

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR COLUMBIA COUNTY, OREGON

In the Matter of Adopting the)	
Columbia County Road)	Ordinance No. 96-6
Standards Ordinance)	Repealing Ordinance Nos. 92-12 and 94-2
<hr/>		

The Board of County Commissioners for Columbia County, Oregon ordains as follows:

SECTION 1. TITLE.

This ordinance shall be known as Ordinance No. 96-6.

SECTION 2. AUTHORITY.

This ordinance is adopted pursuant to the authority of ORS 203.035 and ORS Chapter 368.

SECTION 3. PURPOSE.

The purpose of this ordinance is to adopt the Columbia County Road Standards Ordinance, and to repeal Ordinance Nos. 92-12 and 94-2.

SECTION 4. FINDINGS.

1. The Board of County Commissioners finds that it is in the best interest of the County to develop road standards which are compatible with existing and potential land uses.
2. The road standards will apply to road construction as part of new development, whether that development includes a road to be constructed, or whether it includes development on an existing right of way.
3. The purpose of the road standards is to improve public accesses for all users of County roads.
4. The road standards provide for the establishment of private roads to serve small scale residential developments, thereby allowing public funds to be better used on the more travelled thoroughfares.
5. The road standards are intended to provide for safe transportation options for a variety of vehicles during most climatic conditions.
6. The road standards are intended to require improvements to public rights of way in proportion to the development proposed.
7. The road standards are part of a comprehensive approach to transportation systems planning within Columbia County. Integrating land use and technical transportation elements is intended to support the purposes of the Oregon Transportation Planning Rule.

- elements is intended to support the purposes of the Oregon Transportation Planning Rule.
8. The decision process is intended to allow for public review of land use decisions related to the use of property and development of transportation systems. Technical and engineering decisions are to be made without further review.
 9. The information supplied in a staff report to the Board of County Commissioners, dated June 10, 1996, which is attached hereto, labelled Exhibit "B" and incorporated herein by this reference, document the process used to adopt the proposed road standards.

SECTION 5. RELATIONSHIP WITH OTHER ORDINANCES.

1. The road standards are intended to describe the technical and engineering requirements for road improvements based on needs for access determined by land use regulations. The Columbia County Comprehensive Plan (CCCP), the Columbia County Zoning ordinance (CCZO) and the Columbia County Subdivision and Partitioning ordinance (CCSPO) contain separate review criteria. The development densities and uses allowed according to the Comprehensive Plan and Zoning Ordinance shall guide land divisions and road standards. If there is a conflict among the ordinances with regard to development densities and allowed uses, the Comprehensive Plan and the Zoning Ordinance shall govern. Otherwise, the most restrictive provision governs.
2. Determination of development density on a particular access is a land use decision subject to notice and appeal pursuant to ORS Chapter 197, in conformance with the process for administrative actions described in CCZO Sections 1601, 1608, 1609 and 1612. Determinations of development density shall occur at one of two times: at the time a subdivision and partition plat is submitted for review by the Land Development Services Department, or at the time an access permit is requested for development on an existing parcel on an existing right of way. Appeals shall follow the process described in CCZO Section 1700 for an appeal of a decision of the Planning Director.
3. Determinations of development density will conform to any Transportation Systems Plan adopted by the County. To the extent that a determination of development density implements a transportation systems plan through transportation project development pursuant to OAR 660-12-045, it is not an appealable land use decision. The road construction standards are technical decisions of the Public Works Director and are not land use decisions subject to appeal.

SECTION 6. ADOPTION.

The Columbia County Road Standards are hereby adopted. The Board of County Commissioners also adopts the findings of facts and recommendations of the Columbia County Planning Commission, the Road Department and the Land Development Services Department in adopting the proposed design standards.

SECTION 7. REPEALER.

Ordinance Nos. 92-12 and 94-2 are repealed.

SECTION 8. SEVERABILITY.

The provisions of this ordinance, including Exhibit "A", are severable. If any provision of this ordinance is determined to be invalid by a court of competent jurisdiction, such provision shall be considered a separate, distinct and independent provision and the decision shall not affect the validity of the remaining portions hereof.

ADOPTED THIS 14th DAY OF August, 1996.

BOARD OF COUNTY COMMISSIONERS
FOR COLUMBIA COUNTY, OREGON

By: William R. Wright
Chair

By: Carole W. Smith
Commissioner

By: Joe K. Nelson
Commissioner

Approved as to form:

By: Gene Cochran Pmegg
Office of County Counsel

Attest:

By: Jan Swenborg
Recording Secretary

First Reading: July 17, 1996

Second Reading: July 31, 1996

Effective Date: November 12, 1996

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EXHIBIT "A"

COLUMBIA COUNTY

ROAD STANDARDS

Prepared by:

The Columbia County Board of Commissioners
The Columbia County Road Department
The Columbia County Land Development Services Department
The Columbia County Legal Counsel

Adopted by Columbia County on:
August 14, 1996

EXECUTIVE SUMMARY

The Columbia County Road Standards are intended to establish and implement a uniform set of engineering technical design standards for road improvements that will meet the transportation needs of today as well as the Year 2020. These Standards are intended to provide specific technical direction and guidance to the private sector and staff for the design and construction of all public and private roads and associated improvements for the County's transportation system.

These Standards have been developed in response to the Board of County Commissioners' goal to develop Uniform County Road Standards. The development of these Standards during the past year represent a balance between the present economic realities, local governments' responsibilities to protect the safety of the traveling public, and the need to protect County taxpayers from the burden of undue maintenance costs. These Standards represent the culmination of numerous meetings and discussions between the Columbia County Land Development Services staff, the Columbia County Road Department, Columbia County Counsel, fire marshals, and numerous other interested parties.

The Columbia County Board of Commissioners, by adopting these Standards, will implement modern construction practices on County Roads funded by private enterprise, County/State/Federal sources and local improvement districts.

The Oregon Department of Transportation Standard Specifications for Highway Construction and Standard Drawings, as currently modified, are hereby adopted as the physical standards for the construction of streets and roads except as provided herein or by amendment within each contract.

These standards are intended as a working document to provide a common understanding for design and construction affecting Columbia County Roads and public roads under the jurisdiction of Columbia County. As such, they will be revised and updated periodically.

**RELATIONSHIP BETWEEN THE ROAD STANDARDS AND
LOCAL LAND USE REGULATIONS**

The road standards rely on a determination of ultimate build out in crafting the minimum level of access improvement necessary to support development. The determination of ultimate build out is a land use decision, based on the minimum parcel size requirements in the zoning ordinance and the road system program articulated in the county's transportation plan. The latter is being drafted in response to the mandates of LCDC Goal 12 (Transportation) and the Transportation Planning Rule (TPR).

In Columbia County, the majority of demand for access is from residential development which feeds into collector streets, such as Millard and Morse Roads, and major arterials, such as the Scappoose Vernonia Highway and Highway 30. Development on residential streets can be controlled on an interim basis by the establishment of cul de sacs and by determining the physical constraints to the land which would form a natural terminus. In the road standards, this would be a decision by the Land Development Services Department (See e.g., standards for private roads, Section IV, p. 33).

The requirements for construction of a road, both private and public, will be triggered in one of two ways: when an application for subdivision/partition is submitted to the Land Development Services Department, and when an access approach permit is requested of the Road Department. An access approach permit is required prior to the issuance of building permits for construction. Therefore, there is a preliminary requirement for the developer to improve an access when the land is divided, and a subsequent improvement requirement when a building permit is requested.

**PROCEDURES TO COMPLY WITH THE COMPREHENSIVE PLAN
AND OTHER LAND USE REGULATIONS.**

1. The road standards are intended to describe the technical and engineering requirements for road improvements based on needs for access determined by land use regulations. The Columbia County Comprehensive Plan (CCCP), the Columbia County Zoning ordinance (CCZO) and the Columbia County

Subdivision and Partitioning ordinance (CCSPO) contain separate review criteria. The development densities and uses allowed according to the Comprehensive Plan and Zoning Ordinance shall guide land divisions and road standards. If there is a conflict among the ordinances regarding development densities and allowed uses, the Comprehensive Plan and the Zoning Ordinances shall govern. Otherwise, the most restrictive provision governs.

2. Determination of development density on a particular access is a land use decision subject to notice and appeal pursuant to ORS Chapter 197, in conformance with the process for administrative actions described in CCZO Sections 1601, 1608, 1609 and 1612. Determinations of development density shall occur at one of two times: at the time a subdivision and partition plat is submitted for review by the Land Development Services Department, or at the time an access permit is requested for development on an existing parcel on an existing right of way. Appeals shall follow the process described in CCZO Section 1700 for an appeal of a decision of the Planning Director.
3. Determinations of development density will conform to any Transportation Systems Plan adopted by the County. To the extent that a determination of development density implements a transportation systems plan through transportation project development pursuant to OAR 660-12-045, it is not an appealable land use decision. The road construction standards are technical decisions of the Public Works Director and are not land use decisions subject to appeal.

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SCOPE

These standards have been developed as a uniform guide to developers and property owners in their plans for constructing roads for access to properties.

Roads are classified in several categories:

- 1) **Driveway:** The most basic road is a driveway from a public road which serves as an access to a residence, business, or property. A driveway may serve up to two lots or parcels. Driveways are inspected for compliance by the local fire district. The section of a driveway that intersects with a private or public road is defined as the access approach. An access approach permit is required from the Road Department prior to obtaining a building or siting permit from the Land Development Services office.
- 2) **Private Road:** A private road is privately maintained and may have controlled access if approved by the local fire authority. Up to six parcels may be served by a private road. Private roads must access directly to a public road and are often referred to as common driveways. Maintenance agreements and easements are required for new private roads before any development permits can be processed or issued. Private roads are allowed within Urban Growth Boundaries upon concurrence with the city.
- 3) **Public Road:** A public road is a road located on a public right-of-way that has been dedicated to the public and accepted by the Board of County Commissioners on behalf of the public as a public road but it has not been formally adopted by the Board of County Commissioners as a "County Road". Many public roads have been platted and dedicated to the public but have not been constructed. Topography and feasibility of construction may not have been of much concern when many public roads were initially platted. Modern vehicles are very different from those anticipated many years ago and the result is that it is often more difficult and sometimes impossible to construct a public road to current standards within the rights-of-way established decades ago. This document attempts to apply current road standards to existing platted roads while considering feasibility and respecting the rights of individual landowners.

Public roads that are platted after adoption of this document must comply with all standards in place at the time the plat is approved.

The County Road Department does not maintain public roads on a regular basis.

- 4) County Road: A public road formally adopted by the Board of County Commissioners as a "County Road". The County Road Department is responsible for maintenance of County Roads. The degree of maintenance of serviceability of a County Road depends on the maintenance classification and can vary from road to road.

County Roads that are adopted by the County Commissioners after approval of this document must comply with all standards in place at the time the road is adopted.

DEFINITIONS

This section contains only those definitions which may have more than one definition. The definition presented will govern. Not only is the definition stated, but in some cases, further information is given.

- ADT Average Daily Traffic. The total number of vehicles traveling in both directions in a 24-hour period past a fixed point.
- All-Weather
maintained
Driving
Surface A firm, uniform road surface designed and to bear the imposed loads of fire apparatus. An all-weather driving surface does not necessarily require paving.
- Alley A street or road primarily intended to provide secondary access to the rear or side of lots or buildings and not intended for normal through vehicular traffic. An alley shall have a minimum 20 foot right-of-way.
- Arterial A roadway intended to carry large volumes of traffic (1000 ADT or more outside of an Urban Growth Boundary [UGB]) and connect major traffic generators, cities, recreational areas, and major segments of transportation networks. High capacity is achieved through allowing higher speed, limited access, wider roadway and movement preference at intersections with lesser standard roadways.
- Collector A roadway intended to carry intermediate volumes of traffic (500-1500 ADT outside of a UGB) and collect and distribute traffic from local streets to arterial roads, state highways or small population centers.
- County Road A public road incorporated into the County Road System by formal action of the Board of County Commissioners. These roads are assigned official County Road numbers

Cul-de-sac	A permanently maintained, clear, unobstructed road space at least 90 feet in diameter at the end of a dead-end road.
Design Speed	The minimum design speed for each road classification shall be as shown in drawings I & II.
Director	The Director of the Road Department.
Driveway	An access from a road that serves up to two lots or parcels.
Fire apparatus Access Road	A 20 foot wide (minimum) road with all weather driving surface and a clear unobstructed height of 13'6" which is used by fire apparatus and other vehicles.
Grade	The percent of inclination of a slope or road.
Intersection	The area joining 2 or more intersecting roads.
Local Road	A public roadway serving short distance, intra-neighborhood and residential needs. They are characterized by minimal access limitations, lowest traffic movement preference at intersections with collector and arterial roads, and minimum widths. These factors lead to minimum traffic carrying capacity, but provide maximum access to adjacent property.
Lot	A unit of land that is legally established by a subdivision of land.
Parcel	A unit of land that is legally established by a partitioning of land.
Private Road	A road which serves up to 6 lots or parcels, is located on private property, and is dedicated by easement to the subject properties. It is maintained with private funds and a maintenance agreement is required.
Public Road	A road constructed within a public right-of-way dedicated for use by the public and accepted by the Board of County Commissioners on behalf of the public as a public road but has not been adopted by the Board of County Commissioners as a County

Road. Columbia County only assumes responsibility for maintenance of "County Roads".

Road That portion or portions of the right-of-way used for vehicular traffic, and includes areas 2 feet behind the curb or 2 feet beyond the edge of the shoulder. Streets and roads are synonymous.

Rural An area of property with lot sizes one-quarter acre or larger. (This is different from the subdivision and partitioning ordinance in that it stipulates that rural is only those areas outside Urban Growth Boundaries. Therefore, a subdivision outside of UGBs could be considered an urban area for the purposes of these standards if the lot sizes are smaller than one-quarter acre.)

Urban Area of property with lot sizes smaller than one-quarter acre. (This differs from the subdivision and partitioning ordinance. See "Rural" above.)

Utilities Any water, gas, sanitary or storm sewer, electrical, telephone, drainage way, wire, or television communication service and all persons, companies, or governmental agencies supplying the same.

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADS	Advanced Drainage Systems
ADT	Average Daily Traffic
APWA	American Public Works Association
CBE	Crushed Base Equivalent
EAL	Equivalent Axle Load
LID	Local Improvement District
NA	Not Applicable
ORS	Oregon Revised Statutes
ODOT	Oregon Department of Transportation
PUE	Public Utility Easement
ROW	Right of Way
UFC	Uniform Fire Code
UGB	Urban Growth Boundary

I. OVERVIEW OF THE ROAD STANDARDS

A) DEVELOPMENT OF ONE EXISTING PARCEL OF LAND BY CONSTRUCTION OF A HOME OR BUSINESS NOT IN CONJUNCTION WITH A PARTITION OR SUBDIVISION.

Prior to obtaining a permit for construction of a home or business, a road access permit is required from the Road Department. The road access and associated improvements must be constructed according to the Road Standards (or a bond in the amount of 125% of the estimated road work deposited with the County) before the permit will be approved.

The access to the property may consist of several parts:

- 1) Driveway: That section of the access located entirely on the private property and may serve one or two lots or parcels. This driveway section must be constructed according to "Fire Department Driveway Standards", Section II. Only that section of the driveway near the public right-of-way or private easement necessary to construct the access approach will be inspected by the Road Department. The access approach to the public road or private easement must comply with the "Access Approach Standards" (Section III).
- 2) Private or nonexclusive access easement. Access to the property may also be partially located on a private or nonexclusive easement. The access on such easement must be constructed according to "Private Road Standards" (Section IV) to the extent feasible within the limits of the easement. Improvements to roads on easements currently in use by other residents shall be apportioned such that the cost of the necessary improvements to construct the road within the easement will be divided between the potential undeveloped lots and parcels along the easement. Owners of undeveloped properties shall be required to pay or make improvements to the road only after making application to the Land Development Services Office of the County for development of the property. Therefore, it is the intent that the road will be in compliance with the standards to the extent feasible (as determined by the Public Works Director) upon development of all the properties along the easement. Property owners along such easement will be required to construct such improvements up to a maximum expense of \$3,000, in conjunction with development of the property.
- 3) Public Road or County Road Rights-of-way. Access to the property may also be directly onto an existing

public road or County Road. Such existing public right-of-way shall be improved in accordance with the "Development of Existing Public Rights-of-way" standards (Section V) to the extent feasible, as determined by the Public Works Director, within the right-of-way limits.

Development of a public right-of-way currently in use by other residents shall be apportioned proportionate to the maximum buildout of the area such that the cost of the necessary improvements to construct the road within the right-of-way to the public road or County road standards will be divided between the potential undeveloped lots and parcels along the right-of-way. Owners of undeveloped properties shall be required to pay or make improvements to the road only after making application to the Land Development Services Office of the County for development of the property. Therefore, it is the intent that the road will be in compliance to the extent feasible (as determined by the Public Works Director) with the public road or county road standards upon development of all the properties along the right-of-way. Improvements required of a developer of a single lot or parcel to a public or county road that is currently used by other property owners shall be to a maximum expense of \$3,000. Such improvements to the road shall only be required upon application for a development permit for the property from the Land Development Services Office.

Improvements to a public road required of a developer of one existing lot shall not include paving. However, in lieu of paving of a public road, the owner of the existing lot will be required to sign a waiver of remonstrance for creation of a Local Improvement District (LID) for future improvements to the road.

- 4) Placement of utilities within a public road or county road right-of-way, or road improvements to any public road or county road, or placement of any fence, sign or facility within a public road or county road right-of-way requires a separate permit from the Road Department as described in Section I (D) of this guide.

B) PARTITIONS

Partitions create additional parcels of land and potentially additional traffic that may or may not have been anticipated for a roadway.

Prior to final approval of a partition, access improvements will be required as follows:

- 1) Private Roads or Easements. Up to six lots or parcels may be accessed by a private road or easement (more than six parcels may use a private road or easement for access if the parcels are preexisting). Additional parcels shall not be created along a private road or easement if there are currently more than six parcels along the private road or easement or if the partition would result in a total of more than six parcels. Prior to final approval of the partition, the private road or easement must be developed, from the intersection with the public road to the end of the easement or to the limits of the partitioned property (whichever is less), to the "Private Road" standards, Section IV, proportionate to the maximum buildout of the area.

These improvements may be required beyond the limits of the partitioned property. If the standards cannot be achieved, other means of access to the property will be required.

- 2) Creation of New Public Roads. New public roads created in conjunction with a partition shall be improved in accordance with the "Creation of New Public Road" standards (Section VI). The entire length of the new public right-of-way shall be improved according to the standards prior to final approval of the partition.
- 3) Existing Public Road Rights-of-way. Developers of partitions with frontage on existing public roads or county road rights-of-way may be required to make improvements to roads within such rights-of-way beyond the limits of the frontage proportionate to the maximum build of the area. Such improvements shall be made in accordance with the "Development of Existing Public Road" standards (Section V). If such improvements cannot feasibly be constructed, other means of access to the property will be required.

If the improvements to the public road or county road do not require paving, the owner of the property to be partitioned must sign a waiver of remonstrance to creating an LID for future road improvements.

After a partition has been given final approval, each individual parcel will be treated as an existing parcel and additional road improvements will be required as explained in "A" above, which will require a road access permit from the Road Department prior to construction of a home or placement of a modular home.

- 4) Placement of Utilities Within a Public Road Right-of-way. Placement of utilities within a public road or county road right-of-way, or road improvements to any public road or county road, or placement of any fence, sign or facility within a public road or county road right-of-way requires a separate permit from the Road Department as described in Section I (D) of this guide.

C) SUBDIVISIONS

Subdivisions create many additional parcels of land and associated increase in traffic that is usually not anticipated for a roadway.

Access to properties in subdivisions is usually by public roads and county roads. Improvements to such roads will be as follows:

- 1) Creation of New Public Rights-of-way. All new public roads or county roads created in conjunction with a subdivision shall be improved in accordance with the "Creation of a New Public Road" standards (Section VI). The entire limits of the new public right-of-way shall be improved prior to final approval of the subdivision.
- 2) Existing Public Road or County Road Rights-of-way. The section of the existing public road or county road right-of-way adjacent to or within the subdivision (or those sections that are not currently used for residential access but necessary for the subdivision); shall be improved in compliance with the "Creation of New Public Road" standards, Section VI.

Improvements to the existing and currently used public or county roads in the area of the subdivision will be reviewed on a case by case basis to determine the road improvements necessary beyond the limits of the subdivision boundaries (off site improvements), and to be certain that the access roads can be constructed to the new road construction standards of Section VI. If such improvements cannot feasibly be constructed, other means of access to the property will be required. Such off site improvements shall be proportionate to the maximum buildout of the area.

After a subdivision has been given final approval, each individual lot will be treated as an existing lot and roads shall be improved in accordance with "A" above, which will require a road access permit from the Road Department prior to construction of a home or placement of a modular home.

3) Placement of Utilities Within a Public or County Road Right-of-way. Placement of utilities within a public road or county road right-of-way, or road improvements to any public road or county road, or placement of any fence, sign or facility within a public road or county road right-of-way requires a separate permit from the Road Department as described in Section I (D) of this guide.

D) CONSTRUCTION OF UTILITIES, FACILITIES, OR ROADS WITHIN PUBLIC OR COUNTY ROAD RIGHTS-OF-WAY.

Prior to construction of a road within a public road or county road right-of-way, or construction or placement of any utilities, signs or facilities within a public road or county road right-of-way, a permit for such work is necessary from the Road Department.

Even if the Land Development Services Department has approved of a proposed partition or subdivision, prior to any work within an existing or proposed public road or county road right-of-way, a permit must be obtained from the Road Department.

E) SUMMARY OF STANDARDS

The following table is a brief summary of some of the major development standards for the various road classifications:

SUMMARY OF NEW ROAD CONSTRUCTION STANDARDS

Road Classification	Typical ADT	Minimum ROW Width	Base Rock 4" / 3/4"	Surface Type	Surface Width/ Thickness	Bike Lane	Shoulder Width/ Type	Design Speed	Max Super	Max Grade
Driveway	0-10	NA	8" / 2"	Gravel	12'	No	None	NA	4%	12% AVG ⁽⁷⁾
Private ⁽⁸⁾ Road	0-100	40'	8" / 2"	⁽²⁾ Gravel	⁽¹⁾ 20'	No	None	15	4%	12% AVG ⁽⁷⁾
Public Road - Local	0-500	50'	10" / 2"	A.C.	20'/3"	Note 4	⁽⁵⁾ 3' /Gravel	25	4%	12%
Public Road - Collector	500-1500	60'	12" / 2"	A.C.	24'/4"	Note 4	⁽⁵⁾ 4' /Gravel	35	6%	10%
County Road - Local	0-500	50'	10" / 2"	A.C.	20'/4"	Note 4	⁽⁵⁾ 3' /Gravel	25	4%	12%
County Road - Collector	500-1500	60'	12" / 2"	A.C.	24' / 4"	Note 4	⁽⁵⁾ 4' /Gravel	35	6%	10%

- (1) 12 feet for one or 2 residences.
- (2) Paving over 12% average grade.
- (4) If designated.
- (5) 8 feet paved in urban areas.
- (6) 4% in urban areas.
- (7) 17% with paving if approved by the local fire department.
- (8) May access up to 6 parcels.

II. FIRE SERVICE REQUIREMENTS

The Columbia County Fire Service has the authority and responsibility to process requests for review and approval of all fire apparatus access roads and driveways. Outside Rural Fire District boundaries, the Oregon Department of Forestry will have the responsibility and authority to process requests. The Oregon Department of Forestry may request the Fire District to check and approve these roads and driveways.

A) FIRE APPARATUS ACCESS ROADS

Fire apparatus roadways shall be provided so that no portion of an exterior wall of the first story of a structure is located more than 150 feet from an approved fire department vehicle access as measured by an unobstructed route around the exterior of the building. Fire apparatus access roads for outside storage areas shall be provided in accordance with applicable provisions of the Uniform Fire Code or in accordance with nationally recognized standards, see UFC 902.2.1.

Fire apparatus access roads shall be provided as required by the Uniform Fire Code and meet the following conditions:

- 1) All fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround (see Section II.C.8 of this document & UFC 902.2.2.4.
- 2) All fire apparatus access roads shall be at least 20 feet wide, a minimum curve radius of 45 feet and have a clear height of 13 feet, 6 inches and be maintained clear of debris/obstructions, see UFC 902.2.2.1 & 902.2.2.3.
- 3) Grade for fire apparatus access roads shall not exceed an average of 12 percent with a maximum of 15 percent on short distances of no more than 75 feet. Where there are existing conditions, particularly topography, which cause non-negotiable conditions, the Fire Chief may require paving or additional fire protection. This additional fire protection may include an approved fire sprinkler system and/or other fire protection devices as specified in UFC 1001.9 in considering a variance of this interpretation and Fire Code, see UFC 902.2.1.(2)

- 4) Fire apparatus access roads shall be designed and maintained to support loads of fire apparatus and sustain a minimum wheel load of 12,500 pounds and gross vehicle load of 50,000 pounds and be provided with a firm, uniform all-weather driving surface, approved by an Oregon Registered Professional Engineer. Otherwise, written verification of compliance shall be provided by the applicant, see UFC 902.2.2.2.
- 5) Private bridges shall be constructed in accordance with the Uniform Building Code and the American Association of State Highway and Transportation Official specifications and be capable of sustaining a minimum wheel load of 12,500 pounds and a gross vehicle load of 50,000 pounds, and such plans shall bear the stamp and/or seal of an Oregon Registered Professional Engineer. Otherwise, written verification of compliance shall be provided by the applicant, see UFC 902.2.2.5.
- 6) More than one fire apparatus road shall be provided where emergency evacuation, emergency operations could be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access and evacuation. UFC 902.2.1.

Wherever possible, developments must provide two means of access to and from site when serving twenty five or more units (a duplex counts as two units, etc). When two means of access cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief is authorized to require additional fire protection as specified in UFC 1001.9 or may require other alternatives such as medians, gated emergency roads, etc.

- 7) Approved signs and/or notices shall be provided and maintained to identify such roads and prohibit the obstruction thereof. They shall comply with the manual or Uniform Traffic Control Devices, 1988 Edition, see UFC 901.4.2. "No Parking" and "Fire Lanes" shall be signed and marked as follows:
 - a) Fire lane markings on curbs or road surface shall be painted bright red with white letters. The stroke shall be 1 inch with letters 6 inches high to read "No Parking Fire Lane". Spacing for signage shall be every 25 feet.
 - b) Vertical signs shall be mounted no lower than 4 feet and no higher than 8 feet.

- c) Vertical signs shall be 12 inches wide by 18 inches high. Signs shall have red letters and border on a white background. The word "NO" shall be presented in a reversed color arrangement in the upper left hand corner. Spacing shall not exceed 25 foot intervals between signs.

B) DRIVEWAY STANDARDS:

It is the purpose of this driveway standard to establish a uniform interpretation of the Uniform Fire Code and to promote the public's health, safety and welfare through the regulation of fire apparatus access roads and driveways as required by the Uniform Fire Code, Article 9, Section 902.1.

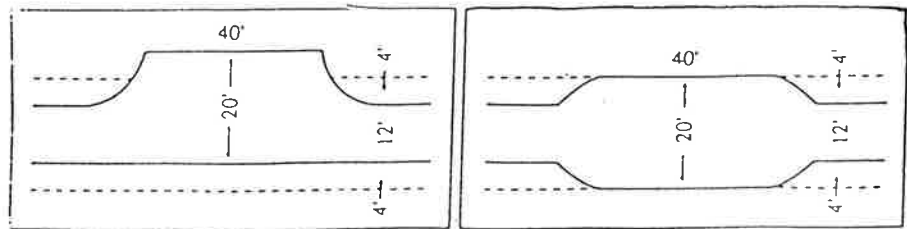
Driveways may serve one or two residences. Driveways beyond the limits of the access approach to a public road, county road, or private road, must comply with the Fire Department Driveway Standards listed below. The Land Development Services Department must receive approval of the proposed road improvements from the Fire Department prior to the issuance of a building permit.

Standards for driveways in excess of 150 feet in length accessing a residence, or any other building over 1000 sq. ft. in size which requires a building permit, shall be provided as required by the Uniform Fire Code 902.2 and shall meet the following conditions.

- 1) Driveways shall be built and maintained to provide a minimum 12 foot width of firm, uniform all-weather surface capable of supporting gross vehicle weights of 50,000 pounds, minimum wheel load of 12,500 pounds and approved by an Oregon Registered Professional Engineer. Otherwise, written verification of compliance shall be provided by the applicant. The 20 foot right-of-way shall consist of a 12 foot firm, uniform all weather travel lane bordered by a 4 foot section on each side which shall be maintained clear of debris and obstructions. Driveways shall have a minimum curve radius of 45 feet and a vertical clearance of 13 feet 6 inches, see 902.2.2.1, 202.2.2.2 and 202.2.2.3.
- 2) Driveways 400 foot long but less than 800 feet shall have a turnout provided at approximately one-half the length of the driveway. Driveways greater than 800 feet will have turnouts provided not greater than 400 feet apart. Wherever visibility is limited, these

distances should be reduced appropriately. Turnouts are generally considered an additional 8-foot wide by 40-foot long portions of the driveway, other forms of turnouts may be accepted with prior approval of the Fire Chief.

Examples:



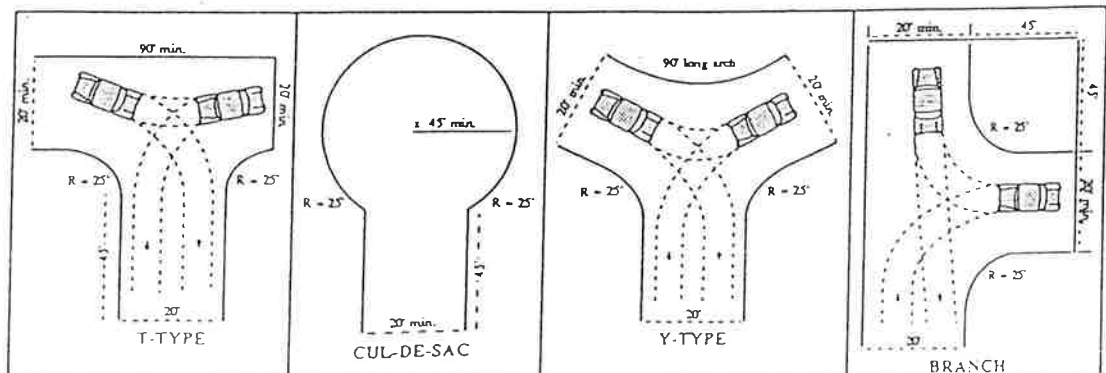
- 3) Dead-end-driveways are defined as dead-end roads over 150 feet in length serving a single residence. Dead-end-driveways shall have turnarounds such as a cul-de-sac, hammer head etc. as shown in Section II.C.8, see also UFC 902.2.2.4.
- 4) Bridges, culverts, and other structures in the driveway shall be constructed and maintained to support gross vehicle weights of 50,000 pounds. If bridges or culverts are involved in the construction of a road or driveway, written verification of compliance with the 50,000 gross vehicle weight standard shall be provided from an Oregon Registered Professional Engineer. Otherwise, written verification of compliance shall be provided by the applicant, see UFC 902.2.2.5.
- 5) Driveway grades shall not exceed an average of 12 percent, with a maximum of 15 percent on short distances of not more than 75 feet. Where there are existing conditions, particularly topography, which cause non-negotiable conditions, the Fire Chief may require additional fire protection. This additional fire protection may include an approved fire sprinkler system and/or other fire protection devices as specified in UFC 1001.9 in considering a variance of this interpretation and Fire Code, see UFC 902.
- 6) Driveways shall be marked with the residence's address unless the residence or building is in such a position as to be plainly visible from the roadway. The residence or building address must be legible from the street or road fronting the property. Letters or numbers should be a minimum of three inches in height and constructed of reflective material.
- 7) If the driveway has a road name it shall be identified with approved signs, see UFC 901.4.5.

C) TURNAROUNDS:

Turnarounds, cul-de-sacs, and other turnaround configurations shall be provided as required by the Uniform Fire Code 10.207(h), and meet the following conditions (refer to diagrams below):

- 1) Maintain unobstructed clearance for bumper overhang on rights-of-way.
- 2) Curb height shall not exceed 6 inches.
- 3) "No Parking" areas shall be designated by the Fire Chief and comply with the manual of Uniform Traffic control Devices; 1988 Edition. If curbs are not present "No Parking" signs shall be used.
- 4) "No Parking, Fire Lane, and Tow Zone" sign locations will be determined by the Fire Chief and comply with the Manual of Uniform Traffic Control Devices, current Edition.
- 5) The structural section of the road shall be designed to support 50,000 pounds of vehicle weight, 12,500 pounds wheel load and be approved by an Oregon Registered Professional Engineer or written verification of compliance shall be provided by the applicant.
- 6) Drainage shall be required to prevent ponding.
- 7) The area of the turnarounds shall be permanently maintained, kept clear, and unobstructed at all times.
- 8) The creation of turnarounds shown in this document on any specific site, must be approved by the Fire Chief, an Oregon Registered Professional Engineer and the Columbia County Department of Land Development Services on apparatus access roads. On driveways the Fire Chief shall approve all proposed turnarounds with verification as described in "5" above.

TURNAROUND DIAGRAMS:



D) EMERGENCY ACCESS/SECURITY GATES:

When access to or within a structure or an area is unduly difficult because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the Fire Chief may require a key box to be installed in an accessible location. The key box shall be a type approved by the Fire Chief and shall contain keys to gain necessary access as required by the Fire Chief, see UFC 902.4.

E) PLANS AND SPECIFICATIONS:

Plans for fire apparatus access roads/driveways shall be received by the Rural Fire District in accordance with the Uniform Fire code 901.2.2.1. These plans shall contain all of the following information:

- 1) Right-of-way width
- 2) Width of all weather surfaces
- 3) Turnouts
- 4) Turnarounds
- 5) Grades
- 6) Curves
- 7) Bridges
- 8) Culverts
- 9) Structures in relation to roadways
- 10) Addressing
- 11) Intersections
- 12) Existing structures & driveways on roadway
- 13) Location of hydrants/hydrant reflectors if required
- 14) Approval stamp of an Oregon Registered Professional Engineer or written verification compliance from applicant for 50,000 pound vehicle weight and 12,500 pound per wheel load weight.

F) INSPECTION FOR COMPLIANCE

To insure that access roads/driveways are improved to the required standards, the following "Fire Services Improvement Requirements" form must be signed by a Fire District official before a building permit is issued. This will assure that road improvements are adequate for fire protection equipment to reach the site not only during the construction phase, but also throughout the existence of the structure(s), see UFC 901.3.

**FIRE SERVICE IMPROVEMENT REQUIREMENTS
FOR ROADS OVER 150 FEET IN LENGTH WITH
ONE AND TWO FAMILY DWELLINGS**

If this is a new access connecting to a county road, please contact the Columbia County Department of Land Development Services to obtain a road approach permit or a sign-off indicating that no permit is required.

The Uniform Fire Code 902.1 and the Zoning and Development Ordinance of Columbia County, Oregon, requires roadway/driveway improvements to a construction or mobile home installation site prior to the issuance of a building permit. One reason for this requirement is to assure that road improvements will allow fire protection equipment to reach the site, not only during the construction phase but throughout the existence of the structure. In order to assure that the access road meet the required standards, this form must be a local Fire Service official, and a copy of the signed form must be attached to your application for a dwelling, construction or mobile home placement permit.

Minimum standard roadway approval requires a twelve foot (12') wide, uniform all-weather travel lane, with a twenty foot (20') right-of-way maintained clear of debris and obstructions four feet (4') on each side of the travel lane. Driveways shall sustain a minimum wheel load of twelve-thousand five-hundred (12,500) pounds per wheel and a gross vehicle load of fifty-thousand (50,000) pounds. Turnouts twenty feet wide (20') and forty feet (40') long may be required on any access road exceeding four-hundred feet (400') in length. The unobstructed width must be maintained for not less than twenty feet (20'). Vertical clearance shall be maintained at no less than thirteen feet, six inches (13'6"). All access roads over one-hundred-fifty feet (150') in length shall be provided with a turnaround area at or near the end, improved to the above standards and of a design approved by the local Fire Service. Proper drainage must be provided. Bridges and culverts shall be capable of supporting a minimum of fifty-thousand (50,000) pounds. Average road grade shall not exceed twelve percent (12%) and no grade shall exceed fifteen percent (15%). Maximum curve centerline shall be not less than forty-five feet (45') radius. Any new access connecting to a Columbia County road requires a Columbia County Access Permit.

Please deliver this form to the local Fire Service and assist them in locating and inspecting the roadway/driveway providing access to the proposed development site. Maps to assist you in this effort may be obtained from the Columbia County Assessor's office or the Columbia County Department of Land Development Planning.

TYPE AND LOCATION OF PROPOSED DEVELOPMENT

Name: _____ Phone: _____ Tax Lot: _____

Address: _____

Description: _____

-----THIS SECTION TO BE COMPLETED BY FIRE SERVICE-----

_____ I have inspected the plot plan for the above location and proposed road improvements. The roadway may be built as proposed.

_____ I have inspected the above property and have determined that road improvements are adequate for temporary access by Fire Service equipment. A reinspection must take place prior to occupancy.

_____ I have inspected the above property and determined that road improvements to the proposed development site are suitable for access by Fire Service equipment.

_____ The following improvements must be completed prior tot permit issuance:

Name: _____ Date: _____

Fire Service: _____ Date: _____

III. ACCESS APPROACH

A) ACCESS

Access to County Roads, Public Roads, and Private Roads shall conform to the Columbia County Approach Road Ordinance (EXHIBIT 3) and these standards, or as modified by Urban Growth Boundary Management Agreements. An access approach permit must be obtained from the Columbia County Road Department prior to constructing any access approach to any county road, public road under the jurisdiction of the county, or any private road. An access approach permit is also required prior to obtaining a building permit from the Land Development Services office.

B) LOCATION AND NUMBER

It is the county's policy to provide access onto public and private roads in a manner and location that will protect the public safety. In general, the number of access points onto a roadway shall be held to the minimum necessary to provide adequate access to a particular parcel of property.

The location and number of driveways shall be as follows:

- 1) No access shall be allowed where there is less than the Minimum Stopping Sight Distance. Sight distance shall be measured from 3.5 feet above the pavement or traveled road surface at a location of 10 feet behind the edge of the traveled surface at the intersecting driveway, to a point that is 4.25 feet above the pavement in both directions. The sight distance shall then be measured along the center line of the public roadway between these two points. Minimum sight distance requirements shall be 10 times the 85th percentile speed of traffic as indicated in the following table. Applicants for road approaches shall develop and maintain adequate sight distance across their property to allow for the safe movement of traffic in every direction. No fence, tree, shrub, structure or natural earth mound may block this clear vision area.

Adequate sight distance is dependent on the speed of traffic (not necessarily the posted speed) at the location of the proposed driveway approach as follows:

85th PERCENT SPEED	MINIMUM SIGHT DISTANCE REQUIRED
25	250
30	300
35	350
40	400
45	450
50	500

The 85th percentile speed of traffic is that speed at which 85% of traffic travels at or below.

