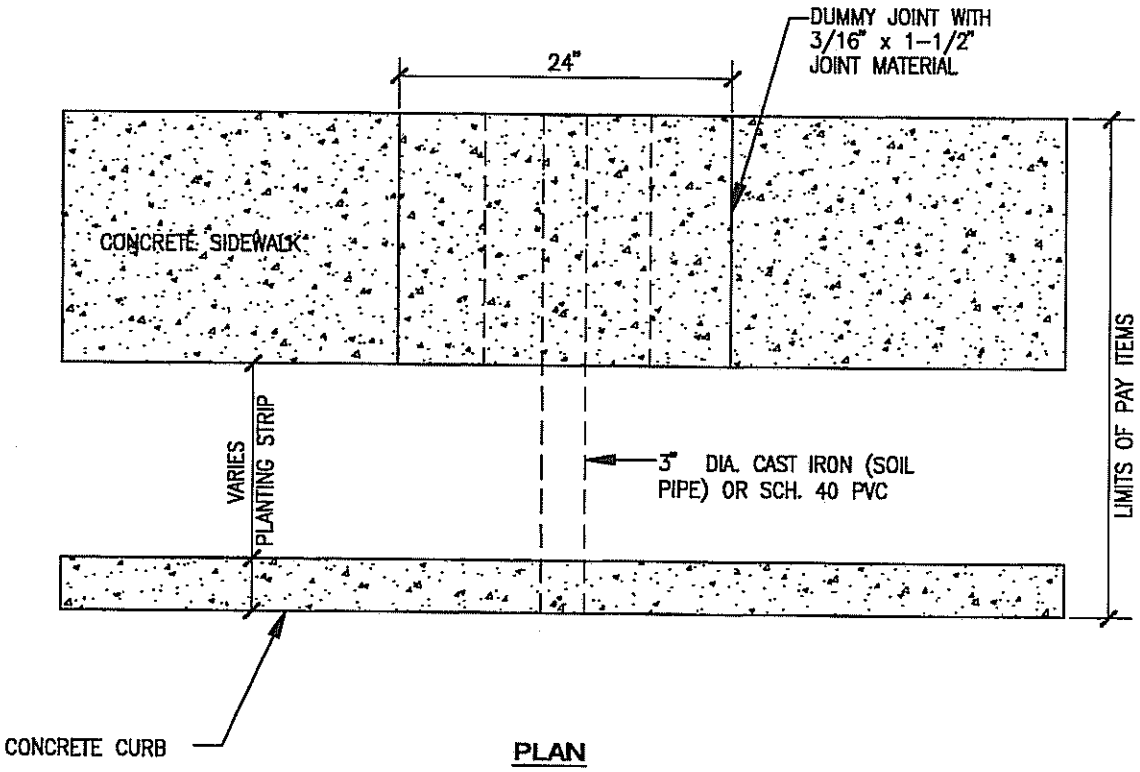


ELEVATION



PLAN

SNOQUALMIE RIDGE II				
SIDEWALK DRAIN RESIDENTIAL				
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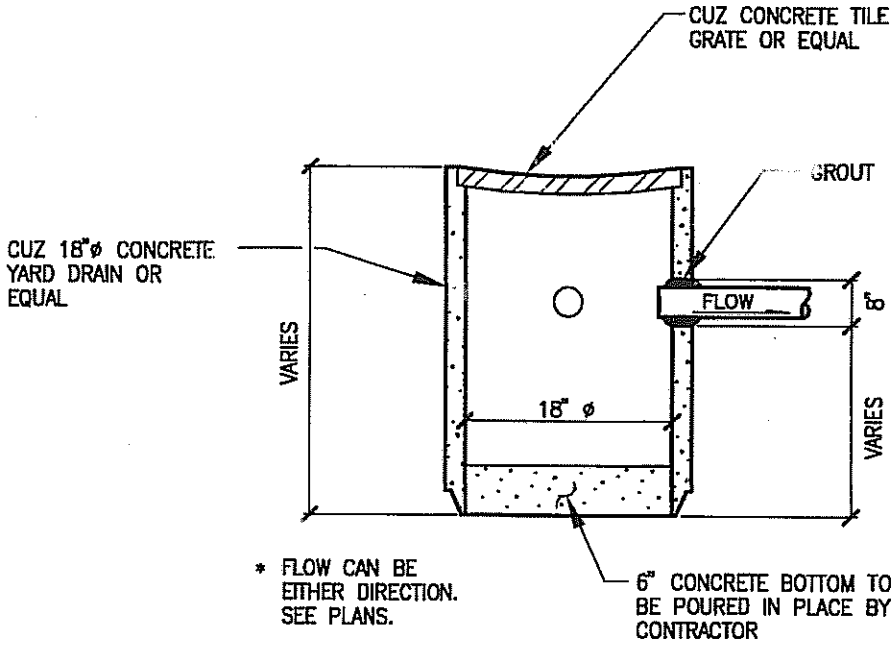

SNOQUALMIE RIDGE II			
YARD DRAIN			
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Approved AB#04-172 11/8/04
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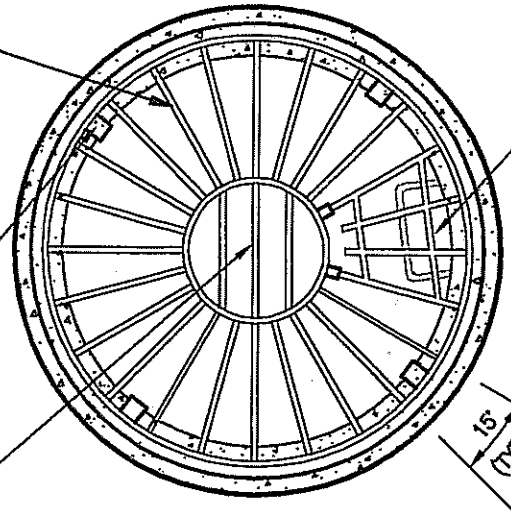
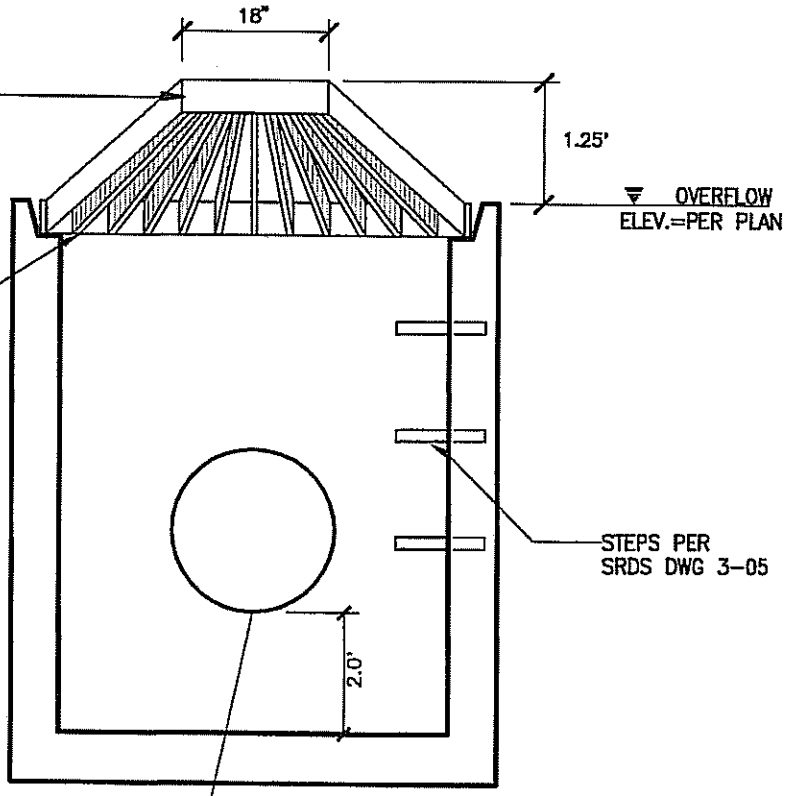


PLAN VIEW



NOTES:

1. FOR DIFFERENT ø C.B.'S ADJUST DIMENSIONS TO MAINTAIN 45° ANGLE ON "VERTICAL" BARS AND 7" O.C. MAX. SPACING OF BARS AROUND LOWER ALUMINUM BAND.
2. METAL PARTS: ALUMINUM. BOLTS: STAINLESS STEEL.

SNOQUALMIE RIDGE II

DEBRIS CAGE DETAIL

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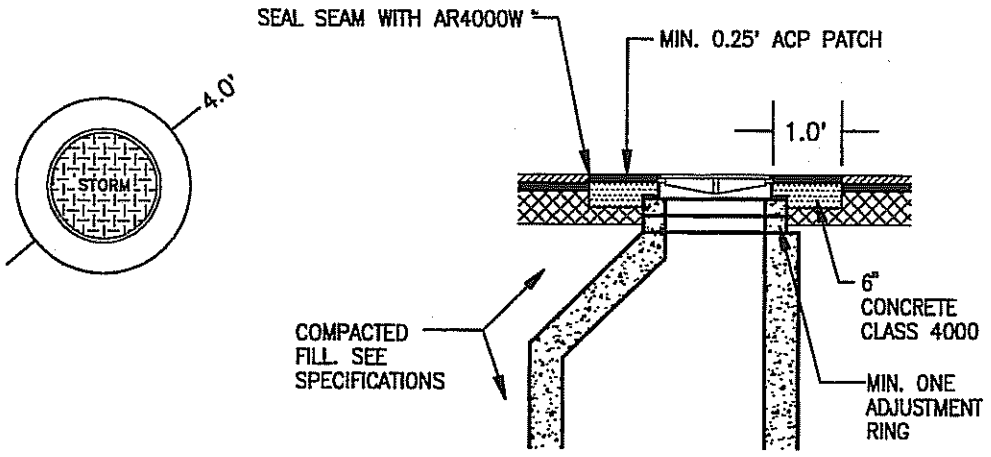
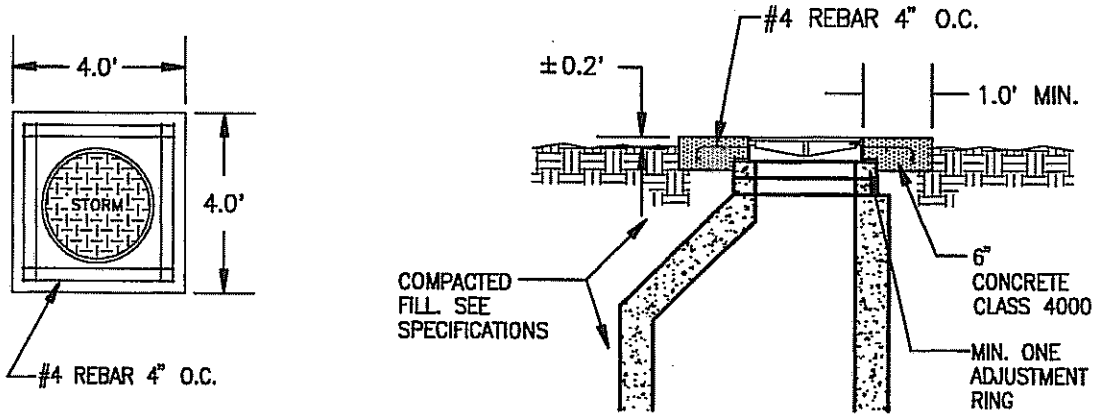


CATCH BASIN IN ASPHALT



CATCH BASIN OUTSIDE ASPHALT

NOTE:

1. ON CATCH BASINS OUTSIDE ASPHALT ADD REINFORCING STEEL AS SHOWN ABOVE. DEFORMED BAR TO MEET ASTM A615 GRADE 60 FY=60,000 P.S.I.

SNOQUALMIE RIDGE II				
CATCH BASIN COLLAR				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 03\3-18.DWG	DWN ER	CKD JSF	DATE 10/18/04	DWG 3-18

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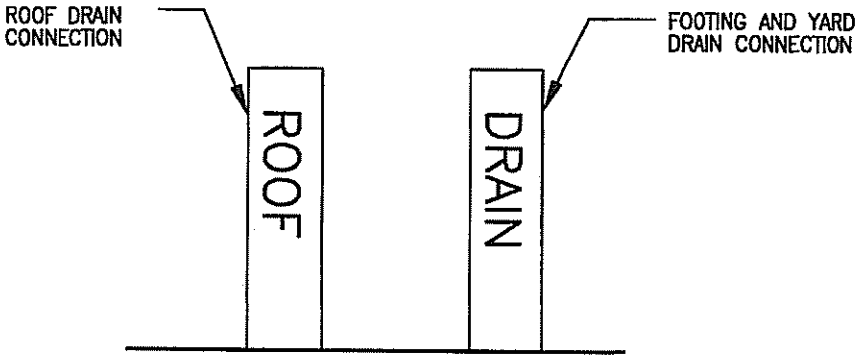

STUB-OUTS ON EACH LOT SHALL BE LOCATED BY A WHITE 2x4. ONE STUB-OUT SHALL BE MARKED "STORM" OR "DRAIN" IN BLACK LETTERS, AND THE PIPE SHALL BE CONNECTED TO ROAD RUNOFF CONVEYANCE SYSTEM. THE OTHER STUB-OUT SHALL BE MARKED "ROOF" IN BLACK LETTERS AND CONNECTED TO THE SECONDARY CONVEYANCE SYSTEM WHICH RUNS PARALLEL AND IN THE SAME TRENCH AS THE ROADWAY RUNOFF CONVEYANCE SYSTEM IN MOST LOCATIONS. THE STAKES SHALL EXTEND ABOVE SURFACE LEVEL, BE VISIBLE AND LOCATED AT THE END OF THE STUB-OUT. THE STUB-OUT SHALL NOT BE CONNECTED TO THE STAKE IN any MANNER.

SNOQUALMIE RIDGE II				
STUB-OUT STAKE DETAIL				
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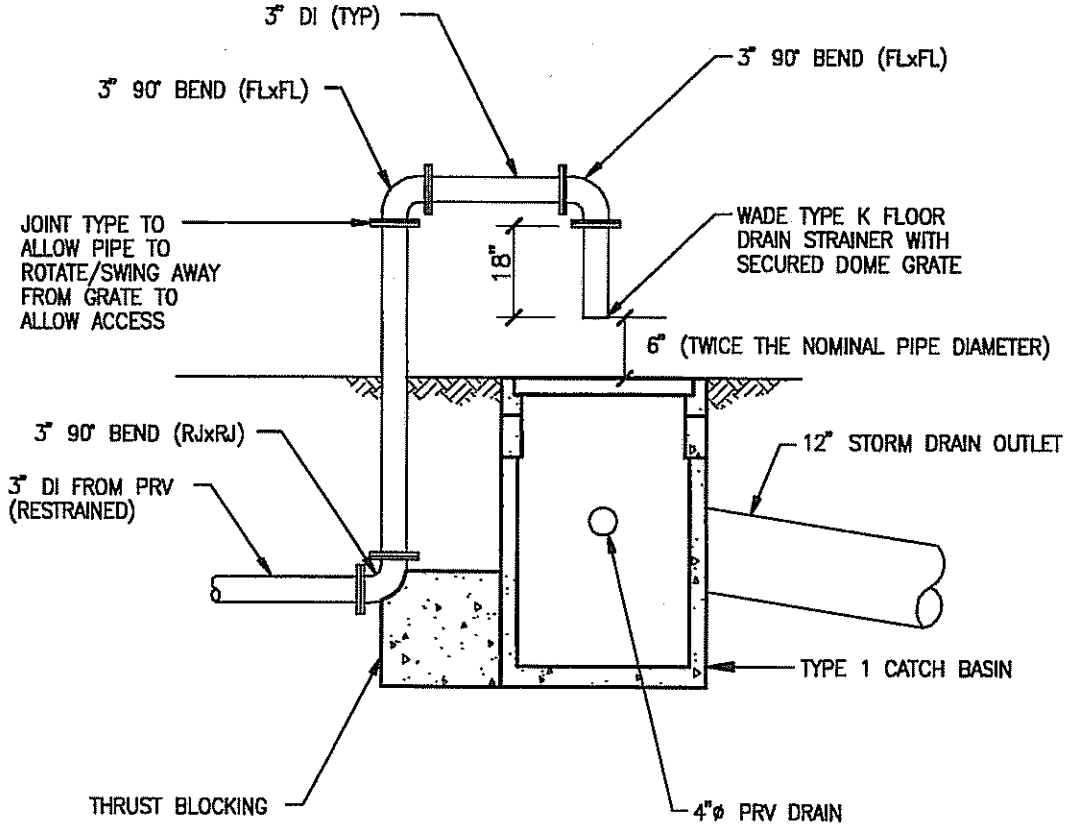

SNOQUALMIE RIDGE II				
PRV CONNECTION TO CATCH BASIN				
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Approved: AB#04-172 11/8/04
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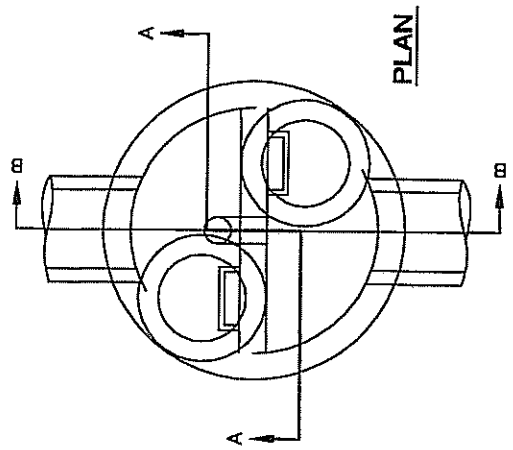
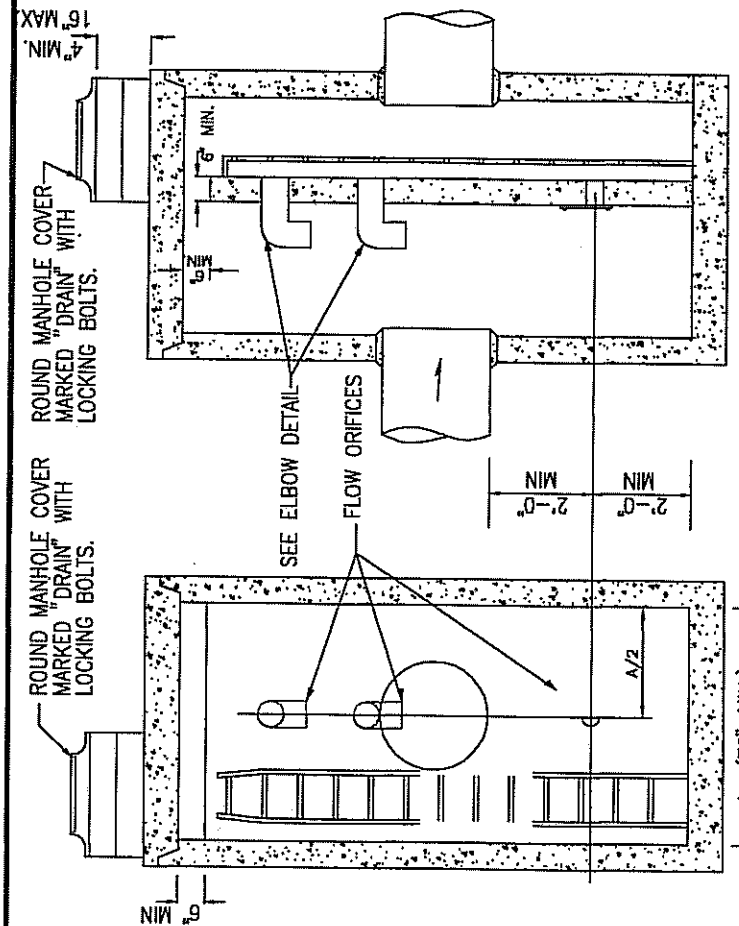
NOTES:

1. PIPE SIZE, SLOPES AND ALL ELEVATIONS: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. EXCEPT AS SHOWN OR NOTED UNIT SHALL TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF CATCH BASIN TYPE 2, 72", 84" OR 96".
4. COVERS: ROUND, SOLID MARKED "DRAIN," WITH LOCKING BOLTS SEE DWG. NO. 2-022 & 2-023.
5. ORIFICES: SIZED AND LOCATED AS REQUIRED, WITH LOWEST ORIFICE MIN. 2' FROM BASE.
6. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
7. PRECAST BAFFLE WALL SHALL BE KEYED AND GROUTED IN PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4" MIN. GALVANIZED STEEL AND ATTACHED WITH 1/2" STAINLESS STEEL BOLTS. OMIT ORIFICE PLATE IF ONLY FOR OIL SEPARATION.
9. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR GALVANIZED STEEL. SEE DWG. NO. 3-11. GALVANIZED STEEL SHALL HAVE TREATMENT 1.



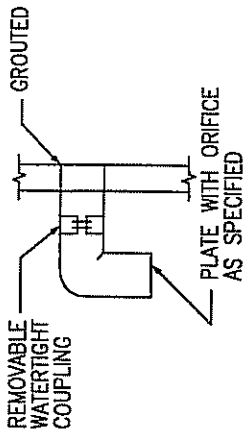
PLAN



SECTION B-B

ELEVATION

SECTION A-A



ELBOW DETAIL

SNOQUALMIE RIDGE II

TYPE 2 CATCH BASIN W/ BAFFLE OIL SEPARATOR

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	ER		09/30/04	3-21

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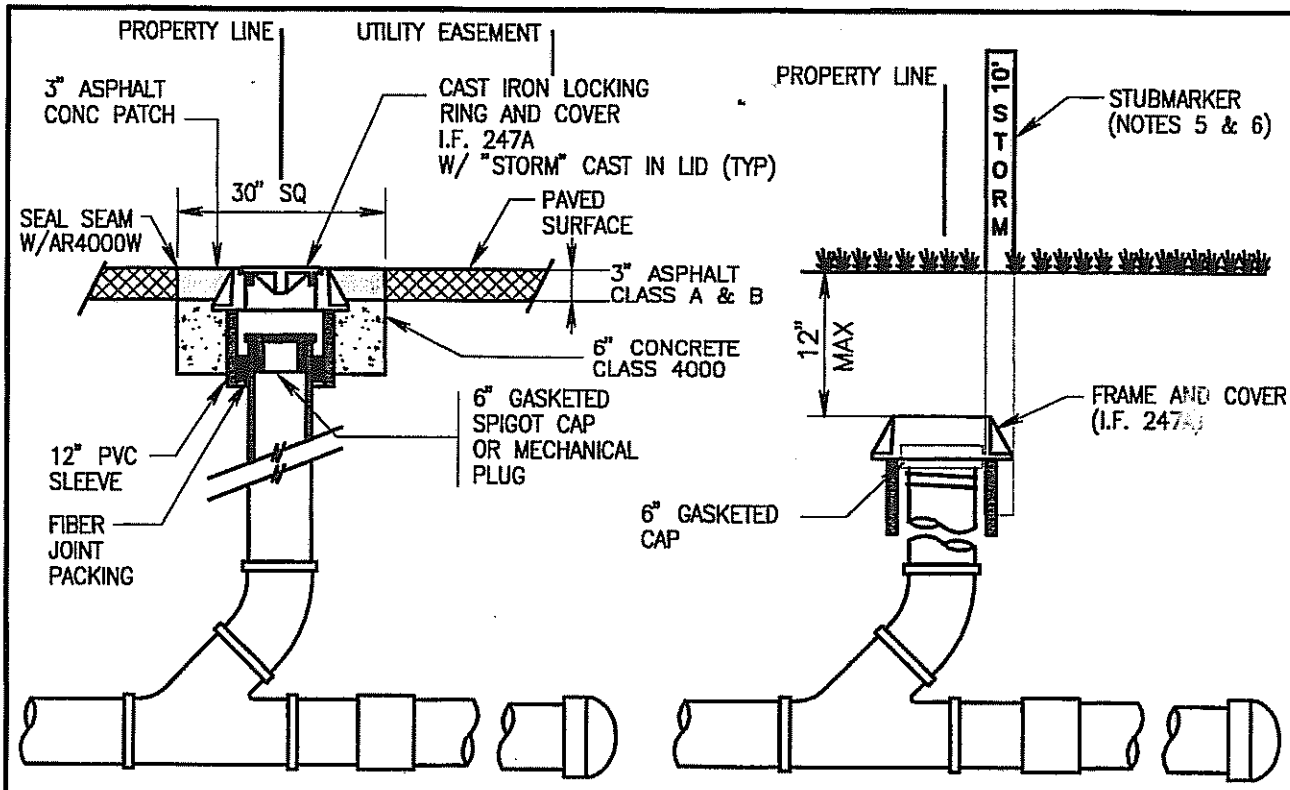

PAVED AREAS
TRAFFIC AREAS

UNPAVED AREAS
NON–TRAFFIC AREAS

NOTES

1. CLEAN–OUT PIPE AND FITTINGS SHALL BE PVC.
2. A STORM TEE OR SWEEP MAY BE INSTALLED IN LIEU OF A WYE AS SHOWN. STRAIGHT TEES ARE NOT ACCEPTABLE.
3. FOR NEW PLATS THE VERTICAL RISER PORTION OF THE CLEAN–OUT WILL BE CONSTRUCTED AT TIME OF CONNECTION TO BUILDING TO MINIMIZE DAMAGE, THE 6" WYE AND 6" PVC PIPE W/GASKETED CAPS WILL BE INSTALLED PRIOR TO BUILDING CONNECTION.
4. STORM STUB WILL BE EXTENDED 10' BEYOND PROPERTY LINE TO PREVENT DAMAGE TO CLEAN–OUT AND MINIMIZE CONFLICTS WITH OTHER UTILITIES WHEN SERVICE TO BUILDING IS ACCOMPLISHED.
5. A PRESSURE TREATED 2"x4" STUBMARKER SHALL EXTEND DOWN TO THE BOTTOM OF THE STORM PIPE. A MINIMUM OF 3 FEET SHALL EXTEND ABOVE GROUND.
6. THE STUBMARKER SHALL BE PAINTED WITH WHITE TRAFFIC PAINT AND THE WORD "STORM" AND THE LENGTH OF THE 2"x4" SHALL BE PAINTED ON THE MARKER WITH HIGH BLACK PAINTED LETTERS

SNOQUALMIE RIDGE II

STORM CLEAN–OUT

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	ER	JSF	10/18/04	3–22

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

CHAPTER 4

4.000 WATER

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CHAPTER 4

4.000 WATER

4.010 Specifications

These Technical Specifications shall be used for all water system construction in the Snoqualmie Ridge II Development.

All construction of water mains and related appurtenances shall conform to these Standards, applicable American Water Works Association (AWWA) Specifications and the current "English unit" edition of the *Standard Specifications for Road, Bridge, and Municipal Construction,* prepared by the Washington State Department of Transportation and the American Public Works Associations, Washington State Chapter, herein referred to as the "Standard Specifications." The general requirements of applicable AWWA and the Standard Specifications shall apply unless they are inconsistent with any of the provisions of this particular section. Should inconsistencies occur, these Standards shall have precedence.

References to sections in the Standard Specifications are based on the latest published edition of the Standard Specifications. If section references in future editions of the Standard Specifications are changed, these Standards will be deemed to be revised accordingly without re-issuance.

4.020 General

Design details, workmanship and materials shall be in accordance with Washington State Department of Health requirements, the City of Snoqualmie Comprehensive Water System Plan, the Snoqualmie Ridge II Water Supply, Storage, and Primary Distribution Facilities Project Report, and the Standard Specifications, except as they may be modified by this chapter.

Standard Plans need not be repeated on the plans unless required for plan clarification for the contractor, if being modified to suit a specific design, or as required by the City. However, standard plans shall be clearly referenced on the drawings.

The installation of all water system facilities shall be done in accordance with plans which have been approved by the City Engineer. Plans shall be prepared in accordance with Chapter 1.

Installation of all water main pipe and appurtenances, including placement and compaction of bedding and backfill, shall occur only when an authorized representative of the City is present to directly observe the work. All costs of such inspection shall be paid by the developer/contractor.

The City may waive this requirement on a case by case basis if continued evidence of sound construction practice by the contractor so warrants. In any event, installations which do not meet the requirements of these standards shall be removed and replaced at the contractor's sole expense.

If, after the contractor has given the City Engineer the required 48-hour notification prior to commencing construction and after a pre-construction conference has been held with the City where the contractor has clearly defined the waterline construction schedule and if the City's inspector or representative is absent from the site during the time the contractor has scheduled construction of the waterline, then such absence shall constitute the City's waiver of the requirement that the installation of water main pipe and appurtenances shall only occur when an authorized representative of the City is present.

4.030 Easements

All water mains not in the public right-of-way shall be in easements granted to the City of Snoqualmie.

In general, all easements for water mains shall be a minimum of 15 feet wide. In special circumstances, the easement width may be reduced to 10 feet with the approval of the City Engineer.

No permanent structures are allowed to be constructed in the easement area. No additional building setback line from the edge of easements is required. Access to easements for maintenance and/or repair of the utility by the City shall not be restricted or prohibited by fences, rockeries, plantings and other improvements.

Easements shall be located within single lots rather than being split by a lot line. Easements may be located on two adjacent lots with the approval of the City Engineer.

The locations of water mains within easements shall be accurately surveyed and staked to guide the construction. Any deviation from this requirement must be approved by the City Engineer.

4.040 System Design

Water mains shall be sized to provide adequate domestic service plus fire flow at the required residual pressure. Fire flow requirements will be determined by the City of Snoqualmie Fire Marshal, however, the quantity of water required will, in no case, be less than that established by the Comprehensive Water System Plan.

The minimum water main size shall be 8 inches diameter. Larger size mains are required in specific areas outlined in the *Comprehensive Water System Plan* and as modified by the *Water System Project Report.* Water mains in cul-de-sacs or "hammerhead" tracts beyond the last hydrant may be reduced to 4-inch or 6-inch with the City Engineer's approval. Fire hydrant laterals that exceed 50' in length

or also serve a building sprinkler system shall be 8" in diameter.

Unless otherwise required, the following guidelines shall apply for hydrant number and location.

1. Hydrant spacing shall be in accordance with the requirements listed in Table A-111-B-1, Number and Distribution of Fire Hydrants, in the 2003 International Fire Code or as otherwise approved by the Fire Marshal.

2. Where possible, hydrants shall be located at street intersections, except that in no event shall any hydrant be more than three hundred (300) feet from the center of the frontage of any lot except on dead-end cul-de-sacs with dwellings only. When the dead-end cul-de-sac exceeds three hundred (300) feet from the center of the intersection to the end of the cul-de-sac, a hydrant shall be located at the intersection and additional hydrant(s) will be required. The hydrant(s) shall be located no more than three hundred (300) feet from the center of the frontage from the last lot on the cul-de-sac, and shall comply with the maximum requirements listed above.
3. When any portion of a proposed building is in excess of 150 feet from a water supply on a public or private street on-site hydrants shall be provided when required by the Fire Chief.

The installation of all water mains and appurtenances shall be in accordance with the construction plans as approved by the City Engineer. Plans shall be prepared in accordance with Chapter 1.

All materials shall be new and undamaged. Unless otherwise approved by the City Engineer, the same manufacturer of each item shall be used throughout the work. Contractors shall furnish a water tight plug of the appropriate size which shall be installed in the end of the water main anytime work is delayed or stopped.

Minimum vertical separation of 18 inches shall be maintained between sanitary sewers and water mains in accordance with Department of Health requirements. The minimum cover for water main of 42 inches may be reduced to 24 inches, when approved by the City Engineer, to provide as much vertical separation as possible. In no case water mains shall be deeper than 60" from final grade unless approved by the City Engineer.

A minimum of 10 feet horizontal clearance shall be maintained between a water main and a sewer main and a minimum of 5 feet horizontal clearance shall be provided between a water main and a storm drain whenever possible.

The plans shall clearly indicate that the longest standard length of water pipe shall be installed so that the joints will fall equidistant from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water pipe and/or sewer line in pipe or concrete.

Dead ends shall be minimized by looping of all mains where practical. Where dead end mains are unavoidable, a standard 2-inch blow-off assembly is required. A fire hydrant may be used in lieu of a blow-off assembly if flow and pressure are sufficient to warrant a hydrant assembly.

All requests for witnessing of tests shall be scheduled with the City 48 hours in advance. Failure to give adequate advance notice may result in delay to the contractor.

A State of Washington Department of Health approved backflow prevention device is required for all irrigation systems.
Valves are required on all legs of tees and crosses, except tees for fire hydrants, irrigation systems and firelines (i.e. sprinkler systems) where one valve on the stub at the mainline tee shall be provided. In-line and mainline valves are required at 600 foot maximum spacing.

Plan approval by the City Engineer will not constitute approval of a backflow prevention system. A separate backflow prevention system design must be submitted and approval must be obtained prior to initiation of water service.

The following notes shall be included on each plan set:

1. All workmanship and materials shall be in accordance with the latest "English" unit edition of the *Standard Specifications for Road, Bridge and Municipal Construction* (WSDOT/APWA). The Standard Specifications, except as they may be modified or superseded by the Snoqualmie Ridge II Development Standards and these plans, shall govern all phases of work.

2. No connection to the existing mains will be allowed except by means of an approved backflow prevention device prior to satisfactory flushing, testing, disinfection, and receipt of satisfactory bacteriological test results.

3. All connections to existing water mains shall be cut-in tees unless otherwise approved by the City Engineer. Connections to on existing mains will be made by the City at the developer's expense or by the developer pursuant to a developers agreement. Cut-in tee connections may only be made by contractors or personnel approved by the City to perform that specialized work. Installation of Cut-in tees must be observed by the City Engineer or the City's representative. Only City personnel shall operate City's water system valves.

4. All water pipe shall be bedded. Bedding material shall conform to "Bedding Material for Rigid Pipe" as specified in Section 9-03.15 of the Standard Specifications or pea gravel. Bedding shall be placed to a minimum depth of 4 inches under the barrel of the pipe and up to the springline of the pipe. As an option the contractor may use controlled

density fill.

5. Trench backfill shall be excavated native material or Bank Run Gravel for Trench Backfill conforming to Section 9-03.19 of the Standard Specifications, depending on the suitability of the native material to compaction. Suitable native material shall be free from mud, muck, organic matter, broken pavement, rocks greater than 6-inch dimension, except in pipe zone (one foot above the crown of the pipe) where no rocks shall be greater than 2-inch dimension, and other deleterious material, and must be capable of compaction to the required density at the time of placement. If the native material cannot be readily compacted to the specified density, only Bank Run Gravel shall be utilized and any insufficiently compacted native material shall be removed and replaced with Bank Run Gravel. The native material shall only be used and remain in place if in situ compaction testing provides sufficient evidence that the specified compaction is uniformly attained.

   Backfill shall be placed in lifts not to exceed 12 inches in loose depth, and each lift shall be mechanically compacted to the following densities:

   - Along and over the pipe to a depth of one foot above the crown of the pipe – 90 percent of maximum density.
   - Above one foot above the crown of the pipe in unimproved areas – 90 percent of maximum density.
   - Above one foot above the crown of the pipe in areas to be paved (roadway and/or sidewalk) – 95 percent of maximum density.
   - Maximum density to be determined by ASTM: D-1557.

6. The owner or the owner's authorized agent shall notify the City Engineer of a person who can be contacted regarding problems during construction on a 24 hour basis.

7. Open-cut transverse crossings of roadways after final paving are not to be permitted unless it can be shown that alternatives such as jacking, auguring or tunneling are not feasible or unless the utility can be installed just prior to reconstruction or an overlay of the road. Should an open cut be approved, all transverse trenches shall be backfilled with controlled density fill. Transverse crossings in roadway under construction with ATB applied may be backfilled with crushed rock.

8. Call underground locate line 1-800-424-5555 a minimum 48 hours prior to any excavations.

9. Before any construction or development activity, a preconstruction meeting must be held between the contractor, the City's inspector and other appropriate parties.

10. The City Engineer must be notified at least 48 hours prior to commencing construction. Installation of all water main pipe and appurtenances, including placement and compaction of bedding and backfill, shall occur only when an authorized representative of the City is present to directly observe the work. All costs of such inspection shall be paid by the developer/contractor. No part of the water system shall be put into use until the City has completed its normal inspections and has concluded that the work is acceptable. The City Engineer may waive this requirement on a case by case basis if continued evidence of sound construction practice by the contractor so warrants. In any event, installations which do not meet the requirements of these standards shall be removed and replaced at the contractor's sole expense.

    If, after the contractor has given the City Engineer the required 48-hour notification prior to commencing construction and after a pre-construction conference has been held with the City where the contractor has clearly defined the waterline construction schedule and if the City's inspector or representative is absent from the site during the time the contractor has scheduled construction of the waterline, then such absence shall constitute the City's waiver of the requirement that the installation of water main pipe and appurtenances shall only occur when an authorized representative of the City is present.

11. A copy of these approved plans must be on the job site whenever construction is in progress.

12. When fire flow will be interrupted to allow construction, City and of Snoqualmie Fire Department shall be given 24 hours notice of time period and locations affected.

    Phone Numbers:

Snoqualmie Public Works Department	(425) 831-4919
City of Snoqualmie Fire Department	(425) 888-1551

13. Water main pipes shall be installed with minimum of 42 inches and a maximum of 48 inches of cover to finished grade above pipe. Cover may be reduced locally to 24 inches if necessary to avoid utility conflicts with City Engineer approval.

14. Water service stub-outs shall be located by a white 2x4 stake marked "WATER" in black letters. The stake and stub-out shall extend above surface level, be visible, and directly adjacent to each other. The stub-out

shall not be connected to the stake in any manner.

15. Hydrants are to be fitted with 4" Storz Adapter pumper ports. Hydrants shall be either Mueller or M&H. All hydrants are to be located 5 feet minimum from driveway approaches.

16. Water meters are to be located clear of driveways and sidewalks. All lot services shall be 1 inch diameter from main to house. Use Ford meter setter VBH74-18W-11-44.

17. Valve box cover plate lugs to be lined up with water main.

18. Water main pipe shall be ductile iron Class 52.

4.050 Existing Utilities

When utility services occupy the same space as the new water main, the contractor shall do all necessary excavation to fully expose such services. The contractor shall protect said services and work around them during excavating and pipe laying operations. The contractor shall be responsible for all damages to the services due to his operation and shall immediately notify the engineer and arrange for replacement of all damaged services.

In the event of conflicts the contractor shall remove and restore existing catch basin connections, inlet connections, drains, side sewer inlets, and other sewerage and drainage facilities. All restoration shall be constructed to Snoqualmie Ridge II standards.

The contractor may encounter private water service utilities (water service lines running between the City's union at the meter and private residences) during work operations. Records of these utilities are not maintained by the City and will not be field located by the City. It shall be the contractor's responsibility to ascertain the location of and protect these private utilities from damage.
Where it is feasible and practical, as determined by the City Engineer, all abandoned pipes and appurtenances shall be removed. If it is decided by the City Engineer that the pipes can be abandoned in-place, then ends of abandoned pipes shall be plugged for a distance of 2 pipe diameters with commercial concrete.

4.060 Trench Excavation and Backfill for Water Mains

Trench excavation and backfill shall conform to the requirements of Section 7-10 of the Standard Specifications except as modified herein and by the Standard Plans.

Trench backfill shall be excavated native material or Bank Run Gravel for Trench

Backfill conforming to Section 9-03.19 of the Standard Specifications, depending on the suitability of the native material to compaction. Suitable native material shall be free from mud, muck, organic matter, broken pavement, rocks greater than 6-inch dimension, except in pipe zone (one foot above the crown of the pipe) where no rocks shall be greater than 2-inch dimension, and other deleterious material, and must be capable of compaction to the required density at the time of placement. If the native material cannot be readily compacted to the specified density, only Bank Run Gravel shall be utilized and any insufficiently compacted native material shall be removed and replaced with Bank Run Gravel. The native material shall only be used and remain in place if in situ compaction testing provides sufficient evidence that the specified compaction is uniformly attained

Backfill shall be placed in lifts not to exceed 12 inches in loose depth, and each lift shall be mechanically compacted to the following densities:

- Along and over the pipe to a depth of one foot above the crown of the pipe – 90 percent of maximum density.

- Above one foot above the crown of the pipe in unimproved areas – 90 percent of maximum density.

- Above one foot above the crown of the pipe in areas to be paved (roadway and/or sidewalk) – 95 percent of maximum density.

Compaction of trench backfill material shall be accomplished with mechanical tampers, vibratory compactors, or other equipment suitable to the characteristics of the soils. Water settling shall not be employed. The use of compaction equipment directly over the pipe shall be controlled and limited in accordance with installation instructions and recommendations provided by the manufacturer of the pipe.

In-place density testing of compacted backfill material shall be in accordance with ASTM: D-1556 (sand cone device) or ASTM: D-2922 (nuclear density gauge). Laboratory maximum density testing of fill material shall be performed in accordance with ASTM: D-1557.

A minimum of one compaction test is required for each 200 feet of trench or as may be directed by the City Engineer. Trenches failing the required test shall have the backfill removed, replaced, and re-compacted. Compaction testing shall be done only by an approved testing laboratory at the contractors/developers expense. All test results and analysis shall be promptly given to the City Engineer. The City reserves the right to contract with an independent testing laboratory for testing of trench backfill. This testing shall also be done at the contractors/developers expense.

When, after excavating for pipes to the foundation level, the in situ material at the

bottom of the trench is determined by the City Engineer to be unsuitable, excavation shall be continued to such additional depth as may be required by the City Engineer. Unsuitable foundation material shall be replaced with foundation gravel conforming to Section 9-03.17 of the Standard Specifications.

4.070 Trenching Transverse to Existing Roadway

Open-cut transverse crossings of roadways after final paving are not to be permitted unless it can be shown that alternatives such as jacking, auguring or tunneling are not feasible or unless the utility can be installed just prior to reconstruction or an overlay of the road. Should an open cut be approved, all transverse trenches shall be backfilled with controlled density fill. Transverse crossings in roadway under construction with ATB applied may be backfilled with crushed rock.

4.080 Jacking, Augering, or Tunneling

Tunneling may be required by the City Engineer under pavements, buildings, road tracks, etc. The developer/contractor shall install the pipe by jacking, augering or tunneling, or installing the pipe in a casing pipe by a combination of these methods.

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

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

4.090 Bedding

All water pipe shall be bedded. Bedding material shall conform to "Bedding Material for Rigid Pipe" as specified in Section 9-03.15 of the Standard Specifications or pea gravel. Bedding shall be placed to a minimum depth of 4-inches under the barrel of the pipe and up to the springline of the pipe. As an option the contractor may use controlled density fill.

4.100 Shoring

The requirements of the Occupational Safety and Health Act (OSHA) and the Washington Industrial Safety and Health Act of 1973 (WISHA) shall apply to all excavation, trenching, and ditching operations on this project. All trenches over four (4) feet in depth shall be shored, braced, and shielded in compliance with applicable Federal and/or State regulations. Shoring, bracing, or shielding shall be required in all street area excavations, including those areas where all existing pavement is being removed. Sloping to the angle of repose will be permitted only in non-critical, off-street areas.

Shoring and cribbing of excavations and trenches shall be provided in accordance with the provisions of Section 2-09 of the Standard Specifications.

The shoring system shall be a commercially available shoring system designed for the depths anticipated on the project. The shoring system shall meet all requirements of the Washington State Safety and Health Act (WISHA) and United States federal Occupational Safety and Health Act (OSHA).

Construction safety is the developer's/contractor's responsibility and all persons on site are subject to the safety direction of developer/contractor personnel. The City of Snoqualmie and its representatives do not have either control or authority on site safety issues and therefore assumes no responsibility for the safety of others.

4.110 Controlled Density Fill

Controlled Density Fill (CDF) shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures proportioned to provide a non-segregating, self-consolidating, free-flowing, and excavatable material which will result in a hardened dense, non-settling fill. Slump shall be 3 inches to 6 inches.

CDF shall be discharged from the mixer by any reasonable means into the area to be filled. The CDF shall be brought up uniformly to the elevation shown on the plans.

CDF shall not be placed on frozen ground.

CDF patching, mixing, and placing may be started if weather conditions are favorable, when the temperature is at 34 degrees F and rising. At the time of placement, CDF must have a temperature of at least 40 degrees F. Mixing and placing shall stop when temperature is 38 degrees F or less and falling. Each filling stage shall be as continuous an operation as is practicable.
Trench section to be filled with CDF shall be contained at either end of trench section by bulkhead or earth fill.

Contractor shall provide steel plates to span utility trenches and prevent traffic contact with CDF for at least 24 hours after placement or until CDF is hard enough to prevent rutting by construction equipment or traffic.

Controlled Density Fill shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures which have been batched and mixed in accordance with Section 6-02.3 of the WSDOT/APWA Standard Specifications.

Materials

1.	Portland Cement	AASHTO M 85 or WSDOT 9-01
2.	Fly Ash	Class F
3.	Aggregates	WSDOT 9-03.1(2)B
4.	Admixtures	WSDOT 9-23.6

4.120 Sawcutting Existing Pavement and Sidewalk

The contractor shall make a vertical sawcut to the full depth of existing asphalt or concrete pavement for all crossings of the existing pavement.

Where necessary to remove existing curb, gutter, driveways and sidewalk, full panels shall be removed. Care shall be taken during removal to protect adjacent sidewalk panels, concrete curbs and existing utilities from damage. In no case shall any segment of sidewalk or curb and gutter be shorter than 5 feet in length.

4.130 Pavement Patching

This work shall consist of the reconstruction and patching of existing pavement that is scheduled to remain. The following provisions shall apply regardless of the condition or type of roadway base and pavement types encountered. Asphalt pavements shall be patched with asphalt, and concrete pavements shall be patched with concrete.

Pavement patching shall be scheduled to accommodate the demands of traffic and shall be performed as rapidly as possible to provide maximum safety and convenience to public travel.

Before the patch is constructed, all pavement cuts shall be trued so that the marginal lines of the patch will form a rectangle with straight edges and vertical faces. The patch shall be flush with the surrounding surface and shall provide a smooth riding surface for passing traffic.

Asphalt shall be Asphalt Concrete Pavement, Class B. The depth of asphalt shall be a minimum of four inches in all areas, and shall be increased as necessary to match the existing thickness. Asphalt Concrete Pavement shall be laid over four inches of crushed surfacing and shall be placed in max. 2" lifts. All faces of patch that will receive asphalt shall be clean and dry and have tack coat applied.

Cement Concrete Pavement shall be a 3-day mix conforming to the requirements of Section 5-05 of the WSDOT/APWA Standard Specifications. The thickness of concrete shall be a minimum of 6 inches, and shall be increased as necessary to match the existing thickness.

Until such time as the permanent patch placed, the contractor shall install a temporary patch over the unfinished portions of work that will affect traffic in any way. Temporary pavement patch shall be accomplished by using 3 inches of cold mix (MC 250) or 3 inches of ATB.

4.140 Pipe and Fittings for Water Mains

Water mains shall be ductile iron pipe for all sizes.

Pipe:

Ductile iron pipe shall conform to ANSI Specification A21.51-1976, or AWWA Specification C151-76, and current amendments thereto. Grade of iron shall be a minimum of 60-42-10. The pipe shall be cement lined in accordance with AWWA C-104 to a minimum thickness of 1/16", and the exterior shall be coated with coal tar varnish. Each length shall be plainly marked with the manufacturer's identification, year cast, thickness, class of pipe and weight. The pipe shall be furnished with mechanical joint or push-on joint, conforming to ANSI Specification A21.11 (AWWA C-111), except where otherwise noted calling for flanged joints. The ductile iron pipe shall be thickness Class 52 and shall be manufactured by Tyler, US Pipes, Griffin, or approved equal.

Fittings:

All fittings shall be short-bodied or ductile iron, Class "D", complying with applicable AWWA Specifications. Fittings shall be cement lined and either mechanical joint or flanged, as indicated on the drawings.

Provide concrete blocking at all fittings and horizontal or vertical angle points. All fittings to be blocked shall be wrapped with 8-mil polyethylene plastic. At no time will the concrete be allowed to cover joints and bolt heads or nuts.

Concrete blocking shall be properly formed with plywood or other acceptable forming materials and shall not be poured around joints. The forms shall be stripped prior to backfilling. Concrete thrust blocks must be in place at least 24 hours before beginning the pressure test to allow the concrete to set. Concrete shall be Class 3,000.

4.150 Pipe Installation for Water Mains

Cover of pipe shall be 42 inches minimum from top of pipe to finish grade. The minimum cover for water mains may be reduced to 24 inches, when approved by the City Engineer, to provide for as much vertical separation as possible. Max cover shall be 60 inches.

Adjustment in depth to avoid conflicts with other utilities shall be accomplished by either deflecting the pipe at the joints in conformance with manufacturer's recommendations or by the use of vertical bends and thrust blocking. The contractor shall lay the pipe at grades which limit high points in the waterline to

the specific locations indicated on the construction plans. Water line shall be staked with horizontal and vertical locations outside the roadway prism.

4.160 Pipe Restraint Methods

1. All Fire Hydrants shall be restrained with 3/4" all-thread shackle rods. 90 degree elbows shall also be restrained with shackle rods and pipe clamps or mega lugs in addition to thrust blocks.

2. Shackle rods shall be connected to mechanical joints using "star" bolts (ductile iron lugs not allowed).

3. Shackle rods shall be galvanized or be stainless steel.

4. All pipe restraint systems and their application must be approved by the City Engineer.

4.170 Backflow Prevention

Backflow prevention devices shall be installed and maintained by the service customer on any service connection to the City's water supply system, where backflow prevention is necessary for protection of the City's water supply.

For irrigation, the minimum level of backflow prevention required is a double check valve assembly. Fire services shall have a double detector check valve assembly. Air gaps and reduced pressure backflow assemblies are required wherever a potential health hazard exists.

All backflow preventers shall be approved by the State of Washington. The City of Snoqualmie's backflow prevention program is based on WAC 248-54-285.

Plan approval does not constitute approval of a backflow prevention system. A separate backflow prevention system design must be submitted and approval must be obtained from the City Engineer prior to initiation of water service.

4.180 Water Main Connections

To prevent contaminated water in the new main from entering the existing distribution system, a state approved backflow prevention device shall be used on the line supplying the water. Prior to use, the device and all necessary data shall be submitted to the City Engineer for approval. During the hydrostatic pressure test, the temporary connection between the new main and the existing distribution system shall be removed.

No permanent connections to the existing system shall be made until the new water main has been tested and approved by the City Engineer. Temporary connections of the untested, unapproved new water main to the existing system shall not be made without the installation of an approved backflow prevention device between the new water main and the existing system. The contractor shall

verify the size, material, and location of the existing main at the connection point prior to installing the new connecting water main. The contractor is required to design the connection and testing configuration for connection points. These shall not be constructed without design approval by the City Engineer.

Prior to commencement of any work on a connection to an existing water main, the contractor will assemble all materials, equipment, and labor necessary to properly complete the work.

All connections to existing water mains shall be made by contractors or personnel approved by the City to perform that specialized work.

"Wet Tap" connections, if approved, to make tie-ins to the existing water mains shall consist of a tapping tee and tapping valve as approved by the City Engineer and in accordance with the Standard Plan for "Connection to Existing Main."

Where cut-in connections are approved by the City Engineer, the City will shut off water supply in the existing main. The contractor (or developer) requiring the particular connection for the proposed water main extension shall notify the City at least fifteen (15) days in advance of such required connection installation (and water main shutoff) so that the City may publish and distribute notices to the affected property owners. The water works material and labor for the connection and all other related items shall be furnished by the contractors (or developer) requiring the water main extension. The connection shall be in accordance with the Standard Plan for "Connection to Existing Main." Only the City will shut down the existing water main, and only the City will notify the owners affected by the water shutoff. The connection must be completed within the time allowed by the City in order to minimize disruption of service. All City cost and expense for the above work shall be paid for by the contractor/developer.

4.190 Hydrostatic Pressure Testing and Disinfection

The water main pipes shall be disinfected and tested before being placed in service. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the contractor. The section to be disinfected shall be thoroughly flushed at maximum flow prior to chlorination.

Testing and disinfection shall take place after all underground utilities are installed and compaction of the roadway section is complete.

Pipelines outside of roadway sections shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the contractor shall furnish and install temporary blocking.

Water mains and appurtenances shall be pressure tested in accordance with Section 7-11.3(11) of the Standard Specifications.

Mains and appurtenances shall be disinfected when being tested. Disinfection shall be performed in accordance with 7-11.3(12) E through O of the Standard Specifications.

PRESSURE TEST PROCEDURE

GENERAL:

1. Test shall comply with Section 7-11.3(11) of the Standard Specifications.
2. Witnessed pressure test shall not be conducted until all other utility cross trenching and rough grading are completed.
3. The new line shall be separated from existing approved lines.
4. The test gauges shall be certified for accuracy.
5. The test gauges shall be graduated in 5 psi increments with a range of 0-400psi.
6. Contractor shall perform a successful pressure test before calling for the witnessed test.
7. Makeup water:
   a. Only potable water metered from the City system.
   b. Transport only in containers or trucks certified for potable water.
   c. At time of use, disinfect with chlorine at concentration of 50 mg/l.
8. Before testing, the lines shall be flushed at a minimum velocity of 2.5 ft/sec.

PROCEDURE:

1. Install a pump and test gauge at the low end of the test section.
2. Test the line and fire hydrants with all valves open and with adequate back pressure on any closed valve at the end of the test section.
3. Test each hydrant by:
   a. Closing the auxiliary valve, then opening a port cap (carefully) while observing the gauge.
   b. The closing the hydrant operating valve then opening the auxiliary valve to atmosphere while observing the gauge.

4. Test each remaining line valve by closing it, then releasing (venting) to atmosphere the pressure from behind it, then observing the test gauge.

4.200 Valves for Water Mains

All valves shall meet the standard for AWWA valves.

All valves 10-inch and smaller shall be resilient seated gate valves. All valves 12-inch and larger shall be butterfly valves.

1. Resilient-Seated Gate Valves

All valves ten (10) inches in diameter and smaller shall be resilient-seated gate valves. Valves shall be iron-body resilient-seated gate valves with non-rising stems (NRS) opening to the left and equipped with a two (2) inch square operating nut. Valves shall meet the full requirements of the AWWA C-509 and current amendments thereto. The valves shall have "O" ring stem seals which shall withstand the test pressure without leakage. Valves shall be rated at 200 P.S.I.G., working pressure, furnished with either flanged and/or mechanical joints as noted on the drawings

Valves shall be Mueller, M&H or an approved equal.

Valves shall be set with the stems vertical. The axis of the valve box shall be common with the projected axis of the valve stem. The tops of the adjustable valve boxes shall be set to the existing or established grade, whichever is applicable.

2. Butterfly Valves

All valves twelve (12) inches in diameter and larger shall be butterfly valves rated at 150 psi, working pressure, furnished with either flanged or mechanical joints complete with extension stem and telescoping valve box. All butterfly valves shall be of the tight closing, rubber seat type. Valves shall meet the full requirements of AWWA C504, Class 150-B, and be tested in strict accordance with Section 13, thereof. Butterfly valves shall be Henry Pratt Company "Groundhog", "Dresser '450", or "Mueller Lineal III" or an approved equal. Valves shall be able to withstand test pressure.

3. General for All Valves

Valve boxes for both gate valves and butterfly valves shall be equal to the "Rich 940-B" Model, complete with a deep well base type valve box bottom section. The flared end of the valve box base shall be set below the bottom section of the 2 inch operating nut or below the stuffing box. The top section shall be 18" long "Seattle" type. Lids shall have 2" deep skirt.
The valve box shall be placed over the valve or valve operator in such a manner that the valve box does not transmit shock or stress loads to the valve. The lower casting of the unit shall be installed in such a manner as to be supported by a minimum backfill of not less than two inches in thickness. The casting shall not rest directly upon the body of the valve or upon the water main. (Use 5 inch cast iron soil pipe for extension of valve boxes.)

Valve operating nut extensions shall be in accordance with the Standard Plan "Valve Box and Valve Operating Nut Extension."

4.210 Hydrants

New fire hydrants shall be M & H "Reliant" #929, or Mueller "Centurion". Hydrants shall be compression type, meeting AWWA Standards. Fire hydrants shall be installed at proper grade without extension sections to the barrel.

The fire hydrants shall be the break-away type, in which the valve will remain closed if the barrel is broken. Inlet connections shall be for six (6) inch pipe, and shall be mechanical joint. The hydrant and tee shall be blocked in accordance with the Standard Plan "Horizontal Blocking Details."

The gate valve shall be flanged to the mainline tee and provided with a mechanical joint for connection to the hydrant lateral pipe and shall be shackled as indicated on the Standard Plan.

The hydrants shall have a barrel diameter of not less than eight and one-half inches (8 1/2"), and the main valve opening shall be not less than five and one-quarter inches (5 1/4") in diameter. The fire hydrants shall be equipped with two (2), two and one-half inch (2 1/2") hose nozzles and one (1), four inch (4") pumper port STORZ Adaptor. Nozzle and port threads shall conform to City of Snoqualmie Standards.

After installation, all fire hydrants (regardless of factory finish) shall be wire brushed and field painted with a minimum of one coat of yellow paint per the Standard Plan.

Between the time that the hydrant is installed and the completed facility is accepted by the City and placed in operation, the hydrant shall at all times be wrapped in burlap, or covered in some other suitable manner as approved by the City, to clearly indicate that the hydrant is not in service. Hydrants shall be installed plumb.

