



KING COUNTY
ROAD STANDARD
1993

LOUIS J. HAFF, P.E.
County Road Engineer

King County
Department of Public Works

ORDINANCE NO.

11187

AN ORDINANCE approving and adopting the "King County Road Standards", 1993 update, as the standards for road design in King County, amending Ordinance No. 8041, Sections 4 and 6, and K.C.C. 14.42.030 and 14.42.050, and repealing and replacing Ordinance No. 8041, Sections 2 and 10 and K.C.C. 14.42.010 and 14.42.090.

PREAMBLE: The King County Road Standards were last adopted in their entirety by King County Ordinance 8041 dated April 27, 1987. The proposed new publication "King County Road Standards" updates the 1987 document. These standards update, clarify and correct portions of the previous road standards. These changes are intended to support and be part of the county's goals regarding growth management, housing and sensitive areas.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. Ordinance No. 8041, Section 2, as amended and K.C.C. 14.42.010 are hereby repealed and the following is substituted.

Adoption. A. "King County Road Standards", 1993 update, as amended by the council December 20, 1993, incorporated herein as Attachment A with amended Sections 2.03, 2.20, 2.21, 3.02, 5.03 and 5.10 as Attachment B are hereby approved and adopted as the King County standards for road design and construction.

B. Consistent with council's direction and intent in adopting these standards the department of public works is hereby authorized to develop public rules and make minor changes to the drawings in order to better implement the standards and as needed to stay current with changing design and construction technology and methods.

C. Consistent with council's direction and intent in adopting these standards the department of public works will establish a committee consisting of county staff and representatives of the fire and emergency medical service and development communities. The committee will investigate alternative roadway widths and other road standard related issues that impact the ability to provide emergency fire and medical service to the public and report findings back to council by September 1994.

SECTION 2. Ordinance No. 8041, Section 4 and K.C.C. 14.42.030 are hereby amended to read as follows:

Applicability. A. The standards modifications of roadway features or extent of the scope of reconstructions or capital projects required by King County or to the extent of project plans and specifications. These standards shall apply to "resurfacing, restoration and reconstruction" terms are defined in the Local Agency Guidelines of the Department of Transportation, as amended. In the exercise of its discretion consider the standards as optional.

B. The standards shall apply to planned, non-emergency replacement of utility structures within King County right-of-way.

SECTION 3. Ordinance No. 8041, Section 4, is hereby amended as follows:

References. The standards implemented shall be consistent with the references listed in the "King County Road Standards, ((1986)) 1993 update."

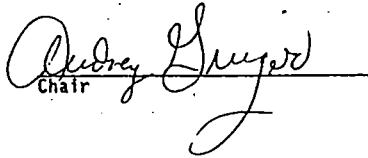
SECTION 4. Ordinance No. 8041, Section 4, is hereby repealed and the following is substituted:

11187

Effective Date. This ordinance shall take effect (30) days from its enactment.

INTRODUCED AND READ for the first time this 7th day of September, 1993.
PASSED this 20th day of December 1993.

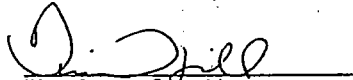
KING COUNTY COUNCIL
KING COUNTY, WASHINGTON


Chair

ATTEST:


Clerk of the Council

APPROVED this 30th day of DECEMBER, 1993.


King County Executive

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Attachment: A. King County Road Standards, 1993
B. Attachment B

TABLE OF CONTENTS

PURPOSE

CHAPTER 1. GENERAL CONSIDERATIONS

- 1.01 Shortened Designation
- 1.02 Applicability
- 1.03 Responsibility to Provide Roadway Improvements
- 1.04 General References
- 1.05 WSDOT/APWA Documents as Primary Design and Construction References
- 1.06 Other Specifications
- 1.07 Road Plans
- 1.08 Variances
- 1.09 Penalties and Financial Guarantees
- 1.10 Meaning of Terms
- 1.11 Severability

CHAPTER 2. ROAD TYPES & GEOMETRICS

- 2.01 Road Classifications
- 2.02 Arterial Roads
- 2.03 Residential Access Streets
- 2.04 Commercial Access Streets
- 2.05 Horizontal Curvature and Sight Distance Design Values
- 2.06 Private Streets
- 2.07 Half Streets
- 2.08 Cul-de-sacs and Eyebrows
- 2.09 Alleys and Private Access Tracts
- 2.10 Intersections and Low Speed Curves
- 2.11 Maximum Grade and Grade Transitions
- 2.12 Stopping Sight Distance
- 2.13 Entering Sight Distance
- 2.14 Medians
- 2.15 One-Way Streets
- 2.16 Bus Zones and Turn-Outs
- 2.17 Exception to Paving on Rural Minor Access Streets (Residential)
- 2.18 Intersections with State or Federal Highways
- 2.19 Slope, Wall, & Drainage Easements and Right-of-Way Reduction

ation Requirements	22
imum Dwelling Units on Urban Subcollectors	23

CHAPTER 3. DRIVEWAYS, WALKS, & TRAILS

ks	24
and Sidewalks	26
immy Joints	27
	27
Metal Handrail and Handicapped Access Ramps	28
s	28
ays, Bikeways and Trails	28
	29
	29
ities	29
	30