- 2) Driveway accesses shall intersect other roadways at or near a 90 degree angle. In no case shall it be less than 75 degrees. The angle of the access shall be constructed such that ingress and egress can be made completely within appropriate travel lanes.
- 3) Where there are several adjacent parcels with narrow frontage or where sight distance is inadequate, a frontage road or combined driveway may be required.
- 4) Within a UGB, a maximum of one double driveway or a looped driveway with a 90 degree intersection to the roadway shall be allowed per single family dwelling on a collector or arterial.
- 5) Within a UGB, no more than 40 percent of the roadway frontage of a lot shall be devoted to driveways (except for flag lots).
- 6) Where property is located at the intersection of an arterial or collector and a local street, the preferred access shall be on the local street.
- 7) On a corner lot, no portion of any driveway shall be allowed within the curb return or pavement flare of the intersection. On collector or arterial streets it shall be a minimum of 30 feet from the end of the curb

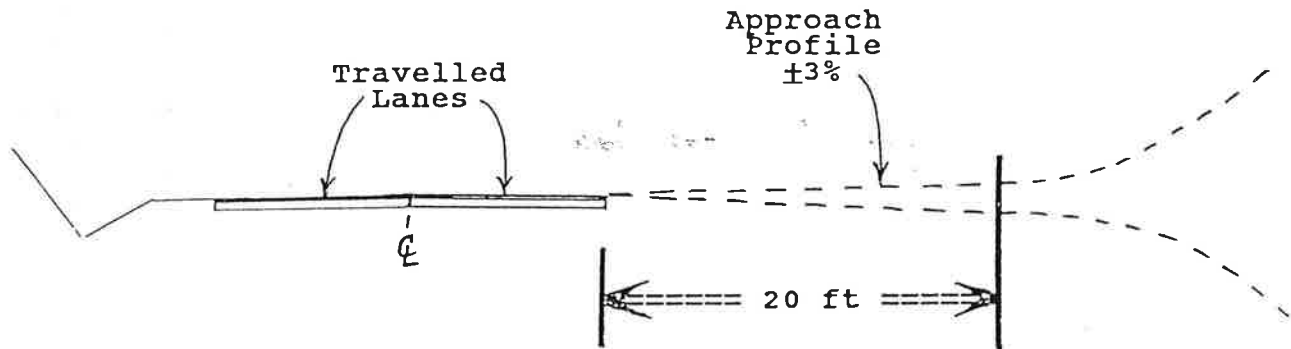
return or, if there is no curb, from the end of the pavement flare.

C) WIDTHS

Widths for commercial driveways shall be determined on a case by case basis. Residential driveways shall be 16 feet wide at a distance of 20 feet from the edge of the traveled surface of the intersecting road.

D) GRADE

The profile of the approach centerline shall not exceed $\pm 3\%$ from the edge of the traveled surface for a distance of 20 feet, as follows:



IV. PRIVATE ROADS

Private roads may serve up to six lots upon approval by the Land Development Services office of the county, may be located within an Urban Growth Boundaries upon concurrence with the city, and must access directly to a public road. Private roads shall comply with Fire Department Fire Apparatus Access Road standards and the following:

A) MINIMUM REQUIREMENTS

- 1) Private roads shall not be approved if the road is presently needed, or is likely to be needed, for public

road purposes in the normal development of the area, or if the private road is intended to facilitate more intensive development of the area, or if the private road is intended to serve commercial or industrial uses. Private roads shall not be approved for commercial or industrial land divisions.

- 2) The minimum easement width for a private road shall be 40 feet, except where the natural slope or topography of the land requires a greater width. The minimum right-of-way width shall accommodate required cut and fill slopes, ditches, turnouts and cul-de-sacs. Additional right-of-way will be required to be dedicated from developers of property if the easement is not currently 40 feet wide or if additional right-of-way is required for the necessary improvements within the limits of the property being developed.
- 3) A lot or parcel abutting a railroad or limited access road right-of-way may require special consideration with respect to its access requirements.
- 4) Guardrails are required on all bridges and for a distance of 40 feet along the approaches to all bridges. A guardrail is also required along any roadway where the fill slope or natural ground slope below the road is steeper than 1:1, over 10 feet high, and is within 10 feet horizontally of the edge of the traveled road surface. The guardrail materials must conform to the Oregon State Highway Standard Drawings and Specifications.
- 5) The County may require that the private road being created for a partition or other development be dedicated for public road and utility purposes and improved to the applicable standards, if it is determined by the Public Works Director or the Columbia County Land Development Services Department that the access and transportation needs of the public would be better served by such a change.

The determination made by the County will include the following:

- a) Proximity of other roads being used for the same purpose,
- b) Topography of the parcel and contiguous parcels,
- c) Potential development and potential buildout densities as determined by the existing zoning,
- d) Safety factors such as visibility, frequency or road access points.

- 6) All private dead-end roads shall have a cul-de-sac or other suitable turnaround.
- 7) A private road shall directly connect only to a public road. (It shall not connect to another private road.)
- 8) The County shall require that a maintenance agreement be recorded in the office of the County Clerk of Columbia County with the map or plat creating the private road, and the agreement shall include the following terms:
 - a) That the agreement for maintenance shall be enforceable by a majority of homeowners served by the road.
 - b) That the owners of land served by the road, their successors, or assigns, shall maintain the road, either equally or in accordance with a specific formula that is contained in the maintenance agreement.
 - c) Amendments shall be allowed by written and recorded agreement and consent of 75% of property owners adjacent to the road.
- 9) The County shall require that an easement over the private road for access, including the right of maintenance, be conveyed to the properties served by the road.

B) MINIMUM CONSTRUCTION STANDARDS

- 1) Twelve foot wide improved travel surface for one or two lots. Twenty foot wide improved travel surface for 3 to 6 lots.
- 2) The travel surface of the private road shall be constructed to ensure access for the parcels served during all climatic conditions. Minimum requirements:
 - a) Ten inches of pit run or eight inches of 4"-0 base rock or equivalent. The grade of rock shall be approved by the County Road Department prior to construction.
 - b) Two inches of 3/4"-0 surface rock.
- 3) Turnouts shall be required on 12 foot wide roadways at 400 foot maximum intervals, or at distances which ensure continuous visual contact between turnouts. Turnouts shall be constructed to the following dimensional standards: 40 feet in length and 8 feet in

width, with 12 foot tapers on each end back from its point of connection with the private road.

- 4) The minimum cut and fill slope ratio shall be $1 \frac{1}{2}$ units horizontal to 1 unit vertical ($1\frac{1}{2} : 1$). The developer shall be required to provide all erosion control measures necessary to maintain the standard cross section and to eliminate increases in any stream turbidity.
- 5) The finished grade within 20 feet of the traveled portion of the public roadway shall not exceed ± 3 percent. Elsewhere the finished grade shall not exceed 17%. Any section of road grade that exceeds an average of 12% (excepting up to 75 foot sections of up to 15%) shall be paved. Any section of road with a grade in excess of 15% shall be paved. Minimum compacted depth of pavement on a private road shall be 2 inches.
- 6) A 45 foot radius cul-de-sac, or other suitable turnaround, at the terminus of the private road or within 200 feet of its terminus.
- 7) All culverts, bridges and other waterway crossings shall be constructed and maintained to carry American Association of State Highway and Transportation Officials (AASHTO) HS-20 loading. All culverts shall have a minimum diameter of 12 inches. Bridges and other large waterway crossings shall be certified by a registered professional engineer.
- 8) All private road points of access to public roads shall include a landing area to extend 20 feet minimum beyond the shoulder of the public road on which the profile grade shall not exceed 3 percent. A greater landing area may be required to allow for future road improvements.
- 9) If the intersecting public road is paved (or asphalt "oil" mat), the private road shall be paved at least 20 feet back from the edge of the existing asphalt roadway.
- 10) Centerline curve radius shall be at least 45 feet.
- 11) Overhead clearance shall be maintained at least 13 feet 6 inches.
- 12) Variances to this standard shall require a written letter of approval from the appropriate fire department, Rural Fire District, or Oregon State Board of Forestry.

- 13) Approved signs shall be provided and maintained by the owners of property being accessed by the private road to identify the road and to prohibit parking or obstruction of the roadway as required by the Columbia County Fire Services Fire Apparatus Access Road and Driving Standard.
- 14) An access permit is required from the Road Department for a driveway that accesses a private road.

continually improved until the gravel base is completely constructed upon the final development of the last lot or parcel at which time it is intended that the gravel base improvements will be completed.

Road improvements shall be constructed to the standards listed in Section VI to the extent possible within the limits of the existing right-of-way. Additional right-of-way shall be dedicated to the public for public or county road purposes by the applicant within the boundaries of their property as indicated in drawings I and II, pages 50 and 51, if the existing right-of-way is not of standard width or if the improvements cannot be constructed to the standards of Section VI within the existing right-of-way limits for this section of roadway.

Sequence of improvements shall be made to the road from the point of the intersecting public road to the rear.

Applicants for construction of a new residence or single development on an existing through public road or county road not constructed to the standards of Section VII shall widen the gravel shoulder for the full length of their road frontage to a surface width of 13 feet from constructed centerline for a local road, a width of 16 feet from constructed centerline for a collector road and 17 feet from centerline of an arterial road. The applicant shall dedicate enough right-of-way to allow maintenance of the constructed shoulder, ditch, and fill or cut slope, or to a width as indicated in drawings I and II on pages 50 and 51.

2) OPENING OF UNDEVELOPED PUBLIC RIGHTS-OF-WAY

New construction must pay particular attention to alignment and grade such that future improvements can be economically made to the roadway to eventually comply with the new road construction standards (Section VI) of this document. The subgrade shall be constructed to the full extent possible within the right-of-way limits.

To ensure that the road construction on unopened public roads complies as close as possible to the construction standards for new platted public roads, plans are required to be approved by the Road Department before a permit will be issued. The plans must include the same information as required in Section VI of this document, however the plans are not required to be stamped by a registered professional engineer. The subgrade must be constructed to the full width of the right-of-way or to new road construction standards such that future developers of property along the roadway will not have to construct the subgrade.

If additional right-of-way is needed for construction to the standards of Section VI within the limits of the property owned by the applicant, right-of-way shall be dedicated to the public prior to issuing a permit for construction.

3) CONSTRUCTION STANDARDS FOR EXISTING PUBLIC ROADS

Fire Standards: Must comply with the Columbia County Fire Services fire apparatus access roads and driveways standards.

Grade: Generally as existing. Minor improvements may be required by the Public Works Director as a condition of the construction permit. (Partitions and subdivisions will not be allowed where existing grades are greater than 15%.)

Alignment: Generally as existing. Minor improvements may be required by the Public Works Director as a condition of the construction permit.

Road Width: Road rock base requirements for public roads shall be 30 feet for 7 or more properties, 20 feet for 2 to 6 properties, and 12 feet with turnouts for 1 or 2 properties. Approved turn-arounds are also required at the end of all dead-end roads.

Determination of Right-Of-Way: It is the applicant's sole responsibility to determine the location of all existing rights-of-way, and to construct the roadway within such rights-of-way. Applicant shall hold the county harmless from any liability resulting from work outside the limits of the subject right-of-way.

Marketable Timber and Vegetation: Adjacent property owners are the rightful owners of timber and vegetation within the right-of-way. Applicant shall be responsible to arrange with adjacent property owners for the removal and disposal of vegetation and timber that must be removed for road construction. Work shall not begin on the road until the adjacent property owners have been notified of the intended work and given 10 days to respond to the applicant for removal of the vegetation. Applicant shall hold the County harmless from any liability resulting from removal of any trees or vegetation.

4) MODIFIED STANDARDS FOR EXISTING PUBLIC ROADS

If the existing public road or county road cannot be constructed to new road construction standards (Section VI) or the widths as described above, the developer of a lot or parcel may modify the road standards as follows if

approved by the Public Works Director:

- 1) Steepen cut and fill slopes to 1 1/4:1 for cut slopes, 1 1/3:1 for fill slopes.
- 2) Pipe storm water with 12" minimum diameter smooth wall pipe and catch basins.
- 3) Reduce radius of curvature down to 50 feet minimum.
- 4) Reduce shoulder width, not road surface width, by up to 3 feet on each side.
- 5) Increase grade to 15% and comply with Columbia County Fire Services fire apparatus access roads and driveways standard.
- 6) Reduce road surface width.

B) PARTITIONS

All roads platted with partitions and subdivisions which are filed after this ordinance is adopted shall be constructed to new road construction standards as required in Section IV and Section VI of this document.

1) DEVELOPMENT OF EXISTING PLATTED PUBLIC RIGHTS-OF-WAY

Partitions will not be allowed to access any public road where it is not feasible (as determined by the Public Works Director) to construct that public road to the new road improvement standards required in Section VI of this document, without further order of the Board of County Commissioners or Planning Commission, after considering the report and recommendation from the Public Works Director. If the road improvements are determined to be feasible within the existing right-of-way, the applicant for a partition shall improve the existing road that is adjacent to the subject property, whether or not a new road is created within the partition, to the applicable standard as if new residences were immediately constructed on the new parcels. (i.e. If a partition creates 3 parcels of property and there are 7 other undeveloped potential parcels along the road, the applicant for the partition will be required to construct 3/10 of the required road improvements prior to final approval of the partition.)

Additional right-of-way will be required to be dedicated as required of developers of single parcels as described above.

Additional road improvements will be required when application is made for an access permit to build on the property.

See also Section I(B) and I(C) of these standards.

2) OPENING OF UNDEVELOPED PUBLIC RIGHTS-OF-WAY

If the developer of a partition requests to construct a road on an unopened (not currently used by a residence) public road, that entire road section shall be developed to new road improvement standards required in Section VI of this document subject to the following:

- a) If the partition creates a public road, the existing unopened public road shall also be paved.
- b) If the partition does not create a public road, the existing public road shall not be required to be paved.

C) SUBDIVISIONS

1) CREATION OF NEW PUBLIC RIGHTS-OF-WAY

All new public roads or county roads created in conjunction with a subdivision after adoption of this ordinance, shall be improved in accordance with the Creation of New Public Road standards (Section VI). The entire limits of the new public right-of-way shall be improved prior to final approval of the subdivision.

2) EXISTING PUBLIC ROAD OR COUNTY ROAD RIGHTS-OF-WAY

The sections of the existing public road or county road rights-of-way adjacent to or within the subdivision (or those sections that are not currently used for residential access but necessary for the subdivision), shall be improved in compliance with the Creation of New Public Road Standards, Section VI, of this document.

Improvements to the existing and currently used public or county roads in the area of the subdivision will be reviewed on a case by case basis to determine the road improvements necessary beyond the limits of the subdivision boundaries (off site improvements), and to be certain that the access roads can be constructed to the new road construction standards of Section VI. Such improvements shall be proportionate to the maximum buildout density of the area. If such improvements cannot feasibly be constructed, other means of access to the property will be required.

After a subdivision has been given final approval, each individual lot will be treated as an existing lot and roads shall be improved in accordance with Section V (A) above, which will require a road access permit from the Road Department prior to construction of a home or development of the property.

VI. CREATION OF NEW PUBLIC ROADS

A) REQUIREMENTS FOR PUBLIC IMPROVEMENTS

1) GENERAL

Road and drainage improvements are conditioned through the development review process, this Ordinance, and other County policies adopted by the Board of County Commissioners. No road, bridge, drainage or utility construction, within or affecting public rights-of-way and County easements, shall commence prior to obtaining a permit from the Road Department approving the construction plans (Exhibit 4). Designs submitted shall be stamped by a Registered Professional Engineer licensed to practice within the State of Oregon.

Design of the public improvement shall be in conformance with the specifications of this section, the standard drawings contained in Section VII, the Oregon Department of Transportation Standard Specifications for Highway Construction and Oregon Department of Transportation Standard Plans, in preferential order. The Standard Drawings of Section VII may be periodically revised by the Public Works Director.

Regardless of any approval or acceptance by the County, the applicant shall be responsible to correct any defect in the road, drainage, or related facilities discovered within 2 years of final acceptance of the improvements.

All roads within the Urban Growth Boundary of a city shall comply with these standards as well as the standards required by Urban Growth Boundary management agreements between the city and the County.

B) SUBMITTAL REQUIREMENTS

1) GENERAL

Complete plans for all proposed improvements within or affecting public rights of way shall be submitted to the Public Works Director for approval. Submittal requirements consist of design plans, grading plans, erosion control plans, drainage calculations and other information as required by the Public Works Director of Columbia County.

2) DESIGN PLAN FORMAT

Vicinity Maps shall be located on the first sheet of all plans showing the location of the project in relation to the nearest major street intersection.

The location and elevation of a National Geodetic Survey, United States Geological Survey, State Highway, or Columbia County bench mark shall be shown. No other datum shall be used without permission of the County Surveyor. Temporary bench marks shall be shown on the plans.

A title block shall appear on each sheet of the plan set. The title block shall include the names of the project, the engineering firm, the owner and the sheet title.

The seal of the Registered Professional Engineer responsible for preparation of the plans shall appear on each sheet.

The description and date of all revisions to the plans shall be shown on each revised sheet, and shall be approved and dated by a Registered Professional Engineer as evidenced by signature or initial.

3) PLAN VIEW

Plan views shall show the following:

All plan view sheets shall include a north arrow oriented to the top or left side of the page. All plan views shall be drawn to a scale of 1 inch equals 50 feet.

Right-of-way, property, tract, and easement lines.

Subdivision name, lot numbers, street names and other identifying labels. Street names are subject to the approval of the County.

Location and stationing of existing and proposed street centerlines and curb faces.

Horizontal curve data of street centerlines and curb returns including radii, lengths, and central angles.

Vegetation in conflict with the construction or operation of the street and drainage facilities.

Top of cut and top of fill lines and respective slopes. Location and size of drainage facilities, including ditches and culverts.

Match lines with sheet number references.

Sidewalk ramp locations.

Centerline stationing of all intersecting streets.

Location and description of existing survey monuments, including but not limited to, section corners, quarter corners and donation land claim corners.

All existing and proposed utility locations and drainage facilities.

Location and type of signs, delineations, lane markings.

Legend.

Developer's name, address and phone number.

4) PROFILE VIEW

Profile Views shall show the following:

Stationing, elevations, vertical curve data and grades for center of streets and top of curbs. Where curbs are not to be constructed, centerline of street and ditch inverts shall be shown.

Original ground along the center line.

Centerline of existing streets for a distance of at least 100 feet each way from intersections with proposed streets.

All proposed drainage facilities, size, slopes, materials, bedding and backfill.

Existing drainage facilities, including off-site facilities, upstream and downstream that affect the design (e.g., downstream restrictions that back water on to project site).

All existing and proposed utility locations.

5) TYPICAL CROSS SECTION

Typical cross sections shall show the base design, curbs and gutters or ditch lines, rights-of-way, drainage facilities, utilities, fill slopes, and cut slopes.

6) DRAINAGE CALCULATIONS

Drainage calculations shall be presented in a clear,

concise and complete manner. These calculations shall address all runoff into the drainage system. Areas contributing flow to each inlet must be computed separately and each inlet with contributing area shall be designated and shown on an accompanying contour map work sheet.

Downstream calculations shall be made to determine the affect on downstream facilities to such a point at which the increase in stormwater is determined by the engineer to be insignificant. The applicant shall be responsible to increase the size of all downstream drainage facilities that are determined to be inadequate.

Initial time of concentration calculation with assumptions listed and charts or monographs used shall also be included with drainage calculations.

7) OTHER REQUIREMENTS

Other information to be shown on the construction drawings or the other submittals include:

The design elements such as:

- (1) Street classification;
- (2) Design speed;
- (3) Superelevation;
- (4) Average Daily Traffic (ADT) or Design Hourly Volume (DHV).

Structural construction plans and the necessary calculations shall be submitted for proposed structures (i.e., walls, box culverts, bridges, etc.).

Any additional information that the County deems necessary.

8) REVIEW PROCEDURE

Two sets of complete plans and supporting documentation shall be submitted for a cursory review. This review is to check that all the required information has been submitted. The required information includes drainage calculations, and a list of requested variances from these Road Standards. If the submittal is adequate, a detailed review will begin based on a first-in, first-out approach. If the submittal is not complete, notification will be given by the County to the private engineer specifying what is needed. This initial review of the construction drawings shall typically be completed within 30 days following submission of the drawings. Variances to the specifications will require additional review time.

Upon completion of the detailed review by the County, the County will return 1 set of plans with "Red Line" comments and calculations. After the private engineer has completed all revisions, 2 revised plans and the original "Red Line" plans shall be returned to the County for approval. If approved, 1 set will be returned and stamped approved by the County. This review of the resubmitted drawings shall be completed within 30 days of receipt of the revised drawings. County approval does not relieve the applicant of complete responsibility for the adequacy of the design submitted.

Plan review priority will be given to plans submitted for final review. This plan review and approval is valid for 2 years from the date of the approval stamp. Extensions can be made as part of the Development Permit extension process. See the Columbia County Community Development Code for requirements for permit extensions.

9) AS-BUILT DRAWINGS

Following the completion of construction and inspection approval by the County, a complete set of as-built drawings shall be submitted. Drawings shall describe any and all revisions to the previously approved construction plans. The engineer shall submit the as-built drawings on 3 mil minimum thickness mylar. On the first page of the drawings, the developer's engineer shall make the following statement and affix his/her stamp adjacent thereto: "I hereby affix my seal to certify that these improvements have been inspected and constructed in conformance with these plans as approved by the Public Works Director and the general specifications adopted by the Columbia County Road Department."

C) ROAD REQUIREMENTS

1) PRIVATELY MAINTAINED ROADS WITHIN PUBLIC RIGHTS-OF-WAY

The maintenance of roads within public rights-of-way will remain the responsibility of adjacent property owners until such time as the road has been constructed to county standards and accepted as a "County Road" by the Board of Commissioners.

2) ACCESS

Access to County and Public Roads shall conform to the Columbia County Access/Approach Road Ordinance, or as modified by UGB Management Agreements. An access approach permit must be obtained from the Columbia county Road Department prior to the construction of any access approach to any county road, public road under the jurisdiction of the county, or private road. An

access approach permit is also required prior to obtaining a building permit from the Land Development Services office.

An inspection form/permit is also required from the appropriate fire district official (or Oregon State Board of Forestry) for approval of a driveway prior to obtaining a building permit from the Columbia County Land Development Services Department.

When partitions or subdivisions abut on an existing or proposed arterial road, the County may require limited access to the arterial by construction of frontage roads or other local access roads.

3) WIDTH

Drawings I and II are a summary of road width standards by the functional classification of the road. It should be noted that public utility easements beyond the right-of-way are required in some instances. The preliminary approval given for the public improvement should indicate the classification of road required.

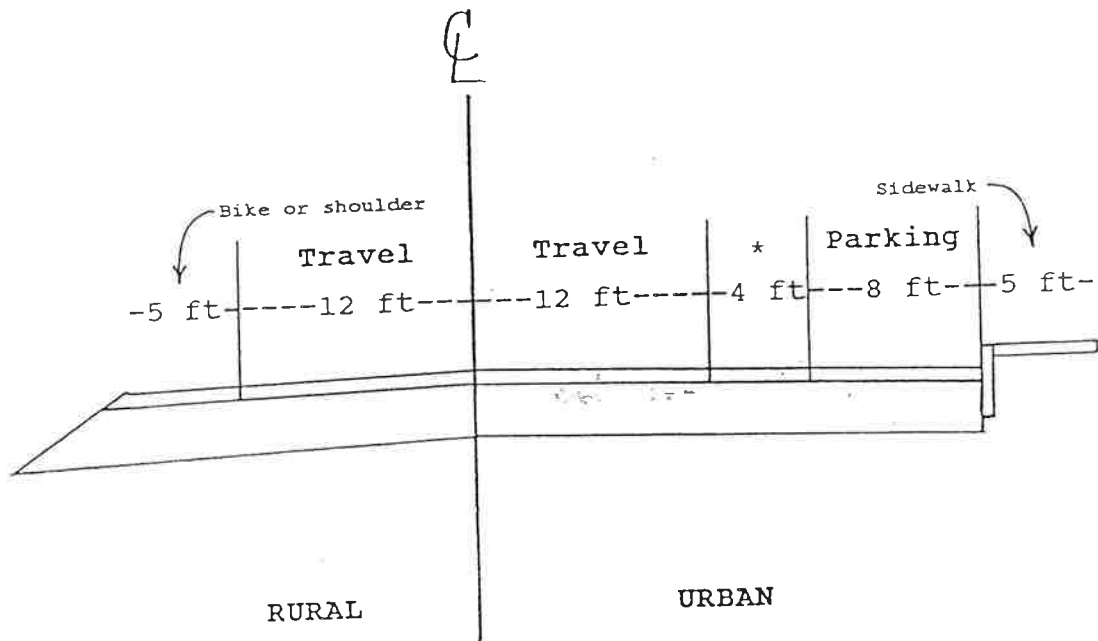
4) RIGHT-OF-WAY

Right-of-way may be needed in addition to that shown in Drawings I and II to accommodate the increased number of lanes at intersections, required cut and fill slopes, for utilities, or future bike routes.

5) DESIGN SPEED

The minimum design speed for each road classification shall be as shown in Drawings I and II.

ARTERIAL ROAD TYPICAL CROSS SECTION



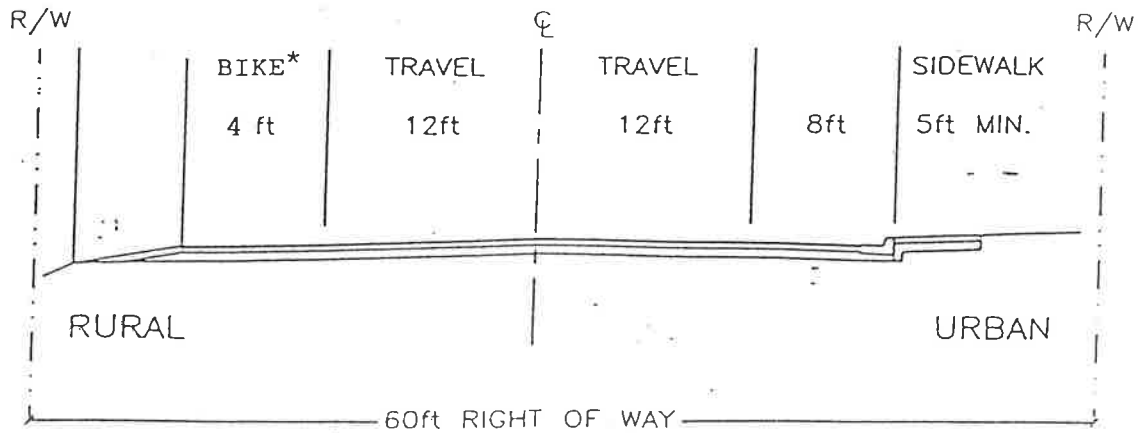
Superelevation = 6% max

Superelevation = 4% max

Right-of-Way = 80 ft minimum
Design Speed = 45 mph
Profile Grade = 8% maximum
Fill slope = 2 : 1
Cut Slope = 1½ : 1
A.C. Depth = 4 inches

* Bike Lane if Designated

DRAWING II
COLLECTOR ROAD



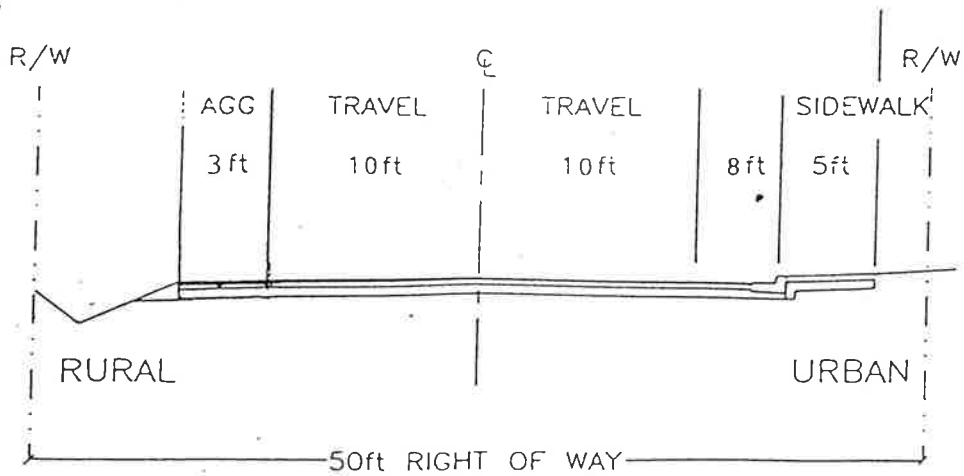
DESIGN SPEED 35 MPH

MAXIMUM GRADE = 10 %

MAXIMUM SUPERELEVATION = 6%

* AGGREGATE IF BIKE LANE NOT DESIGNATED

LOCAL ROAD



DESIGN SPEED 25 MPH

MAXIMUM GRADE = 12%

MAXIMUM SUPERELEVATION = 4%

COLUMBIA COUNTY

COLLECTOR ROAD
LOCAL ROAD

ROAD STANDARDS

DATE
JAN. 1996

SHEET NO.
1-2

D) DESIGN SPECIFICATIONS - Public and County Roads

1) ROAD STRUCTURAL CROSS SECTION

The road structural base design shall be as follows:

Road Classification	Asphalt Concrete		$\frac{3}{4}$ "-0 ⁽²⁾ Leveling Course	4"-0 or 1 $\frac{1}{2}$ "-0 ^{(1) (2)} Base Course
	Public	County		
Local	3"	4"	2"	10"
Collector	3"	4"	2"	12"
Arterial	4"	4"	2"	14"

- (1) If pit run is used, the pit run source must be pre-approved by the County and 4 inches added to the base course.
- (2) Additional leveling course or base course will be required if any deflection of the road base is noticeable upon passing of a loaded 10 yard dump truck.

2) ALTERNATIVE ROAD STRUCTURAL DESIGN

The following road base design may be used as an alternative to the structural cross section as defined above.

a) SUBGRADE EVALUATION

Soil testing to obtain the strength of the soil is required for all roads (except private roads and driveways) to analyze and design the road structural section. Soil tests are needed on undisturbed samples of the subgrade materials that are expected to be within 3 feet of the planned subgrade elevation. Samples are needed for each 1,000 feet of roadway and for each visually observed soil type. Soil tests are required for a minimum of 2 locations. Soil tests shall determine the R-value by AASHTO 190.

The selected design structural strength of the soil needs to be consistent with the subgrade compaction requirements. That is, the MAXIMUM density and compaction moisture content at optimum to slightly over optimum needs to be specified. This soils report shall address subgrade

drainage and ground water considerations for year round conditions. Recommendations for both summer and winter construction shall be included.

b) STRUCTURAL SECTION

Roads may be constructed of:

full depth asphaltic concrete, or

asphaltic concrete with crushed rock base or treated bases, or

portland cement concrete with cushion course of crushed rock or on a base of crushed rock or treated base.

1) ASPHALT PAVEMENT AND BASE DESIGN

The wearing surface of asphalt concrete (A.C.) streets shall be Type C. Minimum total thickness of asphalt concrete shall be 3 inches in 2 lifts for public roads and 4" in 2 lifts for County Roads.

Asphalt pavement may be designed using any nationally recognized or ODOT procedure. Designs used by the County or the State by contract within 2 years may be acceptable.

Oregon State Highway Division Method

Test the soil to determine the R-value by AASHTO 190. Design and testing guidelines are available from the State offices in Salem or the County's Road Department staff.

Determine the 18 kip Equivalent Axle Load (EAL) constant. Use a Traffic Analysis Worksheet (See Figure 1) to calculate 18 kip EAL and the Traffic Coefficient. The 2-way traffic should be based on vehicle classification counts and functional classification of the street. The expansion factor for a 20 year period and the daily traffic for each project should be determined by a traffic study or by the County.

Calculate the total structural thickness for the roadway section in terms of the crushed aggregate base. This is the Crushed Base Equivalent in inches, (CBE).

$$CBE = 0.03546 (TC) (100-R)$$

Choose the structural section for the street using Table II.

2) DESIGN EXAMPLE

A.C. STRUCTURAL SECTIONS EXAMPLE (ODOT METHOD)

FIND: STRUCTURAL SECTION (Asphaltic Concrete)

GIVEN: 24 HOUR TRAFFIC MIX (90-2 axle trucks, 45-3 axle trucks, 5-4 axle trucks, 90-5 axle trucks, 0-6 axle trucks, 25 buses)

R = 6 (ODOT Method)

STEP I. Complete the traffic analysis worksheet, Figure I.

STEP II. TC = 9.2 (from Step I).

STEP III. Go to Table II, with R = 6, and TC = 9.2, find CBE = 31.8".

STEP IV. Using CBE factors from Table II, go to CBE factors Table II and find that:

Alternative I

4" "AC" x 2 =	8.0" CBE
2" 3/4"-0 x 0.8 =	1.6" CBE
13" CTB x 1.8 =	<u>23.4" CBE</u>
	33.0" CBE

or we find an alternative structural section could be:

Alternative II

8" "AC" x 2 =	16.0" CBE
2" 3/4"-0 x 0.8 =	1.6" CBE
18" 2"-0 x 0.8 =	<u>14.4" CBE</u>
	32.0" CBE

FIGURE I - TRAFFIC ANALYSIS WORK SHEET

PRESENT ADT

PRESENT NUMBER OF:

2 Axle trucks _____
 3 Axle trucks _____
 4 Axle trucks _____
 Buses or
 garbage trucks _____
 5 Axle trucks _____
 6 Axle trucks _____

STREET _____

FROM _____

TO _____

D = BxC

E = B+D

2

F = One-Way Annual

G = ExF

A	B	C	D	E	F	G
2		1.48			36.5	
3		1.48			119.5	
4		1.48			157.0	
5		1.48			296.0	
6		1.48			325.0	
Buses		1.48			540.0	
					TOTAL =	

TOTAL - AVG. ANNUAL 18 Kip EAL = _____ = TOTAL
 18 Kip EAL/day = _____ = TOTAL ÷ 365
 20 Year 18 Kip EAL = _____ = TOTAL x 20
 Traffic Coefficient, TC = _____

A = Number of axles per truck
 B = Number of Trucks

$$TC = 9x \left[\frac{(20 \text{ Year } 18\text{Kip EAL})^{0.119}}{1,000,000} \right]$$

TABLE II - CRUSHED BASE EQUIVALENT ALL ROADS

TRAFFIC COEFFICIENT	R=4 MINIMUM "CBE" REQUIREMENT	R=8 MINIMUM "CBE" REQUIREMENT	R=12 MINIMUM "CBE" REQUIREMENT	R=18 MINIMUM "CBE" REQUIREMENT	R=22 MINIMUM "CBE" REQUIREMENT	R=26 MINIMUM "CBE" REQUIREMENT	R=30 MINIMUM "CBE" REQUIREMENT
12.0-13.0	42.5"	41.0"	39.0"	36.5"	34.5"	33.0"	31.0"
11.0-12.0	39.0	37.5"	36.0"	33.5"	32.0"	32.0"	28.5"
10.0-11.0	36.0"	34.5"	33.0"	30.5"	29.0"	27.5"	26.0"
9.0-10.0	32.5"	31.0"	29.5"	27.5"	26.5"	25.0"	24.0"
8.0-9.0	29.0"	27.5"	26.5"	24.5"	23.5"	22.5"	21.0"
7.0-8.0	25.5"	24.5"	23.5"	22.0"	21.0"	20.0"	18.5"
6.0-7.0	22.0"	21.0"	20.0"	19.0"	18.0"	17.0"	16.0"
4.8-6.0	18.5"	17.5"	17.0"	15.5"	15.0"	14.0"	13.5"
Below 4.8	16.5"	15.5"	15.0"	14.0"	13.5"	12.5"	12.0"

R = R Value by AASHTO 190

CBE Factors

- 1.0" Asphaltic Concrete Wearing Surface or Base
- 1.0" Emulsion Treated Base
- 1.0" Concrete Treated Base
- 1.0" 3/4"-0 or 2"-0

- 2.0" Aggregate Base
- 2.0" Aggregate Base
- 1.8" Aggregate Base
- .8" Aggregate Base

Use fabric mat where moisture is present in the subgrade, or use fabric mat plus excavate an additional 12" and replace with rock for unusually wet subgrade conditions.

TABLE III - DESIGN SPEED/CENTERLINE RADIUS

Design Speed (MPH)	(e) 2%	(e) 4%	(e) 6%
25	220'	205'	185'
30	325'	300'	275'
35	455'	420'	380'
40	610'	560'	510'
45	795'	730'	660'
50	1010'	925'	835'
55	1300'	1190'	1060'
60	1655'	1500'	1335'

NOTES:

For Table III - right-of-way runoff shall be controlled to prevent concentrated cross flow in superelevated sections.

Urban curves should be designed for a maximum superelevation rate of 0.04. (See AASHTO Policy on Geometric Design of Highways and Streets.)

=====

3) PORTLAND CEMENT CONCRETE STRUCTURES

Design portland cement concrete structures using the guidelines and requirements of the American Association of State Highway and Transportation Officials design procedures.

Use a twenty 20 year design period.

c) HORIZONTAL ALIGNMENT

Alignments shall meet the following requirements:

Centerline alignment of improvements should be parallel to the centerline of the right-of-way.

Centerline of a proposed street extension shall be aligned

with the existing street centerline.

Horizontal curves in alignments shall meet the minimum radius requirements as shown in Table III.

TABLE IV - DESIGN CONTROLS FOR CREST VERTICAL CURVES BASED ON STOPPING SIGHT DISTANCE

DESIGN SPEED	K
25	20 - 20
30	30 - 30
35	50.0
40	80.0
45	120.0
50	160.0
55	220.0

$$L = K \times A$$

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

TABLE V - DESIGN CONTROLS FOR SAG VERTICAL CURVES BASED ON STOPPING SIGHT DISTANCE

DESIGN SPEED*	K
25	30 - 30
30	40 - 40
35	50 - 50
40	70.0
45	90.0
50	110.0
55	130.0

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TABLE VI -

SIGHT DISTANCE AND VERTICAL CURVE STANDARDS
 FOR WET PAVEMENT

Speed of traffic of intersecting roadway (85th percentile speed)	Preferred Intersection Sight Distance	Minimum Stopping Sight Distance	K Values		F Values
			Crest Curve	Sag	Friction Coefficient
20	200	125	10	20	0.39
25	250	150	20	30	0.37
30	300	200	30	40	0.35
35	350	250	50	50	0.33
40	400	325	80	70	0.32
45	450	400	120	90	0.31
50	500	475	160	110	0.30
55	550	550	220	130	0.29

Where the grade is not level, the minimum stopping sight distance shall be determined by the following formula:

$$SSD = 3.68V + \frac{V^2}{30(F+g)}$$

- V = Traffic speed (mph) 85th percentile
- g = grade, + for uphill, - for downhill
- F = coefficient of friction for wet pavement

d) VERTICAL ALIGNMENT

Alignments shall meet the following requirements:

Minimum tangent street gradients shall be one-half (0.5) percent along the crown and curb.

Maximum street gradients shall be 12 percent for local roads, and 10 percent for collectors and 8 percent for arterials.

Roads intended to be posted with a stop sign, shall provide a landing averaging 3 percent grade or less. Landings are that portion of the street within 20 feet of the edge of the intersecting street at full improvement.

Grade changes of more than 2 percent shall be accomplished with vertical curves. Grade changes shall not be closer than 100 feet.

Street grades, intersections and superelevation transitions shall be designed to not allow concentrations of stormwater to flow over the pavement.

Roads intersected by roads not constructed to full improved standards shall be designed to match both present and future vertical alignments of the intersecting roads. The requirements of this manual shall be met for both present and future conditions.

Vertical curves shall conform to the values found in Tables IV and V.

Slope easements shall be dedicated or obtained for the purposes of grading outside of the rights-of-way.

e) INTERSECTIONS

The following specify the minimum requirements for intersections:

The interior angle at intersecting streets shall be kept as near to 90 degrees as possible and in no case shall it be less than 75 degrees. A tangent section shall be carried a minimum of 25 feet each side of intersecting right-of-way lines.

Edge of pavement or curb radii at intersections shall be as shown in Table VII for the various function classifications.