Before acceptance by the City, Fire Hydrants shall drain at a reasonable rate to prevent freezing as determined by the Public Works Department.

4.220 Service Connections

Connecting of services will require installation of a continuous new service line from the main to the water meter. Upon completion of the installation of the water main (before testing and disinfection) install the required services by connecting to the water main and extending the service line to the property line as indicated on the Standard Plans.

Service lines for residential property shall be 1 inch (minimum size), 200 psi.

SDR 9 poly pipe high MOL plastic manufactured by Phillips Drisco pipe.

Larger service lines shall be of the type and style as shown on the Standard Plans.

Service lines shall be perpendicular to the water main and a straight line from the main to the meter box, unless approved otherwise by City Engineer.

Corporation stops shall be "FORD" or "MUELLER" of the type and style noted on the Standard Plans. Before reconnecting the service line, the contractor shall flush the service line to remove any debris and to verify that the service line has full pressure to the meter box.

Included as a part of the service connection shall be the furnishing and installation of the meter box complete with a lid, set flush with the existing or proposed finished grade. Upon completion of each service line as indicated herein, the contractor shall flush the service line to remove debris and further verify that the service line has full pressure to the meter box. In unimproved areas, meter boxes shall be marked with a painted 2 x 4 stake.

Service lines between the main and the property line shall be placed at a trench depth sufficient to maintain a 3-foot cover over the top of service for its full length, taking into consideration the final finished grade of any storm ditches, the final grade of the street, and final grade at the property line. Tracer tape and wire wrapped around the pipe shall be installed on all service lines. No meter boxes shall be located in driveways or any traffic areas.

4.230 Air Relief Assembly

Air relief valves shall be installed at all high points in water line at locations approved by the City Engineer. Air relief valves shall conform to the details shown on the Standard Plans.

4.240 Approval of Alternate Materials

"Approved Equal" Process

The City Engineer shall be the sole judge of whether suppliers or materials qualify as "or equal" and/or "or equivalent" substitutions as may be indicated herein or on the standard plans. As a minimum, submit catalog cuts clearly showing the equivalency. The developer/contractor shall have the full burden of proof in proving equivalency. Incomplete submittals will be rejected. Allow 20 working days after receipt of all required information for the approval process.

Other Substitutions

In order to minimize the costs to the City in maintaining a spare parts inventory, to minimize the need for additional training, and to increase reliability, the City has standardized several key water system components as listed in these design and construction standards and as shown on the standard plans. The items do not include the words "or equal" and/or "or equivalent". The developer/contractor

shall only supply those specific manufacturers' items and models unless prior approval for the substitution has been granted.

Other manufacturer's equipment may be substituted for those specified, provided that the City Engineer has approved the substitute equipment prior to beginning of construction. The following procedures will be followed.

Submit the following data:

(a) Catalog Data

(b) Weight Information

(c) Certified Assembly Drawings

(d) Affidavit of Compliance with AWWA Specifications and the supplementary specifications contained herein.

(e) An actual complete, operable working unit proposed for the substitution. This sample will be returned if the equipment is not approved. If approved, it shall become the property of the City for its use in possible future replacement of the substitute unit.

Approval to substitute will be made based on a comparison of the proposed item with the City's approved standard. Substitutions which require the City to increase its inventory of spare parts, or require re-training of maintenance personnel will not be approved.

In order to alert maintenance crews as to the existence of non-standard items, the projects record drawings prepared by the developer/contractor shall clearly state: THIS INSTALLATION WAS MADE USING (item type, manufacturer, model) with a leader pointing to the item in question.

The developer/contractor shall supply two each of any special tools needed for installation, operation, repairs or maintenance at no cost to the City.

Allow sixty (60) working days to approve the requested substitution.

LIST OF STANDARD DRAWINGS

CHAPTER 4 – WATER

TITLE	DRAWING
Fire Hydrant	4-01
Valve Marker Post and Hydrant Bollard	4-02
1" Single Meter Service	4-03
Radio Read Conduit	4-04
1 ½" and 2" Single Meter Service	4-05
Connection to Existing Main	4-06
Valve Box and Operating Nut Extension	4-07
Valve Operating Extension Fabrication Details	4-08
2" Blow-Off Assembly	4-09
1" Combination Air Valve Assembly	4-10
2" Combination Air Valve Assembly	4-11
Standard Horizontal Blocking Details	4-12
Standard Vertical Blocking Details	4-13
Water Meter – 3", 4", 6" Meter Details	4-14
Water Meter – 3"-6" Material List	4-15
Irrigation D.C.V.A. – ¾"-1"	4-16
Irrigation D.C.V.A. – 1½"-2"	4-17
Irrigation D.C.V.A. – 2½"-3"	4-18

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

Fire Sprinkler D.C.D.A. and Vault w/F.D.C. 4-19

Fire Sprinkler D.C.D.A. and F.D.C. Material List 4-20

Fire Hydrant and F.D.C. Location 4-21

Flushing New Mains 4-22

Approved: AB#04-172 11/8/04
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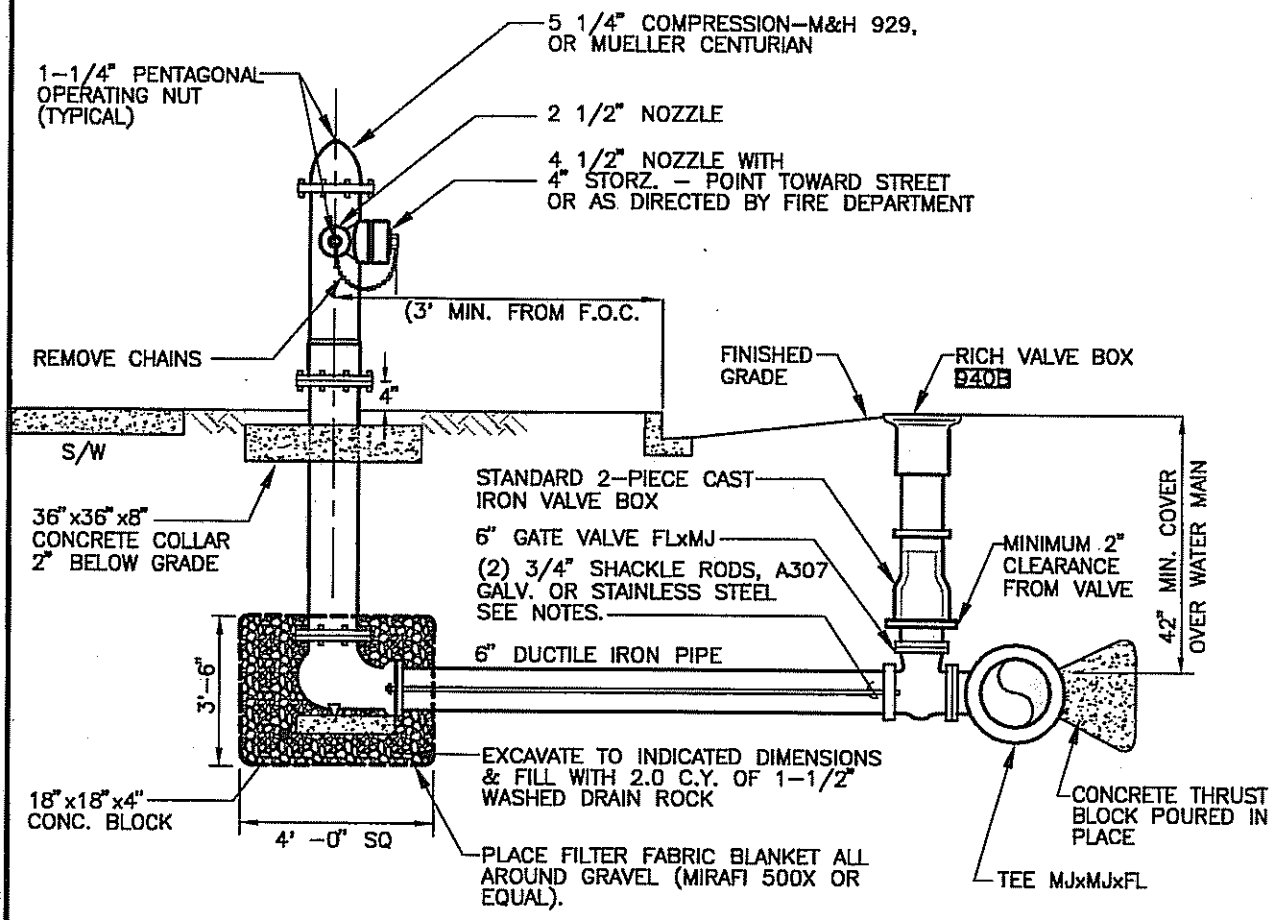

NOTES:

1. HYDRANT LATERALS OVER 50' SHALL BE 8" MINIMUM.
2. SHACKLE RODS SHALL BE CONNECTED TO MECHANICAL JOINTS WITH STAR BOLTS.
3. AN UNOBSTRUCTED THREE FOOT MINIMUM WORKING AREA RADIUS SHALL BE PROVIDED AROUND ALL HYDRANTS.
4. SHACKLE RODS SHALL BE CONSTRAINED AT ALL INTERMEDIATE JOINTS WITH PIPE CLAMPS.
5. FIELD PAINT HYDRANTS WITH ONE COAT SHERWIN WILLIAMS ALKYD GLOSS INDUSTRIAL ENAMEL SAFETY YELLOW NO. 554Y37.
6. PLACE FELT PAPER BETWEEN FIRE HYDRANT AND BLOCK.
7. BARREL EXTENSIONS ARE NOT PERMITTED.

SNOQUALMIE RIDGE II			
FIRE HYDRANT			
DWN	CKD	DATE	DWG
ER		09/16/04	4–01

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Approved: AB#04-172 11/8/04
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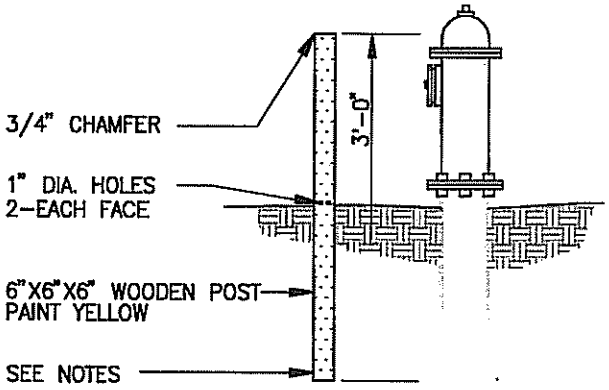

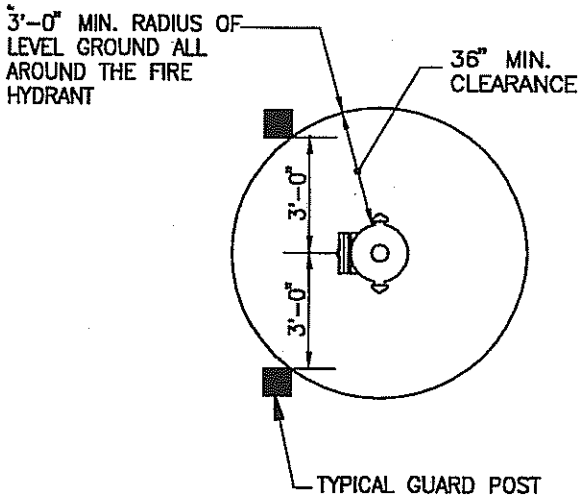

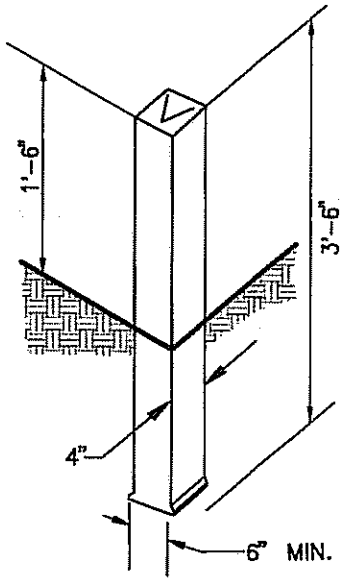

NOTES:

1. GUARD POST SHALL BE 6"x6"x6" LONG DOUGLAS FIR (STRUCTURAL GRADE) TREATED WITH CHEMANITE AND DRILLED WITH 2-1" DIA. HOLES EACH WAY TO PROVIDE BREAKAWAY SAFETY FEATURE.
2. VALVE MARKER SHALL BE "VALVE MARKER", AS MANUFACTURED BY FOG TITE METER SEAL COMPANY. PAINT WITH TWO COATS OF ALKYD BASE HIGH GLOSS BLUE PAINT. PAINT DISTANCE FROM THE VALVE MARKER ON THE POST WITH BLACK ENAMEL PAINT.
3. VALVE MARKER POST TO BE USED FOR ALL MAINLINE VALVES OUTSIDE PAVED AREAS.
4. GUARD POSTS TO BE A MINIMUM 10'-0" FROM EDGE OF NEAR TRAFFIC LANE WHERE NO CURBS EXIST HYDRANTS TO BE LOCATED ACCORDINGLY.

SNOQUALMIE RIDGE II

VALVE MARKER POST AND HYDRANT BOLLARD

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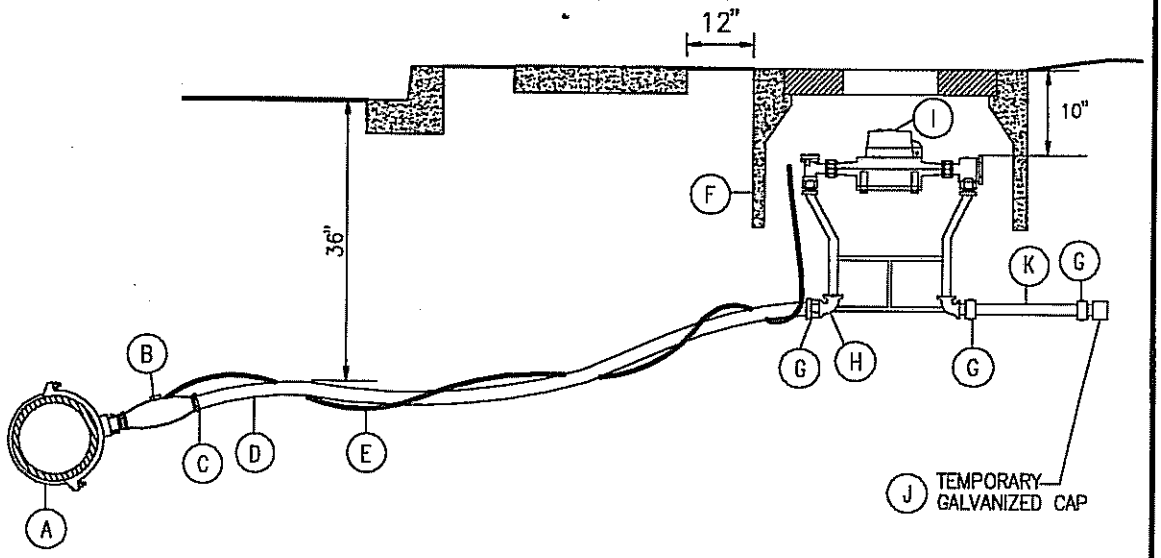
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



PARTS

(A) SERVICE SADDLE, 1" FEMALE IRON PIPE THREAD (FIP) ROMAC 101 SADDLE. FOR PVC OR AC MAINS, STRAPS TO BE DOUBLE STAINLESS STEEL; SADDLE TO BE PRE FORMED FOR C-900 (PVC).

(B) CORPORATION STOP – 1" MALE IRON PIPE THREAD MIP x 1" MIP, FORD BALLCORP FB 500 OR MUELLER ORISEAL H10013.

(C) COMPRESSION ADAPTER – 1" FIP x 1" COPPER TUBE SIZE (CTS), MUELLER H15451 ONLY

(D) SERVICE PIPE – 1" CTS PHILLIPS DRISCOPIPE SDR 9-200 PSI.

(E) TRACER WIRE – SHALL BE 12 GAUGE SOLID COPPER CORE, BLUE COLORED INSULATION. WIRE ENDS TO BE STRIPPED AND TIED TO CORPORATION STOP AND TO METER SETTER. A MINIMUM OF 12 INCHES OF WIRE IS TO EXTEND INTO METER BOX AND LEFT COILED JUST UNDER THE LID. WIRE IS TO BE CONTINUOUS WITHOUT SPLICES.

(F) METER BOX – SHALL BE FOGTITE NO. B-10 METER BOX WITH CAST IRON HINGED READER LID.

(G) COMPRESSION ADAPTER – 1" CTS x 1" MIP; MUELLER H-15428 OR FORD Q-FITTINGS.

(H) METER SETTER – 1" x 18" FORD OR MUELLER WITH ANGLE VALVE AND PADLOCK WINGS, CHECK VALVE, AND DOUBLE PURPOSE NUTS; FOR A 1" METER.

(I) METER – SENSUS 1" SR-2 (CUBIC FEET) WITH RADIO READ.

(J) TEMPORARY CAP – 1" GALVANIZED.

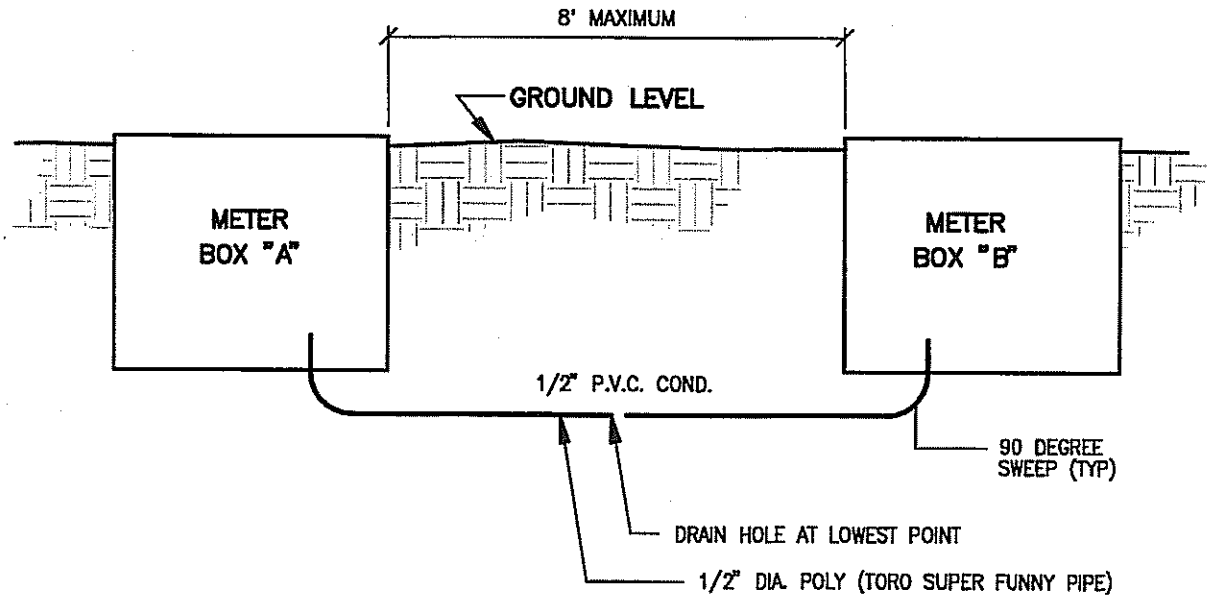
(K) SERVICE LINE – 1" CTS PHILLIPS DRISCOPIPE SDR 9 – 200 PSI, 4 FEET LONG.

NOTES:

1. SERVICE LINE SHALL BE PERPENDICULAR TO THE WATER MAIN UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. STAINLESS STEEL INSERT STIFFENERS REQUIRED FOR ALL COMPRESSION FITTINGS.
3. ALL INCIDENTAL PIPE FITTINGS SHALL BE BRASS (NOT GALVANIZED).
4. PVC SERVICE PIPE NOT RECOMMENDED ON PRIVATE PROPERTY SIDE OF METER BOX.
5. METER BOXES SHALL BE LOCATED OUTSIDE DRIVEWAYS OR TRAFFIC AREAS OR SIDEWALKS.
6. INSTALL TEMPORARY (NONFUNCTIONAL) IDLER AT TIME OF SETTER INSTALLATION.

SNOQUALMIE RIDGE II			
1" SINGLE METER SERVICE			
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 4\4-03.DWG	DWN ER	CKD JSF	DATE 09/16/04	DWG 4-03

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



NOTE:

INSTALL WHEN TWO METERS ARE WITHIN 8 FEET OF EACH OTHER.

SNOQUALMIE RIDGE II				
RADIO READ CONDUIT				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 4\4-04.DWG	DWN ER	CKD JSF	DATE 09/16/04	DWG 4-04

Approved: AB#04-172 11/8/04
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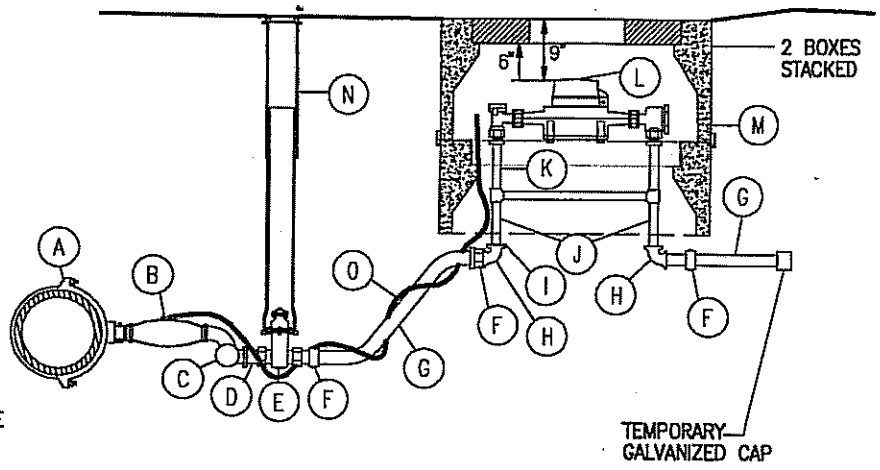
NOTES:

1. SERVICE LINE SHALL BE PERPENDICULAR TO THE WATERMAIN UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. STAINLESS STEEL INSERT STIFFENERS REQUIRED FOR ALL COMPRESSION FITTINGS.
3. ALL INCIDENTAL PIPE FITTINGS SHALL BE BRASS (NOT GALVANIZED).
4. PVC SERVICE PIPE NOT RECOMMENDED ON PRIVATE PROPERTY SIDE OF METER BOX.
5. BOTTOM OF VALVE BOX TO BE KEPT CLEAR OF GATE VALVE, SWING JOINT, SERVICE LINE, ETC. VALVE BASE FLANGE TO BE SET ON WELL COMPACTED SAND OR SANDY GRAVEL SO AS TO NOT SETTLE ONTO SERVICE LINE AND/OR FITTINGS.
6. CORPORATION STOP TO BE INSTALLED LEVEL AT SPRING LINE OF WATER MAIN.
7. METERS SHALL BE LOCATED OUTSIDE DRIVEWAYS OR TRAFFIC AREAS.



1-1/2" AND 2" SERVICES

(A) SERVICE SADDLE – ROMAC 202, 2" FEMALE IRON PIPE THREAD (FIP) (FOR PVC OR AC PIPE – ROMAC 202S; STRAPS TO BE PREFORMED FOR C-900 (PVC)). DOUBLE U-BOLT STRAP FOR DUCTILE IRON.

(B) CORPORATION STOP – 2" MIP x MIP, FORD BALLCORP FB 500 OR MUELLER ORISEAL H9969.

(C) SWING JOINT – TWO 2" BRASS STREET ELLS; ONE, BRASS 90° ELBOW.

(D) NIPPLE – 2" BRASS x 12" LONG.

(E) GATE VALVE – 2" RESILIENT SEAT, CAST IRON BODY, SCREWED WITH 2" SQUARE OPERATING NUT.

(F) COMPRESSION ADAPTER – 2" MALE IRON PIPE THREAD (MIP) x COPPER TUBE SIZE (CTS), MUELLER H15428 OR FORD Q-FITTING.

(G) SERVICE PIPE – 2" CTS PHILLIPS DRISCOPIPE SDR 9-200 PSI.

(H) 90° ELBOW – 2" BRASS.

(I) BRASS BUSHING – 2" x 1-1/2". NOT REQUIRED FOR 2" METER SETTER.

(J) NIPPLE – 2" BRASS OR 1-1/2" BRASS. LENGTH TO FIT.

(K) METER SETTER – WITH VERTICAL INLET, BALL VALVE WITH PADLOCK WINGS, CHECK VALVE, AND OMIT BYPASS. TO BE: FORD 1-1/2" – VBH86-12; 2" – VBH87-12 OR MUELLER 1-1/2" B2422-2 x 12; 2" B2422-2 x 12.

(L) METER – SENSUS 1-1/2" OR 2" SR (CUBIC FEET) WITH RADIO READ.

(M) METER BOX – TWO CONCRETE METER BOXES STACKED. FOGTITE NO. 2 IN NONTRAVELED AREAS AND SIDEWALK. LID TO BE CONCRETE WITH HINGED CAST IRON READER LID. METER BOXES IN TRAFFIC AREAS SHALL BE ONLY AS APPROVED BY THE CITY ENGINEER.

(N) VALVE BOX – SHALL BE RICH #940B WITH SEATTLE TYPE 18" TOP SECTION (NON-LUGGED) AND DEEP WELL BASE SECTION.

(O) TRACER WIRE – SHALL BE 12 GAUGE SOLID COPPER CORE, BLUE COLORED INSULATION. WIRE ENDS TO BE STRIPPED AND TIED TO CORPORATION STOP AND TO METER SETTER. A MINIMUM OF 12 INCHES OF WIRE IS TO EXTEND INTO METER BOX AND LEFT COILED JUST UNDER THE LID. WIRE IS TO BE CONTINUOUS WITHOUT SPLICES.

SNOQUALMIE RIDGE II

1-1/2" AND 2" SINGLE METER SERVICE

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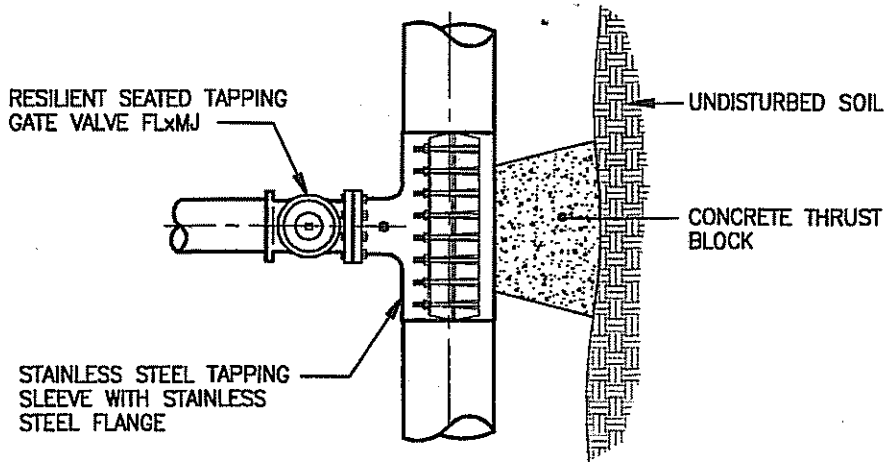
	ER	JSF	09/16/04	4-05

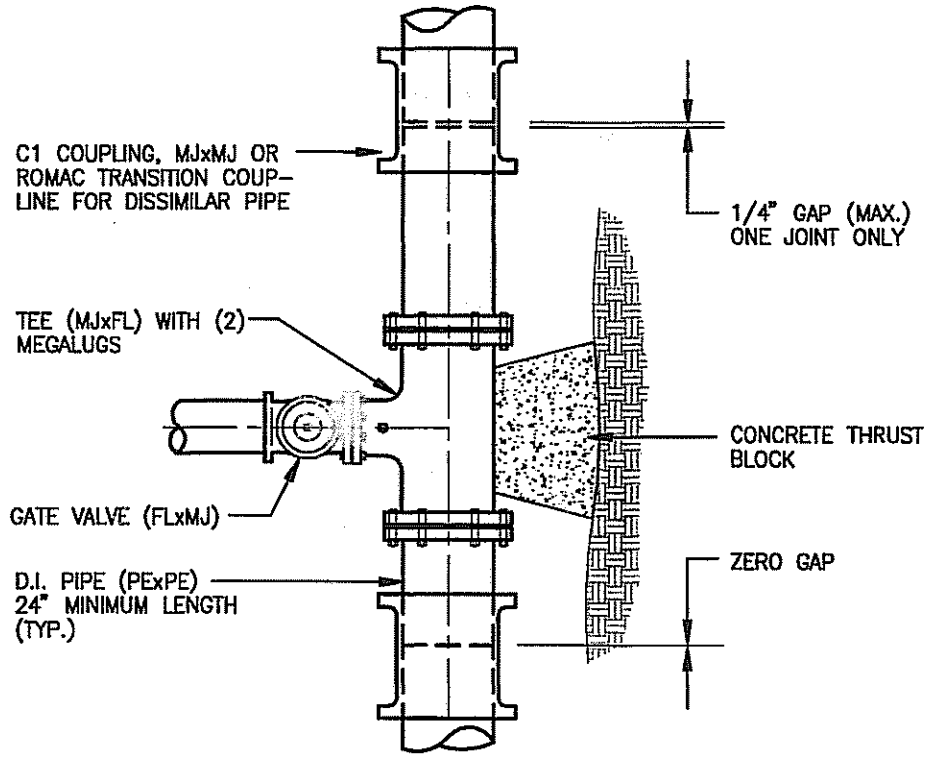
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



ALTERNATIVE

WET TAP

(IF SPECIFICALLY APPROVED)



CUT-IN

NOTES:

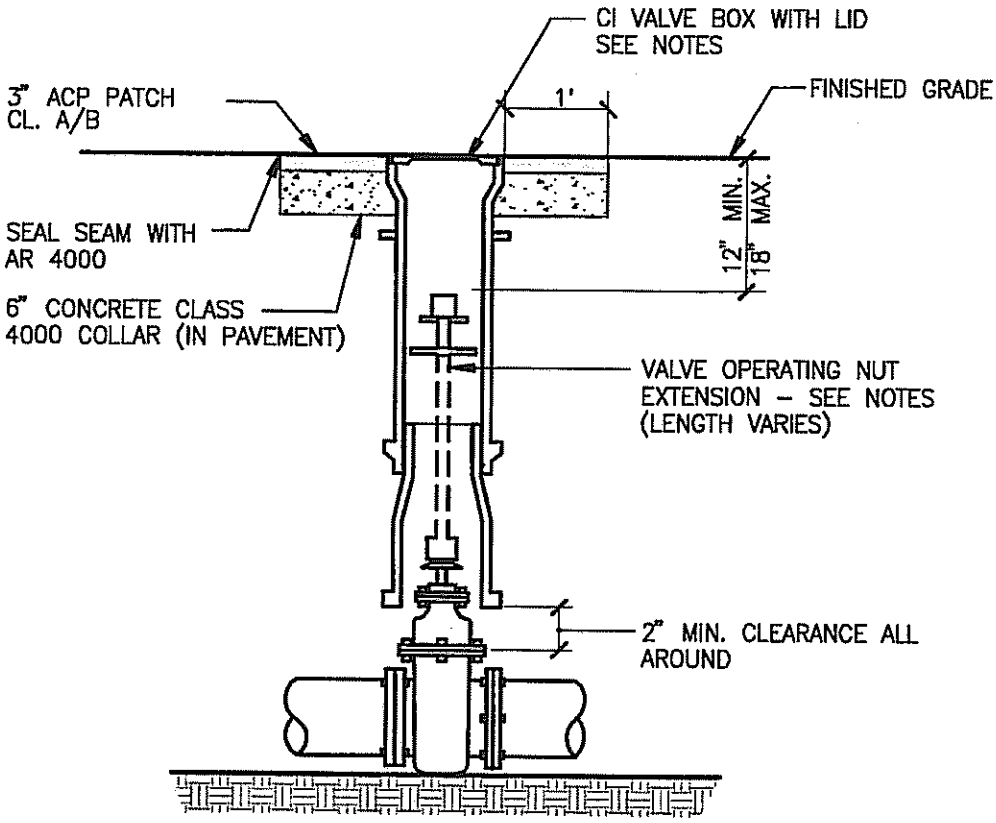
1. SUPPORT VALVE AND SLEEVE CONTINUOUSLY THROUGH INSTALLATION.
2. 11 MIL PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THRUST BLOCK AND BACKFILL ARE POURED.

SNOQUALMIE RIDGE II

CONNECTION TO EXISTING MAIN

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 4\4-06.DWG	DWN	CKD	DATE	DWG
	ER	JSF	09/16/04	4-06

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

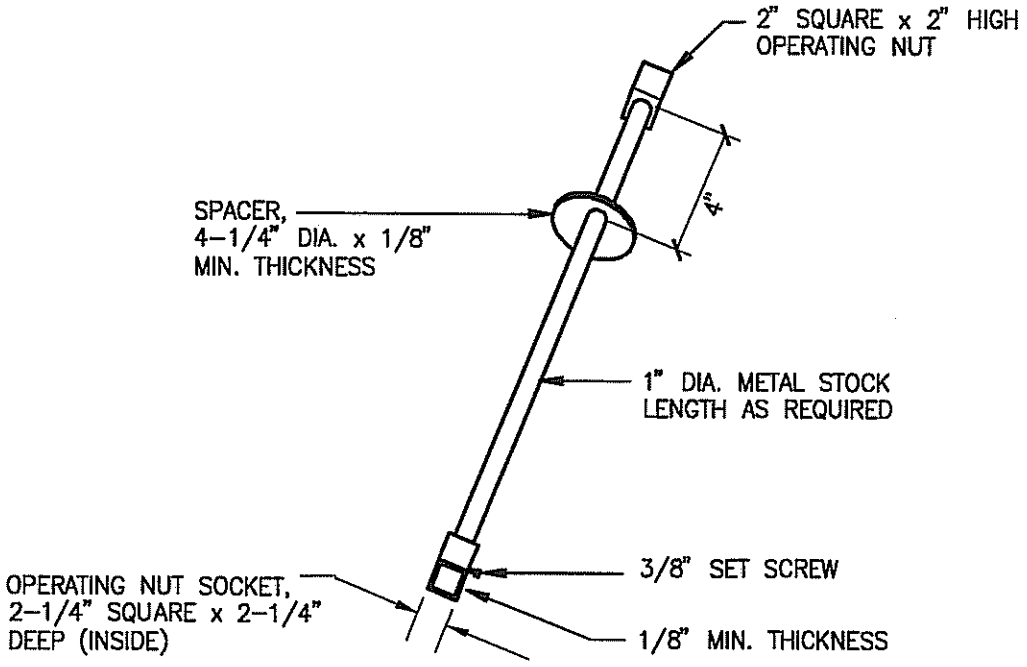


NOTES:

1. 5" DIAMETER HUBBED CAST IRON SOIL PIPE MAY BE USED FOR VALVE BOX EXTENSION.
2. ONLY ONE VALVE BOX EXTENSION TO BE USED PER VALVE.
3. ONLY ONE OPERATING NUT EXTENSION TO BE USED PER VALVE. (SEE DETAIL 4–08)
4. OPERATING NUT EXTENSION REQUIRED WHEN VALVE NUT IS OVER 4 FEET DEEP.
5. VALVE BOX SHALL BE RICH 940B WITH 18" SEATTLE STYLE TOP SECTION.
6. SET VALVE BOX LID 2 INCHES BELOW UNPAVED ROADWAY SHOULDER SURFACE.
7. VALVE LID MARKED "WATER".
8. 2" SKIRT ON LID.

SNOQUALMIE RIDGE II			
VALVE BOX AND OPERATING NUT EXTENSION			
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 4\4-03.DWG	DWN: ER	CKD: JSF	DATE: 09-30-04	DWG: 4-07

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



NOTES:

1. EXTENSIONS ARE TO BE A MIN. OF ONE (1) FOOT LONG WITH ONLY ONE EXTENSION TO BE USED PER VALVE.
2. FILLET WELD ALL COMPONENTS.
3. ALL EXTENSIONS ARE TO BE MADE OF STEEL SIZED AS NOTED, AND PAINTED WITH TWO COATS OF INDUSTRIAL ALKYD GLOSS PAINT. COLOR TO BE WHITE.

SNOQUALMIE RIDGE II			
VALVE OPERATING EXTENSION FABRICATION DETAILS			
DWN	CKD	DATE	DWG
ER	JSF	09/16/04	4-08

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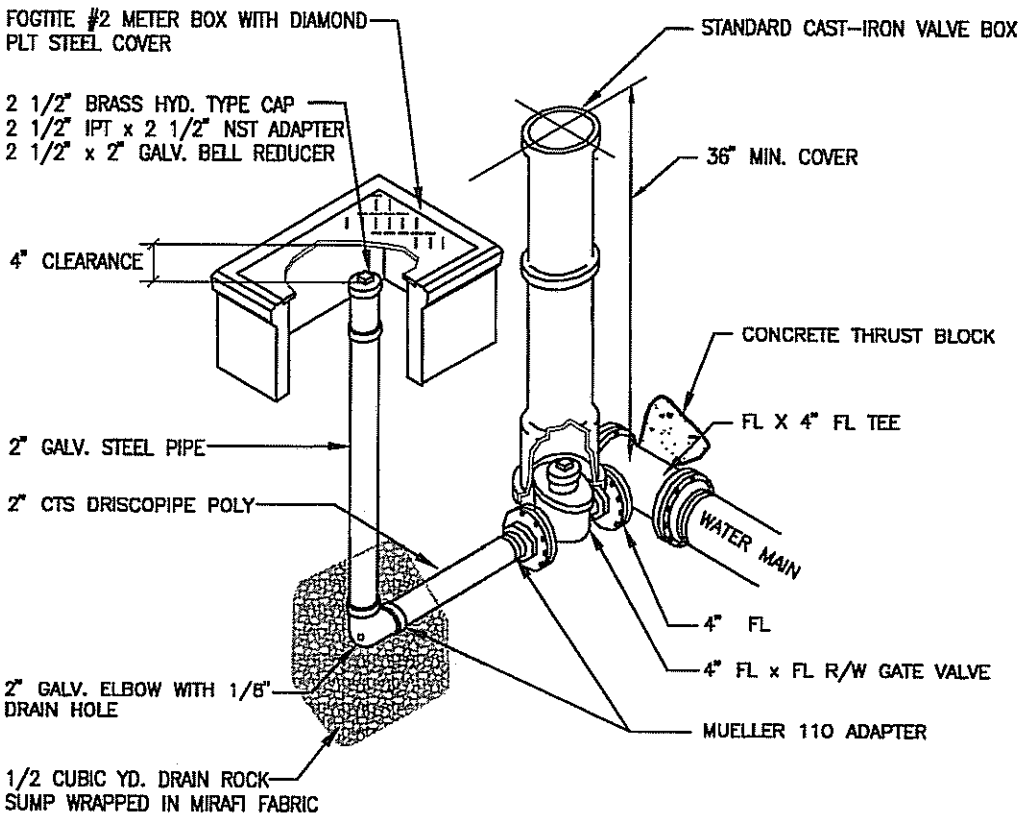
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

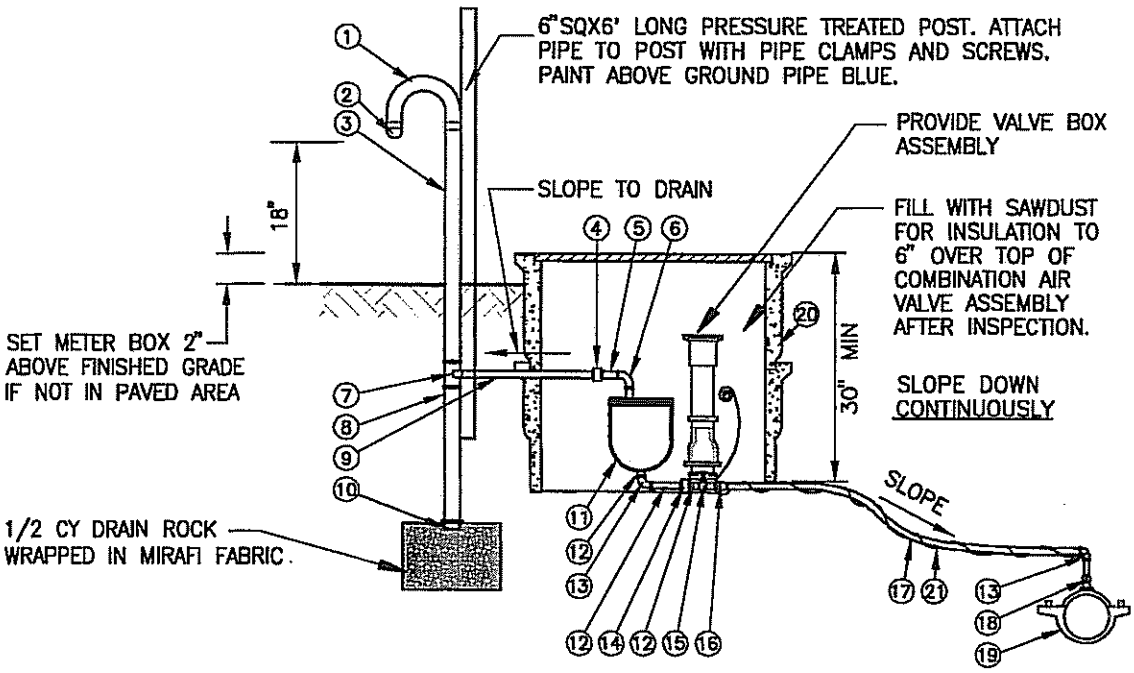


NOTES:

1. PLACE CONCRETE THRUST BLOCKS PER STANDARD DETAILS 4-12.

SNOQUALMIE RIDGE II				
2" BLOWOFF ASSEMBLY				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 4\4-09.DWG	DWN ER	CKD JSF	DATE 09/30/04	DWG 4-9

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



NOTES

1. ALL FITTINGS TO BE BRASS OR COPPER FROM WATER MAIN TO 1" COMBINATION AIR VALVE ASSEMBLY.
2. 1" GALVANIZED PIPE ABOVE GRADE TO BE PAINTED WITH 2 COATS RUSTOLEUM HIGH GLOSS BLUE PAINT.
3. COMBINATION AIR VALVE ASSEMBLY MUST BE INSTALLED AT THE HIGHEST POINT IN THE LINE. IF THE HIGH POINT FALLS IN A LOCATION WHERE THE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL LENGTH OF LINE TO CREATE A HIGH POINT WHERE THE ASSEMBLY CAN BE INSTALLED.

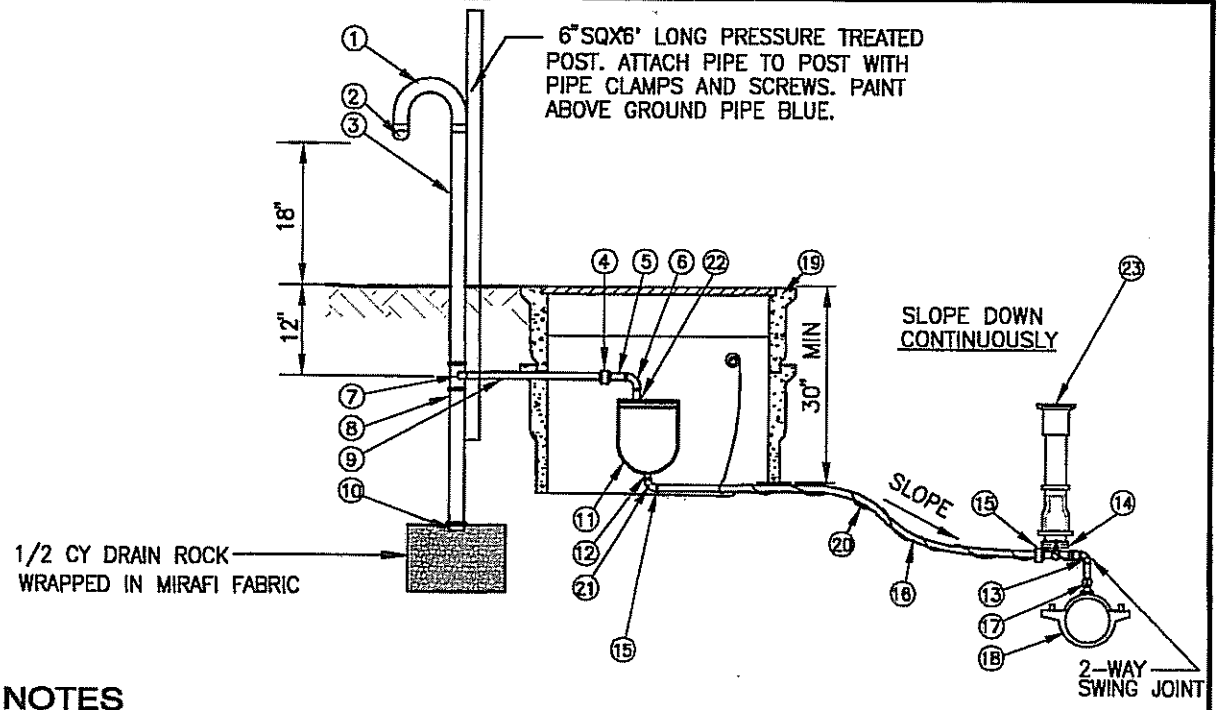
1. 1" 180° OPEN PATTERN RETURN BEND
2. 1" BEEHIVE STRAINER
3. 1" GALV. IRON PIPE. LENGTH AS REQ'D
4. 1" UNION
5. 1" GALV. IRON NIPPLE
6. 1" 90° BEND
7. 1" TEE
   1" CLOSE NIPPLE
   1" 90 BEND
8. 1" GALV. IRON PIPE 18" LONG
9. 1" GALV. IRON PIPE TO FIT
10. 1" CAP WITH 1/8" HOLE FOR DRAIN
11. 1" COMBINATION AIR VALVE APCO 143C
12. 1" BRASS NIPPLE
13. 1" 90° BEND, BRASS, & 1" 90° STREET ELL, BRASS (INSTALL 90 BEND ON CORP, ALIGN PARALLEL WITH WATERMAIN. TURN SO THAT ELL IS NOT OVER CORP OPERATING NUT.)
14. 1" UNION, BRASS
15. 1" BALL CURB STOP, FORD B11-4444, OR MUELLER B20283
16. 1" CTS X 2" MIP COMPRESSION ADAPTER – MUELLER OR FORD.
17. 1" CTS PHILLIPS DRISCOPIPE SDR-9– 200 PSI
18. CORP STOP, MIP x MIP FORD BALLCORP OR MUELLER ORISEAL
19. SERVICE SADDLE, ROMAC 202 IPT
20. FOGTITE NO. 2. CONCRETE METER BOXES STACKED WITH 3/8" STEEL TRAFFIC COVER.
21. TRACER WIRE– SHALL BE 12 GUAGE SOLID COPPER COPPER CORE, BLUE COLORED INSULATION. WIRE ENDS TO BE STRIPPED AND TIED TO CORP STOP AND TO METER SETTER. A MINIMUM OF 12 INCHES OF WIRE IS TO EXTEND INTO METER BOX AND LEFT COILED JUST UNDER THE LID. WIRE IS TO BE CONTINUOUS, WITHOUT SPLICES.

SNOQUALMIE RIDGE II

1" COMBINATION AIR VALVE ASSEMBLY

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 4\4-10.DWG	DWN	CKD	DATE	DWG
	ER	JSF	09/16/04	4-10

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



NOTES

1. ALL FITTINGS TO BE BRASS OR COPPER FROM WATER MAIN TO 1" COMBINATION AIR VALVE ASSEMBLY.
2. 1" GALVANIZED PIPE ABOVE GRADE TO BE PAINTED WITH 2 COATS RUSTOLEUM HIGH GLOSS BLUE PAINT.
3. COMBINATION AIR VALVE ASSEMBLY MUST BE INSTALLED AT THE HIGHEST POINT IN THE LINE. IF THE HIGH POINT FALLS IN A LOCATION WHERE THE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL LENGTH OF LINE TO CREATE A HIGH POINT WHERE THE ASSEMBLY CAN BE INSTALLED.

1. GALV. IRON 2" RETURN BEND.
2. 2" BEEHIVE STRAINER (BRASS)
3. 2" GALV. IRON PIPE. LENGTH AS REQ'D
4. 2" UNION
5. 2" GALV. CLOSE NIPPLE
6. 2" GALV. ELBOW
7. 2" TEE, 2" 90° STREET ELL
8. 2" GALV. IRON PIPE 8" LONG
9. 1" GALV. IRON PIPE TO FIT
10. 2" CAP WITH 1/8" HOLE FOR DRAIN
11. 2" AIR VACUUM VALVE ASSEMBLY, APCO 145C PRESSURE RATING AS APPROVED BY CITY ENGINEER.
12. 2" BRASS NIPPLE x 12" LONG
13. (2) 2" 90° BEND, BRASS SWING JOINT.
14. 2" GATE VALVE – CAST IRON BODY – RESILIENT SEAT – SCREWED – 2" SQUARE OPERATING NUT
15. 2" CTS x 2" MIP COMPRESSION ADAPTOR
16. 2" CTS PHILLIPS DRISCOPIPE SDR 9-200 PSI
17. CORP. STOP – 2" MIP x MIP – FORD BALLCORP FB 500 OR MUELLER ORISEAL H9969
18. SERVICE SADDLE, ROMAC 202 IPT
19. FOGTITE NO. 2 CONCRETE METER BOXES STACKED WITH 3/8" STEEL TRAFFIC COVER.
20. TRACER WIRE – SHALL BE 12 GAUGE SOLID COPPER CORE, BLUE COLORED INSULATION. ENDS TO BE STRIPPED AND TIED TO CORP STOP AND TO AIR UNIT. A MINIMUM OF 12" WIRE IS TO EXTEND INTO BOX AND LEFT COILED JUST UNDER THE LID. WIRE IS TO BE CONTINUOUS, WITHOUT SPLICES.
21. 2" BRASS STREET ELL
22. 2" GALV. NIPPLE, LENGTH TO FIT
23. VALVE BOX – RICH 940B WITH REGULAR BASE

SNOQUALMIE RIDGE II

2" COMBINATION AIR VALVE ASSEMBLY

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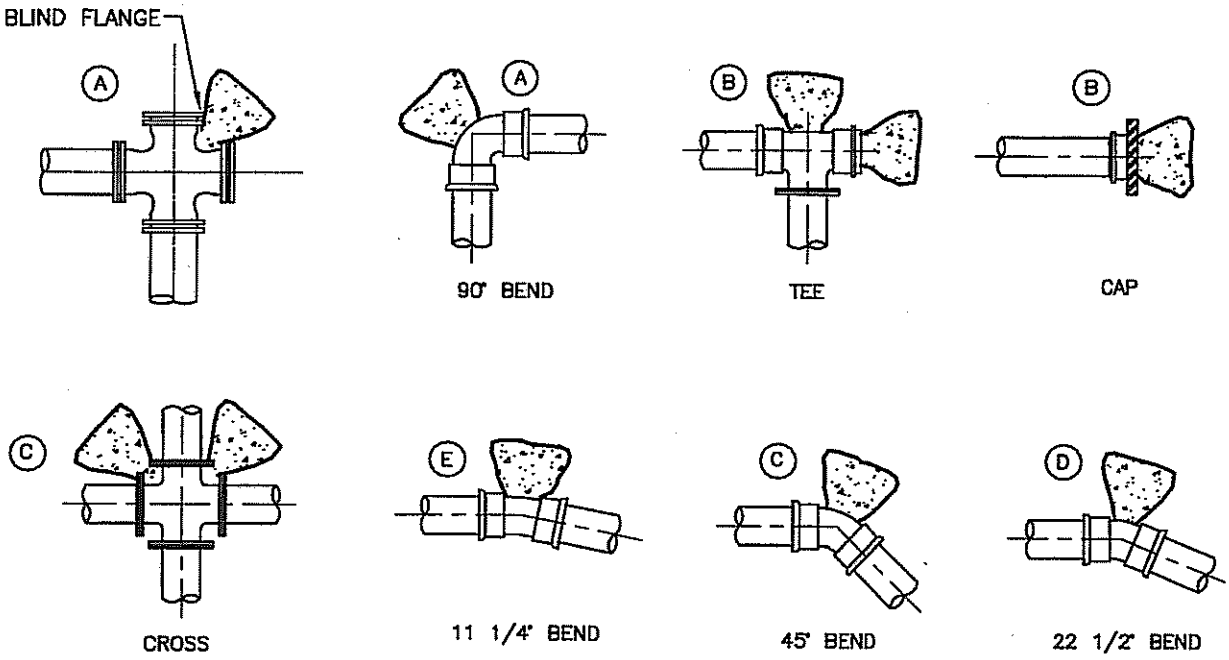
	ER	JSF	09/16/04	4-11

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



NOTES:

1. BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL-BEARING LOAD OF 2,000 POUNDS PER SQUARE FOOT.
2. BEARING AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES, AND SOIL CONDITIONS.
3. CONCRETE BLOCKING (CLASS 3000) SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.
4. BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.
5. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE UNDER ALL CONDITIONS OF SERVICE.
6. MINIMUM ROD DIAMETER SHALL BE 3/4" ASTM A-307 WITH 36KSI YIELD STRENGTH, GALV.
7. ALL BLOCKS SHALL BE FORMED WITH PLYWOOD & SHALL BE INSPECTED AND APPROVED PRIOR TO PLACING CONCRETE. FORM LUMBER SHALL BE SUBSTANTIAL IN DIMENSION (WIDTH, LENGTH, THK). FORMING SHALL BE COMPLETE AND SUFFICIENT SO AS TO KEEP THE CONCRETE FROM OVERFLOWING ONTO THE FITTINGS BEYOND THE FORMED LIMITS.
8. FITTINGS AND BOLTS SHALL BE COVERED WITH VISQUEEN PRIOR TO CONCRETE PLACEMENT.

THRUST BLOCK TABLE

MINIMUM BEARING AREA AGAINST UNDISTURBED SOIL

PIPE SIZE	(A) SQ. FT.	(B) SQ. FT.	(C) SQ. FT.	(D) SQ. FT.	(E) SQ. FT.
4"	3	1	1	1	1
6"	4	4	2	1	1
8"	7	6	4	2	1
10"	11	10	6	3	2
12"	16	14	9	5	3
14"	22	19	12	6	3
16"	29	25	16	8	4
18"	36	31	20	10	5
20"	45	39	24	13	6
22"	54	47	29	15	8
24"	64	56	35	18	9
28"	87	76	48	24	12
30"	101	87	55	28	14
36"	145	125	78	40	20
42"	197	171	107	55	27
48"	257	223	140	71	36

SNOQUALMIE RIDGE II

STANDARD HORIZONTAL BLOCKING DETAILS

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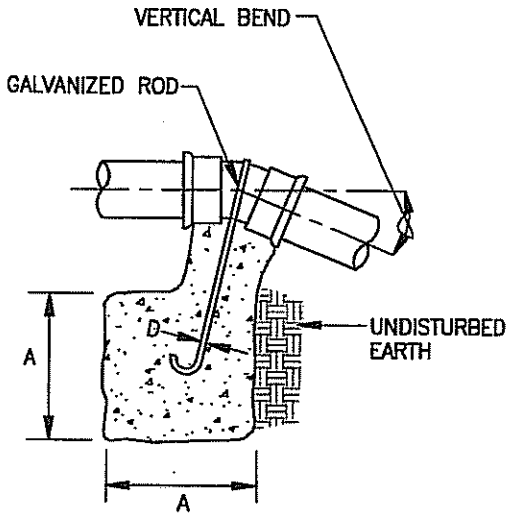
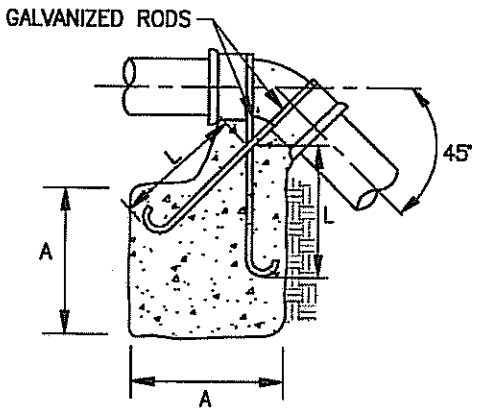
	ER	JSF	09/16/04	4-12

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



VERTICAL BLOCKING
FOR 11–1/4°, 22 1/2° & 30° BENDS

PIPE SIZE	V B	CU. FT.	A	D	L
4"	22–1/2°	8	2.0'	3/4"	1.5'
	11–1/4°	11	2.2'		2.0'
	30°	17	2.6'		
6"	11–1/4°	11	2.2'	3/4"	2.0'
	22–1/2°	25	2.9'		
	30°	41	3.5'		
8"	11–1/4°	16	2.5'	3/4"	2.0'
	22–1/2°	47	3.6'		
	30°	70	4.1'	3/4"	2.5'
12"	11–1/4°	32	3.2'	3/4"	2.0'
	22–1/2°	88	4.5'	7/8"	3.0'
	30°	132	5.1'		
16"	11–1/4°	70	4.1'	7/8"	3.0'
	22–1/2°	184	5.7'	1–1/8"	4.0'
	30°	275	6.5'	1–1/4"	
20"	11–1/4°	91	4.5'	7/8"	3.0'
	22–1/2°	225	6.1'	1–1/4"	4.0'
	30°	330	6.9'	1–3/8"	4.5'
24"	11–1/4°	128	5.0'	1"	3.5'
	22–1/2°	320	6.8'	1–3/8"	4.5'
	30°	480	7.9'	1–5/8"	5.5'



VERTICAL BLOCKING
45° BEND

VERTICAL BLOCKING
FOR 45° BENDS

PIPE SIZE	V B	CU. FT.	A	D	L
4"	45°	30	3.1'	3/4"	2.0'
6"		68	4.1'		
8"		123	5.0'		
12"		232	6.1'	3/4"	2.5'
16"		478	7.8'	1–1/8"	4.0'
20"		560	8.2'	1–1/4"	
24"		820	9.4'	1–3/8"	4.5'

DEAD WEIGHT BLOCKING

PIPE SIZE	PIPE AREA SQ. IN.	22.5°	45°	60°	90°
		TYPE OF FITTING			
4"	12.5	0.3	0.6	0.7	1.1
6"	28.3	0.5	1.1	1.4	2.1
8"	50.3	0.9	1.9	2.5	3.8
12"	113	2.1	4.2	5.6	8.4
16"	201	3.7	7.5	9.9	15
18"	254	3.7	10	13	20
20"	314	4.9	12	16	24
24"	432	6.0	16	21	32

SIZE OF DEAD WEIGHT BLOCK C.Y. CONCRETE

NOTE:

1. CONCRETE BLOCKING BASED ON 200 PSI PRESSURE & CLASS 3000 CONCRETE.
2. FITTINGS AND BOLTS SHALL BE COVERED WITH VISQUEEN PRIOR TO CONCRETE PLACEMENT.
3. PROVIDE MIN 3" COVER OVER GALVANIZED RODS.
4. RODS SHALL BE GALV. A307 OR STAINLESS STEEL. MIN. 36 KSI YIELD STRENGTH, SIZE AS SHOWN.
5. BEARING AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.