CHAPTER 4. SURFACING

ets, Pedestrian and Bike	32
r Residential Streets on Poor Subgrade	34
ommercial Access Streets	34
-Down Procedures	34
gs, Markers, and Pavement Tapers	35

CHAPTER 5. ROADSIDE FEATURES

	37
	39
Landscaping	39
	39
tion	41
s	41
des	41
	42
kment Heights	42
ing Spaces	42
les	42

TABLE OF CONTENTS (Continued)

CHAPTER 6. BRIDGES

- 6.01 Principal References
- 6.02 Bridge Geometrics
- 6.03 Bridge Design Criteria
- 6.04 Special Permits

CHAPTER 7. DRAINAGE

- 7.01 General
- 7.02 Road Ditches
- 7.03 Storm Sewers and Culverts
- 7.04 Catch Basins and Junctions
- 7.05 Frames, Grates, and Covers
- 7.06 Erosion Control
- 7.07 Trenches

CHAPTER 8. UTILITIES

- 8.01 Franchising Policy and Permit Procedure
- 8.02 Standard Utility Locations Within the Right-of-Way
- 8.03 Underground Utility Installation
- 8.04 Final Utility Adjustment (To Finish Grade)
- 8.05 Final Cleanup, Restoration of Surface Drainage and Erosion Control

CHAPTER 9. CONSTRUCTION CONTROL AND INSPECTION

- 9.01 Basis for Control of the Work
- 9.02 Subdivision, Commercial and Right-Of-Way Land Use Inspection
- 9.03 Penalties for Failure to Notify for Land Use Inspection
- 9.04 Embankment Construction Control in Developments
- 9.05 Traffic Control in Development Construction
- 9.06 County Forces and County Contract Road Inspection
- 9.07 Call Before You Dig

ed)

DRAWINGS

Drawing Title

Shoulder Type Roadway	65
Vertical Curb Type Roadway	66
Flled Curb Type Roadway	67
Level Surface Roadway	68
Thickened Edge Roadway	69
Extruded Curb Roadway	70
Cul-de-Sacs	71
Temporary Cul-de-Sac	72
Shoulder	73
Half Street	74
Layer Pavement Detail	75

Drawing Title

Reveled End Pipe Section	76
Field Tapping of Concrete Pipe	77
Catch Basin Type 1	78
Catch Basin Type 1-L	79
Catch Basin Type 2 - 48", 52", 60", 72" & 96"	80
Catch Basin Details	81
Manhole Type 1 - 48", 52" & 60"	82
Manhole Type 2 - 72" & 96"	83
Manhole Type 3 - 48", 52", 60", 72" & 96"	84
Manhole Type 4	85
Manhole Details	86
curb Inlet	87
Standard Grate	88
Standard Frame with Vertical Curb Installation	89
Lid Cover	90
Rough-curb Inlet Frame	91
Rough-curb Inlet Frame and Grate with Vertical Curb Installation	92
Reinforced Grate	93

TABLE OF CONTENTS (Continued)

<u>Drawing Number</u>	<u>Drawing Title</u>
2-019	Rolled Curb Frame and Grate
2-020	Rolled Curb Frame and Grate Installation
2-021	Rolled Curb Vaned Grate
2-022	Locking Manhole Cover
2-023	Locking Manhole Frame
2-024	Rock-lined Shoulder Ditches & Curbed or Turnpike Shoulders
2-025	Flow Restrictor/Oil Pollution Control Device, Tee Type (FROP-T)
2-026	FROP-T Shear Gate Detail
2-027	Flow Restrictor/Oil Pollution Control Device, Baffle Type (FROP-B)
2-028	Debris Cage

SECTION 3-000 CURB & DRIVEWAY

<u>Drawing Number</u>	<u>Drawing Title</u>
3-001	Curb and Sidewalk Joints
3-002	Curb Details
3-003	Shoulder and Ditch Section Driveway
3-004	Curb and Gutter Section Driveway
3-005	Reverse Slope Driveway
3-006	Location and Width of New Driveways
3-007	Joint Use Driveway Tract

SECTION 4-000 SIDEWALKS & CURB RAMPS

<u>Drawing Number</u>	<u>Drawing Title</u>
4-001	Curb Ramp Locations
4-002	Curb Ramps in Vertical Curb
4-003	Curb Ramps in Rolled Curb
4-004	Cement Concrete Sidewalk Transition to Asphalt Shoulder

SECTION 5-000 ROADSIDE APPURTENANCES

<u>Drawing Number</u>	<u>Drawing Title</u>
5-001	Clearance of Roadside Obstacles on Shoulder Type Road
5-002	Intersection Landing
5-003	Barricades
5-004	Rock Facing, Cut Section

ted)