Sidewalk access ramps shall be provided at all corners of all intersections, regardless of curb type, and shall conform to Standard Drawing CS-306.

TABLE VII - TURNING RADII (FEET)

Edge of Pavement/Curb - Minimums*

Street Classification	Maj/Min Arterial Street	Collector	Local Street
Major/Minor Arterial Street	50	35	20
Collector	35	30	20
Local Street	20	20	20

* If bike lane or on-street parking exists, above radii may be reduced by 10 feet.

f) CUL-DE-SACS, TURNAROUNDS

The following specifies the minimum requirements for cul-de-sacs, and turnaround areas:

Cul-de-sacs, and turnaround areas shall be allowed only on local and private roads.

The minimum curb radius for cul-de-sac bulbs shall be 45 feet.

Cul-de-sacs, and turnaround areas shall have a six (6) foot public utility easement or right-of-way outside the pavement or sidewalk.

Optional turnaround shall be as shown in drawing TII.

The minimum curb radius for transitions into cul-de-sac bulbs shall be 25 feet.

g) SIGHT DISTANCE

The sight distance requirements for intersections shall be 10 times the 85th percentile speed of the intersecting street (35 mph traffic speed requires 350 feet of sight distance).

h) ACCESS APPROACHES

The following specifies the minimum requirements for access

approaches:

Access approaches shall conform to Standard Drawings DW-200 through DW-205.

Each access approach must be approved by a separate access approach permit and the access approach Section III of these standards.

Concentrated surface runoff shall not be allowed to flow over driveways, or sidewalks, or roads.

All commercial and industrial driveways shall be constructed to standards set by the Director of Public Works on a site specific basis so as to support the anticipated traffic upon complete development of the area.

i) CURBS AND GRADING

The following specifies the requirements for curbs and cross-slope grading for roads:

Urban roads shall include curbs on both sides.

Rural roads shall have shoulders adjacent to the road at a 2-1/2 percent cross-slope or super rate, whichever is greater, and roadside ditches each side of the shoulders with a minimum side-slope of 2 to 1. Ditches shall be of depth of at least 6 inches below the road base material.

Grading outside the improved areas shall be as follows:

Roads shall be graded no steeper than one and 1-1/2 to 1 cut slope or 2 to 1 fill slope.

Flatter slopes are preferred and may be required by the Road Department if soils are unstable. Slopes exceeding 5 feet in height shall be stabilized by seeding or rocking or mulching.

Retaining walls shall be used only if fill or cut slopes cannot be constructed on property within the right-of-way or property owned by the developer.

Cross-slope of the typical street section shall be a 2 percent crown.

j) SIDEWALKS

The following specifies the requirements for sidewalks:

Sidewalks shall be constructed according to Standard Drawing CS-305.

Where objects within a sidewalk are approved by the Public Works Director to remain, the walk shall be widened to provide clearance equal to the required sidewalk width.

k) GUARDRAILS

The following specifies the minimum requirements for the location and type of guardrails:

ODOT Standard Guardrail Type IIA (Drawing 2126) shall be placed along all sections of new road construction where the fill slope is greater than 10 feet high, within 10 feet of the edge of the traveled surface and steeper than $1\frac{1}{2}$ to 1 or at other locations as required by the County based on information found in the current edition of the AASHTO publication, GUIDE FOR SELECTING, LOCATING, AND DESIGNING TRAFFIC BARRIERS.

Guardrails shall also be required for a distance of 40 feet from each corner of all bridges.

l) TRANSITIONS

Street width transitions from a narrower width to a wider width shall be designed with a 3 to 1 taper. Delineators, as approved by the County, shall be installed to define the configuration.

Street width transitions from a wider width to a narrower width, the length of transition taper shall be determined as follows:

$$L = S \times W$$

Where L = minimum length of taper (ft.)

S = Design speed (MPH)

W = EP to EP offset width

Delineators, as approved by the County, may be installed to define the configuration. Maximum spacing of delineators shall be the numerical value of the design speed, in feet (i.e. 35 foot spacing for 35 MPH).

m) SIGNS

Road signs shall be installed in compliance with the Manual of Uniform Traffic Control Devices.

n) DELINEATION

1) Consistency of Installation of Delineation

Both for the purpose of consistency and to avoid

diminishing effectiveness due to overuse, delineation shall be installed in accordance with the following hierarchy:

- (1) Painted yellow centerline
- (2) Painted white "fog" lines
- (3) Turn and curve warning signs, with or without advisory speed plates
- (4) Delineators (reflectors mounted on posts)
- (5) Raised reflective pavement markers
- (6) Large arrow signs
- (7) Chevron alignment signs

Items (1), (2), (4), and (5) may be used on both tangents and horizontal curves whereas Items (3), (6), and (7) may be used only on horizontal curves.

Items (1), (2), and (5) cannot be installed on gravel roads.

2) Selection of Delineation

The selection of delineation to be installed at a particular location shall be based on the hierarchy listed above, the results of an engineering study and the following warrants:

a) Painted yellow centerlines and painted white "fog" lines constitute the standard delineation for paved roads and other types of delineation shall supplement rather than replace these painted lines.

b) Turn and Curve Warning Signs and Advisory Speed Plates

- (1) The turn sign is intended for use where an engineering study shows that the recommended speed on a turn is 30 mph or less and is 10 mph less than the legal speed limit.
- (2) The curve sign is intended for use where an engineering study shows that the recommended speed on a turn is greater than 30 mph and is 10 mph less than the

the legal speed limit.

- (3) The advisory speed plate is intended to supplement the turn and curve signs to give additional warning. It shall not be used alone. It shall show the maximum speed recommended by an engineering study.

c) Delineators (Reflectors Mounted on Posts)

- (1) Delineators shall be installed in accordance with Table VIII:

TABLE VIII
DELINEATOR WARRANTS

Traffic Volume (ADT)	Road Classification	Install Delineators
0-500	Local	Only in special cases where justified by an engineering study
500-1000	Collector	On curves with a degree of curvature greater than 12 degrees
1000 or more	Arterial	On curves with a degree of curvature greater than 6 degrees

- (a) Delineators should be installed only on curves with a central angle of 20 degrees or greater.
- (b) Delineators may be installed on curves when raised reflective pavement markers alone have been found to be inadequate. Such situations may occur where a crest vertical curve blocks the driver's view of the pavement markers within the safe stopping sight distance or where the need for additional advance warning is demonstrated by the occurrence of accidents.
- (c) Delineators shall not be installed within any urban growth boundary.

(2) Delineators on horizontal curves shall be spaced in accordance with Table IX:

TABLE IX

DELINEATOR SPACING ON HORIZONTAL CURVES

Degree of Curve	Spacing on Curve-feet	Spacing in Advance of Curve-feet	
		First-Space	Second-Space
6	120	200	350
7-8	100	180	300
9-10	90	160	270
11-12	80	140	240
13-18	70	130	210
19-25	60	110	180
26-up	50	100	150

- (a) For curves falling between the values listed, use the spacing given for the next sharper curve.
 - (b) To clear driveways, crossroads, etc., or for required adjustments at ramps and at intersections, either vary placement of that delineator up to $\frac{1}{8}$ of spacing shown, or if that will not work, eliminate that delineator.
 - (c) On curves with central angles greater than 40 degrees, installation of delineators should be terminated at the location where deflection reaches 40 degrees.
- (3) The Public Works Director shall be consulted on the installation of delineators on substandard roadway sections, particularly where ditches are narrow and where delineators would hamper maintenance operations.

- (4) Where warranted, delineators should be installed on both sides of horizontal curves with white reflective sheeting or reflectors installed on the side of the delineator visible to the driver's right.
 - (5) The use of large arrow signs or chevron signs should be considered on all curves where the degree of curvature is greater than 30 degrees.
- (d) Raised Reflective Pavement Markers
- (1) Raised reflective pavement markers shall be installed only in special situations where justified by an engineering study.
 - (2) Pavement markers shall be spaced at the following intervals:
 - (a) Rural areas: 80 feet apart on tangents and 40 feet apart on curves.
 - (b) Urban areas: 40 feet apart on tangents and curves.
 - (3) Where pavement markers are to be installed only on a curve, markers shall also be installed on the approach tangents for a distance of 400 feet in each direction from the curve. On these tangents, the marker spacing shall be the standard 80 feet.
 - (4) Pavement markers shall not be installed in areas where snow removal operations are expected to be necessary. In the absence of site-specific records, markers shall not be installed at elevations greater than 800 feet above mean sea level.

(e) Large Arrow Sign

A large arrow sign is intended to be used to give notice of a sharp change in roadway alignment. It should be used to mark curves that have a high accident history where raised reflective pavement markers or delineators do not provide adequate warning to motorists. The large arrow sign shall be erected on the outside of the curve in line with and at right angles to approaching traffic. It should be visible for at least 500 feet.

(f) Chevron Alignment Sign

The chevron alignment sign may be used as an alternate or supplement to delineators and the large arrow sign. The chevron alignment sign is intended to be used to give notice of a sharp change in roadway alignment and to provide additional emphasis and guidance for vehicle operators. Chevron alignment signs are normally installed in groups of three or more with spacing such that drivers always have two in view as they proceed around the curve. Chevron alignment signs are installed on the outside of a curve at right angles to approaching traffic and the first two should be visible for at least 500 feet.

o) BRIDGES

All vehicular bridges on public roads shall be designed to carry at least HS 25 vehicle loading, plus impact. (See Standard Drawing No. HS 25.)

Structural and geometric design of bridges, including width, shall be in accordance with the current standards in use by ODOT. These include, but are not limited to, Standard Specifications for Highway Bridges (AASHTO). Minimum bridge width shall normally be equal to the total width of the travel lanes plus the shoulders but in no case shall be less than 28 feet.

p) UTILITIES

Utilities shall be located outside of the paved road to avoid future cuts in paved roads. On all phased (interim) road improvements, the necessary utilities shall be stubbed across the interim improvement to assure cuts are not necessary when the road is expanded to its full width.

Underground utilities intended to provide direct service to adjacent properties with future connections shall not be located in the full-width paved section of a street to be constructed. If all service connections are installed and extended beyond the full-width section prior to paving the street, underground utilities can be located in the paved section. Valves and manholes shall not be located in any pavements.

Underground utilities being constructed along existing paved streets shall not be located under the existing pavement

unless approved by the Road Department. Underground utilities that must cross an existing paved street shall not be installed by any method which cuts the pavement, unless approved by the County.

Underground utilities shall be buried a minimum depth of 30 inches, as measured from finished grade to top of utility. Utilities in ditch lines shall be located 30 inches below ditch grade.

Street lights shall be located as required to provide proper illumination, but shall not physically or visually interfere with vehicle or pedestrian traffic.

3) DRAINAGE DESIGN

a) GENERAL

The following facility design requirements are intended to protect the public health, safety and welfare from damage due to flooding. Provisions must be made to provide for surface drainage on and crossing the development. A specific level of protection from all damage is encompassed in this chapter. Beyond that level of protection, additional measures are specified which should minimize damage.

Provisions must be made for gravity drainage of roofs and foundation drains for new homes and offices. In urban developments, these drains shall be piped to the street gutter or directly to the storm drain system. The connection to the street gutter must be through a 3 inch plastic pipe set in the curb during construction or cut through an existing curb, see Standard Drawings CS-300 and CS-301.

These requirements shall apply to all storm drainage facilities in existing and proposed County Road rights-of-way, public road rights-of-way, public drainage easements and tracts of common ownership in unincorporated areas. Storm drainage systems include, but are not limited to: inlets, pipes, ditches, creeks, rivers and runoff detention facilities.

Within public rights-of-way, where there are no curbs, there shall be culverts placed under driveways to provide for drainage as needed. The location, type and size of the culvert shall be specified by the Director of Public Works. Minimum diameter culvert shall be 12 inches and minimum length shall be 30 feet.

b) SYSTEM COMPONENTS

1) CATCH BASINS, CURB INLETS AND GUTTER INLETS

The spacing between catch basins and curb or gutter inlets shall be as required from the hydraulic design. For all other roads, gutter flow shall not run in the travel lane or deeper than 4 inches against a curb. Catch basins and gutter inlets shall be of sufficient size to accept the inflows without backing up water on the street.

Catch basins with curb inlets or gutter inlets shall be provided just prior to curb returns on streets with a centerline gradient of 3 percent or more and a street gutter drainage run of 100 feet or more.

Minimum depth shall be pipe diameter plus 12 inches.

Catch basins with curb inlets, either standard or oversize, shall be used on all streets with curbs or sidewalks.

Catch basins with curb inlets or gutter inlets shall be installed at the low point of all sag vertical curves in roads.

2) PIPES AND CULVERTS

Tongue and groove joints are preferred and shall be used when commercially available in the size required. Joints used shall meet the manufacturer recommendations.

All pipe and culvert type shall be as required by size, loading, bedding and trench conditions.

Minimum cross culvert diameter shall be 12". Minimum storm drain diameter shall be 10 inches.

No curved storm drain pipes shall be allowed by joint displacement or deflection if it results in a joint that allows the adjacent soil material to enter the pipe. Joints with rubber gaskets shall be used for all curved storm drains. Minimum radii shall be as shown in Table XIX.

All pipe and culvert outlets with exit velocities in excess of 4 feet per second shall be examined with respect to soil type to guarantee adequate erosion control. Where grades require, all end pipes shall be supported by tie downs, end walls or aprons, etc., to prevent the separation and dislodging of pipe sections.

3) MANHOLES

Manholes shall have a maximum spacing such that no pipe

has a continuous run of 400 feet without access from open end pipe or manhole.

Manholes, shall be required at, but not limited to, the following locations:

Abrupt change in vertical grade or horizontal alignment of storm drain pipes.

Change in size or abrupt change in elevation of storm drain pipes.

Uppermost extent of storm pipe not open (daylighted) to receive ditch or other open conveyance flows. Cleanouts are not allowed in this situation.

Manholes or catch basins with pipe horizontal alignment changes of more than 30 degrees in angle shall have the outlet pipe invert at least two-tenths (0.20) of a foot in elevation lower than all inflow pipe inverts, in addition to the normal grade crossing the manhole.

Manholes shall have two hole lids; in some locations, tamper proof lids may be required. Heavy duty frames and covers shall be used on all manholes.

Manholes and catch basins deeper than 4.0 feet, measured from top of frame to flowline, shall have steps installed.

Offset manholes shall be used with pipes larger than 36 inches.

4) DITCHES AND CHANNELS

Proposed roadside ditches shall be properly sized to pass all required flows, have a maximum depth of no more than 3 feet as measured from the shoulder of the road, side slopes no steeper than 2 to 1 and have a minimum flow velocity of 3 feet per second when flowing full. All other ditches shall be properly sized to pass all required flows but are not limited to the geometric restrictions of roadside ditches. Any proposed roadside ditch improvement that does not meet this requirement above shall be piped.

All proposed or modified channels shall have adequate erosion control provisions to prevent damage to the shoulder of the adjacent road or the water course channel. Side slopes no steeper than 2 to 1 will be allowed unless preapproved by the public works director.

No protruding pipes, culverts or other structures which reduce or hinder the flow characteristics of the ditch channel or creek will be allowed.

5) STANDARD DRAWINGS

Drainage structures shall conform to the applicable Standard Drawings in this Manual. Materials for all structures shall be as specified on the Standard Drawings. Allowable materials for pipes and culverts are specified in the HYDRAULICS section of this chapter.

c) HYDROLOGY

The following specifies the minimum requirements for the hydrologic criteria necessary for design of storm drains and culverts:

1) Methodology

The Rational Method ($Q=CIA$) is the standard method for calculations related to the peak discharge and other related hydrologic information for drainages of less than 400 acres. For reference to the concepts and theories of the Rational Method, see "The American Society of Civil Engineers", Design and Construction of Sanitary and Storm Sewers or others. If other hydrologic methods are used, calibration or comparison to the Rational Method is required prior to acceptance by the County.

Drainage Basin Areas (A)

The drainage area used in the design or analysis of storm drainage facilities shall include all areas that are or will be tributary (both on and off the project site) to the location under consideration.

Runoff Coefficients (C)

The runoff coefficients used in the design or analysis of storm drainage facilities shall vary depending on existing land uses and the maximum potential zoning of all land tributary to the location under consideration. Table VII shows minimum acceptable values for the coefficients. The composite runoff coefficients shall be the acceptable form and standard for this parameter.

In some instances, the use of individual characteristic runoff coefficients is more appropriate than composite coefficients. Project-specific composite coefficients can be calculated from an area-weighted-average basis using characteristic coefficients. Table VIII shows minimum acceptable values for the coefficients. The characteristic runoff coefficients shall only be used when required by the County.

2) Rainfall Intensity (I)

The rainfall intensity used in the design and analysis of storm drainage facilities shall vary depending on the time of concentration for the drainage basin that is

tributary to the location under consideration. Tables XII and XIII show a tabular representation of the rainfall intensities for the 2, 5, 10, 25, 50 and 100 year storm events as a function of time of concentration. Interpolate for values not shown.

TABLE X - COMPOSITE RUNOFF COEFFICIENT CHART

Existing Land Use OR Maximum Potential Zoning		Values of coefficient, C		
		Average Gradient of Terrain		
		Less than 2%	2% to 7%	More than 7%
Use	Zone*			
Commercial or Industrial	4	0.70	0.80	0.90
Multiple Family	3	0.60	0.65	0.70
Duplexes, Single Family	2	0.50	0.55	0.60
Single Family & Schools	1	0.40	0.45	0.50
Parks, golf courses, Agricultural or undeveloped	5	0.20	0.25	0.30

* These are to be used as a guide in evaluating undeveloped land based on current zoning and where no information is available defining a proposed development.

ZONE	PRIMARY LAND USE DISTRICT	
1	R-5	(Residential 5 units per acre)
1	R-6	(Residential 6 units per acre)
2	R-9	(Residential 9 units per acre)
3	R-15	(Residential 15 units per acre)
3	R-24	(Residential 24 units per acre)
3	R-25	(Residential 25 units per acre)
4	NC	Neighborhood Commercial
4	CBD	Community Business District
4	GC	General Commercial
4	OC	Office Commercial
4	IND	Industrial
2	INS	Institutional
5		Undeveloped, Rural
4	SID	Special Industrial District

TABLE XI - CHARACTERISTIC RUNOFF COEFFICIENT CHART

Land Characteristic	Values of coefficient, C		
	Average Gradient of Terrain		
	Less than 2%	2% to 7%	More than 7%
Asphalt or concrete	0.85	0.90	0.95
Roofing	0.85	0.90	0.95
Grassy surface	0.20	0.25	0.30
Bare soil	0.30	0.35	0.40

TABLE XII

RAINFALL INTENSITIES FOR NORTH COLUMBIA COUNTY

TIME OF CONCENTRATION (MIN)	Rainfall Intensity (inches/hr)					
	STORM EVENT - YEAR/(PROBABILITY)					
	2 (50%)	5 (20%)	10 (10%)	25 (4%)	50 (2%)	100 (1%)
0	2.50	3.30	3.80	4.20	5.00	5.50
5	2.50	3.30	3.80	4.20	5.00	5.50
10	1.50	2.20	2.80	3.25	3.80	4.30
15	1.25	1.80	2.20	2.60	3.10	3.50
20	1.00	1.40	1.75	2.10	2.50	2.80
30	0.80	1.10	1.30	1.60	1.80	2.10
40	0.65	0.95	1.10	1.35	1.55	1.80
50	0.55	0.80	0.95	1.15	1.30	1.55
70	0.50	0.70	0.85	1.00	1.15	1.30
100	0.45	0.60	0.75	0.87	1.00	1.10
180 or more	0.40	0.50	0.60	0.75	0.90	0.95

North Columbia County is that area northerly of Nicolai, Anlicker, Meissner, Apiary, Highways 47 and 202

TABLE XIII

RAINFALL INTENSITIES FOR SOUTH COLUMBIA COUNTY

Rainfall Intensity (inches/hr)

TIME OF CONCENTRATION (MIN)	STORM EVENT - YEAR/(PROBABILITY)					
	2 (50%)	5 (20%)	10 (10%)	25 (4%)	50 (2%)	100 (1%)
0	1.90	2.50	3.00	3.40	4.00	4.50
5	1.90	2.50	3.00	3.40	4.00	4.50
10	1.30	1.70	2.20	2.50	3.00	3.50
15	1.10	1.40	1.80	2.10	2.50	2.90
20	0.90	1.20	1.50	1.80	2.10	2.40
30	0.75	0.95	1.20	1.40	1.65	1.90
40	0.60	0.75	1.00	1.15	1.30	1.60
50	0.55	0.70	0.82	1.00	1.15	1.35
70	0.45	0.55	0.70	0.82	0.95	1.10
100	0.40	0.45	0.55	0.67	0.75	0.90
180 or more	0.35	0.40	0.50	0.60	0.70	0.85

South Columbia County is that area southerly of Nicolai, Anlicker, Meissner, Apiary, Hwy 47, and Highway 202.

TABLE XIV

OVERLAND FLOW TRAVEL TIME OF CONCENTRATION
(MIN)

LENGTH OF OVERLAND FLOW (FT)	AVERAGE GRADIENT OF TERRAIN														
	1% or less			2%			4%			7%			10% or more		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
50	11	6.5	4	10	5.5	3	8.5	4	2	7.5	3.5	2	7	3	2
100	15	8.5	5	13	7.5	4	11.5	6.5	3	10	5.5	2	9	5	2
200	20	11	6	17	9.5	5	15	8.5	4	12	7.5	3	13	7	2
300	23	13	7	20	11.5	6	18	10.0	5	16	9	4	14	8	3
400	16	15	8	22	12.5	6.5	20	11.0	6	18	10	5	16	9	4
500	28	16	9	24	14.0	7.0	22	12.5	6.5	19	11	6	18	10	5
700	33	18	10	28	16.0	8.0	25	14.0	7.5	22	12	6.5	20	11	6

This table is to be used for Sheet Flow conditions only.

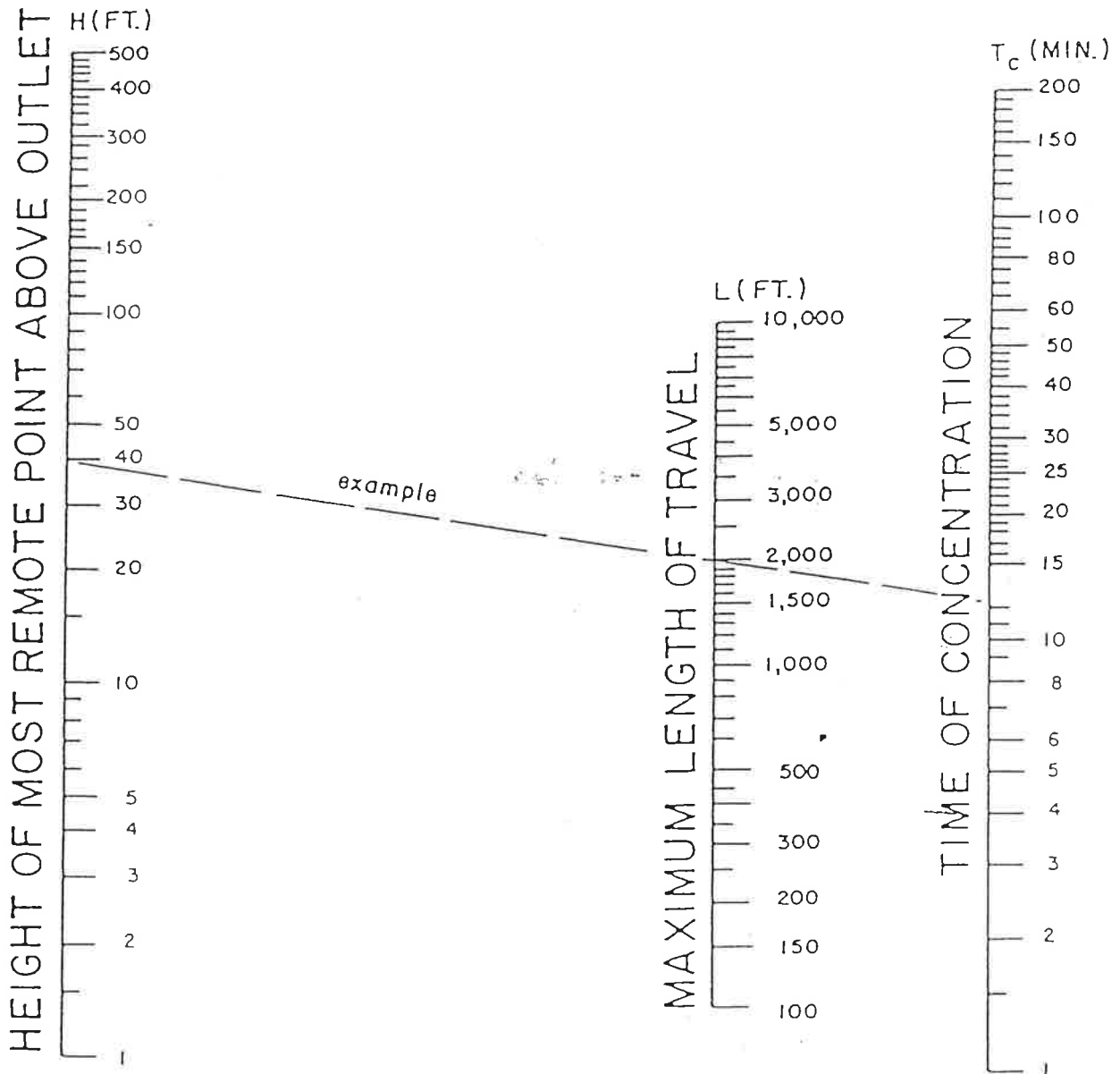
SURFACE TYPE:

- A Grassy
- B Bare Soil
- C Rooftop/Paved

FIGURE II

TIME OF CONCENTRATION

NOTE: USE NOMOGRAPH T_c FOR NATURAL BASINS WITH WELL DEFINED CHANNELS.



KIRPICH, P.Z., "TIME OF CONCENTRATION OF SMALL AGRICULTURAL WATERSHEDS", CIVIL ENGINEERING, 29, 60, 1959.

The time of concentration shall be calculated as the time required for all portions of the drainage basin to contribute to the location under consideration assuming the most extensive land use possible. This time is the addition of the travel time for overland flow from the most remote part of the drainage basin to the headwaters of the conveyance system. For drainage basins not yet fully developed, the anticipated conveyance system must be incorporated to generate the shortest possible time of concentration.

Table XI shows the acceptable values for the overland flow travel time. For residential developments use the nominal travel time of 10 minutes from roof to gutter or use Table XIV; whichever is less.

Figure II may be used to compute time of concentration in rural areas (ref. Table X).

The travel time in a conveyance system shall be based on the full-flow velocity of the conveyance facilities.

The benefits of upstream detention systems shall not be accounted for in determining the time of concentration for any storm drain system.

3) Design Event

The following specifies the design event for sizing storm drainage facilities:

All conveyance components (such as catch basins, curb inlets, manholes, pipes, culverts, ditch inlets, ditches, swales, etc.) shall be designed to provide a level of protection from all damages due to flooding for a 25 year event. Beyond this level of protection, additional measures shall be designed to minimize the potential damage incurred as stated under HYDRAULICS.

Design flows shall be based on the maximum runoff created by existing land uses, the maximum potential zoning (according to the Comprehensive Plan) or a combination thereof.

d) HYDRAULICS

1) GENERAL

The following specifies the minimum requirements for various hydraulic criteria necessary for the design and construction of storm drains:

All conveyance components shall be designed to provide a level of protection from all damage due to flooding for the 25 year storm event. Hydraulically, "a level of protection from all damage due to flooding" means that all surface runoff waters must pass through a conveyance system without flooding streets, rights-of-way, public and private property and other items of value not normally publicly acceptable to be flooded. Surcharge in below-ground facilities shall be allowed provided that it will not cause surface flooding. Surcharge in below-ground facilities shall not be allowed if it will cause subsurface seepage flooding in any portion of a habitable structure, including the below-floor crawl spaces.

Beyond the level of protection stated above, additional measures must be designed to minimize the potential damage incurred for more intense rainfall. Hydraulically, "additional measures must be designed to minimize the potential damage incurred" means that surface runoff may surcharge the flood and cause damage, but this damage must be minimized as far as practicable. This level of minimization shall include making all attempts, as far as practicable, to reduce potential damage due to flooding in regards to loss of life, public safety, public and private property, structures and other items of value. Methods to minimize potential damage may include, but are not limited to, site grading, overflow structures (such as ditches), etc.

The benefits of upstream detention systems shall not be accounted for in designing a conveyance system.

2) IMPACT CONSIDERATIONS

Overall System Design Considerations.

Improvement projects shall address more than just the on-site drainage concerns. The off-site concerns, both upstream and downstream of a project, are critical to the development of proper improvements. The requirements in this section address most of those concerns.

Impacts on Upstream Off-site Property.

Modifications to the existing on-site storm drainage facilities shall not restrict flows creating backwater onto off-site property to levels greater than the existing situation.

Impacts on Downstream Off-site Property.

Proposed storm drainage facility modifications shall not

move the location of the runoff's outflow without executing properly recorded agreements with all affected downstream property owners.

Proposed concentration of outflows shall not be allowed without executing properly recorded agreements with all affected property owners between the release point and an existing defined receiving conveyance facility such as a pipe, culvert, ditch, creek, river, etc.

Agreements described above shall include, but are not limited to, execution of the proper easements in favor of the public and construction of conveyance facilities satisfactory to all property owners and the County.

Siltation of receiving streams due to construction of streets, drainage facilities and other utilities shall be prevented through the use of temporary on-site siltation detention systems. Such systems shall be subject to County approval. Erosion control plans and details may be required by the County as part of regular plan submittal.

Upstream Impacts of On-site Property.

Storm drainage facilities shall be designed and constructed to accommodate all flows generated from upstream off-site property (assuming no upstream detention) for the most extensive land-use possible, be it the existing land-use, the maximum potential zoning of the off-site property or a combination thereof.

Downstream Impact of On-site Property.

The design of storm drainage facilities shall take into account the impact of downstream restrictions on the project site. These restrictions that create on-site backwater shall either be removed by the development or their impact incorporated into the on-site design.

3) FLOW CAPACITIES

The following describes the detailed procedures required for the calculation of flow capacities of drainage facilities. This section also specifies the capacities for most common hydraulic components. If hydraulic components other than those discussed in this section are proposed or encountered, the method of hydraulic calculations shall be subject to County approval. If other methods of hydraulic calculations are used for components discussed in this section, calibration or comparison to the methods in this section is required

prior to acceptance by the County.

The maximum acceptable intake flowrate for catch basins, curb inlets and gutter inlets shall be as shown in Table XII.

The maximum acceptable intake flowrate for area drains shall be as shown in Table XIII.

Pipes and Culverts

For inlet control, pipe and culvert capacities shall be shown in Table XV. This inlet control table assumes worst case entrance condition. For various improved entrances, the Oregon State Highway Division, Hydraulics Manual is acceptable for capacity determinations.

For outlet control, Manning's Formula with proper consideration for entrance, exit and other minor losses shall be the accepted method of calculation. See Table XIV for the acceptable values of Manning's "n" and minor loss coefficients.

Ditches and Creeks (open channels)

For inlet control (upstream control), flow depths and elevations shall be based on critical depth calculations.

For outlet control (downstream control), the Standard Step Method using Manning's Formula with proper consideration for entrance, exit, contraction, expansion and other minor losses shall be the accepted method for calculating flow elevation profiles. See Table XIV for the acceptable values of Manning's "n" and minor loss coefficients.

TABLE XV - CATCH BASIN & CURB INLET CAPACITIES

Structure Style	Maximum Allowable Intake Flowrate (cfs)		
	Centerline Street Gradient (%)		
	0 (SAG)	Less than 6	6 or more
* Standard Catch Basin w/pavement taper	N/A	3.0	N/A
* Oversize Catch Basin w/pavement taper	8.0	4.5	N/A
Standard Curb Inlet w/pavement taper	N/A	3.5	2.5
Oversize Curb Inlet w/pavement taper	8.0	5.0	3.5
Gutter Inlet 2 1/2A w/pavement taper 2 1/2"	4.2	N/A	N/A
Gutter Inlet 4A w/pavement taper 2 1/2"	6.7	N/A	N/A

N/A - Not allowed in this situation.

* - Not allowed on streets with curbs.

TABLE XVI - AREA DRAIN, TYPE II CAPACITIES

Hydraulic Head (ft.)*	Grate Angle 30°									
	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0	7.0	10.0
Flowrates CFS	2.0	5.6	10.3	11.9	13.3	14.6	16.8	18.8	22.3	26.6

* Measured from bottom of grate to headwater.

TABLE XVII - FRICTION AND MINOR LOSS COEFFICIENTS

Friction Coefficients	
Conveyance Facility	Manning's n (FT ^{1/6})
Concrete Pipe	0.012
Polyvinyl Chloride (PVC) pipe	0.008
Corrugated Polyethylene (CPE) pipe	0.026
Ductile or cast iron	0.014
Corrugated aluminum or steel pipe	
Annular (2-2/3" x 1/2")	0.025
Helical (2-2/3" x 1/2")	
not full flow	0.025
10", 12" flowing full	0.013
18" flowing full	0.015
24" flowing full	0.017
36" flowing full	0.019
48" flowing full	0.021
54" flowing full	0.022
Annular (3" x 1")	0.025
Helical (3" x 1")	
not full flow	0.025
36" flowing full	0.020
48" flowing full	0.020
54" flowing full	0.021
60" flowing full	0.021
66" flowing full	0.021
72" flowing full	0.022
Fully paved	0.012
Earth ditches; straight, uniform, clean	0.025
Earth ditches; rough, grass	0.035
Stream channels; fine gravel, straight grass	0.030
Stream channels; coarse gravel, straight, clean banks	0.035
Stream channels; fine gravel, slightly winding, grass	0.045
Stream channels; fine gravel, slightly winding, weeds	0.048
Stream channels; fine gravel, slightly winding, obstructions	0.055
Stream channels; obstructed, very winding	0.080

For overbank flooding and other characteristics refer to Ven Te Chow's, Open-Channel Hydraulics

TABLE XVII - FRICTION AND MINOR LOSS COEFFICIENTS (CONTINUED)

Minor loss coefficients

<u>Situation</u>	<u>k-factor</u>
Pipes:	
Entrance	0.5
Exit	1.0
Expansion	1.0
Contractions	0.5
10° bends	0.04
20° bends	0.10
30° bends	0.15
45° bends	0.25
60° bends	0.35
90° bends	0.50
Open channel:	
Abrupt contractions	0.6
Abrupt expansions	0.8
Gradual contractions	0.1
Gradual expansions	0.3
Abrupt direction changes	0.4
Gradual directions changes	0.2

TABLE XVIII - PIPE/CULVERT CAPACITIES FOR INLET CONTROL

Hydraulic Head (feet)*	Flowrates, Q (cfs)							
	Diameter (in)							
	10	12	15	18	21	24	27	30
1.00	2.1	2.4	-	-	-	-	-	-
1.25	2.4	3.3	4.2	-	-	-	-	-
1.50	2.7	3.8	5.5	6.7	-	-	-	-
1.75	3.0	4.2	6.3	8.5	9.8	-	-	-
2.00	3.3	4.6	6.9	9.5	12.3	13.6	-	-
2.25	3.6	5.0	7.5	10.4	13.6	16.9	18.3	-
2.50	3.8	5.3	8.1	11.2	14.8	18.5	21.5	23.8
3.00	4.2	6.0	9.1	12.8	16.9	21.4	26.2	31.2
3.50	4.6	6.5	10.0	14.1	18.8	23.9	29.5	35.4
4.00	5.0	7.1	10.8	15.3	20.5	26.2	32.4	39.2
4.50	5.3	7.6	11.6	16.5	22.0	28.3	35.1	42.6
5.00	5.6	8.0	12.4	18.5	23.5	30.2	37.7	45.7
6.00	6.2	8.9	13.7	19.5	26.2	33.8	42.2	51.5
7.00	6.7	9.6	14.9	21.3	28.6	37.0	46.4	56.6
8.00	7.2	10.4	16.0	22.9	30.9	40.0	50.2	61.4
9.00	7.7	11.0	17.1	24.4	33.0	42.8	53.7	65.8
10.00	8.1	11.6	18.1	25.9	35.0	45.4	57.0	69.9
12.00	8.9	12.8	19.9	28.5	38.6	50.1	63.1	77.4
14.00	10.1	14.4	22.4	32.1	43.5	56.6	71.3	87.6

*Measured from invert to headwater.

TABLE XVIII - PIPE/CULVERT CAPACITIES FOR INLET CONTROL (CONTINUED)

Hydraulic Head (feet)*	Flowrates, Q (cfs)						
	Diameter (in)						
	36	42	48	54	60	66	72
3.00	37.6	-	-	-	-	-	-
3.50	48.1	55.3	-	-	-	-	-
4.00	53.8	69.4	77.2	-	-	-	-
4.50	58.9	76.8	95.6	104	-	-	-
5.00	63.6	83.5	105	127.0	135.0	-	-
5.50	68.0	89.7	113	138	159	171	-
6.00	72.2	95.4	121	148	177	177	201
7.00	79.8	106	135	167	200	236	272
8.00	86.7	116	148	184	222	262	304
10.00	99.2	133	171	213	259	308	360
12.00	110	148	191	239	391	348	408
15.00	125	169	218	273	334	400	471

*Measured from invert to headwater.

TABLE XIX - TONGUE & GROOVE PIPE ON CURVED ALIGNMENT

Pipe Diameter in Inches	**MINIMUM RADIUS OF CURVATURE in FEET									
	*Length of pipe Section - in FEET									
	3 ½	4	6 ½	7 ½	8					
10	128									
12	149		277							
15		208		390						
18		245		460	121					
21		283		530	160	176	192			
24		320		600	195	215	234	254	273	292
27		357			230	253	276	299	322	346
30		395			265	292	318	345	371	398
36		469			300	330	360	390	420	450
42		560			335		402		469	536
48		635			370		444		518	592

NOTE: **1. Table is based on a maximum joint deflection of 3/8 inch.
 *2. Check with Manufacturer on pipe lengths available.
 3. Table is based on R=32xDxL as derived by CPAV Bulletin U-11 and Supplement of 4/15/69. R=min radius, in feet D=pipe o.d., in feet L=pipe section, in feet.

4) MATERIALS

Pipes and culverts may be constructed of the following materials:

- concrete
- asphalt coated corrugated steel
- ADS
- polymer coated corrugated steel
- corrugated aluminum
- polyvinyl chloride
- corrugated polyethylene
- plastic or polyvinyl chloride
- ductile iron/steel/aluminum

The material used shall be adequate to carry anticipated dead and live loads within deflection limits specified by the manufacturer. All pipes and culverts shall have a minimum design service life of 75 years based on manufacturer recommendations and be per the applicable ASTM (American Society of Testing Materials) standards. All pipes and culverts shall be strong enough to withstand the stresses created by cleaning equipment. Installation techniques shall be documented and follow manufacturers recommendations.

Pipes of different metals shall be connected together properly to avoid damaging chemical interaction between the two metals.

5) MISCELLANEOUS DRAINAGE REQUIREMENTS

All portions of the storm drainage system shall preferably be located in rights-of-way, but if necessary, may be located in easements or common tracts.

All common tracts for open drainage facilities such as ditches and creeks shall be 10 feet wider than the width necessary to carry the flows of a 10 year storm. This additional width shall be on one side only, be usable for maintenance equipment and have adequate access to a right-of-way.

Easements and Common Tracts that are not straight shall

provide space at the corners adequate to allow maintenance vehicles to negotiate the required turns.

E. SURVEYING

1) GENERAL

This document, Section 105 of the APWA specifications and ORS 209.140-150, define the requirements for protection of existing survey monuments during any construction and setting new survey monuments following construction of new streets and roads.