SNOQUALMIE RIDGE II

STANDARD VERTICAL BLOCKING DETAILS

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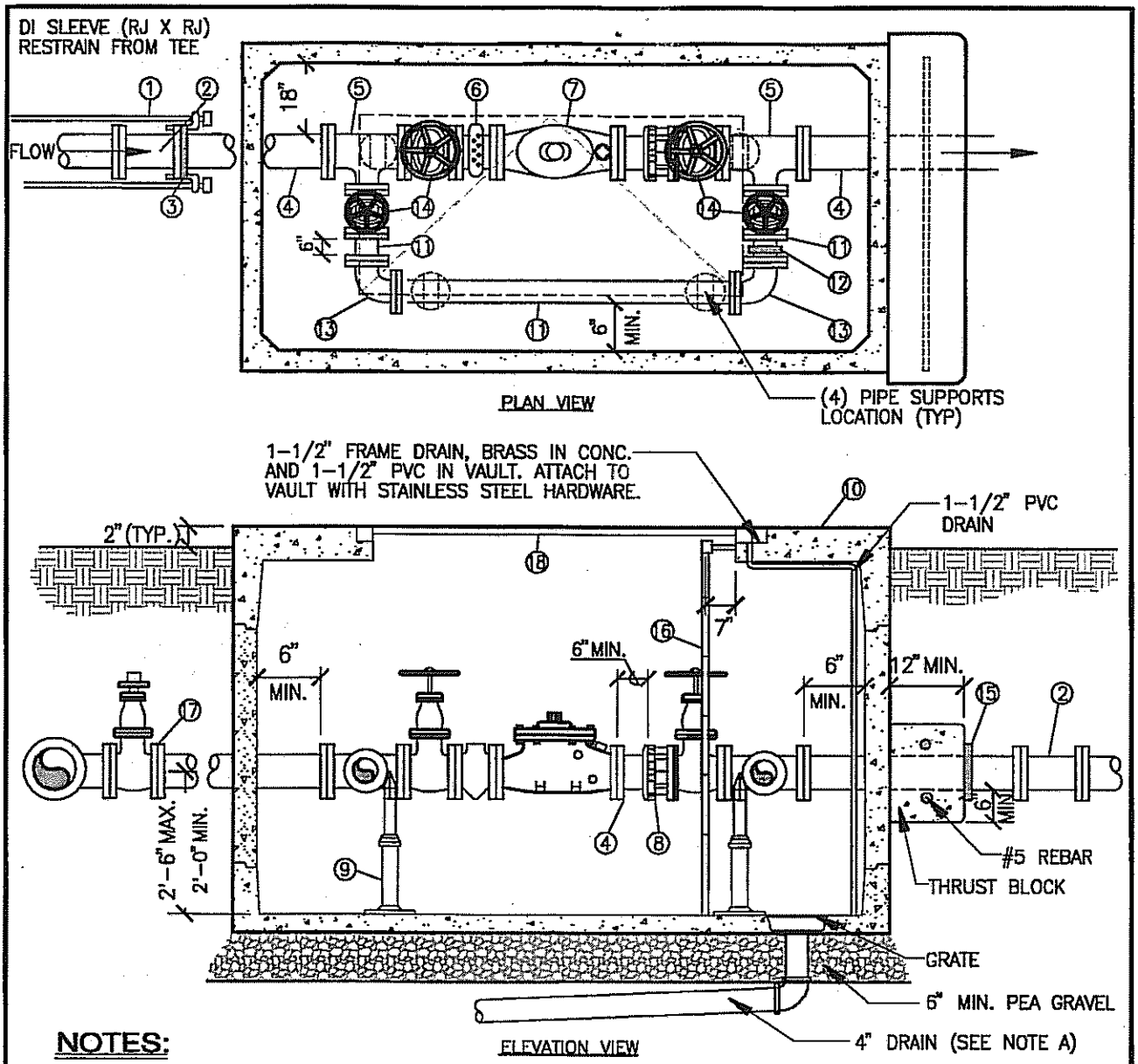
	ER	JSF	09/16/04	4-13

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



NOTES:

A. GRAVITY VAULT DRAIN SHALL BE CONNECTED TO STORM SEWER OR DAYLIGHT AS SHOWN ON DRAWINGS.

B. METER SHALL BE STYLE AND TYPE SPECIFIED BY WATER SUPERINTENDANT.

C. GATE VALVE ⑰ SHALL BE 4" SIZE FOR 3" SERVICES.

D. SEE RELATED MATERIAL LIST.

E. VAULT SHALL BE LOCATED IN PLANTER OR NON-TRAFFIC AREA UNLESS SPECIFICALLY APPROVED BY CITY ENGINEER.

F. INSTALL BLIND FLANGES ON ALL OPEN PIPES UNTIL METER IS INSTALLED.

VAULT, FITTINGS AND PIPING SIZING REQUIREMENTS

METER SIZE	BYPASS VALVES AND PIPING	BYPASS TEE (FL X FL)	MIN. INSIDE VAULT DIM.		
			LENGTH	WIDTH	HT.
3"	3"	3" x 3"	7 FT.	5.0 FT.	6 FT.
4"	4"	4" x 4"	8 FT.	5.0 FT.	6 FT.
6"	4"	6" x 4"	10.5 FT.	5.0 FT.	6 FT.

SNOQUALMIE RIDGE II

WATER METER
3", 4", 6" METER DETAILS

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3", 4", 6" METER ASSEMBLY MATERIAL LIST

1. SHACKLE RODS WITH STAR BOLTS.
2. D.I. SLEEVE (MJ X MJ)
3. MEGALUG RESTRAINT GLAND.
4. D.I. SPOOL (FL X PE)
5. TEE (FL X FL)
6. SENSUS STRAINER (FL X FL)
7. SENSUS METER AS SPECIFIED BY CITY SUPERINTENDANT FOR APPLICATION.
8. ROMAC FCA 501 FLANGE X COUPLING ADAPTER
9. ADJUSTABLE PIPE SUPPORT WITH SADDLE AND ANCHOR FLANGE.
10. UTILITY VAULT CO. CONCRETE VAULT
    - 3" ASSEMBLY– #675–LA WITH TL–2–332P COVER
    - 4" ASSEMBLY– #687–LA WITH TL–2–332P COVER
    - 6" ASSEMBLY– #5106–LA WITH TL–2–332AL COVER
11. D.I. SPOOL (FL X FL)
12. ROMAC 101 3/4" SERVICE SADDLE WITH IPT 3/4" CORP STOP TAPPED INTO BOTTOM OF SPOOL FOR FLUSH/DRAIN DOWN.
13. D.I. 90° ELBOW (FL X FL)
14. RESILIENT SEATED GATE VALVE (FL X FL) WITH HAND WHEELS.
15. MEGALUG RESTRAINT GLAND
16. LADDER PER WSDOT AND OSHA SPECIFICATIONS
17. GATE VALVE AT MAIN TEE:
    - 3" METER– USE 4" G.V. (FL X FL) WITH 4" X 3" REDUCER (FL X MJ)
    - 4" METER– USE 4" G.V. (FL X MJ)
    - 6" METER– USE 6" G.V. (FL X MJ)
18. HINGED ALUMINUM DIAMOND PLATE LOCKING HATCH COVER

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WATER METER 3"–6" MATERIAL LIST				
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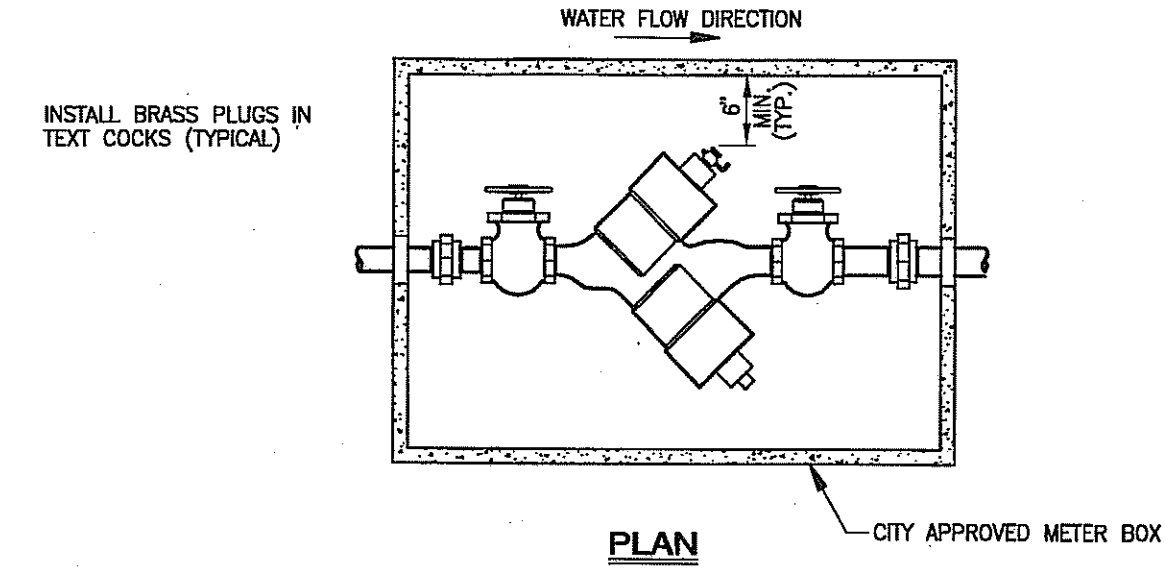
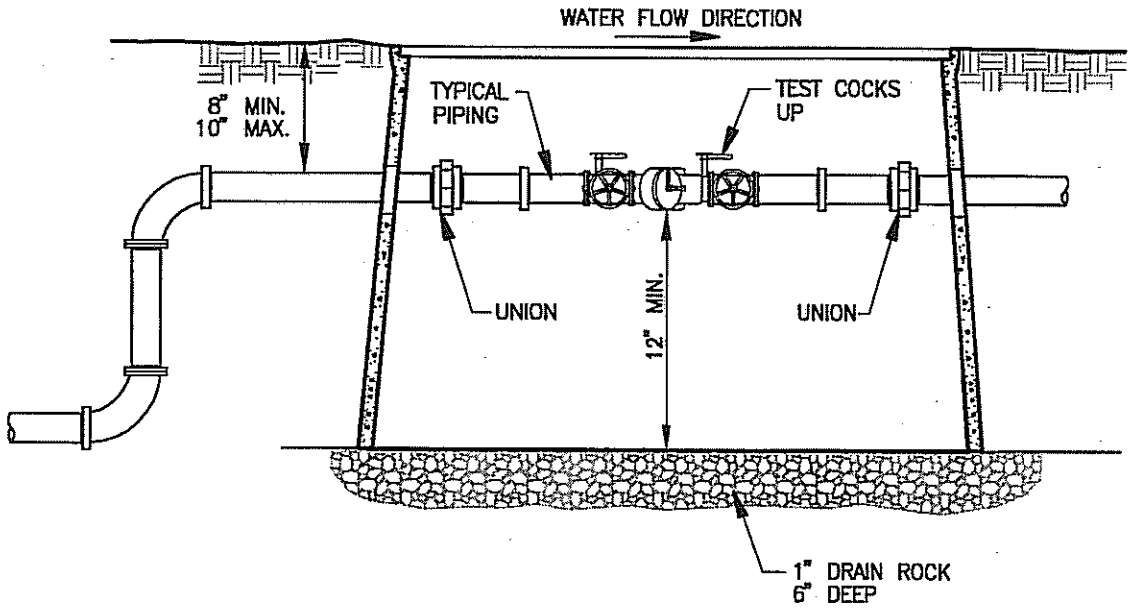


PLAN



ELEVATION

N.T.S.

NOTES:

1. FOR 3/4" – 1" D.C.V.A. USE FOGTITE B–10 BOX WITH SOLID LID.
2. ASSEMBLY MUST BE TESTED BY A CERTIFIED TESTER AFTER INSTALLATION AND BEFORE USE.

SNOQUALMIE RIDGE II			
IRRIGATION D.C.V.A. 3/4" – 1"			
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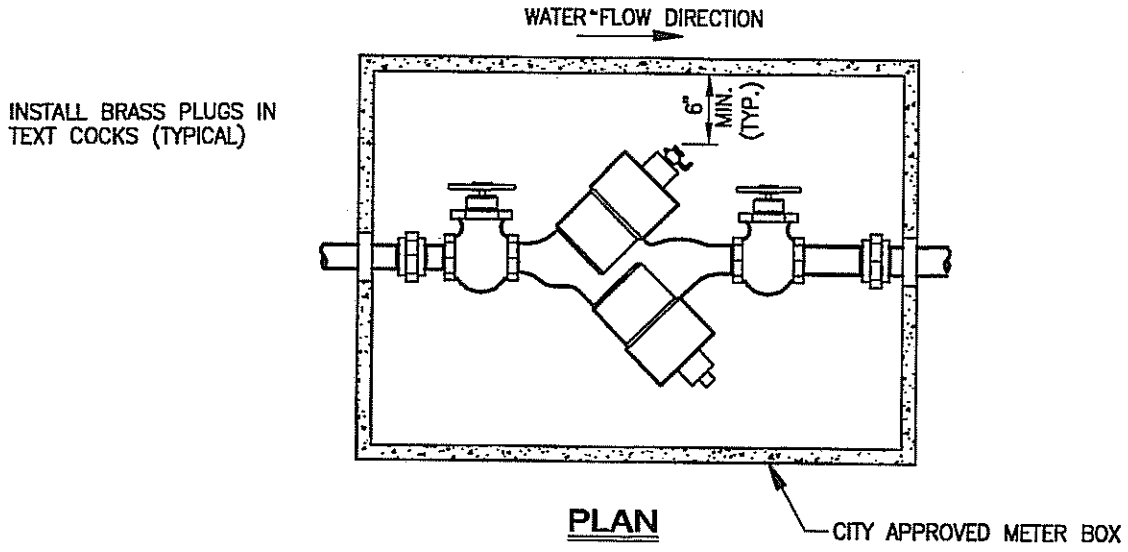

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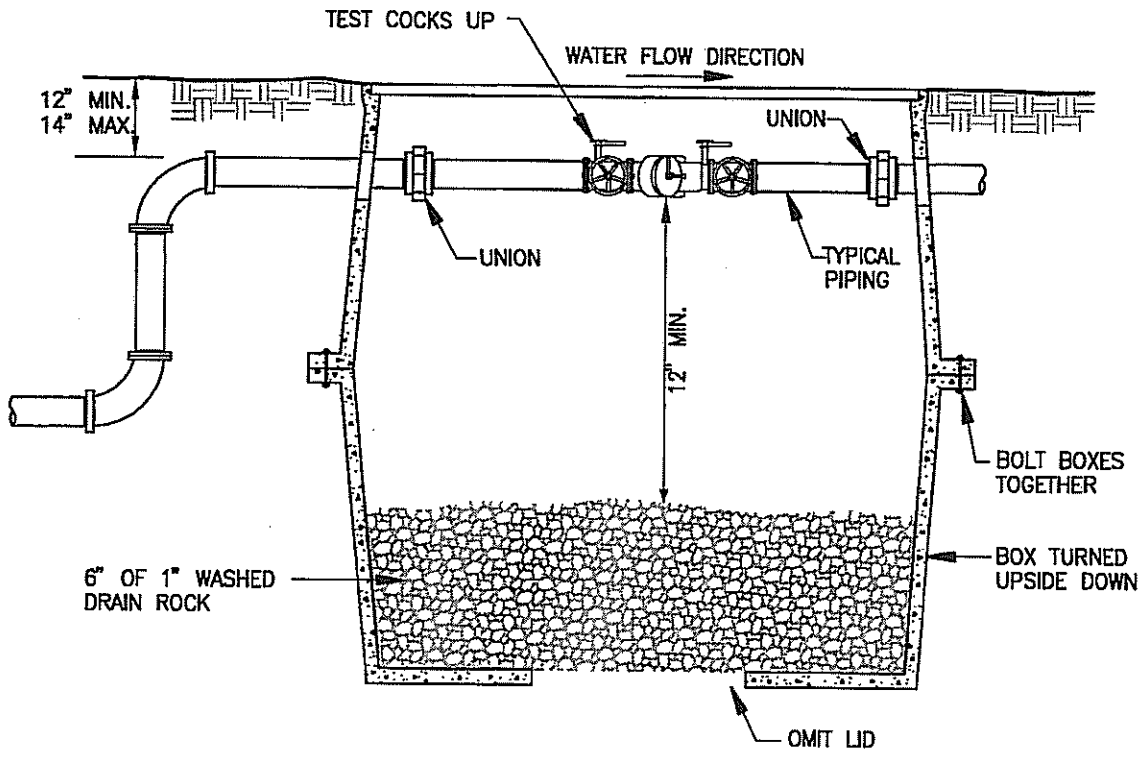

ELEVATION

NOTES:

1. FOR 1-1/2" – 2" D.C.V.A. USE FOGTITE CONCRETE BOX #2 DOUBLE STACKED OR FOGTITE SECTIONAL VAULT – CATALOG #124.
2. ASSEMBLY MUST BE TESTED BY A CERTIFIED TESTER AFTER INSTALLATION AND BEFORE USE.

SNOQUALMIE RIDGE II			
IRRIGATION D.C.V.A. 1 1/2" – 2"			
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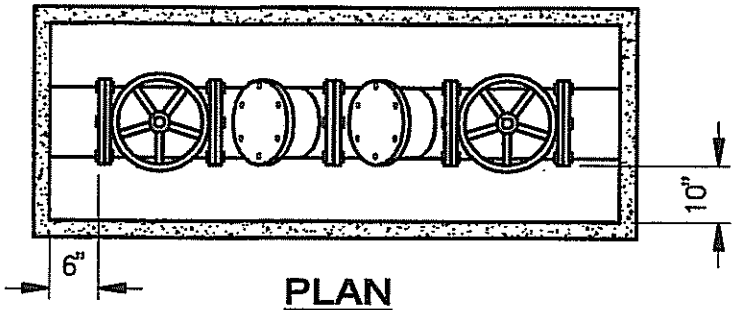

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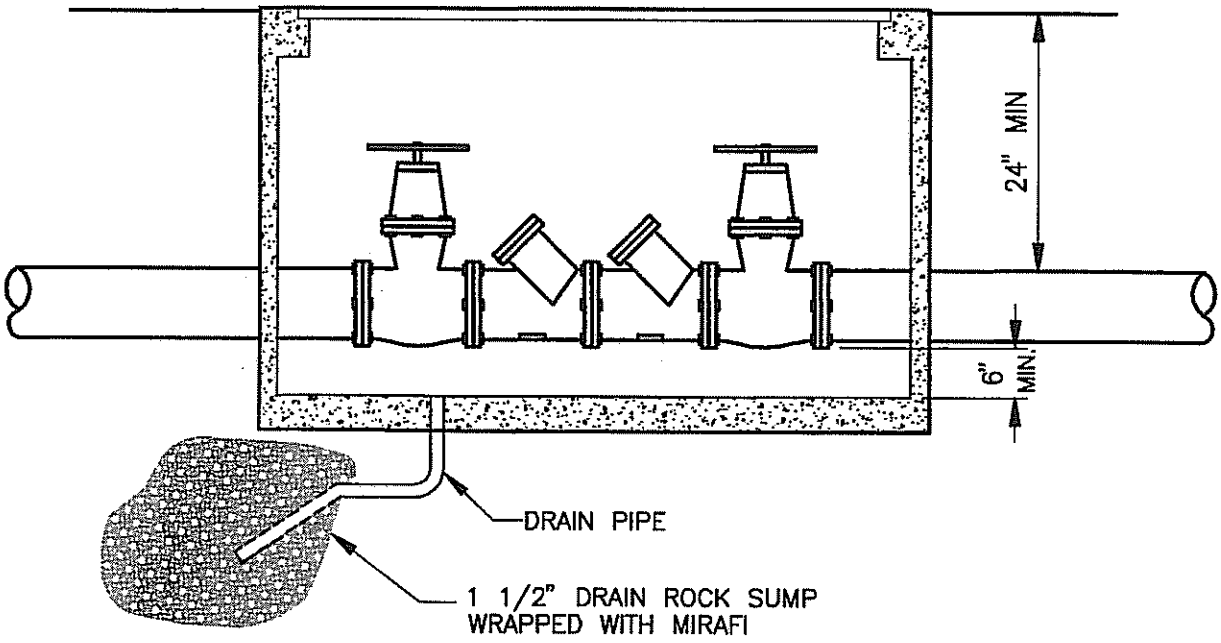

PROFILE

NOTES:

1. FOR 2–1/2" – 3" DCVA USE FOG–TITE MODEL 25T OR FOG–TITE 33–1/2"x57–1/2" SECTIONAL VAULT CATALOG #135.
2. ASSEMBLY MUST BE TESTED BY A CERTIFIED TESTER AFTER INSTALLATION AND BEFORE USE.

SNOQUALMIE RIDGE II			
IRRIGATION D.C.V.A. 2–1/2" – 3"			
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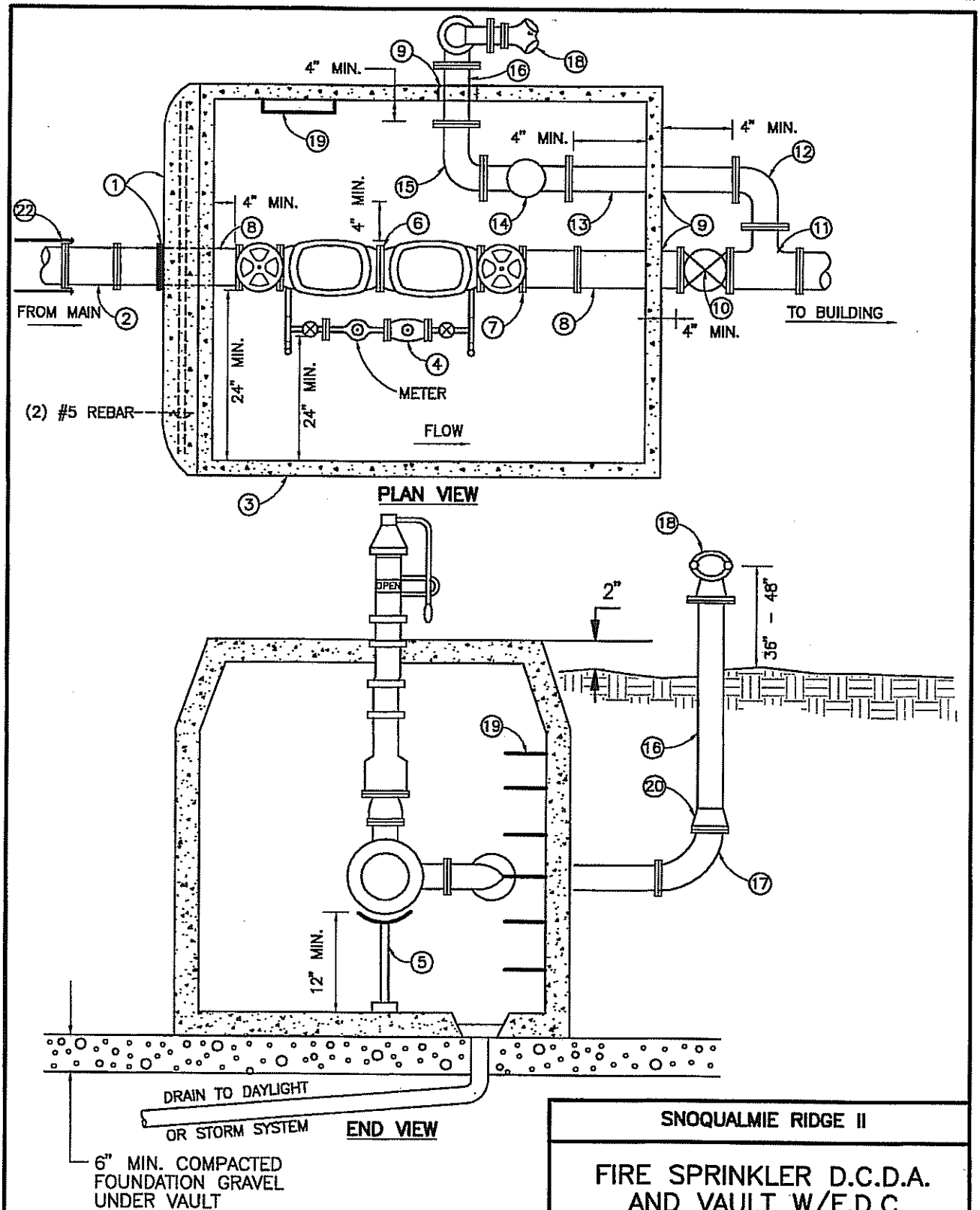

SNOQUALMIE RIDGE II

FIRE SPRINKLER D.C.D.A. AND VAULT W/F.D.C.

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MATERIAL LISTING

1. CONCRETE BLOCKING (2500 PSI) AS REQUIRED WITH LOCKING MEGALUG OR EQUAL JOINT RESTRAINT. SEE DETAIL "A".
2. DUCTILE IRON SLEEVE (MJxMJ) WITH MEGALUGS.
3. PRECAST UTILITY VAULT CO. VAULT.
4. APPROVED 3/4 DCVA WITH SENSUS SR-2 METER OR AS SPECIFIED BY CITY WATER SUPT.
5. TWO ADJUSTABLE PIPE SUPPORTS.
6. D.O.H. APPROVED DCDA IN MAIN LINE.
7. FLANGE B COUPLING ADAPTOR, ROMAC STYLE FCA501.
8. D.I. PIPE (FLxPE).
9. INSTALL EPOXY NON-SHRINK GROUT, TYPICAL, ALL WALL PENETRATIONS.
10. GATE VALVE (FLxFL) WITH POST INDICATOR MUELLER OR EQUAL.
11. TEE (FLxFL)
12. LONG RADIUS 90° BEND.
13. 4" D.I. SPOOL (FLxFL)
14. 4" SWING TYPE GRAVITY OPERATED CHECK VALVE WITH AUTOMATIC DRIP FOR DRAIN DOWN.
15. 4" 90° BEND (FLxFL)
16. 4" SCHEDULE 40 GALVANIZED STEEL PIPE (IPTxIPT)
17. 4" D.I. LONG RADIUS 90° BEND (FLxFL) WITH RESTRAINED JOINTS.
18. UL LISTED FD CONNECTION AND BREAKAWAY CAPS, POWHATAN 21-133.
19. OSHA COMPLIANT LADDER BOLTED TOP AND BOTTOM. (COORDINATE WITH HATCH LID).
20. ADAPTOR (FLxIPT)
21. O.S. & Y VALVES TO BE RESILIENT SEATED W/TAMPER SWITCHES. ADD WIRING IN ACCORDANCE WITH L & I
22. 3/4 INCH SHACKLE RODS TO MAIN TEE.

DETECTOR DOUBLE CHECK AND VAULT ASSEMBLY NOTES

1. ALL VAULT LIDS SHALL BE LOCKING DOUBLE ALUMINUM HINGED COVERS.
2. ALL BACKFLOW PREVENTERS SHALL BE TESTED AFTER INSTALLATION BY A CERTIFIED TESTER.
3. ALL BENDS TO BE DUCTILE IRON CLASS 250 CEMENT LINED.
4. ALL MATERIAL TO BE MANUFACTURED IN U.S.A.
5. ALL PIPE TO BE DUCTILE IRON CLASS 52 (3" AND LARGER).
6. BYPASS METER PIPING SHALL BE BRASS.
7. 4" GALVANIZED STEEL STAND PIPE BELOW GRADE SHALL BE WRAPPED WITH POLYETHELENE 10 MIL THICKNESS.
8. CHAIN AND PADLOCKS (CITY KEYED) SHALL BE PROVIDED TO SECURE VALVES.
9. FOR HYDRAULICALLY DESIGNED SPRINKLER SYSTEMS WITH A SYSTEM DEMAND OF 1,000 GPM OR MORE A MINIMUM 6" PIPING IS REQUIRED AT THE FDC WITH A MINIMUM OF THREE 2-1/2" INLET PORTS.
10. MATERIALS SHALL BE LISTED AND LABELED AS UL AND FM APPROVED FOR INTENDED USE.
11. VAULT TYPE LAYOUT TO BE USED ONLY WHEN AN INSIDE THE BUILDING LOCATION HAS BEEN VERIFIED BY THE CITY ENGINEER AS INFEASIBLE OR NOT REQUIRED.
11. VAULT DRAIN TO BE CONNECTED TO STORM SEWER.
12. PLANS MUST BE APPROVED BY CITY ENGINEER AND FIRE DEPT.
13. SEE RELATED MATERIAL LIST.
14. LOCATE IN PLANTING AREA – NOT PAVING AREA.
15. PROVIDE SHOP DRAWINGS AND MATERIAL SUBMITTALS.
16. COMPLY WITH NFPA 24
17. INSTALL BLIND FLANGES ON ALL OPEN PIPES UNTIL METER IS INSTALLED.

SNOQUALMIE RIDGE II

FIRE SPRINKLER D.C.D.A. AND F.D.C. MATERIAL LIST

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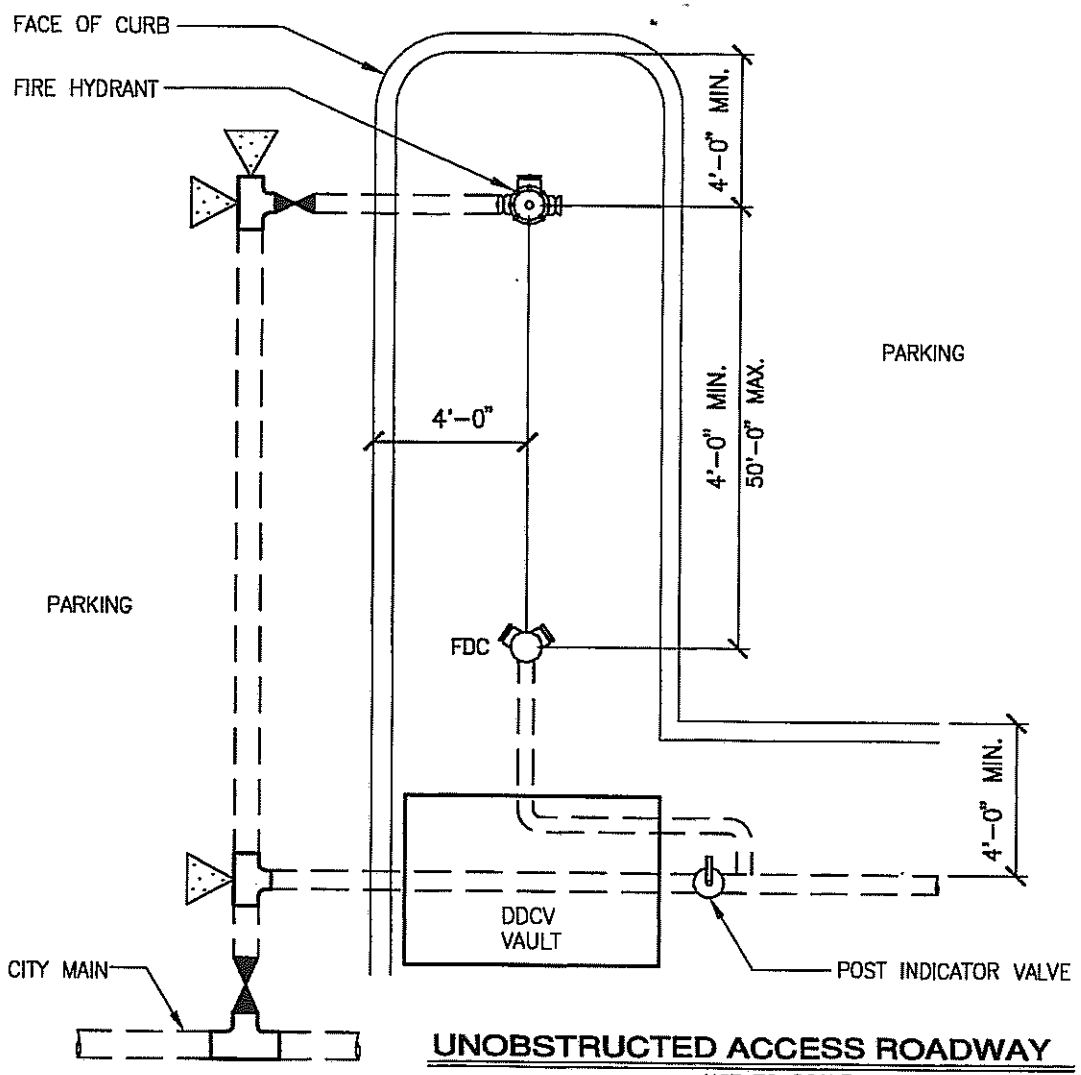

UNOBSTRUCTED ACCESS ROADWAY

NOT TO SCALE

NOTES:

1. THIS TYPICAL LAYOUT TO BE USED ONLY WHEN AN INSIDE BUILDING INSTALLATION HAS BEEN VERIFIED BY THE CITY ENGINEER TO BE INFEASIBLE OR NOT REQUIRED.
2. SEE APPROVED PROJECT DRAWINGS AND DETAILS.
3. EASEMENTS TO BE SHOWN ON PLANS.
4. FIRE HYDRANT MAY BE LOCATED UP TO 50 FEET FROM FDC.
5. FIRE HYDRANT LATERALS (FROM CITY MAIN) EXCEEDING 50 FEET LENGTH OR ALSO SERVING SPRINKLER SYSTEMS SHALL BE 8" MIN. DIAMETER OR LARGER BASED ON FIRE FLOW CALCULATIONS.
6. PIPE FROM CITY MAIN SHALL HAVE TWO VISIBLE MEANS OF RESTRAINT, I.E. SHACKLE RODS, THRUST BLOCKS, MEGALUGS.
7. ONLY GROUND COVER LANDSCAPING SHALL BE PLANTED WITHIN 8' OF STRUCTURES.
8. SEE LOCAL FIRE CODES AND NFPA 24.

SNOQUALMIE RIDGE II			
FIRE HYDRANT AND FDC LOCATION			
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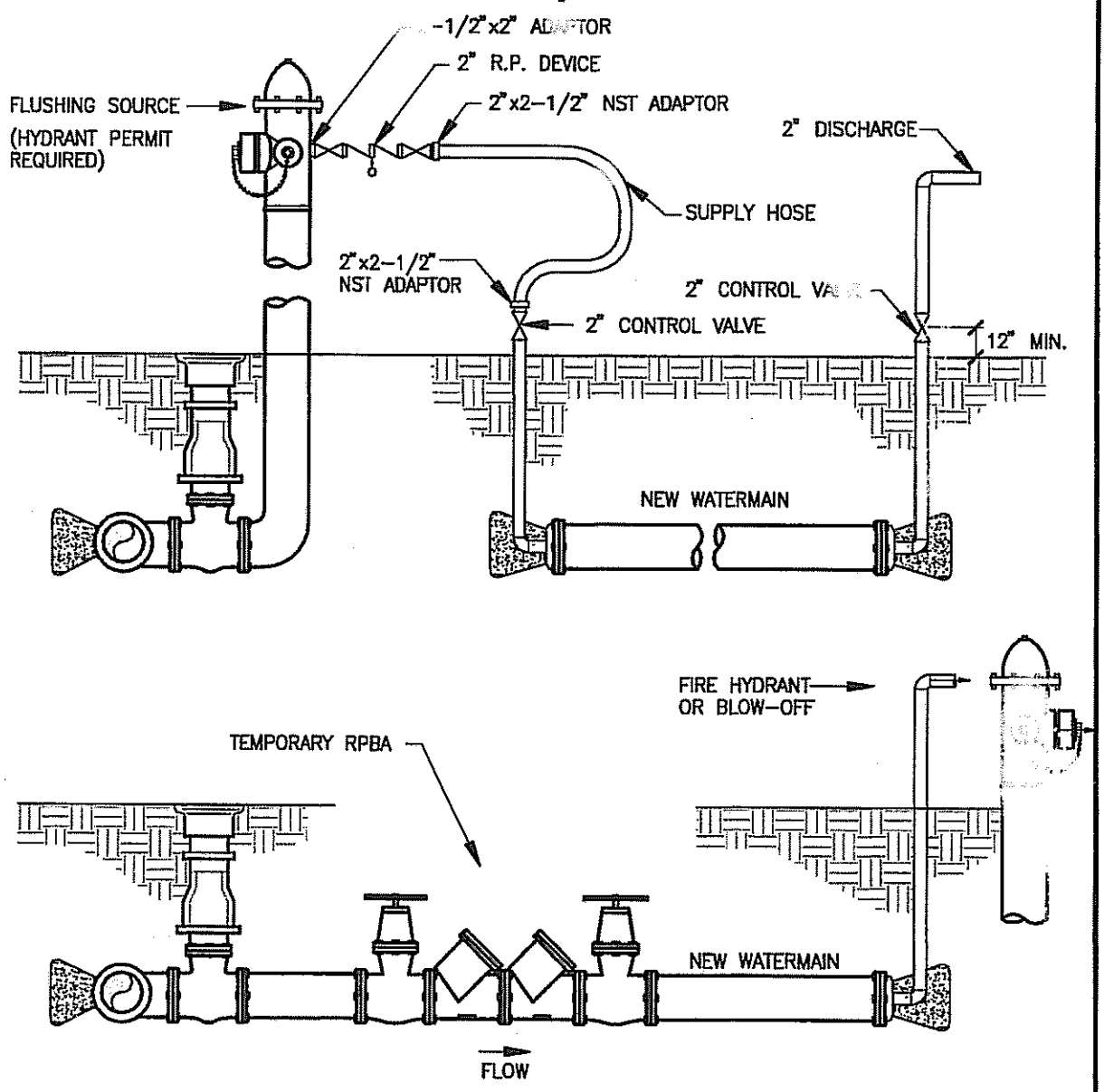

NOTES:

1. SIZE FITTINGS AS NEEDED FOR 2.5 F.P.S. FLUSHING.
2. RPBA MUST BE CERTIFIED AFTER INSTALLATION.
3. CONTRACTOR TO DISPOSE OF CHLORINE AND FLUSH WATER AS DIRECTED BY THE CITY ENGINEER.
4. AFTER FLUSHING REPLACE RPBA WITH PE END PIPE AND D.I. SLEEVES (MJ).
5. WATER USAGE MUST BE REPORTED FOR BILLING & RECORDS.
6. TEMPORARY METER MAY BE OMITTED IF USE IS TO BE ESTIMATED.
7. COORDINATE FLUSHING WITH CITY WATER SUPERINTENDENT.

SNOQUALMIE RIDGE II			
FLUSHING NEW MAINS			
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CHAPTER 5

5.000 SANITARY SEWERS

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CHAPTER 5

5.000 SANITARY SEWERS

5.010 Specifications

These Technical Specifications shall be used for all sanitary sewer construction in the Snoqualmie Ridge II Development.

The current "English unit" edition of the Standard Specifications for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation and the American Public Works Associations, Washington State Chapter, herein referred to as the Standard Specifications, shall be used to supplement these Standards. The general requirements of the Standard Specifications shall apply unless they are inconsistent with any of the provisions of these Standards. Should inconsistencies occur, these Standards shall have precedence.

References to sections in the Standard Specifications are based on the latest published edition of the Standard Specifications. If section references in future editions of the Standard Specifications are changed, these Standards will be deemed to be revised accordingly without re-issuance.

5.020 General

Design details, workmanship and materials shall be in accordance with Washington State Department of Ecology requirements, the City of Snoqualmie Comprehensive Sewer System Plan, the SR II Wastewater Collection Facilities Project Report and the Standard Specifications.

Standard Plans need not be repeated on the plans unless required for plan clarification for the contractor, if being modified to suit a specific design, or as required by the City. However, standard plans shall be clearly referenced on the drawings.

The installation of all sanitary sewer facilities shall be done per plans which have been approved by the City Engineer. Plans shall be prepared in accordance with Chapter 1.

5.030 Easements

All sewer mains not in the public right-of-way shall be in easements granted to the City of Snoqualmie.

In general, all easements for sanitary sewers shall be a minimum of 15 feet wide or twice the average depth of the pipe, whichever is greater. In special

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circumstances the easement width may be reduced to 10 feet or increased depending on pipe size and depth with the approval of the City Engineer.

No permanent structures are allowed to be constructed in the easement area. No additional building setback line from the edges of easements is required. Access to easements for maintenance and/or repair of the utility by the City shall not be restricted or prohibited by fences, rockeries, plantings and other improvements.

In general, all easements shall be located within single lots rather than being split by a lot line. In special circumstances, easements may be located on two adjacent lots with the approval of the Engineer.

Vehicular access shall be provided to every manhole. The configuration and construction of the vehicular access shall be as approved by the City Engineer.

5.040 System Design

Sanitary sewer pipe shall be ductile iron class 50 for trenches 25' – 30' deep and class 52 for trenches greater than 30' deep.

NOTES – System Design

1. **Vertical Separation (Perpendicular)**
   Sewer lines crossing potable water lines shall be laid below the water lines to provide a separation of at least 18" between the invert of the water pipe and the crown of the sewer, whenever possible.

   Unusual Conditions (Perpendicular)
   When local conditions prevent a vertical separation as described above, the following construction shall be used:

   a. Gravity sewers passing over or under water lines shall be:

      1. The one segment of the maximum standard length of pipe (but not less than 18 feet long) shall be used with the pipes centered to maximize joint separation.
      2. Standard Gravity sewer material encased in concrete or in a ¼" thick continuous steel casing with all voids pressure-grouted with sand-cement grout.
      3. The length of sewer pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the water line. The sewer pipe shall be the longest standard length available from the manufacturer.

   b. Potable water lines passing under gravity sewers in addition, shall be protected by providing:

      1. A vertical separation of at least 18 inches between the invert of the sewer and the crown of the water line;

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2. Adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking of the water lines; and
3. The length of sewer pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the water line. The sewer pipe shall be the longest standard length available from the manufacturer.

c. Pressure sewers shall only be constructed under potable water lines in a steel casing for a distance of at least ten (10) feet on each side of the crossing.

2. Sanitary sewer force mains to be HDPE SDR 17 continuously welded pipe with a minimum pressure rating of 100 PSI. Sanitary sewer force mains to have minimum 3 feet cover to finished grade, except where shown on plans or profiles.

Force mains shall be installed with tracer wire. Tracer wire shall be 12 gauge solid copper core and green colored insulation. Ends of tracer wire shall be extended a minimum of 12" into value boxes and into the end manholes under the frame and left coiled just under the lid. Tracer wire is to be continuous without splices unless the length of installation is longer than the standards tracer wire coil in which case splice shall be made using an underground splicing kit for electrical applications.

3. The minimum sewer main size shall be 8 inches diameter. Larger size mains are required in specific areas as outlined in the *Comprehensive Sewer System Plan* and as modified by the *Sewer System Master Plan.*

In residential areas, the minimum slope of 8-inch mains shall be as follows:

a. 1% slope for the first run between manholes and a dead end line.

b. 0.75% slope when the number of lots upstream of the run totals 60 or less and the line is not covered under condition "a" above.

c. 0.50% slope when the total number of lots upstream of the run is 60 or more.

In the non-residential areas, sanitary sewer grades shall be determined based on DOE standards. In no case shall the design grade be less than 0.50% for an 8-inch pipe.

Maximum spacing of manholes shall be 400 feet.

Manholes will be required at any change in pipe slope, alignment, or size. Manholes are not allowed in a fill section unless base is on a structural fill.

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A manhole is required at the ends of all sewer mains. The City Engineer may approve a cleanout in lieu of a manhole where the end pipe run serves 4 or less lots. The maximum allowable distance between a manhole and a cleanout is 200 feet.

All requests for inspections and for witnessing of tests shall be scheduled with the City 24 hours in advance. Failure to give adequate advance notice may result in delay to the contractor.

The following notes shall be included on each plan set:

1. All workmanship and materials shall be in accordance with the latest "English" unit edition of the Standard Specifications for Road, Bridge and Municipal Construction (WSDOT/APWA). The Standard Specifications, except as they may be modified or superseded by these plans, shall govern all phases of work.
2. Before any construction or development activity, a preconstruction meting must be held between the contractor, the City's Inspector and other appropriate parties.

3. The City Engineer must be notified at least 24 hours prior to commencing construction. No part of the sanitary sewer system shall be put into use until the City has completed its normal inspections and has concluded that the work is acceptable. The City may waive this requirement on a case by case basis if continued evidence of sound construction practice by the contractor so warrants. In any event, installations which do not meet the requirements of these standards shall be removed and replaced at the contractor's sole expense.

4. Approximate locations of existing utilities have been obtained from available records and are shown for convenience. The contractor shall be responsible for verification of locations and to avoid damage to any additional utilities not shown. If conflicts with existing utilities arise during construction, the contractor shall notify the public works inspector and any changes required shall be approved by the City Engineer prior to commencement of related construction on the project.

5. All sewer main extensions within the public right-of-way or in easements must be staked by survey for line and grade prior to starting construction. Surveys shall be performed by a surveyor licensed by the State of Washington.
6. All sewer pipe shall be bedded. Bedding material shall conform to "Bedding Material for Rigid Pipe" as specified in Section 9-03.15 of the Standard Specifications or pea gravel. Bedding shall be placed to a minimum depth of 6-inches under the barrel of the pipe and up to the following levels:

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- PVC Sewer Pipe and HDPE pipe – one (1) foot above the crown of the pipe.

- Ductile Iron Sewer Pipe – springline of the pipe

As an option the contractor may use controlled density fill.

Bedding shall be placed in more than one lift. The first lift, to provide at least 6 inches thickness under the barrel of the pipe, shall be placed before the pipe is installed and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6 inches thickness shall be installed and individually compacted to 90% density as determined by ASTM: D-1557.

7. Trench backfill shall be excavated native material or Bank Run Gravel for Trench Backfill conforming to Section 9-03.19 of the Standard Specifications, depending on the suitability of the native material to compaction. Suitable native material shall be free from mud, muck, organic matter, broken pavement, rocks greater than 6-inch dimension, and other deleterious material, and must be capable of compaction to the required density at the time of placement. If the native material cannot be readily compacted to the specified density, only Bank Run Gravel shall be utilized and any insufficiently compacted native material shall be removed and replaced with Bank Run Gravel. The native material shall only be used and remain in place if in situ compaction testing provides sufficient evidence that the specified compaction is uniformly attained.

   Backfill directly over the pipe to a depth of two (2) feet above the pipe shall be hand tamped only. Above this level, backfill shall be placed in lifts not to exceed 12 inches in loose depth, and each lift shall be mechanically compacted to the following densities.

   - Above two (2) feet above the crown of the pipe in unimproved areas – 90 percent of maximum density.

   - Above two (2) feet above the crown of the pipe in areas to be paved (roadway and/or sidewalk) – 95 percent of maximum density.

   - Maximum density to be determined by ASTM: D-1557.

8. The maximum tolerance from true line and grade shall be as follows:

a. Maximum deviation from established line and grade shall not be greater than 1/32 inch per inch of pipe diameter and not to exceed 1/2 inch per pipe length.

b. No adverse grade or ponding in any pipe length will be permitted.

c. The difference in deviation from established line and grade between two successive joints shall not exceed 1/3 of the amounts specified above.

9. Open-cut transverse crossings of roadways after final paving are not to be permitted unless it can be shown that alternatives such as jacking, auguring or tunneling are not feasible or unless the utility can be installed just prior to reconstruction or an overlay of the road. Should an open cut be approved, all transverse trenches shall be backfilled with controlled density fill. Transverse crossings in roadway under construction with ATB applied may be backfilled with crushed rock.

10. Call underground locate line 1-800-424-5555 a minimum 48 hours prior to any excavations.

11. A copy of these approved plans must be on the job site whenever construction is in progress.

12. Sanitary sewer stub-outs on each lot shall be located by a white 2x4 stake marked "Sewer" in black letters. The stake shall extend above surface level, be visible, and located at the end of the stub-out. The stub-out shall not be connected to the stake in any manner.

13. 6" sanitary pipe for sewer mains shall be PVC SDR 35.

14. Sanitary sewer force main shall be either HDPE pipe or D.I. as approved on plans by the City Engineer.

15. All sanitary sewer systems shall be video inspected 30 days after installation to allow time for settlement. Video tape and report shall be submitted to the City for review.

5.050 Utility Removal

Where it is feasible and practical, as determined by the City Engineer, all abandoned pipes and appurtenances shall be removed. If it is decided by the City Engineer that the pipes can be abandoned in-place, then ends of abandoned pipes shall be plugged for a distance of 2 pipe diameters with commercial concrete.

5.050 Trench Excavation and Backfill

The maximum permissible trench width between the foundation level and to 12 inches above the pipe shall be 40 inches for pipe 15 inches or smaller inside

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diameter or 1 1/2 times the inside diameter plus 18 inches for pipe 18 inches or larger. If the maximum trench width is exceeded without written authorization of the City Engineer, the contractor will be required to provide pipe of higher strength classification or to provide a higher class of bedding, as required by the City Engineer.

Trench backfill shall be excavated native material or Bank Run Gravel for Trench Backfill conforming to Section 9-03.19 of the Standard Specifications, depending on the suitability of the native material to compaction. Suitable native material shall be free from mud, muck, organic matter, broken pavement, rocks greater than 6-inch dimension, and other deleterious material, and must be capable of compaction to the required density at the time of placement. If the native material cannot be readily compacted to the specified density, only Bank Run Gravel shall be utilized and any insufficiently compacted native material shall be removed and replaced with Bank Run Gravel. The native material shall only be used and remain in place if in situ compaction testing provides sufficient evidence that the specified compaction is uniformly attained.

Backfill directly over the pipe to a depth of two (2) feet above the pipe shall be hand tamped only. Above this level, backfill shall be placed in lifts not to exceed 12 inches in loose depth, and each lift shall be mechanically compacted to the following densities:

- Above one foot above the crown of the pipe in unimproved areas – 90 percent of maximum density.

- Above two (2) feet above the crown of the pipe in areas to be paved (roadway and/or sidewalk) – 95 percent of maximum density.

Compaction of trench backfill material shall be accomplished with mechanical tampers, vibratory compactors, or other equipment suitable to the characteristics of the soils. Water settling shall not be employed. The use of compaction equipment directly over the pipe shall be controlled and limited in accordance with installation instructions and recommendations provided by the manufacturer of the pipe.

In-place density testing of compacted backfill material shall be in accordance with ASTM: D-1556 (sand cone device) or ASTM: D-2922 (nuclear density gauge). Laboratory maximum density testing of fill material shall be performed in accordance with ASTM: D-1557.

A minimum of two compaction tests are required for each 200 linear feet of trench (one at subgrade and one at 50% of trench depth). Trenches failing the required test shall have the backfill removed, replaced, and re-compacted. Compaction testing shall be done only by an approved testing laboratory at the contractor's/developer's expense. All test results and analysis shall be promptly given to the City Engineer. The City reserves the right to contract with an independent testing laboratory for testing of trench backfill. This testing shall be

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done at the contractor's/developer's expense.

When, after excavating for pipes to the foundation level, the material remaining in the trench is unsuitable, as determined by the City Engineer, excavation shall be continued to such additional depth as may be required by the City Engineer. Unsuitable foundation material shall be replaced with foundation gravel conforming to Section 9-03.17 of the Standard Specifications.

The developer/contractor shall furnish, install, and operate all necessary equipment to keep excavations above the foundation level free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property or nuisance to the public. Sufficient pumping equipment in good working condition shall be available at all times for all emergencies, including power outage, and shall have available at all times competent workmen for the operation of the pumping equipment.

5.060 Trenching Transverse to Existing Roadway

Sewer trenching that crosses transversely to existing roadway paving will generally not be permitted unless it can be shown that alternatives such as jacking, auguring or tunneling are not feasible or unless the pipe can be installed just prior to reconstruction or an overlay of the road. Should an open cut be approved, the trench shall be backfilled with controlled density fill (CDF). Transverse crossings in roadway under construction with ATB applied may be backfilled with crushed rock.

5.070 Jacking, Auguring, or Tunneling

Tunneling may be ordered by the City Engineer under pavements, buildings, railroad tracks, etc. The developer/contractor shall install the pipe by jacking, auguring or tunneling, or installing the pipe in a casing pipe by a combination of these methods.

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

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

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5.080 Bedding

All sewer pipe shall be bedded. Bedding material shall conform to "Bedding Material for Rigid Pipe" or pea gravel as specified in Section 9-03.15. Bedding shall be placed to a minimum depth of 6 inches under the barrel of the pipe and up to the following levels:

- PVC Sewer Pipe and HDPE pipe – one (1) foot above the crown of the pipe
- Ductile Iron Sewer Pipe – springline of the pipe

As an option the contractor may use controlled density fill.

Bedding shall be placed in more than one lift. The first lift, to provide at least 6 inches thickness under the barrel of the pipe, shall be placed before the pipe is installed and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6 inches thickness shall be installed and individually compacted to 90% density as determined by ASTM: D-1557.

5.090 Shoring

Construction safety is the developer's/contractor's responsibility and all persons on site are subject to the safety direction of developer/contractor personnel. The City of Snoqualmie and its representatives do not have either control or authority on site safety issues therefore assumes no responsibility for the safety of others.

The requirements of the Occupational Safety and Health Act (OSHA) and the Washington Industrial Safety and Health Act of 1973 (WISHA) shall apply to all excavation, trenching, and ditching operations on this project. All trenches over four (4) feet in depth shall be shored, braced, and shielded in compliance with applicable Federal and/or State regulations. Shoring, bracing, or shielding shall be required in all street area excavations, including those areas where all existing pavement is being removed. Sloping to the angle of repose will be permitted only in non-critical, off-street areas.

Shoring and cribbing of excavations and trenches shall be provided in accordance with the provisions of Section 2-09 of the Standard Specifications.

The shoring system shall be a commercially available shoring systems designed for the depths anticipated on the project. The shoring system shall meet all requirements of the Washington State Safety and Health Act (WISHA) and United States federal Occupational Safety and Health Act (OSHA).

5.100 Controlled Density Fill

Controlled Density Fill (CDF) shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures proportioned to provide a non-segregating, self-consolidating, free-flowing, and excavatable material which will result in a

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hardened dense, non-settling fill. Slump shall be 3 inches to 6 inches.

CDF shall be discharged from the mixer by any reasonable means into the area to be filled. The CDF shall be brought up uniformly to the elevation shown on the plans.

CDF shall not be placed on frozen ground.

CDF patching, mixing, and placing may be started if weather conditions are favorable, when the temperature is at 34 degrees F and rising. At the time of placement, CDF must have a temperature of at least 40 degrees F. Mixing and placing shall stop when temperature is 38 degrees F or less and falling. Each filling stage shall be as continuous an operation as is practicable.

Trench section to be filled with CDF shall be contained at either end of trench section by bulkhead or earth fill.

Contractor shall provide steel plates to span utility trenches and prevent traffic contact with CDF for at least 24 hours after placement or until CDF is hard enough to prevent rutting by construction equipment or traffic.

Controlled Density Fill shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures which have been batched and mixed in accordance with Section 6-02.3 of the WSDOT/APWA Standard Specifications.