Drawing Title

Block Facing, Fill Section	119
Block Facing Under Sidewalk	120
Block Facing, Fill Section Reinforcement	121
Concrete Steps and Metal Handrail	122
Street Tree Standards	123
Mailbox Mounting, Curb Type Location	124
Mailbox Mounting, Shoulder Type Location	125
Neighborhood Delivery & Collection Box Unit (N.D.C.B.U.) Mailbox Installation	126
Billards	127
Roadway Survey Monument with Case and Cover	128
Off-Roadway Survey Monument	129

PURPOSE

King County has adopted these road design criteria primarily for a two-fold purpose:

- (1) To set forth specific, consistent road design elements for developers and other persons constructing or modifying road or right-of-way facilities which require County licensing.
- (2) To establish uniform criteria to guide the County's own construction of new County roads and of existing roads.

In addition, these Standards are intended to support King County's goals for achieving a high level of service by providing adequate facilities for development in an efficient manner, complying with stormwater management sensitive area policies and to balance these goals with the general safety and mobility of the traveling public.

In adopting these Road Standards, the County has sought to encourage standardization of road design where necessary for consistency and to assure so far as practical that motoring, bicycling, and pedestrian public safety needs are met. Considerations include safety, convenience, proper drainage, and economical maintenance. The Standards also provide requirements for the location and placement of utilities within the right-of-way. The County's permitting and licensing activities will require specific, identifiable standards to guide private individuals and entities in the administrative process of procuring the necessary County approval. Yet, the County must have needed flexibility to meet its duty to provide streets, roads, and highways for the diverse and changing needs of the traveling public. Accordingly, these Standards are not intended to represent the legal standard by which the traveling public is to be measured.

These Standards cannot provide for all situations. They are intended to assist but not to replace competent work by design professionals. It is expected that land surveyors, engineers, and architects will bring to each project the best of skills from their respective disciplines. These Standards are intended to limit unreasonably any innovative or creative effort which could result in better design, cost savings, or both. Any proposed departure from the Standards will be judged, however, such variance will produce a compensating or comparable result, in every way adequate for the benefit of the county resident.

CHAPTER 1. GENERAL CONSIDERATIONS

on: These King County Road Standards will be cited routinely in the text as the

Standards shall apply prospectively to all newly constructed road and right-of-way public and private, within King County. In the event of conflict with the current short C.C. Chapter 19.26, these Standards shall control.

to modifications of roadway features of existing facilities which are within the scope required off-site road improvements for land developments, or capital improvement required by King County or to the extent they are expressly referred to in project plans. These Standards are not intended to apply to "resurfacing, restoration, and projects as those terms are defined in the Local Agency Guidelines, WSDOT, as amended; nor may at his discretion consider the Standards as optional goals.

apply to every new placement and every planned, non-emergency replacement of existing other utility structures within the King County right-of-way.

Provide Roadway Improvements:

development which will impact the service level, safety, or operational efficiency of or is required by other County code or ordinance to improve such roads shall improve in accordance with these Standards. The extent of off-site improvements to serving be based on an assessment of the impacts of the proposed land development by the agency.

development abutting and impacting existing roads shall improve the frontage of those roads with these Standards. The extent of improvements shall be based on an assessment of the proposed land development by the Reviewing Agency. Urban residential short plats one additional lot to a tax lot with an existing dwelling unit are exempt from urban type street improvements but are subject to shoulder improvements as specified in provided these improvements are consistent with the surrounding roads.

development that contains internal roads shall construct or improve those roadways to these

County's practice that it will not allow subdivisions to be recorded unless there exists a continuous public access to the subdivision except as provided for in Section 2.06. Nor will the County accept a road for maintenance until the road is directly connected to a County or other maintained road.

- E. All road improvement and development projects shall include pedestrian access design. Where existing roadways are to be modified, pedestrian facilities shall conform to Sections 3.02, 3.07, 3.08 or 3.09.

1.04 General References: The Standards implement and are intended to be consistent with

- A. Home Rule Charter for King County, approved by the electorate on November 5, subsection 920.20.10.
- B. King County Code, as amended, including:
- Title 9, Surface Water Management
 - Title 14, Roads and Bridges
 - Title 16, Building and Construction Standards
 - Title 17, Fire Code
 - Title 19, Subdivisions
 - Title 20, Planning
 - Title 21, Zoning
 - Titles 46 and 47, Traffic
- C. Implementing guidelines on drainage prepared by Surface Water Management Division, Department of Public Works, and hereafter referred to as the "Surface Water D
- D. King County Comprehensive Plan 1985, as updated.
- E. King County Transportation Plan, current edition.
- F. Affordable Housing Policy Plan.
- G. Adopted Community Plans.
- H. King County Regional Trails Plan.
- I. King County Non-Motorized Transportation Plan.
- J. King County Capital Improvement Program, as amended.
- K. King County Parks and Open Space Plan 1986.
- L. King County Specifications for Off-Street Parking.
- M. King County adopted Basin Control Plans.
- N. King County Flood Hazard Plan, when adopted.

as Primary Design and Construction References: Except where these Standards provide detail, construction workmanship, and materials shall be in accordance with the plans produced separately by Washington State Department of Transportation (WSDOT), or Washington State Chapter of American Public Works Association (APWA).