2) EXISTING SURVEY MONUMENTS

Whenever an existing section corner, quarter corner or donation land claim corner monument or accessory, appears to be in danger of damage or destruction by construction, the County Surveyor shall be notified in writing, not less than 10 working days prior to construction. The County Surveyor shall reference the monument prior to construction and replace it following construction. The County Surveyor shall be reimbursed for all expenses from said replacement by the party responsible for the construction.

As per ORS 209.150, no person shall willfully or negligently remove, destroy or deface any existing survey monument. If damage cannot be avoided, the monument shall be referenced and replaced, under the direction of a Registered Professional Land Surveyor, according to state law. A copy of the field notes referencing such monuments shall be provided to the County Surveyor. Failure to comply with this provision is subject to penalty according to ORS 209.990.

3) NEW SURVEY MONUMENTS

Centerline monuments, as shown on Standard Drawing M-404, shall be installed at all centerline intersections of streets (including intersections with existing streets), P.C.'s and P.T.'s of each curve, beginning and end of each road, and at all centers of cul-de-sacs and turnarounds or as required by the County Surveyor to sufficiently monument the right-of-way. Monuments shall be set by a registered Professional Land Surveyor or by the County, at the option of the County. If monuments are set by a registered Professional Land Surveyor, they shall file a record of survey complying with ORS 209.250 and any additional requirements set forth by the County Surveyor. If a monument box is used, or required to be used by the County, it shall not be less than eight (8) inches inside diameter and shall be approved by the County Surveyor before its installation.

F) STRUCTURAL DESIGN

1) GENERAL

Structures not included in the Standard Drawings of this document shall be designed and constructed in accordance with the requirements of the Structural Design Section of the Oregon State Highway Division of ODOT. These Standards are referenced in ODOT's BRIDGE DESIGN MANUAL AND ACCOMPANYING STANDARD DRAWING, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, and STANDARD DRAWINGS FOR DESIGN AND CONSTRUCTION.

The project special provisions shall specify the APWA or ODOT requirements for bridges and other structures that apply to the specific project.

G) DESIGN MODIFICATIONS

1) GENERAL - REQUEST TO MODIFY SPECIFICATIONS/STANDARDS

To seek approval, non-compliant specifications/standards must be sent through the following process. It is to be noted that if the requested modification involves public safety, the County will rule in the direction of safety.

2) MODIFICATION PROCESS

a) SUBMITTAL

Requests to modify shall be submitted in writing to the County Public Works Director on the application form (Exhibit 5). This written request shall state the desired modification(s), the reason(s) for the request(s) and a comparison between the specification(s) or standard(s) and the modification(s) as far as performance, etc.

Any modification or variance of these standards should be documented and reference nationally accepted specifications/standards. The use thereof shall not compromise public safety or the intent of the County's standards.

b) REVIEW

The request to modify shall be reviewed by the County Public Works Director, County Counsel, Land Development Services Staff, and appropriate Fire Services Officer. The Public Works Director shall make a report to the Board of County Commissioners, who shall make one of the following decisions:

Approve as is,

Approve with changes, or

Deny with an explanation.

Approval of a request shall not constitute a precedent.

c) CRITERIA FOR MODIFICATION OF SPECIFICATIONS/ STANDARDS

The County Public Works Director may grant a minor modification to the adopted specifications or standards, without requiring the process of steps a and b above, when any one of the following conditions are met:

The specification or standard does not apply in the particular application.

Topography, right-of-way or other geographic conditions impose an economic hardship on the applicant and an equivalent alternative which can accomplish the same design is available.

A minor change to a specification or standard is required to address a specific design or construction problem, which, if not enacted, will result in an undue hardship.

Minor modifications include modifications to the requirement for plan submittals, cut or fill slopes, minor shoulder narrowing if other delineation is provided, and alternative drainage facilities and designs. Major modifications not subject to appeal by the Public Works Director include pavement width, design speed, grade, engineering requirements, right of way, or drainage capacity.

H) CONSTRUCTION SPECIFICATION

1) MATERIALS AND CONSTRUCTION

All materials and construction shall comply with the current version of ODOT Standard Specifications for Highway Construction unless otherwise specified herein.

2) CONSTRUCTION INSPECTION

a) GENERAL

All public construction falling under the jurisdiction of the County shall be inspected by an Oregon Registered Professional Engineer or a qualified individual under the supervision of an Oregon Registered Professional Engineer. The Road Department will not authorize work to begin on public roads without designation of an inspecting engineer by the owner, developer, or the County.

If the owner or developer does not designate an inspecting engineer, the County shall do so, selecting from a current list of engineers who have indicated their desire to perform such services. All inspection costs, including required testing, shall be paid by the owner or developer directly through service contracts or agreements. The County will require inspection costs be included in the bond or contract assurances as a percent of the total construction costs and in accordance with prevailing professional fee schedules.

An engineer whose firm, or any member of the firm, has a corporate, partnership or any form of real property interest in the development for which the improvements are required, cannot be designated inspecting engineer. The inspecting engineer's relationship to the project must be solely that of a professional service nature.

It shall be the policy of the County not to provide full inspection services for non-public funded public improvements. However, the County may perform limited inspection services upon request, if the project scale is such that the retention of a private inspecting engineer is not warranted. These inspecting requirements are not applicable to individual sidewalk, driveway or utility permits.

b) COUNTY ACTIVITIES

Inspecting services provided by the County shall include:

- 1) Liaison between the inspecting engineer and the County;
- 2) Monitoring of work progress and performance testing as deemed desirable;
- 3) The performance of administrative and coordinative activities as required to support the processing and completion of the project; and
- 4) The issuance of stop work orders upon notifying the inspection engineer of the County's intention to do so.

c) INSPECTING ENGINEER'S ACTIVITIES

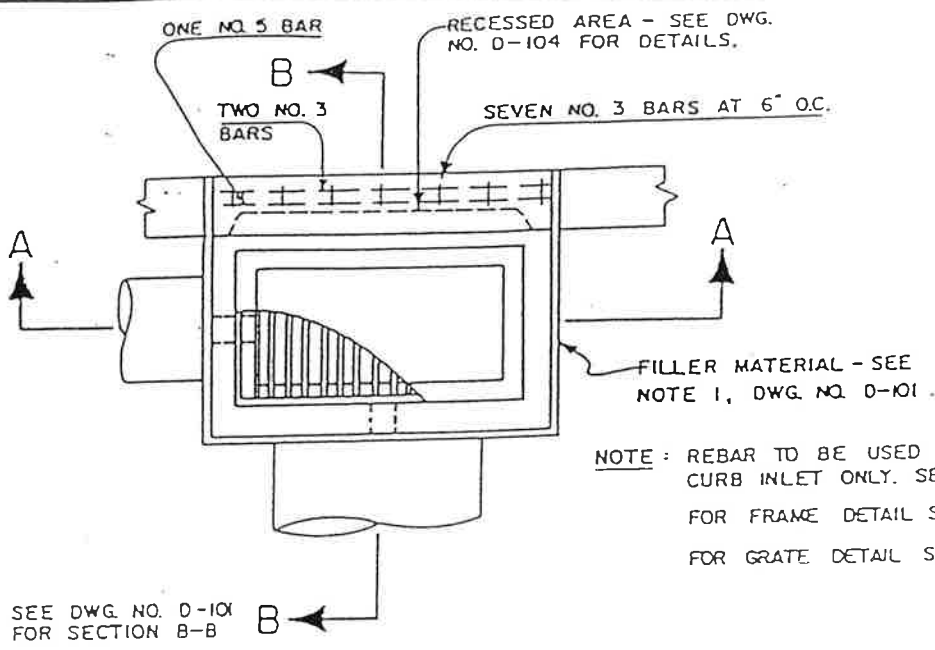
The following minimum activities are required of the designated inspecting engineer:

- 1)* Execute a form accepting responsibility;
- 2) Maintain a project log book which contains at least the following information:
 - A. Job number and name of engineer and designees;
 - B. Date and time of site visits;
 - C. Weather conditions, including temperature;
 - D. A description of construction activities;
 - E. Statements of directions to change plans, specifications, stop work, reject materials or other work quality actions;
 - F. Public agency contacts which result in plan changes or other significant actions;
 - G. Perceived problems and action taken;
 - H. General remarks;
 - I. Final and staged inspections;
 - J. Record all material, soil and compact tests.
- 3) The inspecting engineer shall obtain and use a copy of County-approved construction plans and specifications;
- 4) Review and approve all pipe, aggregate, concrete, A.C. and other materials to ensure their compliance with County standards;
- 5)* Approve all plan or specification changes in writing and obtain County approval;
- 6) Monitor and concur in construction activities to ensure end products meet County specifications;

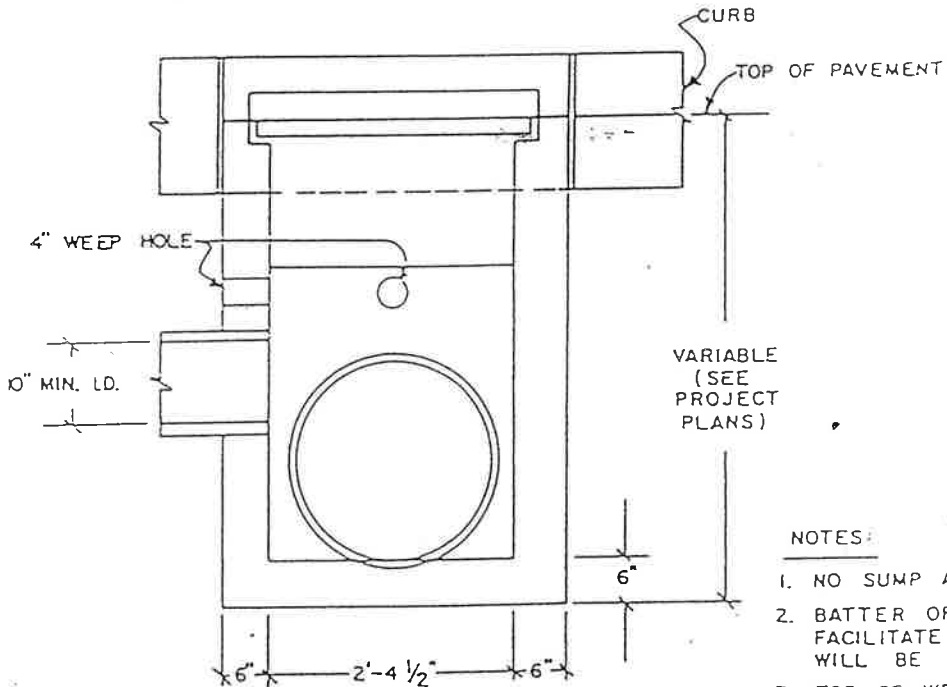
CHAPTER VII

STANDARD DRAWINGS

The Standard Drawings of this section are to be used as a guide for design of public improvements. If a standard drawing of a certain facility or structure is not included in this section, Standard Drawings as prepared by the Oregon Department of Transportation shall be used. These drawings and the drawings from the Oregon Department of Transportation may be revised periodically without further approval of the Columbia County Board of Commissioners.



PLAN



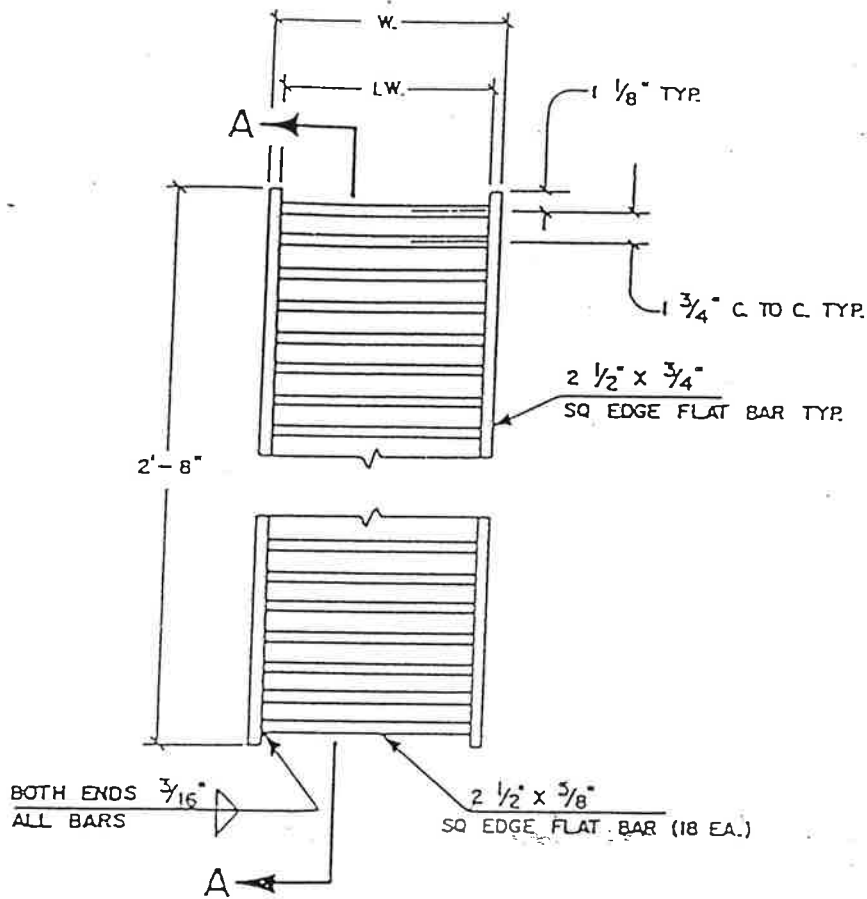
SECTION A-A

- NOTES:
1. NO SUMP ALLOWED.
 2. BATTER OF 1/4" TO 1" TO FACILITATE FORM REMOVAL WILL BE ALLOWED.
 3. TOP OF WEEP HOLE AT SUBGRADE.

COLUMBIA COUNTY

Catch Basin
also see Dwg. No.
D-101 & Dwg. No. 104

Col. Cty. Standard
Drawing No. D-100



PLAN

SECTION A-A

T Y P E *	W.	L.W.
STANDARD	1' - 1 1/2"	1' - 0"
OVERSIZE	1' - 1 1/2"	1' - 0"

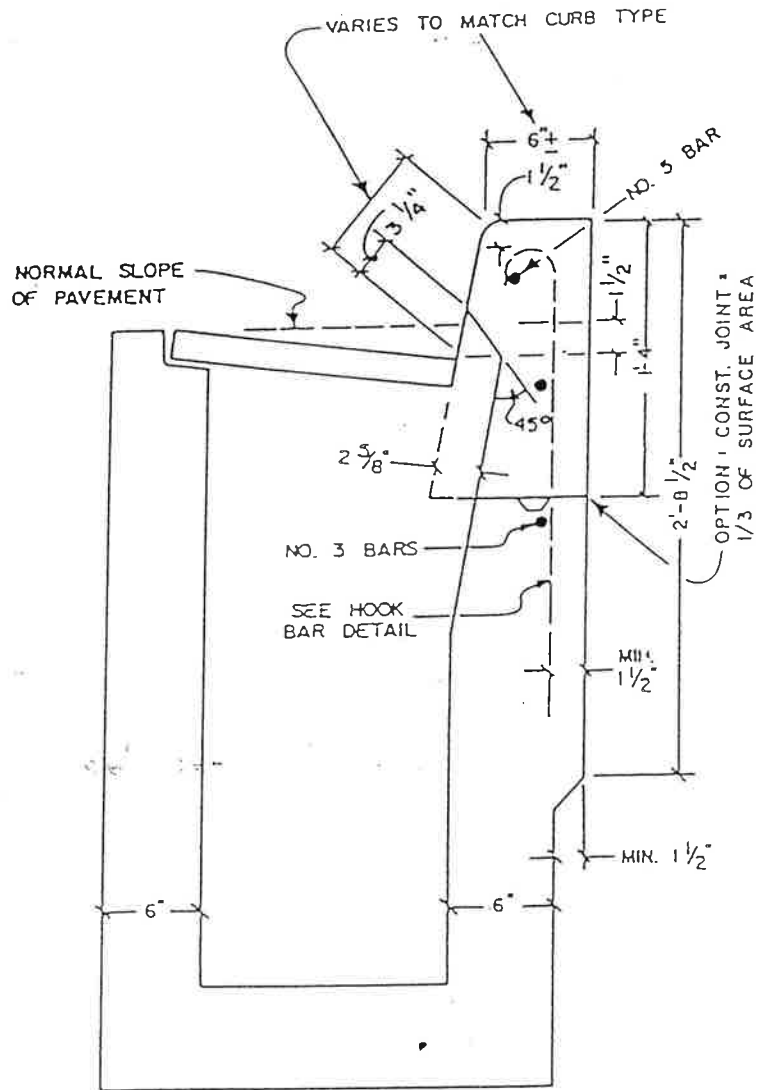
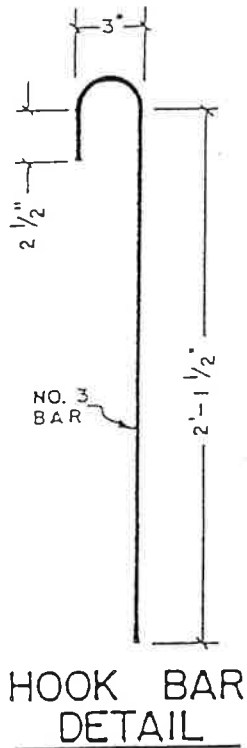
1 REQUIRES 2 GRATES.

* "STANDARD" AND "OVERSIZE" ARE Columbia COUNTY DESIGNATIONS.

COLUMBIA COUNTY

Grate

Col. Cty. Standard
Drawing No. D-103

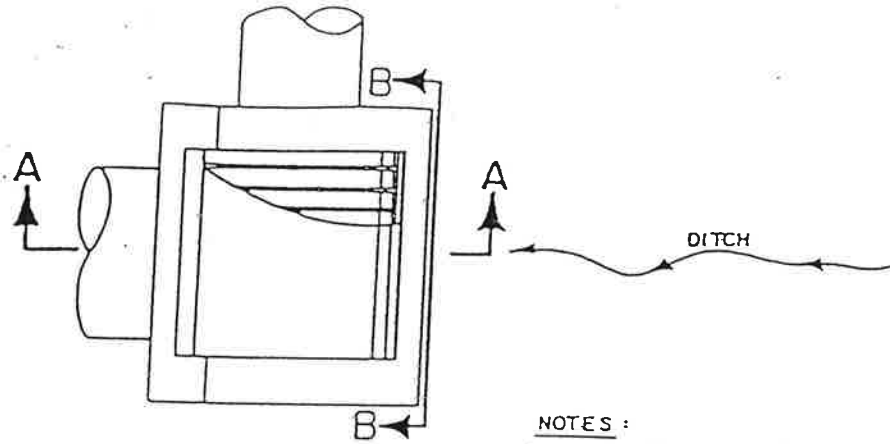


NOTE: FOR PLAN & ELEVATION SEE
DWG. NO. D-100 & D-101.

COLUMBIA COUNTY

Recessed Curb Inlet

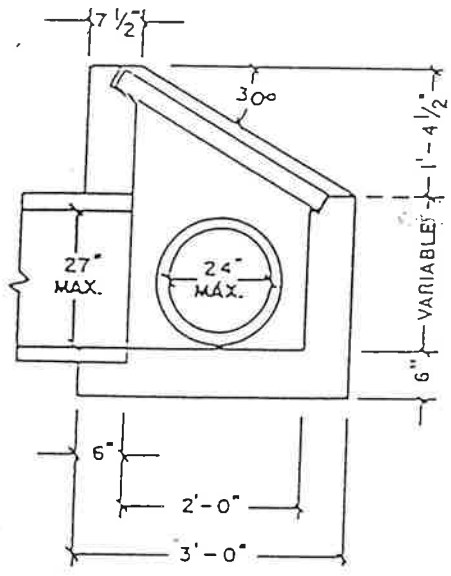
Col. Cty. Standard
Drawing No. D-104



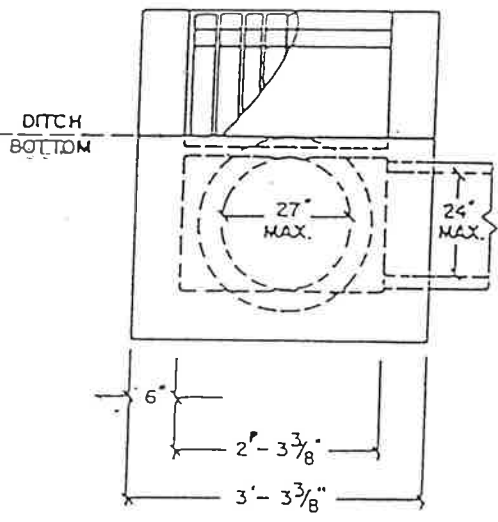
PLAN

NOTES :

1. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS.
2. FOR FRAME DETAIL, SEE DWG. NO. D-107.
3. FOR GRATE DETAIL, SEE DWG. NO. D-108.



SECTION A-A



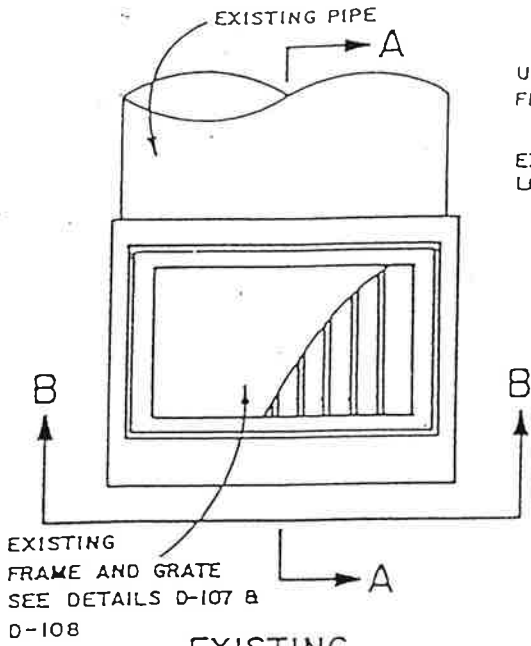
ELEVATION B-B

COLUMBIA COUNTY

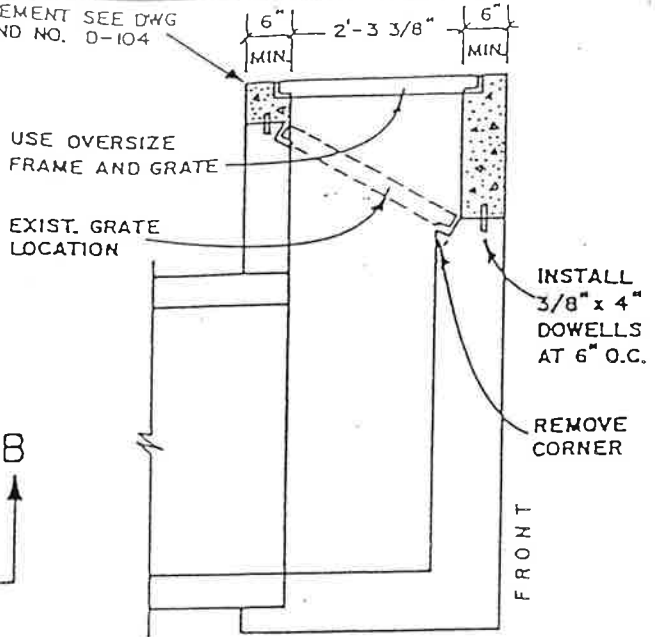
Area Drain, Type II

Col. Cty. Standard
Drawing No. D-105

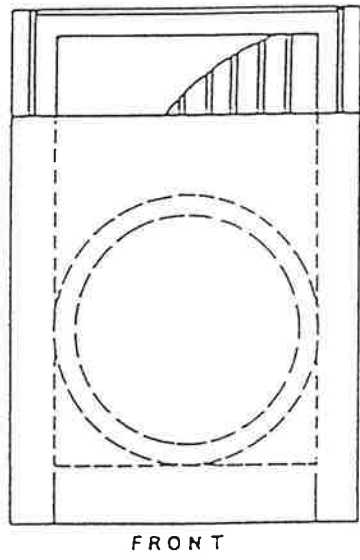
FOR CURB PLACEMENT SEE DWG
NO. CS-304 AND NO. D-104



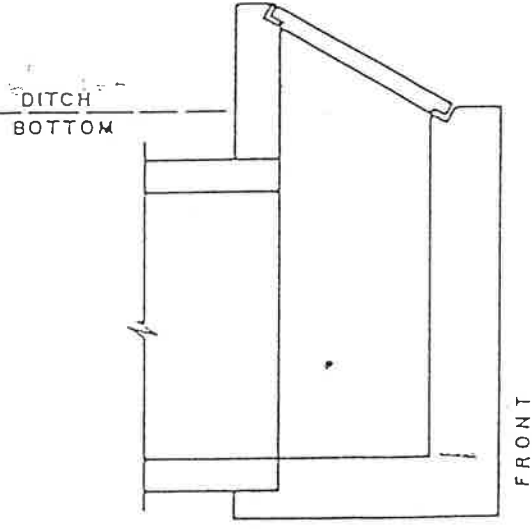
EXISTING
PLAN VIEW



SECTION A - A
DITCH INLET RAISED TO MAKE
OVERSIZE CATCH BASIN



EXISTING ELEVATION B - B



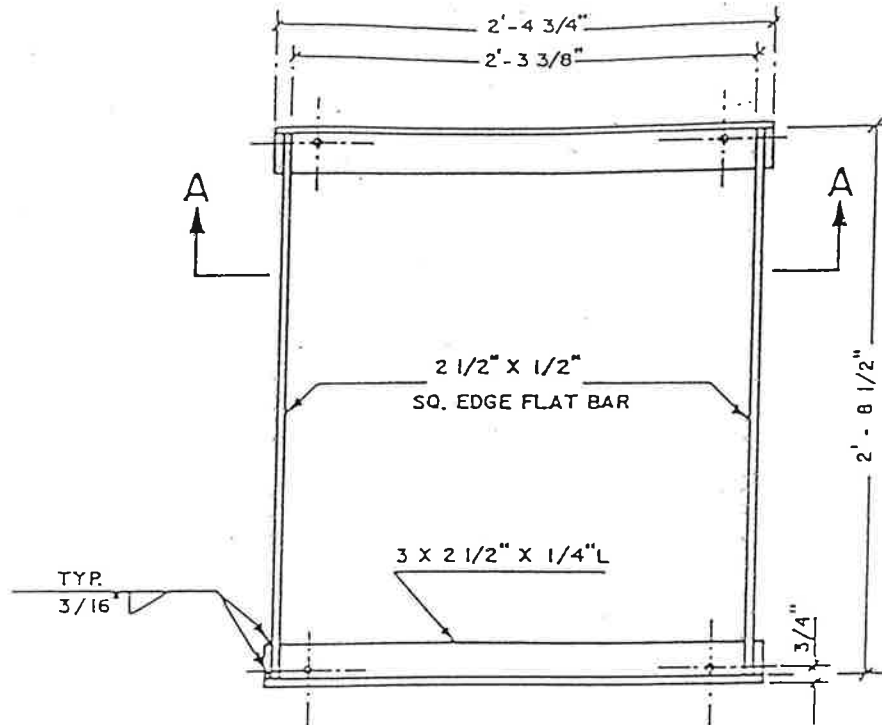
EXISTING ELEVATION A - A

CONCRETE TO BE 3000 P.S.I. - 28 DAYS - 6 SACK MIX

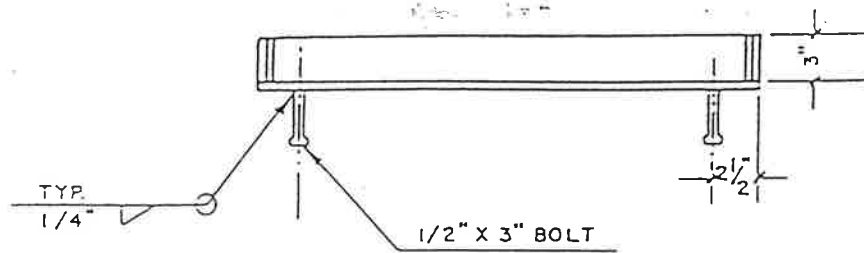
COLUMBIA COUNTY

Raised Area Drain

Col. Cty. Standard
Drawing No. D-106



PLAN

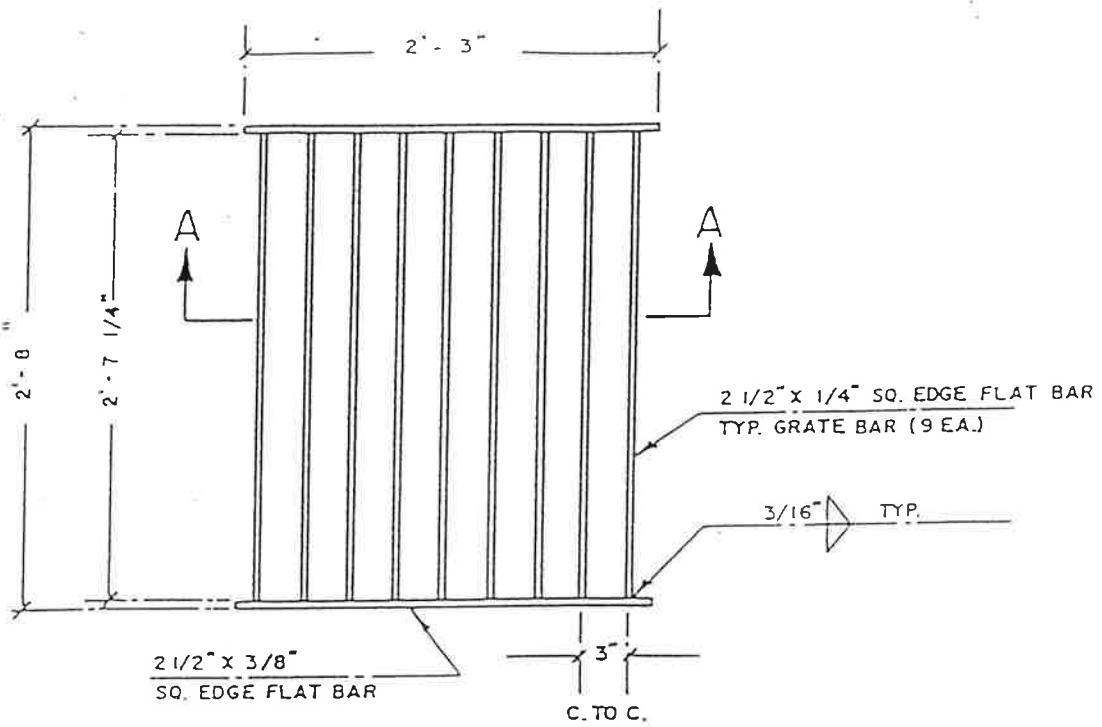


SECTION A-A

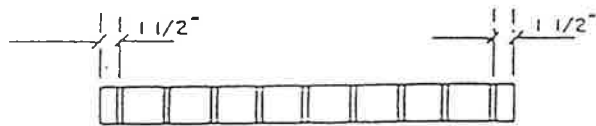
COLUMBIA COUNTY

Frame Area Drain, Type II

Col. Cty. Standard
 Drawing No. D-107



PLAN

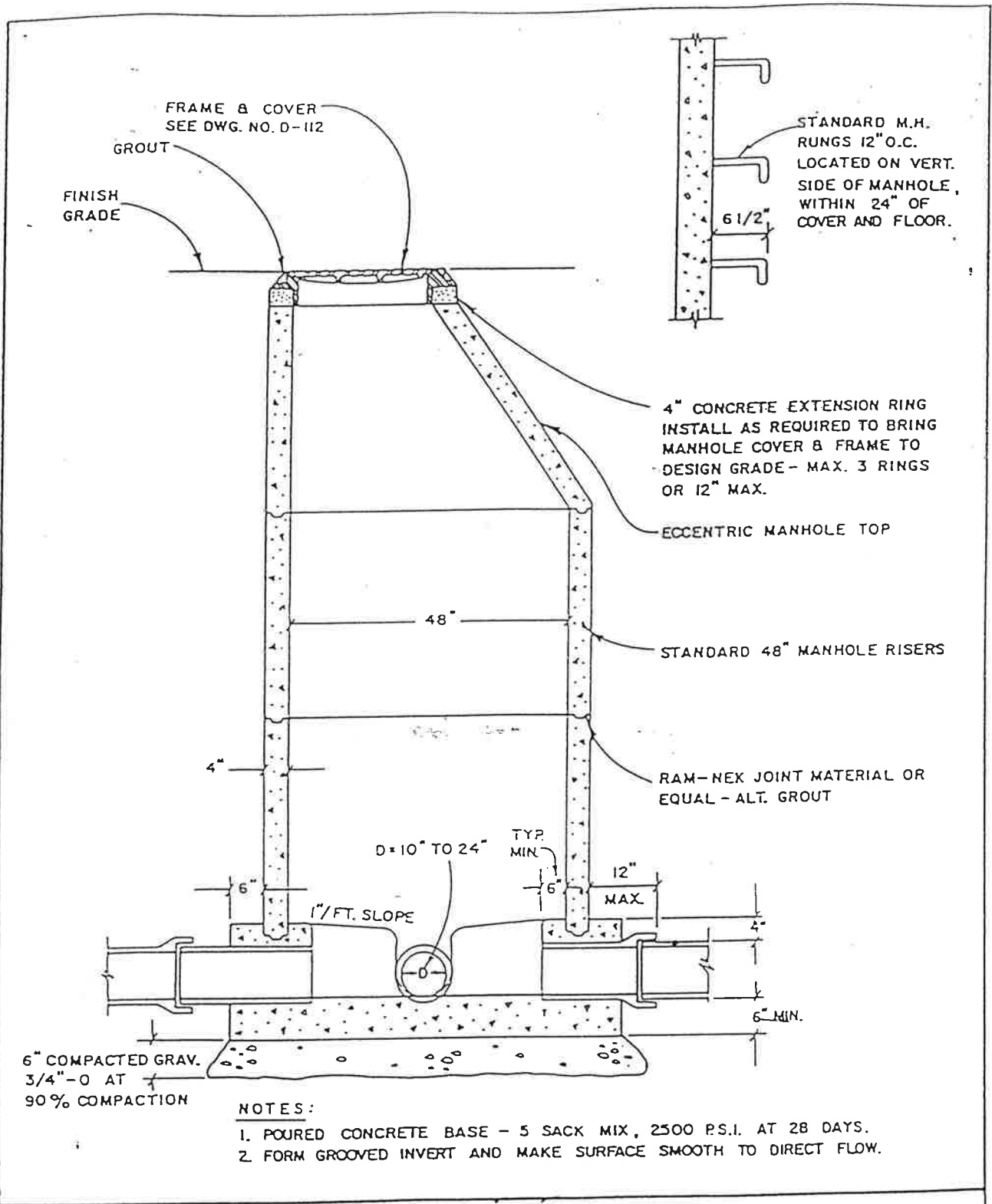


SECTION A - A

COLUMBIA COUNTY

Grate Area Drain, Type II

Col. Cty. Standard
Drawing No. D-108

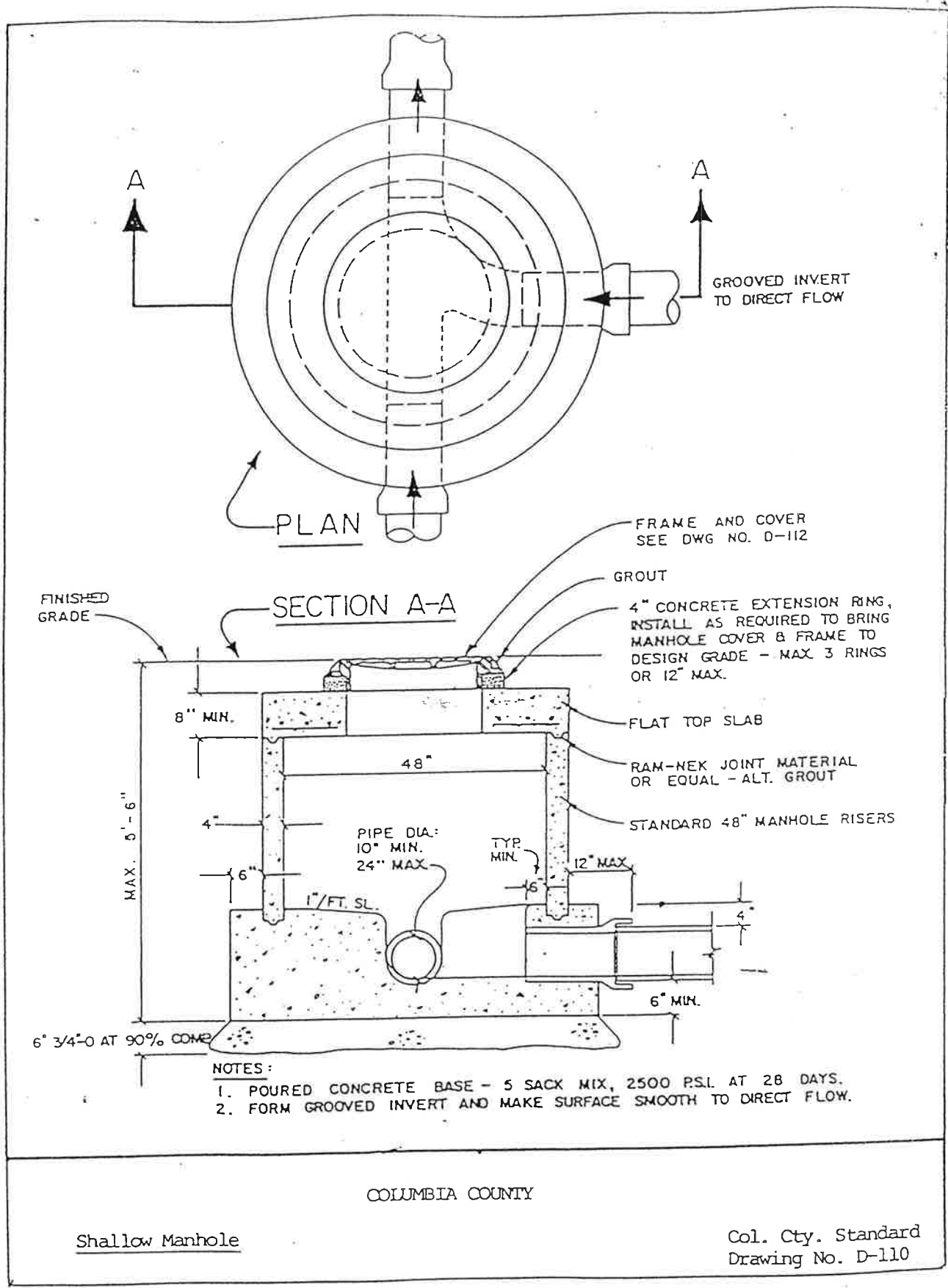


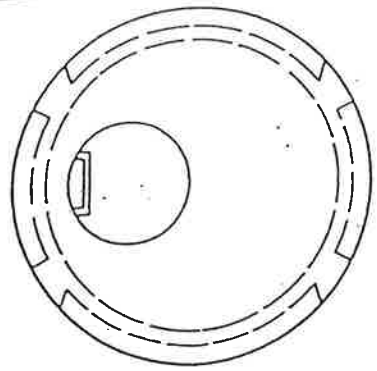
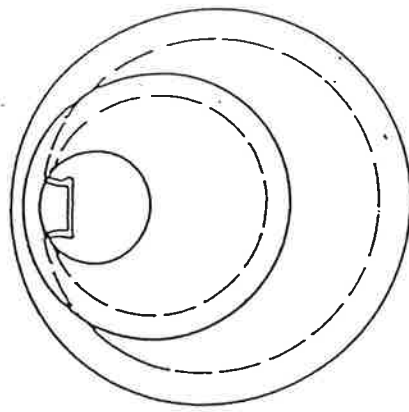
- NOTES:
- POURED CONCRETE BASE - 5 SACK MIX, 2500 P.S.I. AT 28 DAYS.
 - FORM GROOVED INVERT AND MAKE SURFACE SMOOTH TO DIRECT FLOW.