Materials	
1. Portland Cement	AASHTO M 85 or WSDOT 9-01
2. Fly Ash	Class F
3. Aggregates	WSDOT 9-03.1(2)B
4. Admixtures	WSDOT 9-23.6

5.110 Sawcutting Existing Pavement & Sidewalk

The contractor shall make a vertical sawcut to the full depth of existing asphalt or concrete pavement for all crossings of the existing pavement.

Where necessary to remove existing curb, gutter, driveways and sidewalk, full panels shall be removed. Care shall be taken during removal to protect adjacent sidewalk panels, concrete curbs and existing utilities from damage. In no case shall any segment of sidewalk or curb and gutter be shorter than 5 feet in length.

5.120 Pavement Patching

This work shall consist of the reconstruction and patching of existing pavement that is scheduled to remain. The following provisions shall apply regardless of the condition or type of roadway base and pavement types encountered. Asphalt pavements shall be patched with asphalt, and concrete pavements shall be patched with concrete.

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

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shall be performed as rapidly as possible to provide maximum safety and convenience to public travel.

Before the patch is constructed, all pavement cuts shall be trued so that the marginal lines of the patch will form a rectangle with straight edges and vertical faces. The patch shall be flush with the surrounding surface and shall provide a smooth riding surface for passing traffic.

Asphalt shall be Asphalt Concrete Pavement, Class B. The depth of asphalt shall be a minimum of four inches in all areas, and shall be increased as necessary to match the existing thickness. Asphalt Concrete Pavement shall be laid over four inches of crushed surfacing.

Cement Concrete Pavement shall be a 3-day mix conforming to the requirements of Section 5-05 of the WSDOT/APWA Standard Specifications. The thickness of concrete shall be a minimum of 6 inches, and shall be increased as necessary to match the existing thickness.

Until such time as the permanent patch placed, the contractor shall install a temporary patch over unfinished portions of work. Temporary pavement patch shall be accomplished by using 3 inches of cold mix (MC 250), or 3 inches of ATB.

5.130 Lift (Pump) Stations

All side sewers must gravity into the City's sanitary system. The City does not promote the construction of individual side sewer pumps or public service pump stations. The City will only consider this method if no area gravity system can be constructed. Private pressure lines are not permitted on public right-of-way. If no gravity system can be constructed and a non-gravity system has been approved by the City, the private pressure lines must enter a manhole on private property and gravity into the public system with a standard side sewer connection. The minimum manhole size permitted for this application is 48 inch diameter installed with a locking lid frame and cover.

Lift Stations must be in conformance with the standards outlined in the SR II Wastewater Collection Facilities Project Report and meet the following general criteria:

- State, Federal, and Local Regulatory Compliance.
- Safety.
- Performance.
- Reliability.
- Maintenance and service efficiency.
- Operational efficiency.
- Environmental compatibility.
- Pumps shall be submersible type.
- Provisions for auxiliary power shall be provided as defined by the SR II Wastewater Collection Facilities Project Report

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- Provisions for telemetry shall be provided; monitoring, signal transmission and reception, status and alarm display and data archiving equipment and systems shall conform to the equipment and systems currently in use by the City and/or as directed by the City Engineer.
- Force main design materials, construction and testing shall be as approved by the City Engineer.

Plans and design calculations for lift stations and force mains must be approved by the City Engineer.

5.140 Manholes

Description

This work shall consist of constructing manholes in accordance with these Standards, the Standard Plans and Section 7-05 of the Standard Specifications.

Materials

Manholes shall be constructed of pre-cast units, in accordance with the Standard Plans. Any deviations from Standard Plans will be subject to a shop drawing submitted by the contractor and approved by the City Engineer.
Joints between manhole elements shall be rubber gasket.

All pre-cast concrete shall be Class 4000. Manhole channels shall be Class 3000 concrete. Concrete blocks or concrete (masonry) rings may be used for adjustment of the casting to final street grade. Mortar will be used in between joints.

Standard pre-cast cones shall provide reduction from 48 inches to 24 inches with height of not less than 18 inches and 54 to 24 inches with height of not less than 24 inches.

PVC pipe may be used to a maximum depth of 25' cover. Over 25' requires use of ductile iron pipe.

Standard flat slab covers shall be a minimum of 8 inches thick and shall conform to the outer dimension of the standard sections upon which they are to be placed.

Bedding

Unless otherwise directed by the City Engineer, manholes constructed with pre-cast base sections or cast-in-place sections shall be placed to grade upon a 6 inch minimum depth of pea gravel.

Joints

Joints between pre-cast manhole elements shall be rubber gasketed in a manner similar to pipe joints conforming to ASTM: C-443. Shop drawings of the joint design shall be submitted to the City Engineer for approval, prior to manufacture. Mortar shall be placed in between every joint, both vertical and horizontal, of concrete adjustment sections, risers, and bricks when rising and adjusting manhole

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and catch basin frames. Completed joints shall show no visible leakage and shall conform to the dimensional requirements of ASTM: 478.

Manhole Channels

All manholes shall be channeled unless otherwise approved by the City Engineer. Manhole channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well rounded junctions. Channel sides shall be carried up vertically to the crown elevation of the various pipes, and the concrete shelf between channels shall be smoothly finished and warped evenly with slope to drain.

The very first manhole in parcels shall not be channeled until after the majority of all construction activities are finalized. This manhole shall be ordered with a 2' catch and shall be cleaned and filled with commercial concrete for channeling with the permission of the City of Snoqualmie Public Works Department.

Manhole Pipe Connections

All pipes except PVC pipe entering or leaving the manhole shall be provided with flexible joints within 1/2 of a pipe diameter or 12 inches, whichever is greater, from the outside face of the manhole structure and shall be placed on firmly compacted bedding, particularly within the area of the manhole excavation which normally is deeper than that of the sewer trench. Special care shall be taken to see that the openings through which pipes enter the manhole are completely and firmly rammed full of non-shrink grout to ensure watertightness.

PVC pipe connections to manholes shall be with a flexible pipe to manhole connection such as "Kor-n-Seal" approved by the City Engineer. No pipe joint in PVC shall be placed within 10 feet of the outside face of the manhole.

Frame and cover

Manhole frame and cover shall conform to the standard plan. All manhole covers shall be secured to the frame by means of three 5/8" diameter stainless steel socket head cap screws. A light coating of anti-seize thread compound shall be applied to the screws at the time of installation. Frame and cover shall be water tight with a pick notch.

Ladder

All manholes over 3 feet in height shall be provided with a ladder or steps as specified in the Standard Plans. Steps shall be installed at 12 inch spacing.

5.150 Connections to Existing Manholes

The contractor shall verify invert elevations prior to construction. The crown elevation of laterals shall be the same as the crown elevation of the incoming pipe unless specified. The existing base shall be reshaped to provide a channel equivalent to that specified for a new manhole.

The contractor shall core drill an opening to match the size of pipe to be inserted. Jackhammer shall not be used. The contractor shall excavate completely around

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the manhole to prevent unbalanced loading. The manhole shall be kept in operation at all times and the necessary precautions shall be taken to prevent debris or other material from entering the sewer, including a tight pipeline bypass through the existing channel if required. All openings must provide a minimum of 1 inch and a maximum of 2 inches clearance around the circumference of the pipe.

5.160 Sewer Main

Materials

Materials for sanitary sewer pipe shall meet the requirements of the following:

1. PVC Sewer Pipe: Polyvinyl Chloride (PVC) sanitary sewer pipe shall conform to the requirements of ASTM: D-3034 SDR35.

2. Ductile Iron Sewer Pipe: Ductile iron sanitary sewer pipe shall conform to ANSI A 21.51 or AWWA C151 and shall be cement mortar lined, push-on joint or mechanical joint. The ductile iron pipe shall be Class 50 or 52 depending on trench depth.

From time to time, the City may approve other types of pipe for use in sanitary sewer systems. The list of approved alternative sanitary sewer pipes is on file at the office of the City Engineer.

Laying Sewer Pipe

All sewer main installations shall have line and grade set prior to construction by survey, with a minimum of staking for each manhole with cuts to inverts of inlets and outlets. All mains are to be straight between manholes, unless specifically approved otherwise in writing by the City Engineer or shown as such on the approved plans.

The contractor may use any method such as "swede line and batter board" and "laser beam" etc., which would allow him to accurately transfer the control points provided by the surveyor in laying the pipe to the designated alignment and grade.

When using the "swede line and batter board" method, the contractor shall transfer line and grade into the ditch where they shall be carried by means of a taut grade line supported on firmly set batter boards at intervals of not more than 30 feet. No less then three batter boards shall be in use at one time. Grades shall be constantly checked and in the event the batter boards do not line up, the work shall be immediately stopped and the cause remedied before proceeding with the work.

When using a "laser beam" to set pipe alignment and grade, the contractor shall constantly check the position of laser beam from surface hubs provided by the surveyor to ensure the laser beam is still on alignment and grade. In the event the laser beam is found out of position, the contractor shall stop work and make necessary corrections to the laser beam equipment and pipe installed.

A minimum of 10 feet horizontal clearance and 18 inches vertical clearance

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between sewer and water main pipe shall be maintained whenever possible in accordance with Department of Health requirements.

Plugs and Connections

All fittings shall be capped or plugged with a plug of an approved material gasketed with the same gasket material as the pipe unit; or shall be fitted with an approved mechanical stopper; or shall have an integrally cast knock-out plug. The plug shall be able to withstand all test pressures without leaking, and when later removed, shall permit continuation of piping with jointing similar to joints in the installed line.

Jointing

Where it is necessary to break out or connect to an existing sewer during construction, only new pipe having the same inside diameter will be used in reconnecting the sewer. Where joints must be made between pipes with a mismatched wall thickness, the contractor shall using flexible gasketed coupling, adapter or coupling-adapter to make a watertight joint. Couplings shall be those manufactured by "Romac," "Smith Blair," or approved equal for reinforced pipes and "Fernco" or approved equal for non-reinforced pipes.

5.170 Cleaning and Testing

All sanitary sewer pipe installations shall be tested in accordance with Section 7-17.3(4) of the Standard Specifications. A copy of this testing procedure is available for inspection at the office of the City Engineer. Sewers and appurtenance shall be cleaned and tested after backfilling by either the exfiltration or low pressure air method at the option of the contractor, except where the ground water table is such that the City Engineer may require the infiltration test.

The contractor/developer shall be required to clean and flush, with an approved cleaning ball and clean water, all gravity sanitary sewer lines prior to testing. The cleaning ball shall be an inflatable diagonally ribbed rubber ball of a size that will inflate to fit snugly into the pipe to be tested. A rope or chord will be fastened to the ball to enable total control of the ball at all times. Television inspection of the sewer mains is required 30 days after the installation of the system. Such inspections will be done at the developer's/contractor's cost.

All required tests shall be performed in the presence of the City Engineer or their authorized representative.

5.180 Side Sewers

Description

A side sewer is that portion of a sewer line that will be constructed between a main sewer line and a residence or other buildings in which the disposal of sanitary waste originates. It does not include any of the internal piping or connecting appurtenances, the installation of which is controlled by a municipal code, ordinance or regulation.

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The general requirements for construction of sewers in other sections of these Specifications shall apply for construction of side sewers unless they are inconsistent with any of the provisions of this particular section and the Specifications shall apply alike to all side sewers on public rights-of-way and private property.

Materials
Materials shall meet the requirements of these Specifications.

All pipe shall be clearly marked with type, class, and/or thickness, as applicable. Lettering shall be legible and permanent under normal conditions of handling and storage.

Approved jointing shall be flexible gasketing.

Flexible gasketing shall be construed to include rubber, synthetic rubber-like and plastic materials specially manufactured for the joint, pipe size, and use intended and shall be furnished by the manufacturer of the pipe to be used.

General
Side sewer construction shall conform to the Standard Plans. Tracer wire shall be installed from the main to the clean out.

The minimum depth of side sewer shall be 6 feet at the curb or edge of shoulder and 5 feet at the property line.

Side sewer locations shown on the drawings shall be subject to relocation in the field after construction starts. Regardless of the drawing location, the contractor shall place the wye branch in the main sewer line at the location designated by the engineer.

A maximum of two residential units or one non-residential building will be allowed to connect to each side sewer. If the equivalent sewage flow from the building will be equal to more than 20 residential units, then a manhole will be required to be constructed at the connection to the sewer main.

Side sewers are not permitted to cross a public right-of-way or run parallel to the right-of-way centerline. All lots must front on a public sanitary system in order to be sewered unless otherwise approved by the City Engineer.

Excavation, Bedding, Backfill And Compaction
Excavation, bedding, backfill and compaction for side sewers shall conform to the requirements set forth in other sections of these Standards.

Size
The minimum size requirement for that portion of any side sewer within the public right-of-way is 6 inches in diameter.

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On private property, that portion of the side sewer may be reduced to 4 inches in diameter for service to single family homes, side sewers to other buildings from duplexes to commercial must be 6 inch minimum diameter.

Slope
The minimum slope for side sewers shall be 2%.

Fittings
All fittings shall be factory-produced and shall be designed for installation on the pipe to be used. Fittings shall be of the same quality and material as the pipe used, except when installing a PVC insert on existing pipe.

Side sewers shall be connected to the tee or riser provided in the public sewer where such is available, utilizing approved fittings or adapters. Where no tee or riser is provided or available, connection shall be made by core drilling and installing an approved tee. Tees shall be "Romac Industries, Style CG" or approved equal.

Cleanouts
All side sewers shall have a 6 inch clean-out at the property line per the Standard Plans. The riser portion of the clean-out shall be PVC unless otherwise approved by the City Engineer. For longer side sewer installations, extra clean-outs will be required at spacings not to exceed 100 feet.

Testing
All side sewers shall be tested after backfill. Side sewers that are reconstructed or repaired to a length of 10 feet or more shall be tested for watertightness. Testing of newly reconstructed sections of side sewers consisting of a single length of pipe will not be required. Testing shall be performed in the presence of the City Engineer in accordance with Section 7-17.3(4) of the Standard Specifications. A copy of this testing procedure is available at the office of the City Engineer.

When a new side sewer is installed, the entire length of new pipe installed shall be tested. In cases where a new tap is made on the main, the first joint of pipe [illegible] the main shall be installed with a test tee, so that an inflatable rubber ball can be inserted for sealing off the side sewer installation for testing. In cases where the side sewer stub is existing to the property line, the test ball may be inserted through the clean-out wye to test the new portion of the side sewer installation.

5.190 Approval of Alternate Materials

"Approved Equal" Process
The City Engineer shall be the sole judge of whether suppliers or materials qualify as "or equal" and/or "or equivalent" substitutions as may be indicated herein or on the standard plans. As a minimum, submit catalog cuts clearly showing the equivalency. The developer/contractor shall have the full burden of proof in proving equivalency. Incomplete submittals will be rejected. Allow 20 working days after receipt of all required information for the approval process. See Chapter 1 for submittal requirements.

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LIST OF STANDARD DRAWINGS

CHAPTER 5 – SEWER

TITLE	DRAWING
Manhole Type 1 - 48" and 54"	5-01
Manhole Type 2 - 72"	5-02
Manhole Collar	5-03
Miscellaneous Manhole Details	5-04
Manhole Ring and Cover	5-05
Manhole Outside Drop Connections	5-06
Clean-Out	5-07
Typical Single Side Sewer Layout	5-08
Typical Double Side Sewer Layout	5-09
Typical Side Sewer Connection	5-10
Side Sewer Clean-Out	5-11
Bolt-Down Locking Ring and Cover	5-12
2" Sewage Air & Vacuum Valve Assembly	5-13
Wye Side Sewer Connection	5-14

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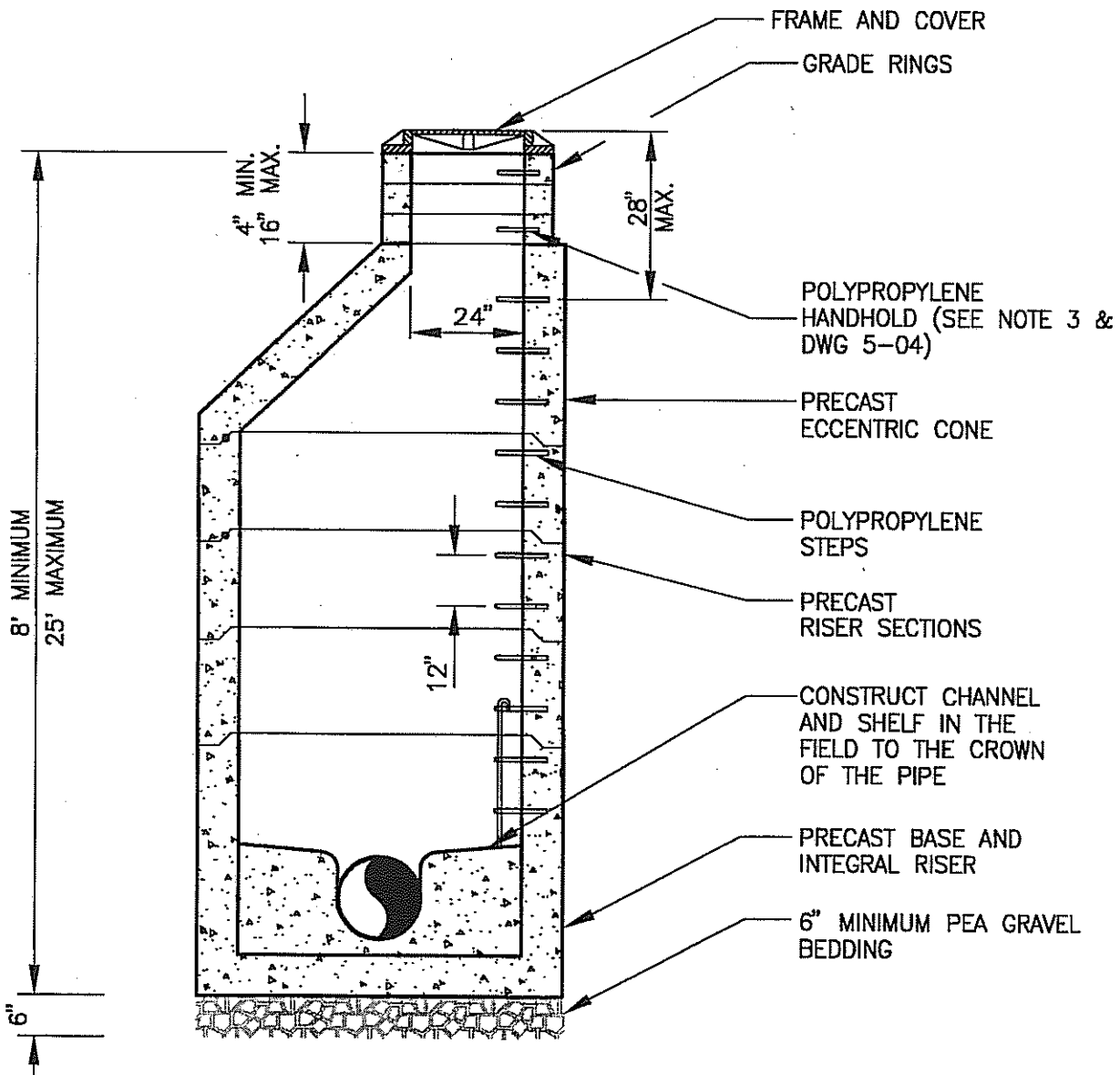

NOTES:

1. CONNECTIONS TO MANHOLE WITH PVC PIPE SHALL BE MADE BY KOR-N-SEAL BOOT, OR APPROVED EQUIVALENT.
2. FLAT TOP MANHOLES UNDER 8 FEET MAY BE USED UPON APPROVAL BY CITY ENGINEER.
3. SEE WSDOT STANDARD PLANS, FIGURE B-23a FOR FURTHER SPECIFICATIONS.
4. FRAME AND COVER TO BE LOCATED AT LANE EDGE, LANE CENTERLINE OR ROADWAY CENTERLINE.

SNOQUALMIE RIDGE II			
MANHOLE TYPE 1 48" AND 54"			
DWN ER	CKD	DATE 09/30/04	DWG 5-01

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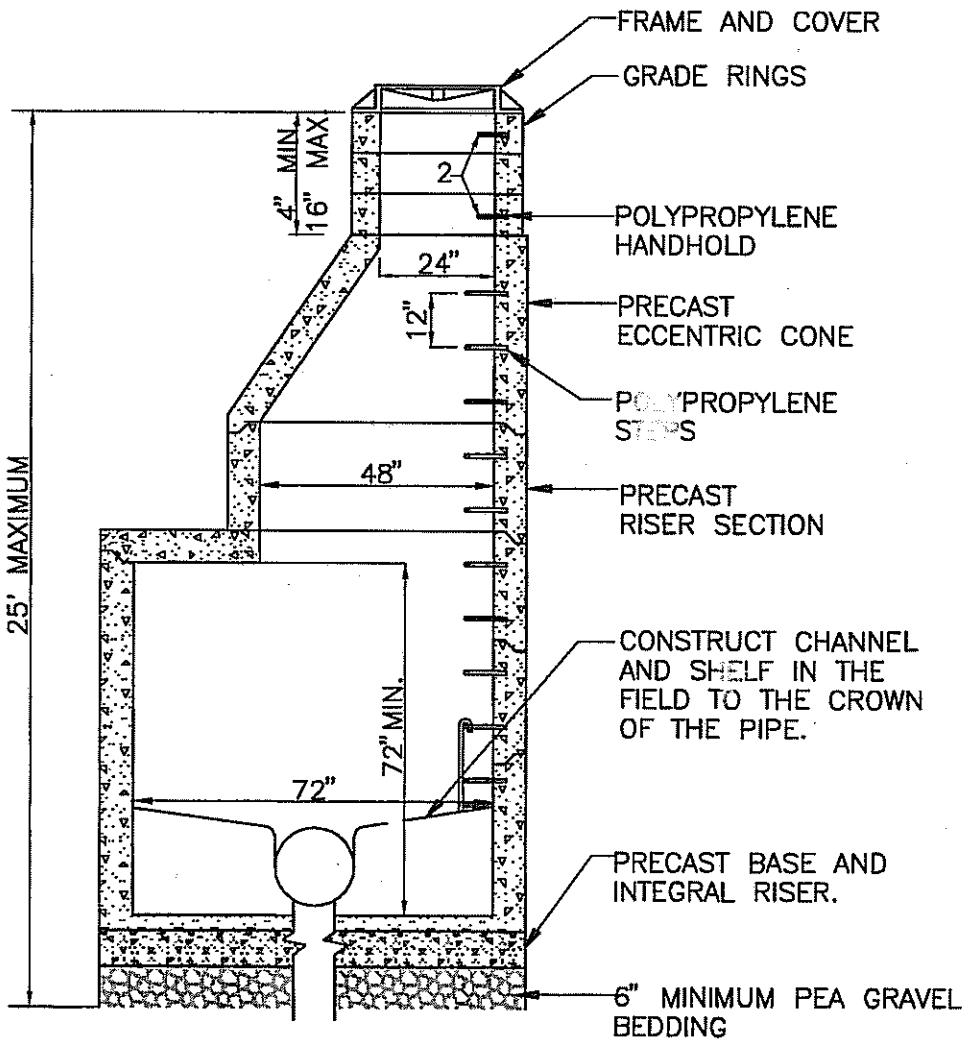

NOTES:

1. CONNECTIONS TO MANHOLE WITH PVC PIPE SHALL BE MADE BY KOR-N-SEAL BOOT, OR APPROVED EQUIVALENT.
2. SEE WSDOT STANDARD PLANS, FIGURE B-23b FOR FURTHER SPECIFICATIONS.
3. FRAME AND COVER TO BE LOCATED AT LANE EDGE, LANE CENTERLINE OR ROADWAY CENTERLINE.

SNOQUALMIE RIDGE II			
MANHOLE TYPE 2 72"			
DWN	CKD	DATE	DWG
ER		09/30/04	5-02

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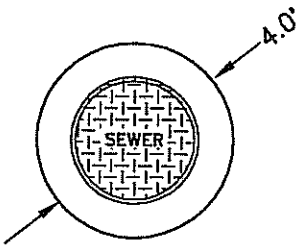
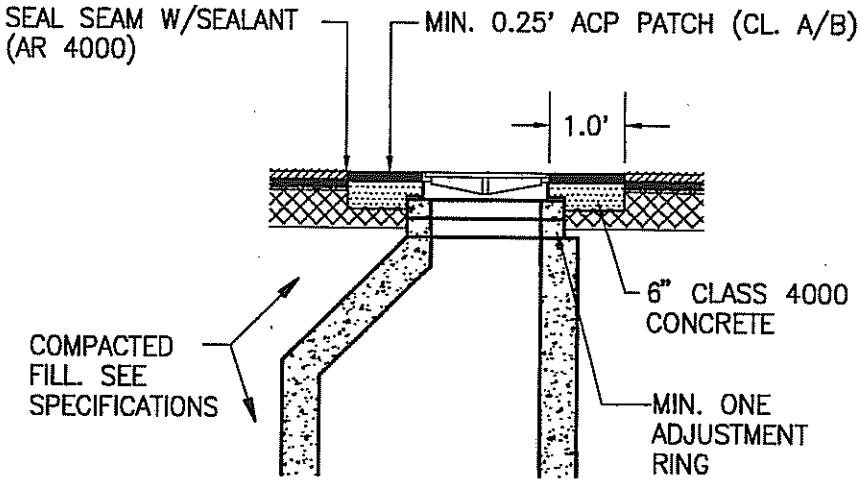
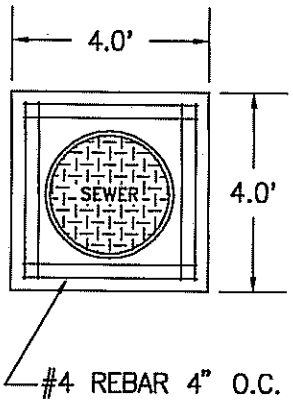
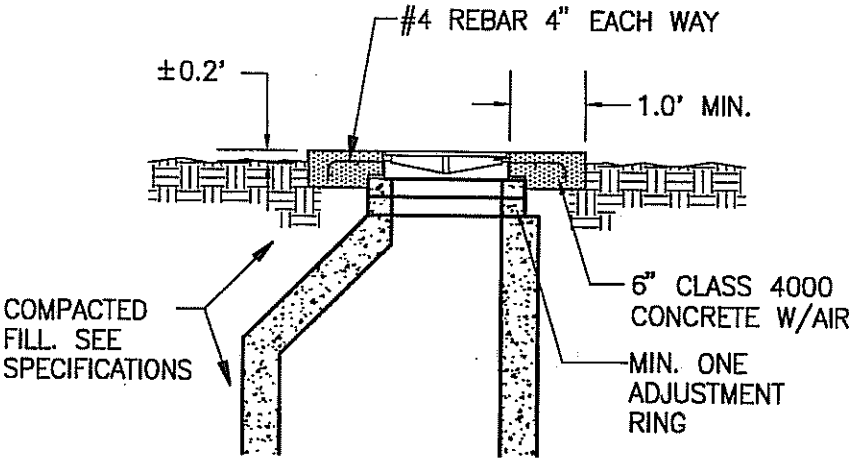




MANHOLE IN ASPHALT





MANHOLE OUTSIDE ASPHALT

NOTE:

1. ON MANHOLE OUTSIDE ASPHALT ADD REINFORCING STEEL AS SHOWN ABOVE. DEFORMED BAR TO MEET ASTM A615 GRADE 60

SNOQUALMIE RIDGE II			
MANHOLE COLLAR			
DWN	CKD	DATE	DWG
ER		10/18/04	5-03

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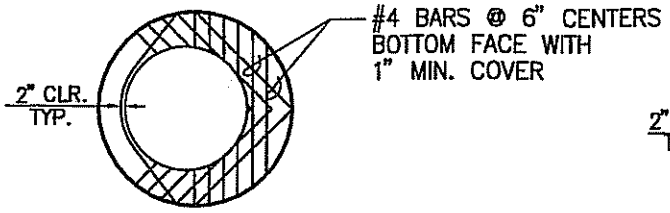
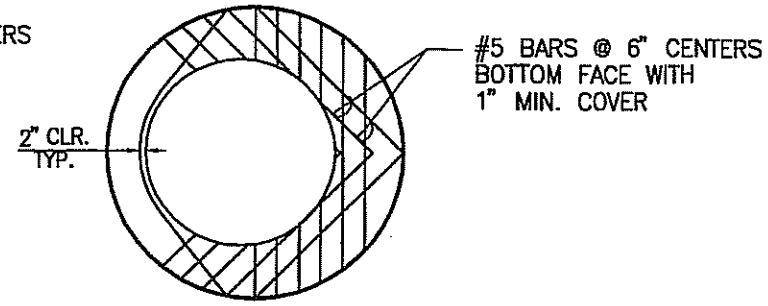
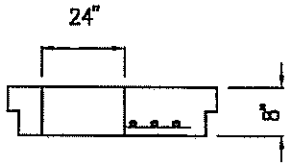
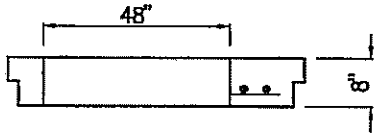


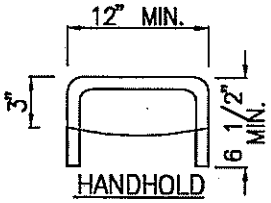




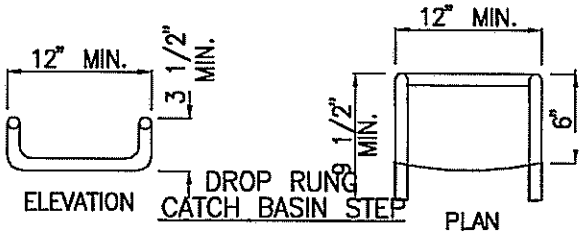
48", 54" TOP SLAB

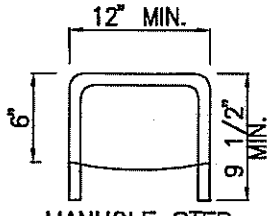


72" TOP SLAB

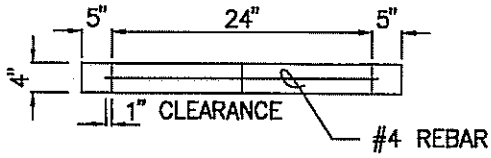


HANDHOLD





MANHOLE STEP



GRADE RING

NOTES:

1. PROPRIETARY MANHOLE STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO R, ASTM C478, (AASHTO M199) AND MEET ALL WISHA REQUIREMENTS.
2. MANHOLE STEP LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.

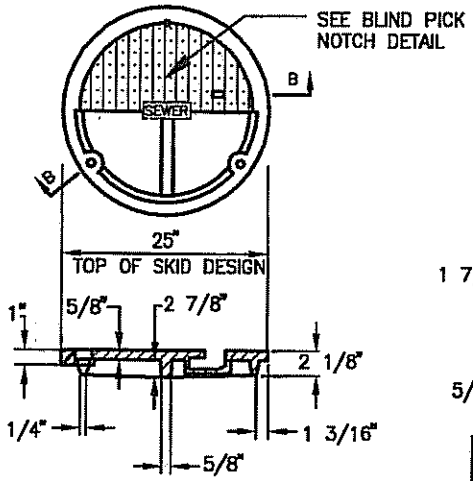
* ALL STEPS & RUNGS 1" DIA. COPOLYMER PROPYLENE WITH MINIMUM 1/2" DIA. GRADE 60 REINFORCING BAR.

SNOQUALMIE RIDGE II

MISCELLANEOUS MANHOLE DETAILS

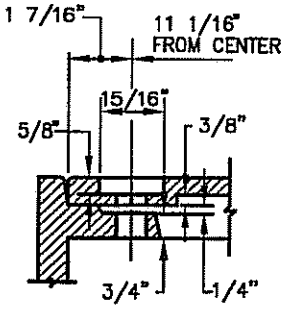
DWN	CKD	DATE	DWG
ER		09/16/04	5-04

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

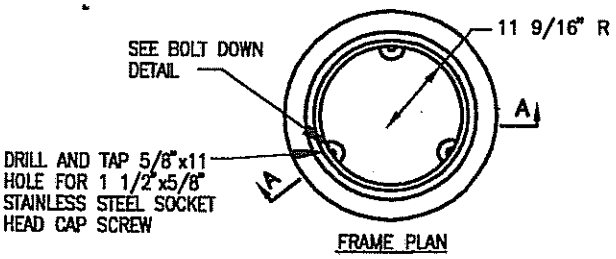


SECTION B-B

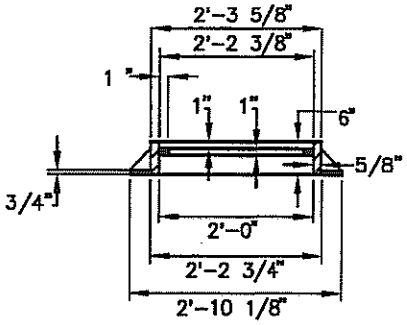
TYPE 2
BOLT-DOWN/WATERTIGHT



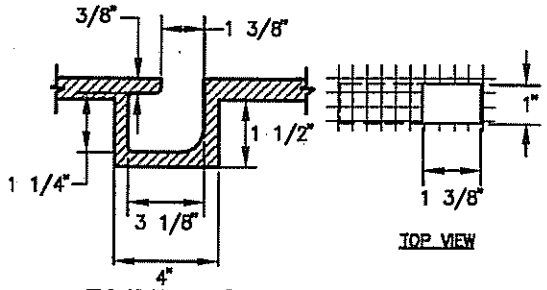
BOLT-DOWN DETAIL (WATERTIGHT)



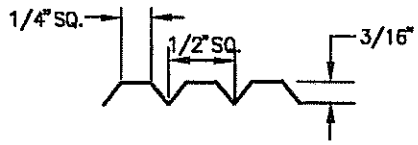
FRAME PLAN



SECTION A-A



BLIND PICK NOTCH DETAIL



COVER SKID DESIGN DETAIL

NOTES:

1. GASKET AND GROOVE MAY BE IN THE SEAT OR UNDERSIDE OF COVER.
2. FOR BOLT DOWN MANHOLE RING AND COVERS THAT ARE NOT REQUIRED TO BE WATERTIGHT, THE NEOPRENE GASKET, GROOVE AND WASHER ARE NOT REQUIRED.
3. WASHER SHALL BE NEOPRENE.
4. TYPE 1 STANDARD MANHOLE RINGS AND COVERS SHALL BE USED, UNLESS OTHERWISE SHOWN ON THE PLANS, OR SPECIFIED IN THE SPECIAL PROVISIONS.
5. PROPRIETARY MANHOLE COVERS WITHOUT BOTTOM RIBS ARE ACCEPTABLE, PROVIDED THEY MEET THE STANDARD SPCIFICATIONS REQUIREMENTS FOR "METAL CASTINGS".
6. MANHOLE RINGS SHALL BE DUCTILE IRON CONFORMING TO THE REQUIREMENTS OF ASTM 19-48, CL 30.
7. MANHOLE COVERS TO BE DUCTILE IRON CONFORMING TO ASTM A-536, CL 50-55-06.
8. RING AND COVER SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS FOR DELIVERY.
9. ALL CASTINGS TO HAVE A BITUMINOUS COATING.
10. SANITARY SEWER COVERS SHALL BEAR THE WORD "SANITARY OR SEWER" AND STORM DRAIN COVERS SHALL BEAR THE WORD "DRAIN OR STORM".
11. ALL MANHOLE RING AND COVERS TO BE LOCKING TYPE (BOLT-DOWN).

SNOQUALMIE RIDGE II

MANHOLE RING AND COVER

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 05\5-05.DWG	DWN	CKD	DATE	DWG
	ER	JSF	09/16/04	5-05

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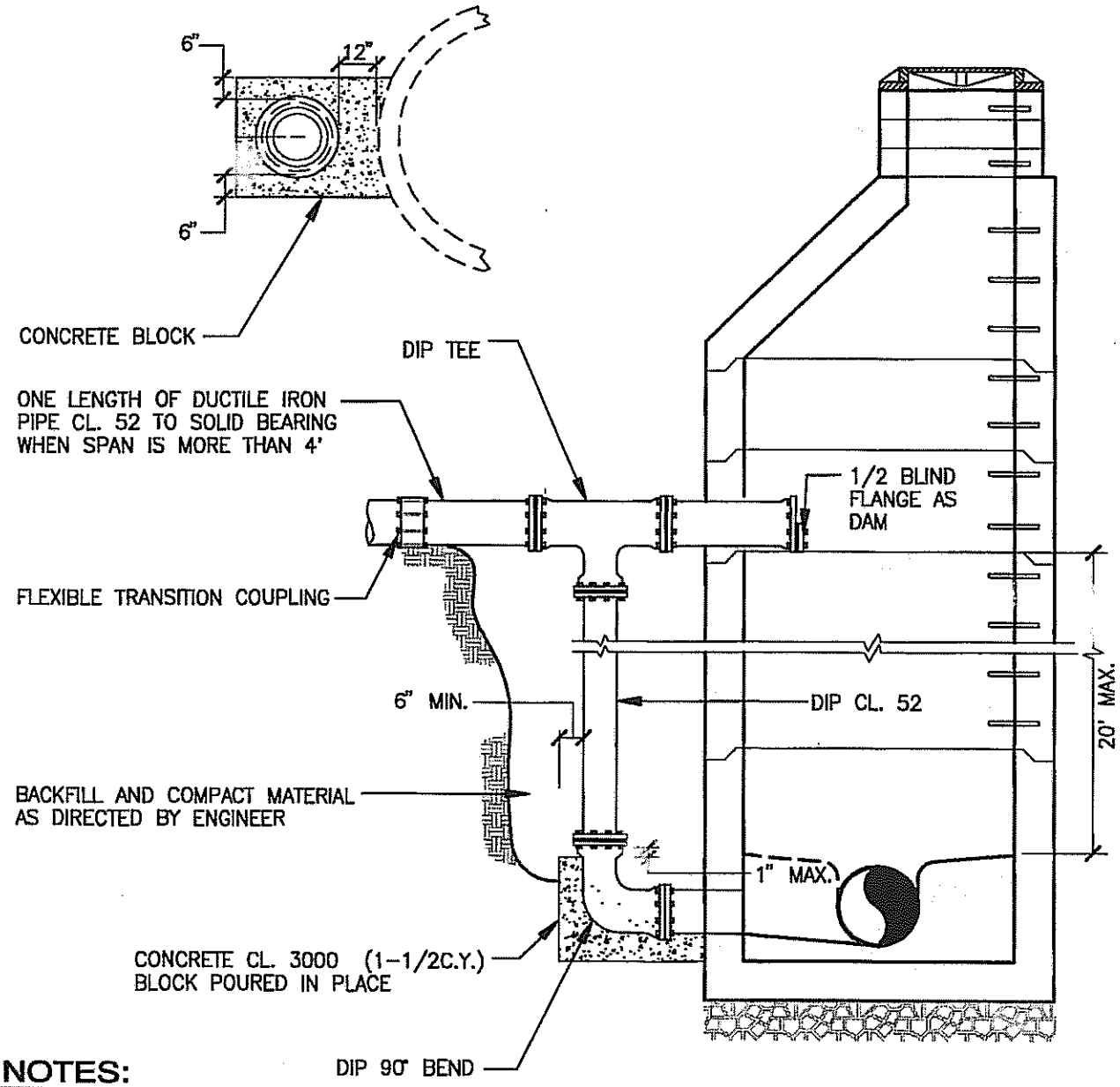


NOTES:

1. UPPER AND LOWER CONNECTIONS TO MANHOLE SHALL BE MADE BY KOR-N-SEAL BOOT, OR APPROVED EQUIVALENT.
2. SEE WSDOT STANDARD PLANS, FIGURE B-23b FOR FURTHER SPECIFICATIONS.

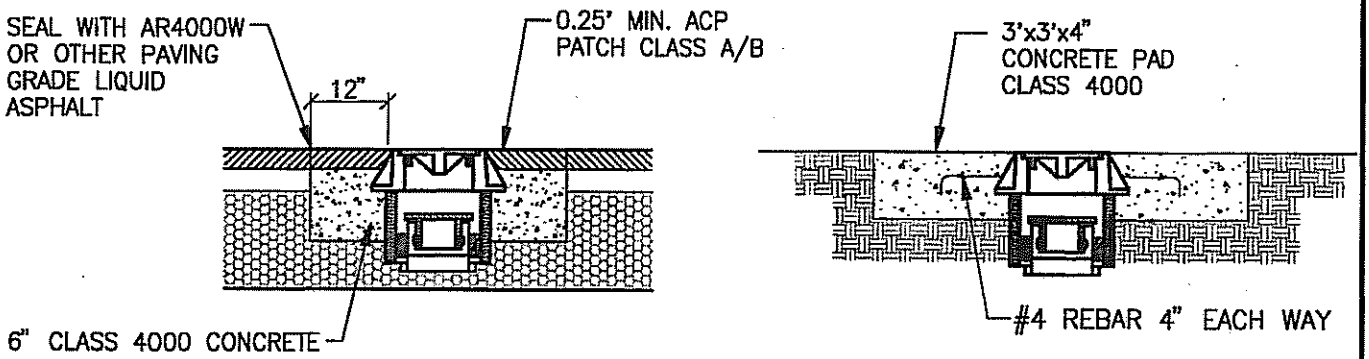
SNOQUALMIE RIDGE II

MANHOLE OUTSIDE DROP CONNECTION

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 05\5-06.DWG

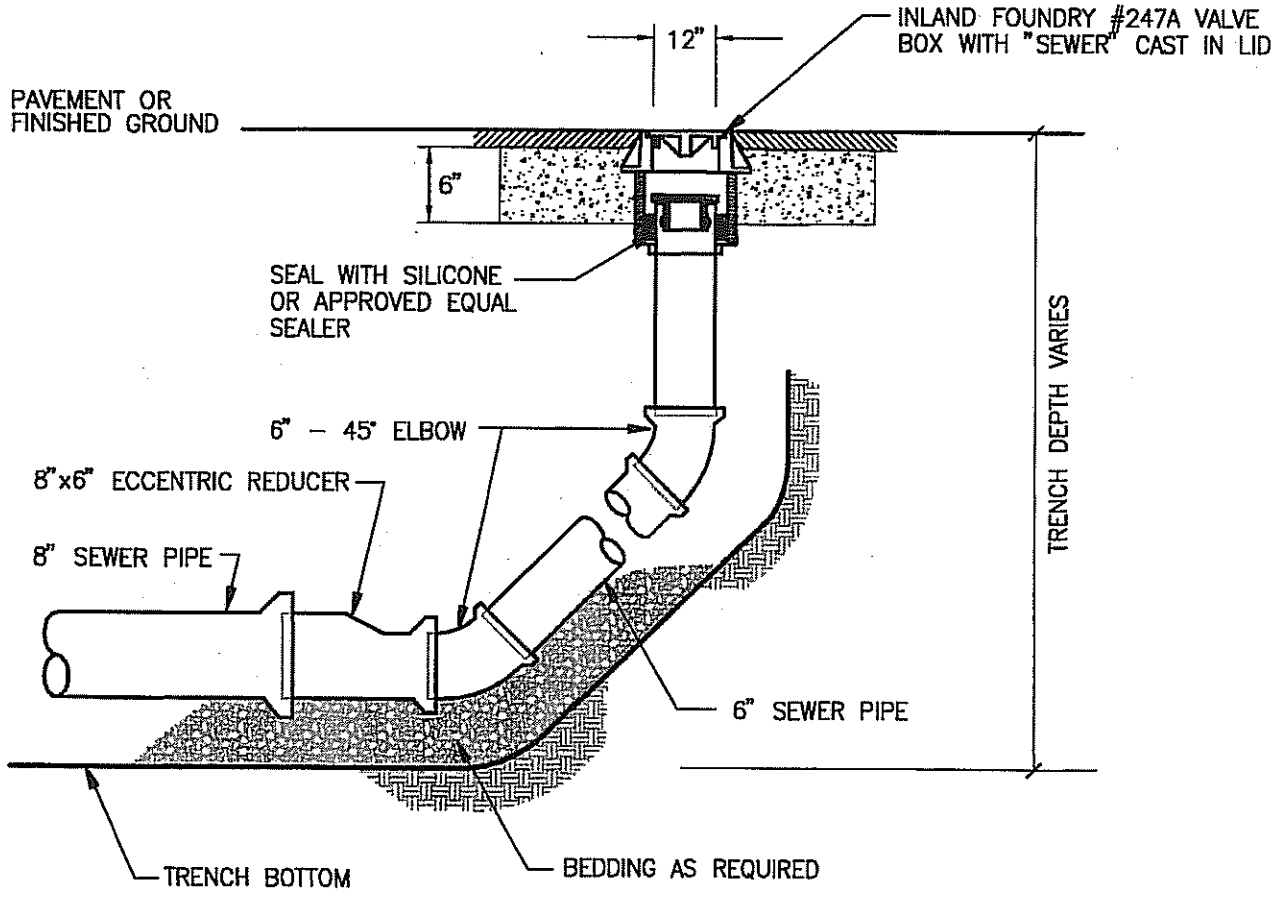
DWN	CKD	10/18/04	DWG
ER	JSF	10/18/04	5-06

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



INSIDE PAVED ROADWAY

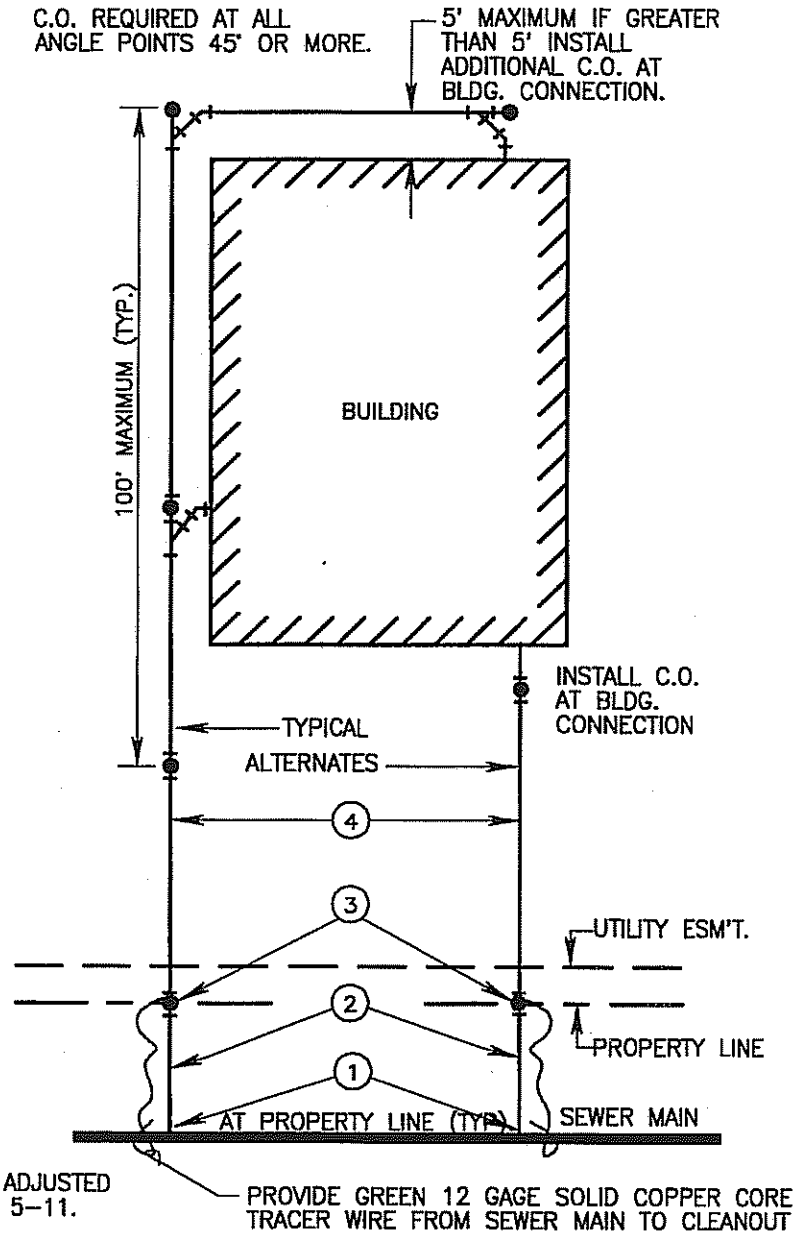
OUTSIDE PAVED ROADWAY



SNOQUALMIE RIDGE II				
CLEAN–OUT				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 05\5–07.DWG	DWN ER	CKD JSF	DATE 10/19/04	DWG 5–07

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

1. CONNECTION TO SEWER MAIN PER SPECIFICATIONS AND STD DWG 5–14 AND 5–10
2. INSTALL 6" MINIMUM PIPE SIZE IN R.O.W.
3. INSTALL 6" C.O. PER STD DWG 5–11
4. PRIVATE SIDE SEWER
   4" MINIMUM FOR SINGLE FAMILY
   6" MINIMUM FOR ALL OTHER USES.



NOTES:

1. ALL C.O.'S ON PRIVATE PROPERTY ARE TO BE ADJUSTED TO GRADE IF IN PAVED AREAS PER STD. PLAN 5–11.
2. C.O.'S ARE TO BE CONSTRUCTED WITH WYES OR SANITARY "T"S (SWEEPS). STRAIGHT "T"S ARE NOT PERMITTED.
3. ALLOWABLE GRADES ARE 2% (1/4"/FT) MIN. TO 100% (FT/FT) MAXIMUM.
4. SEWER MUST BE STRAIGHT BETWEEN ANGLE POINTS, CHANGES IN LINE OR GRADE SHALL BE MADE WITH APPROVED FITTINGS.

SNOQUALMIE RIDGE II

TYPICAL SINGLE SIDE SEWER LAYOUT

DWN	CKD	DATE	DWG
ER		09/30/04	5–08

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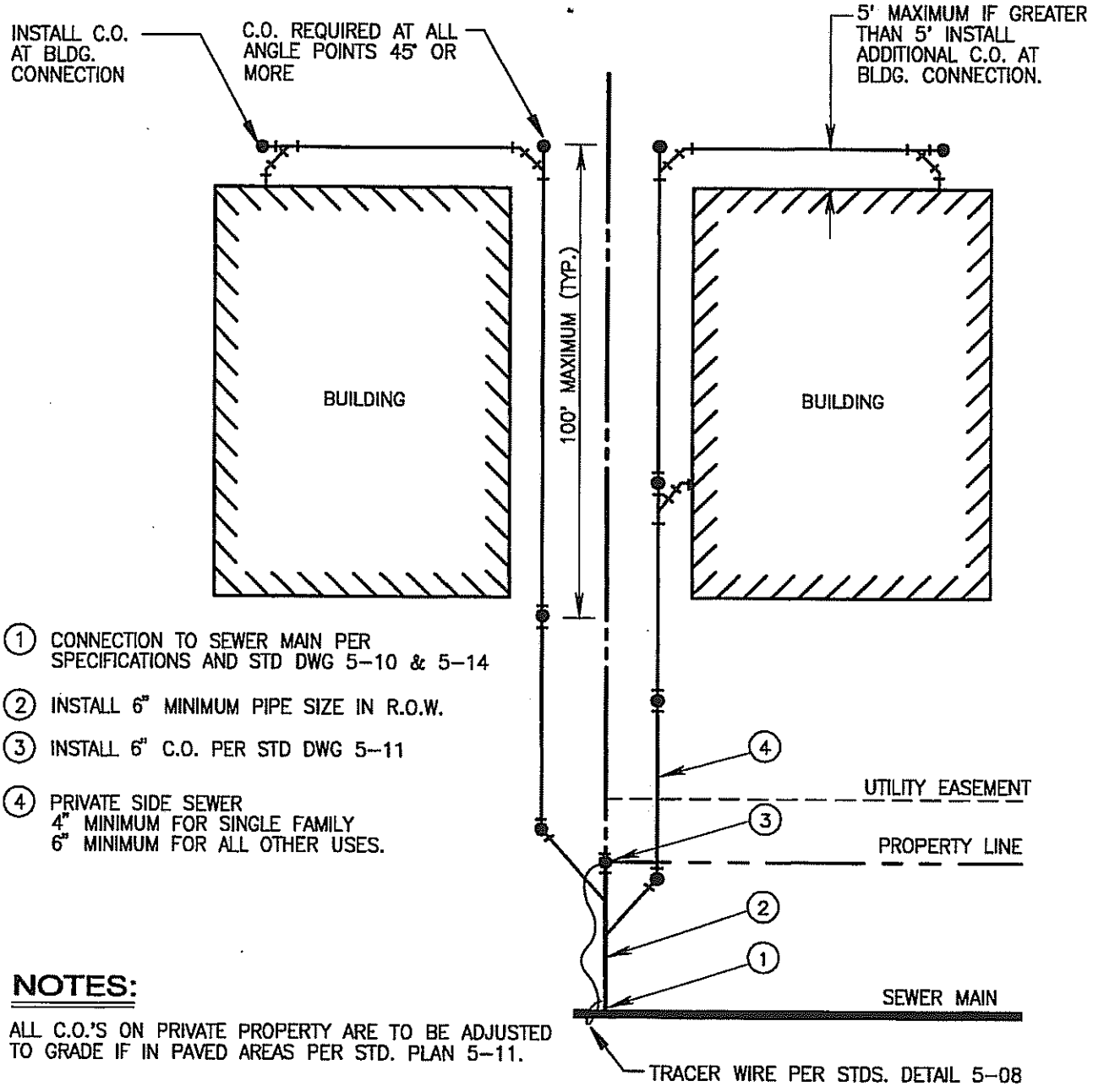

1. CONNECTION TO SEWER MAIN PER SPECIFICATIONS AND STD DWG 5-10 & 5-14
2. INSTALL 6" MINIMUM PIPE SIZE IN R.O.W.
3. INSTALL 6" C.O. PER STD DWG 5-11
4. PRIVATE SIDE SEWER
   4" MINIMUM FOR SINGLE FAMILY
   6" MINIMUM FOR ALL OTHER USES.

NOTES:

1. ALL C.O.'S ON PRIVATE PROPERTY ARE TO BE ADJUSTED TO GRADE IF IN PAVED AREAS PER STD. PLAN 5-11.
2. C.O.'S ARE TO BE CONSTRUCTED WITH WYES OR SANITARY "T"S (SWEEPS). STRAIGHT "T"S ARE NOT PERMITTED.
3. ALLOWABLE GRADES ARE 2% (1/4"/FT) MIN. TO 100% (FT/FT) MAXIMUM.
4. SEWER MUST BE STRAIGHT BETWEEN ANGLE POINTS, CHANGES IN LINE OR GRADE SHALL BE MADE WITH APPROVED FITTINGS.

SNOQUALMIE RIDGE II

TYPICAL DOUBLE SIDE SEWER LAYOUT

DWN	CKD	DATE	DWG
ER		09/30/04	5-09

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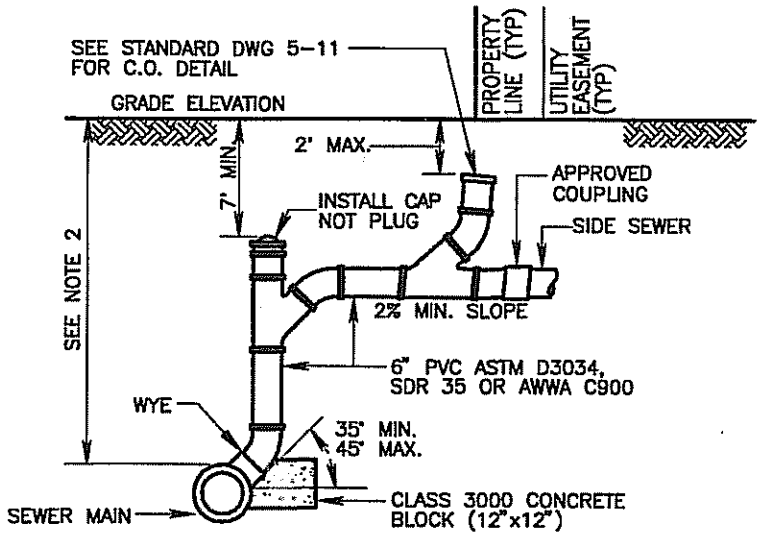
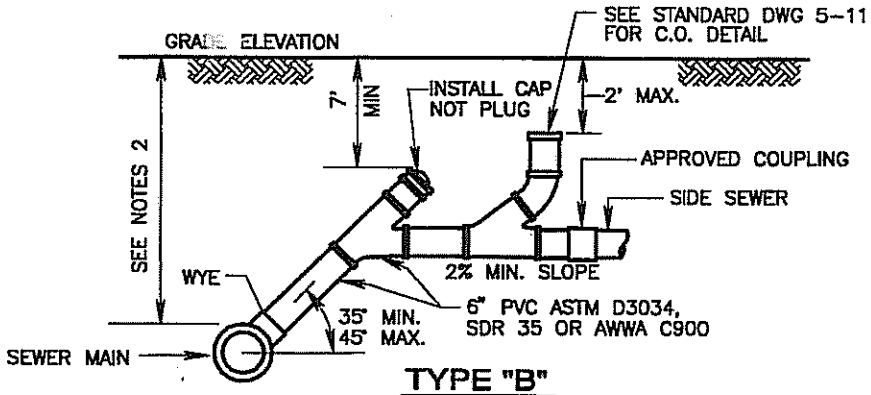
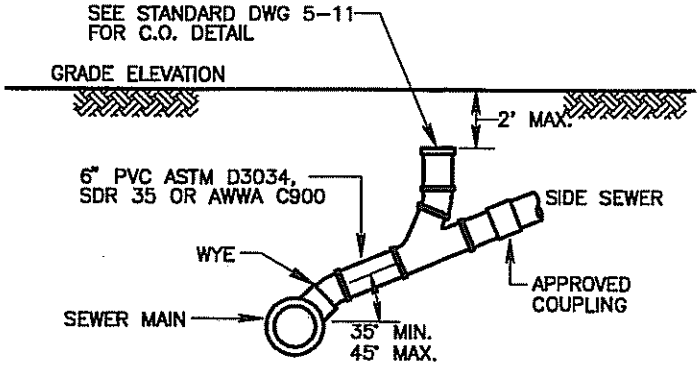


TYPE "A"



TYPE "B"



TYPE "C"

NOTES:

1. PVC SIDE SEWER CONNECTIONS TO NEW MAINS SHALL BE FACTORY WYES.
2. TYPE A & B SHALL BE USED ONLY WHEN MAIN DEPTH EXCEEDS 15 FEET OR AS APPROVED BY THE ENGINEER.