Standard Specifications for Road, Bridge, and Municipal Construction, as adopted by King County, current edition as amended. These will be referred to as the "WSDOT/APWA Standard Specifications."

Standard Plans for Road and Bridge Construction, to be referred to as the "WSDOT/APWA Standard Plans," current edition as amended.

Manual, current edition as amended.

Design Standards for the Construction of Urban and Rural Arterial and Collector Streets, per RCW 35.78.039 and RCW 43.32.020, May 24, 1989, current edition as amended.

Notes: The following shall be applicable when pertinent, when specifically cited in the plans, and when required by state or federal funding authority.

Design Guidelines, WSDOT, as amended.

Urban Arterial Program, WSDOT, as amended.

Guidelines of federal agencies including the Federal Housing Administration, Department of Urban Development; and the Federal Highway Administration, Department of Transportation.

Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO), 1984, or current edition when adopted by WSDOT.

Specifications for Highway Bridges, adopted by AASHTO, current edition.

Manual on Uniform Traffic Control Devices, "MUTCD", as amended by Washington State Department of Transportation, current edition.

Development of Bicycle Facilities, adopted by AASHTO, current edition.

Standard Rock Wall Construction Guidelines, Standard Rock Wall Construction Contractors.

Standard Specifications for Testing and Materials (ASTM).

Plans for roads and road drainage shall be prepared and submitted consistent with these Standards in accordance with administrative rule published by the Director, Department of Public Safety. These Standards shall apply to public or private roads whether constructed by private party or

public agency. Subject to review, the Reviewing Agency may waive plan requirements, based on the following criteria:

- A. For improvements to existing roads if:
 - 1. No more than 5,000 square feet will be cleared and graded within the right-of-way and
 - 2. The existing grade or slope in the road right-of-way or easement does not exceed the existing grade and
 - 3. The work will not intercept a stream or wetland or otherwise impact natural resources as set forth in County Code regarding Sensitive Areas and the Surface Water Management Act
 - 4. Plans do not include a retention/detention facility within the right-of-way
 - 5. The work is required of a short plat development, or a right-of-way use that requires less than 100 lineal feet of existing public road improvement; and
 - 6. King County standard drawings, submitted with required permits, are sufficient for the improvement to be constructed.

1.08 Variations

- A. Variations from these Standards may be granted by the Engineer upon evidence that the proposed work is in the public interest and that requirements for safety, function, fire protection, and maintainability based upon sound engineering judgement are fully met. Detailed information regarding requesting variations and appealing variance decisions are contained in an administrative manual available from the County Road Engineer. Variance requests for subdivisions must be submitted at the preliminary plat stage and prior to any public hearing. Variations must be approved by the Engineer prior to approval of the engineering plans for construction. Any anticipated variations from the Fire Code which do not meet the Uniform Fire Code shall also require concurrence by the Fire Marshal.
- B. Questions regarding interpretation of these Standards may be directed to the Development Coordinator, at 296-6640 or the Roads and Engineering Services Vice President at 3783.

Financial Guarantees: Failure to comply with these Standards may result in denial of plan approval, revocation of prior approvals, legal action for forfeiture of financial commitment, and/or other penalties as provided by law.

PERFORMANCE GUARANTEES: Any construction work on King County right-of-way (both unmaintained) other than Capital Improvement Projects or County maintenance work guaranteed by a financial guarantee. All work on private road and drainage facilities on the condition of a County approval process shall be guaranteed by a financial guarantee at the time of recording. The amount and form of the financial guarantee shall be determined by the Reviewing Agency. The minimum performance guarantee shall be \$1,000.00

The financial guarantee may be reduced during construction, as determined by the Reviewing Agency. At no time will the financial guarantee amount be reduced to less than 30 percent of the original amount or \$1,000.00, whichever is greater.

PERFORMANCE GUARANTEES: The successful performance of the right-of-way improvements shall be guaranteed for a period of at least one year (or other period if updated by King County) from the latest date of either the acceptance or Final Construction Approval. The amount and form of the maintenance financial guarantee shall be determined by the Reviewing Agency. The minimum performance guarantee shall be \$1,000.00. Maintenance guarantees will not be required when the performance guarantee is \$1,000.00.

Driveway or right-of-way, usually narrower than a street, which provides access to the driveway or more residential properties and is not intended for general traffic circulation;

The portion of the roadway adjoining the traveled way for parking, turning or other use not necessary to through-traffic movement.