COLUMBIA COUNTY

Standard Manhole

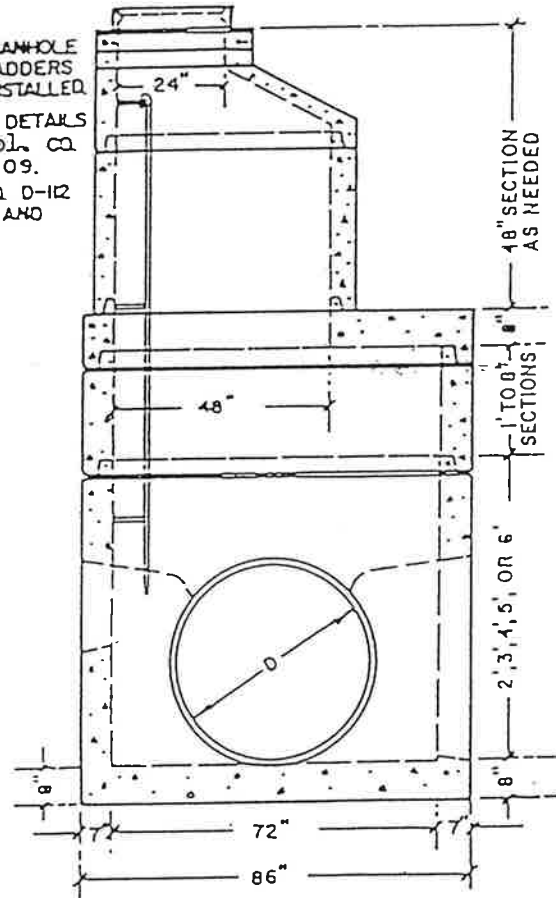
Col. Cty. Standard
 Drawing No. D-109



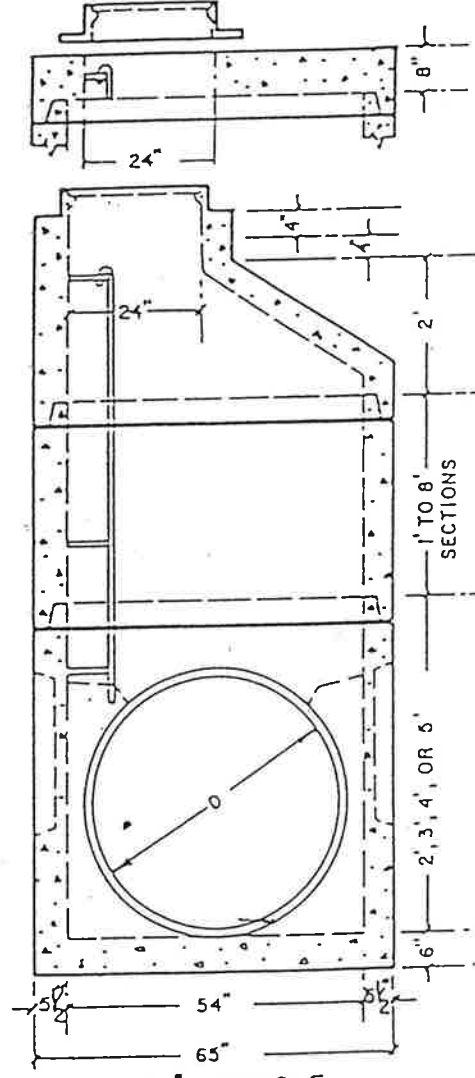


NOTES:

1. STANDARD MANHOLE STEPS OR LADDERS SHALL BE INSTALLED.
2. FOR OTHER DETAILS REFER TO COL. CO. DWG. NO. D-109.
3. SEE DWG. NO. D-112 FOR FRAME AND COVER.



72" MANHOLE
FOR 42" DIAMETER OR SMALLER PIPE

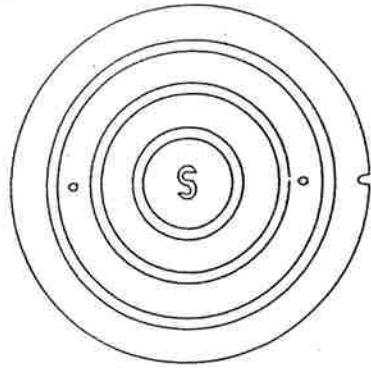


54" MANHOLE
FOR 36" DIAMETER OR SMALLER PIPE

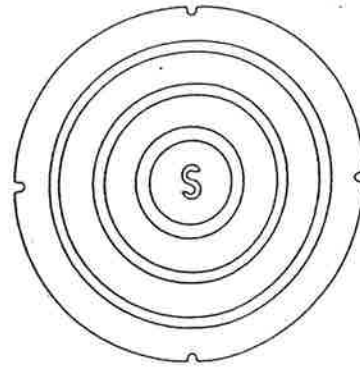
COLUMBIA COUNTY

Special Oversize Manhole

Col. Cty. Standard
Drawing No. D-111

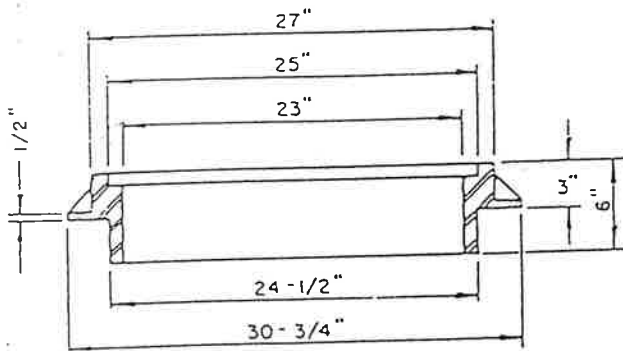
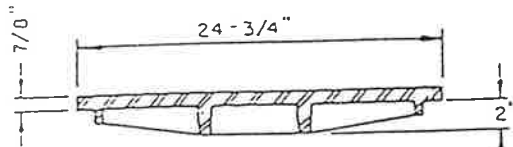


STANDARD COVER
PLAN VIEW

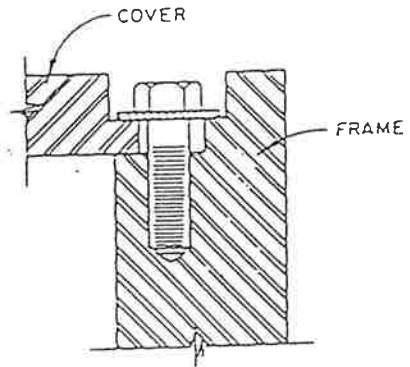


WATERTIGHT COVER
PLAN VIEW

NOTE: LID CENTER MARKING SHALL BE "W" IF USED FOR WATER



FRAME & COVER
SECTION



CAPSCREW
4 REQ'D. - 1/2" x 1-1/2"
CADMIUM PL.
HEX HEAD

WATERTIGHT
FRAME & COVER DETAIL

COLUMBIA COUNTY

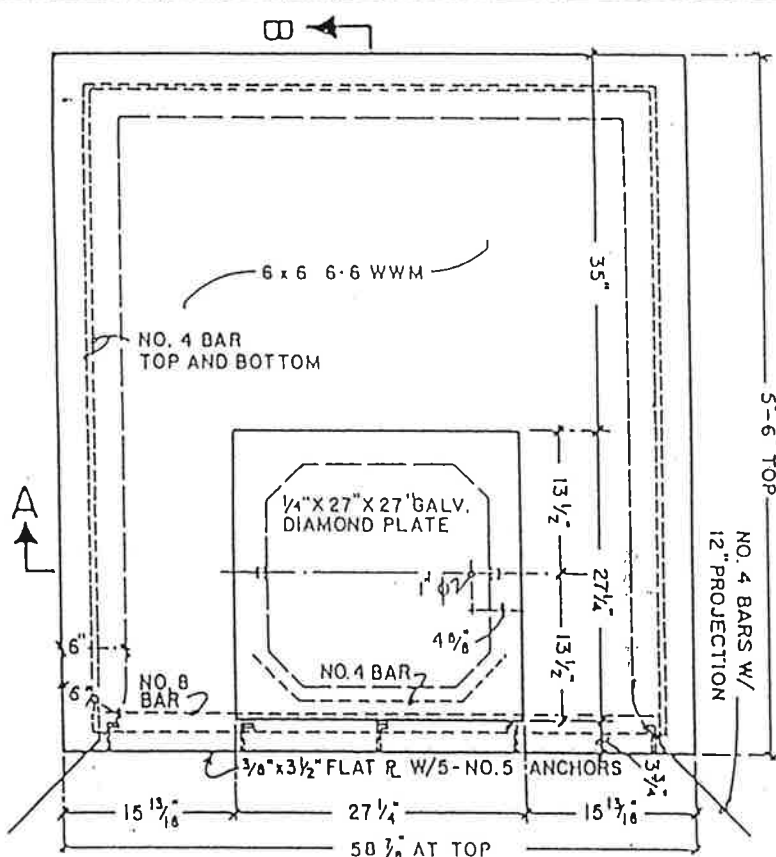
Manhole Frame & Cover

Col. Cty. Standard
Drawing No. D-112

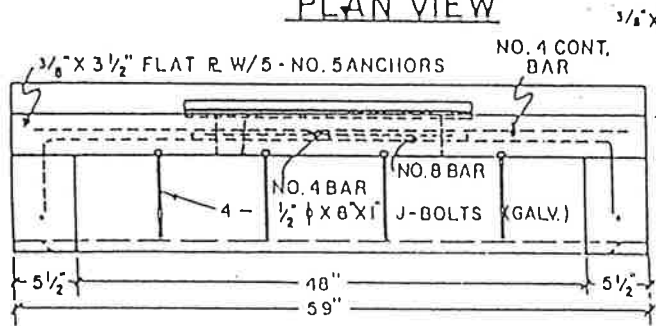
Gutter Inlet - 4A

COLUMBIA COUNTY

Col. Cty. Standard
 Drawing No. D-113

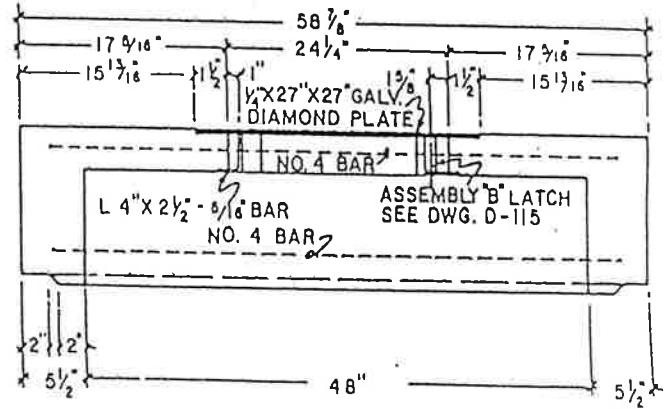


PLAN VIEW

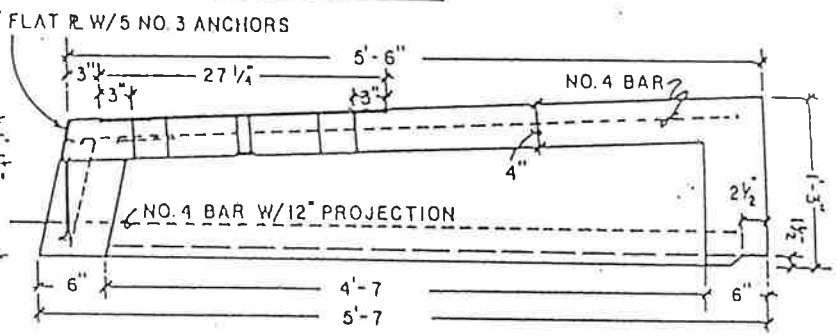


FRONT ELEVATION

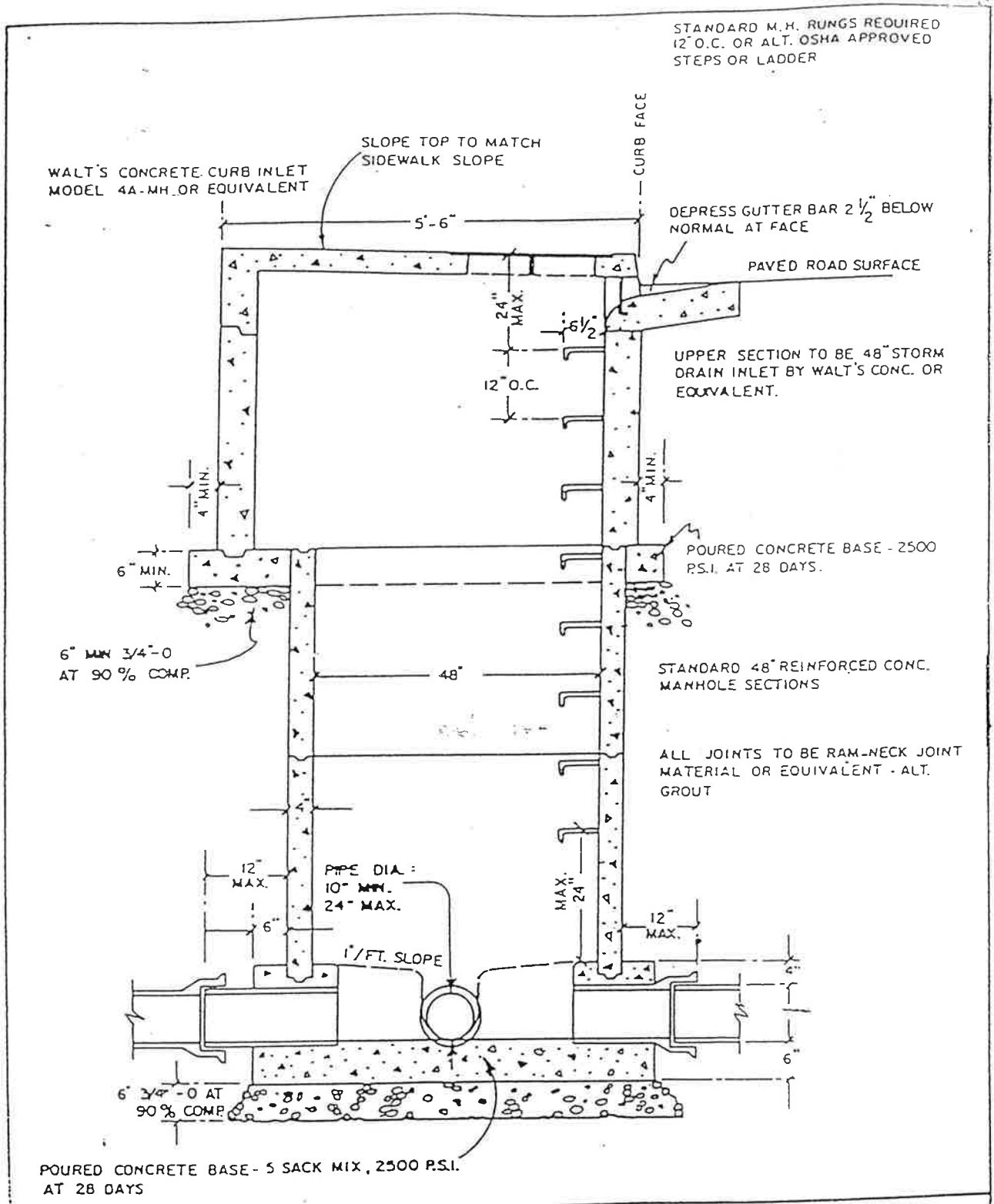
NOTE: ALL CONC. MIN. 3500 P.S.I. AT 28 DAY TEST



SECTION - A



SECTION - B

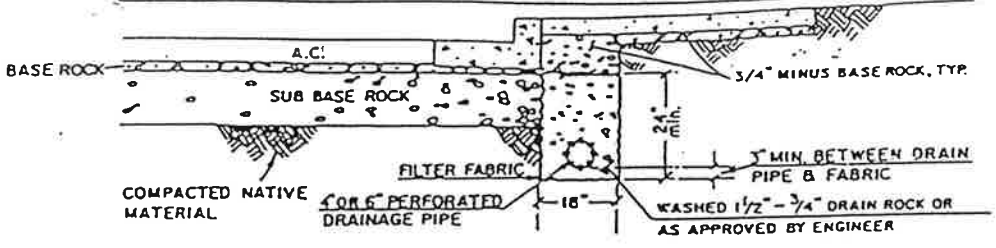


COLUMBIA COUNTY

Gutter Inlet - 4A (modified)

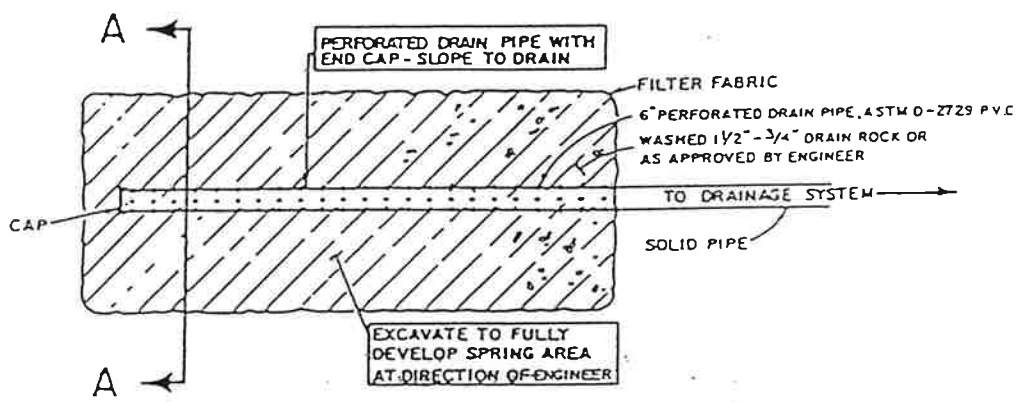
Col. Cty. Standard
Drawing No. D-113.1

- NOTES: 1.) PROVIDE DIRECT DRAINAGE CONTACT BETWEEN BASE ROCK, SUB BASE ROCK & SUBGRADE DRAIN.
 2.) LOCATE SUBGRADE DRAIN ON UPHILL SIDE OF ROAD OR AS DIRECTED BY ENGINEER
 3.) SHOW PROPOSED LOCATION ON PLANS
 4.) USE ASTM D-2729 PERFORATED P.V.C.

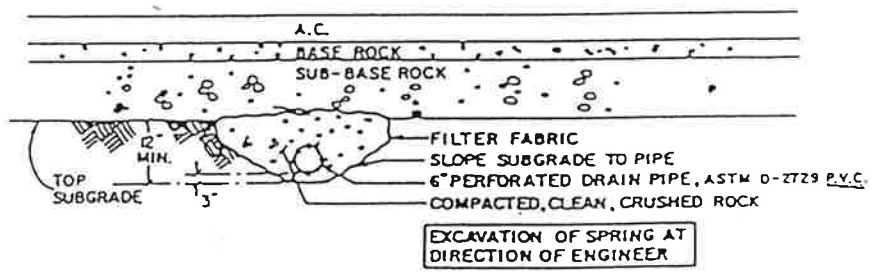


TYPICAL SUBGRADE DRAIN

SPRING CATCHMENT DETAIL



P L A N

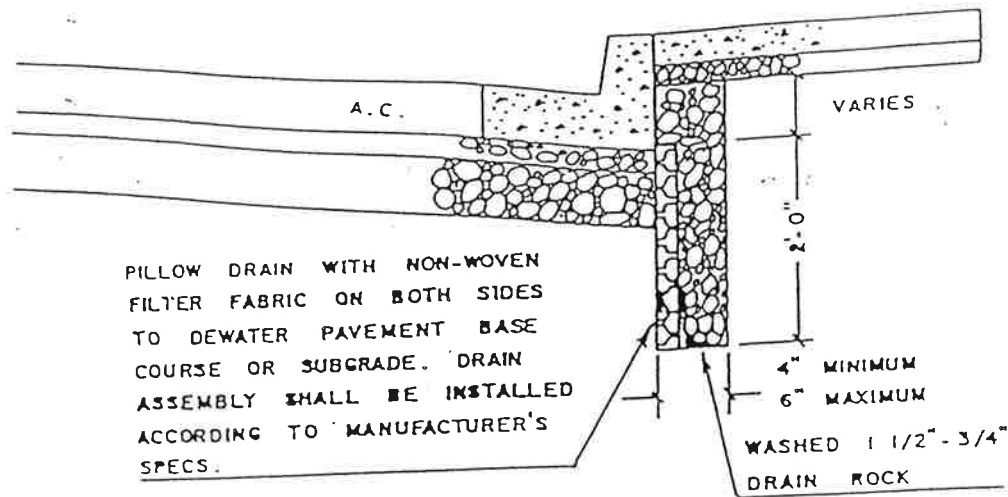


SECTION A-A

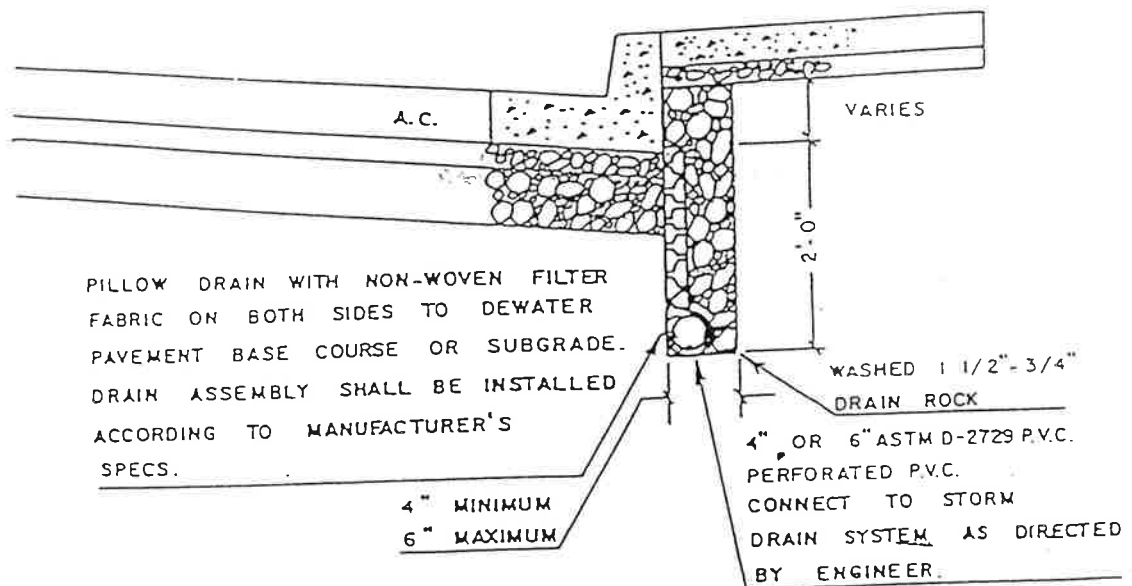
COLUMBIA COUNTY

Subgrade & Spring Catchment Drain

Col. Cty. Standard
 Drawing No. D-116



WITHOUT DRAIN PIPE

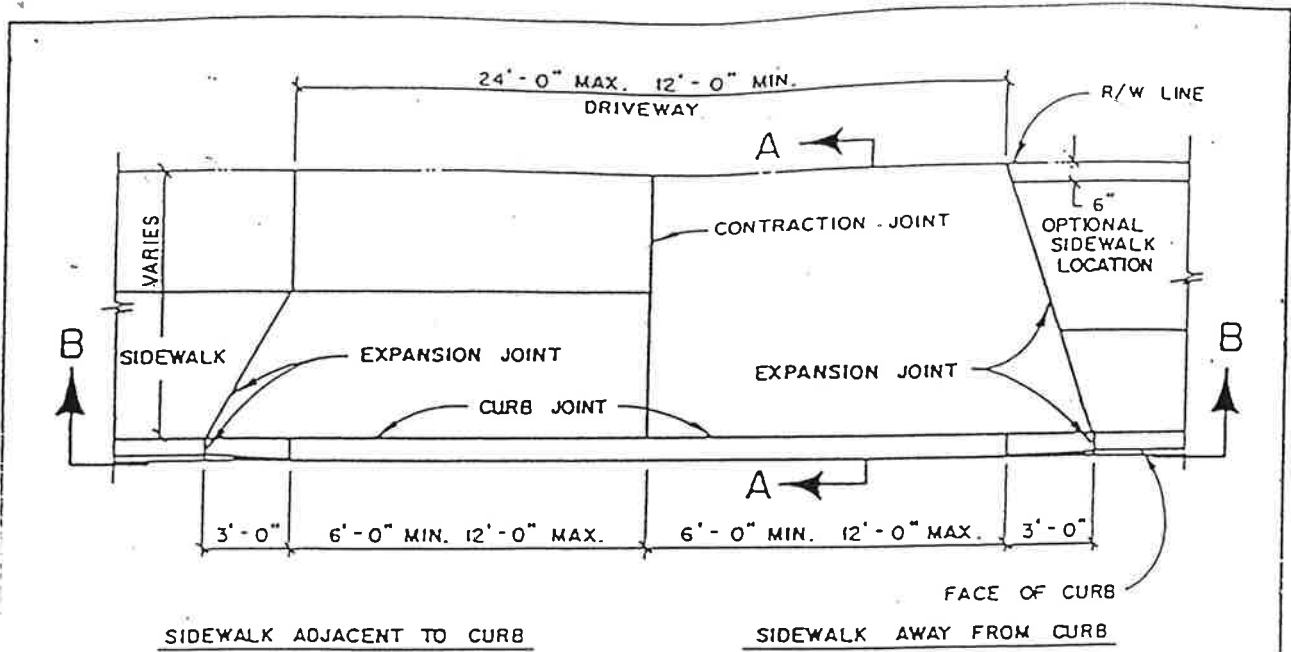


WITH DRAIN PIPE

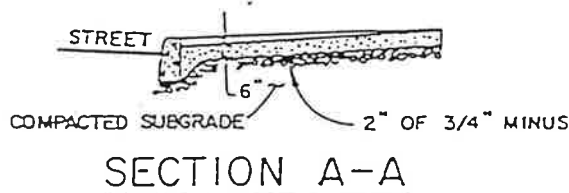
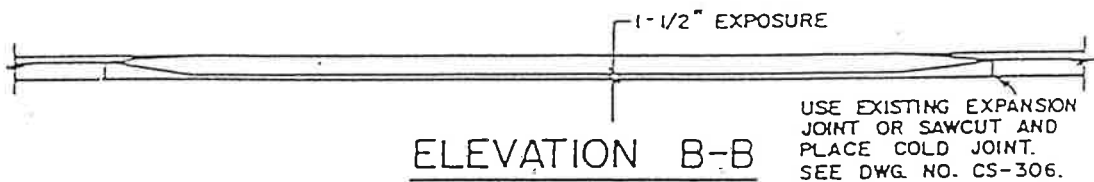
COLUMBIA COUNTY

Alternate Subgrade Drain

Col. Cty. Standard
Drawing D-117



PLAN



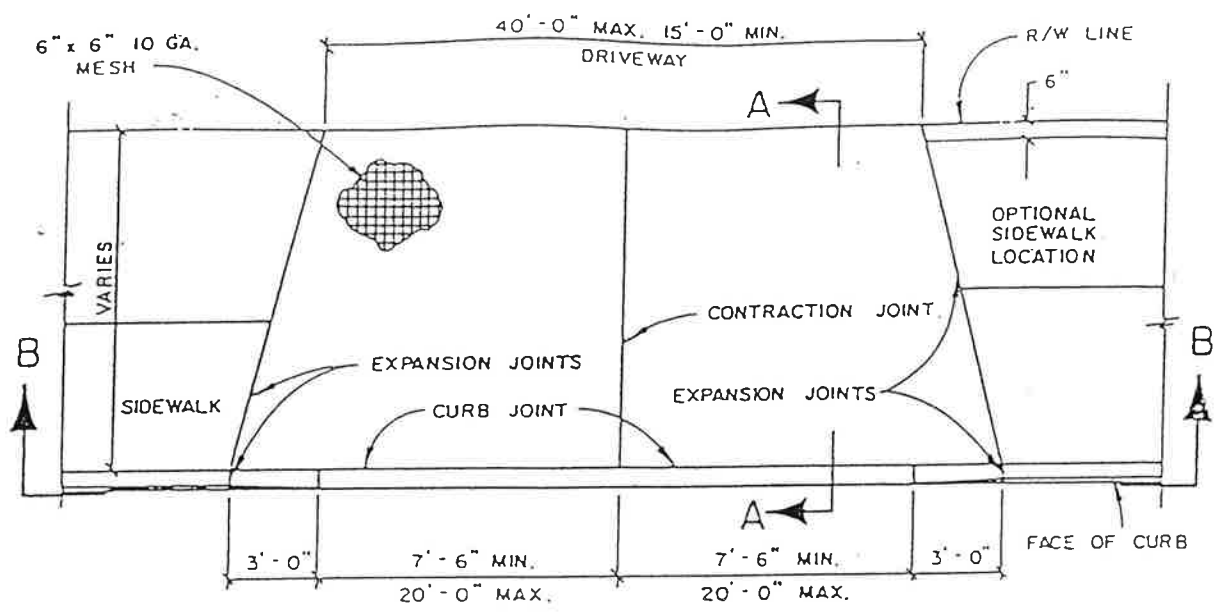
NOTES:

1. CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3000 P.S.I. AFTER 28 DAYS, 6 SACK MIX.
2. CURB JOINT SHALL BE A TROWELED JOINT WITH A MINIMUM 1/2" RADIUS ALONG BACK OF CURB.
3. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED ASPHALT IMPREGNATED MATERIAL OR EQUAL, EXTENDING FROM SUBGRADE TO FINISHED GRADE.
4. SEE DWG. NO. CS-300 AND NO. CS-305.

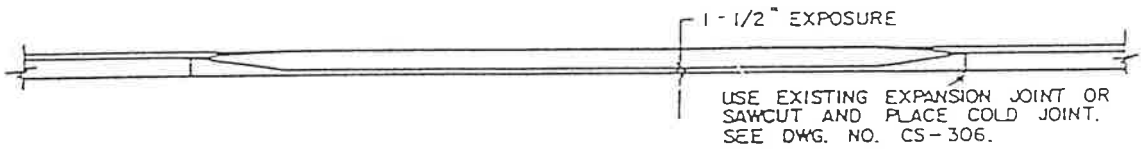
COLUMBIA COUNTY

Residential Driveway

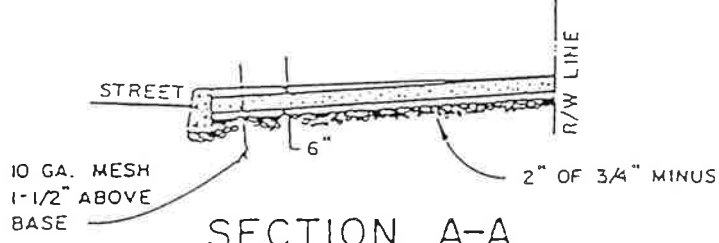
Col. Cty. Standard
Drawing No. D-200



PLAN



ELEVATION B-B



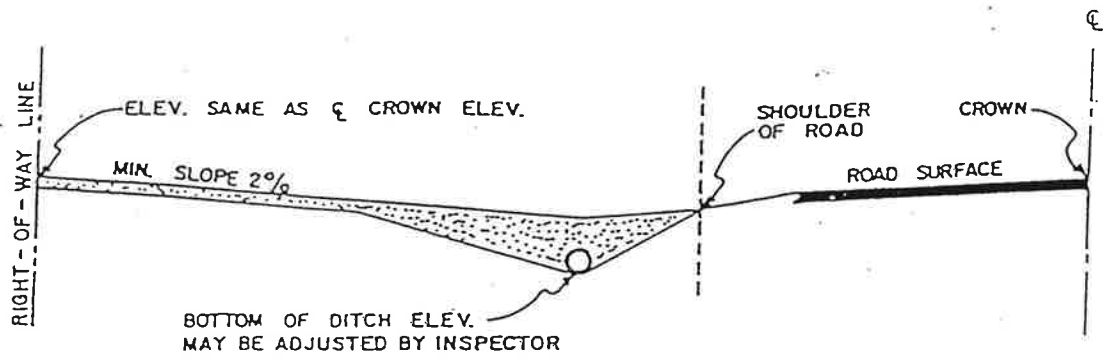
SECTION A-A

1. CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3000 P.S.I. AFTER 28 DAYS , 6 SACK MIX .
2. CURB JOINT SHALL BE A TROWELED JOINT WITH A MINIMUM 1/2" RADIUS ALONG BACK OF CURB.
3. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED ASPHALT IMPREGNATED MATERIAL OR EQUAL, EXTENDING FROM SUBGRADE TO FINISHED GRADE.
4. SEE DWG. NO. CS-300 AND NO. CS-305.

COLUMBIA COUNTY

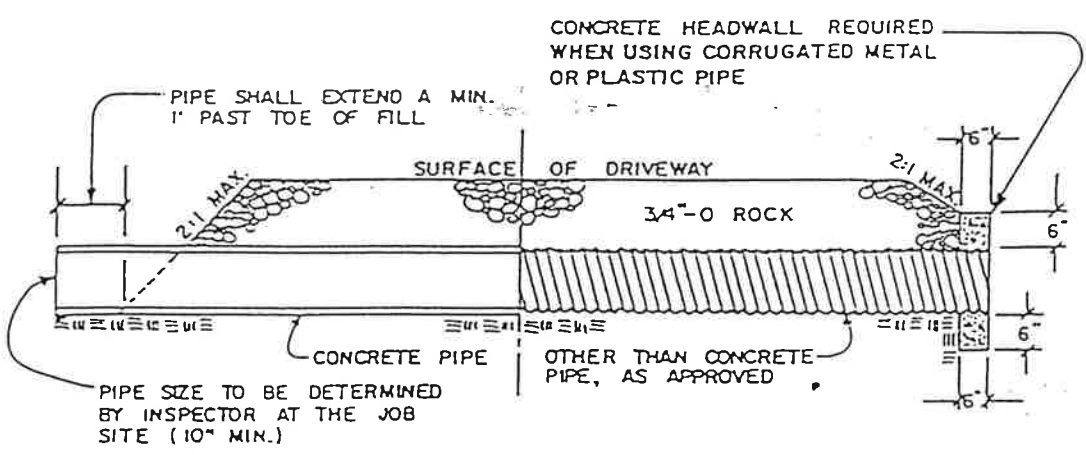
Commercial Driveway

Col. Cty. Standard
Drawing No. D7-201



- NOTES:**
1. SEE DWG. NO. 205 FOR ALTERNATIVE
 2. IF AC DRIVEWAY IS TO BE CONSTRUCTED, USE 2" OF CLASS "C" MIX ON APPROVED BASE

PROFILE



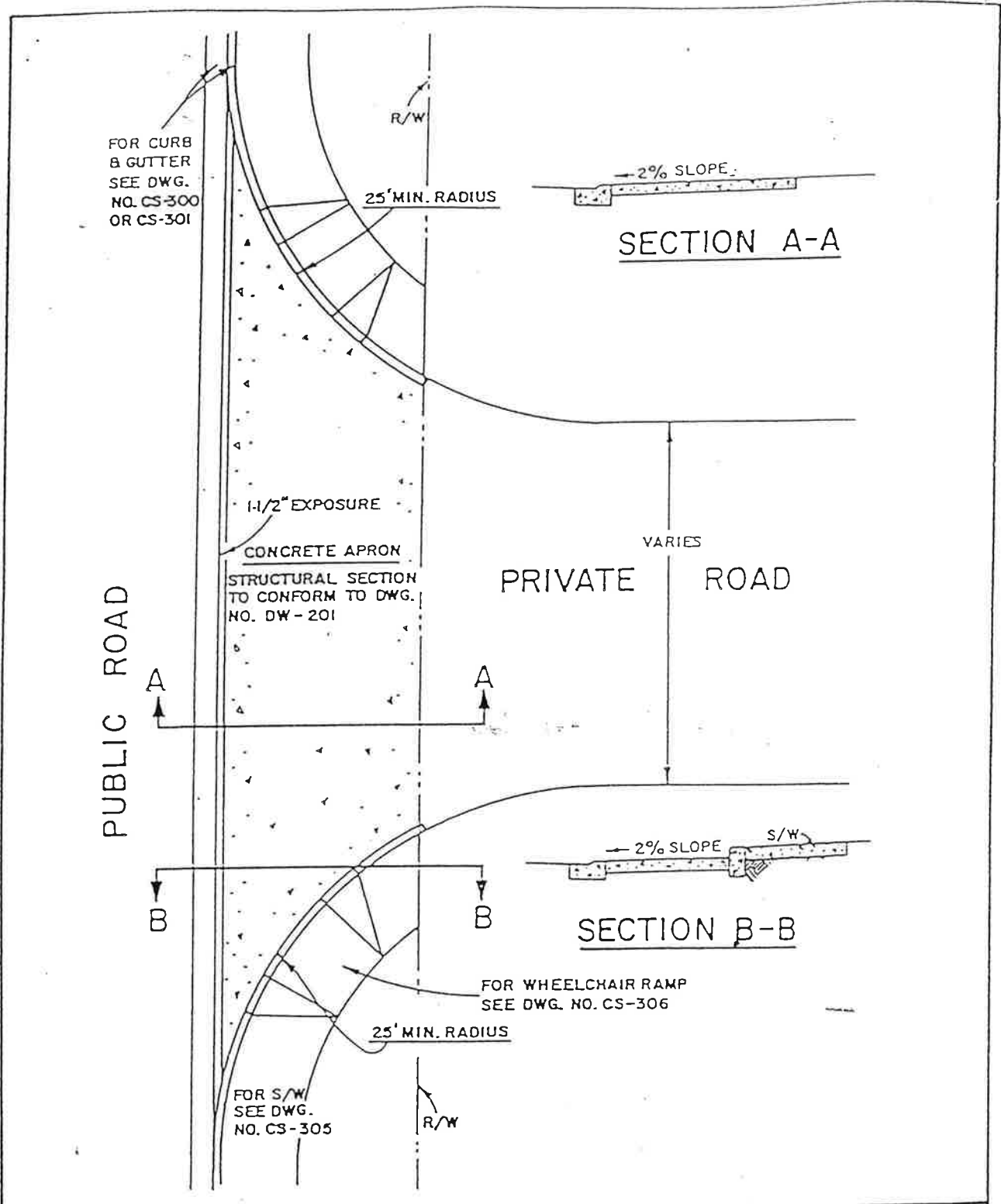
PIPE TO BE LAYED AT EXISTING GRADE OF DITCH - NO SLUMPS

CROSS-SECTION

COLUMBIA COUNTY

Driveway for Streets
Without Curbs

Col. Cty. Standard
Drawing No. DW-202

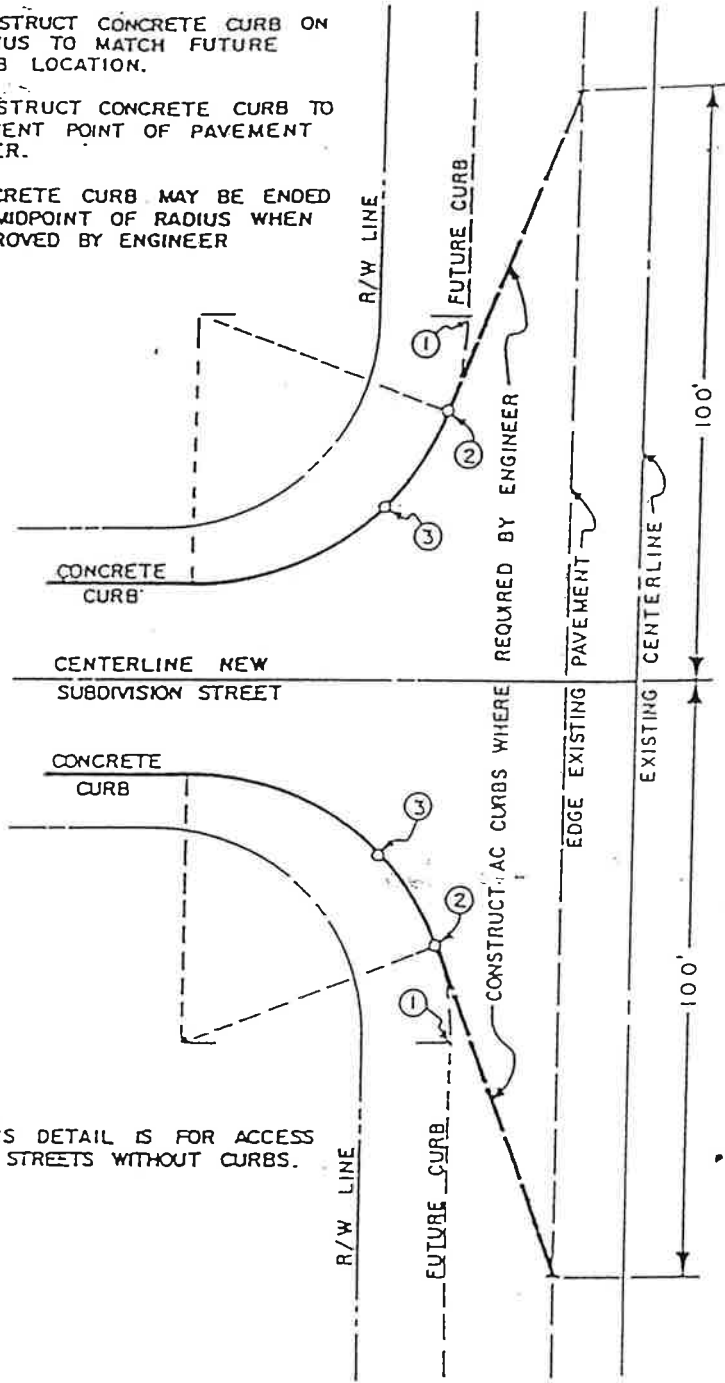


COLUMBIA COUNTY

Private Road Entrance Off
of Public Road With Curbs

Col. Cty. Standard
Drawing No. DX7-203

- ① CONSTRUCT CONCRETE CURB ON RADIUS TO MATCH FUTURE CURB LOCATION.
- ② CONSTRUCT CONCRETE CURB TO TANGENT POINT OF PAVEMENT TAPER.
- ③ CONCRETE CURB MAY BE ENDED AT MIDPOINT OF RADIUS WHEN APPROVED BY ENGINEER

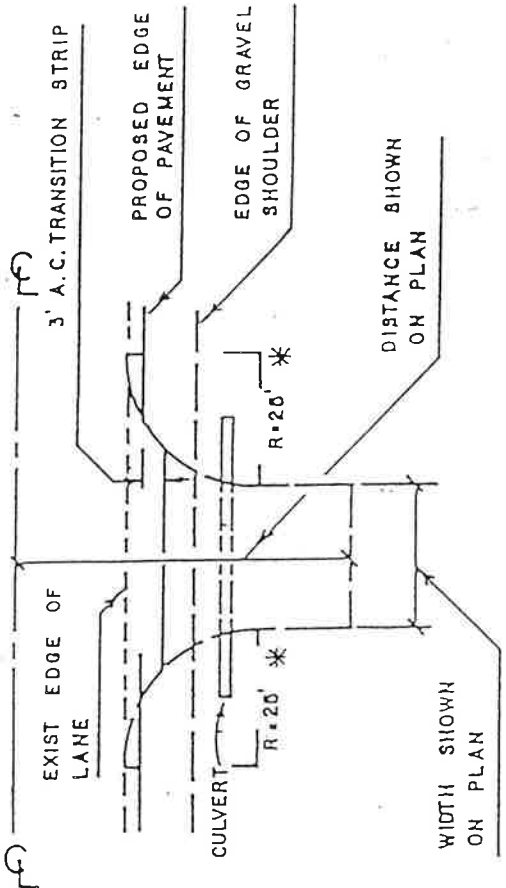


NOTE : THIS DETAIL IS FOR ACCESS TO STREETS WITHOUT CURBS.