SNOQUALMIE RIDGE II

TYPICAL SIDE SEWER CONNECTION

DWN	CKD	DATE	DWG
ER		09/30/04	5-10

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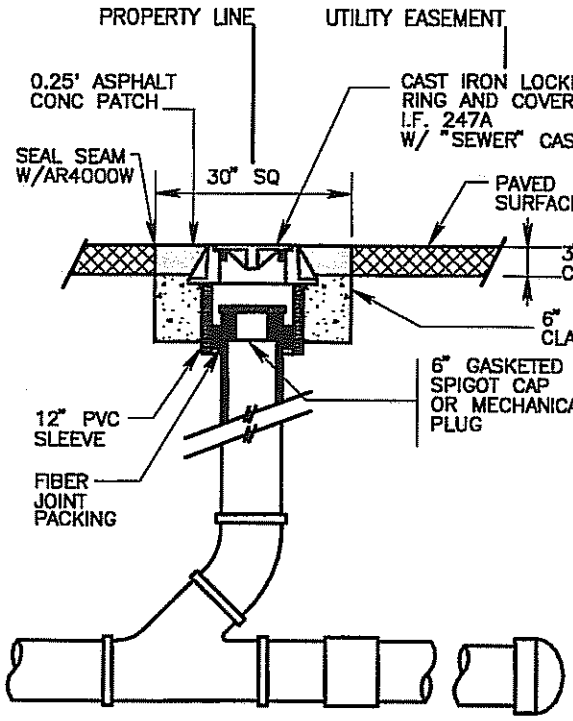
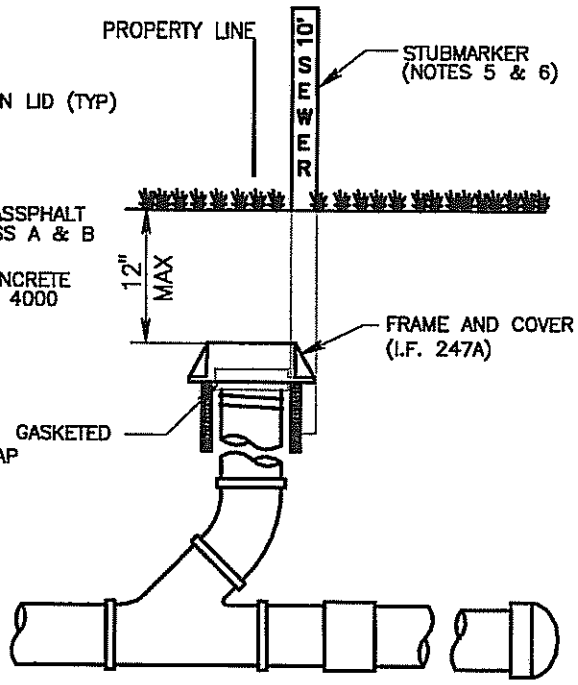


PAVED AREAS
TRAFFIC AREAS



UNPAVED AREAS
NON-TRAFFIC AREAS

NOTES

1 CLEAN–OUT PIPE AND FITTINGS SHALL BE PVC.

2 A SANITARY TEE OR SWEEP MAY BE INSTALLED IN LIEU OF A WYE AS SHOWN. STRAIGHT TEES ARE NOT ACCEPTABLE.

3 FOR NEW PLATS THE VERTICAL RISER PORTION OF THE CLEAN–OUT WILL BE CONSTRUCTED AT TIME OF CONNECTION TO BUILDING TO MINIMIZE DAMAGE, THE 6" WYE AND 6" PVC PIPE W/GASKETED CAPS WILL BE INSTALLED PRIOR TO BUILDING CONNECTION.

4 SEWER STUB WILL BE EXTENDED 10' BEYOND PROPERTY LINE TO PREVENT DAMAGE TO CLEAN–OUT AND MINIMIZE CONFLICTS WITH OTHER UTILITIES WHEN SERVICE TO BUILDING IS ACCOMPLISHED.

5 A PRESSURE TREATED 2"x4" STUBMARKER SHALL EXTEND DOWN TO THE BOTTOM OF THE SEWER PIPE. A MINIMUM OF 3 FEET SHALL EXTEND ABOVE GROUND.

6 THE STUBMARKER SHALL BE PAINTED WITH WHITE TRAFFIC PAINT AND THE WORD "SEWER" AND THE LENGTH OF THE 2"x4" SHALL BE PAINTED ON THE MARKER WITH HIGH BLACK PAINTED LETTERS

SNOQUALMIE RIDGE II

SIDE SEWER CLEAN–OUT

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 05\5-11.DWG	DWN	CKD	DATE	DWG
	ER	JSF	10/18/04	5-11

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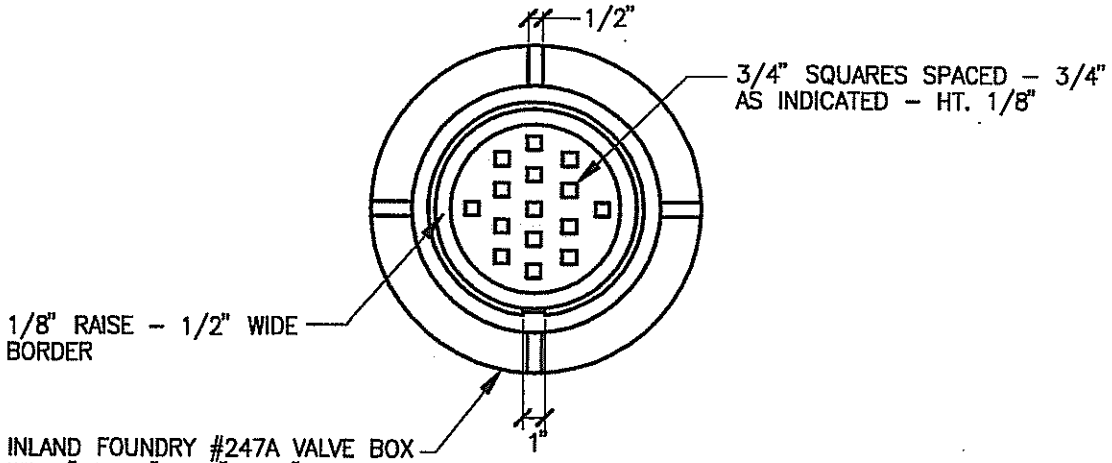

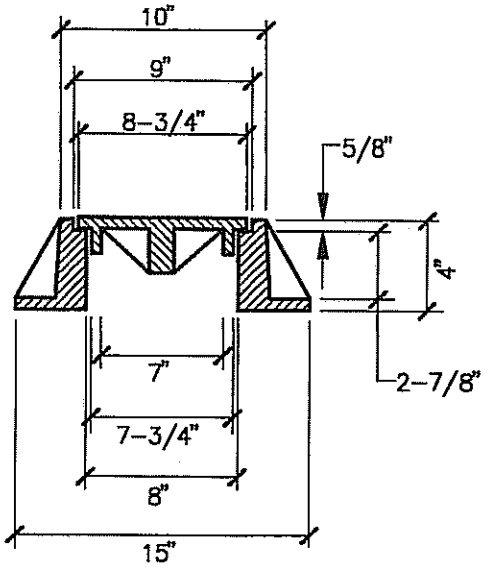

DUCTILE IRON BOLT-DOWN LOCKING RING AND COVER RATING H-20

NOTE:

1. ALL DRAINAGE AND SEWER STRUCTURES SHALL HAVE BOLT–DOWN LOCKING LIDS.
2. THE LIDS SHALL HAVE BLIND PICK NOTCHES.

SNOQUALMIE RIDGE II			
BOLT–DOWN LOCKING RING AND COVER			
DWN	CKD	DATE	DWG
ER		09/30/04	5–12

Approved: AB#04-172 11/8/04
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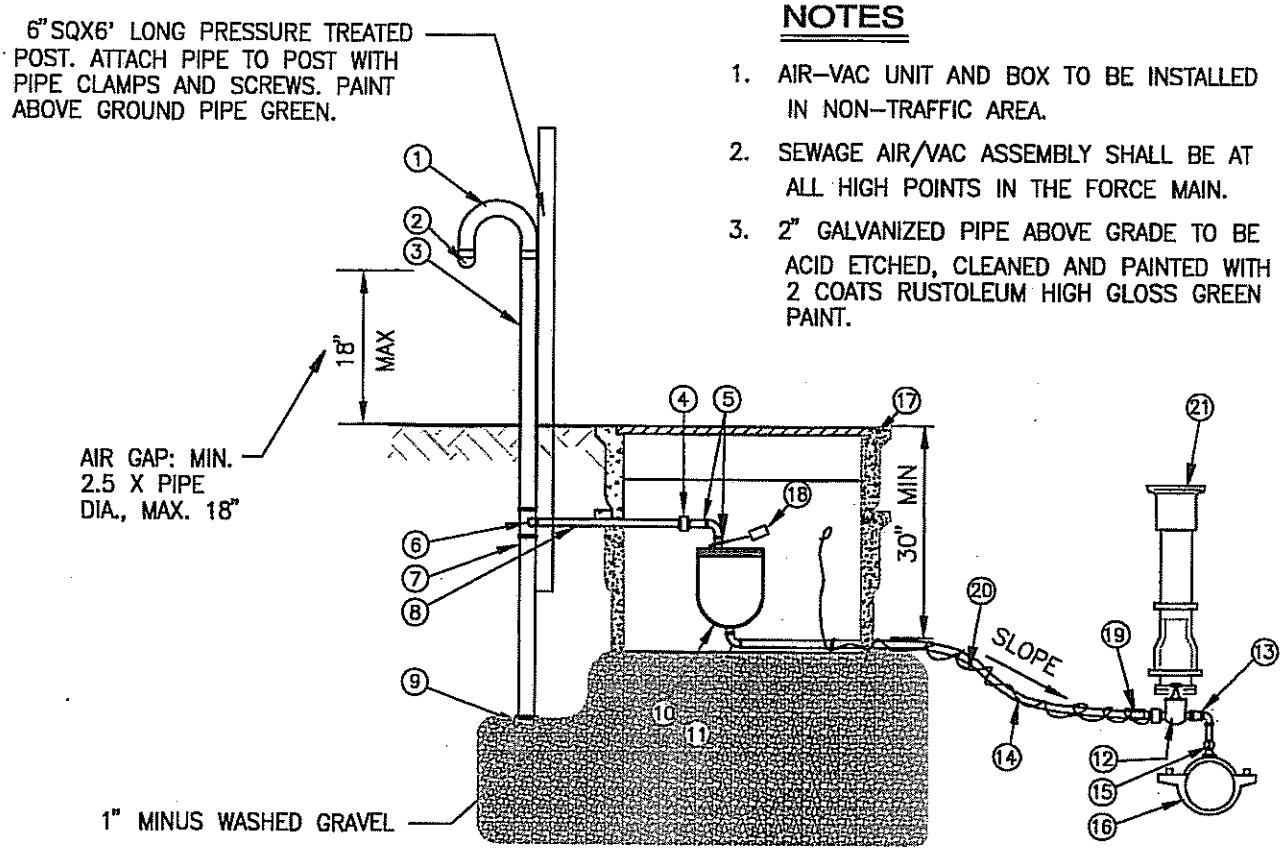

NOTES

1. AIR–VAC UNIT AND BOX TO BE INSTALLED IN NON–TRAFFIC AREA.
2. SEWAGE AIR/VAC ASSEMBLY SHALL BE AT ALL HIGH POINTS IN THE FORCE MAIN.
3. 2" GALVANIZED PIPE ABOVE GRADE TO BE ACID ETCHED, CLEANED AND PAINTED WITH 2 COATS RUSTOLEUM HIGH GLOSS GREEN PAINT.

1. 2" – 180 OPEN PATTERN, RETURN BEND
2. INSECT SCREEN STAINLESS STEEL
3. 2" GALV. IRON PIPE FIELD LOCATE
4. 2" UNION
5. 2" BRASS NIPPLE
6. 2"x2"x1" TEE, 2" CLOSE NIPPLE, 2" 90° BEND
7. 2" GALV. IRON PIPE TO FIT
8. 2" GALV. IRON PIPE TO FIT
9. 2" CAP WITH 1/8" HOLE FOR DRAIN
10. 2" AIR VACUUM SEWAGE VALVE ASSEMBLY, "FLOMATIC" SEWAIR OR EQUIVALENT.
11. 2" BRASS 90° BEND
12. 2" GATE VALVE–CAST IRON BODY, RESILIENT SEAT, SCREWED 2" SQUARE OPERATING NUT.
13. (2) 2" 90° BEND BRASS SWING JOINT.
14. 2" PIPE POSITIVE SLOPE TO AIR VAC
15. CORPORATION STOP–2" MIP X MIP FORD BALLCORP FB 5000 OR MUELLER ORISEAL H9969
16. FORCE MAIN
17. FOGTITE NO.2 CONCRETE METER BOXES STACKED WITH 3/8" STEEL TRAFFIC COVER.
18. AFFIX 2"X3" ALUMINUM TAG STAMPED "SEWER" WITH STAINLESS STEEL WIRE.
19. 2" CTS X 2" MIP COMPRESSION ADAPTOR.
20. TRACER WIRE.
21. VALVE BOX – RICH 940B WITH REGULAR BASE

SNOQUALMIE RIDGE II

2" SEWAGE AIR & VACUUM VALVE ASSEMBLY

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 05\5-13.DWG	DWN	CKD	DATE	DWG
	ER		10/18/04	5-13

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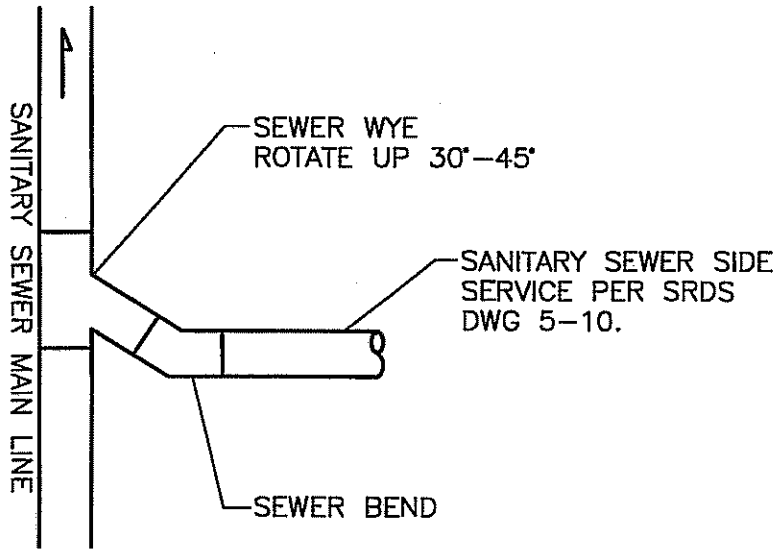
Attest: Jodi Warren/CMC City Clerk



SNOQUALMIE RIDGE II			
WYE SIDE SEWER CONNECTION			
DWN	CKD	DATE	DWG
ER		09/16/04	5–14

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

CHAPTER 6

6.000 EROSION AND SEDIMENTATION CONTROL

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HYDROLOGIC METHODS 6-1

Approved: AB#04-172 11/8/04 Attest: jw Jodi Warren/CMC City Clerk

CHAPTER 6

6.000 EROSION AND SEDIMENTATION CONTROL

6.010 General Requirements

The standards established by this chapter are intended to represent the minimum standards for design and construction of temporary erosion and sedimentation control facilities for Snoqualmie Ridge II. Specific standards including seasonal requirements, design details, workmanship, and materials shall be in accordance with the 1998 King County Surface Water Design Manual (KCSWDM), as specified by Condition 11.10 of the March 31, 2004 SR II Mixed Use Final Plan Conditions. Erosion and sediment control standards are described in Appendix D to the 1998 KCSWDM.

6.020 Hydrologic Methods

Hydrologic methods to determine design flows for TESC facilities shall be consistent with those described in the 1998 King County Surface Water Design Manual or, alternatively, use the unit runoff values presented below which were determined from HSPF hydrologic modeling of the Snoqualmie Ridge Site. When KCRTS is used to determine design flows, the analysis shall be based on 15-minute time steps with flow path adjustments.

Design Condition	Peak Flow Unit Runoff, cfs/acre
2-year developed (impervious)	0.41
10-year developed (impervious)	0.59
25-year developed (impervious)	0.69
100-year developed (impervious)	0.83
10-year pre-developed, forested till soils	0.11
10-year pre-developed, forested outwash soils	0.03

Where the SCS methodology is used for the Snoqualmie Ridge site, the following design storm precipitation values shall apply:

2-year, 24-hour storm:	$P_{2,24}$	=	3.1 inches
10-year, 24-hour storm:	$P_{10,24}$	=	4.5 inches
25-year, 24-hour storm:	$P_{25,24}$	=	5.0 inches
100-year, 24-hour storm:	$P_{100,24}$	=	6.0 inches
100-year, 7-day storm:	$P_{100,7}$	=	14.0 inches

Approved: AB#04-172 11/8/04 Attest: Jodi Warren/CMC City Clerk

CHAPTER 7

7.000 LIGHTING

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Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

CHAPTER 7

7.000 LIGHTING

7.010 General

Lighting is more than a functional part of the infrastructure, it is a design tool that shapes the night landscape of our cities and countryside. Choosing a lighting strategy that preserves the livability of Snoqualmie makes sense from both a planning and an environmental perspective.

In general, light levels should parallel the hierarchy of land uses. Illumination levels can be encouraged that reinforce and accentuate gateways and important public spaces while providing a safe pedestrian and driving environment. The more densely developed and active commercial areas call for a slightly higher level of light than do quieter residential areas. Lamps that are aesthetically pleasing and produce good color rendition shall be used. No mercury vapor lamps shall be permitted.

Some activities, such as walking in a park, do not need much light, and may, in fact, be best enjoyed with very little light. Other activities, such as finding and unlocking a car in a commercial parking lot, need higher light levels. Using only the amount of light necessary saves energy, decreases skyglow, and avoids escalation of light levels in surrounding neighborhoods.

Snoqualmie Ridge intends to take a proactive role in ensuring that outdoor lighting avoids light and glare on surrounding properties and contributes positively to our nighttime environment.

7.020 Street Lighting

7.021 General

This section applies to streets with a classification of local access or higher. Street Lighting shall employ localized illumination similar to the lighting in Railroad Park, rather than illuminating large areas. Street lighting is generally necessary to allow people to see comfortably and to illuminate hazards along or on the roadway. In many residential areas, street lighting may not be necessary except at intersections, sharp curves, or other hazardous locations. In those areas with street lighting, luminaries should direct more light onto the street and sidewalk than onto yards and homes. (See Drawings 7-01,7-02)

7.022 Poles

A. Residential and Retail Areas

All lighting poles on streets classified as collectors or higher shall be cast aluminum or high quality fiberglass,

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consisting of a tapered fluted shaft and a classic double tapered and fluted base. All other residential streets may use concrete poles as an alternate to aluminum or fiberglass. Pole height shall be such to allow luminary mounting height of approximately 12 feet above ground level.

Aluminum poles shall be Unique Solution, Wadsworth Series or equivalent. The color shall be dark green (Tiger-Drylac® Powder Coatings – RAL6004 or equivalent). See Figure 7-03.

Fiberglass poles shall be direct buried Whatley Washington Series 405 pole or equivalent. The color shall be Whatley Dark Green or equivalent. See Figure 7-04.

Concrete poles shall be direct buried Ameron Series "M" or equivalent, medium octagonal pole, gray, natural exposed aggregate. See Figure 7-05.

B. Snoqualmie Parkway Intersections of neighborhood collector streets and Snoqualmie Parkway shall be lighted consistent with existing parkway intersections.

C. Accessories
Optional Accessories on poles may include banner brackets, hanging basket brackets, flagpole holders and electrical receptacles. See Chapter IV of Residential Design Guidelines for banner requirements.

7.023 Luminaries

A. Residential
Luminaries in the residential areas shall be AAL Providence Series, model PROV-H3-SPK, with decorative spikes and Type III full cut-off distribution or other luminaries as approved by the City Design Review Board and the New Construction Committee. See Figures 7-03 to 7-05. The color shall match those of the poles except for the concrete pole option where the color of the luminaries shall be the Whatley Dark Green.

B. Snoqualmie Parkway *(See SR I DS)*

7.024 Lamps

A. Residential
On Neighborhood Collectors and Connectors, lamps shall be a maximum of 100 watt high pressure sodium. Except where required for public safety, residential area lamps

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should a be maximum of 70 watt high pressure sodium. Alternate lamps, such as Phillips QL, may be used under the following conditions:

1. Produce equal or better color rendition.
2. Produce similar light output (lamp lumens).
3. Similar or better installation and maintenance costs.
4. Approved by Puget Sound Energy for installation, ownership and maintenance.

B. Snoqualmie Parkway *(See SR I DS)*

7.025 Placement and Spacing

Pole placement varies with location and intensity of use, both by pedestrians and vehicles. Figure 7-01 and 7-02 shows the standards for spacing of light poles for roads classified as neighborhood collector. Actual pole placement shall be determined at the time of roadway design based upon intersection locations, traffic and pedestrian safety considerations, neighborhood security concerns, and viewshed protection.

Clear distance between the face of curb and the nearest part of the pole shall be 3 feet for streets classified as Neighborhood Collector and above and 2 feet for local access streets. In areas of thickened edge asphalt, a clear distance of 10 feet shall be maintained between the pole and edge of the travel lane.

A. Residential Local Access Street
For local access streets within residential neighborhoods, street lighting is optional. If the street lighting option is selected, pole spacing shall generally be no less than 200 feet apart (staggered). The City shall not be responsible for the cost of optional street lighting within residential neighborhoods.

B. Snoqualmie Parkway *(See SR I DS)*

7.030 Parking Lot Lighting

7.031 Retail - [reserved]

7.040 Parks and Trails Lighting

7.041 Parks

A. Mini-Parks
Mini-parks typically adjoin streets which are subject to Section 7.020. Any additional lighting within the mini-park will be addressed at the time of mini-park design.

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B. Neighborhood and Community Parks
Uses and facilities in Neighborhood and Community Parks vary widely. Each park requires a unique design which is subject to review by the City. Lighting requirements for each park will be presented as part of the park design.

7.042 Trails

The purposes and locations of trails in Snoqualmie Ridge vary widely. Lighting of trails within Community, Neighborhood or Mini-parks would be considered part of a specific park plan. Soft-surface trails will not be illuminated. Lighting of hard surface trails, paralleling streets (i.e. sidewalks) is addressed in the Street Lighting section of this chapter.

7.050 Residential

Motion Detector Lights shall be full cut-off.

7.060 Design, Testing and Warranty

7.061 Street Lighting

All street lighting will be designed, installed, owned and maintained by Puget Sound Energy or its successor. Lighting plans shall be submitted to the City for review prior to installation.

All street light designs shall be prepared by Puget Sound Energy, its successor, or an engineering firm capable of performing such work. The engineer shall be licensed by the State of Washington. All developments shall submit the street lighting plan on a separate sheet.

All street light electrical installations including wiring conduit and power connections shall be located underground.

7.062 Public Parks and Trails

All light designs for public parks and trails shall be prepared by an engineering firm capable of performing such work. The engineer shall be licensed by the State of Washington. All developments shall submit the lighting plan on a separate sheet to the City for review prior to installation.

All street light electrical installations including wiring conduit and power connections shall be located underground.

Lamp, photocell and fixture, including construction and materials, shall be warranted by the contractor for a period of one year.

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LIST OF STANDARD DRAWINGS

CHAPTER 7 – LIGHTING

TITLE	DRAWING
Street Light Standard Spacing Plan, North	7-01
Street Light Standard Spacing Plan, South	7-02
Street Light – Option 1 (Aluminum Pole)	7-03
Street Light – Option 2 (Fiberglass Pole)	7-04
Street Light – Option 3 (Concrete Pole)	7-05

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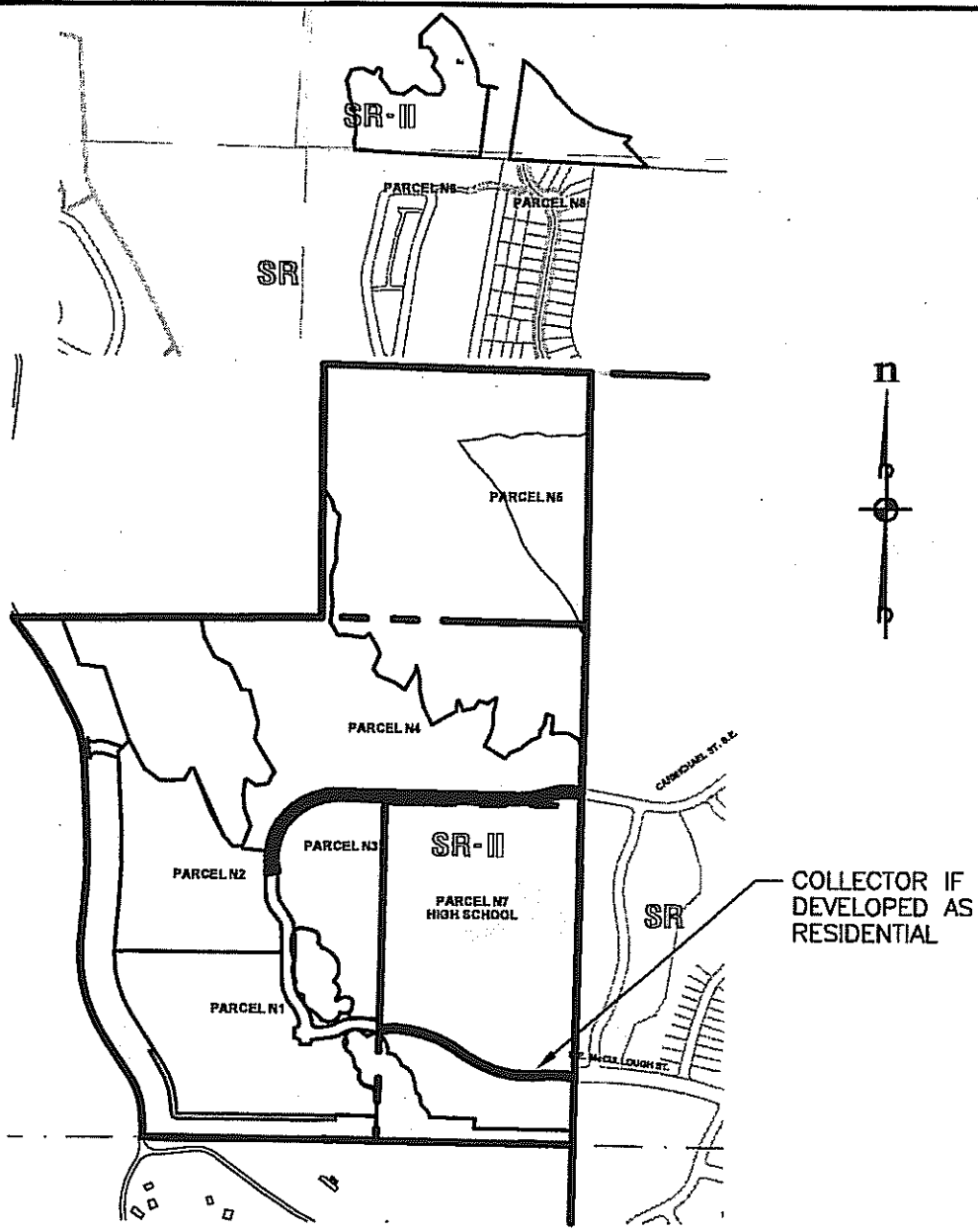

STREET LIGHT STANDARD SPACING PLAN, NORTH

NO SCALE

LEGEND

NEIGHBORHOOD COLLECTOR
MIN. SPACING: 150'
MAX. SPACING: 250'
REQ'D AVG: 200'

PUBLIC ACCESS ROAD:
-OPTIONAL LIGHTING. IF LIGHTED, STAGGERED SPACING > 200' APART

SNOQUALMIE RIDGE II			
STREET LIGHT STANDARD SPACING PLAN, NORTH			
DWN	CKD	DATE	DWG
ER/DLS	JSF	09-21-04	7-01

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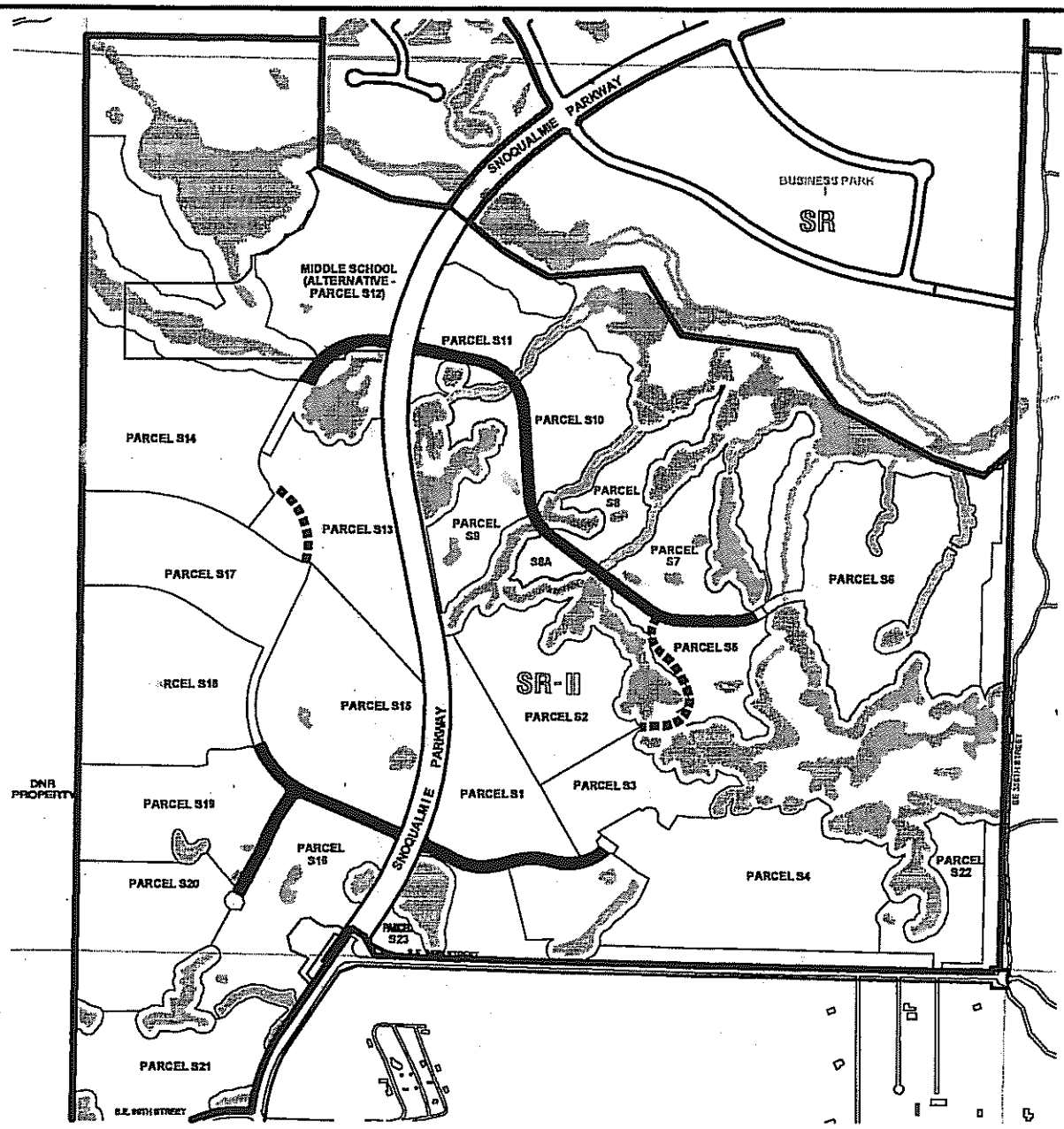

STREET LIGHT STANDARD SPACING PLAN, SOUTH

NO SCALE

LEGEND

NEIGHBORHOOD COLLECTOR
MIN. SPACING: 150'
MAX. SPACING: 250'
REQ'D AVG: 200'

PUBLIC ACCESS ROAD:
–OPTIONAL LIGHTING. IF LIGHTED, STAGGERED SPACING > 200' APART

NEIGHBORHOOD ACCESS CONNECTORS

SNOQUALMIE RIDGE II			
STREET LIGHT STANDARD SPACING PLAN, SOUTH			
DWN	CKD	DATE	DWG
ER/DLS	JSF	09/22/04	7–02

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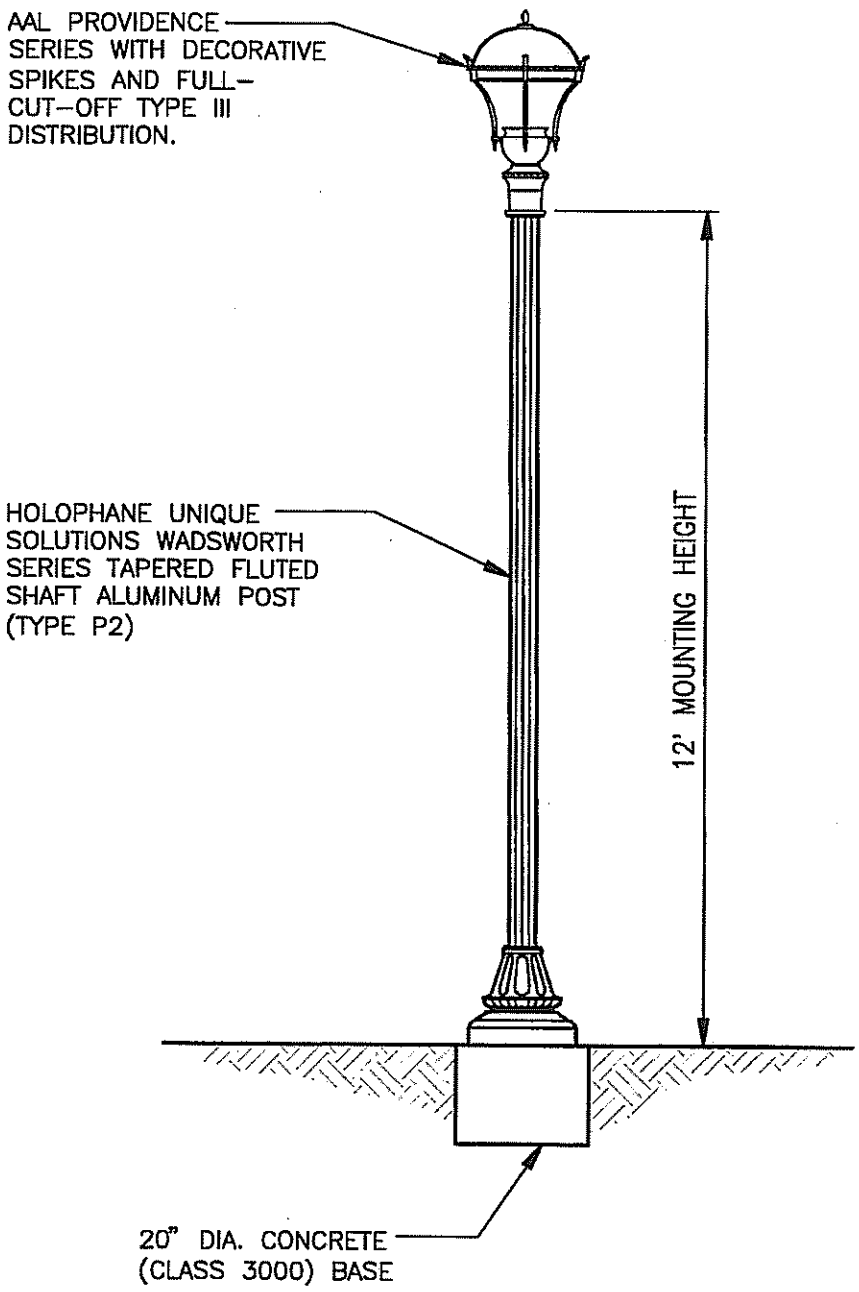

SNOQUALMIE RIDGE II			
STREET LIGHT–OPTION 1 ALUMINUM POLE			
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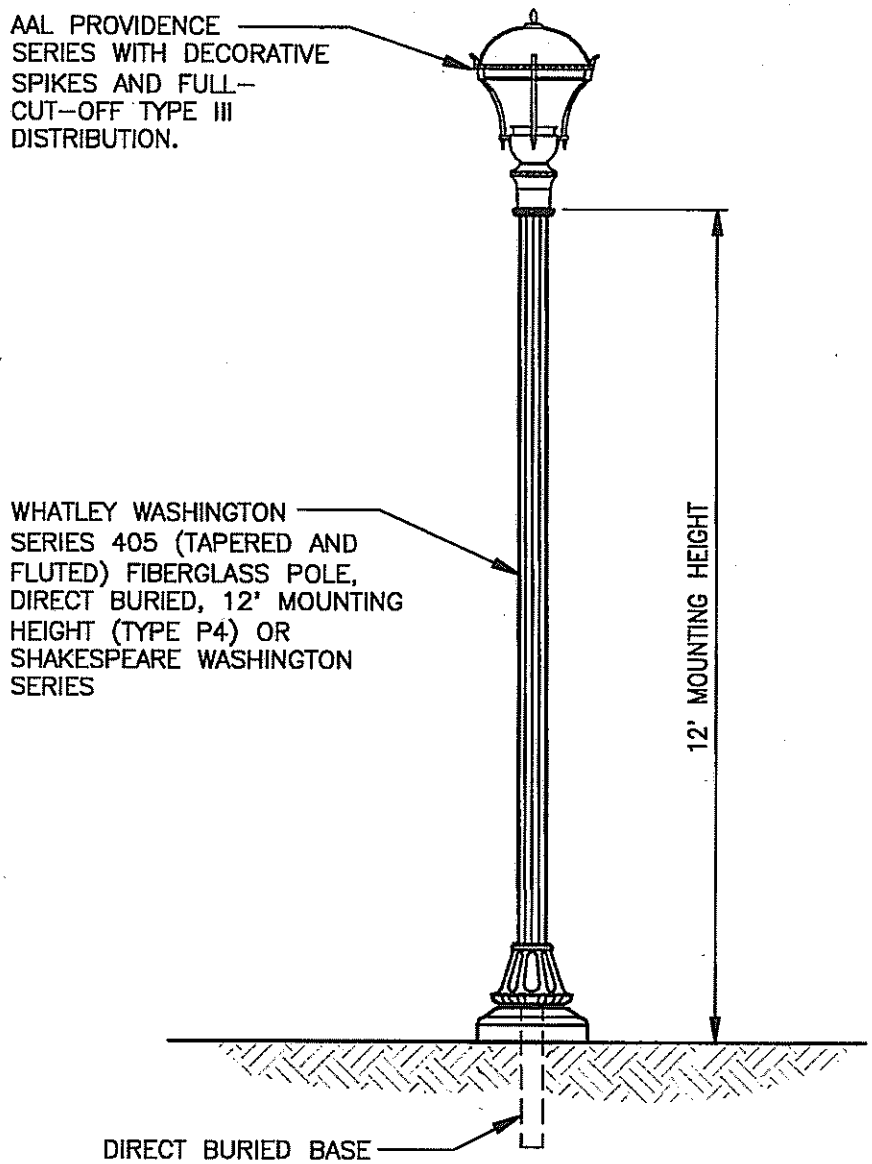

SNOQUALMIE RIDGE II			
STREET LIGHT–OPTION 2 FIBERGLASS POLE			
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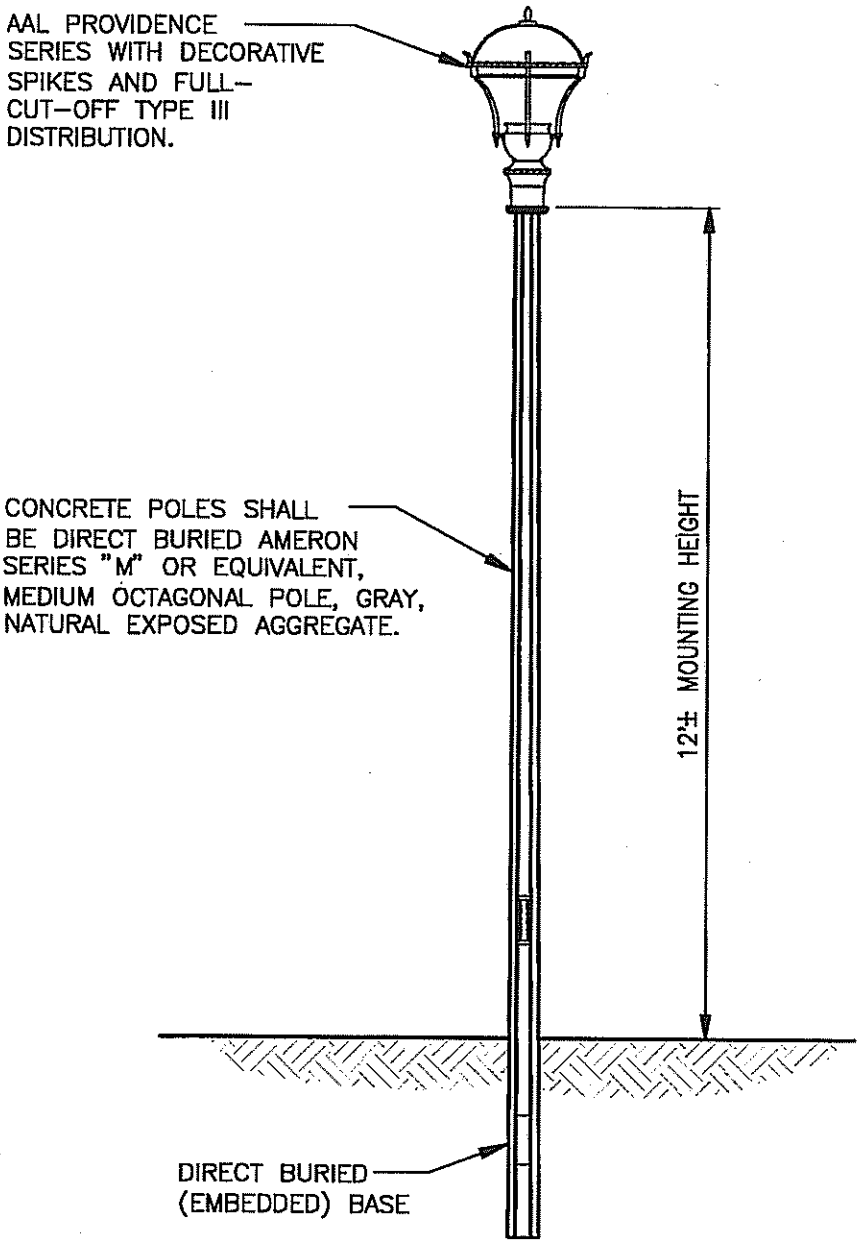
Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk



SNOQUALMIE RIDGE II

STREET LIGHT–OPTION 3
CONCRETE POLE

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	KMB	JSF	09/29/04	7-05

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CHAPTER 8

8.0 LANDSCAPING

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CHAPTER 8

8.000 LANDSCAPING

8A Overall Project

8A.010 Landscape Character

One of the most important elements of Snoqualmie Ridge II will be the treatment of street right-of-way landscaping and both public and private open space areas. Their treatment is based on the guiding principle of preserving and enhancing the natural character of the Upper Snoqualmie Valley, and in particular, the upland plateau environment of Snoqualmie Ridge. As used in this chapter, "private open space" does not apply to residential lots.

8A.011 Preservation of Existing Vegetation

Preservation and enhancement of native plant communities should be basic to any future development or open space area improvement. Where feasible, existing vegetation should be preserved. Certain larger trees (Significant trees) are subject to the City of Snoqualmie Municipal Code Section 15.20.060. Native and hardy low water use ornamental species should be used to supplement existing native vegetation.

8A.012 Native Plant Salvage

Prior to commencing clearing and grading on any parcel, the Applicant shall allow access to the parcel for a plant salvage program, similar to the program that is operating in King County. The City or other non-profit entity shall assume responsibility for running the program, including responsibility for identifying areas where plants can be salvaged, supervision, a Hold Harmless provision in favor of the Applicant, and any measures necessary to ensure that critical areas and their required buffers are not disturbed. The Applicant's only obligation pursuant to this requirement is to identify the location(s) and notify the City and other entity(ies) at least 30 days in advance to allow access to salvage plants prior to clearing and grading.

8A.013 Native Soil Salvage.

After clearing and grading on any parcel, the Applicant shall allow access to soils strippings from the parcel for a soil salvage program. The City or other non-profit entity shall assume responsibility for running the program, responsibility for identifying areas where soil can

be placed (on or off the parcel) and salvaged, supervision, including a Hold Harmless provision in favor of the Applicant, and any measures necessary to ensure that critical areas and their required buffers are not disturbed. A portion of the community and neighborhood park sites adjacent to the collector roads may be cleared and graded to provide a location to stockpile salvaged soil. The Applicant's only obligation pursuant to this condition is to identify the timing of available soil strippings and to notify the City and other entity(ies) sufficiently in advance to allow access to salvage soil.

8A.014 Undeveloped Areas

In natural undeveloped areas, such as along the trail corridors, or buffers, natural plant succession should be fostered. Native plants not only appear more natural, they require less maintenance and little to no supplemental irrigation after establishment. Many native plants are available in seed or juvenile form and can be established relatively easily and adapt sooner to new areas.

8A.020 Topsoil

Existing topsoil, which includes the duff layer, should be saved and reused in natural areas and parks where possible. Other landscape areas may require the use of amended native or import topsoil to ensure proper growing conditions, as further specified in these standards.

8A.030 Plant Species

A variety of native or hardy low water use adapted plant species are encouraged in any new street, park, open space or landscape tract plantings. Wetland crossings (as necessary for roads or infrastructure) and buffer enhancement should contain native wetland or riparian species. Native tree and shrub species for the mixed conifer/ deciduous forest include, but are not limited to, Western Red Cedar, Western Hemlock, Douglas Fir, Grand Fir, Sitka Spruce, Cascara, Black Hawthorn, Vine Maple, Serviceberry, Red Huckleberry, Salal, Snowberry, Oregon Grape, Oceanspray, and Sword Fern. Adapted non-native species include, but are not limited to, Maple, Sweetgum, Rhododendron, and Azalea. Groundcover plantings should be mostly native grasses, low-growing evergreen shrubs, or other similar hardy, non invasive and low water use adapted species, or lawn. Bark mulch, rock or other artificial ground cover should not be used except for temporary cover. All plants shall conform to the most recent edition of the ANSI Z60.1 American Standards for Nursery Stock. Refer to the *Snoqualmie Ridge II Recommended Street Tree Varieties list* at the end of this chapter for a complete listing of approved street trees. Refer to the *Snoqualmie Ridge II Recommended Plant List,* located at Appendix A to the Snoqualmie Ridge II Residential Design Guidelines, for a listing of recommended native plants for landscaping.

8A.040 Inspection

All required landscape construction shall be inspected and approved by the city. The City shall require a Pre-Construction meeting with the landscape contractor prior to the start of any landscape construction. The City must be notified at least three working days prior to commencing construction. In addition, the nursery source of trees along with one representative digital image shall be provided to the City at least two weeks before delivery of the trees to the site. The City may reject street tree and other landscape plants that do not meet size or other planting specifications. Soil preparation and amendment shall be reviewed and inspected prior to planting. The City may reject any drainage and prepared planting beds that do not conform to SR II standards or specifications. Plants shall be inspected prior to planting to verify conformance with planting size and other specifications. If the required notice has been given and the City's inspector or representative is absent from the site during the time the contractor has scheduled for construction of the improvements, including soil preparation and planting, the work may proceed, provided that planting shall be inspected upon completion to verify conformance with approved planting plans and specifications.

8A.050 Performance and Maintenance

The required landscaping must be installed prior to final inspection or issuance of a certificate of occupancy unless the Planning Director determines that a performance assurance device, for a period of not more than one year, will adequately protect the interests of the city. All landscaping in public areas shall be warranted for two years. The Planning Director shall require a maintenance and replacement assurance device for a period of two years from the completion and final inspection of planting in order to ensure compliance with these standards and any applicable requirements of SMC 17.70. Prior to the end of the warranty period, the City shall inspect plantings and provide one complete punch list. The developer shall replace any unhealthy or dead plant materials in conformance with the approved landscape plan. Replacement plants shall meet the size and quality of the established plants to the extent reasonably available. Following inspection of replacement plantings, the City shall release maintenance or performance bonds.

The developer or successor shall maintain all landscape plant material within privately owned areas.

8A.060 Irrigation

8A.061 Water Conservation

The use of available potable water supplies for landscape irrigation is subordinate to domestic household demand. Water conservation shall be promoted in both public and private projects. Except for turf areas, the use of low water use species that can thrive without regular supplemental irrigation once plants are established shall be maximized; at a minimum meeting the percentages specified in SMC 17.70. Planting plans for public

landscape areas and private landscape tracts shall emphasize the use of native and low water use species that can thrive without regular irrigation once plants are established. Irrigation for plantings in street right-of-ways and public and private open space areas shall be limited to the minimum amounts required for the healthy establishment and maintenance of trees, turf and other plantings. Park and planter strip irrigation shall be managed to occur during non-peak hours.

8A.062 Automatic Irrigation

Automatic irrigation systems shall be provided in all neighborhood and community parks, in all Arterial and Collector right-of-way planter strips, medians and landscape islands, and in Connector roadway planter strips where adjacent to parks. In other public rights of way, tree canteens or other approved methods should be installed per Figure 8-5. The City may eliminate the requirement for automatic irrigation for non-turf landscape areas when locally adapted native and drought tolerant species are used and a temporary watering method (including funding) is approved that will ensure sufficient irrigation for proper establishment of all tree, shrub and ground cover plantings. Irrigation shall be constructed according to the detail and specifications set forth in Appendix 8-B.

8A.070 General Planting Practices

Unless otherwise specified in this chapter, plant size, height, spacing and general requirements shall be as set forth in SMC 17.70. Plant size, height and spacing, and planting details for SRII perimeter and Snoqualmie Parkway buffers shall be as set forth in Chapter 9 of these standards and Attachment D to the Mixed Use Final Plan for Snoqualmie Ridge II.

8A.080 Landscape Plans

Preliminary landscape plans will be consistent with preliminary grading and drainage plans, and will be submitted with applications for preliminary subdivisions and binding site improvement plans. Landscape plans shall include plants from the Snoqualmie Ridge Recommended Plant List (contained in the Snoqualmie Ridge II Residential Design Guidelines, Appendix A), and the SR II Recommended Street Tree Varieties list incorporated herein as Appendix 8B. Included in these lists are plants which can normally adapt with little or no supplemental watering after the initial establishment period and which therefore meet the City's requirement for drought tolerant/low water use adapted species. Landscape plans will meet the submittal requirements of SMC 17.70.030 except that when the information requested is included elsewhere in the integrated project submittal package, it need not be included on the landscape plans. As provided in SMC 17.70.120, other landscape requirements of the Snoqualmie Municipal Code may be modified to provide creative and cost-effective methods of accomplishing the purposes and objectives of the landscape regulations. Landscape plans will be reviewed by the City for conformance with all applicable standards and regulations. The City, subject to SMC 14.20.050

and any consultant agreement under that section, may enlist the assistance of a professional landscape architect, consulting arborist, or environmental consultant in the consistency review of landscape plans. Final landscape plans shall be approved by the City prior to construction and installation of the landscaping.

8B Park and Open Space Area Landscaping

8B.010 Landscape Plan

The design and location of all parks, open space tracts, trails and facilities shall be submitted to the City for review during or prior to the preliminary development approval for the parcel in which they are located. The design shall include a preliminary landscape plan, including a conceptual drainage plan for the site showing connection points to the stormwater drainage system outside of the park. For parks and trails to be conveyed to the City, the Parks Board will forward its findings and recommendation to the City as part of the review for the associated development approval. A final landscape plan, including a planting plan, grading plan, drainage system plan and irrigation plan, shall be approved by the City prior to construction and installation of the landscaping. Plant size, spacing and planting specifications shall be as indicated in the approved landscape plan and specifications for each park.

8B.020 Site Preparation

Site preparation in parks will vary according to intended design use of various areas. These areas include athletic fields, informal play/lawn areas, ornamental lawns and planting beds. In general, preparation for all uses shall make adequate provision for drainage. The following standards apply to specific areas.

8B.021 Athletic Fields

Athletic Fields are designed for intensive/higher impact activities throughout the year. Athletic fields require the most intensive maintenance (including over-seeding, aeration, topdressing, fertilization) and require an automatic irrigation system for turf areas. The following standards shall apply:

- Playing surface slope shall be 1% to 1½ % provided that adequate drainage to facilitate conveyance of water off the field has been provided.
- Sub-grade shall be compacted to a minimum 90% of maximum dry density according to ASTMD-1557 and sloped to drain to the sub-drain system.
- All required athletic fields shall include an approved sub-drainage system within the limits of the field connected to an approved daylight location or storm sewer.
- All required football fields shall include a minimum of 9 inches of well graded top sand growing medium with no more than 1.5 percent passing a #270 sieve.
- All required soccer fields shall include a minimum of 12 inches of well

graded top sand growing medium with no more than 1.5 percent passing a #270 sieve.

- Baseball and softball fields shall include 9 inches of well graded top sand growing medium with no more than 1.5 percent passing a #270 sieve, or a sand/soil mixture approved by the City with a combined minimum total depth of 9 inches.

8B.022 Lawn /Informal Play Areas and Ornamental Lawn

Open turf/lawn areas are generally designed for informal, occasional use in dry weather versus that of athletic fields. Intended to be low maintenance (primarily focused on mowing, reseeding & fertilization), they may be un-irrigated or irrigated for establishment, depending on location. To avoid standing water, informal play areas shall be designed with surface conveyance to storm structures, swales or natural areas to allow drainage within 48 hours after a storm event. If open lawn/turf and play areas have been built to the following standards and do not meet the standing water drainage standard during the one year park warranty period, then, provided the areas have been being utilized and maintained as designed, the developer shall take corrective action.

- Lawn surface shall have a minimum slope of 2% with surface conveyance to storm structures or drainage swales.
- All lawn areas shall be compacted to 85% of maximum dry density according to ASTMD-1557
- Lawn areas will receive a minimum of 4 inches of fertile, free draining on site or import topsoil as approved by the Parks Director.

Ornamental lawn areas designed primarily for visual continuity with little, if any, human use should generally follow these same standards except that slopes may be 2% or more, as required to meet design goals for the park or landscape area. Ornamental lawns should not exceed a 5:1 slope in order to facilitate maintenance.

8B.030 Tree Planting Beds

When landscaping tree planting beds where density in the top 18 inches of sub-grade exceeds 85% of maximum dry weight according to ASTMD-1557, ground shall be scarified to a depth of 18" and amended to ensure proper drainage of the root zone. This specification is not required in planting beds with ground cover only. When trees are planted on slopes with compacted soils, a circular perforated drain pipe shall be provided under the planting pit and day-lighted downhill from the pit.

8C Street Trees

Street trees in or along the Public Right-of-Way shall be placed in accordance with the following standards. The "Snoqualmie Ridge II Recommended Street Tree Varieties" , contained in Appendix 8-A at the end of this Chapter, includes the list of approved street trees.

8C.010 Planting Size

The minimum plant size for all street trees along roadways shall be 2" minimum caliper measured 6 inches above the root flare or just above the graft base. See Figures 8-1 to 8-3 for the street tree planting detail. The first branch of the tree shall be a minimum of five feet above the ground except where the tree location does not present an obstruction to pedestrians, passing vehicles or sight lines.

The area between trees in planter strips shall be planted with either turf or other ground cover as follows: At planting, the ground cover shall be from 4 inch pots spaced 18 to 20 inches on center or 1 gallon pots at 24-36 inches on center. Massed low-growth shrubs may also be used in planter strips as design accents provided adequate site distance is provided at intersections and driveways and a pathway is provided from the curb to the sidewalk in front of each residential lot where on-street parking is allowed.