Turnaround for vehicle turnaround typically located at the end of a cul-de-sac street.

Turnaround street having one end open to traffic and the other temporarily or permanently closed for vehicle turnaround.

Design speed approved by the Reviewing Agency or the Engineer for the design of the physical facilities established by Sections 2.03 and 2.04 for residential and commercial access streets with traffic volumes per hour above the current or expected posted speed limit for arterials.

Person, firm, partnership, association, joint venture or corporation or any other entity that owns, leases, or otherwise controls residential, commercial, or industrial property or to subdivide for the purpose

"Driveway": A privately maintained access to residential, commercial or industrial

"Engineer": King County Road Engineer, having authorities specified in RCW 36.75. his/her authorized representative.

"Eyebrow": A partial bulb located adjacent to the serving road that provides access to a vehicle turnaround.

"Half-Street": Street constructed along edge of development, utilizing a portion of the right-of-way and permitted as an interim facility pending construction of the other half by the adjacent owner.

"Joint-Use Driveway Tract": A jointly owned and maintained tract or easement serving

"Landing": A road or driveway approach area to any public or private road.

"Loop": Road of limited length forming a loop, having no other intersecting road, providing direct access to abutting properties. A loop may be designated for one-way or two-way traffic.

"Off-Street Parking Space": An area accessible to vehicles, exclusive of roadways and pedestrian facilities, that is improved, maintained and used for the purpose of parking

"Pavement Width": Paved area on shoulder-type roads or paved surface between curb and gutter flow line on all other roads as depicted on Drawings 1-001 through 1-003, 1-004

"Pipe Stem": A strip of land having a width narrower than that of the lot or parcel it serves, designed for providing access to that lot or parcel.

"Private Access Tract": A privately owned and maintained tract providing vehicular access to residential properties.

"Private Street": A privately owned and maintained access provided for by a tract owner through legal means, typically serving three or more potential dwelling units.

"Professional Engineer": A professional civil engineer licensed to practice in the State of Washington

"Public Street": Publicly owned facility providing access, including the roadway and utility improvements, inside the right-of-way.

"Reviewing Agency": King County Department of Development and Environmental Services, the reviewing agency for plats and proposed developments.

"Right-of-Way": Land, property, or property interest (e.g., an easement), usually dedicated or devoted to transportation purposes.

providing public or private access including the roadway and all other improvements way.

will be considered interchangeable terms for the purpose of these Standards.

width plus any non-paved shoulders.

areas so designated in King County Comprehensive Plan and as implemented through area zoning; characterized by long-term agriculture, forestry, and mining.

areas so designated in King County Comprehensive Plan, and as implemented through area zoning; characterized by long-term low density of development.

shoulder or unpaved portion of the roadway outside the traveled way that is available for non-motorized use.

the King County Traffic Engineer responsible for design, operation and maintenance of facilities.

: Areas so designated in the King County Comprehensive Plan; characterized by low density and intended for redesignation through a community plan as either a rural or an urban area.

the part of the road made for vehicle travel excluding shoulders and auxiliary lanes.

areas so designated in King County Comprehensive Plan, and as implemented through area zoning; characterized by denser commercial/industrial and residential

facilities providing public service such as gas, electric power, telephone, telegraph, water, sewerage, whether or not such company is privately owned or owned by a governmental

any part of these King County Road Standards as established by ordinance shall be found void if any part shall remain in effect.

CHAPTER 2. ROAD TYPES & GEOMETRICS

2.01 Road Classifications

- A. County roads are classified functionally as indicated in Sections 2.02, 2.03, the controlling element for classification and shall govern right-of-way, road geometrics. Other given elements such as access, arterial spacing and average (ADT) are typical.
- B. Within each functional classification, roads are further characterized as "curb" type road typically requires curb and gutter with inlets and underdrains. A "shoulder" type road typically requires a shoulder and open ditch drainage.
 - 1. Land developments in urban areas, as defined by the current King County Plan Map, shall provide "curb" type road improvements. Exceptions to this standard shall be reviewed by the Reviewing Agency on residential access streets which are located in low density neighborhoods as designated by adopted community plans and where a pattern of road use is firmly established. Exceptions for two-lot urban short plats shall be reviewed by the Reviewing Agency. Section 1.03.
 - 2. Land developments in rural areas as defined by the current King County Plan Map shall provide "shoulder" type road improvements unless otherwise approved by the Reviewing Agency. Certain exceptions to the "shoulder" type standard may apply to rural developments and rural activity centers (unincorporated rural towns such as Maple Valley, Issaquah, and Rainier) where urban densities and uses may make a "curb" type road appropriate. For rural developments, the specifically authorized land uses, adopted community plans, and district design guidelines may provide for either a "curb" or "shoulder" type road.
 - 3. Land developments in transitional areas as defined by the current King County Plan Map shall provide "curb" or "shoulder" type road improvements as determined by the Reviewing Agency.
 - 4. Guidelines applicable to Rural Areas shall apply also to Resource Lands.

prising the County primary road system, see Drawings No. 1-001 and 1-002.