COLUMBIA COUNTY

Temporary Entrance

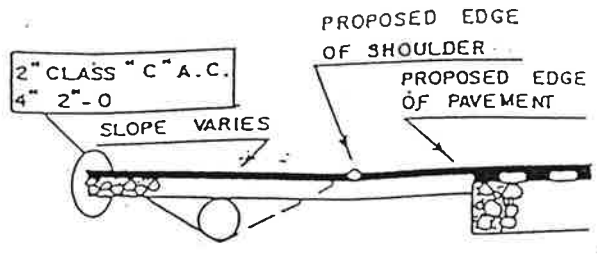
Col. Cty. Standard
Drawing No. DW-204



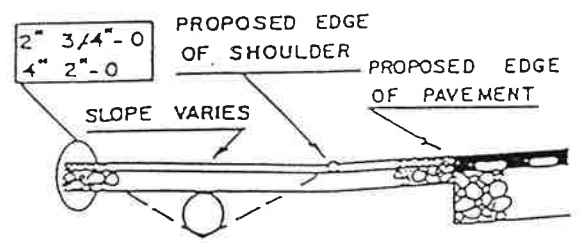
TYPICAL PLAN
A.C. OR GRAVEL DRIVEWAY

* UNLESS OTHERWISE NOTED

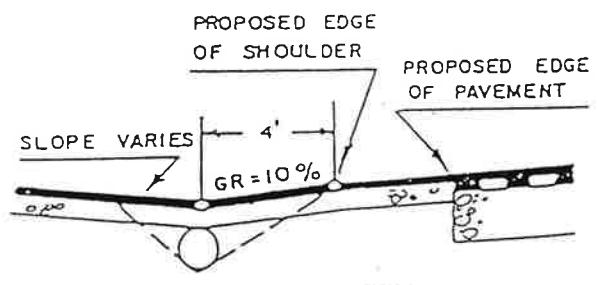
SEE DWG. NO. DW-202



TYPICAL SECTION
A.C. DRIVEWAY



TYPICAL SECTION
GRAVEL DRIVEWAY

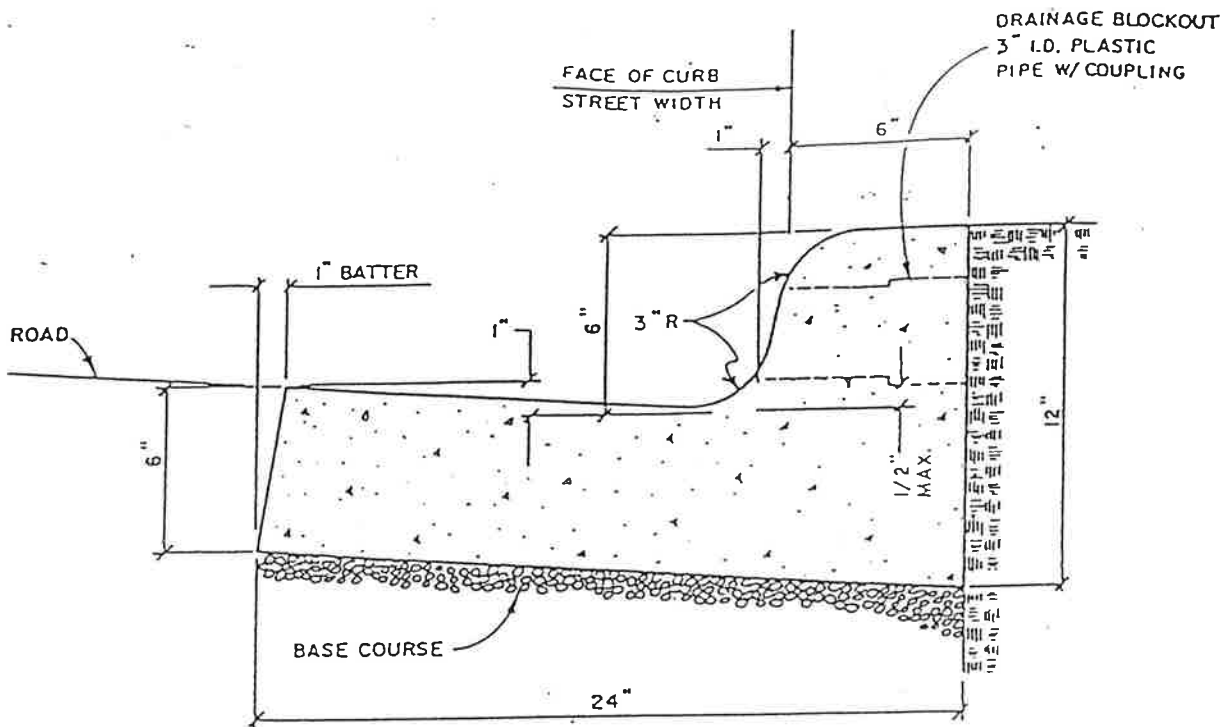


TYPICAL SECTION
ALTERNATE

Columbia County

Driveway Details for
Non-Curbed Areas

Col. Cty. Standard
Drawing No. DW-205

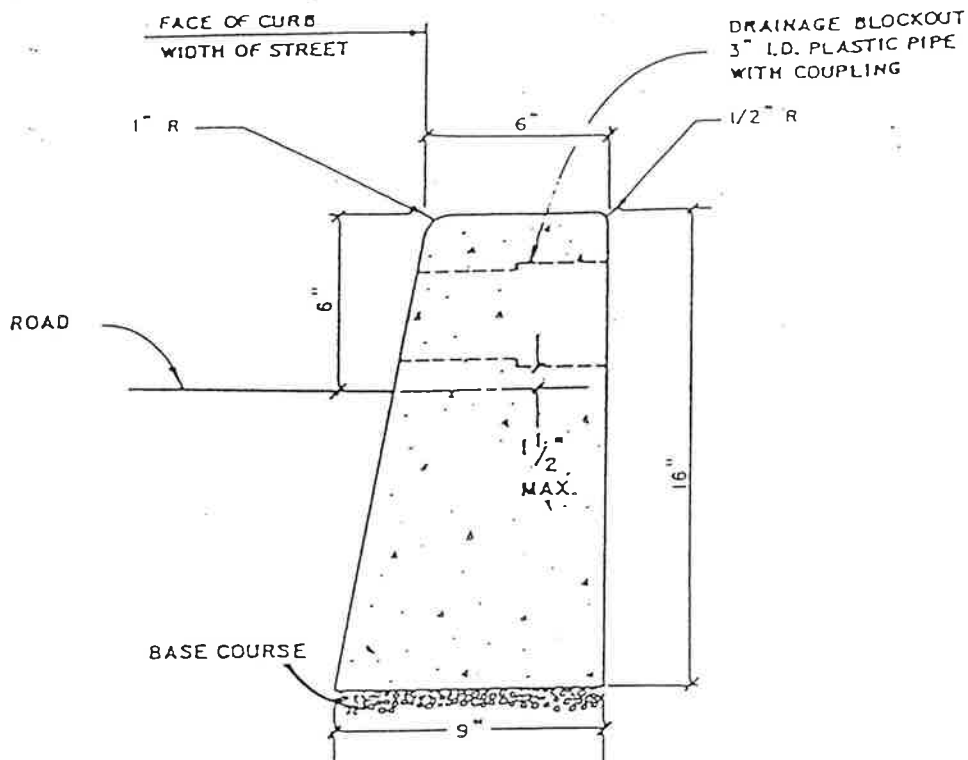


1. FOR USE ALONG MEDIANS, GUTTERS MAY BE REDUCED WITH PRIOR APPROVAL FROM THE ROAD ENGINEER.
2. CONCRETE TO HAVE A BREAKING STRENGTH OF 3000 P.S.I. AFTER 28 DAYS .
3. EXPANSION JOINTS
 - A. TO BE PROVIDED:
 - 1) AT EACH POINT OF TANGENCY OF THE CURB .
 - 2) AT EACH COLD JOINT .
 - 3) AT EACH SIDE OF INLET STRUCTURES.
 - 4) AT EACH END OF DRIVEWAYS .
 - 5) AT LOCATIONS NECESSARY TO LIMIT SPACING TO 45 FEET .
 - B. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON EXTRUDING, WITH A THICKNESS OF 1/2 INCH.
4. CONTRACTION JOINTS
 - A. SPACING TO BE NOT MORE THAN 15 FEET .
 - B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1 1/2 INCHES .
5. BASE ROCK-2'-0 OR 3/4'-0 , 95 % COMPACTION . BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4" IN DEPTH , WHICHEVER IS GREATER .
6. DRAINAGE BLOCKOUT - 3" DIAMETER PLASTIC PIPE
 - A. I.D. PLASTIC PIPE WITH COUPLING
 - B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED OR CURB SAW CUT VERTICALLY 18" EACH SIDE OF DRAIN AND REPOURED TO FULL DEPTH OF CURB.

COLUMBIA COUNTY

Curb & Gutter Emergency Mountable

Col. Cty. Standard
Drawing No. CS-300

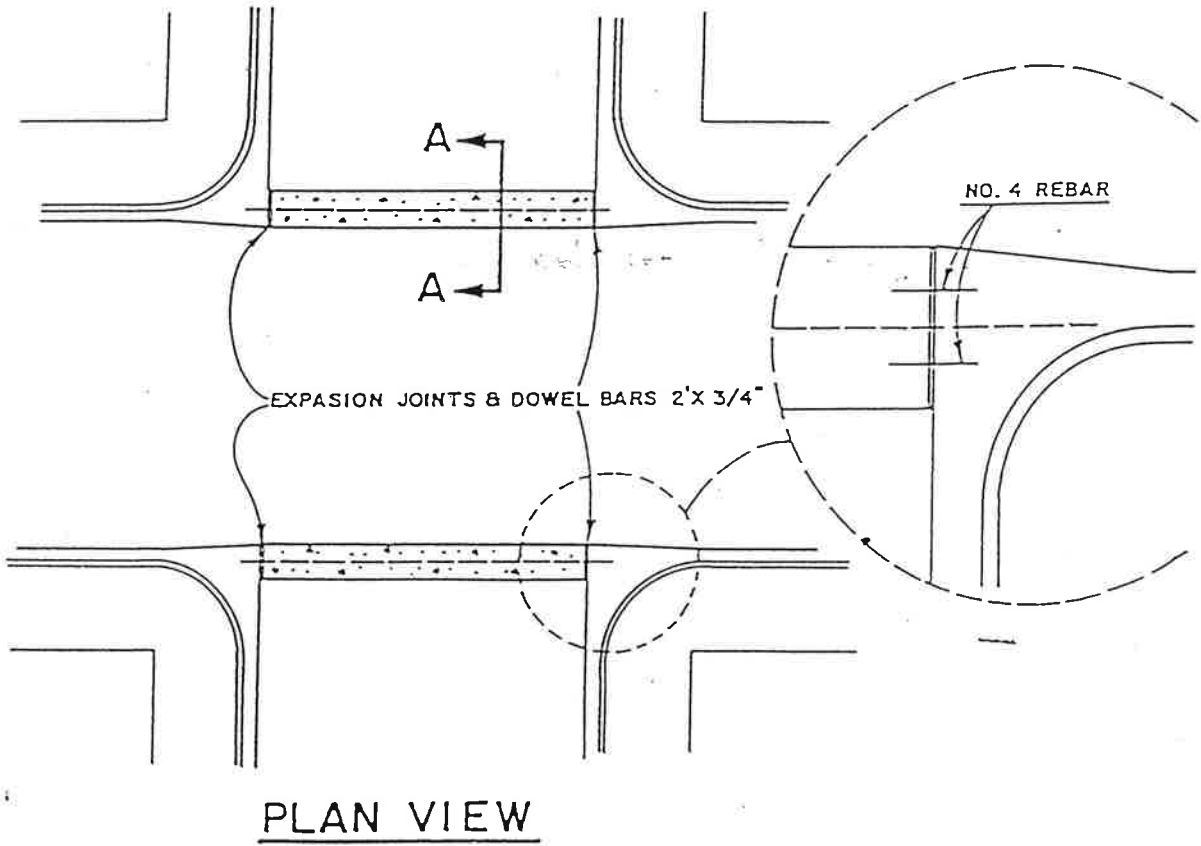
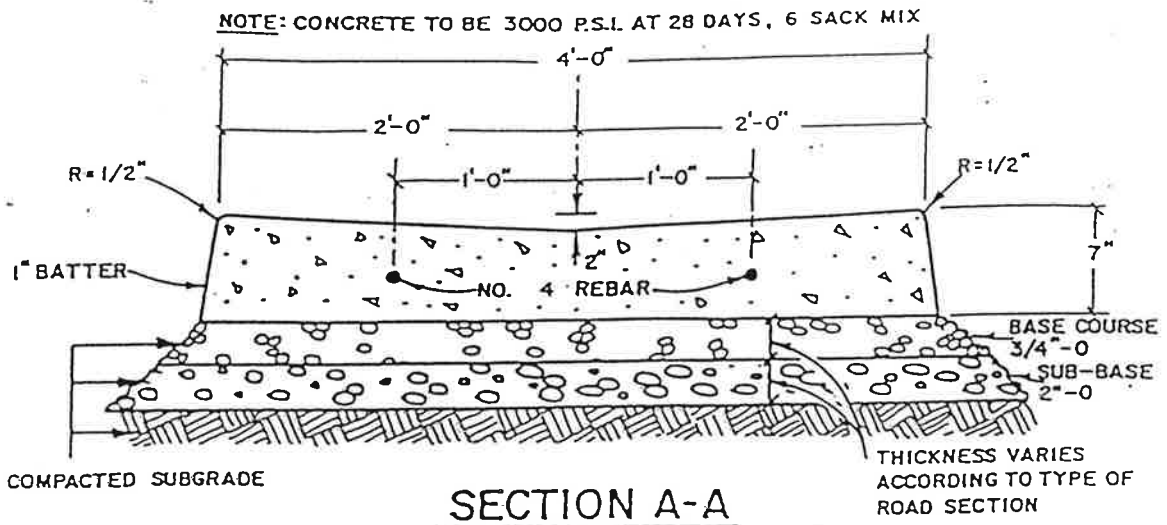


1. FOR DESIGN SPEEDS GREATER THAN 40 MPH THE EMERGENCY MOUNTABLE CURB CS-300 SHALL BE USED.
2. CONCRETE TO HAVE A BREAKING STRENGTH OF 3000 P.S.I. AFTER 28 DAYS.
EXPANSION JOINTS.
 - A. TO BE PROVIDED :
 - 1) AT EACH POINT OF TANGENCY OF THE CURB .
 - 2) AT EACH COLD JOINT .
 - 3) AT EACH SIDE OF INLET STRUCTURES.
 - 4) AT EACH END OF DRIVEWAYS .
 - 5) AT LOCATIONS NECESSARY TO LIMIT SPACING TO 45 FEET .
 - B. MATERIAL TO BE PRE - MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2 INCH.
3. CONTRACTION JOINTS .
 - A. SPACING TO BE NOT MORE THAN 15 FEET .
 - B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1 1/2" INCHES .
4. BASE ROCK - 2"-0 OR 3/4"-0 , 95 % COMPACTION. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4" IN DEPTH , WHICHEVER IS GREATER .
5. DRAINAGE BLOCKOUT - 3" DIA. PLASTIC PIPE .
 - A. I.D. PLASTIC PIPE WITH COUPLING.
 - B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED OR CURB SAW CUT VERTICALLY 18" EACH SIDE OF DRAIN & REPOURED TO FULL DEPTH OF CURB.

COLUMBIA COUNTY

Curb Non-Mountable for
Use on Medians

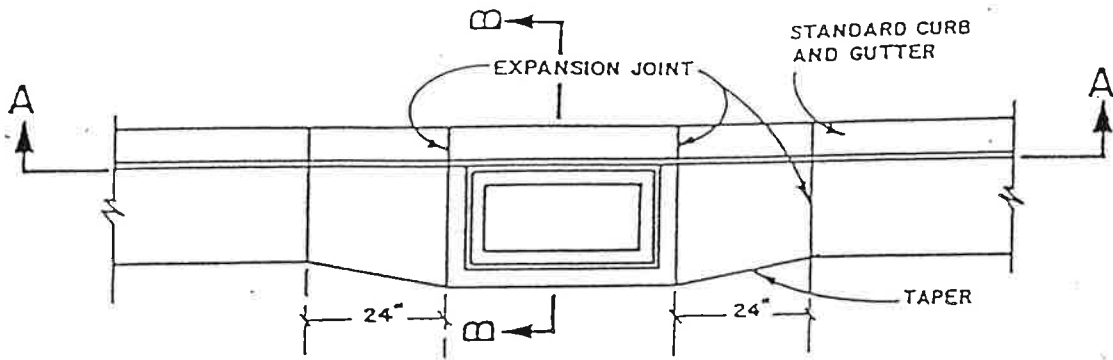
Col. Cty. Standard
Drawing No. CS-301



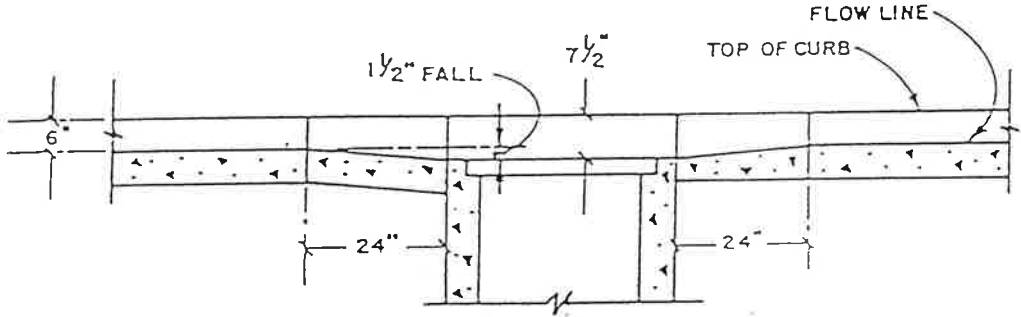
COLUMBIA COUNTY

Cross Gutter

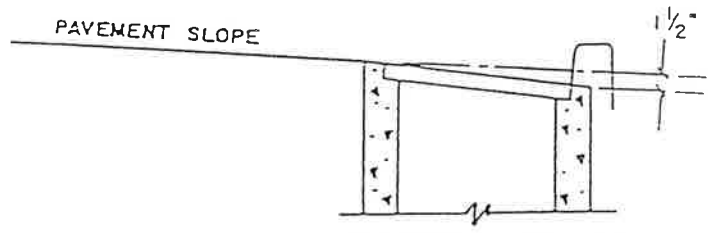
Col. Cty. Standard
Drawing No. CS-303



PLAN VIEW - STANDARD CURB & GUTTER



SECTION A - A

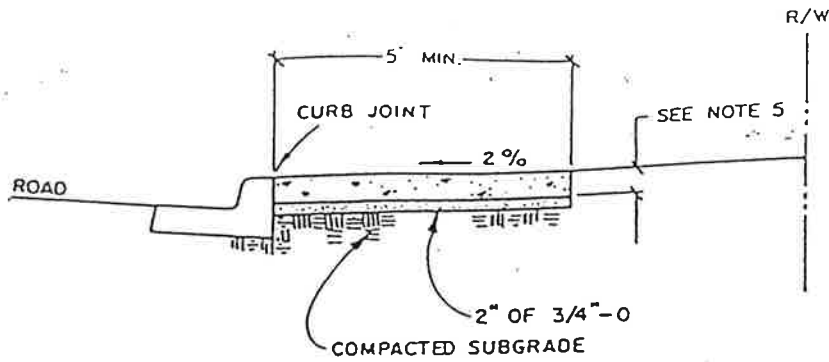


SECTION B - B

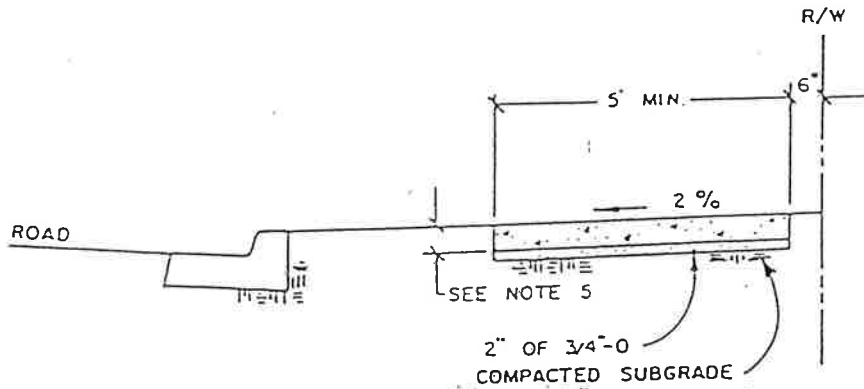
COLUMBIA COUNTY

Catch Basin - Pavement Taper

Col. Cty. Standard
Drawing No. CS-304



SIDEWALK ADJACENT TO CURB



SIDEWALK AWAY FROM CURB

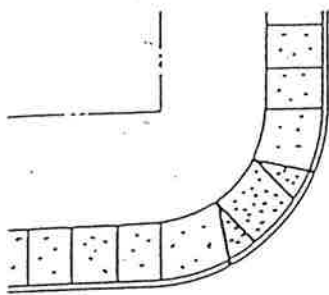
NOTES :

1. CONCRETE SHALL BE 3000 P.S.I. AT 28 DAYS , 6 SACK MIX , SLUMP RANGE OF 1 1/2" TO 3"
2. PANELS TO BE 5 FEET LONG
3. EXPANSION JOINTS TO BE PLACED AT SIDES OF DRIVEWAY APPROACHES , UTILITY VAULTS , WHEELCHAIR RAMPS , & AT SPACING NOT TO EXCEED 45 FT.
4. FOR SIDEWALKS ADJACENT TO THE CURB & POURED AT THE SAME TIME AS THE CURB , THE JOINT BETWEEN THEM SHALL BE A TROWELED JOINT WITH A MIN. 1/2" RADIUS.
5. SIDEWALK SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES IF MOUNTABLE CURB IS USED OR IF SIDEWALK IS INTENDED AS PORTION OF DRIVEWAY . OTHERWISE SIDEWALK SHALL HAVE A MINIMUM THICKNESS OF 4 INCHES .
6. DRAIN BLOCKOUTS IN CURBS SHALL BE EXTENDED TO BACK OF SIDEWALK WITH 3" DIA. PLASTIC PIPE AT 2% SLOPE . CONTRACTION JOINT TO BE PLACED OVER PIPE.

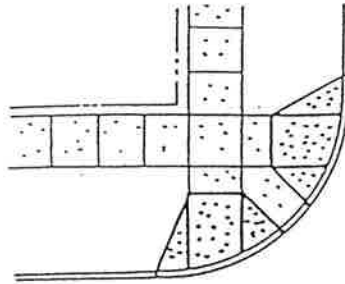
COLUMBIA COUNTY

Concrete Sidewalk

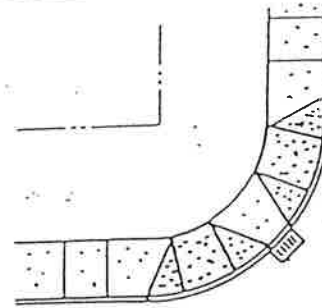
Col. Cty. Standard
Drawing No. CS-305



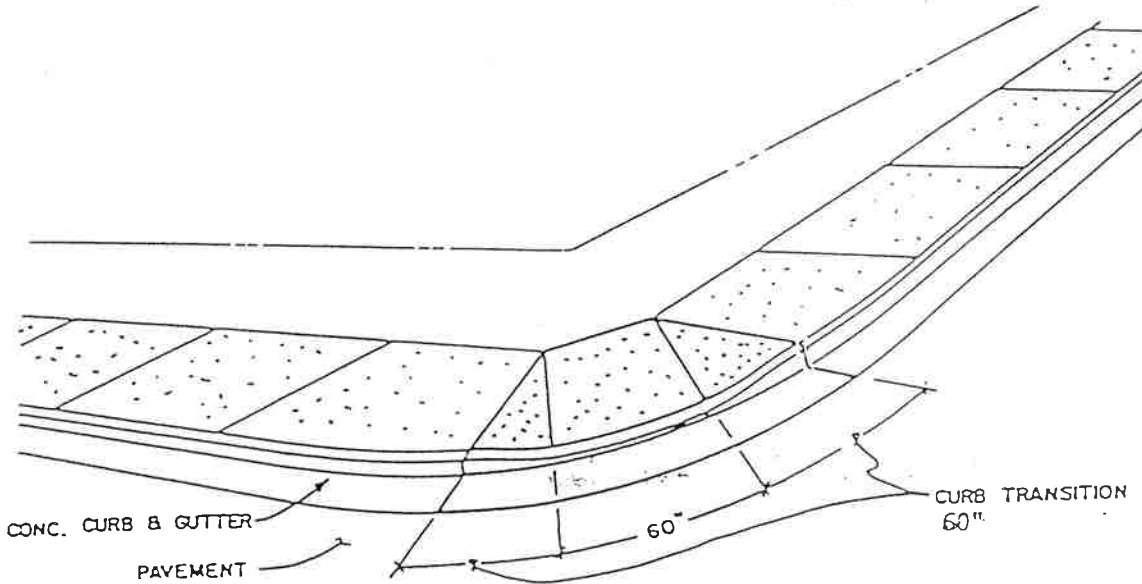
CENTER RAMP
(CURB LINE WALKS)



END RAMPS
(PROPERTY LINE WALKS)

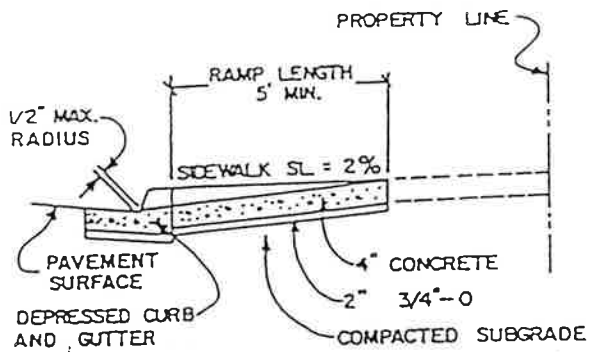


SIDE RAMPS
(WHERE CATCH BASIN IS WITHIN RADIUS)



NOTES

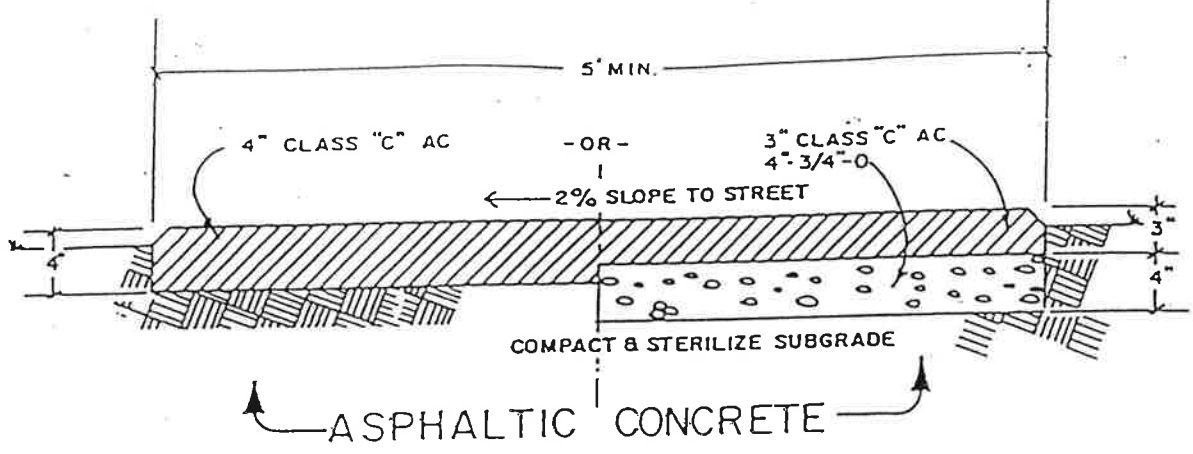
1. FOR SIDEWALK DETAIL, SEE DWG. NO. CS-305.
2. SEE DWG. NO. CS-300 FOR CURB AND GUTTER DETAIL, OR SEE DWG. NO. CS-301 FOR CURB DETAIL.
3. RAMP WIDTH SHALL BE AS SHOWN HEREON UNLESS OTHERWISE APPROVED BY THE ENGINEER.
4. CONCRETE SHALL BE 3000 P.S.I. AT 28 DAYS, 6 SACK MIX, SLUMP RANGE 1-1/2" TO 3".
5. PROVIDE EXPANSION JOINT ON EACH SIDE OF RAMP.



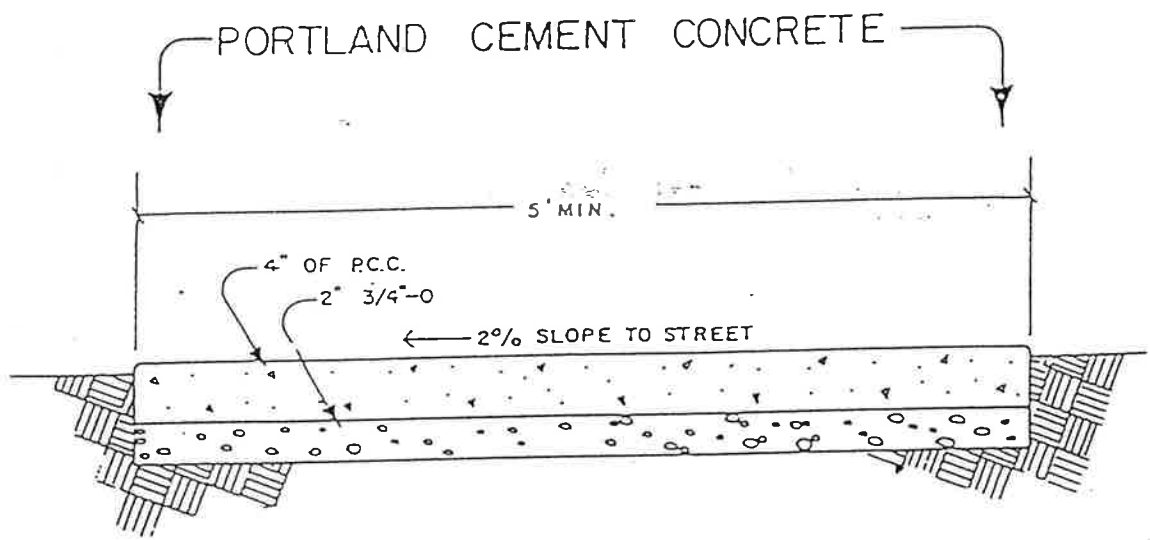
COLUMBIA COUNTY

Sidewalk Ramp

Col. Cty. Standard
Drawing No. CS-306



OR



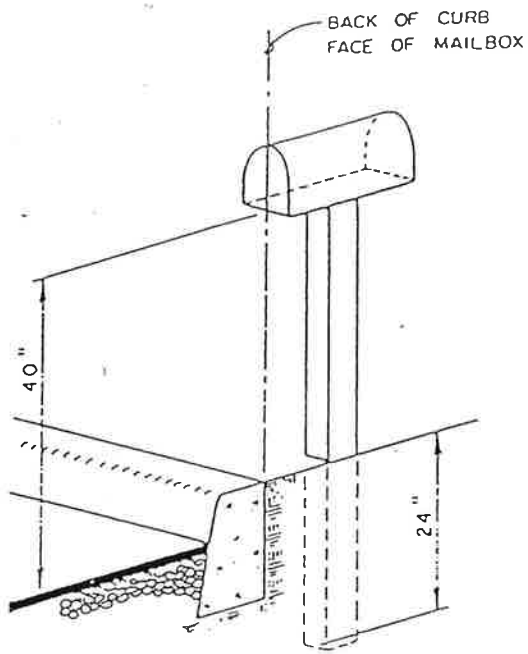
NOTES :

1. CONCRETE SHALL BE 3000 P.S.I. AT 28 DAYS, SIX SAC MIX, SLUMP RANGE OF 1 1/2" - 3"
2. SIDEWALK PANELS SHALL BE SQUARE, 3/4" DEEP SCRIBES AT JOINTS 5 FEET APART, EDGED ON 4 SIDES & HAVE A LIGHT BROOM FINISH.