8C.020 Location

Street trees shall be located in all planter strips 5 feet or greater in width. Street trees shall be evenly spaced within planter strips in accordance with the spacing requirements contained in Appendix 8-A - "Snoqualmie Ridge II Recommended Street Tree Varieties" for the tree variety chosen. Exceptions to the specified tree spacing may be permitted for larger maturing trees in order to preserve important view corridors, or for other site specific design considerations, as approved by the City. Tree spacing may be adjusted slightly to allow: 1) a 5-foot clear zone on either side of a driveway in the residential areas; 2) compatibility with utilities and light standards; or 3) for other traffic and pedestrian safety considerations.

8C.030 Cul-de-sac Design for Street Trees

Street trees shall be planted within cul-de-sacs according to the spacing requirements in Appendix 8-A for the species selected, and consistent with the planting details specified in Figures 8-1 to 8-3. To provide adequate planting area where space is limited due to driveway cuts through the planter strip, the following strategies shall be used, if necessary, separately or in combination:

1. place homes on lots to share a driveway cut;
2. narrow driveway cut to single garage width of 10 ft.;
3. reduce driveway wing wall width from 5 ft. to 4 ft.;
4. shared driveways between adjacent lots.

8C.040 Planting Practices

Install new trees in accordance with these SR II standards, including the Snoqualmie Street Tree Planting Details (see Figures 8-1 to 8-3). The City may approve an alternate design based on site specific conditions.

8C.050 Snoqualmie Ridge II Recommended Street Tree Varieties

The Snoqualmie Ridge II Recommended Street Tree Varieties list (Appendix 8-A)

identifies specific street tree species recommended for all collector, connector, local and minor access streets. This list includes a variety of tree species, with varying tree shapes and sizes, and with different design features such as leaf shape and texture, flowers and fall color. The list concentrates on readily available trees species that are hardy for the Snoqualmie area. Selection of tree species from the approved list shall be by the applicant with approval by the City.

Along collectors, a primary street tree species shall be selected but other species of street trees may be used with the primary street tree as accents at intersections and bulbouts. Changes in street tree species shall occur at logical locations such as intersections. Also, because the current industry belief is that species diversity is a major key to a healthy community/urban forest, no one species shall account for more than 20% of the total number of trees used in a plat, unless otherwise approved by the Planning Director.

Always select the tree variety that fits available growing space above and below ground and that considers the limitations and attributes of the species. Street trees recommended herein should be considered first for planting in Snoqualmie Ridge II street right-of-ways. New varieties are continually being evaluated and discovered. Some trees on this list may be found to be less desirable over time because of local conditions. This list should not be considered final and will be updated periodically

LIST OF STANDARD DRAWINGS

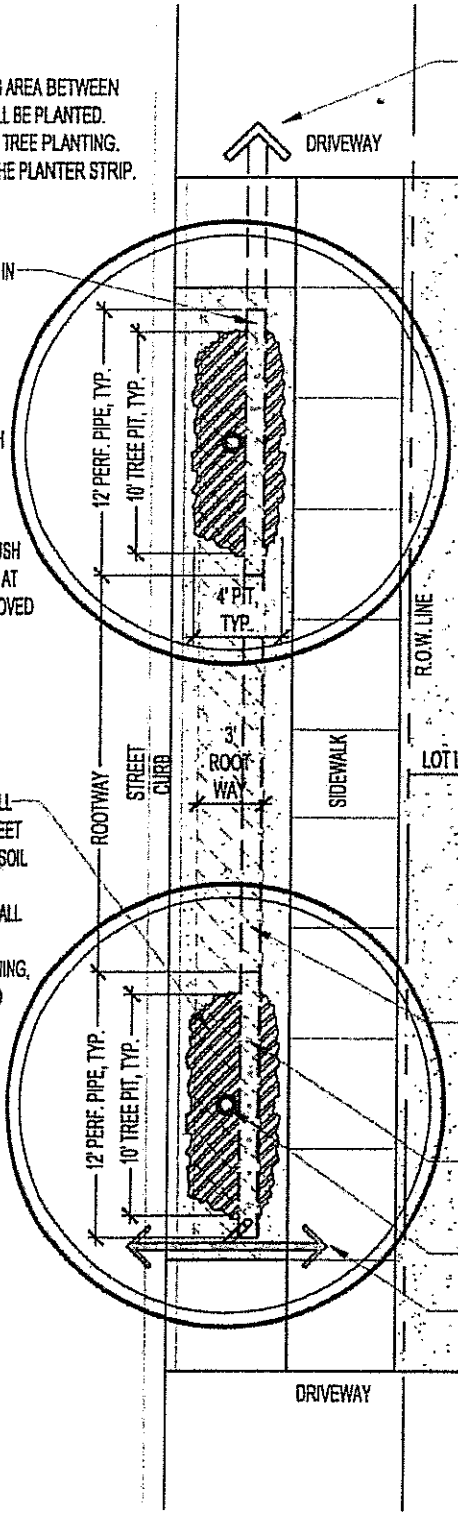
CHAPTER 8 – LANDSCAPE

TITLE	DRAWING
Street Tree Rootway Soil Preparation / Drainage Detail	8-01
Street Tree Planting and Drainage Detail	8-02
Street Tree Planting – Tree Canteen Detail for Non-irrigated Trees	8-03

1.) THE PLANTER STRIP IS THE ENTIRE PLANTING AREA BETWEEN CURB AND SIDEWALK WHERE STREET TREES WILL BE PLANTED. THE TREE PIT IS THE EXCAVATED AREA FOR THE TREE PLANTING. THE ROOTWAY IS THE LOOSENED PORTION OF THE PLANTER STRIP.

2.) INSTALL CONTINUOUS 4 INCH SUBDRAIN LINE IN PLANTER STRIP UNDER ROOTWAY AND TREE PIT, A MINIMUM 3 FEET DEEP FROM INVERT OF PIPE TO FINISH GRADE (ADJUST HORIZONTAL AND VERTICAL LOCATION AS REQUIRED FOR POSITIVE DRAINAGE). USE SMOOTH WALL PVC TIGHTLINE IN ROOTWAY AND 12 FEET OF SMOOTH WALL PVC PERFORATED PIPE IN TREE PIT. BACKFILL WITH NATIVE AROUND TIGHTLINE AND 3/8 INCH PEA GRAVEL ENVELOPE AROUND PERFORATED PIPE. INSTALL ONE CLEAN OUT FLUSH WITH FINISH GRADE AT 300 FEET ON CENTER, OR AT HIGH END OF EACH SYSTEM. CONNECT TO APPROVED STORM DRAIN OR OUTFALL.

3.) AT EACH TREE PIT, EXCAVATE AND REMOVE ALL NATIVE SOIL TO CREATE A 4 FEET X 10 FEET X 2 FEET DEEP PLANTING PIT. BACKFILL WITH IMPORT TOPSOIL OVER LOOSENED NATIVE SUBGRADE TO AVOID INTERFACE. SLIGHTLY MOUND TOPSOIL BELOW BALL FOR POSITIVE DRAINAGE. EXISTING SOIL MAY BE USED/AMENDED AS BACKFILL ONLY IF FREE DRAINING, AND ALLOWING AT LEAST 1 GALLON OF WATER TO DRAIN FROM PIT IN 4 HOURS.



4.) BETWEEN TREE PITS CREATE A CONTINUOUS ROOTWAY, IN THE CENTER 3 FEET OF PLANTER STRIP BY SCARIFICATION OF EXISTING SOIL. AVOID DAMAGE TO SUBSURFACE DRAINAGE DURING SCARIFICATION. SET SUBGRADE APPROXIMATELY SIX TO TEN INCHES BELOW FINISH GRADE. PLACE FOUR TO FIVE INCHES OF IMPORT TOPSOIL. PLACE BACKHOE BUCKET INTO SOIL 2 FEET DEEP, LIFT AND CURL BUCKET HALF WAY OUT OF ROOTWAY AND DROP MATERIAL BACK IN PLACE TO MIX NATIVE AND IMPORT. ADD ADDITIONAL TWO TO THREE INCHES OF IMPORT TOPSOIL TO FINISH GRADE AND RAKE SMOOTH.

5.) PLACE SEGMENTED ROOT BARRIER FLUSH AGAINST CURB AND/OR SIDEWALK IF REQUIRED IN DEVELOPMENT STANDARDS.

SNOQUALMIE RIDGE II

Street Tree Rootway Soil Preparation / Drainage Detail

Not to Scale

DWN	CKD	DATE	DWG
ae	maw/nph	3/21/05	8.01

1.) PLANTING IN THE PLANTING STRIPS OR ROOTWAYS SHALL NOT PROCEED UNTIL SITE PREPARATION HAS BEEN APPROVED BY THE CITY IN ACCORDANCE WITH THE DEVELOPMENT STANDARDS.

2.) PLANT 2 INCH CALIPER TREES OR LARGER.

3.) ALL TREES SHALL CONFORM TO MOST RECENT ANSI 260.1 AMERICAN STANDARD FOR NURSERY STOCK. FIRST LIMBS SHALL BE 5 FEET ABOVE GROUND OR HIGHER. NO TREES SHALL BE PLANTED UNTIL THE CITY HAS APPROVED THE NURSERY STOCK WITHIN THE DESIGNATED INSPECTION PERIOD.

4.) EXCAVATE HOLE INTO IMPORTED TOPSOIL TO 1 INCH LESS THAN HEIGHT OF ROOTBALL AND (2) TIMES WIDTH OF ROOTBALL. TAMP BOTTOM OF PIT UNDER ROOTBALL THOROUGHLY TO KEEP TREE FROM SETTLING. BUTTRESS AT THE BOTTOM OF THE PIT NO LESS THAN 3 FEET WIDE IF NEEDED TO REINFORCE LATERAL SUPPORT.

5.) DO NOT DAMAGE BALLED AND BURLAP ROOTBALLS WHEN PLANTING. REMOVE ALL WIRE, STRING AND BURLAP FROM TOP AND SIDES OF BALL ONLY AFTER PLACING IN HOLE. COMPLETELY REMOVE ALL FABRIC FROM GROWBAG TREES. CUT AND SPREAD KINKED ROOTS TO ELIMINATE ROOT CIRCLING FOR CONTAINER STOCK.

6.) SET TREE STRAIGHT AND ROOTBALL ON TAMPED SOIL. TOP OF ROOTBALL MUST REMAIN SLIGHTLY ABOVE FINISHED GRADE.

7.) BACKFILL HOLE HALF FULL WITH IMPORT SOIL AND NO AMENDMENTS. TAMP SOIL TO STABILIZE ROOTBALL. FINISH BACKFILLING AND TAMP AGAIN.

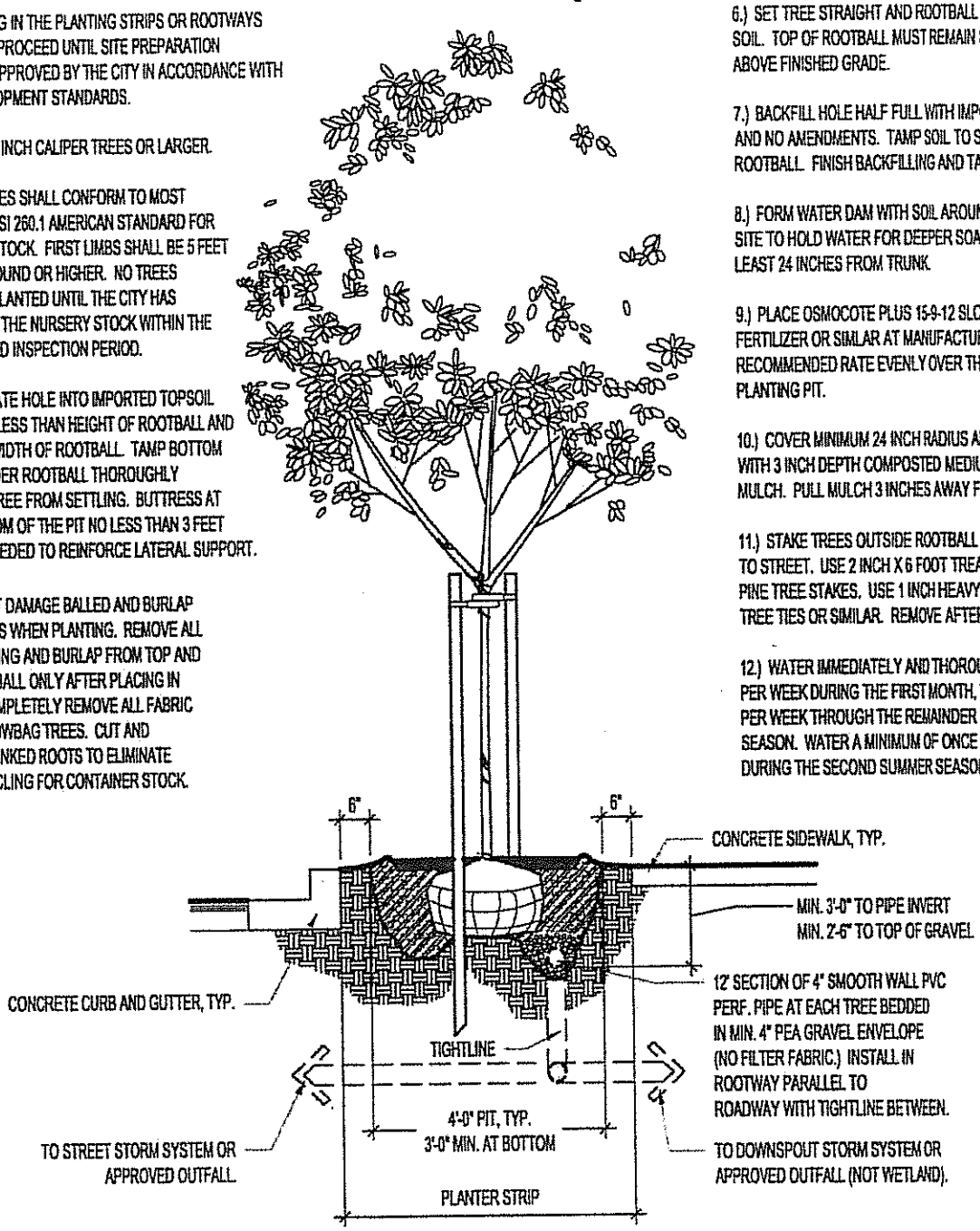
8.) FORM WATER DAM WITH SOIL AROUND PLANTING SITE TO HOLD WATER FOR DEEPER SOAKING AT LEAST 24 INCHES FROM TRUNK.

9.) PLACE OSMOCOTE PLUS 15-9-12 SLOW RELEASE FERTILIZER OR SIMLAR AT MANUFACTURERS RECOMMENDED RATE EVENLY OVER THE SOIL OF THE PLANTING PIT.

10.) COVER MINIMUM 24 INCH RADIUS AREA WITH 3 INCH DEPTH COMPOSTED MEDIUM/COARSE BARK MULCH. PULL MULCH 3 INCHES AWAY FROM TRUNK.

11.) STAKE TREES OUTSIDE ROOTBALL AND PARALLEL TO STREET. USE 2 INCH X 6 FOOT TREATED LODGEPOLE PINE TREE STAKES. USE 1 INCH HEAVY CHAINLOCK TREE TIES OR SIMILAR. REMOVE AFTER (1) YEAR.

12.) WATER IMMEDIATELY AND THOROUGHLY, TWICE PER WEEK DURING THE FIRST MONTH, THEN ONCE PER WEEK THROUGH THE REMAINDER OF THE DRY SEASON. WATER A MINIMUM OF ONCE PER MONTH DURING THE SECOND SUMMER SEASON.

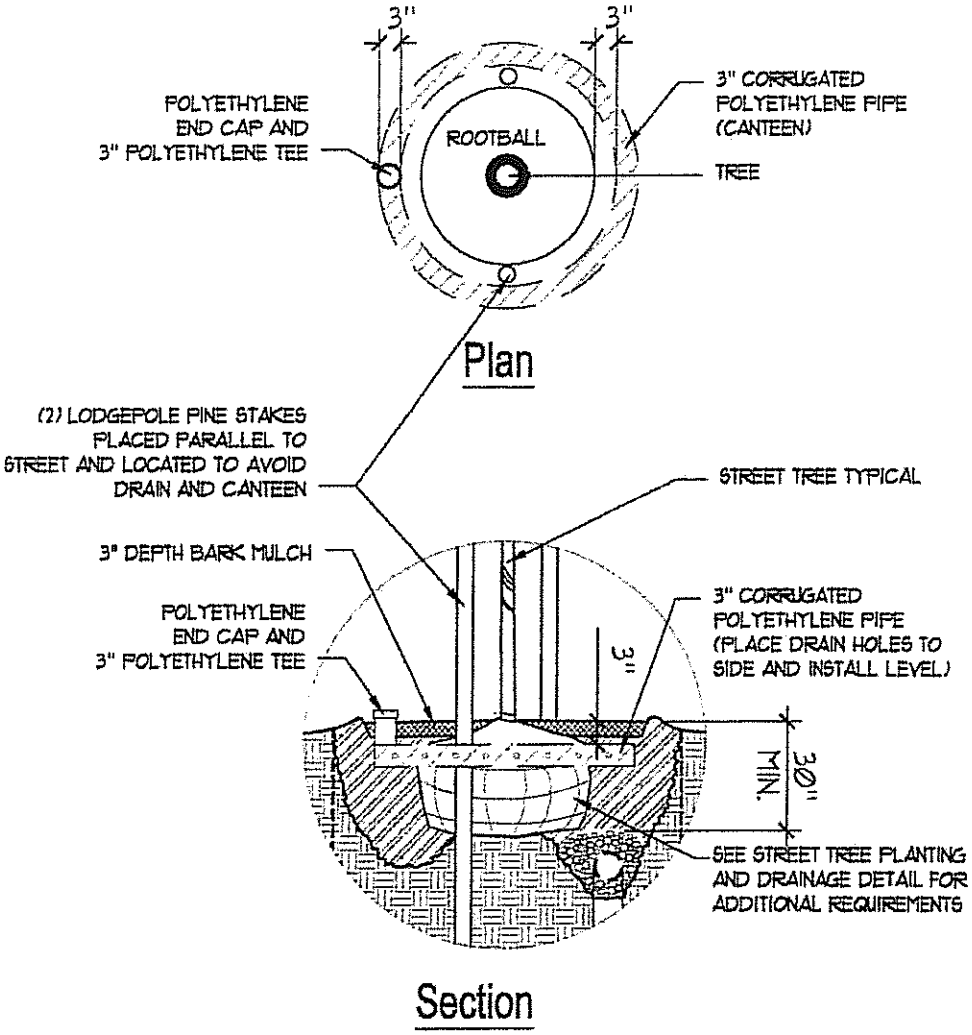


SNOQUALMIE RIDGE II

Street Tree Planting and Drainage Detail

Not to Scale

DWN	CKD	DATE	DWG
ae	maw/nph	3/21/05	8.02



SNOQUALMIE RIDGE II			
Street Tree Planting – Tree Canteen Detail for Non–Irrigated Trees Not to Scale			
DWN ae	CKD maw	DATE 3/21/05	DWG 8.03

APPENDIX 8-A

Snoqualmie Ridge II Recommended Street Tree Varieties

All trees are allowed without a root barrier unless otherwise noted.

Street Tree Categories and Spacing Requirements:

1. Small street trees to 30' in height with spreading habit – 30 ft. on center
2. Small street trees to 30' with narrow habit – 30 ft. on center
3. Medium street trees to 45' with spreading habit - 35 – 45 ft. on center (see species list)
4. Medium street trees to 45' with narrow habit – 35 ft. on center
5. Large street trees over 45' with spreading habit – 45 ft. on center

1) Small Street Trees to 30' in height with Spreading Habit

OK for under utility lines. These small street trees typically have a crown not exceeding 30 feet tall and a spreading habit. The following trees are considered small street trees and are allowed without a root barrier (unless otherwise specified) in a planting strip at least 4 feet wide, unless otherwise noted.

Flowering Crabapples

- Prairie Maid Crabapple (*Malus* 'Prairie Maid')
- Golden Raindrops Crabapple (*Malus transitoria* 'Schmidtcutleaf')
- Sugar Tyme Crabapple (*Malus* 'Sutysam')
- Everest Crabapple (Malus 'Everest')
- Others considered upon performance review.

Flowering Cherries

- Kwanzan Oriental Cherry (*Prunus serrulata* 'Kwanzan') Use Root Barrier
- Shiro-fugen Flowering Cherry (*Prunus serralata* 'Shiro-fugan') Use Root Barrier
- Cascade Snow Cherry (*Prunus* 'Berry') Use Root Barrier

Hornbeams

- American Hornbeam (*Carpinus caroliniana*)
- Japanese Hornbeam (*Carpinus japonica)*

Other Assorted varieties

- Lavalle Hawthorn (*Crataegus* x *lavallei*) with vase shape.
- Globe Ash (*Fraxinus excelsior* 'Globosa')

2) Small Street Trees to 30' in height with Narrow Habit

OK for under utility lines. These small narrow street trees typically have a crown not exceeding 30 feet tall and have a narrow growing habit. The following trees are considered small street trees and are allowed without a root barrier in a planting strip at least 4 feet wide, unless noted.

Assorted Varieties

- Red Cascade Mountain Ash (*Sorbus americana* 'Dwarfcrown')
- Adirondack Crabapple (*Malus* 'Adirondack')
- Summer Sprite Linden (Tilia cordata 'Halka')
- Marilee Flowering Crab (*Malus "Jarmin"*)

3) Medium Street Trees to 45' in height with Spreading Habit.

These medium street trees typically have a crown not exceeding 45 feet in height and a spreading habit. The following trees are allowed without a root barrier in a planting strip at least 5 feet wide and with a root barrier in a planting strip less than 5 feet wide unless noted.

Flowering Pears

- Aristocrat Callery Pear (*Pyrus calleryana* 'Aristocrat') – 40 ft. spacing
- Redspire Flowering Pear (*Pyrus calleryana* 'Redspire') – 35 ft. spacing

Maples

- Red Maple (*Acer rubrum*) (Morgan, Northwood, October Glory, Red Sunset, Autumn Flame, Autumn Spire, Brandywine, Burgundy Belle). - 40 ft. spacing
- Freemanii Red Maples (Autumn Blaze, Autumn Fantasy, Marmo and others of wide form) – 45 ft. spacing
- Queen Elizabeth Hedge Maple (*Acer campestre 'Evelyn'*) – 40 ft. spacing
- Pacific Sunset Maple (*Acer truncatum* x *A. platanoides 'Warrenred'*) - Use Root Barrier – 40 ft. spacing
- Norwegian Sunset Maple (*Acer truncatum* x *A. platanoides 'Keithsform'*) - Use Root Barrier – 40 ft. spacing
- Parkway Norway Maple (*Acer platanoides* 'Columnarbroad' as well as 'Cleveland') - Use Root Barrier – 40 ft. spacing
- Sugar Maple (Acer saccharum) (Consider other cultivars of saccharum) – 40 ft. spacing

Assorted Varieties

- Whitebeam (*Sorbus aria* 'Magnifica' and 'Majestica') – 35 ft. spacing
- Jacquemont Birch (*Betula jacquemontii*)- 40 ft. spacing
- Chinese Tulip (*Liriodendron chinense*) – 45 ft. spacing
- Kobus Magnolia (*Magnolia kobus*) – 40 ft. spacing
- Little Leaf Linden (*Tilia cordata* 'Green Spire') – 40 ft. spacing
- Worplesdon Sweetgum (*Liquidambar styraciflua* 'Worplesdon') Use Root Barrier – 40 ft. spacing
- Ruby Red Horsechestnut (*Aesculus* x *carnea* 'Briotii') – 40 ft. spacing

- Elms (*Ulmus* spp.) (any Dutch Elm Disease Resistant variety - Consider Accolade; Frontier Elm) – 45 ft. spacing

4) Medium Street Trees to 45' in height with Narrow Habit.

These medium narrow street trees typically have a crown not exceeding 45 feet and with a narrow growing habit. Some of these varieties are narrow in youth and broaden out as they mature. The following are allowed without a root barrier in a planting strip at least 5 feet wide and with a root barrier in a planting strip less than 5 feet wide unless noted.

Flowering Pears
- Capital Callery Pear (*Pyrus calleryana* 'Capital')
- Chanticleer Pear or Cleveland Select Flowering Pear (*Pyrus calleryana* 'Chanticleer' or 'Cleveland Select')

Hornbeams
- Fastigiate European Hornbeam (*Carpinus betulus* 'Fastigiata')
- Frans Fontaine European Hornbeam (*Carpinus betulus* 'Frans Fontaine')

Maples
- Karpick Maple (*Acer rubrum* 'Karpick')
- Bowhall Red Maple (*Acer rubrum* 'Bowhall')[same as Acer rubrum 'Scanlon')
- Freemanii Red Maples, (Acer rubrum x Acer freemanii) Armstrong, Celebration, Scarlet Sentinel and others.
- Emerald Queen Norway Maple (*Acer platanoides* 'Emerald Queen') Also Easy Street, Parkway, Columnar and other Norway. Use Root Barrier

Oaks
- Crimson Spire Oak (*Quercus alba* x *Q. robur* 'Crimschmidt')
- Skyrocket English Oak (*Quercus robur* 'Skyrocket')

Assorted varieties
- Fastigiate Arnold Tulip Tree (*Liriodendron tulipifera* 'Fastigiatum')
- Cardinal Royal Mountain Ash (*Sorbus aucuparia* 'Michred')
- Dawn Redwood (*Metasequoia glyptostroboides*)
- Pyramidal Dawyckii Beech (*Fagus syvlatica* 'Dawyckii')
- Princeton Sentry Ginkgo (Ginkgo biloba 'Princeton Sentry')
- Emerald Sentinal Sweetgum (Liquidambar styaciflua 'Clydesform') Use Root Barrier
- Corinthian Linden ('Tilia cordata'Corzam')

5) Large Street Trees over 45' in height with Spreading Habit.

These large street trees typically have a crown exceeding 50 feet tall and a spreading habit. The following trees are allowed without a root barrier in a planting strip at least 8 feet wide and with a root barrier in a planting strip at least 6 feet wide.

Oaks
- Pin Oak (*Quercus palustris*)
- Red Oak (*Quercus rubra*)
- English Oak (*Quercus robur*)
- Scarlet oak (Quercus coccinea)
- Northern Pin Oak (Quercus ellipsoidalis)

Maples
- Sugar Maple (Acer saccharum)
- Silver Queen Maple (*Acer saccharinum 'Silver Queen'*)

Assorted varieties
- American Beech (Fagus grandifolia)
- Tulip Tree (*Liriodendron tulipifera*)
- Bloodgood London Plane Tree (*Platanus* x *acerifolia* 'Bloodgood')
- European Beech (Fagus sylvatica)
- Elms (Ulmus)
- Monarch Birch (Betula maximowicziana)
- Horse Chestnut (Aesculus hippocastanum)
- Maidenhair tree (Ginko biloba) (select male cultivars)

APPENDIX 8-B

CITY OF SNOQUALMIE IRRIGATION SPECIFICATIONS

PART ONE - GENERAL

1.01 Scope

The irrigation systems that are to be connected to and maintained by the City of Snoqualmie Parks Department and the Snoqualmie Ridge Owners Association, is controlled by Rain Birds Maxicom Central Computer Control System. This system consists of a central computer, central control units (CCU), field controllers (ESP), flow sensors and monitors, master valves and weather station. This equipment is used to monitor and regulate water usage within the landscape areas. All future systems that will come under the supervision of the City of Snoqualmie Parks Department and the Snoqualmie Ridge Owners Association shall be compatible to this existing system and installed by a Certified Maxicom Installer. In some cases, newly installed systems can be tied into the communication cable loop with minimal work. In the cases where the new system is too far away from the communication cable loop, another CCU will have to be installed along with a communication link back to the computer. Other systems not within the above mentioned control system, will still be required to follow these standards,

It is intended that all irrigation systems shall be complete and operable for the landscape areas. Systems shall provide 100% coverage and great care must be taken to adjust spray patterns to minimize overspray onto non-landscaped areas. The Owners Representative will make final approval of all designs.

1.02 Related Standard Specifications

All sections of the standard specifications applicable to any and all parts of this project shall govern, except as specifically modified in these project specifications.

A. American Water Works Associations
B. American Society for Testing and Materials
C. State of Washington and Standards
D. National Electrical Code
E. Standard Specifications for Municipal Public Works Construction, Washington State Chapter (latest edition)
F. City of Snoqualmie standards
G. State of Washington Department of Health
H. Snoqualmie Ridge Development Standards

1.03 Permits

The Contractor at their expense shall obtain all required permits through the City of Snoqualmie.

1.04 As-Built Drawings and Layout

The Contractor shall be responsible for maintaining a current and accurate records of all equipment installed and record any deviations to the plans (all deviations to plans shall be approved by Owners Representative). As-Built records shall be updated daily on site and shall be available for review by the Owners Representative's at any time. All mainline, sleeves, quick coupling valves, automatic valves, gate valves, backflow devices, electrical splice boxes, controllers, shall be dimensioned on the As-Built drawings to two permanent monuments. Upon

completion of the system and prior to final acceptance, the Contractor shall provide the Owners Representative with a NEAT AND CLEAN, reproducible, set of As-Built drawings. The contractor shall also provide these As-Built drawings on AutoCAD (Release 12) generated computer disc. Coordinates shall be based on the Washington State grid. After acceptance of the As-built irrigation drawings, the Contractor shall place a reduced, non-fading, laminated copy, inside of the controller cabinet door.

All system layout shall be done by the Contractor and is subject for review by the Owners Representative.

1.05 Maintenance Manuals

The Contractor shall provide four (4) sets of the following, in three-ring binders with sections indexed and tabbed.

A. Guarantee / Warranty certificates for all equipment used and Contractors written one (1) year guarantee / warranty for entire system.
B. List of authorized distributors and service representatives for each item of equipment used, including names, addresses, and phone numbers.
C. Instruction manuals for all equipment used.
D. Parts lists and exploded views showing part numbers of each item used.
E. Winterization and Spring start-up procedures.
F. Controller wire color code chart.
G. Detail drawings of areas that were unable to be included on the As-Built drawings.

1.06 Submittals

Proposed plans and equipment cut sheets shall be submitted to the City for approval. The Contractor is to submit four (4) copies of each. Design shall include verification that adequate water volume and pressure is available to properly operate the system. Results of on site tests or copy of site engineer statement shall accompany the plans.

1.07 Inspection

The Contractor shall verify underground utilities locations within the site. Care is to be taken to avoid damage to any existing utilities and plants. Contractor should contact Utility Locate at 1-800-424-5555 in advance of any digging to have existing utilities located and marked on site. The contractor is responsible for any damage that is cause.

1.08 System Protection

As part of the warranty, the Contractor shall be responsible for winterizing the irrigation system prior to the onset of the freezing season. The Contractor will also be required to reactivate the system in the spring season. Each event must be accomplished within the one-year maintenance period. The Contractor will notify the Owners Representative in writing (with at least 72-hrs. notice) when this work will be performed. Winterizing and Spring start-up shall be done in the presents of the Owners Representatives maintenance staff. The Contractor will be liable for all damages resulting from failure to comply.

1.09 Spare Parts

The Contractor shall provide to the Owners Representative the following items as spare parts at no additional cost.

A. Four sets of Controller cabinet keys.
B. Two sets of Quick Coupling keys with hose swivels.
C. Two manual gate valve keys.
D. Two of each type and size of head used on the project.

1.10 **System Operation**

Prior to final acceptance, the Contractor shall schedule a training session with the Owners Representatives staff for orientation of the operation and winterization of the system. The Owners Representative will be informed of this session in writing at least 72 hours in advance.

1.11 **Final Approval**

Upon completion of all test, receipt of acceptable As-built documents, receipt of all Maxicom documents and test results, spare parts, training session, signed and approved permits, and substantial completion approval from the Owners Representative.

2.00 **PRODUCTS**

2.01 **Polyvinyl Chloride Pipe and Fittings**

Mainline piping shall be Schedule 40, bell end pipe, conforming to ASTM D 1785. Lateral line piping shall be Class 200, bell end pipe, conforming to ASTM D 2241. Pipe shall be marked with manufacture's name, class of pipe, NSF seal, and date of manufacture run. Interior and exterior walls shall be uniform, smooth, and glossy. There shall be no evidence of extrusion marks. Areas utilizing potable water connections shall use standard white PVC pipe.

Risers on swing assemblies shall be Schedule 80, standard threads on both ends, conforming to ASTM D 1784.

PVC fittings shall be Schedule 40, conforming to ASTM D 2466.

2.02 **Pipe Thread Compound**

All male pipe threads shall be wrapped at least three times and not more then four times with Teflon tape. A thin coat of virgin Teflon paste shall be applied on top of the Teflon tape prior to application. Teflon paste shall be Rector Seal T+2 or equal.

2.03 **PVC Solvent Compound**

Shall be "Weld-On" P-70 purple and 711 heavy body gray cement.

2.04 **PVC Pipe Sleeves**

Pipe sleeves shall be twice the size of the pipe going into it. No more then one pipe is to be installed in each sleeve. Sleeves 6" and larger shall be Class 200. Sleeves 4" and smaller shall be Sch 40. A separate sleeve will be installed for control and communication wires.

Any sleeve to be installed under roadway pavement shall be Sch 40, sized to print.

2.05 **Sprinkler Heads**

Lawn spray head shall be Rain Bird 1806 or equal.
Landscape spray head shall be Rain Bird 1806 or 1812 or equal.
Bubblers for tree wells shall be Rain Bird 1300A-F or equal.
Lawn rotors shall be Rain Bird 3500, 5000 or 7000 PC or equal.

All heads shall have screens under the nozzle. All spray heads shall be equipped with an internal pressure regulator to prevent misting and fogging. The heads shall be equipped with a check valve to prevent low head drainage where required. The check valve shall hold back-pressure equivalent to 10 foot of head.

2.06 **Quick Coupling Valves**

Quick Coupling Valves that are installed on a "POTABLE WATER" supply shall be a Rain

Bird 44 LRC with a yellow vinyl locking top.

Quick Coupling Valves shall be located in 10" valve box, mounted on prefabricated SCH 80 swing assembly with "O-Ring" fittings as manufactured by Spears Manufacturing or Lasco Manufacturing.

Provide Owners Representative with two 2049 cover keys, two 44DK quick coupling keys and two SH-1 hose swivels with this project as part of the spare parts requirements.

2.07 Automatic Control Valves

Sizes shall be indicated on the drawings. Valves shall be Rain Bird PEB series, 24v, or Rain Bird PEB - PRS series with pressure regulator, 24v, automatic valves as indicated on the plans. Valves shall be of glass-filled nylon construction, normally closed, with flow control handle, internal bleed, 200 psi-rated. All valves shall be tagged with its controller and station zone number using a white plastic tag and permanent marker pen.

2.08 Gate Valves

Sizes shall be indicated on the drawings. Mainline isolation gate valves shall be the same size as the Mainline. Mainline isolation gate valves shall be Kennedy 4057 or approved equal. The valve shall have a 2" square operating nut, standard threaded ends, resilient seat, non-rising stem. The body of the valve shall be constructed of cast iron and all internal parts shall be accessible without removing the body from the line. The valve shall have a working pressure of at least 200 psi.

2.09 Backflow Preventer

Shall be Febco 805Y or equal for units 2" inches and smaller. Shall be Febco 850 or equal for units 3" inches and larger. All backflow devices installed, shall be listed on the current AWWA approved list. After installation is completed and before system is put into service, the backflow device shall be tested by a certified backflow technician.

2.10 Point of Connection Vault

Where the systems requires a 2" or smaller Double Check Assembly, the assembly will be installed into a Carson 1324-15 or equal.

Where the system requires a 2-1/2" or larger Double Check Assembly, the assembly will be installed into a concrete utility vault with an adjustable steel lid, such as Utility Vault Company 25TA. Drill a one (1") inch drain hole in the floor of the vault, in each corner.

2.11 Valve Boxes

Shall be a combination of polyolefin and fibrous material with a green lid. Extensions may be required to bring the valve box to the proper level. Valve boxes for gate valves shall be Ametek Roadway base No. 111050 with a Carson 910 on top per detail. Quick coupling valves and wire splices shall be Carson 910 pit. Valve boxes for automatic control valves and Communication Cable splices shall be Carson Standard 1419-12 with locking lid. Install only one valve per valve box. See Details.

2.12 Control Wires

For automatic control valves #14 single strand copper wire designed for 24 - 50 volts and shall be UL approved for UF (underground feeder) . UL and UF designations must be clearly marked on the insulation jacket of the wire. Copper conductor must exceed ASTM B-3 specifications. The white colored wire will always be the common and the yellow colored wire will always be the spare leads. The red colored wire will be the primary hot lead for small systems and for large systems refer to the detail drawing sheet for the wire color chart. A separate white common wire

shall be supplied to the master valve. Not, under any circumstance, will a "Doubler" or "Spliter" be allowed on the system.

All cable required for the 2-wire paths for each Cluster Control Unit out to the Field Satellites (ESP-SAT) shall be PE89- 19 gauge- 12 conductor (6 pairs) twisted pair, shield cable suitable for underground burial. PE89 cable shall also be used between the flow sensor and the flow monitor located in the controller cabinet.

2.13 Controllers

Irrigation system satellites, where indicated on the drawings, shall be Rain Birds model number ESP-SAT (12, 16, 24, 32, or 40 stations). The satellite shall be a microprocessor based micro-electronic solid-state type, capable of fully automatic, semi-automatic and manual operation.

The ESP-SAT shall have a durable, heavy duty, metal cabinet with backed epoxy coated enamel finish complete with a sponge rubber gasket door having a key operated lock and suitable for wall mounting.

The satellite shall operate on a minimum of 117 VAC power input. It shall be capable of operating up to eight 5.5 VA 24 VAC electric remote control valves plus a master valve. The controller shall have an electronic circuit breaker capable of detecting faults and taking action on individual stations, to protect it from surge damage.

Under normal operation, all station timing of the satellite unit, shall be done by the central control computer through the Cluster Control Unit (CCU) and not according to the times programmed at the satellite. The programming on the satellite unit itself shall only be functional during back up mode when the link between the satellite and the computer has been interrupted.

2.14 Remote Testing Equipment

All controllers shall be equipped with a 01060 Receiver Card to receive their model TRC2-32 receiver for field testing the irrigation system.

2.15 Cluster Control Unit

Shall be able to operate up to 6 or 28 channels (CCU-6 / CCU28) of either field satellites or decoders. The CCU shall be a microprocessor based, micro-electronic, solid-state circuitry device for storing and implementing the commands downloaded from the MAXICOM Central Control System computer. The CCU shall also be capable of storing in memory a log of field events which will uploaded to the central computer. Communication link options to the central computer shall include Direct Connect communication cable, fiber optics, standard telephone, cellular phone, point-to-point radio (450mhz), or trunking radio (800mhz).

The CCU shall be a single unit containing asynchronous communication connections, a phone modem and the encoder module. The CCU shall utilize a single two wire output through the terminal strip with an in-line resettable circuit breaker. The two-wire communication signal shall be low voltage (26.5 VAC).

The CCU shall require 117 VAC power supply for the internal transformer. The CCU shall maintain its memory even during power outages with a 100 year lithium battery backup system. The CCU units shall have a heavy duty, metal cabinet with baked epoxy coated enamel finish. The door shall have a sponge rubber gasket and a key operated lock. The cabinet shall be suitable for wall mounting.

A two wire path shall be used to communicate from the CCU to the field satellites and the

sensors. This two wire path shall also be used to communicate a feed-back signal, used by the CCU t verify and log in memory all satellite and decoder activity. This two wire communication link shall be of the wire type hereinafter specified and installed and tested as specified in section 2.13 and 3.09.

2.16 Outdoor Controller Cabinet

Shall be a Strong Box model SB-24-CR/120v steel enclosures. The cabinet shall be mounted on a concrete base model 32-32-18, per detail. The exterior color shall be Hunter Green (O'brien powder coat No. PFG509S8055). The interior of the cabinet shall be powder coat Sky White (No.PFW510S9).

The load center shall be a Square D 70 AMP Main lug 1 phase with 120/240 VAC catalog No. QO2-4L70S. It shall be equipped with 3 each 20 AMP 1P branch breakers. The meter base shall be a 100 AMP 4 jaw meter base Milbank No. U3504. The load center side of the cabinet shall have one 15 AMP / 120 VAC duplex GFI receptacle.

It will be the owners responsibility to provide the power provider with access to the power side of the cabinet when required.

2.17 Electrical Tape

Shall be black plastic, 3/4" wide, a minimum of 0.007 inches thick, and all weather type.

2.18 Electrical Wire Splices

Automatic control valve wire splices shall be 3M DBY, or approved equal. All splices shall be within a valve box. At each splice, the wire is to be tagged with a non - fading plastic maker with the zone number permanently marked on the tag. This tag must also be included at the control valve itself. No "Doubler" of any kind will be allowed.

Splicing of the PE89 cable shall be done with following equipment. When connecting to a Flow Sensor, model 8006317 Ranger Seal Closures shall be used. When there are only two cables to be spliced, model 8006039 Super Serviseal Closures shall be used. When there are three or four cables to be spliced model 8006318 Blackjack Closures shall be used. All splicing shall be done within a valve box. All splices boxes must be numbered and indicated on the As-Built drawings.

2.19 Drain Rock

Shall be 5/8" washed pea gravel.

2.20 Manual Drain Valve

Shall be a B&K Model 75K 1/2" brass globe valve with a replaceable rubber seat.

2.21 Electrical Conduit

This specification pertains only to low voltage wiring and communication cable. All 110v power specifications are referred to the Electrical Section.

Conduit above finish grade shall be rigid galvanized steel with zinc protected threads. Fittings shall be of the same material with hot dipped galvanized finish. Conduit within a building shall be EMT where permitted by Code. Fittings shall be suitable for this product.

Conduit within the ground shall be Schedule 40 rigid PVC. Fittings shall be suitable for this product.

Conduit for the maxi communication cable where it is not buried with the mainline shall be Sch 40 gray PVC, 1 1/4" in size, with manufactured sweeps. Any run over 400 feet will require

a pull box in the middle of the run or every 400 feet. Pull boxes shall be Carson 1419-12 with "IRRIGATION COMM WIRE" on the lid.

All equipment furnished and installed shall be in accordance with National, State, and City Electrical Codes, established safety codes and applicable local codes and ordinances.

3.00 INSTALLATION

3.01 Trench Excavation and Backfilling

Lateral line piping shall have a minimum of 12" inches of cover in all areas. Backfill cover for Main line shall be 24" inches in all areas. When two or more pipes are installed in the same trench, a minimum four inch separation between pipe is required. Backfill material shall be free from 2" and larger rocks and other foreign materials. All pipe 6" and larger shall be shall be backfilled with sand for the first 12"inches. In refilling the ditch line, soil shall be replaced in 12" lifts and thoroughly compacted mechanically to 90% density at optimum moisture content. Trench lines shall be backfilled even with the existing subgrade. All excess excavated materials, rocks, and roots shall be disposed of properly as directed by the Owners Representative. Contractor is responsible for any settlement of the trench line during the warranty period.

In the event that the soil conditions are very rocky, it will be required that the bottom of the ditch be lined with 4" inches of sand and the first 10" inches of backfill will be sand. The final layer of backfill material must still be free of 2" and larger rocks and other foreign materials. The Owners Representative shall determine the need for sand.

Refer to installation detail

3.02 PVC Pipe and Fittings

All ends to be joined with solvent weld chemicals shall be wiped clean and be free of all dirt and moisture. All cuts of pipe shall be at 90 degrees and cleaned of all burrs prior to applying any solvents. PVC primer shall be applied lightly on both the interior of the fitting and the exterior of the pipe. PVC cement shall be applied lightly on the interior of the fitting and a slightly heavier coating on the pipe. Excess cement shall be wiped from the pipe. No backfilling will be permitted other than at center of pipe lengths until testing has been completed.

Solvent weld joints shall be given at least 15 minutes to set up before moving or handling. Pipe shall be center-loaded to prevent arching and slipping. Water shall not be permitted into the pipe for a minimum of ten (10) hours to allow for solvent weld setting and curing. Before any pressure testing, solvent weld joints shall have a minimum of twenty four (24) hours curing time.

No PVC pipe may be threaded or connected to a threaded fittings without an adapter.

Great care shall be taken in keeping the interior of the pipe clean. Any pipe end not being worked must be protected and not left open.

3.03 Sprinklers

Sprinkler head spacing shall not exceed the spray pattern of the nozzle that has been installed. At no time shall the spray pattern be intentionally designed or installed to spray on to non-landscaped areas, such as sidewalks, streets, ect. Backfill around heads shall be approved native or top soil, well compacted. Sprinklers shall be installed flush with sidewalks and curbs and no closer than four (4") inches from paved or concrete edge. All popup heads shall be equipped with a check valve to prevent low head drainage of up to ten (10) foot of head where required. All heads shall be set perpendicular to finish grade unless otherwise specified on the plans. Sprinklers shall be installed on three point marlex swing assemblies or a flex swing pipe

assembly.

Sprinklers within a shrub bed area shall have a minimum of six (6") inch popup height. The maximum spray pattern within a shrub bed area shall be twelve (12') feet radius.. Sprinklers installed with in the interior of the bed area shall be installed three (3") above finish grade, after top mulch. Sprinkler heads on ridged, above ground risers will not be allowed.

Sprinklers within a lawn area shall have a minimum of a six (6") inch popup height. Heads with in the lawn areas shall be installed 1/2" inch above finish grade.

Thoroughly flush lines before installing sprinkler heads.

Refer to installation details.

3.04 Quick Coupling Valves

Shall be installed on a prefabricated swing assembly with o-ring fittings such as Lasco model number G172-100 or Spears model number 5905-01000. Quick Coupling Valves shall be installed a maximum thirty-six (36") inches and a minimum of twelve (12") inches from pavement or lawn edge. The maximum distance from the top of the quick coupler to the top of the valve box shall be three (3") inches. The valve shall be installed inside a Carson 910 round valve box. Care must be taken to prevent excessive water backup within the valve box. A ten (10") inch layer of washed 5/8" gravel shall be placed in the bottom of the valve box, incased in a layer of Geotextile fabric.

Thoroughly flush lines before installing Quick Coupling Valves.

Refer to installation detail.

3.05 Automatic Valves

Before installation of automatic valves, the mainline shall be flushed and pressure tested. Only after Owners Representative has certified that the main line has passed (see Testing section) shall the automatic valves be installed. Install only one valve per valve box. Use Sch 80 TOE nipple and Sch 40 fittings and pipe from the mainline to the valve. On the outlet side of the valve, install a PVC male adapter and a Slip Fix fully extended. Use valve box extensions to insure that the box extends at least ten (10") inches below the bottom of the valve. The maximum distance from the flow control handle to the top of the valve box shall be six (6") inches. The valve shall be installed inside a Carson 1419-12 valve box. Care must be taken to prevent excessive water backup within the valve box. A ten (10") inch layer of washed 5/8" gravel shall be placed in the bottom of the valve box, incased in a layer of Geotextile fabric. Group valves where practial. Locate valve boxes twelve (12") inches from and perpendicular or parallel to walk edge, building and walls. Provide (18") between boxes where valves are grouped together.

Refer to installation detail.

3.06 Gate Valves

Shall be installed at main line depth. Gate valves shall have a two (2") inch square nut operating nut. Valves will be installed in a plastic roadway valve box, topped with a Carson 190 valve box with locking lid. Care must be taken to prevent excessive water backup within the valve box. A ten (10") layer of washed 5/8" gravel shall be placed in the bottom of the valve box, incased in a layer of Geotextile fabric.

Refer to installation detail.

3.07 **Backflow Device**

Shall be installed in accordance with local plumbing code, and as shown on details.. The vault shall be installed no closer then eighteen (18") inches and no more than thirty-six (36") inches from pavement edge. All fittings within the point of connection vault shall be brass, copper or galvanized steel. Care must be taken to prevent excessive water backup within the vault. A ten (10") layer of washed 5/8" gravel shall be placed under the vault, incased in a layer of Geotextile fabric. Adequate distance from all sides must be maintained for annual testing.

Where the systems requires a 2" or smaller Double Check Assembly, the assembly will be installed into a Carson 1324-15 or equal.

Where the system requires a 2-1/2" or larger Double Check Assembly, the assembly will be installed into a concrete utility vault with an adjustable steel lid, such as Utility Vault Company 25TA. Drill a one (1") inch drain hole in the floor of the vault, in each corner.

Contractor will be responsible to have the double check tested and certified after it has been installed, by a qualified backflow technician.

Contractor will be responsible for all required permits and permit fees.

Refer to installation details.

3.08 **Communication Cable**

Cable for the 2-Wire Path between the Satellite Controllers, CCU, Flow Sensors, and the Central Computer shall be installed with absolutely no buried splices. Any and all splices must be in a Carson 1419-12 valve box for easy access. When splices are required, great care must be taken to maintain twisted pair continuity.

All cable shall be laid in trenches ("Pulling-In" of cable will not be allow) and shall be carefully back-filled with rock free soil or sand. Cable will be installed along side of pipe.

Conduit for the maxi communication cable where it is not buried with the mainline shall be Sch 40 gray PVC, 1" in size, with manufactured sweeps. Any run over 400 feet will require a pull box in the middle of the run or every 400 feet. Pull boxes shall be Carson 1419-12 with "IRRIGATION COMM WIRE" on the lid.

3.09 **Automatic Controllers**

All field controllers and related field monitoring equipment shall be installed on the mounting panel within the Skyline or equal enclosure. The field controller shall be installed on the upper portion of the panel for ease of adjustments. The other required equipment for the required location, shall be properly mounted onto the panel for easy access. Wiring within the enclosure shall be in a neat and orderly manner. 4" wire ways shall be used to route wires within the enclosure. Exposed wires shall be strapped or channeled in such a way that they can be easily traced.

When mounting the field controller, adequate space for the Remote Control Receiver is required on one side of the controller case. Adequate space is also required to fully extent the antenna of the receiver. Antenna to be installed outside of cabinet.

All 120 vt. connections within the controller enclosure are subject to local electrical codes and permitting. All 120 vt. wiring shall be done by a licensed electrician. All low voltage

wiring may be installed and connected by the irrigation contractor.

Contractor will be responsible for all required permits and permit fees.

Refer to installation details.

3.10 Cluster Control Unit

The Cluster Control Unit shall be housed in the same enclosure as the Automatic Controller. A dedicated phone line shall be provided via standard connector model RJ11C to the location on the mounting panel shown on the detail drawings. Confirm location with the Owners Representative.

Install a MSP-1 surge arrestor wired into the 2-wire path per the manufactures' specifications with ground wires run to a three (3)rod grid copper grounding network. Three (3) 5/8" diameter copper clad rods 8' feet long arranged in a triangle at least 8' feet apart and tied together underground with #10 or larger bare copper wire. The ground wire shall continue to the ground terminal of the CCU terminal strip to complete the grounding network. The grounding network shall measure 5 OHMS or less when measured with a Vibra-Ground instrument. Written results of the grounding test shall be submitted to the Owners Representative prior to final acceptance.

3.11 Flow Sensors

Shall be Rain Bird model FS-XXX-P, (-150- for 1 ½"sized to be one size smaller then the mainline. Flow Sensor shall be installed in a Carson 1419-12 standard valve box. Wire connections shall be made with Ranger Serviseal Closure No. 8006137 connectors. Care must be taken to prevent excessive water backup within the valve box. A ten inch (10") bed of 5/8" washed drain rock shall be placed under the flow sensor.

Refer to installation details.

3.12 Remote Control Device Connector

Install connector wires to controller stations and connector base to outside of controller case. Care must be taken to ensure easy connection and disconnection of the TRC receiver and to allow full extension of antenna. 01060 Receiver Card shall be installed inside the Controller.

3.13 Pressure Testing

Before any testing, all piping shall be thoroughly flushed. No automatic valves shall be connected to the main line prior to testing. Center loading the pipe is permissible, but all pipe end joints, fittings, gate valves, and automatic valve stub outs shall be exposed for inspections during the pressure test.

Main lines shall be filled from the point of connection until all air is removed from the main line. All main line pipe, fittings, and gate valves shall be subjected to a hydrostatic pressure test of one hundred fifty (150) psi for one (1) hour. The maximum allowable pressure drop shall be five (5) psi within one (1) hour with no more then a one gallon recovery.

Lateral lines shall be tested at line pressure. All swing joints shall be capped. All pipe end joints, fittings, and swing joints shall be left exposed for inspection. Prior to inspection, lines shall be filled and all air removed from the line. Inspection of lateral lines will be visually.

Rejected systems or portions thereof shall be repaired and re-tested as specified.

Contractor shall furnish all equipment, materials, and labor for all testing. The Contractor shall notify the Owners Representative at least seventy-two (72) hours prior to the test so an inspector may witness the test.

3.14 Performance Test

Upon completion of the system installation and after the flushing and pressure testing have been completed, the Contractor shall operate the system in the presence of the Owners Representative. Systems shall be tested for manual, semi-automatic, and automatic operation and shall be checked for proper coverage. Excessive water on non-landscaped areas will be checked carefully. Check operation of Owners Representative-provided Remote Control Device.

After the system performance test, the Owners Representative may request up to five (5) percent of the total nozzles to be substituted at no additional cost.

3.15 Maxicom Programming Data Requirements

The following data is required from the installing contractor so that the Central Control Computer can monitor the irrigation system: (See sample data sheets)

- Data basing the system will be installing contractors responsibility.
- Actual flow/gpm data for each irrigation zone. This data must be actual running flow from the flow monitor and not design estimates.
- Precipitation rates for each irrigation zone. Precipitation must be calculated using standard industry formats.
- Type of heads on each zone and what is it watering, example: spray or rotor; lawn, or shrub beds etc.
- Number of zones / stations active on the Irrigation Controller.
- CCU type: 6 channel or 28 channel
- Telephone Number or Radio Frequency for communication between the CCU and the Central Control Computer.
- Type of devices and decoders on systems.
- Size and type of Water Source.
- Size of Irrigation Controller.
- Verification of good communication path between all devices: Flow Sensor – Flow Monitor – CCU- Central Control Computer.
- Tracer wire to be installed on main lines and laterals – Tracer wire laid on top of pipe with caution tape.

3.16 Maxicom Installation Checklist

The following is a minimal checklist of items to for proper installation of the Maxicom equipment. The contractor is responsible that all installed components of the system are properly installed per manufactures' specifications and tested by an certified Maxicom Technician.

Pipe Installation

- Check proper unobstructed piping before and after the flow sensor installation (see detail)
- Check proper tap for flow sensor installation
- Check direction of flow and direction of flow sensor
- Check depth of flow sensor in pipe
- Check installation of valve box and wash gravel for finish grade height and clearance
- Check for proper splice kits at splice locations and at the flow sensor

Mechanical and Electrical – Pulse Transmitter & Decoder:

- Check for proper clearance
- Proper electrical conduits, wiring, and service per local codes
- Proper wire sizes/type and grounding components
- 12VDC power supply to pulse output transmitter
- Blue/Blue White decoder wires to pulse transmitter
- Red/Black decoder wires to communication cable path

Settings

- Pulse transmitter calibration (refer to manufacture's installation guide for details)
- Decoder Channel Identification Switch settings

Testing

- Check for power to pulse transmitter – 12VDC
- Check signal from sensor to pulse transmitter
- Check LED's in pulse transmitter for proper operation
- Check single from pulse transmitter to decoder
- Check Communication Cable signal at each device location
- Check telephone/radio connections for proper communication paths
- Check signal from Central Computer to CCU for proper communication paths
- Check operation from Central Computer

3.17 **Clean-up**

The contractor is responsible for maintaining a clean and safe working environment throughout the project site. Regular policing of the project site of trash and project debris will be required. The disposal to all trash will be the contractors responsibility.

CHAPTER 9

9.000 BUFFERS

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Approved: AB#04-172 11/8/04 Attest: Jodi Warren/CMC City Clerk

CHAPTER 9

9.000 BUFFERS

9.010 General

Existing land use/ownership/development patterns along the perimeter of Snoqualmie Ridge II, and the future developed conditions along the Snoqualmie Parkway require different types of landscape buffer treatment or standards. Two types of buffers are addressed in this chapter: Perimeter Buffers and Parkway Buffers. Perimeter buffers provide a benefit to adjacent property owners whose property is outside city limits and is more rural in nature. They provide screening of new homes and a transition between urban and rural levels of development. Parkway buffers are intended to soften the visual impact and create separation between residential development and Parkway traffic. See Chapter 9, Exhibits 1-6 for Perimeter and Parkway buffer locations, dimensions and planting specifications and details as defined by Mixed Use Final Plan Attachments "D" and "E" (Perimeter and Parkway buffers, respectfully).

All buffers shall be provided within the boundaries of the Snoqualmie Ridge II project. Buffers within Snoqualmie Ridge II shall be placed within tracts associated with the adjacent Snoqualmie Ridge II development parcel. Alternatives to tracts such as easements may be considered if the ongoing function of the buffer will not be impaired.