MUNICIPAL ARTERIALS		MINOR ARTERIALS		COLLECTOR ARTERIALS OR "COLLECTORS"			
Inter-community highways connecting distant community centers & facilities		Intra-community highways connecting community centers and facilities.		Intra-community highways connecting residential neighborhoods with community centers & facilities.			
Fully controlled with very restricted access to abutting properties.		Partially controlled with infrequent access to abutting properties.		Partially controlled with infrequent access to abutting properties.			
Rural	Urban	Rural	Urban	Rural			Urban
2 to 5 Miles	2 to 5 Miles	Under 2 Miles	Under 2 Miles	Under 2 Miles			Under 2 Miles
Over 2000	Over 2000	Over 2000	Over 2000	Over 2000	400 to 2000	Under 400	
Shoulder	Curb	Shoulder	Curb	Shoulder [8]	Shoulder [8]	Shoulder [8]	Curb [9]
Varies 40 - 60	Varies 40 - 60	Varies 35 - 55	Varies 35 - 55	Varies 40 - 50	Varies 35 - 50	Varies 35 - 50	Varies 35 - 50
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1
9	9	10	10	10	10	10	12
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1
22/34	44	22/34	44	22/34	22	22	36
44	44	44	44	44	-	-	44
56	56	56	56	-	-	-	-
38/50	44	38/50	44	38 [8]/50 [8]	34 [8]	30 [8]	44 [7]
60	54 [7]	60	54 [7]	60 [8]	-	-	54 [7]
72	66 [7]	72	66 [7]	-	-	-	-
100	100	84	84	60	60	60	60
100	100	-	84	84	-	-	-
100	100	100	84	-	-	-	84
8' Shoulder & Ditch	Vertical Curb & Gutter	8' Shoulder & Ditch	Vertical Curb & Gutter	8' Shoulder & Ditch [8]	6' Shoulder & Ditch [8]	4' Shoulder & Ditch [8]	Vertical Curb & Gutter

Design requirements shall be determined for specific arterial roads consistent with the WSDOT Design Manual. Metric elements and does not imply posted or legally permissible speed. Curves shall be designed within parameters of B,

distances. (See Section 2.11.)

shall apply unless otherwise approved by the Engineer. (See Section 2.12.)

shall apply at intersections and driveways unless otherwise approved by the Engineer. (See Section 2.13.)

require greater width. For guardrail installations, shoulders shall be two feet wider.

arterials where bikeways are not required by the Non-Motorized Plan.

vertical curb and gutter at minimum width of 36 feet curb to curb.

elevations greater than 6 percent.

2.03 Residential Access Streets¹ Serving single-family development, see Drawings No. 1-
For multiple-dwelling development, see Section 2.04.

CLASSIFICATION	LOCAL ACCESS STREETS					
	NEIGHBORHOOD COLLECTORS		SUBCOLLECTORS		SUBACCESS STREETS	
FUNCTION	Streets connecting two or more neighborhoods and typically connecting to arterials or other neighborhood collectors.		Streets providing circulation within neighborhoods typically connecting to neighborhood collectors.		Permanent cul-de-sacs, or short loops [2], connecting to subcollectors and not supportive of through traffic.	
Public or Private	Public streets		Public streets		Typically public streets For private streets (See Sec. 2.06.)	
Access	Restricted, Lots front on Local Access street where feasible.		As needed with some restrictions.		As needed with only minimal restrictions.	
Land Use Area	Rural	Urban	Rural	Urban	Rural	Urban
Serving Potential Number of Single-Family Dwelling Units	Over 100 [3]	Over 100 [3]	100 Max.	100 Max. [4]	50 Max.	50 Max.
CRITERIA						
A. Typical Road Type	Shoulder	Curb	Shoulder	Curb	Shoulder	Curb
B. Design Speed [5] (MPH)	35	35	30	30	Low Speed Curve See Sec. 2.10	Low Speed Curve See Sec. 2.10
C. Max. Superelevation (Ft./Ft.)	0.06	See Sec. 2.05B	0.06	See Sec. 2.05B	See Sec. 2.05B	See Sec. 2.05B
D. Horizontal Curvature Min. Radius (Ft.)	See Table 2.1	See Table 2.2	See Table 2.1	See Table 2.2	Low Speed Curve See Sec. 2.10	Low Speed Curve See Sec. 2.10
E. Max. Grade [6]	11	12	12	15	15	15
F. Standard Stopping Sight Distance (Ft.) [7]	See Table 2.1	See Table 2.2	See Table 2.1	See Table 2.2	150 ft.	150 ft.
G. Standard Entering Sight Distance (Ft.) [8]	See Table 2.1	See Table 2.2	-	-	-	-
H. Min. Pavement Width (Ft.)	22	32[9]	22	28	20	24
I. Min. Roadway Width (Ft.) [11]	38	32[9]	38	28	28	24
J. Min. Right-of-Way Width (Ft.)	60	56	60	48[12]	48 [12]	40[12]
K. Type of Curb or Shoulder and Ditch [11]	8' Shoulder & Ditch [13]	Vertical Curb & Gutter	8' Shoulder & Ditch [13]	Vertical or Rolled Curb & Gutter	4' Shoulder & Ditch [13]	Vertical or Rolled Curb & Gutter
L. Min. Half St. Paved Width (Ft.)	20	20	20	20	20	20
M. Min. One-Way Paved Width (Ft.)	20	20	20	20	20	20