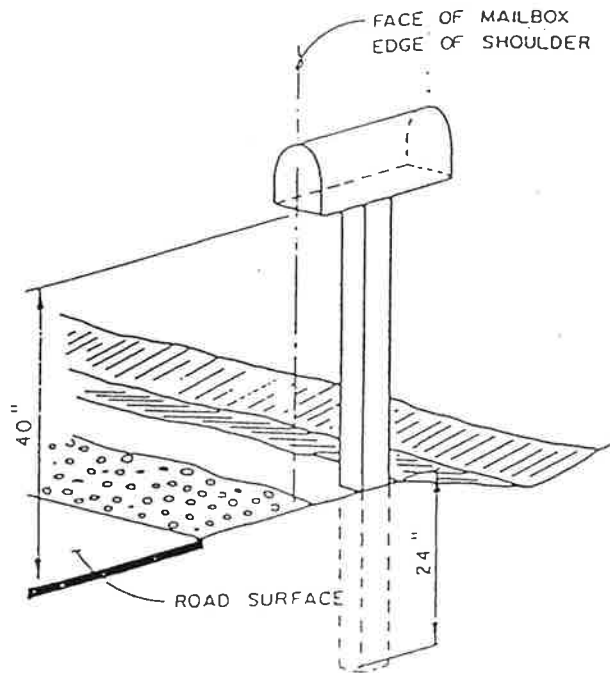
COLUMBIA COUNTY

Pedestrian Path or Bikeway

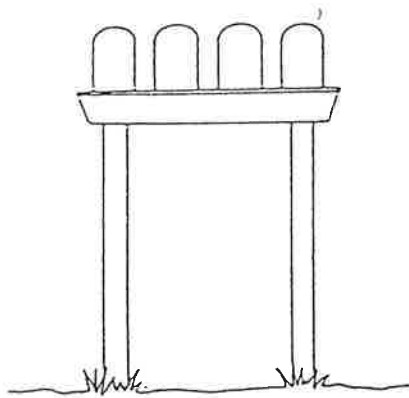
Col. Cty. Standard
Drawing No. CS-307



STREETS WITH CURBS



STREETS WITHOUT CURBS



GROUP BOXES

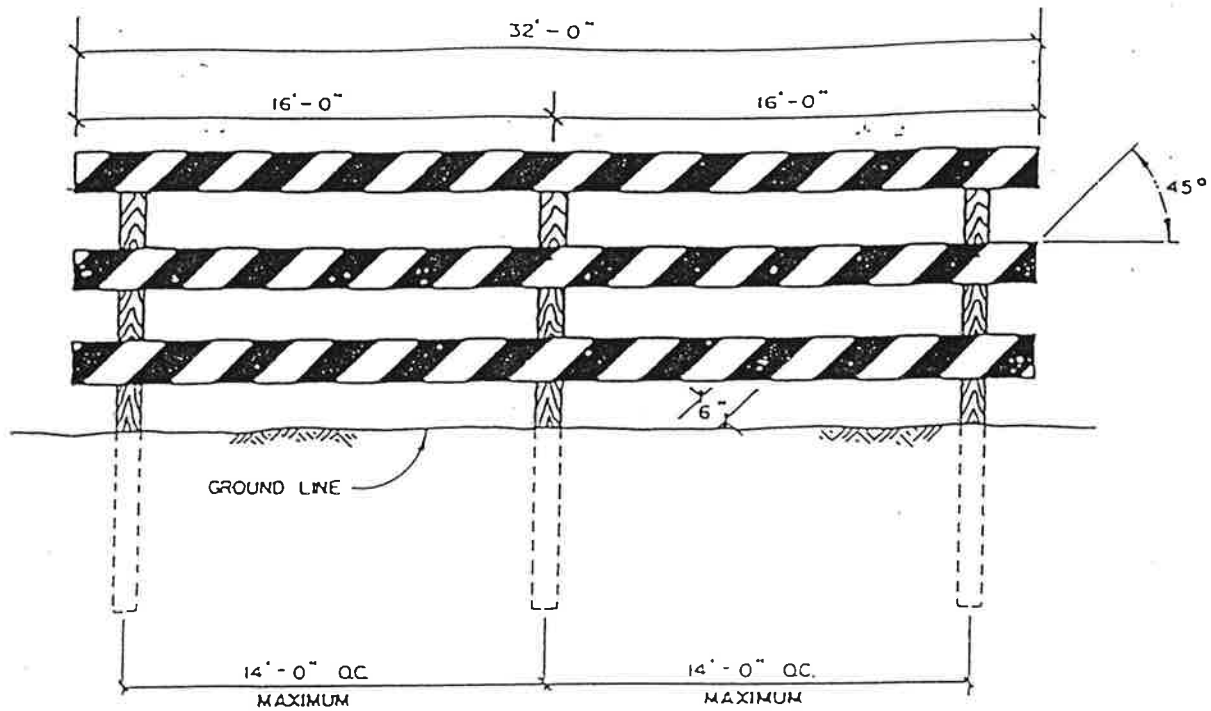
NOTE :

1. BOX NUMBER AND NAMES SHALL BE NOT LESS THAN ONE INCH HIGH
2. POSTS MUST BE NEAT AND OF ADEQUATE STRENGTH AND SIZE
3. ALL MAILBOX LOCATIONS AND CLUSTERS MUST CONFORM TO REQUIREMENTS OF THE UNITED STATES POSTAL SERVICE

COLUMBIA COUNTY

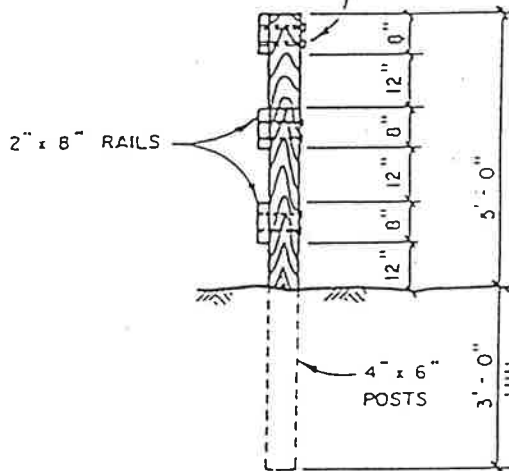
Mailbox Location

Col. Cty. Standard
Drawing No. M-400



ELEVATION

5/8" GALVANIZED SQ. HD.
MACHINE BOLTS / WASHERS



END VIEW

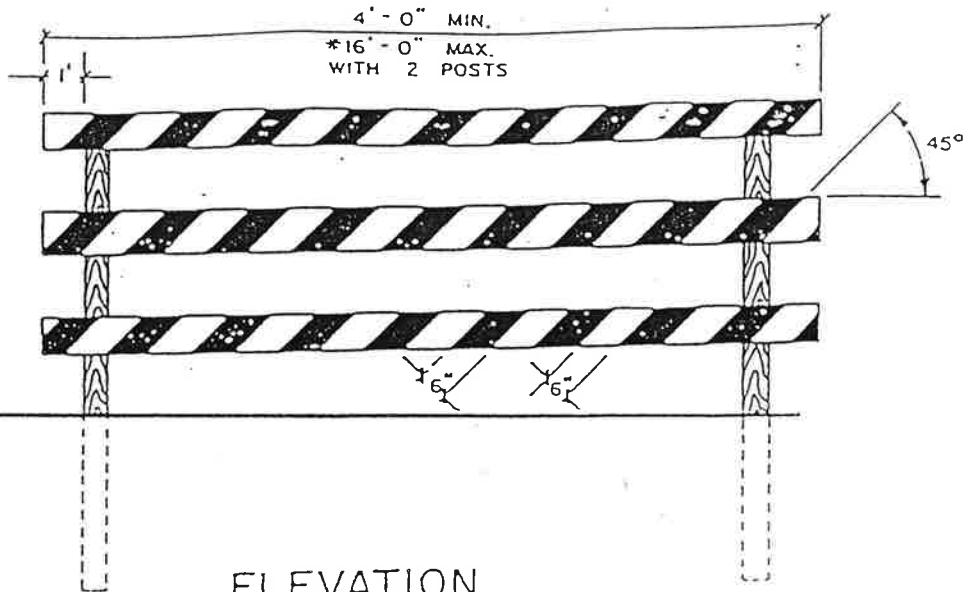
NOTES:

1. RAILS TO BE PAINTED BLACK WITH WHITE STRIPES. THE WHITE STRIPES SHALL BE REFLECTORIZED
* FOR WIDER APPLICATIONS, MULTIPLE SECTIONS AS SHOWN SHALL BE USED.
2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND THE OREGON SUPPLEMENT.
3F-1 BARRICADES
6C-8 BARRICADE DESIGN
6C-9 BARRICADE APPLICATION
3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF OREGON STANDARD SPECIFICATIONS FOR HWY. CONSTRUCTION.

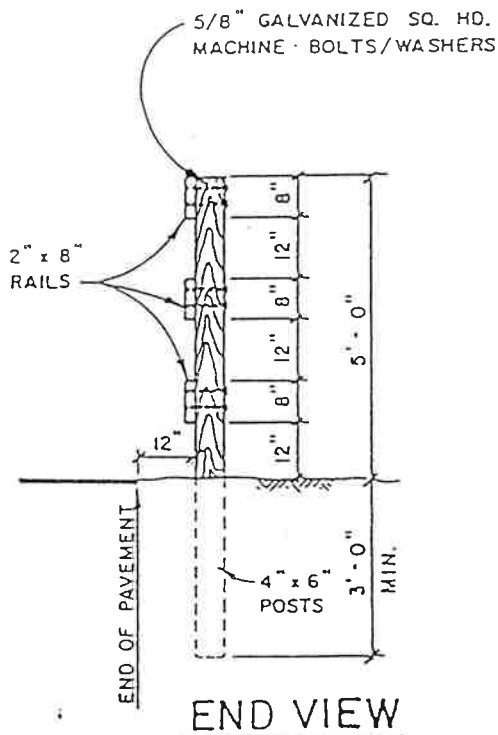
COLUMBIA COUNTY

Street Barricade - Type III

Col. Cty. Standard
Drawing No. M-401



ELEVATION



END VIEW

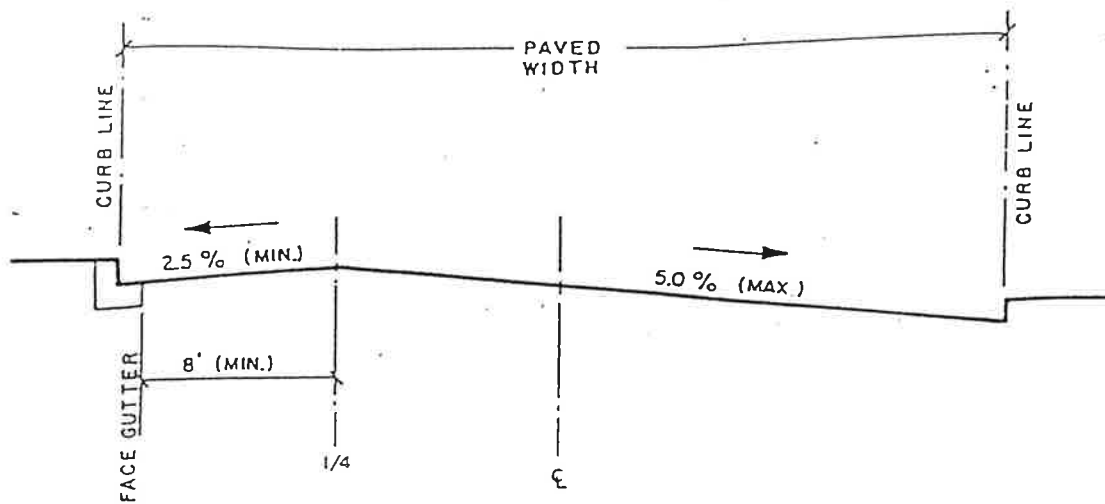
NOTES:

1. RAILS TO BE PAINTED BLACK WITH WHITE STRIPES
THE WHITE STRIPES SHALL BE REFLECTORIZED
* FOR WIDER APPLICATIONS, MULTIPLE SECTIONS AS
SHOWN SHALL BE USED.
2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
FOR STREETS AND HIGHWAYS AND THE OREGON
SUPPLEMENT.
3F-1 BARRICADES
6C-8 BARRICADE DESIGN
6C-9 BARRICADE APPLICATION
3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN
ACCORDANCE WITH THE CURRENT STATE OF OREGON
STANDARD SPECIFICATIONS FOR HWY. CONSTRUCTION.

COLUMBIA COUNTY

Street Barricade - Type III
at Width Transitions

Col. Cty. Standard
Drawing No. M-402



NOTES:

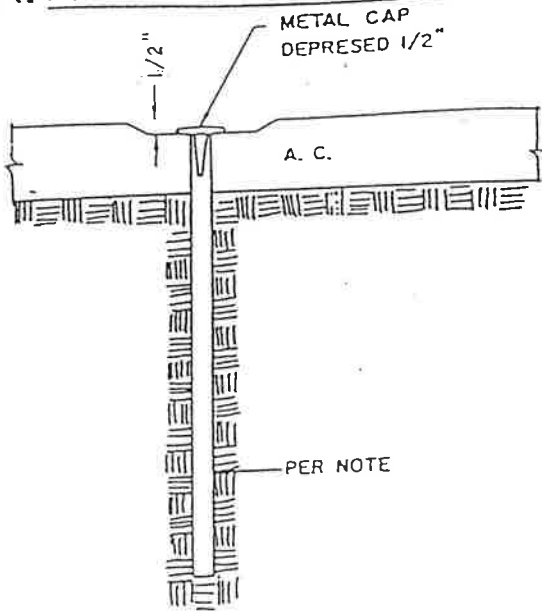
1. OFFSET CROWN CROSS-SECTIONS MAY BE USED IN AREAS OF SUBSTANTIAL CROSS SLOPE, AT THE DISCRETION OF THE ENGINEER.
2. OFFSET CROWN CROSS-SECTIONS SHALL NOT BE USED TO INCREASE DESIGN SPEED IN HORIZONTAL CURVES. SUPERELEVATION SECTIONS SHALL BE USED FOR THAT PURPOSE.
3. MAXIMUM ELEVATION DIFFERENCE OF CURBS (OR EDGE OF PAVEMENT) IS DETERMINED BY CROSS-SLOPES AND WIDTH OF STREET

COLUMBIA COUNTY

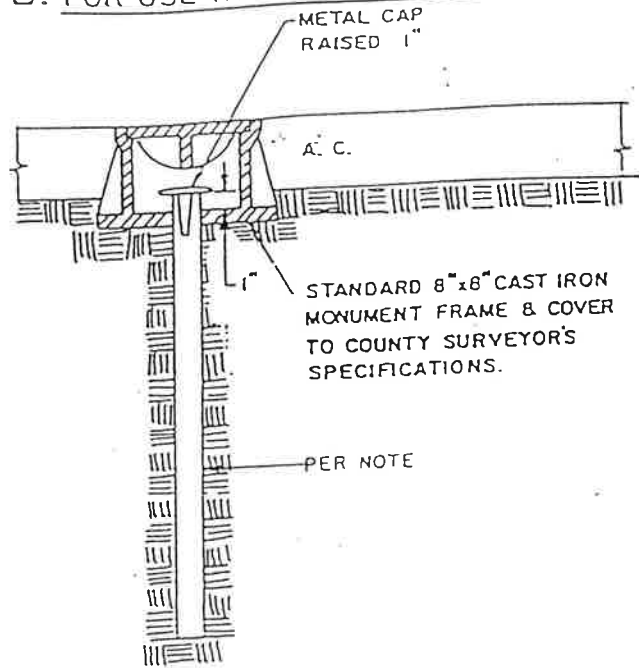
Offset Crown

Col. Cty. Standard
Drawing No. M-403

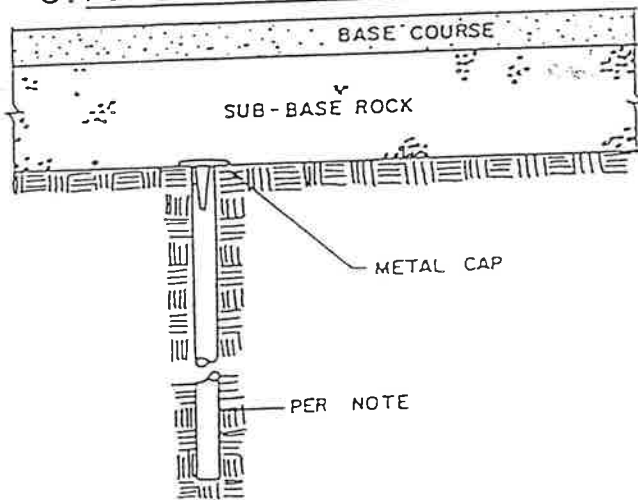
A. FOR USE IN PAVED ROADS



B. FOR USE IN PAVED ROADS



C. FOR USE IN GRAVEL ROADS

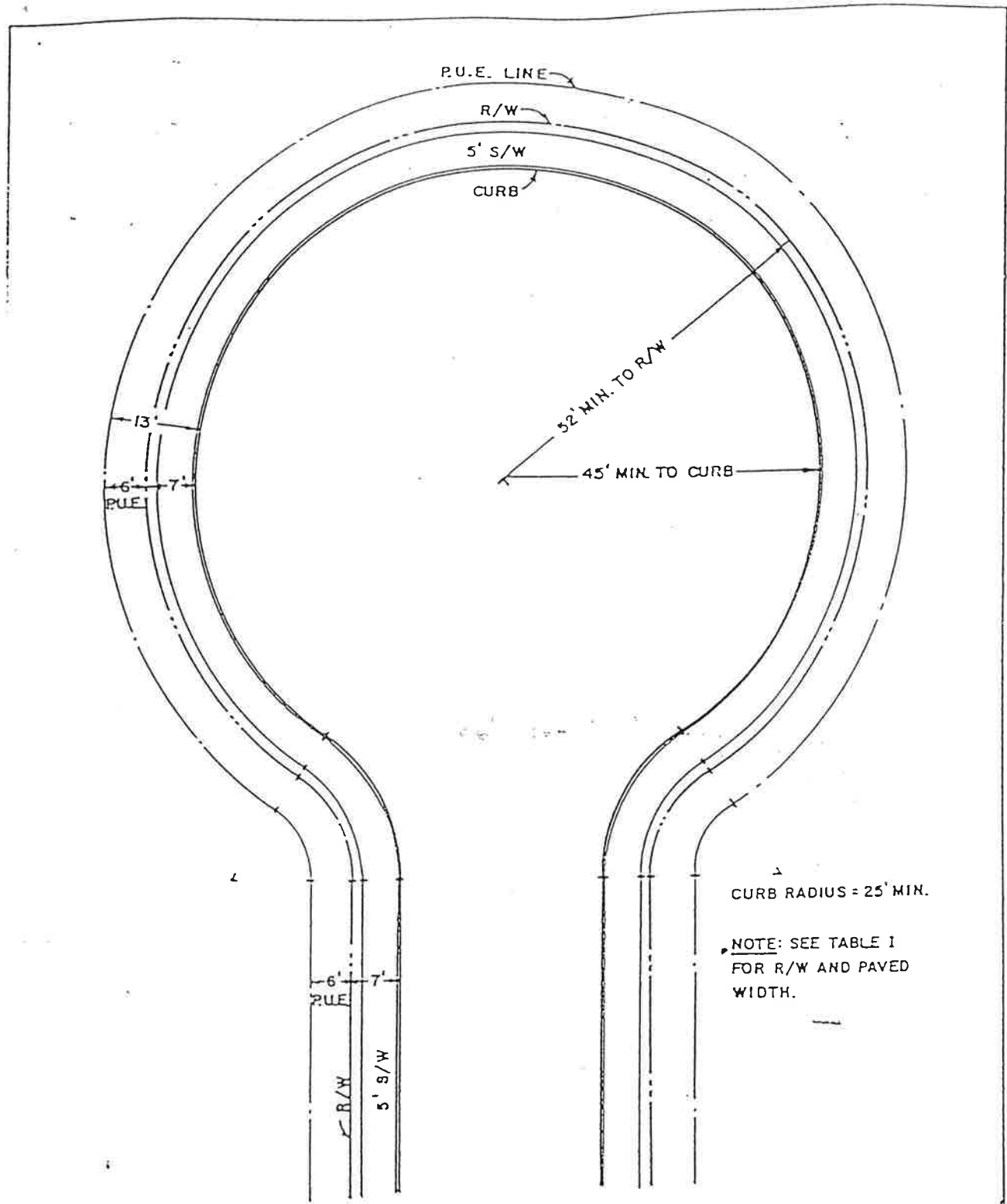


NOTE: ALL MONUMENTS SHALL USE EITHER
5/8" DIA. X 30" LONG IRON ROD OR
3/4" I. DIA. X 30" LONG IRON PIPE.
ALL MONUMENTS SHALL BE IN
ACCORDANCE WITH ORS 209.250(4).

COLUMBIA COUNTY

Centerline Survey Monuments

Col. Cty. Standard
Drawing No. M-404



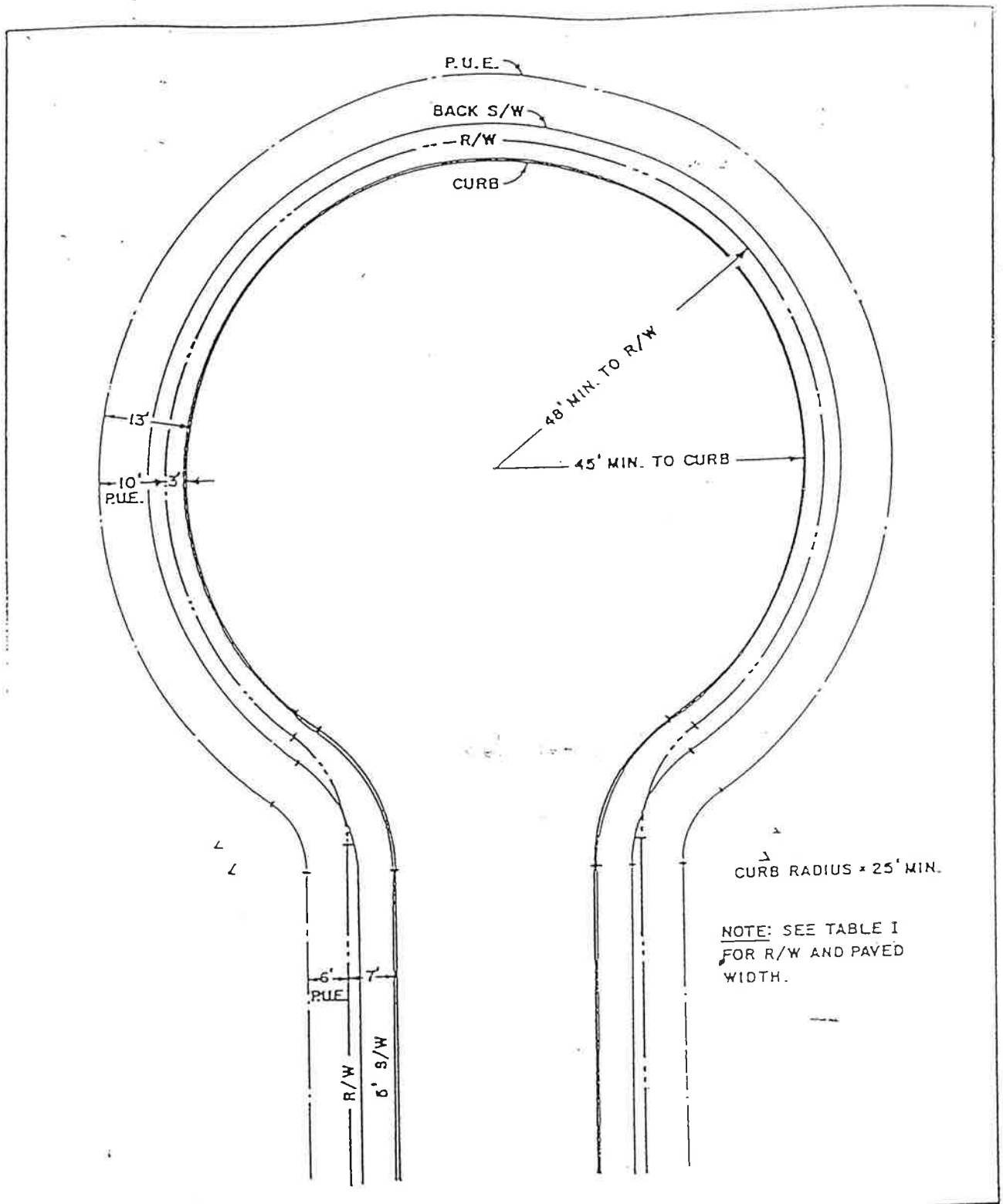
CURB RADIUS = 25' MIN.

NOTE: SEE TABLE I FOR R/W AND PAVED WIDTH.

COLUMBIA COUNTY

Standard Cul-De-Sac

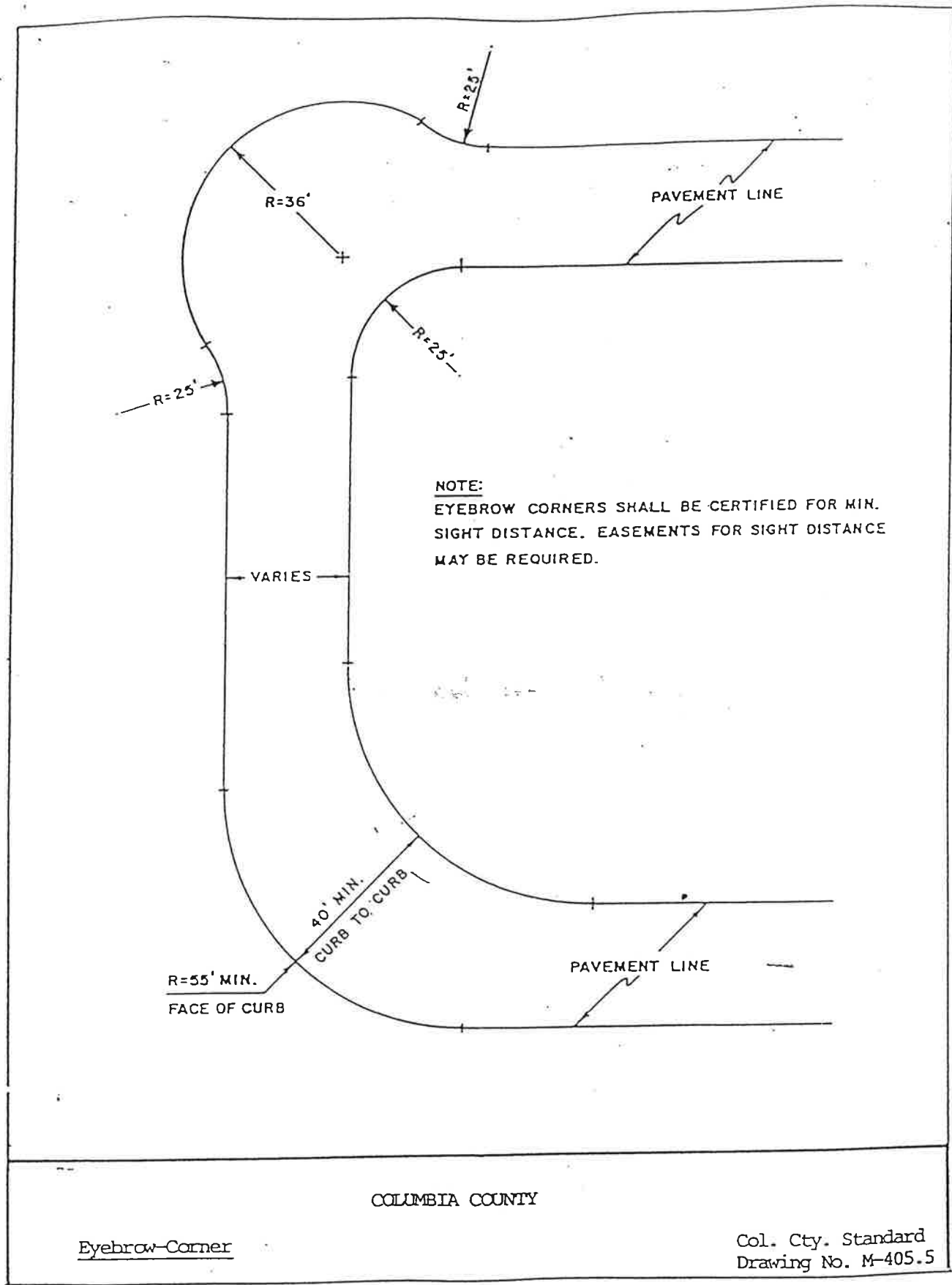
Col. Cty. Standard
Drawing No. M-405

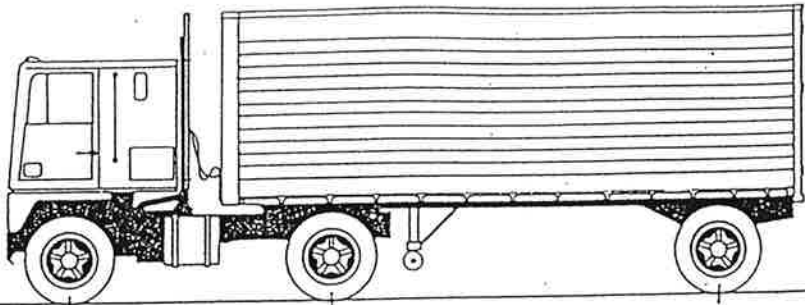


COLUMBIA COUNTY

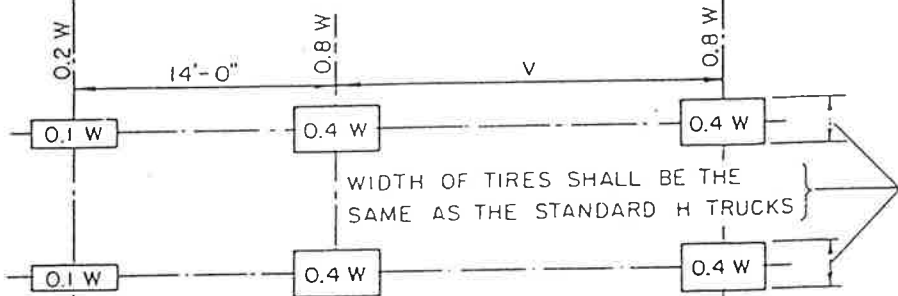
Optional Cul-De-Sac

Col. Cty. Standard
Drawing No. M-405.1



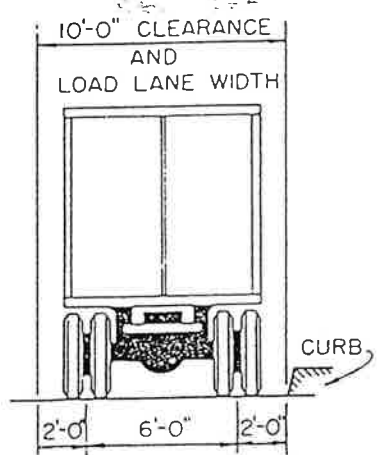


HS 25-44	10,000 LBS.	40,000 LBS.	40,000 LBS.
HS 20-44	8,000 LBS.	32,000 LBS.	32,000 LBS.
HS 15-44	6,000 LBS.	24,000 LBS.	24,000 LBS.



WIDTH OF TIRES SHALL BE THE SAME AS THE STANDARD H TRUCKS

W = COMBINED WEIGHT ON THE FIRST TWO AXLES WHICH IS THE SAME AS FOR THE CORRESPONDING H TRUCK.
 V = VARIABLE SPACING - 14 FEET TO 30 FEET INCLUSIVE. SPACING TO BE USED IS THAT WHICH PRODUCES MAXIMUM STRESSES.



STANDARD HS TRUCKS

COLUMBIA COUNTY

HS Loading

Col. Cty. Standard Drawing No. HS 25

EXHIBITS

EXHIBIT 1

COLUMBIA COUNTY FIRE SERVICES

FIRE APPARATUS ACCESS ROADS & DRIVEWAYS STANDARD

10.0 INTRODUCTION

This Standard shall apply within the unincorporated areas of Columbia County. It is the purpose of this Standard to foster unity of understanding in areas where there may be difficulty in understanding the intent of the Uniform Fire Code language, as well as promote the public's health, safety and welfare through the installation regulation of fire apparatus access roads and driveways as required by the Uniform Fire Code, Article 10 Section 10.207.

The Columbia County Fire Services have the authority and responsibility to process requests for review and approval of all fire apparatus access roads and driveways. Outside Rural Fire District boundaries, Oregon State Forestry and/or County Rural Fire Districts may be contacted and used as a resource.

10.1 DEFINITIONS

All Weather Driving Surface: A firm, uniform road surface designed and maintained to bear the imposed loads of fire apparatus.

Columbia County Fire Services: Any rural fire protection district, the Oregon Department of Forestry, the State Fire Marshal and their authorized representatives.

Cul-de-sac: A permanently maintained, clear, unobstructed road space at least 90 feet in diameter at the end of a dead-end street.

Curb: A border forming part of a gutter along the edge of a street.

Driveway: When OVER 150 feet long, a required twelve (12) foot wide firm, uniform all weather road surface with a clear and unobstructed twenty (20) foot right-of-way. Can be used when there are not more than two (2) Group R, Division 3 (private dwellings) served.

Fire Apparatus Access Road: A required road which is at least twenty (20) feet wide, has a firm, uniform all weather road surface with an unobstructed height of 13'6", which is used by fire apparatus and other vehicular traffic.

Grade: The degree of inclination of a slope, road, or driveway.

Turnaround: A permanently maintained, clear, unobstructed road space used for turning around fire apparatus.

Turnout: A section of road wide enough to permit the passing of two vehicles.

Street Intersection: Place where two or more roads cross.

EXHIBIT 1

10.2 FIRE APPARATUS ACCESS ROADS

Fire apparatus roadways shall be provided so that no portion of an exterior wall of the first story is located more than 150 feet from an approved fire department vehicle access as measured by an unobstructed route around the exterior of the building. Fire apparatus access roads for outside storage areas shall be provided in accordance with applicable provisions of the Uniform Fire Code or in accordance with nationally recognized standards, see UFC 10.207(b).

Fire apparatus access roads shall be provided as required by the Uniform Fire Code and meet the following conditions:

- A. All fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround (see 10.4 of this interpretation and UFC 10.207(h)).
- B. All fire apparatus access roads shall be at least twenty (20) feet wide, a minimum curve radius of forty-five (45) feet and have a clear height of 13 feet, 6 inches (13'6"), and be maintained clear of debris/obstructions, see UFC 10.207(c) and 10.207(d).
- C. Grade for fire apparatus access roads shall not exceed an average of twelve (12%) percent with a maximum of fifteen (15%) percent on short pitches. Where there are existing conditions, particularly topography, which cause non-negotiable conditions, the Fire Chief may require additional fire protection. This additional fire protection may include an approved fire sprinkler system and/or other fire protection devices as specified in UFC 10.301(b). In considering a variance of this interpretation and Fire Code, see UFC 10.207.
- D. Fire apparatus access roads shall be designed and maintained to support loads of fire apparatus and sustain a minimum wheel load of 12,500 pounds and gross vehicle load of 50,000 pounds and be provided with a firm, uniform all weather driving surface, approved by an Oregon Registered Engineer. Otherwise, written verification of compliance shall be provided by the applicant, see UFC 10.207(f).
- E. Private bridges shall be constructed in accordance with the Uniform Building Code and be capable of sustaining a minimum wheel load of 12,500 pounds and a gross vehicle load of 50,000 pounds. Such plans shall bear the stamp and/or seal of an Oregon Registered Professional Engineer. Otherwise, written verification of compliance shall be provided by the applicant, see UFC 10.207(I).
- F. Approved signs and/or notices shall be provided and maintained to identify such roads and prohibit the obstruction thereof. They shall comply with the manual on Uniform Traffic Control Devices, 1988 Edition, see UFC 10.207(1). "No Parking" and "Fire Lanes" shall be signed and marked as follows:
 1. Fire lane markings on curbs or road surface shall be painted bright red with white letters. The stroke shall be one (1) inch with letters six (6) inches high to read "No Parking Fire

EXHIBIT 1

- Lane". Spacing for signage shall be every twenty-five (25) feet.
2. Vertical signs shall be mounted no lower than four (4) feet and no higher than eight (8) feet.
 3. Vertical signs shall be twelve (12) inches wide and eighteen (18) inches high. Signs shall have red letters and border on a white background. The word "NO" shall be presented in a reversed color arrangement in the upper left hand corner. Spacing shall not exceed every twenty-five (25) feet.

10.3 DRIVEWAY STANDARDS

Driveway standards for private roads in excess of 150 feet in length, accessing two or less residences, shall be provided as required by the Uniform Fire Code (10.207(b)3) and shall meet the following conditions:

- A. Driveways shall be built and maintained to provide a minimum twelve (12) foot width of firm, uniform all weather surface capable of supporting gross vehicle weights of 50,000 pounds, minimum wheel load of 12,500 pounds and approved by an Oregon Registered Engineer. Otherwise, written verification of compliance shall be provided by the applicant. The twenty (20) foot right-of-way shall consist of a twelve (12) foot firm, uniform all weather travel lane bordered by a four (4) foot section on each side which shall be maintained clear of debris and obstructions. Driveways shall have a minimum curve radius of forty-five (45) feet and a vertical clearance of thirteen (13) feet six (6) inches (13'6"), see 10.207(f), 10.207(g) and 10.207(d).
- B. Driveways in excess of 200 feet shall provide twenty (20) foot wide by forty (40) foot long turnouts at a maximum spacing of $\frac{1}{2}$ the driveway length or 400 feet, whichever is less. Wherever visibility is limited, these distances should be reduced appropriately.
- C. Dead-end driveways are defined as dead-end roads over 150 feet in length serving a single residence. Dead-end driveways shall have turnarounds such as a cul-de-sac, hammer head etc., as shown in diagram, section 10.4, see also UFC 10.207(h).
- D. Bridges, culverts, and other structures in the roadbed shall be constructed and maintained to support gross vehicle weights of 50,000 pounds. If bridges or culverts are involved in the construction of a road or driveway, written verification of compliance with the 50,000 gross vehicle weight standard shall be provided from an Oregon Registered Professional Engineer. Otherwise, written verification of compliance shall be provided by the applicant, see UFC 10.207(I).
- E. Driveway grades shall not exceed an average of ten (10%) percent, with a maximum of fifteen (15%) percent on short pitches. Where there are existing conditions, particularly topography, which cause non-negotiable conditions, the Fire Chief may require additional fire protection. This additional fire protection may include an approved fire sprinkler system and/or other fire protection devices as specified in UFC 10.301(b). In considering a variance of this

EXHIBIT 1

interpretation and Fire Code, see UFC 10.207(j).

- F. Driveways shall be marked with the residence's address unless the residence or building is in such a position as to be plainly visible from the roadway. The residence or building address must be legible from the street or road fronting the property. Letters or numbers should be a minimum of three (3) inches in height and constructed of reflective material; or, as required by the Columbia County Addressing Ordinance, see UFC 10.208(a).
- G. If the driveway has a road name it shall be identified with approved signs, see UFC 10.208(b).

10.4 TURNAROUNDS

Turnarounds, cul-de-sacs, and other turnaround configurations shall be provided as required by the Uniform Fire Code 10.207(h), and meet the following conditions (refer to diagrams on page 6):

- A. Maintain unobstructed clearance for bumper overhang on rights-of-way.
- B. Curb height not to exceed six (6) inches.
- C. No parking areas shall be designated by the Traffic Engineer or Fire Chief and comply with the manual of Uniform Traffic Control Devices, 1988 Edition. If curbs are not present, "No Parking" signs shall be used.
- D. "No Parking, Fire Lane, Tow Zone" sign locations will be determined by the Traffic Engineer or Fire Chief and comply with the manual of Uniform Traffic Control Devices, 1988 Edition.
- E. The structural section of the road shall be designed to support 50,000 pounds of vehicle weight, 12,500 pounds wheel load and be approved by an Oregon Registered Engineer or written verification of compliance shall be provided by the applicant.
- F. Drainage shall be required to prevent ponding.
- G. The area of the turnarounds shall be permanently maintained, kept clear, and unobstructed at all times.
- H. The creation of the turnarounds shown in this interpretation at any specific site, must be approved by the Fire Chief, an Oregon Registered Professional Engineer and the Land Development Services Department on apparatus access roads. On driveways, the Fire Chief shall approve all proposed turnarounds with verification as described in "E" above.

10.5 EMERGENCY ACCESS/SECURITY GATES

When access to or within a structure or an area is unduly difficult because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the Fire Chief may require a key box to be installed in an accessible location. The key box shall be a type approved by the Fire Chief and shall contain keys to gain necessary

EXHIBIT 1

access as required by the Fire Chief, see UFC 10.209.

10.6 PLANS AND SPECIFICATIONS

Plans for fire apparatus access roads/driveways shall be received by the Rural Fire District or Oregon State Forestry in accordance with the Uniform Fire Code 10.301(f). These plans shall contain all of the following information:

- A. Right-of-way width;
- B. Width of all weather surface;
- C. Turnouts;
- D. Turnarounds;
- E. Grades;
- F. Curves;
- G. Bridges;
- H. Culverts;
- I. Structures in relation to roadways;
- J. Addressing;
- K. Intersections;
- L. Existing structures and driveways on roadway;
- M. Location of hydrants/hydrant reflectors, if required; and
- N. Approval stamp of an Oregon Registered Engineer or written verification compliance from applicant for 50,000 pound vehicle weight and 12,500 per wheel load weight.

10.7 INSPECTION FOR COMPLIANCE

In order to insure that access roads/driveways are improved to the required standards, an inspection form must be signed by a Fire District or Oregon State Forestry official before a building permit is issued. This will assure that road improvements are adequate for fire protection equipment to reach the site not only during the beginning construction phase, but also to ensure continued access throughout the existence of the structure(s), see UFC 10.301(3).

Exhibit 2

**FIRE SERVICE IMPROVEMENT REQUIREMENTS
FOR ROADS OVER 150 FEET IN LENGTH WITH
ONE AND TWO FAMILY DWELLINGS**

If this is a new access connecting to a county road, please contact the Columbia County Land Development Services Department to obtain a road approach permit or a sign-off indicating that no permit is required.