9.011 Use of Buffers

Buffers should be left undisturbed except for clearing of hazardous or diseased trees identified by the City's arborist when necessary for safety, the placement of utilities, construction of the landscape berm specified in Exhibits 1-4 (MUFP Attachment D), or at such time where it is required for future public right-of-way. No trees shall be removed from the buffer for residential construction. Existing underground utilities may also be located within buffers; however, the buffer may not be used as a corridor for new underground utilities. Trails shall not be located within Parkway or Perimeter buffers, provided, the City may approve limited trail crossings through perimeter buffers to provide connections to adjacent rural area roadways. (See Mixed Use Final Plan Condition No. 3.5)

9.012 Buffer Landscaping

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In general, the landscaping of perimeter and parkway buffers will maintain, as much as possible, a natural wooded character. Plantings within the perimeter buffers should not create a wall between neighbors, but a natural wooded transition. Gentle grading may occur for the creation of landscaped berms which enhance the screening of Snoqualmie Ridge II and adjacent properties and roadways. New trees and understory plants will be predominantly native and reflect the composition of the existing species in the buffers. Grading and planting within the Perimeter and Parkway buffers shall be consistent with the buffer plans, sections, specifications and planting details in Mixed Use Final Plan Attachments D and E. (See Chapter 9, Exhibits 1-6)

9.013 Review of Buffers

Specific buffer plans shall be reviewed by the City as part of the review of a development proposal for the adjacent parcel. Except for soft surface trail standards, this chapter does not apply to wetland, stream or steep slope buffers.

9.014 Ownership and Maintenance of Buffers

Ownership and maintenance of the perimeter buffer along the Lake Alice Road shall be as set forth in condition 3.4 of the Mixed Use Final Plan for SRII. All other buffers shall be entirely within separate buffer tracts to be owned by the City.

9.020 Lake Alice/Snoqualmie Ridge II Buffer

The purpose of this buffer is to effectively screen to the degree practical new development on Snoqualmie Ridge II from the adjacent Lake Alice development. A one hundred and twenty five to one hundred and fifty-foot buffer shall separate Snoqualmie Ridge II Neighborhood Residential development from the Lake Alice development. Existing vegetation outside of berms, consisting of native trees and understory, will remain and be left to mature naturally. Where necessary, the existing vegetation will be infilled according to the SRII Buffer plan. (Exhibits 1 and 2 to this chapter)

9.030 West Line of Section 36

The purpose of this buffer is to screen development on Snoqualmie Ridge II from the Snoqualmie Hills Planning Area to the east. The landscape buffer shall comply with Conditions 3.1 through 3.5 and Attachment D of the Mixed Use Final Plan for SRII. (Exhibit 3 to this chapter)

9.040 Parkway Buffer

The purposes of this buffer are to separate and screen residential development from the Parkway, and to preserve the existing vegetated character of the entrance to the City (see Mixed Use Final Plan Condition No. 3.7). To achieve these purposes the buffer shall comply with Condition 3.7 and Attachment E of the SRII

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Mixed Use Final Plan for SRII. (Exhibits 5 and 6 to this chapter)

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LIST OF STANDARD DRAWINGS

CHAPTER 9 – BUFFERS

TITLE	DRAWING
Perimeter Buffer Plan – North Property	Exhibit 1
Perimeter Buffer Sections – Lake Alice Road	Exhibit 2
Perimeter Buffer Plan – South Property	Exhibit 3
Perimeter Buffer Specifications and Planting Detail	Exhibit 4
Snoqualmie Parkway Buffer Plan and Sections	Exhibit 5
Snoqualmie Parkway Buffer Plan and Sections	Exhibit 6

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Snoqualmie Ridge II

The Quadrant Corporation

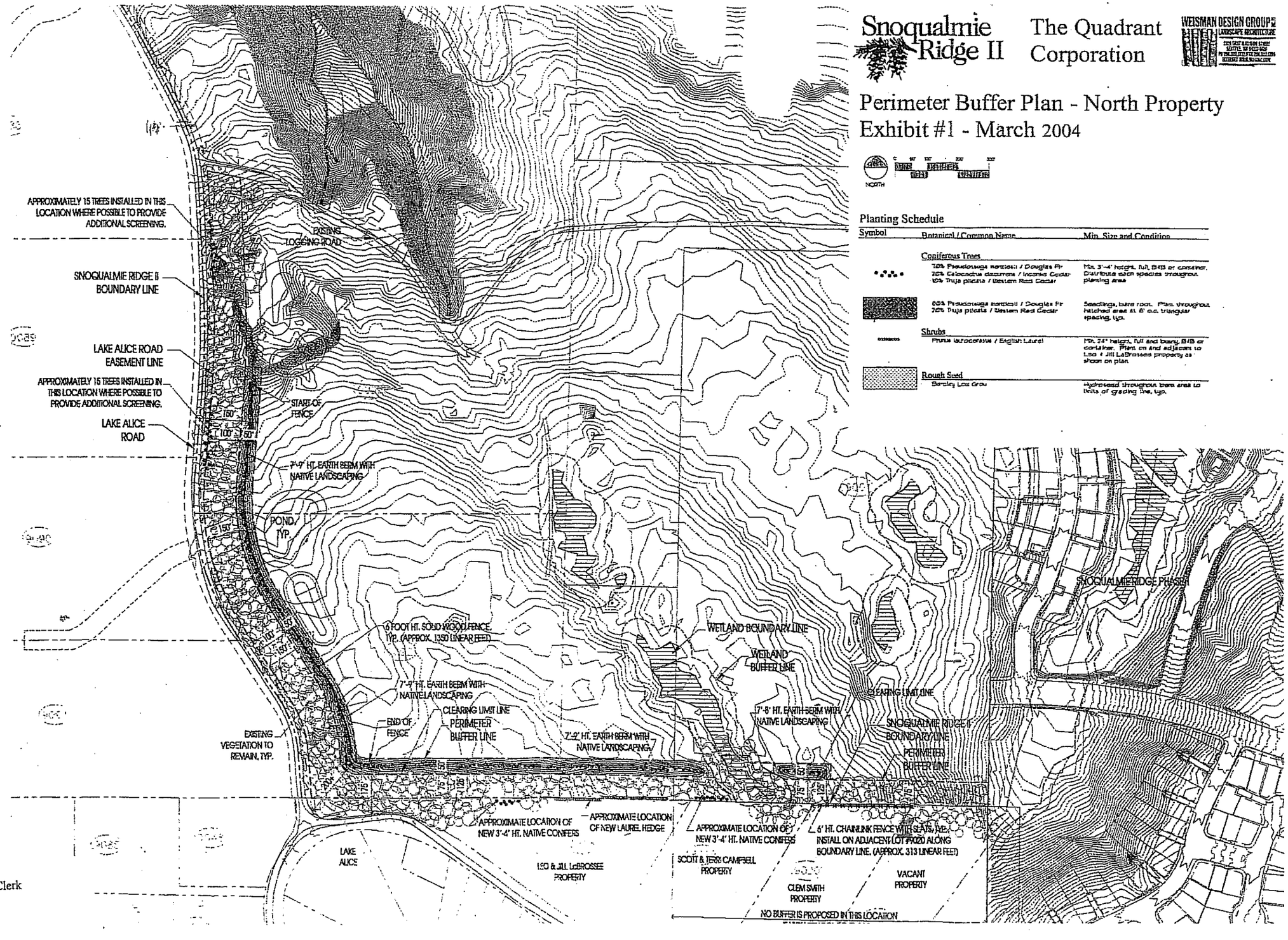
WEISMAN DESIGN GROUP INC LANDSCAPE ARCHITECTURE

Perimeter Buffer Plan - North Property
Exhibit #1 - March 2004

NORTH

Planting Schedule

Symbol	Botanical / Common Name	Min. Size and Condition
	Coniferous Trees	
	70% Pseudotsuga menziesii / Douglas Fir 20% Calocedrus decurrens / Incense Cedar 10% Thuja plicata / Western Red Cedar	Min. 3'-4' height, full, B&B or container. Distribute each species throughout planting area
	80% Pseudotsuga menziesii / Douglas Fir 20% Thuja plicata / Western Red Cedar	Seedlings, bare root. Plant throughout hatched area at 8' o.c. triangular spacing, typ.
	Shrubs	
	Prunus laurocerasus / English Laurel	Min. 24" height, full and bushy, B&B or container. Plant on and adjacent to Lee + Jill LaBrossees property as shown on plan
	Rough Seed	
	Barnley Low Grow	Hydroseed throughout bare area to limits of grading line, typ.



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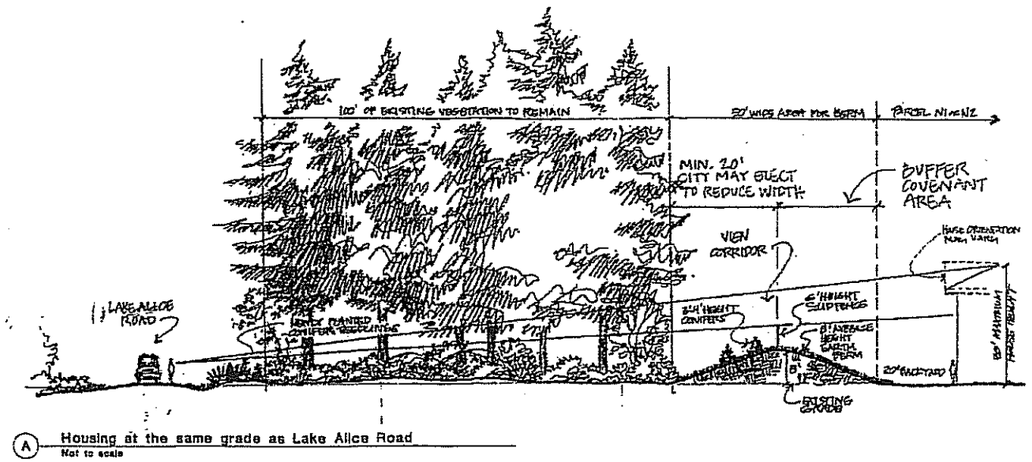
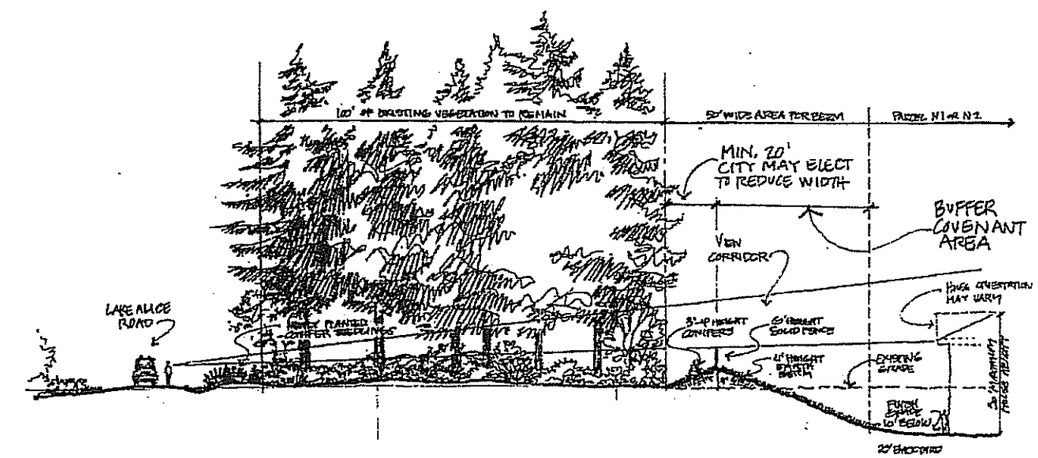
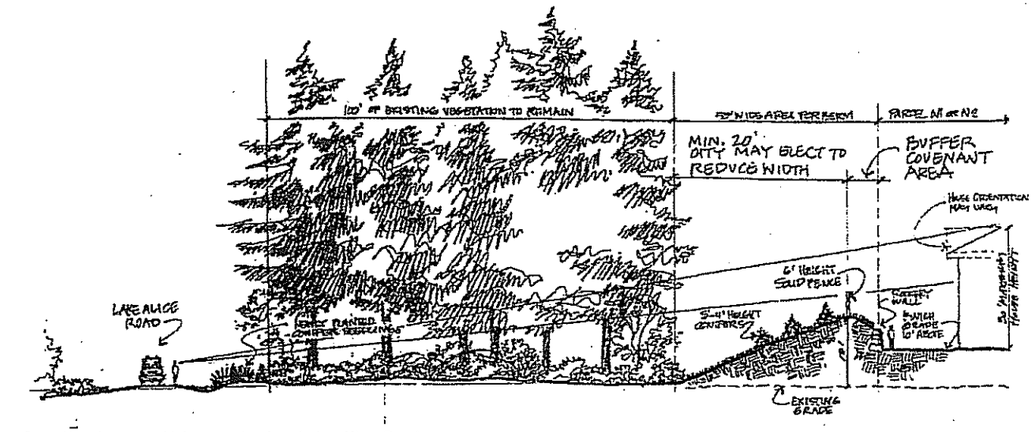


A Housing at the same grade as Lake Alice Road
Not to scale



B Housing at a lower grade than Lake Alice Road
Not to scale



C Housing at a higher grade than Lake Alice Road
Not to scale

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Attest: Jodi Warren/CMC City Clerk

Snoqualmie Ridge II

The Quadrant Corporation

WEISMAN DESIGN GROUP INC LANDSCAPE ARCHITECTURE

Perimeter Buffer Sections - Lake Alice Road
Exhibit #2 - March 2004

BUFFER PROTECTION COVENANT

The perimeter buffer berm, fence and new berm planting is intended to provide screening of new homes from adjacent sites. Maintenance of the area of the berm between the fence and the new home is the responsibility of the adjacent homeowner. Homeowner is also responsible to maintain the integrity of the berm. No structures of any kind are allowed in the Covenant area, however the homeowner may chose to plant the Covenant area consistent with the SRII CC&R's. The remaining buffer from the fence outward is the responsibility of the City of Snoqualmie.

Fencing has been installed on top of the berm to provide initial screening. Once berm vegetation has grown to accomplish the screening, the owner is no longer obligated to maintain fencing.

Snoqualmie Ridge II

The Quadrant Corporation

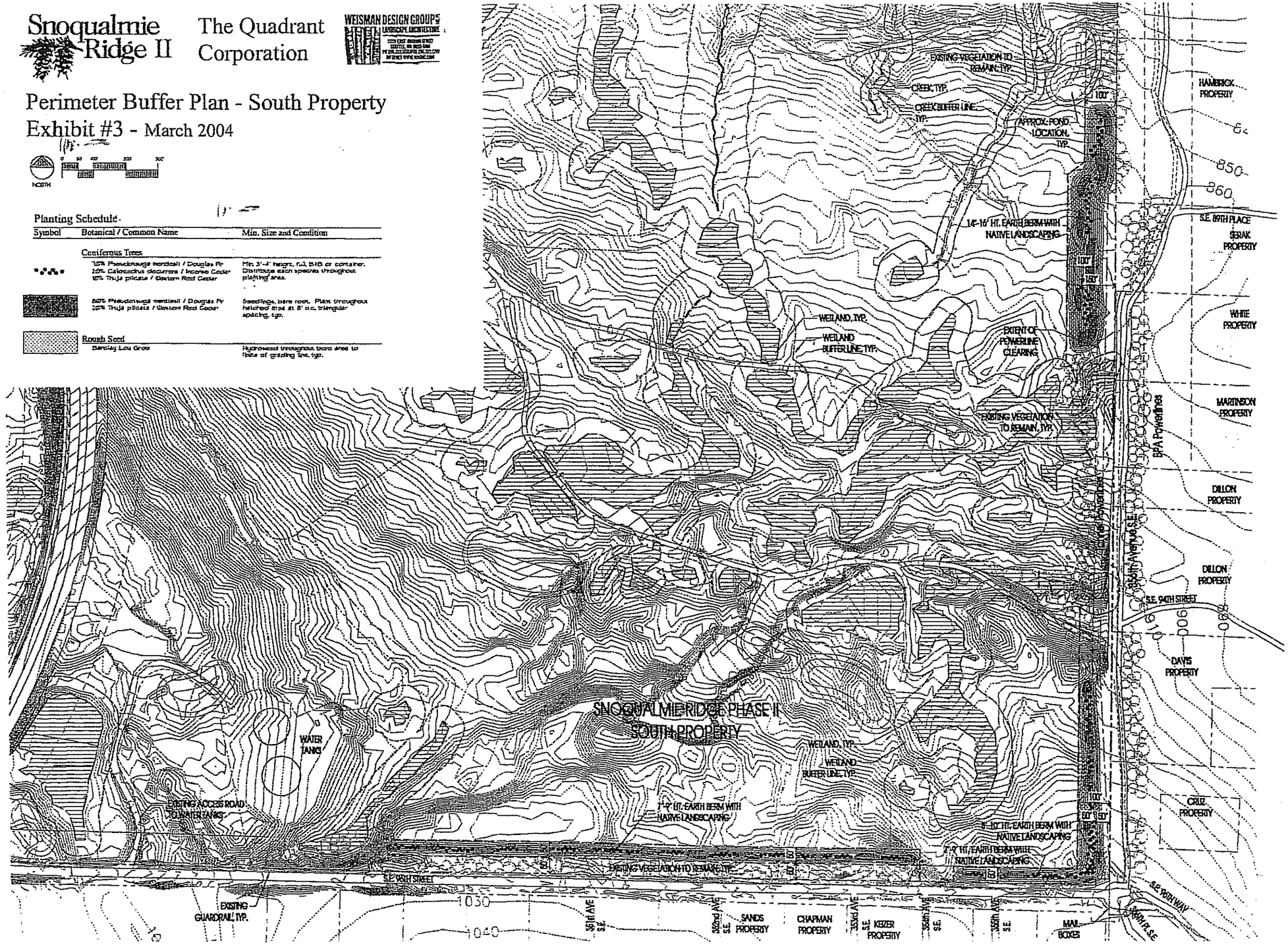
WEISMAN DESIGN GROUP
LANDSCAPE ARCHITECTURE

Perimeter Buffer Plan - South Property
Exhibit #3 - March 2004

NORTH

Planting Schedule

Symbol	Botanical / Common Name	Min. Size and Condition
	Coniferous Trees	
	50% Pseudotsuga menziesii / Douglas Fir 30% Calocedrus decurrens / Incense Cedar 20% Thuja plicata / Western Red Cedar	Min. 3'-4' height, full B&B or container. Distribute each species throughout planting area.
	80% Pseudotsuga menziesii / Douglas Fir 20% Thuja plicata / Western Red Cedar	Seedlings, bare root. Plant throughout hatched area at 8' o.c. triangular spacing, typ.
	Roush Seed Barclay Low Grow	Hydroseed throughout bare area to limits of grading line, typ.



Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

Buffer Specifications
Snoqualmie Ridge Expansion
City of Snoqualmie, Washington

A. General

1. **Berm Grading Intent**
The design intent is to create an undulating berm within the internal 50 ft. portion of the buffer along the areas shown on the perimeter buffer plan. The berm should be graded to have visual variation and smooth transitions so as to have a natural appearance. This can be achieved by varying the height from 7' to 9' and widening and narrowing the berm in various locations as well, to avoid the look of a highway cut slope.

2. **Standards**
All new plant material to comply with size and grading standards of the American Association of Nurserymen (AAN), latest edition. See individual buffer planting plans for installation sizes.

3. **Location of Material**
Plant material is shown schematically on the 100-scale plan. All proposed tree locations are to be pre-staked by the landscape contractor for adjustment by the landscape architect and the City to provide maximum screening.

4. **Watering**
Water all plant material during maintenance and establishment period, utilizing whatever means necessary to support plant growth.

5. **Soils**
Provide planting pit for larger trees, utilizing soil polymers installed at manufacturer's recommended rate in excavated pit as shown on the attached staking detail.

6. **Adjustments**
Make adjustments as necessary to conform to ground conditions to provide the most substantial screening effect possible.

7. **Fence Design**
Fence design on the plans is schematic. Provide 6' high fence where shown on plans. Locate fence to provide maximum height solid screening on top of berm.

B. Construction

1. **Temporary Erosion and Sedimentation Control**
During construction of berm, provide temporary erosion and sedimentation control (TESC) in accordance with City standards to minimize erosion and sedimentation. Maintain control of TESC until berm is stabilized and risk of erosion is passed.

2. **Adjustments**
Pre-stake limits of berms and confirm that the specified heights can be achieved. Verify dimensionally that side slopes will not exceed 2.5 to 1 or other reasonable slope as determined by the geotechnical engineer.

3. **Clearing and Grubbing**
Clear all impediments to the work including stumps, rubble, existing plant material and other elements that could cause instability or settlement.

4. **Grading**
Grade in accordance with City standards and Uniform Building Code. Key new berm into existing soils as necessary to prevent movement. Soils for berm should be selected from on-site materials for stability, permeability and organics. Utilize on-site soils in such a way that top layer of the berm contains the most fertile organic soils.

5. **Stabilization**
Compact berm soils to maintain stability but not so densely as to provide an unyielding medium for plant growth. Loosen top 6" in heavily compacted areas prior to installation of plants. Adjust operations as directed by geotechnical engineer and landscape architect to achieve this objective.

6. **Preservation of Existing Vegetation**
Do not work outside of the limits shown and in no case perform any operations in the existing buffer to remain. Save and protect all vegetation designated as existing to remain, and repair or replace at contractor's cost any vegetation damaged during clearing or grading operations to satisfaction of owner. Install protective fencing around all significant trees to remain. Protect existing trees by establishing limits of work line outside of drip line wherever possible without increasing the width of the buffer.

7. **Temporary Watering**
The intent is that all plant material will be planted in the fall to allow for natural watering by winter rainy season. Supplemental water will be required in a dry fall and the spring and summer months for the first few years during establishment. Provide all necessary watering to support vigorous plant material to achieve the intended design effect.

8. **Storage of Plant Material**
Temporarily store plant material prior to planting in a way that will not impact its growth. Heel in plants in mulch to minimize water loss. Provide temporary watering during storage as needed.

9. **Topsoil**
All topsoil on the project is intended to utilize on-site segregated organic material from the project site. Provide a complete soil test for N, P, K, pH and trace minerals and amend all on-site soils as per recommendations and report to provide a balanced, healthy plant medium around the root ball.

10. **Soil Polymers**
Utilize soil polymers at the manufacturer's recommended rate in all planting pits (except seedlings) to provide a moisture reserve for plant material.

11. **Tree Staking**
Provide tree staking only as required to prevent wind damage and overturning of larger trees. Seedlings are not required to be staked. Remove stakes upon establishment of the plant materials so that they do not damage the cambium layer. Perform all staking in accordance with the attached details.

12. **Mulching**
Mulch all planted trees with a 2'-3' diameter and 2" deep circle of medium fine bark mulch.

13. **Seeding**
Seed all exposed soil areas of the berm with an approved seeding mix consisting of upland species cultivated for their super-low height to prevent fire hazard and an unruly appearance. Acceptable species include Barclay ryegrass, clover and other grasses mentioned in the King County Drainage Manual, recommendations for upland planting areas, latest edition.

14. **Fence Installation**
All fencing to utilize incised, pressure-treated posts, treated to LP22, minimum .40lbs. retention. All fencing material to be #2 cedar or better. All fence posts to be installed in concrete footings. All wood members to be fastened with galvanized hardware and hidden from view.

15. **Warranty**
As a part of the planting operations warranty all larger trees with a minimum one-year warranty after acceptance of entire project. Replace any trees which are dead or dying during the warranty period. Guarantee minimum 80% survival rate for seedlings based upon quantity installed. Provide additional seedlings as needed to ensure that a minimum 80% survival rate is maintained during the first three years of the project. If for some reason seedlings are not surviving, adjust location of proposed seedlings for survival.

Approved: AB#04-172 11/8/04
Attest: Jodi Warren/CMC City Clerk

Snoqualmie Ridge II — The Quadrant Corporation — WEISMAN DESIGN GROUP LANDSCAPE ARCHITECTURE

Perimeter Buffer Specifications and Planting Detail
Exhibit #4 - Revised March 2004

16. **Final Review by City**
Prior to acceptance, applicant and contractor will review the entire installation with the City for conformance with the approved plan. Make any adjustments necessary to conform to the plan at direction of the City of Snoqualmie.

C. Maintenance

1. **Maintenance Bond**
Provide a maintenance bond for all planting on the site as required by the City of Snoqualmie.

2. **General Maintenance**
Perform all necessary maintenance including removal of invasive plant material, replacement of dead or diseased plants, watering, weeding, filling and reseeding of any eroded areas, and other operations as necessary to provide a healthy, growing planted berm.

3. **Tree Replacement**
During the 3-year maintenance bond period, if the existing trees in the buffer or mature specimens or supplemental plantings on the berm are damaged by wind, throwdown or disease and the buffer is no longer effective, provide a minimum of three 3'-4' high evergreen trees for every tree lost. Replacement trees should be planted in approximately the same location as damaged trees.

4. **Documentation of Changes**
In the event that the plans are changed or adjusted during installation, revised updated plans should be submitted to the City as record document for the future. This document shall remain on file and shall serve as the reference document for the project.

5. **Insect Control**
Best Management Practices (BMPs) should be utilized for control of any insect infestations to minimize the use of pesticides. Infestation where possible should be pruned and removed locally and evaluated prior to any pesticide use.

6. **Weed Control**
In addition to removing invasive species as noted above, invasive weeds should be removed only where they are contributing to a decline in native plant material growth. Best Management Practices should be utilized for weed removal where infestations occur by physically removing weeds first and spot treatment preferred prior to any broadcast solutions herbicide.

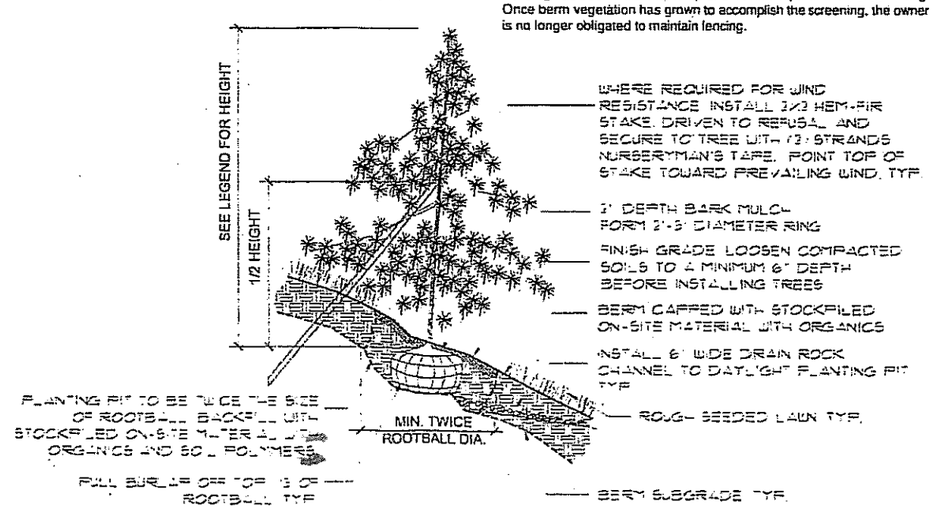
7. **Repair of Drainage Ways and Clogged Drains**
Maintain existing drainage patterns to formalized collection systems where necessary to prevent clogging.

8. **Fence Maintenance**
Applicant will maintain berm fence by replacement of damaged boards, sealing where necessary, or other operations to keep entire fence intact and performing the screening function for a period of five years.

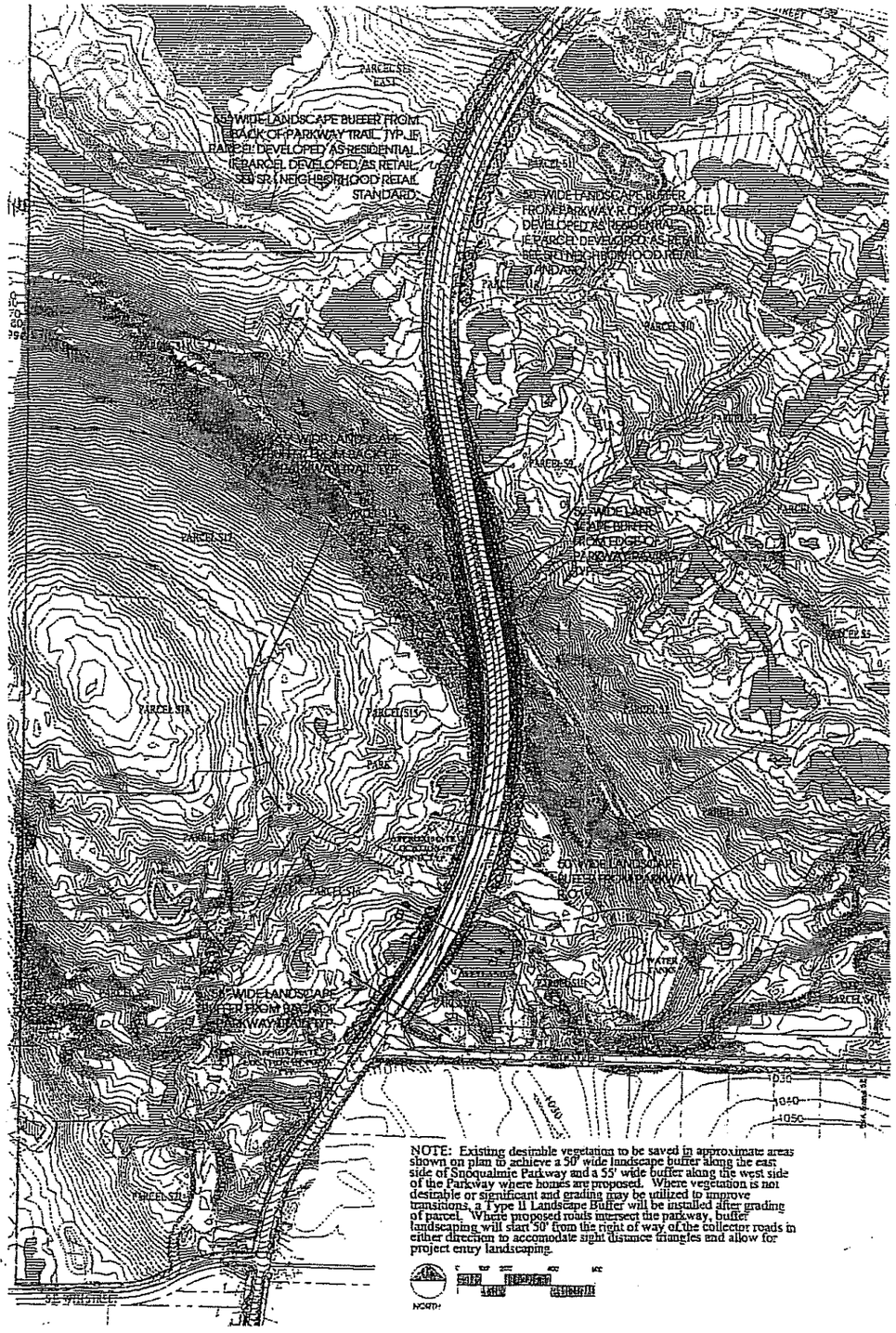
BUFFER PROTECTION COVENANT

The perimeter buffer berm, fence and new berm planting is intended to provide screening of new homes from adjacent sites. Maintenance of the area of the berm between the fence and the new home is the responsibility of the adjacent homeowner. Homeowner is also responsible to maintain the integrity of the berm. No structures of any kind are allowed in the Covenant area, however the homeowner may chose to plant the Covenant area consistent with the SRII CC&R's. The remaining buffer from the fence outward is the responsibility of the City of Snoqualmie.

Fencing has been installed on top of the berm to provide initial screening. Once berm vegetation has grown to accomplish the screening, the owner is no longer obligated to maintain fencing.



A Conifer Tree Planting
Not to scale



NOTE: Existing desirable vegetation to be saved in approximate areas shown on plan to achieve a 50' wide landscape buffer along the east side of Snoqualmie Parkway and a 55' wide buffer along the west side of the Parkway where homes are proposed. Where vegetation is not desirable or significant and grading may be utilized to improve transitions, a Type II Landscape Buffer will be installed after grading of parcel. Where proposed roads intersect the parkway, buffer landscaping will start 50' from the right of way of the collector roads in either direction to accomodate sight distance triangles and allow for project entry landscaping.

NORTH

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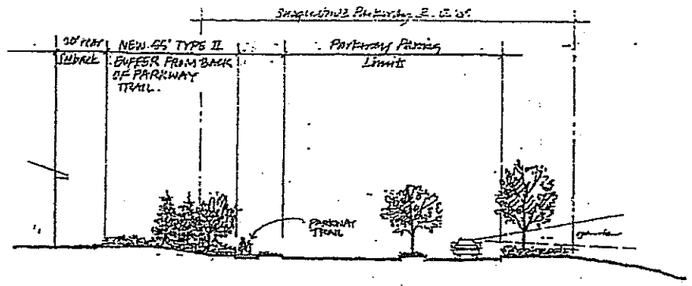
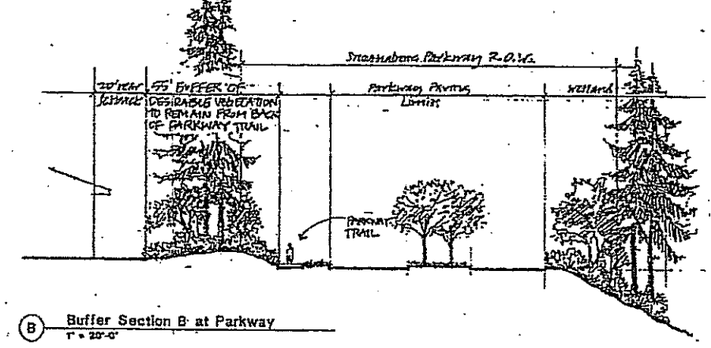
Snoqualmie Ridge II — The Quadrant Corporation

WEISMAN DESIGN GROUP LANDSCAPE ARCHITECTURE

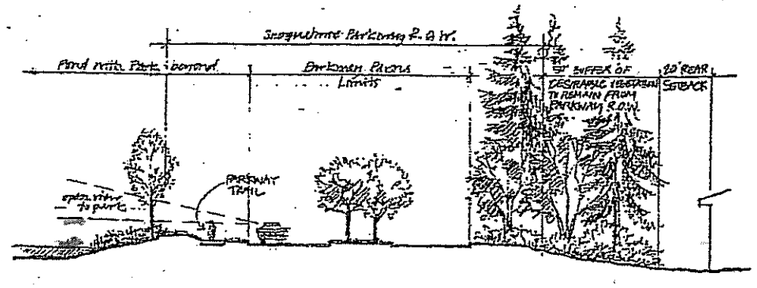
Snoqualmie Parkway Buffer Plan & Sections
Exhibit #5 - April 2004



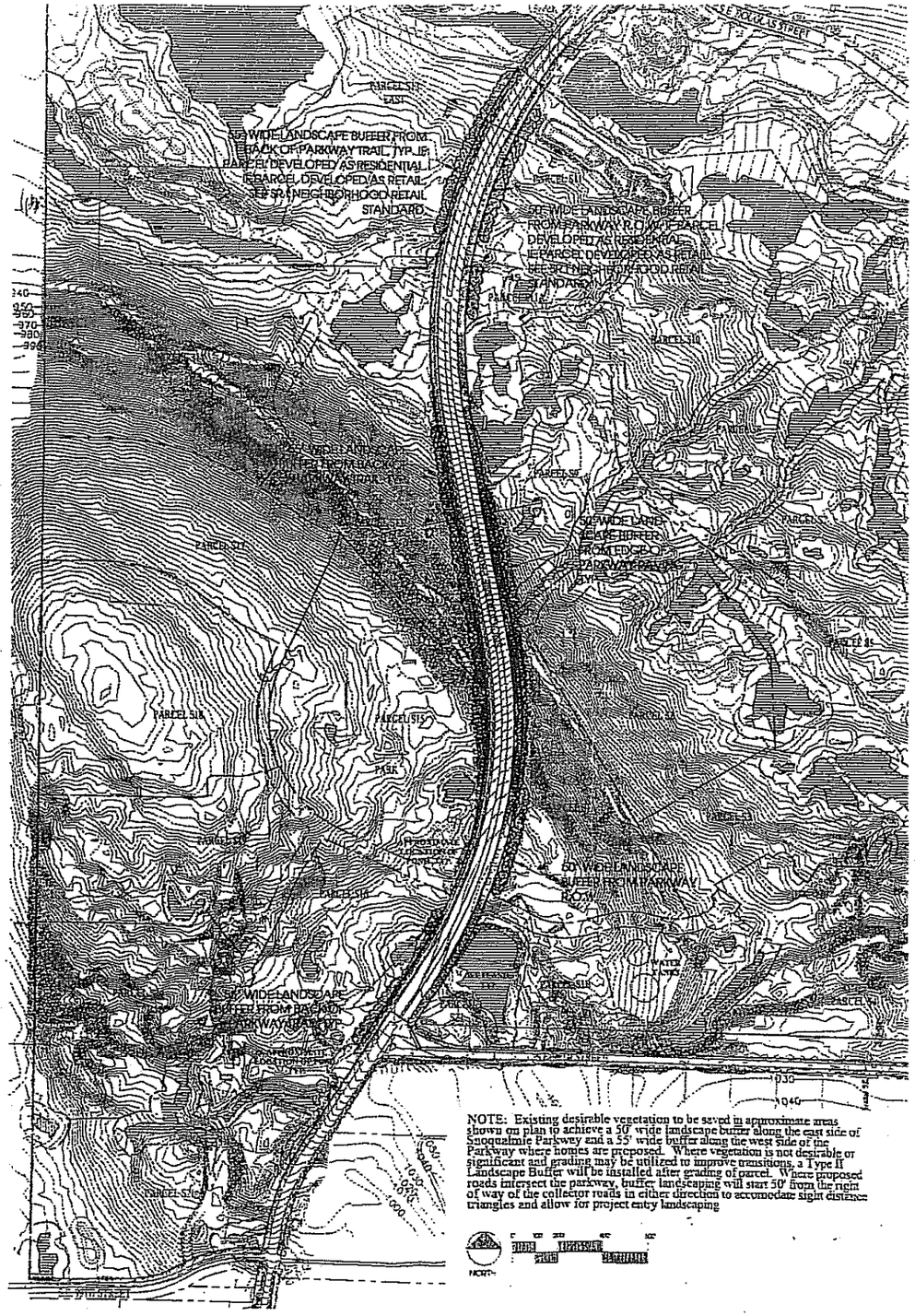
A Buffer Section A at Parkway
1" = 20'-0"



B Buffer Section B at Parkway
1" = 20'-0"



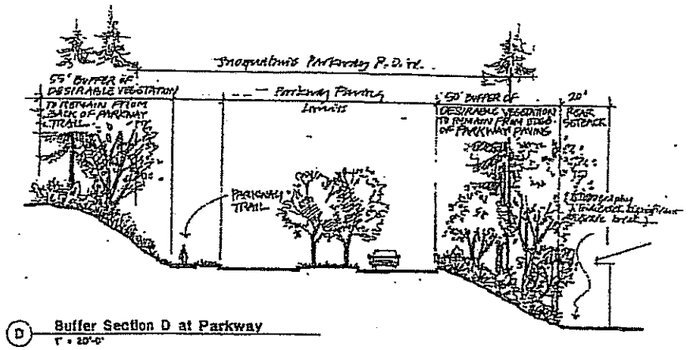
C Buffer Section C at Parkway
1" = 20'-0"



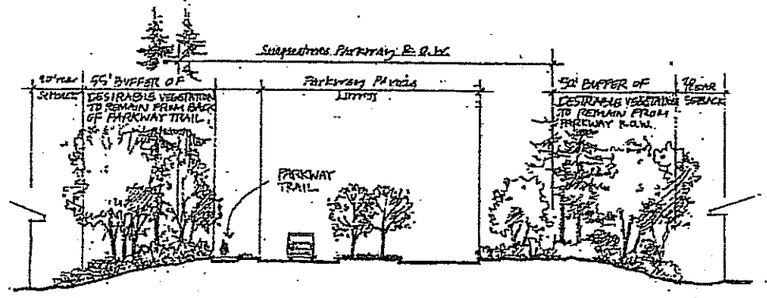
NOTE: Existing desirable vegetation to be saved in approximate areas shown on plan to achieve a 50' wide landscape buffer along the east side of Snoqualmie Parkway and a 55' wide buffer along the west side of the Parkway where homes are proposed. Where vegetation is not desirable or significant and grading may be utilized to improve transitions, a Type II Landscape Buffer will be installed after grading of parcel. Where proposed roads intersect the parkway, buffer landscaping will start 50' from the right of way of the collector roads in either direction to accomodate sight distance triangles and allow for project entry landscaping

Snoqualmie Ridge II — The Quadrant Corporation — WEISMAN DESIGN GROUP

Snoqualmie Parkway Buffer Plan & Sections
Exhibit #6 - April 2004



D Buffer Section D at Parkway
1" = 20'-0"



E Buffer Section E at Parkway
1" = 20'-0"

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CHAPTER 10

10.000 SIGNAGE

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CHAPTER 10

10.000 SIGNAGE

10A GENERAL

10A.010 General

Traffic control signs will conform to the Manual on Uniform Traffic Control Devices (MUTCD) or as approved by the City of Snoqualmie. Alternatives (i.e., upgrades) to these standards may be proposed by Quadrant but are subject to the City's design review process.

10B RESIDENTIAL

10B.010 Residential Signage

All signage in Snoqualmie Ridge shall be in accordance with SMC 17.75 except as defined in Snoqualmie Ridge II Residential Design Guidelines.

See Chapter IV of the Snoqualmie Ridge II Residential Design Guidelines for additional signage information and requirements.

10C RETAIL

10C.010 ***See Chapter 12, Retail***

CHAPTER 11

11.000 RESIDENTIAL PLATTING AND DEVELOPMENT

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CHAPTER 11

11.000 RESIDENTIAL PLATTING AND DEVELOPMENT

11A GENERAL CONSIDERATIONS

11A.010 General

The overall goal of this chapter is to establish standards for well designed plats that emphasize vehicular and pedestrian connectivity, and the siting of individual homes on different sized lots in a manner that compliments each neighborhood as a whole. Consideration is given to parking, scale, views and compatibility with adjoining uses. A specific number of lots per parcel may be designated for affordable housing purposes.

11A.020 Plat Layout and Design

Residential subdivisions should be designed to meet the following design goals and criteria. The provisions of this section apply to all densities except where specifically provided for within specific density range sections of this chapter.

11A.021 Lot Frontage and Orientation

A. All single family detached residential plats, to the maximum degree practicable, shall be designed to avoid having two or more adjacent lots that have frontage on 2 streets such that the rear of lots/houses face/abut public right-of-ways. Alleys or common drives are NOT included in this limitation. Where unavoidable due to topography or other natural constraints, a significant landscape tract, not less than 15 feet deep, planted with Type II landscaping (SMC 17.70.060), shall be provided to screen views of the rear of the lots/homes from the public right-of-way.

B. Orienting homes to or clustering homes around a common green space is an allowable use. Such common green spaces shall have frontage on the adjacent public street. Dead end alleys, -whether public or private, serving cluster lots shall not exceed 150 ft. in length. No fire access turnaround will be required. For clusters of up to 6 lots (3 lots deep from the public right-of-way), the common green shall have a minimum width of 35 feet at the street and between front lot lines. For clusters of more than 6, but not more than 9 lots, the common green shall have a minimum width of 40 feet at the street and

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between front lot lines. Exceptions to these cluster requirements may be allowed for affordable housing units. See applicable sections below for house and porch setback requirements.

11A.022 Floor Plans

To foster variety among the homes constructed in Snoqualmie Ridge II, except in parcels S22, N5, N6, S7A, S8A, S9A, and S11A (if residential), the following floor plan requirements shall apply to all single family detached residential development.

A. Each Mixed Use Final Plan Parcel shall make available a minimum of four (4) floor plans.

B. One of the four floor plans required above shall incorporate the second story into the angled portion of the roof through the use of knee walls, dormers, or other architectural features with eaves at a single-story or story-and-a-half height, to provide a home with a story-and-a-half style.

C. For any parcel that would contain in excess of 50 lots, at least one of the floor plans shall be less than 2,000 square feet in size. This size-limited floor plan may be satisfied with a duplex or triplex floor plan used within the plat.

D. If four or more model homes are constructed for the parcel (on the parcel or on another parcel being used for marketing the parcel), one shall be a story-and-a-half plan and one shall be a less than 2,000 square foot model (these may be the same model unit or 2 separate model units).

E. In addition to the floor plans required in A through D of this section, each parcel that will contain 50 lots or more shall also offer a 1 story home floor plan with at least two elevation options. Significant façade variation shall be provided for each elevation as set forth in the SRII Residential Design Guidelines requirements for housing variation. A model is not required for this 1 story home option.

11A.023 Façade Variation

Four elevations shall be provided for each floor plan. Significant façade variation shall be provided for each elevation as set forth in the Snoqualmie Ridge II Residential Design Guidelines requirements for housing variations.

11A.024 Porches

Porches or covered stoops shall have a minimum depth of 5 feet, as measured at the floor of the porch or stoop from the wall of the house to the closest obstruction, such as a railing, banister, or support beam. Porches generally require a 10-ft. setback from front property line unless otherwise noted herein.

11A.025 Accessory Structure Setbacks

See SMC 17.15.040

11A.030 Setback and Lot Coverage Special Exceptions

Several situations exist that create special setback exceptions. Setbacks and Lot Coverages shall be as specified for each density range, except as allowed or modified by the following special provisions.

A. Special architectural features such as bay windows, eaves, fireplace boxes or other extensions (other than porches and stoops) no wider than 8 feet may encroach into the front and side yard setback by up to 3 feet, provided, no feature shall intrude into the setback closer to the property line than where fire resistive construction is required.

B. The minimum front yard setback may be reduced to 13 feet when the floor plan incorporates a back-of-lot attached or detached garage accessed from a street rather than an alley.

C. Where lots front on neighborhood collectors, but are served by alleys, garage setbacks shall be a minimum of 27' from the alley centerline to provide for additional off-street parking. As an alternative, a clustered parking arrangement off the alley may be provided.

D. If a retaining wall is located within the side yard setback, a minimum 3-foot clearance from the wall shall be provided.

E. To provide a means to vary porch depths and provide more streetscape variation, not as a means of reducing porch setbacks overall (i.e. not all setbacks shall be reduced to the minimum), the front porch may encroach into the front yard setback up to 8 ft., provided the front porch shall not be closer than 7 ft. from the property line.

F. When a one-story home cannot otherwise meet building coverage standards, building coverage may be increased to a maximum of 2,500 square feet. Setback requirements shall still be met.

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11B LARGE LOT SINGLE FAMILY DETACHED (1-2 DU/ACRE)

11B.010 General

Typically, lots 12,000 sq. ft. or more in area, with a minimum lot width of 75 ft. and a minimum lot depth of 100 ft. Maximum building height is 35' (see Section 1.070 for definition of "height").

11B.020 Building Coverage

35 percent maximum

11B.030 Parking

Two garaged spaces minimum per unit

11B.040 Setbacks

All setbacks are minimums measured from property line unless otherwise noted.

A. ***Front Yard***

General

Porch: 10 *feet*
House: 20 feet
(Figures 11-01 to 11-02)

Front Entry Garage: 25 feet from property line with a minimum 5 foot setback from the front wall of the house (Figure 11-01).
Side Entry Garage: 25 feet (Figure 11-02).

B. ***Backyard Without Alley***

General

House: 25 feet from back property line to back wall of house (Figures 11-01 and 11-02).

Corner Lot

Garage: 25-foot backyard setback for garage taking access from side street (Figure 11-02), or greater as required to maintain safe sight distance triangles.

C. ***Side Yards***

15 feet combined side yard setback, 5 foot minimum
(Figure 11-01 to 11-02).

Corner Lot

Distance between side street right-of-way to side wall of structure shall equal front yard setback. (Figure 11-01).

Side Street Garage: Same as garage facing street (Figure 11-02).

11C SINGLE FAMILY DETACHED (3-5 DU/ACRE)

11C.010 General

Typically, lots at least 50 feet wide, 4,000 square feet minimum, with depths of 80 feet or greater from the right of way (Figures 11-03 to 11-05).

Maximum building height is 35 feet.

11C.020 Building Coverage

40 percent

11C.030 Parking

Two garaged spaces per unit.

11C.040 Setbacks

All setbacks are minimums measured from property line unless otherwise noted.

A. ***Front Yard***

General

Porch: 10; may be reduced to 7 feet pursuant to SRIIDS 11A.030E
House: 15 ft.
(Figures 11-03 to 11-05).
Front Entry Garage: 20 feet from property line with a minimum 5 ft. setback behind the front wall of the house(Figure 11-03).
Side Entry Garage: 20 feet from property line (Figure 11-04).

B. ***Front Yard Facing Common Green***

Porch: 5 feet, may be reduced to 3 feet pursuant to SRIIDS 11A.030E
House: 10 feet
Garage: N/A - accessed by alley

C. ***Backyard Without Alley***

General

House: 20 feet from property line to back wall of house (Figures 11-03 and 11-04). For corner lots, see below.

Corner Lot

Garage (Figure 11-04): 5 feet for garage taking access from side street, or greater as required to maintain safe sight distance triangles.

D. ***Backyard With Alley***

House: 20 feet from alley centerline (Figure 11-05)
Garage: 15 feet from alley centerline

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E. ***Side Yards***

General

10 feet combined side yard setbacks (3-foot minimum)
(Figures 11-03 to 11-05)
15 feet side yard setback from alley right-of-way centerline

Corner Lot

Same as front yard (Figure 11-03)

Side Street Garage (Figure 11-04): Same as garage facing front street.

11D SINGLE FAMILY DETACHED (4-9 DU/ACRE)

11D.010 General

A. Residential density within a parcel shall fall within the range designated for that parcel in Attachment B to the Mixed Used Final Plan for Snoqualmie Ridge II. Parcels may contain a mix of densities and lot sizes, provided the overall density within the parcel fits within the designated range. Setback and lot coverage standards shall be based on lot size, as set forth below. Lots less than 40 ft. in width shall be limited to a single car width front-loaded garage, except as noted in Sec. 11A.030, or shall be alley loaded.

B. Maximum building height is 35 feet.

C. All setbacks are minimums measured from property line unless otherwise noted.

11D.020 Lot Sizes between 5,001 SF and 7,500 SF

Two garaged parking spaces per unit provided.

A. ***Lot Coverage***

40 percent

B. ***Front Yard Setbacks***

Porch: 10 ft.; may be reduced to 7 ft. pursuant to SRIIDS 11A.030E .
House: 15 ft.
(Figures 11-06 to 11-08).

Front Entry Garage: 20 feet from property line with a minimum 5 ft. setback behind the front wall of the house (Figure 11-06).
Side Entry Garage: 15 feet from property line (Figure 11-07).

C. ***Front Yard Facing Common Green***

Porch: 5 ft.; may be reduced to 3 feet pursuant to SRIIDS 11A.030E

House: 10 ft.
Garage: N/A accessed by alley

D. ***Backyard Setbacks Without Alley***
General
House: 15 feet from property line to back wall of house (Figures 11-06 and 11-04). For corner lots, see below.

Garage: 0 feet where lot backs up on another back lot line or open space. Adjacent garages may be attached if detached from the house. (Figure 11-07)

Corner Lot
Garage (Figure 11-07): 5 feet for garage taking access from side street, or greater as required to maintain safe sight distance triangles.

E. ***Backyard Setbacks With Alley***
House: 20 feet from alley centerline (Figure 11-08)
Garage: 15 feet from alley centerline

F. ***Side Yard Setbacks***
General
10 feet combined side yard setbacks (3-foot minimum). Zero lot line setback is allowed provided a minimum clearance of 10 feet be maintained between houses. (Figures 11-06 to 11-08)

Garage: 15 feet side yard setback from alley right-of-way centerline.

Corner Lot
Same as front yard (Figure 11-06)

Side Street Garage (Figure 11-07): Same as garage facing front street.

11D.030 Lot Sizes between 3,801 SF and 5,000 SF
Two parking spaces provided per unit. A clustered parking arrangement may be approved by the City for common garage units. A clustered parking arrangement for designated affordable housing units is allowed. (Figures 11-06 to 11-08)

A. ***Building Coverage***
50 percent

B. ***Front Yard Setbacks***
General

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Porch: 10 feet; may be reduced to 7 feet pursuant to SRIIDS 11A.030E.
House: 15 feet
(Figure 11-06 to 11-08).

Front Entry Garage: 20 feet from property line with a minimum 5 ft. setback from the front wall of the house. (Figure 11-06).

C. ***Front Yard Facing Common Green or Park***
Porch: 5 feet, may be reduced to 3 feet pursuant to SRIIDS 11A.030E
House: 10 feet
Garage: N/A accessed by alley

D. ***Backyard Setbacks Without Alley***
General
House: 15 feet from back property line to back wall of the house (Figure 11-06).

Garage: 0 feet where lot backs up on another back lot line or open space. Adjacent garages may be attached if detached from the house. (Figure 11-07)

Corner Lot
Garage (Figure 11-07): 5 feet for garage taking access from side street, or such setback as required to maintain safe sight distance triangles.

E. ***Backyard Setbacks With Alley***
House: 20 feet from alley centerline (Figure 11-08)
Garage: 15 feet from alley centerline

F. ***Side Yard Setbacks***
General
Zero lot line setback is allowed for garages provided a minimum clearance of six feet be maintained between houses or houses and garages if garages are detached. (Figures 11-07).
15 feet side yard setback from alley right-of-way centerline.

Corner Lot
Same as front yard (Figure 11-06).

Side Street Garage (Figure 11-07): Same as garage facing front street.

11D.040 **Lot Sizes 2,400 SF – 3,800 SF**
Single family cottage detached with a minimum width of 30 ft., and duplex lots. Two parking spaces per unit provided. A clustered parking arrangement may be approved

by the City for common garage units. A clustered parking arrangement for designated affordable housing units is allowed.

A. ***Building Coverage***
55 percent

B. ***Front Yard Facing Common Green***
Porch: 5 feet, may be reduced to 3 feet pursuant to SRIIDS 11A.030E
House: 10 feet
Garage: N/A accessed from alley

C. ***Front Yard Setback Facing Street***
Porch: 9 feet; may be reduced to 7 ft. pursuant to SRIIDS 11A.030E.
House: 14 feet (Figures 11-09 to 11-11)
See 11A.024

D. ***Back Yard Setback with Alley***
House: 15 feet from alley centerline
Garage: 15 feet from alley centerline (Figure 11-11)

E. ***Back Yard Setback without Alley***
House: 15 feet (Figure 11-09)
Garage: 0 feet where lot backs up on another back lot line or open space. Adjacent garages may be attached if detached from the house.
Garage with side street access: 0 feet

F. ***Side Yard Setbacks***
General
Zero lot line setback is allowed provided a minimum clearance of six feet is maintained between houses or houses and garages if garages are detached (A duplex is one structure). (Figure 11-10)

Corner Lot
Same as front yard (Figure 11-09 to 11-10)

Garage: Same as garage facing street. (Figure 11-10)

11E SINGLE FAMILY DETACHED CLUSTERED HOUSING (ALL DU/ACRE EXCEPT PARCEL S22)

Single Family Detached Clustered Housing is allowed in all residential parcels except parcel S22, provided the cluster arrangement meets the requirements of section 11A.020(B) and that the overall parcel density shall be within the range designated for the parcel in Mixed Use Final Plan Attachment B.

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Typically, lots are 2,400 square feet or more in size, clustered around a common green or auto court. Where practical, fronts of houses should be oriented to streets, parks or common green space to maintain pedestrian orientation. One garaged space, plus one guest space shall be provided per unit. The guest space may be on-street when adequate on-street parking is available. Garage access may only come from an alley, common auto court, private drive, or an adjacent public street where topography creates excessive side slope to the driveway apron. Garages must be set back a minimum of 5 ft. from the front wall of the house. See section 11A.021 regarding cluster size and green space requirements.

A. ***Building Coverage***
55 percent

B. ***Front Yard Setbacks***
House: 14 feet minimum if facing a public street; 5 feet minimum if facing a common auto court or private drive.
Porch: 9 feet minimum if facing a public street; 3 feet minimum if facing a common auto court.

C. ***Front Yard Facing Common Green***
House: 10 feet minimum
Porch: 5 feet minimum, which may be reduced to 3 feet pursuant to SRIIDS 11.A.030E.

D. ***Back Yard Setbacks***
House: 15 feet minimum
Garage: 15 feet from centerline of alley.

E. ***Side Yard Setbacks***
6 feet minimum between structures
15 feet minimum from public street right of way
6 feet from alley right-of-way or private drive tract

Corner Lot
Same as front yard
Side Street Garage: 19 feet from public street, with minimum of 5 feet behind wall of house.

11F SINGLE FAMILY ATTACHED (8-16 DU/ACRE)

11F.010 General

A. An applicant may submit an application for platting purposes under this Section 11.F for townhomes, row houses, and other single family attached typologies (as described at SR II Mixed Use Final Plan Condition 4.6) within the 8-16 du/acre density range. Within that application the applicant may elect to comply with the multi-family standards of existing Snoqualmie Ridge Development Standards Chapter 12H, or as the same may be modified and adopted for SR II ("MF Standards"), subject to the provisions of this section 11F.010.

B. It is recognized that certain standards within existing SRDS Chapter 12H pertain specifically to the Neighborhood Center and as such do not apply within Snoqualmie Ridge II, specifically: the first two sentences of 12H.011A, 12H.011C, 12H.011G, and 12H013C. If not listed here, a MF Standard will apply within SR II notwithstanding any reference to the Neighborhood Center, unless the City determines in review of a specific proposal that such MF Standard is not applicable in the circumstances of that proposal.