N. NOTES:

- 1 - Within the above parameters, geometric design for specific streets shall be consistent with AASHTO Policy on Geometric Design of Highways and Streets.
- 2 - See Section 2.15 for one-way loops.
- 3 - See Section 2.20 for residential access connection requirements.
- 4 - See Section 2.21 for urban exception criteria.
- 5 - Design speed is a basis for determining geometric elements and does not imply posted or legally permissible speed. Curves shall be designed within parameters of B, C and (See Section 2.05)
- 6 - Maximum grade may be exceeded for short distances. (See Section 2.11)
- 7 - Standard Stopping Sight Distance (SSD) shall apply unless otherwise approved by the Engineer. (See Section 2.12)
- 8 - Standard Entering Sight Distance (ESD) shall apply at intersections and driveways on neighborhood collectors unless otherwise approved by the Engineer (See Section 2.17)
- 9 - Neighborhood collectors intersecting with arterials shall be 36 feet wide for the first 150 feet. See Section 4.05 for tapers.
- 10 - Exception to paving requirement on minor access shoulder type streets: (See Section 2.17)
- 11 - For guardrail installation, shoulders shall be two feet wider.
- 12 - Right-of-way (easement) may be reduced to minimum roadway width, plus sidewalks, provided that all potential serving utilities and necessary drainage are otherwise accommodated on permanent easements within the development. (See Section 2.19)
- 13 - As alternative to shoulder and ditch, underground pipe drainage with either Thickened Edge, Dwg. 1-005 or Extruded Curb, Dwg. 1-006 is acceptable.

streets¹ (See Drawings No. 1-001 and 1-002.)

MULTIPLE-DWELLING ACCESS STREETS		BUSINESS ACCESS STREETS		INDUSTRIAL ACCESS STREETS		MINOR ACCESS STREETS (COMMERCIAL)	
Local streets abutting two-family and multiple-dwelling development.		Local streets abutting dense multiple-dwelling and services, office, professional activities.		Local streets abutting manufacturing, processing, storing & handling activities.		Local streets providing circulation and access to parking and loading sites within multi-dwelling, business, and industrial development boundaries.	
Typically public streets serving all RD and RM zones except RM 900.		Typically public streets serving RM 900 and all B (business) zones.		Typically public streets serving CG and all M Zones.		Public or private streets. (See Section 2.06.)	
As needed, with some regulation.		As needed, with some regulation.		As needed, with some regulation.		As needed with only minimal restrictions.	
Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Shoulder	Curb	Shoulder	Curb	Shoulder	Curb	Shoulder	Curb
35	35	35	35	35	35	Low Speed See Sec. 2.10	Low Speed See Sec. 2.10
0.06	0.06	0.06	0.06	0.06	0.06		
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	Low Speed Curve See Sec. 2.10	Low Speed Curve See Sec. 2.10
12	12	12	12	11	11	12	12
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	150	150
See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	See Table 2.1	N/A	N/A
22	36	24	36	24	40	20	24
38	36	40	36	40	40	28 [7]	24 [7]
60	56	60	56	60	60	48 [7]	40 [7]
8' Shoulder & Ditch	Vertical Curb & Gutter	8' Shoulder & Ditch	Vertical Curb & Gutter	8' Shoulder & Ditch	Vertical Curb & Gutter	4' Shoulder & Ditch	Vertical Curb & Gutter
20	20	20	20	20	20	20	20
20	20	22	22	24	24	20	20

multiple-dwelling, business, and industrial developments. Within the above parameters, geometric design requirements consistent with the WSDOT Design Manual.
 Geometric elements and does not imply posted or legally permissible speed. Curves shall be designed within parameters of B, short distances. (See Section 2.11.)
 shall apply unless otherwise approved by the Engineer. (See Section 2.12.)
 shall apply at intersections and driveways except on minor access streets unless otherwise approved by the Engineer.

shall be two feet wider.
 shall be reduced to minimum roadway width, plus sidewalk, provided that potential serving utilities and necessary drainage are otherwise protected through the development. (See Section 2.19.)