The Uniform Fire Code 902.1, the Columbia County Zoning Ordinance and Subdivision and Partitioning Ordinance require roadway/driveway improvements to a construction or mobile home installation site prior to the issuance of a building permit. One reason for this requirement is to assure that road improvements will allow fire protection equipment to reach the site, not only during the construction phase, but throughout the existence of the structure. In order to assure that the access road meets the required standards, **this form must be signed by a local Fire Service official, and a copy of the signed form must be attached to your application for a dwelling, construction or mobile home placement permit.**

Minimum standard roadway approval requires a twelve (12) foot wide, uniform all weather travel lane, with a twenty (20) foot wide right-of-way maintained clear of debris and obstructions four (4) feet on each side of the travel lane. Driveways shall sustain a minimum wheel load of twelve-thousand five-hundred (12,500) pounds per wheel and a gross vehicle load of fifty-thousand (50,000) pounds. Turnouts twenty (20) feet wide and forty (40) feet long may be required on any access road exceeding four-hundred (400) feet in length. The unobstructed width must be maintained for not less than twenty (20) feet. Vertical clearance shall be maintained at no less than thirteen (13) feet, six (6) inches (13'6"). All access roads over one-hundred-fifty (150) feet in length shall be provided with a turnaround area at or near the end, improved to the above standards and of a design approved by the local Fire Service. Proper drainage must be provided. Bridges and culverts shall be capable of supporting a minimum of fifty-thousand (50,000) pounds. Average road grade shall not exceed twelve (12%) percent and no grade shall exceed fifteen (15%) percent. Maximum curve centerline shall be not less than forty-five (45) feet radius. Any new access connecting to a Columbia County road requires a Columbia County Approach Road Permit.

Please deliver this form to the local Fire Service and assist them in locating and inspecting the roadway/driveway providing access to the proposed development site. Maps to assist you in this effort may be obtained from the Columbia County Assessor's Office or the Columbia County Land Development Services Department.

TYPE AND LOCATION OF PROPOSED DEVELOPMENT:

Name: _____ Tax Lot: _____

-----THIS SECTION TO BE COMPLETED BY FIRE SERVICE-----

_____ I have inspected the above property and determined that road improvements to the proposed development site are suitable for access by Fire Service equipment.

_____ The following improvements must be completed prior to permit issuance:

Name: _____ Date: _____

Fire Service: _____ Date: _____

- White Copy - Fire District
- Canary Copy - Land Development Services Department
- Pink Copy - Applicant

ATTACHMENT 1

Permit No. _____

APPLICATION AND PERMIT TO CONSTRUCT ACCESS APPROACH ROAD
COLUMBIA COUNTY, OREGON

(Print Name)

applicant, declares that he/she is the owner or lessee of the real property adjoining the highway at the location described herein and has the lawful authority to apply for this permit. When approved, the application is subject to the terms and provisions of ordinance 96-__ and those contained herein and attached hereto.

Access Required is: Permanent Temporary
Road Name _____ Tax Account No. _____

Side of Road: North South East West

Between/Near Landmarks _____

(Sketch Below)

Applicants Signature _____ Date _____

Mailing Address _____ Phone _____

(THIS SECTION TO BE COMPLETED BY PUBLIC WORKS DEPARTMENT)

Sight Distance Adequate: Yes No if no, explain: _____

Culvert Required: Yes No Size _____ Type _____ Length _____

Width of Access at 20' from Edge of Public Road _____

Paving to a Distance 20' from Edge of Public Road Required: Yes No

Special Comments: _____

Permit Approved: _____ Date: _____

Title _____

Construction of the access shall be approved or a deposit of _____ made with the County Clerk. Complete deposit verification form at Road Department office.

Construction Approved: _____ Date: _____

Title: _____

(When construction is approved, copy to Columbia County Land Development Services Department)

Exhibit 3

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR COLUMBIA COUNTY, OREGON

In the Matter of Adopting Rules)
and Regulations for Construction))
of Access Approaches to Public)
and County Roads in Columbia)
County, Oregon)
_____)

ORDINANCE 96- __

The Board of County Commissioners for Columbia County, Oregon ordain as follows:

SECTION 1. TITLE

This ordinance shall be known as Ordinance No. 96-__.

SECTION 2. PURPOSE

The purpose of this ordinance is to adopt rules and regulations for construction of access approaches to public, county, and private roads in Columbia County, Oregon.

SECTION 3. AUTHORITY

This ordinance is adopted pursuant to ORS 203.035 and 374.305 to 374.330.

SECTION 4. ACCESS PERMITS REQUIRED

No person shall construct any access approach to any county road in Columbia County, Oregon, to any public road under county jurisdiction, or to any private road authorized by the County, without first, purchasing and obtaining an access permit from Columbia County Road Department.

SECTION 5. ACCESS PERMIT FORMS

The form of access permit shall be as provided by order of the Board of County Commissioners for Columbia County, Oregon. For the purposes of this ordinance, and unless and until revised by order of the Board, the form of access permit shown as "Exhibit A", which is attached hereto and incorporated herein by this reference, is adopted as the official access permit form for Columbia County, Oregon.

SECTION 6. ACCESS PERMIT FEES

The fee for access permits issued by the Columbia County Road Department shall be as provided by order of the Board of County Commissioners for Columbia County, Oregon. For the purpose of this ordinance, and unless and until revised by order of the Board, the fees for access permits shall be as follows:

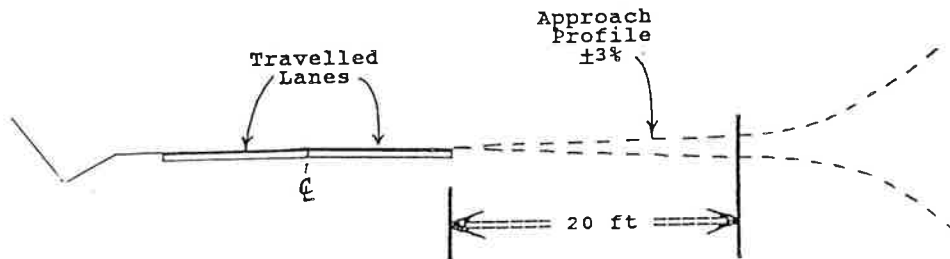
Permanent Access Permits	\$ 50.00;
Temporary Access Permits	\$100.00.

SECTION 7. SPECIFICATIONS

The specifications for construction of access approaches shall be determined by the Columbia County Public Works Director or his designee subject to the minimum standards set forth on the access permit form and the following:

- a If the road surface is damaged by Applicant, Applicant shall replace or restore the highway or highway facilities to a condition satisfactory to the County, whether discovered at the time of inspection or at a later date. The County may have Applicant replace or restore the road to a satisfactory condition or may replace or restore the road by contractor or county forces and the costs incurred to be paid by Applicant.

- b The work area during and construction of maintenance performed under the permit provisions shall be protected in accordance with the current "Manual on Uniform Traffic Control Devices for Streets and Highways" as amended or supplemented by the State Highway Commission. Necessary signs shall be furnished by Applicant unless otherwise specified in the permit.
- c Any supervision and/or control exercised by the County personnel shall in no way relieve Applicant of any duty of responsibility to the general public nor shall such supervision and/or control relieve Applicant from any liability for loss, damage or injury to person or property.
- d The applicant may be required to submit detailed drawings of the approach and/or facilities, with respect to road improvements, right-of-way, and utilities.
- e The profile of the approach centerline shall not exceeds + or - 3% from the edge of the traveled surface for a distance of 20 feet, as follows:



- f Clear Vision Areas: At every road approach where traffic may enter or cross another lane of traffic to reach its destination, every affected property owner must develop and maintain adequate sight distance across their property to allow for the safe movement of the traffic in every direction. No fence, trees, structures, shrubs, natural earth mound or any other obstructions may block this clear vision area.

Adequate sight distance is dependent on the speed of traffic (not necessarily the posted speed) at the location in question and according to the following table:

85th PERCENT

SPEED	MINIMUM SIGHT DISTANCE REQUIRED
25	250
30	300
35	350
40	400
45	450
50	500

The distance shall be measured from a point located 10 feet behind the face of curb or near edge of traveled roadway, 3.5 feet above the near edge of roadway, to a point that is 4.25 feet above the center of the travel lane in both directions. The sight distance shall then be measured along the centerline of the roadway.

- g Accesses shall intersect a public or county road at a minimum of 75° angle, preferably 90°.

SECTION 8. RULES AND REGULATIONS

The following general provisions shall govern the construction of access approaches:

- a. All applicants for an access permit shall complete construction of the access or prior post a \$500.00 cash deposit to obtaining a building permit from the Land Development Services Office. Said deposit shall not be returned until a permanent access approach is constructed and paved in accordance with the rules and regulations adopted pursuant to this ordinance. All temporary access approaches require posting of \$500.00 cash deposit to guarantee removal of the approach to the satisfaction of the Public Works Director.
- b. No access approach of other facility shall be constructed upon the highway right-of-way until a signed copy of this permit is returned to the applicant, whereupon applicant has 2 years to complete construction.
- c. If this access approach does not meet minimum standards specified on the permit within 2 years, necessary corrections will be made at applicant's expense.
- d. The applicant shall be responsible and liable for all accidents or damage to any person or property resulting from the construction, maintenance, repair, operation or use of said access approach.
- e. Any subsequent improvement of the access approach shall be done only under authority of a new permit.
- f. The entire expense of construction and maintenance of said access approach shall be born by the applicant. No work shall be done and no equipment shall be used by the applicant on the shoulder of the County road at any time unless applicant shall have first secured approval from the Columbia County Public Works Director.

These general provisions may be modified or deleted by order of the Board and new provisions may be adopted by order of the Board of County Commissioners.

SECTION 9. INSURANCE AND BONDING

The Public Works Director, or his designee, may require an applicant to furnish public liability and property damage insurance in such amounts as determined by the Board, not to exceed \$1 million for all claims out of each accident or occurrence. Such insurance shall indemnify Columbia County, its Board of County Commissioners, Road Department, and all other county officers, agents and employees from any claim which might arise on account of the issuance of said permit and the use of the access approach constructed pursuant to such permit. In addition, the Board and/or Public Works Director, or his designee, may require the applicant to furnish indemnity insurance or an indemnity bond in a sum fixed by the Board indemnifying any damage caused to the road or highway or roads that may be caused by the issuance of said permit of the use of said permit or the use of said access approach, or indemnifying the Board and/or Road Department against and costs or damages that may be incurred by reason of the failure of said applicant to comply with the terms of any such access permit.

SECTION 10. EXPENSES BORNE BY APPLICANT

All construction under any access permit issued by the Public Works Director shall be under the supervision of the Public Works Director, or his designee, and at the expense of the applicant. After completion of the construction of the access approach, it shall be maintained at the expense of the applicant and in accordance with any rules and regulations adopted by the Board or stipulated in the access permit.

SECTION 11. REMOVAL OR REPAIR OF ACCESS APPROACHES

- a. Upon failure of an applicant to construct, maintain or remove an access approach in accordance with rules and regulations adopted pursuant to this ordinance and the conditions of any access permit issued pursuant to this ordinance, the County may, after the expiration of 30 days following the transmittal of a written notice to the applicant, at applicant's expense, remove the access approach or reconstruct, repair or maintain the access approach in accordance with or as required by such rules and regulations and the conditions of the permit. This expense may be recovered from the applicant by county in any court of competent jurisdiction.
- b. Notwithstanding subsection A above, if the Board of County Commissioners or the Public Works Director, or his designee, determines that a traffic or pedestrian hazard is created by the noncompliance which causes imminent danger, it may:
 - 1) Order the access approach removed, repaired or maintained to eliminate the

hazard, within 24 hours after delivery of written notice to the applicant, and to the owner of the property on which the non-compliance occurred.

- 2) If the hazard is not eliminated within the period set under paragraph 1) of this subsection, eliminate the hazard and recover the expenses of any removal, repair or maintenance from the applicant in any court of competent jurisdiction.

SECTION 12. ENFORCEMENT

- a. In addition to any other remedies which may be permitted by law, this ordinance may be enforced by, and violators hereof are subject to the penalties in, the Columbia County Enforcement Ordinance.
- b. Upon issuance of a letter of authority signed by the Board of County Commissioners pursuant to Section 11 of the Columbia County Enforcement Ordinance, the Columbia County Public Works Director shall be authorized to, have jurisdiction of and may enforce violations of this ordinance. His authority and jurisdiction is subject to the primary authority of the Board of County Commissioners. He may issue a citation or warning to any person who violates this ordinance.

SECTION 13. SEVERABILITY CLAUSE

If, for any reason, any portion of this ordinance is held invalid or unconstitutional by any court of competent jurisdiction, such portion of the ordinance shall be deemed a separate, distinct and independent portion and such holdings shall not affect the validity of the remaining portions therefore.

SECTION 14. EMERGENCY CLAUSE

This ordinance, being immediately necessary for the health, safety and welfare of the citizens of Columbia County, an emergency is declared to exist, and it shall become effective on February 1, 1996.

REGULARLY PASSED AND ADOPTED BY THE BOARD OF COUNTY COMMISSIONERS FOR COLUMBIA COUNTY, OREGON
THIS ___ DAY OF _____, 1996.

BOARD OF COUNTY COMMISSIONERS
FOR COLUMBIA COUNTY, OREGON

BY: _____
CHAIRPERSON

BY: _____
COMMISSIONER

BY: _____
COMMISSIONER

SECTION 7. LOCATION OF DITCHES, STRUCTURES, FACILITIES AND UTILITIES

The Board of County Commissioners have authority to designate the location on the rights of way of County roads and of public roads under County jurisdiction where ditches, structures, facilities and utilities may be located, and may order the location of any such ditch, structure, facility or utility to be changed when the Board deems it expedient. Any ditch, structure, facility or utility placed or constructed in a different location on such right-of-way than that designated in any order of the Board or construction permit issued by the Roadmaster is a public nuisance and may be abated accordingly.

SECTION 8. RULES AND REGULATIONS

The Board of County Commissioners may, by order, adopt reasonable rules and regulations to govern the placement or construction of ditches, structures, facilities or utilities on the rights of way of County roads and of public roads under County jurisdiction. Such rules and regulations shall include such provisions, terms and conditions as in the judgment of the Board are in the best interest of the public for the protection of the road and the traveling public and may impose reasonable requirements for the location, operation and maintenance of such ditches, structure, facilities and utilities.

SECTION 9. SPECIFICATIONS AND CONDITIONS

The Columbia County Roadmaster may include in or attach reasonable specifications and conditions to construction permits issued for the placement or construction of ditches, structures, facilities and utilities on the rights of way of County roads or of public roads under County jurisdiction. Such specifications and conditions shall include such provisions and terms as in the judgment of the Roadmaster are in the best interest of the public for the protection of the road and the traveling public and may impose reasonable requirements for the location, operation and maintenance of such ditches, structures, facilities and utilities.

SECTION 10. INSURANCE AND BONDING

- A) The Board may require an applicant for a construction permit to furnish public liability and property damage insurance in such amounts as determined by the Board, not to exceed \$1 million for all claims out of each accident or occurrence. Such insurance shall indemnify Columbia County, its Board of County Commissioners, the Roadmaster and all other County officers, agents and employees from any claim which might arise on account of the insurance of said construction permit and the use of the ditch, structure, facility or utility placed or constructed pursuant to such permit. In lieu of a separate insurance policy, an applicant may supply the Roadmaster with a certificate of insurance in the amounts designated above naming the County, its Board, the Roadmaster and other County officers, agents and employees as additional insured.
- B) In addition, the Board may require the applicant to furnish indemnity insurance or an indemnity bond in a sum fixed by the Board indemnifying the County for any damage caused to the road or roads that may be caused by the issuance of said construction permit or

the placement, construction or use of said ditch, structure, facility or utility, or indemnifying the Board and the Road Department against and costs or damages that may be incurred by reason of the failure of said applicant to comply with the terms of any such construction permit.

SECTION 11. EXPENSES BORNE BY APPLICANT

All work or construction under any construction permit issued by the Roadmaster shall be at the expense of the applicant and under the general supervision of the Roadmaster or his designee. After completion of the placement or construction of the ditch, structure, facility of utility, it shall be maintained at the expense of the applicant and in accordance with any rules and regulations adopted by the Board and the conditions of the construction permit.

SECTION 12. REMOVAL OR REPAIR OF DITCHES, STRUCTURES, FACILITIES AND UTILITIES CONSTRUCTED WITHOUT PERMISSION

- A) If any person places, builds or constructs any ditch, structure, facility or utility on the right-of-way of any County road or of any public road under County jurisdiction without first obtaining a construction permit from the Road Department, the Columbia County Roadmaster may, after expiration of 30 days following the transmittal of a written notice to such person, at the expense of such person, remove the ditch, structure, facility or utility from the right-of-way or reconstruct, repair or maintain the ditch, structure, facility or utility in accordance with or as required by the rules and regulations adopted pursuant to this ordinance. This expense may be recovered from such person by the County in any court of competent jurisdiction.
- B) Notwithstanding subsection A of this section, if the Roadmaster or his designee determines that a traffic or pedestrian hazard is created by the ditch, structure, facility or utility which causes imminent danger of personal injury, he may:
- (1) Order the ditch, structure, facility or utility removed, repaired or maintained to eliminate the hazard, within 24 hours after delivery of written notice to the person who placed or constructed the ditch, structure, facility or utility, and to the owner of the property on which the ditch, structure, facility or utility was placed or constructed.
 - (2) If the ditch, structure, facility or utility is not removed, repaired or maintained to eliminate the hazard within the time set under paragraph (1) of this subsection, eliminate the hazard and recover the expense of any removal, repair or maintenance of the ditch, structure, facility or utility from any such person in any court of competent jurisdiction.

SECTION 13. REMOVAL OR REPAIR OF DITCHES, STRUCTURES, FACILITIES AND UTILITIES FOR NONCOMPLIANCE

- A If any person fails to place, build, construct, maintain or remove

a ditch, structure, facility or utility in accordance with rules and regulations adopted pursuant to this ordinance and the conditions of any construction permit issued pursuant to this ordinance, the Columbia County Roadmaster may, after the expiration of 30 days following the transmittal of a written notice to such person, at the expense of such person, remove the ditch, structure, facility or utility from the right-of-way or reconstruct, repair or maintain the ditch, structure, facility or utility in accordance with or as required by such rules and regulations and the conditions of the permit. This expense may be recovered from such person by the County in any court of competent jurisdiction.

B Notwithstanding subsection A of this section, if the Roadmaster or his designee determines that a traffic or pedestrian hazard is created by the ditch, structure, facility or utility which causes imminent danger of personal injury, he may:

- (1) Order the ditch, structure, facility or utility removed, repaired or maintained to eliminate the hazard, within 24 hours after delivery of written notice to the person who placed or constructed the ditch, structure, facility or utility, and to the owner of the property on which the non-compliance occurred.
- (2) If the ditch, structure, facility or utility is not removed, repaired or maintained to eliminate the hazard within the time set under paragraph (1) of this subsection, eliminate the hazard and recover the expense of any removal, repair or maintenance of the ditch, structure, facility or utility from any such person in any court of competent jurisdiction.

SECTION 14. ENFORCEMENT

A In addition to any other remedies which may be permitted by law, this ordinance may be enforced by, and violators hereof are subject to the penalties provided in, the Columbia County Enforcement Ordinance.

B Upon issuance of a letter of authority signed by the Board of County Commissioners pursuant to Section 11 of the Columbia County Enforcement Ordinance, the Columbia County Roadmaster shall be authorized to, have jurisdiction of and may enforce violations of this ordinance. His authority and jurisdiction is subject to the primary authority of the Board of County Commissioners. He may issue a citation or warning to any person who violates this ordinance.

SECTION 15. SEVERABILITY CLAUSE

If, for any reason, any portion of this ordinance is held invalid or unconstitutional by any court of competent jurisdiction, such portion of the ordinance shall be deemed a separate, distinct and independent portion and such holdings shall not affect the validity of the remaining portions hereof.

COLUMBIA COUNTY

County Roadmaster
 P.O. Box 366
 1004 Oregon St.
 St. Helens, OR 97051
 397-5090
 FAX 397-7215

**PUBLIC ROAD
 APPLICATION AND
 CONSTRUCTION PERMIT**

PERMIT NO: _____

DISTRICT: _____

NAME AND ADDRESS OF CONTRACTOR:

CONTRACTOR HEREBY APPLIES TO THE BOARD OF COUNTY COMMISSIONERS THROUGH THE ROAD DEPARTMENT FOR PERMISSION TO PERFORM CERTAIN OPERATIONS UPON THE RIGHT OF WAY OF A COUNTY ROAD OR PUBLIC ROAD UNDER COUNTY JURISDICTION AS SHOWN ON THE MAP OR PLAN ATTACHED HERETO AND BY THIS REFERENCE MADE A PART HEREOF.

PHONE NO. _____ FAX NO. _____

- CONSTRUCT, OPERATE AND MAINTAIN A UTILITY LINE
 - CONSTRUCT A PUBLIC OR COUNTY ROAD
 - MISCELLANEOUS OPERATIONS AND/OR FACILITIES AS DESCRIBED
 - ERECT AND MAINTAIN A NON COMMERCIAL SIGN
- EST. STARTING DATE _____ EST. COMPLETION DATE _____

ROAD NAME _____ (ATTACH VICINITY MAP IF NOT A COUNTY ROAD)

ADDRESS OF WORK (OR OTHER DESCRIPTION) _____

SIDE OF ROAD _____

CERTIFICATE OF PROPERTY & LIABILITY INSURANCE:
 ON FILE ATTACHED TO FOLLOW

DESCRIPTION AND LOCATION OF MISCELLANEOUS OPERATIONS AND/OR FACILITIES

ATTACH PLANS (IF APPLICABLE)

THIS PERMIT IS ISSUED BY THE COUNTY ROAD DEPARTMENT SUBJECT TO THE "SPECIFICATIONS FOR FACILITIES OR OPERATIONS UPON A PUBLIC ROAD" ATTACHED HERETO AND IS ACCEPTED AND APPROVED BY CONTRACTOR SUBJECT TO SAID TERMS AND PROVISIONS. CONTRACTOR CERTIFIES THAT ALL INFORMATION SUPPLIED ON THIS APPLICATION IS CORRECT AND AGREES TO ABIDE BY ALL APPLICABLE FEDERAL, STATE AND COUNTY LAWS, RULES AND REGULATIONS WITH REGARD TO PERFORMANCE UNDER THE PERMIT.

APPLICANT: _____

BY: _____

ADDRESS: _____

PHONE: _____

DATE OF APPLICATION: _____

**COLUMBIA COUNTY, OREGON
 ROAD DEPARTMENT
 BOND REQ'D PRIOR TO CONSTRUCTION**

____ YES ____ NO _____ AMOUNT

APPROVED BY: _____
ROADMASTER

EFFECTIVE DATE: _____

EXPIRATION DATE: _____

NOTE: CALL ROAD DEPT. (397-5090) AT LEAST 12 HOURS BEFORE COMMENCING WORK.
 COPY OF PERMIT TO BE KEPT AT JOB SITE.

**SPECIFICATION FOR FACILITIES
OR OPERATIONS UPON A PUBLIC ROAD**

PLAN REQUIREMENTS

A) UTILITY CONSTRUCTION

1. Two (2) sets of plans are required.
2. Plans shall state roads involved and give approximate dimensional location or provide staking of proposed facilities in relationship to centerline of road and edge of existing pavement.
3. Materials and sizes of facilities shall be stated on plans.
4. If other utilities or facilities may be in conflict with proposed project they shall be shown on the plans.
5. Traffic plan if required. (Minimum OSHA standards)

B) ROAD CONSTRUCTION

Comply with requirements in Columbia County Road Standards Document.

LIABILITY AND CONTROL

Applicant shall be responsible and liable for all damage or injury to any person or property resulting from the physical location, installation, construction, maintenance operation or use of the facility or operation for which the Applicant has been granted a permit. Applicant shall indemnify and hold harmless the County of Columbia, its officers, agents and employees against any and all damages, claims, demands, actions, causes of action, costs and expenses of whatsoever nature which they or any of them may sustain by reasons or acts, conduct, or operation of Applicant, its officers agents or employees in connection with locating the physical location, installation, construction, maintenance, repair, operation or use of said facility or in conducting an operation. The Applicant shall file with the Road Department evidence of insurance in the following minimum amounts:

- (a) \$50,000 to any claimant for any number of claims for damage to or destruction of property, including consequential damages, arising out of a single accident or occurrence.
- (b) \$100,000 to any claimant as general and special damages for all other claims arising out of a single accident or occurrence unless those damages exceed \$100,000, in which case the claimant may recover additional special damages, but in no event shall the total award of special damages exceed \$100,000.
- © \$500,000 for any number of claims arising out of a single accident or occurrence.

The work area during any construction or maintenance performed under the permit provisions shall be protected in accordance with the current "Manual on Uniform Traffic Control Devices for Street

and Highways" as amended or supplemented by the State Highway Commission. Necessary signs shall be furnished by the Applicant unless otherwise specified in the permit.

All signs, barricades, lights, cones and other such devices, and all flagpersons, pilot cars, pilot car operators and other such labor and equipment required for the safe directing and guiding of public traffic shall be provided, furnished and maintained by the Applicant. These protective and directional measures shall be undertaken beyond and outside the limits of the project, as well as within the project limits, when they have a direct bearing on or reference to the project.

During suspension of work, for any reason, the Applicant shall continue to be responsible for and shall maintain all temporary and protective and directional devices throughout the period of suspension in the same manner as when work is being performed.

Applicant is liable for any and all losses incurred due to deficiencies in traffic control or signing.

To insure compliance with the terms and conditions of the permit, the Road Department reserves the right to inspect the work during such periods as the Roadmaster deems necessary, to check compliance with the terms of the permit by Applicant and to require Applicant to correct all deviations from those terms and conditions.

Any supervision and/or control exercised by the Road Department personnel shall in no way relieve the Applicant of any duty or responsibility to the general public nor shall such supervision and/or control relieve Applicant from any liability for loss, damage or injury to persons or property.

If the highway surface or highway facilities are damaged by the Applicant, Applicant shall replace or restore highway surface or highway facilities to a condition satisfactory to the Roadmaster, whether discovered at the time of installation or at a later date.

PERFORMANCE BOND

The County may require a performance bond for completion of the work in accordance with the approved plans and specs in an amount up to 100% of the cost of construction.

CONSTRUCTION AND LOCATION

Applicant or its contractor shall advise the Road Department office at 397-5090 at least 12 hours prior to commencing construction of a facility for which a permit has been issued.

Applicant's completed facility shall be in substantial conformance with the drawings or sketches required unless special permission is obtained from the Roadmaster to vary from same during installation. When such permission is obtained, Applicant shall furnish the Roadmaster a set of "as constructed" drawings or sketches detailing any such variances.

TRENCHES

No trench shall be excavated with a top width in excess of eighteen (18) inches more than the outside diameter of the pipe, conduit or cable to be installed with our permission is first obtained from the Roadmaster.

Trenched edges in paved areas shall be sawed or cut to neat lines by methods satisfactory by the Roadmaster to a depth sufficient to permit removal of the pavement without damage to the pavement to be left in place.

The depth of the trench shall be such that the top of the pipe or cable or other facility shall not be less than twenty-four (24) inches lower than of ground cover or the adjoining road surface, whichever is lower. In addition, the side of the pipe or cable or other facility shall be buried at a lateral distance not less than twenty-four (24) inches from any vertical or sloping surface such as the side of a ditch or a bank. In cases where the ground material makes placement at twenty-four (24) inches at depth impossible or impractical, the Roadmaster may approve adequate mechanical protection in lieu of such burial by such methods as are satisfactory to the Roadmaster. Any uneven ground surfaces adjacent to the trench shall be leveled off or the depth of the trench increased.

Maximum length of the open trench shall not be greater than 500 feet and no trench shall be left in an open condition overnight.

Excavated material shall be piled in a manner as to cause the least possible restriction to traffic.

Immediately after the facility authorized by the permit has been placed in the trench, the trench shall be backfilled. If the trench is in the roadbed (surface or shoulder) the trench must be backfilled with Controlled Density Fill (CDF), commonly designated as flowable fill.

Specifications are as follows:

- 1) Less than 300 psi in 28 days.
- 2) 10 psi required before opening to traffic.
- 3) Must be non-segregating which requires air entrainment less than 15%.
- 4) Slump less than 4 inches will require backhoe tamping or vibrator.
- 5) Accelerators recommended for high early strength to allow for traffic.

The surface material shall be asphalt concrete placed to a compacted thickness of four (4) inches or the thickness of the removed pavement, whichever is greater.

The surface grade of any trench shall not deviate from the existing grade by more than ½ inch nor shall it create any noticeable bump or otherwise objectionable ride for motorists.

JACKING, DRIVING AND BORING (Move in front of trenching)

Utility crossings under paved roadways shall be jacked, driven or bored where possible. When the jacking, driving or boring method is used it shall be by approved means which will hold disturbances of surrounding material to a minimum. Sluicing and jetting is not permitted. Void or displacement outside the outside perimeter of the pipe, conduit or cable where greater than 0.1, shall be filled with sand or cement grout packed in place.

PLOWING

Unless special permission is first obtained from the Roadmaster, direct burial of cable placed by the plowing method shall be limited to areas outside the surfaced and shoulder portion of the roadway.

WATER LINES

Water lines crossing public roads shall be encased in casing pipe. Casing pipe shall be constructed to prevent leakage throughout its entire length under the road surfacing. Casing shall be installed so as to prevent the formation of a waterway under the road grade. The casing shall be not less than ten (10) gauge welded steel pipe or approved PVC pressure pipe. The ends of the casing shall extend three (3) feet from each edge of the road surface.

CLEANUP

All debris, refuse and waste of all kinds which may have accumulate upon the public road by reason of the activity of the Applicant shall be removed immediately upon completion of the said activity, or as require by the Roadmaster, and the said public road must be restored to a condition as good as better than it was prior to such activity.

The contractor shall at all times so conduct his or her work as to insure the least possible obstruction or hazard to traffic. The convenience of the general public and the residents along the highway and the protection of persons and property is of prime importance and shall be provided for by the Contractor in an adequate and satisfactory manner.

Construction equipment shall not be parked on the traveled way, shoulder area, narrow median areas, gore areas, sidewalk or other such areas of the highway or street open to public traffic except as necessary for the work. Equipment so parked shall be adequately protected. Construction materials shall not be stockpiled on the traveled way, shoulder area, gore areas, sidewalks or other such areas unless permitted by the Roadmaster for temporary storage and is adequately marked and protected. Other locations within the project areas where parked equipment and stockpile material present a hazard to the public as determined by the Roadmaster shall be adequately protected by barrier or other means.

REMOVAL, RELOCATION, REPAIR

- A. If any person fails to place, build, construct, maintain or remove a ditch, structure, facility or utility in accordance with rules and regulations adopted pursuant to this

ordinance and the conditions of any construction permit issued pursuant to this ordinance, the Columbia County Roadmaster may, after the expiration of 30 days following the transmittal of a written notice to such person, at the expense of such person, remove the ditch, structure, facility or utility from the right of way or reconstruct, repair or maintain the ditch, structure, facility or utility in accordance with or as required by such rules and regulations and the conditions of the permit. This expense may be recovered from such person by the County in any court of competent jurisdiction.

- B. Notwithstanding subsection A of this section, if the Roadmaster or his designee determines that a traffic or pedestrian hazard is created by the ditch, structure, facility or utility which causes imminent danger of personal injury, he may:
- 1) Order the ditch, structure, facility or utility removed, repaired or maintained to eliminate the hazard, within 24 hours after delivery of written notice to the person who placed or constructed the ditch, structure, facility or utility, and to the owner of the property on which the non-compliance occurred.
 - 2) If the ditch, structure, facility or utility is not removed, repaired or maintained to eliminate the hazard within the time set under paragraph 1) of this subsection, eliminate the hazard and recover the expenses of any removal, repair or maintenance of the ditch, structure, facility or utility from any such person in any court of competent jurisdiction.

For a period of one (1) year following the completion of work, the Applicant shall be responsible for the condition of the road surface and shoulders where work was done. Upon the request of the Roadmaster, the Applicant shall repair any patches which become settled, cracked, broken or otherwise faulty.

The permit is issued pursuant to the law of the State of Oregon which authorizes the County to subsequently require the Applicant to remove, relocate, or repair the facility covered by the permit at the sole cost of Applicant.

WARRANTIES, OTHER AGENCIES

The County does not warrant that it has title to the right of way subject to this permit or the process by which it obtained the right of way or granted this permit. The County conveys only such permission as it has right, title and legal authority to convey. Applicant waives any right to damages occasioned by the County having no, or lessor, rights to the right of way or the County having failed to properly grant or administer this permit.

The County does not warrant that the right of way subject to this permit is suitable for any particular purposes and Applicant accepts the same AS IS. Applicant represents that he has inspected the right of way and that he is relying solely upon his inspection, and not upon any representations of the County, in his planning and conduct of operations therein. The County shall not be obligated to repair or maintain the improvements constructed by Applicant and such responsibility shall be Applicant's

alone, until such time as the improvements are accepted as a County Road as that term is defined by Oregon law.

Nothing in this permit is intended to grant rights or imply approval in areas not falling within the authority and jurisdiction of the Public Works Department. It is the responsibility of Applicant to determine the need for and to obtain such licenses, permits, or other forms of approval which may be required by other State agencies, federal agencies, cities and/or counties of Oregon, utility companies or railroads.

COMPLIANCE

If the Applicant is found to be out of compliance with any of these requirements or specifications, the Road master shall notify the Applicant and request the repairs to be made. If they are not made within the time requested or if an emergency exists, the Road master may restore or replace the highway facilities by contractor or County forces, and the costs incurred shall be paid by the Applicant. No additional permits shall be issued to the Applicant by any department of the County, including the Planning Department, Road Department, or other County Department or Agency until the repairs are made and/or paid for.

SURVEY MONUMENTS

Applicant shall comply with ORS 209.150 regarding the removal or disturbance of survey monuments. All survey monuments that are disturbed or removed shall be replaced by a registered surveyor.

SEASONAL CONSIDERATIONS

The Road master may refuse to issue any permit or suspend any permit previously issued when due to weather or ground conditions, or for other important reasons, in the sole discretion of the Road master.

SEVERABILITY

If, for any reason, any portion of this ordinance is held invalid or unconstitutional by any court of competent jurisdiction, such portion of the ordinance shall be deemed a separate, distinct and independent portion and such holdings shall not affect the validity of the remaining portions hereof.

ROAD STANDARDS MODIFICATION APPLICATION

Note: This application, with the appropriate fee, must be completed and submitted to the Columbia County Department of Public Works. Incomplete applications will not be accepted.

General Information

Name of Applicant: _____

Address of Applicant: _____

Daytime Phone: _____

Name of Road subject to modification: _____

Is the Road known by other names? If so, please list: _____

What is the location of the road? _____

Is the road a: _____ Private Easement _____ Dedicated Public Road _____ County Road

Has the road been maintained? _____ By Whom? _____

What modifications to the road standards are requested? _____

Names and Addresses of property owners adjacent to the road (Attach additional sheets, if necessary)*:

*ATTACH AN ASSESSMENT MAP SHOWING THE ROAD AND PROPERTY OWNERSHIPS.

Land Use Information

This information may be obtained from the County Land Development Services Department.

What is the zoning of the property adjacent to that portion of the road to be modified?

Is this application for a road standards modification in conjunction with a land development application (subdivision/partition, conditional use, etc.)? If so, please identify the application.

Were the parcels which access the road legally created prior to June 4, 1991? _____

Road History Information

Was this road the subject of an earlier road modification application? If so, please give the date of the application, and information regarding the Board's decision on the application:

Surveyor Information

Please have the County Surveyor initial the appropriate space below:

Is this a: _____ Dedicated County road OR _____ Public Road? Date: _____
If this is a dedicated county road, is it _____ Deeded _____ Petitioned _____ Unknown

Signature and Certification

I certify that the information contained in this application is true and complete to the best of my knowledge.

Signature

Date

[For staff use only.]

LDS Rec'd: _____ Pub. Wks. Rec'd: _____ Counsel Rec'd: _____

LDS Comment: _____

Pub. Works Comment: _____

Counsel Comment: _____

Date for BOC Review: _____

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COLUMBIA COUNTY BOARD OF COMMISSIONERS

STAFF REPORT

New Columbia County Road Standards

FILE NUMBER: TA 2-96

APPLICANT: Columbia County Public Works Director, Columbia County Road Department.

REQUEST: To completely revise and rewrite the Columbia County Road Standards to replace the existing Columbia County Uniform Road Improvement Design Standards (Ordinance 94-2, adopted January 19, 1994).

BACKGROUND:

Applicant wishes to make major revisions to the Road Standards, including adding private road standards and permitting them to serve up to 6 lots or parcels, new improvement requirements for public and private roads, requirement for a Waiver of Remonstrance for future Local Improvement Districts, allowing the Public Works Director to approve minor modifications to the standards, new road approach standards, and other substantial changes.

The new road standards are divided into 7 major sections, as follows:

- I. Overview of Road Standards: including existing parcel development, partitions and subdivisions, construction of utilities, and a "Summary of New Road Construction Standards".
- II. Fire Service Requirements: including standards for access roads, driveways, turnarounds, emergency access, plans and specifications, and inspections.
- III. Access Approach: including access, location and number, widths, and grades.
- IV. Private Roads: including minimum requirements, construction standards and drawings.
- V. Existing Public Roads: including single lot development, partitions, and subdivisions.
- VI. Creation of New Public Roads: including improvements, submittal and design requirements, specifications, surveying, structural standards, design modification procedures, and construction specifications.

VII. Standard Drawings.

The above seven major sections are followed by 5 exhibits, covering fire service standards and an improvements form, access approach permit requirements, a utility placement permit form, and a road modification application form.

The County Planning Commission held a hearing on this matter on May 20, 1996 and recommends approval.

FINDINGS:

This request is being processed under Sections 1606 and 1611 of the Columbia County Zoning Ordinance, as follows:

"1606 Legislative Hearing: Requests to amend the text of the Zoning Ordinance...are legislative hearings. Legislative hearings shall be conducted in accordance with the following procedures:

- .1 A legislative amendment to the Zoning Ordinance Text or Map may be initiated at the request of the Board of Commissioners, a majority of the Commission, or the Director, or any citizen of the County may petition the Commission for such a change."

Finding 1: This legislative amendment was initiated by the County Public Works Director.

Continuing with Section 1606 of the Zoning Ordinance:

- ".2 Notice of a Legislative Hearing shall be published at least twice, 1 week apart in newspapers of general circulation in Columbia County. The last of these notices shall be published no less than 10 calendar days prior to the Legislative Hearing. The mailing of notice to individual property owners is not required but shall be done if ordered by the Board of Commissioners."

Finding 2: A hearing notice of the Planning Commission hearing was published in the St. Helens Chronicle on May 4 and 11, 1996 and in the Scappoose Spotlight on May 8, 1996. Notice to individual property owners was not required by the Board of Commissioners and was not done.

Section 1611 of the Zoning Ordinance provides as follows:

2-96

"1611 Notice of Legislative Hearing: The notice of a legislative hearing shall contain the following items:

- .1 Date, time and place of the hearing;
- .2 A description of the area to be rezoned or the changes to the text;
- .3 Copies of the statement for the proposed changes are available in the Planning Department. These proposed changes may be amended at the public hearing;
- .4 Interested parties may appear and be heard;
- .5 Hearings will be held in accordance with the provisions of the Zoning Ordinance."

Finding 3: All of the above were included in the Notices of Public Hearing published in the Chronicle and Spotlight newspapers.

COMMENTS:

No comments have been received from property owners or government agencies as of the date of this staff report (June 10, 1996).

CONCLUSION AND RECOMMENDATION:

Based upon the above findings, the Columbia County Planning Commission and the planning staff recommend APPROVAL of these legislative amendments to the text of the Columbia County Road Standards.

pw

6-10-96