C For purposes of applying the MF lot coverage standards to platted lots, the standard shall be applied to the aggregate square footage of building footprints and impervious areas on individual lots and impervious areas within the plat but outside individual lots.

D. If compliance with MF Standards is elected, then those MF Standards will be substituted for the development standards of Section 11F.020 – 11F.040. If the applicant does not elect to comply with MF Standards, then the development standards of this Section 11F shall apply.

11F.015 Building Orientation

Where practical, fronts of homes should be oriented to streets or parks to maintain pedestrian orientation.

11F.020 Building Coverage

60 percent

11F.030 Parking

One garaged space, plus one guest space per unit which may be on-street. Garage access may only come from an alley, common auto court or private street. Where practical, common auto courts should be sited to the interior of lots and/or adjacent to alleys.

11F.040 Setbacks

A. Front

Porch: 9' minimum if facing a public street; 3 feet minimum if facing a common auto court.

House: 14' minimum if facing a public street. 5' minimum if facing a common auto court.

B. Rear

15' minimum to house

C. Side

6 feet minimum between structures

15 feet from edge of right-of-way

6 feet from alley right-of-way or private drive tract

11G RESIDENTIAL MULTIFAMILY (5-16 DU/ACRE)

[Reserved for MF standards relocated from SRIIDS Ch. 12]

LIST OF STANDARD DRAWINGS

CHAPTER 11 – RESIDENTIAL PLATTING AND DEVELOPMENT

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Neighborhood Residential – 3,801-5,000 S.F. Lots	11-06
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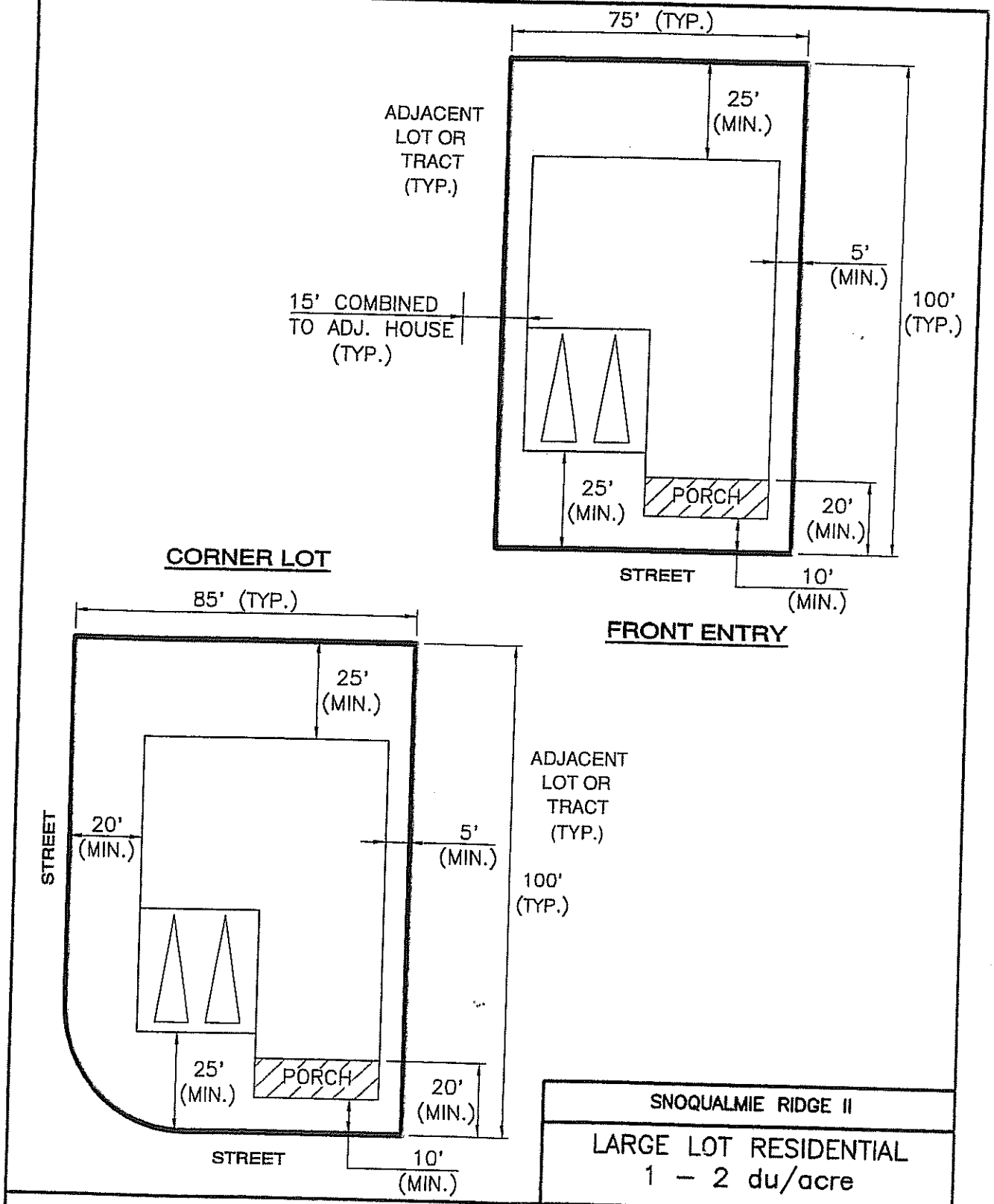
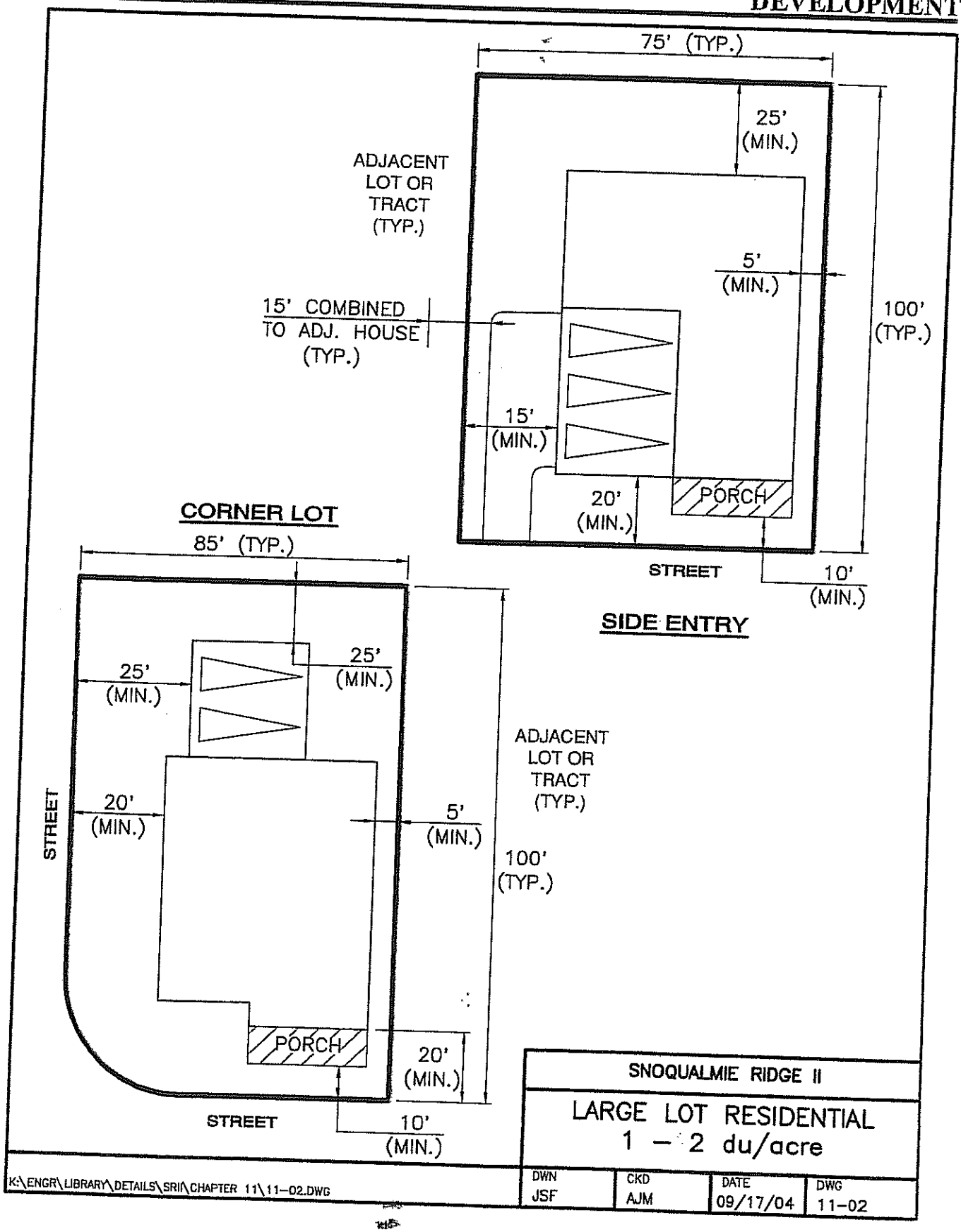
Single Family Clustered Housing	11-12
Single Family Clustered Housing	11-13



SNOQUALMIE RIDGE II	
LARGE LOT RESIDENTIAL 1 – 2 du/acre	
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-01.DWG	DWN: JSF; CKD: AJM; DATE: 09/17/04; DWG: 11-01

Approved: _____



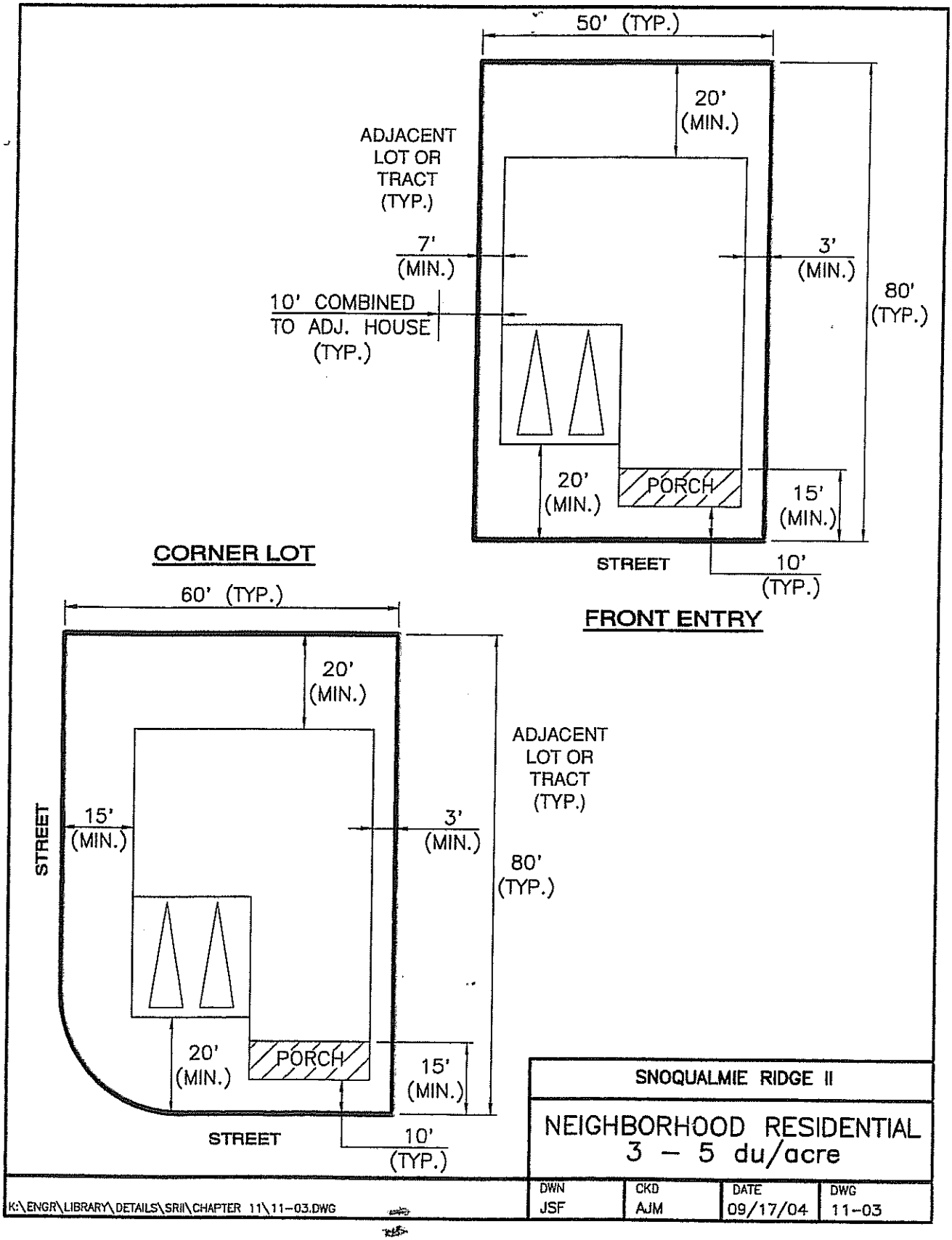
SNOQUALMIE RIDGE II

LARGE LOT RESIDENTIAL
1 – 2 du/acre

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-02.DWG

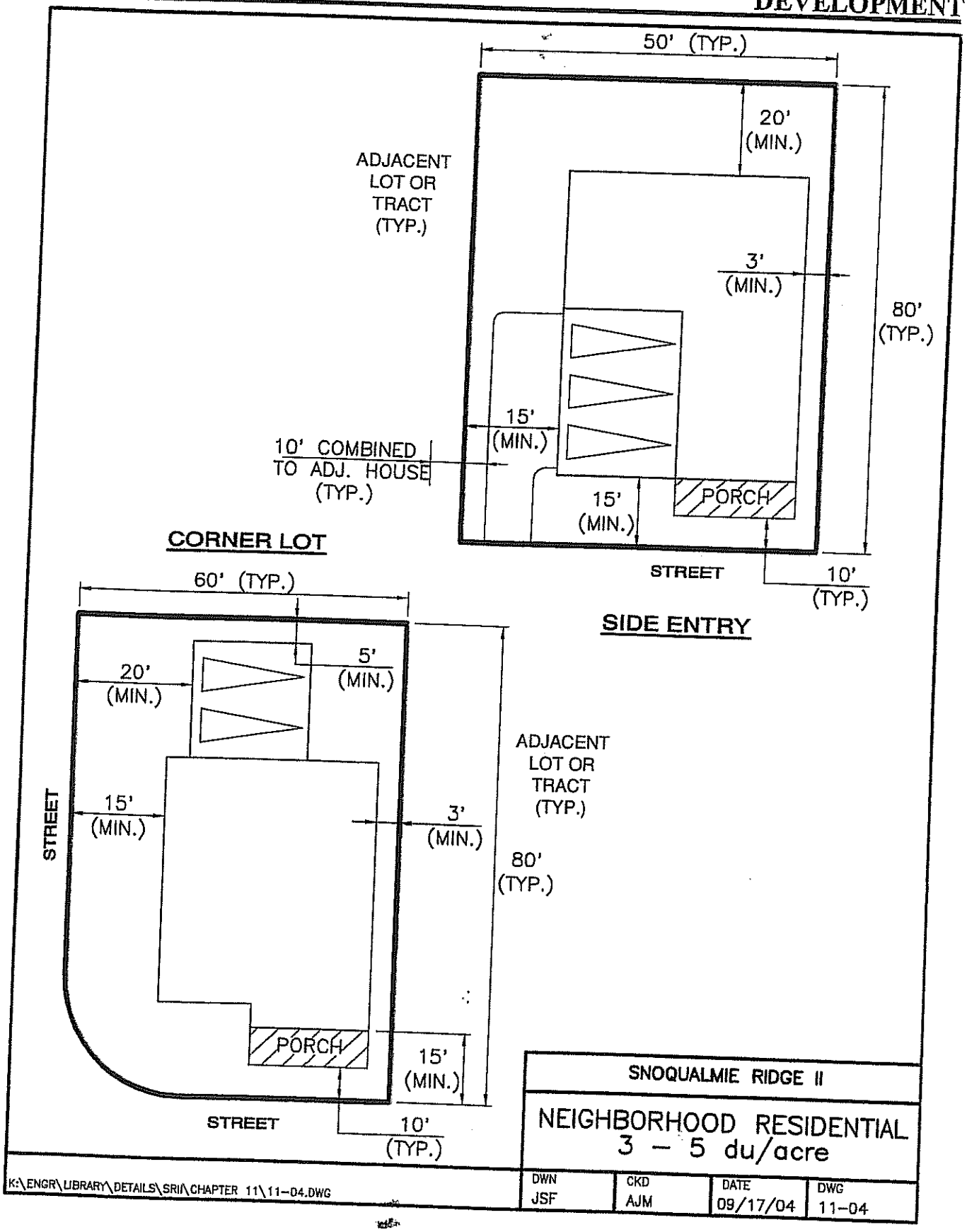
DWN	CKD	DATE	DWG
JSF	AJM	09/17/04	11-02

Approved: _____



SNOQUALMIE RIDGE II				
NEIGHBORHOOD RESIDENTIAL 3 – 5 du/acre				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-03.DWG	DWN JSF	CKD AJM	DATE 09/17/04	DWG 11-03

Approved: _____



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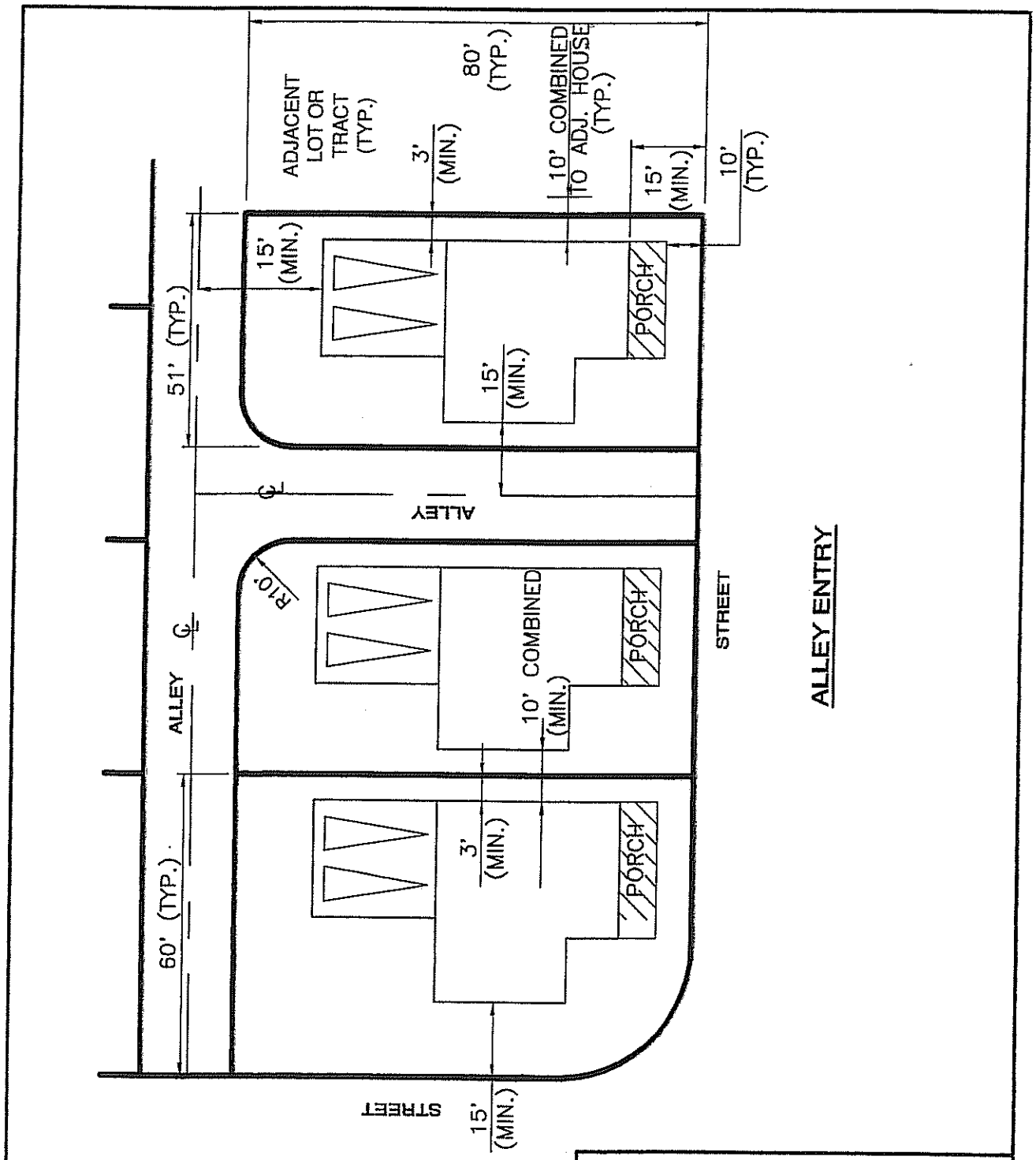
NEIGHBORHOOD RESIDENTIAL 3 – 5 du/acre			
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-04.DWG	DWN JSF	CKD AJM	DATE 09/17/04	DWG 11-04

Approved: _____



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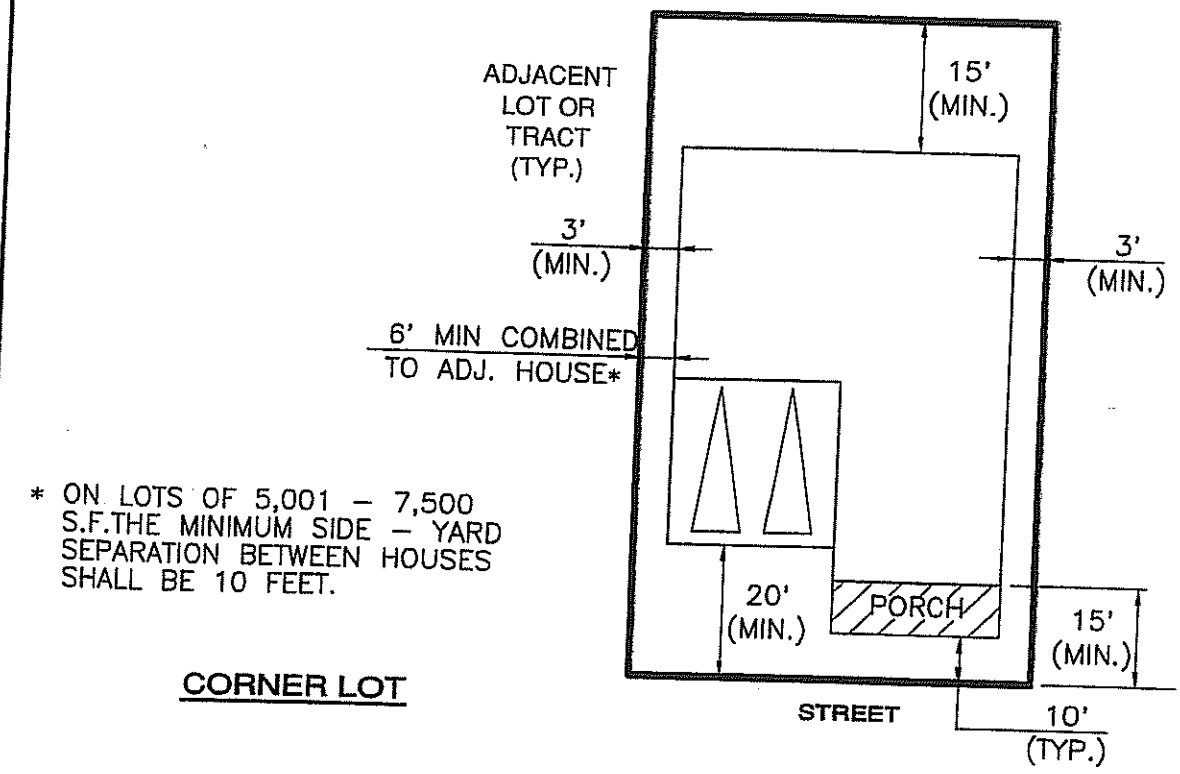
NEIGHBORHOOD RESIDENTIAL 3 – 5 du/acre				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-05.DWG	DWN JSF	CKD AJM	DATE 09/17/04	DWG 11-05

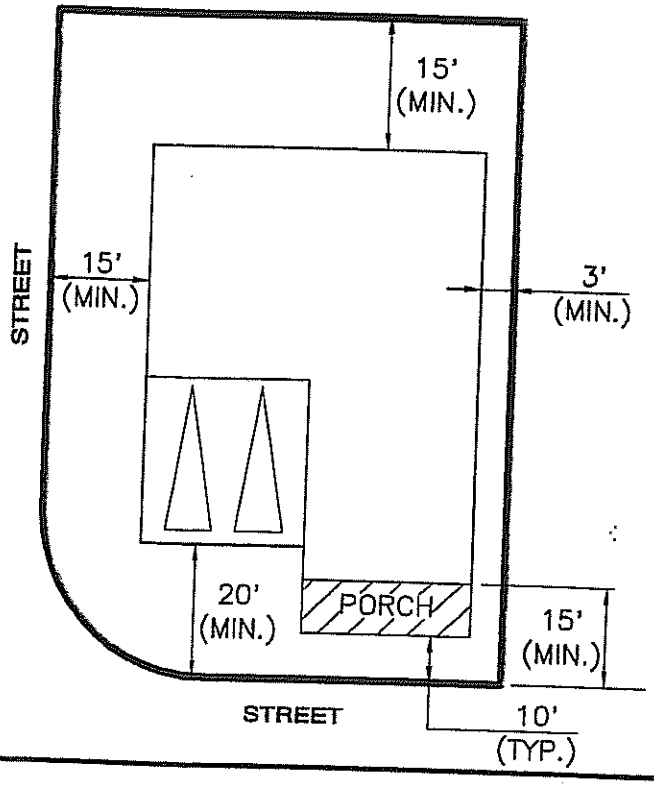
Approved: _____



* ON LOTS OF 5,001 – 7,500 S.F.THE MINIMUM SIDE – YARD SEPARATION BETWEEN HOUSES SHALL BE 10 FEET.

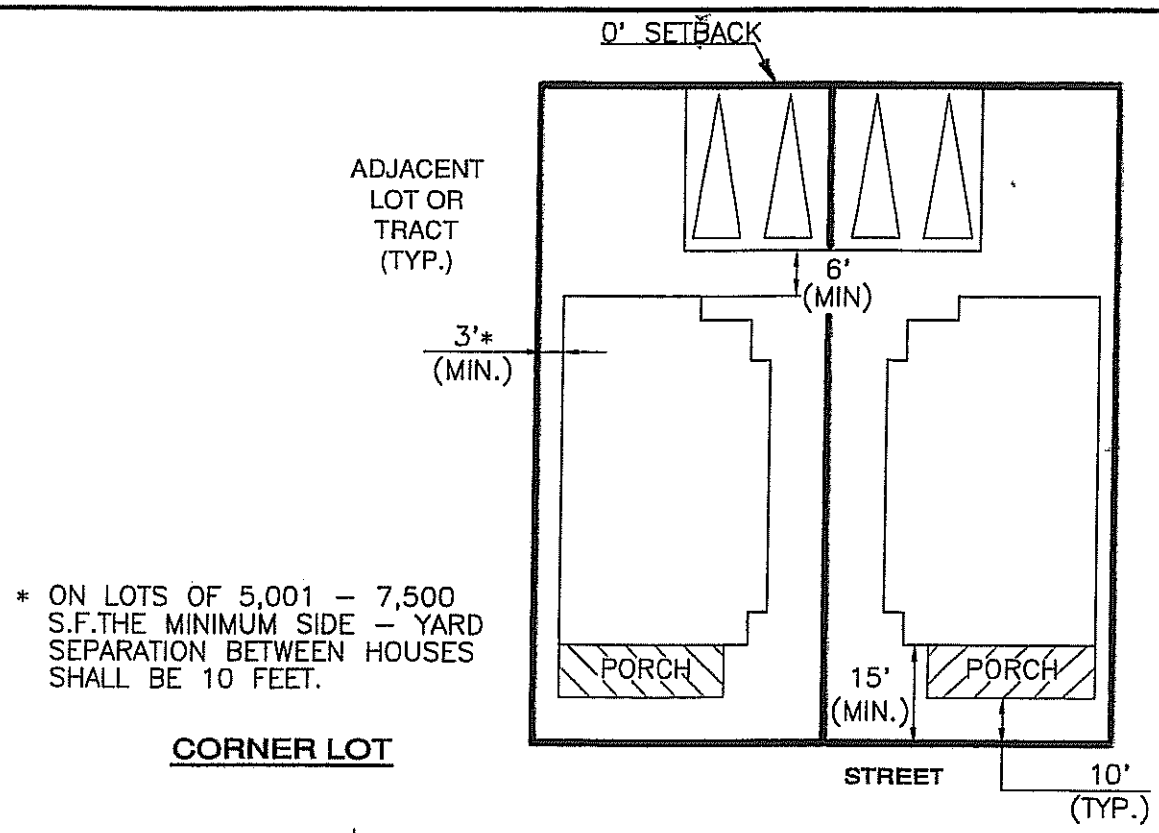
CORNER LOT

FRONT ENTRY



SNOQUALMIE RIDGE II			
NEIGHBORHOOD RESIDENTIAL 3,801 – 5,000 S.F. LOTS 5,001 – 7,500 S.F. LOTS			
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-06.DWG	DWN JSF	CKD AJM	DATE 09/17/04	DWG 11-06

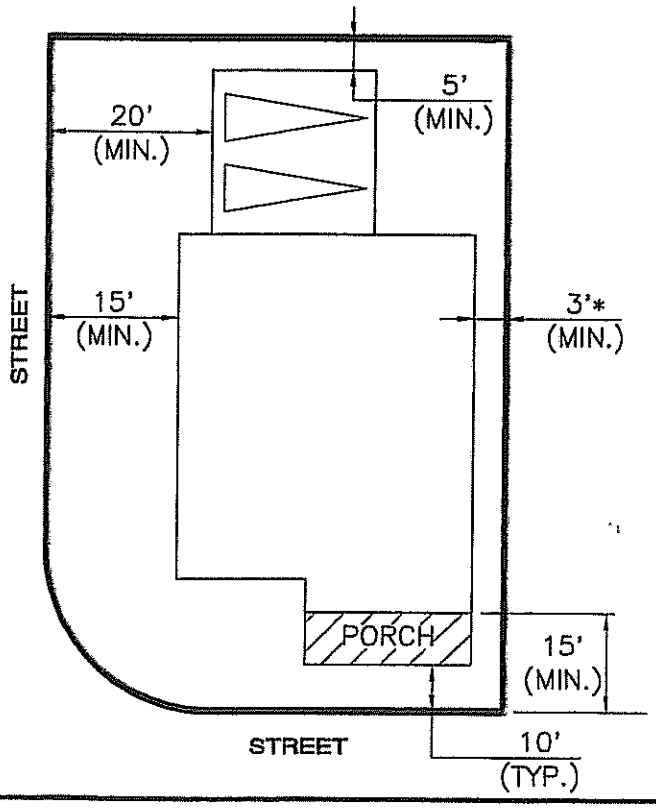
Approved: _____



* ON LOTS OF 5,001 – 7,500 S.F.THE MINIMUM SIDE – YARD SEPARATION BETWEEN HOUSES SHALL BE 10 FEET.

CORNER LOT

GARAGE "0" LOT LINE

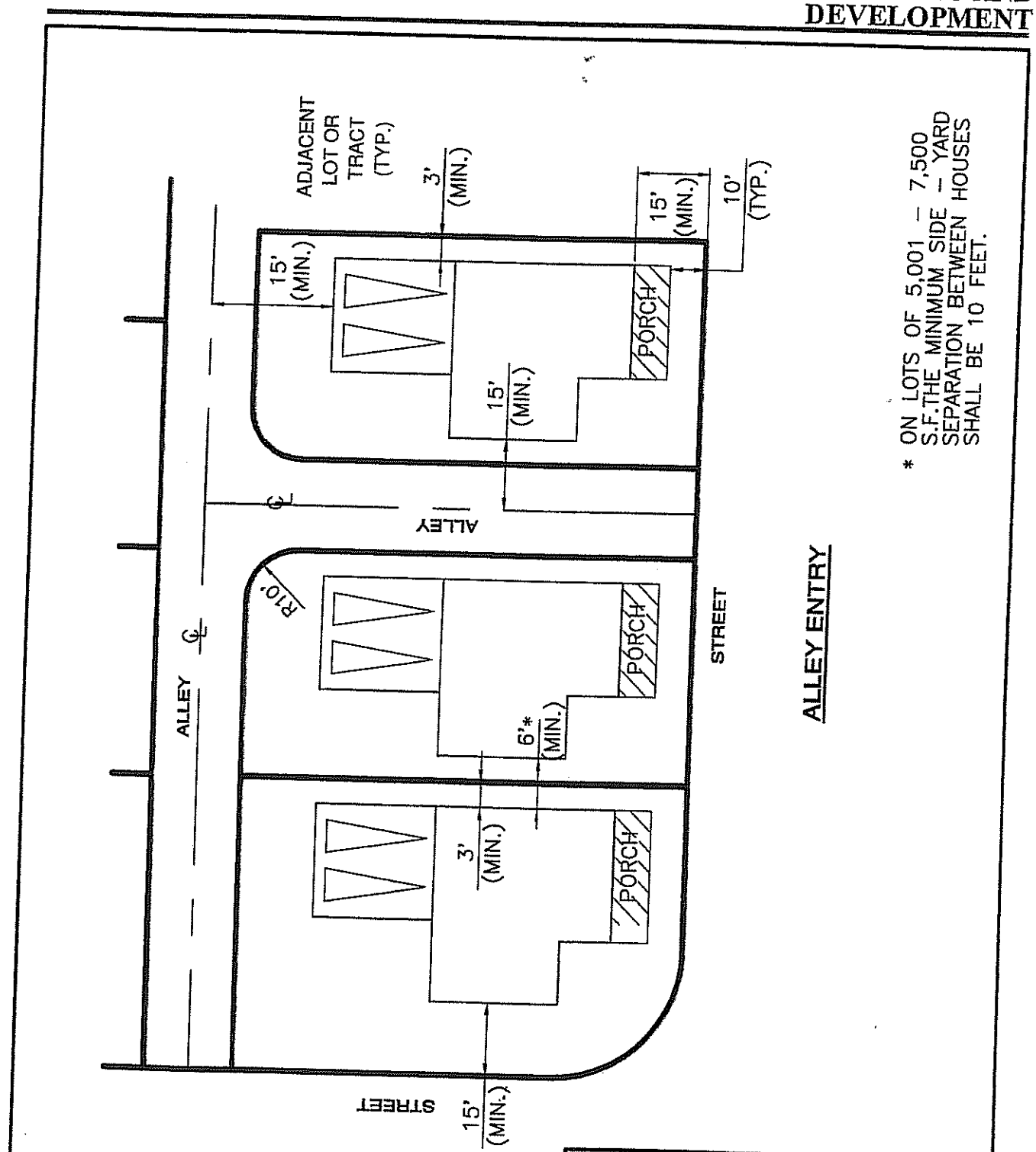


K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-07.DWG	DWN JSF	CKD AJM	DATE 09/17/04	DWG 11-07

SNOQUALMIE RIDGE II

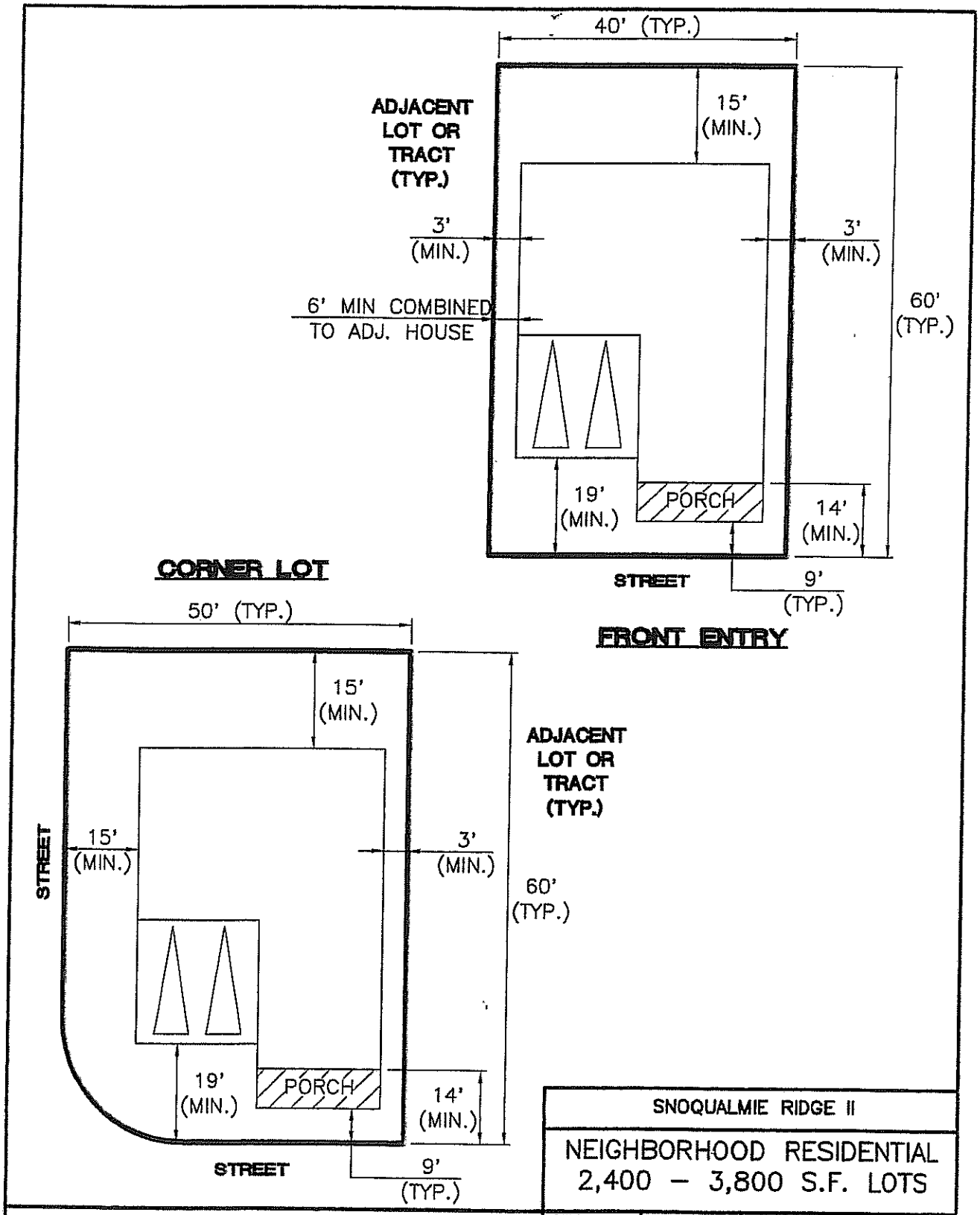
NEIGHBORHOOD RESIDENTIAL
3,801 – 5,000 S.F. LOTS
5,001 – 7,500 S.F. LOTS

Approved: _____



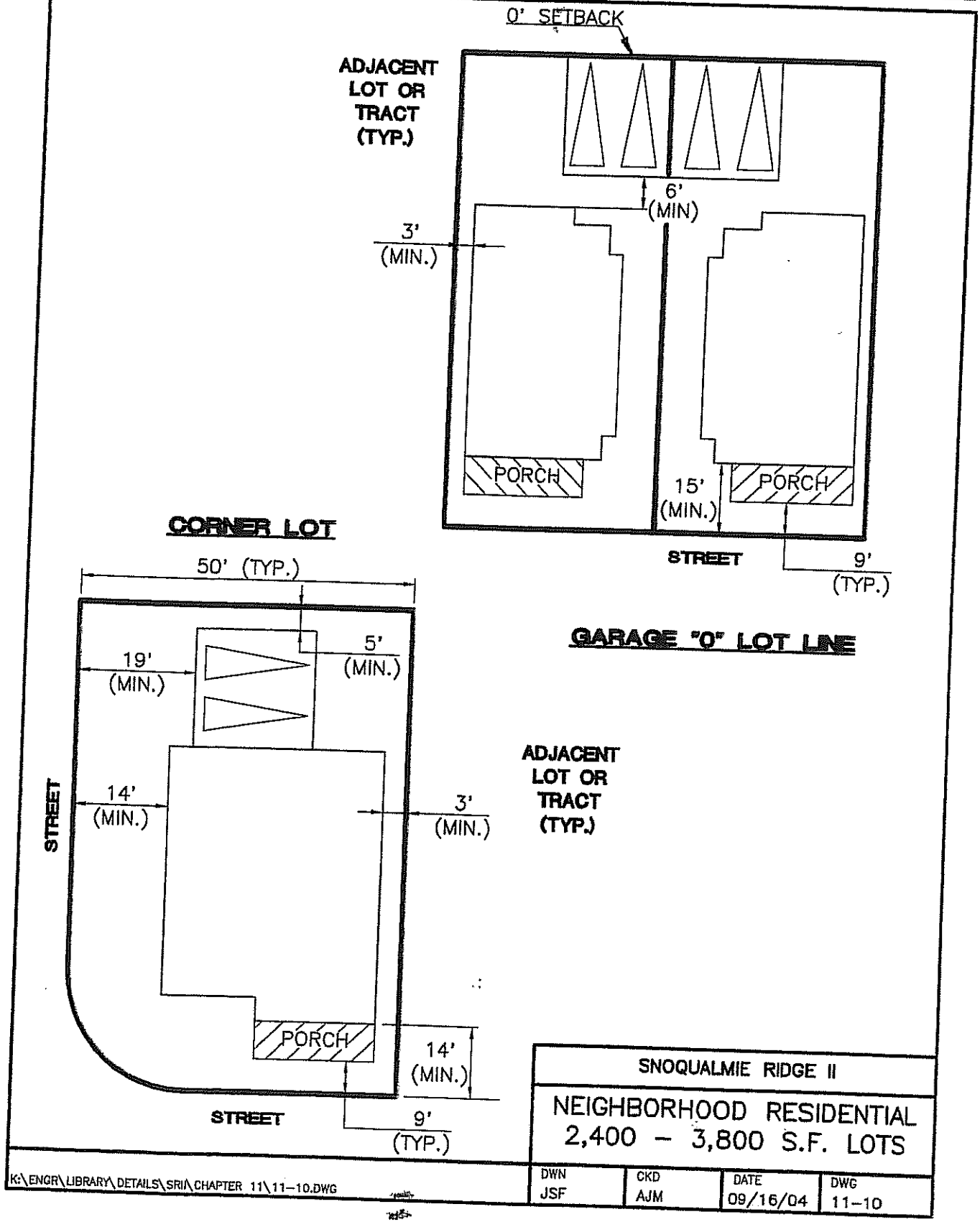
SNOQUALMIE RIDGE II				
NEIGHBORHOOD RESIDENTIAL 3,801 – 5,000 S.F. LOTS 5,001 – 7,500 S.F. LOTS				
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-08.DWG	DWN JSF	CKD AJM	DATE 09/17/04	DWG 11-08

Approved: _____



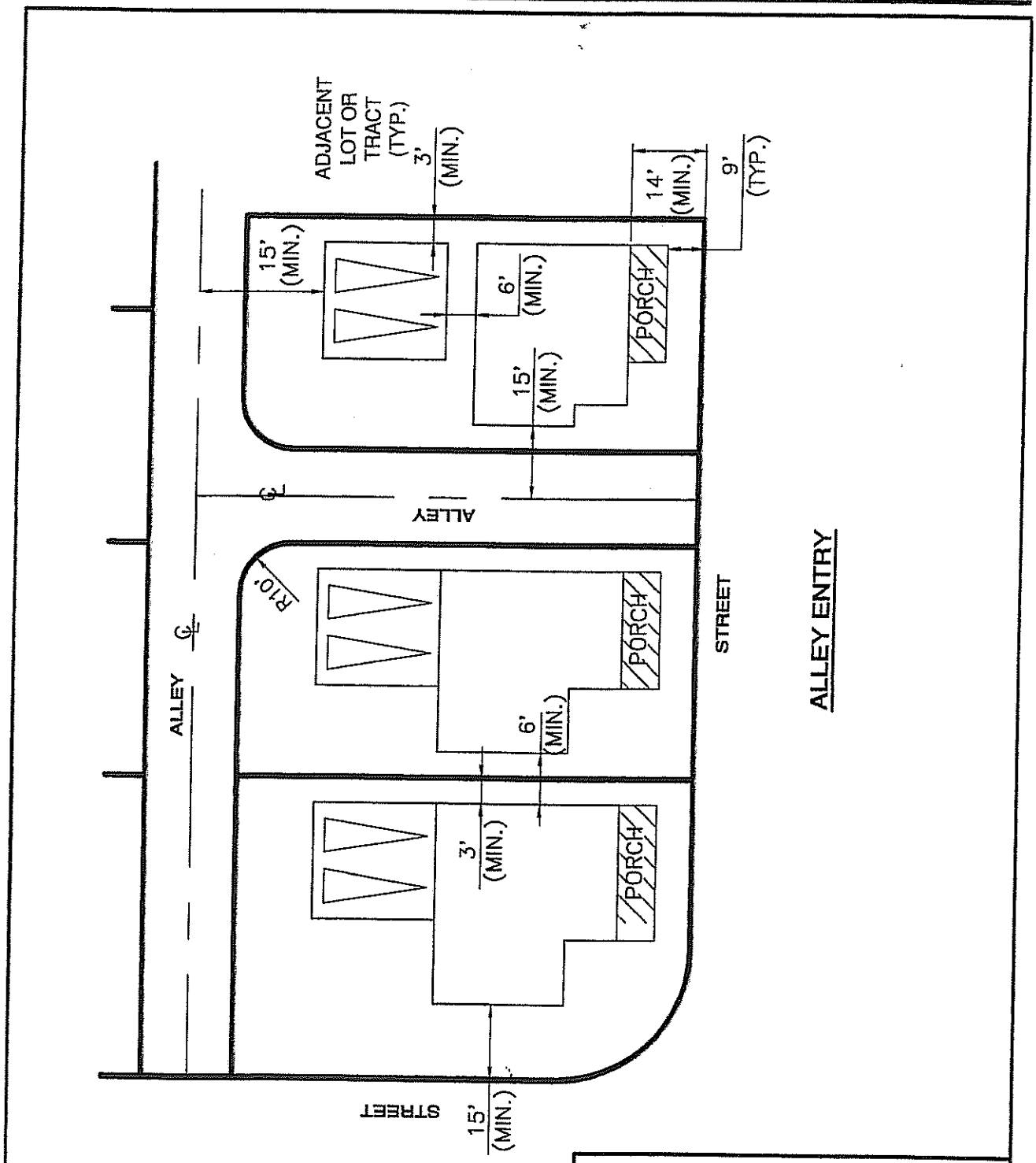
SNOQUALMIE RIDGE II			
NEIGHBORHOOD RESIDENTIAL 2,400 – 3,800 S.F. LOTS			
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-09.DWG	DWN JSF	CKD AJM	DATE 09/16/04	DWG 11-09

Approved: _____

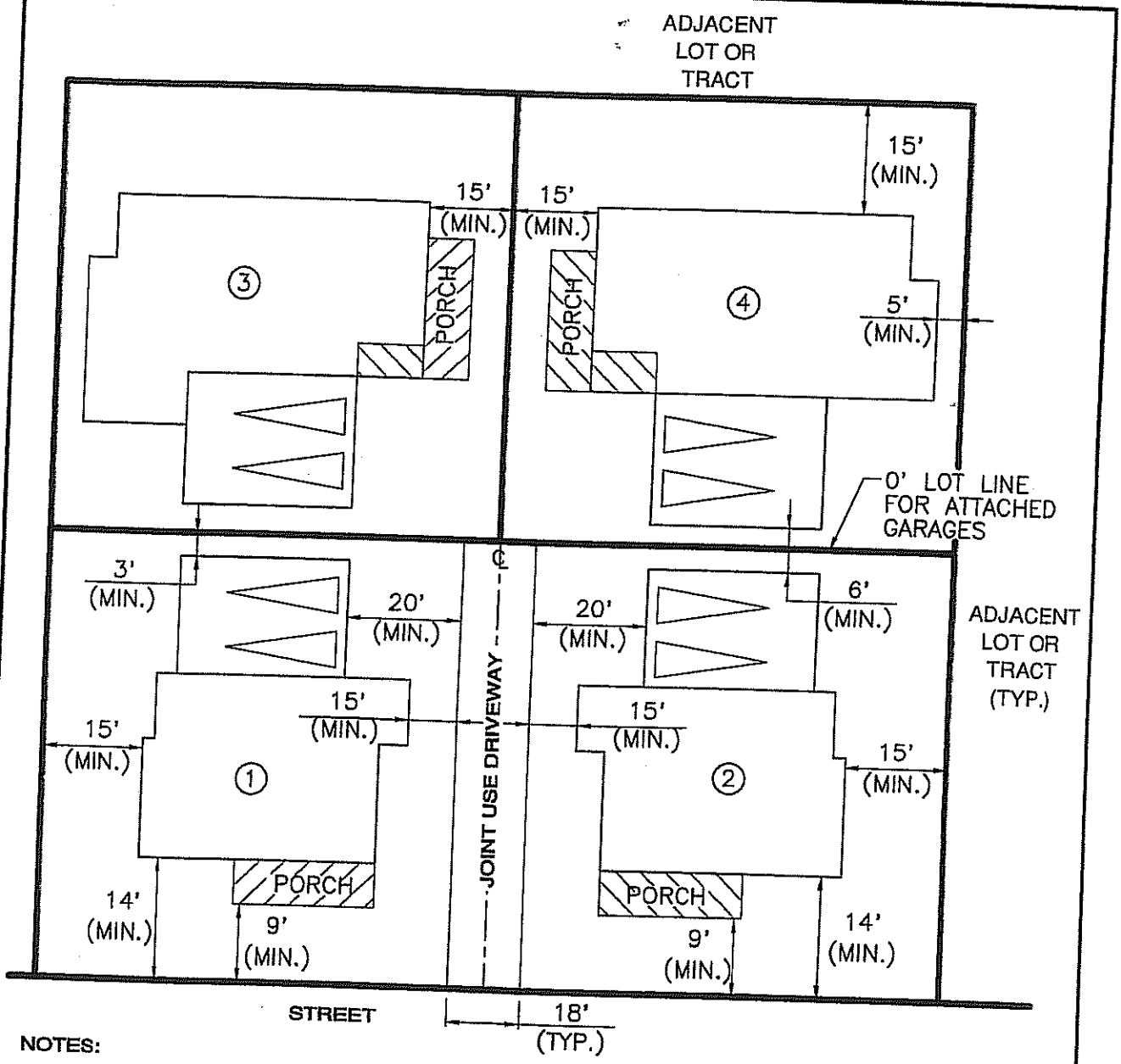


SNOQUALMIE RIDGE II			
NEIGHBORHOOD RESIDENTIAL 2,400 – 3,800 S.F. LOTS			
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-10.DWG	DWN JSF	CKD AJM	DATE 09/16/04	DWG 11-10

Approved: _____


ADJACENT LOT OR TRACT (TYP.)
3' (MIN.)
14' (MIN.)
9' (TYP.)
15' (MIN.)
6' (MIN.)
PORCH
15' (MIN.)
ALLEY
R10'
PORCH
6' (MIN.)
STREET
ALLEY ENTRY
ALLEY
3' (MIN.)
PORCH
STREET
15' (MIN.)
SNOQUALMIE RIDGE II
NEIGHBORHOOD RESIDENTIAL
2,400 – 3,800 S.F. LOTS
K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-11.DWG
DWN JSF
CKD AJM
DATE 09/16/04
DWG 11-11

Approved: _____



NOTES:

A. PORCHES ON HOMES ADJACENT TO THE PUBLIC ROW SHALL BE ORIENTED TO THE STREET.

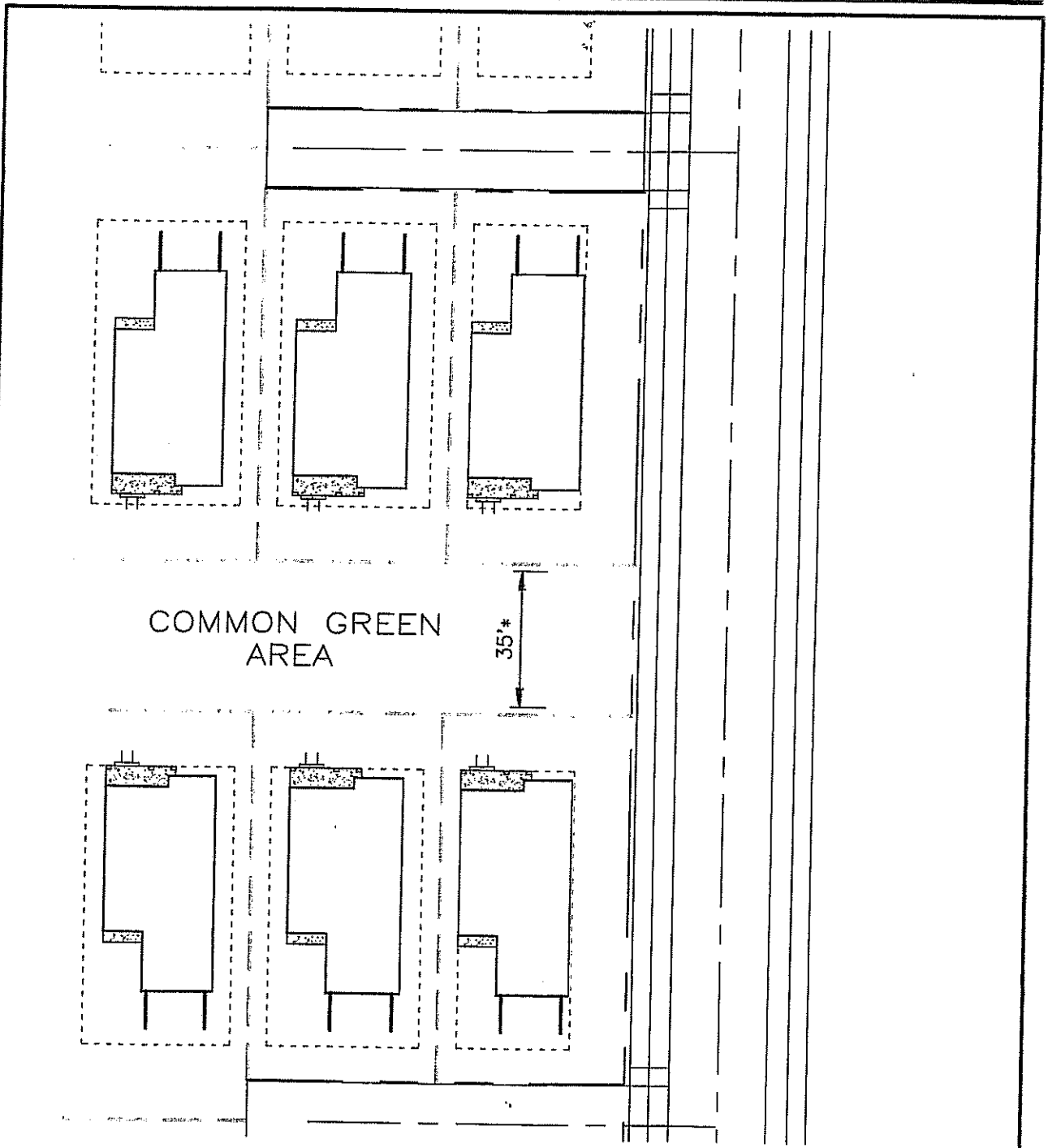
B. ADJUSTMENTS TO THE GARAGE ORIENTATION MAY BE APPROVED BY THE CITY ON A CASE-BY-CASE BASIS WHEN TOPOGRAPHY OR OTHER NATURAL CONSTRAINTS EXIST.

C. THE REAR-YARD SETBACK REQUIREMENT MAY BE MET AT THE SIDE OF THE LOT OPPOSITE THE COMMON DRIVEWAY. SUCH AS LOT NUMBER (2) ABOVE

D. ZERO LOT LINE SETBACKS ARE ALLOWED PROVIDED GARAGES ARE ATTACHED.

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-12.DWG	SNOQUALMIE RIDGE II SINGLE FAMILY CLUSTERED HOUSING	DWN JSF	CKD AJM	DATE 09/21/04	DWG 11-12

Approved: _____



* 35' REQUIRED FOR UP TO 6 LOTS IN CLUSTER. FOR MORE THAN 6 LOTS, AND UP TO 9 LOTS, 40' IS REQUIRED.

SNOQUALMIE RIDGE II

SINGLE FAMILY CLUSTERED HOUSING

K:\ENGR\LIBRARY\DETAILS\SRII\CHAPTER 11\11-13.DWG	DWN	CKD	DATE	DWG
	CMH	JSF	09/16/04	11-13

Approved: _____

CHAPTER 12

12.000 RETAIL

(RESERVED)

Approved: AB#04-172 11/8/04 Attest: Jodi Warren/CMC City Clerk