2.05 Horizontal Curvature and Sight Distance Design Values

- A. The design values shown in Tables 2.1 and 2.2 are minimum values necessary to of Sections 2.02, 2.03 and 2.04 for a selected design speed and road classification. A minimum of 6 percent superelevation may be used, upon approval of the Engineer, for design of existing arterials, as necessary, to meet terrain and right-of-way conditions. Stopping sight distance off lengths on arterials, rural residential and commercial access streets shall be determined in accordance with the WSDOT Design Manual.
- B. Superelevation is not required in the design of horizontal curves on urban residential streets; however, horizontal curves must be designed based on design speed and road classification section as indicated in Table 2.2. Table 2.2 is based on AASHTO "Low Speed Urban" methodology. Superelevation may be used on urban residential streets as necessary to meet terrain and right-of-way conditions.

Table 2.1

Arterial Roads, Rural Residential And Commercial Access Streets
Design Values

Design Speed (mph)	30	35	40	45	50
Horizontal Curvature for 6 percent Superelevation, Radius (Ft.)	273	380	509	656	840
Horizontal Curvature for 8 percent (maximum allowable on arterials) Superelevation, Radius (Ft.) (requires approval of the Engineer)	250	350	465	600	760
Stopping Sight Distance (Ft.)	200	250	325	400	475
Entering Sight Distance (Ft.)	430	490	555	620	685
Passing Sight Distance (Ft.) for a 2-Lane Road	1,100	1,300	1,500	1,650	1,800

Table 2.2

Urban Residential Access Streets Design Values

	25	30	35
r 6 Percent Superelevation, Radius (Ft.)	135	215	320
r 4 Percent Superelevation, Radius (Ft.)	145	230	345
r 2 Percent Superelevation, Radius (Ft.)	155	250	375
ormal Crown Section, Radius (Ft.)	180	300	460
(Ft.)	150	200	250
(Ft.)	365	430	490
Ft.)	80	90	100

ty street requirements are usually best served by public streets, owned and maintained, private streets may be appropriate for some local access streets. Usually these are streets, either residential or commercial.

ts may be approved only when they are:

ntly established by right-of-way, tract or easement providing legal access to each d lot, dwelling unit, or business and sufficient to accommodate required improvements, ude provision for future use by adjacent property owners when applicable; and

o King County Road Standards, as set forth herein, or secured under the provisions of 19.24.040; and

ble at all times for emergency and public service vehicle use; and

tructing, or part of, the present or future public neighborhood circulation plan ed in processes such as the King County Comprehensive Plan, applicable community plan, tal Improvement Program; and

ng to result in land locking of present or future parcels; and

ded as public roads to meet the minimum road spacing requirements of these Standards;

7. Designed to serve a maximum potential of 16 single-family dwelling units; length of the private road system to the nearest public road is considered; potential is the number of dwelling units that can possibly be served by the road; physical barriers, zoning or other legal constraints are considered; and
 8. Maintained by a capable and legally responsible owner or homeowners' association or legal entity made up of all benefited property owners, under the provisions of RCW 19.24.050; and
 9. Clearly described on the face of the plat, short plat, or other development instrument; clearly signed at street location as a private street, for the maintenance of which King County is not responsible.
- C. King County will not accept private streets for maintenance as public streets unless they are brought into conformance with current County road standards. This requirement includes surface paving of any streets originally surfaced with gravel.
- D. King County will not accept private streets within short plats when the roads shown on the plat are private and already have the potential to serve more than the number of dwelling units in Section 2.06 B.7. Short plats proposed on properties to which the access standards that do not meet the standards in this section shall be denied.

2.07 Half Streets. See Drawing No. 1-010

- A. A half street may be permitted as an interim facility when:
1. Such street shall not serve as primary access to more than 35 dwelling units;
 2. Such alignment is consistent with or will establish a reasonable circulation pattern;
 3. There is reasonable assurance of obtaining the prescribed additional right-of-way from the adjoining property with topography suitable for completion of a full-street.
- B. A half street shall meet the following requirements:
1. Right-of-way width of the half street shall equal at least 30 feet; and
 2. If feasible, half street shall be graded consistent with locating centerline of road section on the property line; and
 3. Traveled way shall be surfaced the same as the designated road type to which it is adjacent; 20 feet, sidewalk shall be constructed as required for the designated road type.

Line edge of street shall be finished with temporary curbing, shoulders, ditches, side slopes so as to assure proper drainage, bank stability, and traffic safety; and

Streets shall not intersect other half streets unless so approved by the Engineer.

When a street is eventually completed to a whole street, the completing builder shall restore the original half street as necessary to produce a proper full-width street of uniform width.

The cost of any right-of-way or easements needed to accomplish the above shall be the responsibility of the owning builder or developer.

Drawings. See Drawing No. 1-007.

A cul-de-sac street serves more than six lots or extends more than 150 feet from centerline of street to farthest extent of surfaced traveled way a widened "bulb" shall be provided. The details are as follows:

Right-of-way diameter across bulb section: 100 feet in a permanent cul-de-sac; 84 feet in a temporary cul-de-sac, with bulb area lying outside straight-street right-of-way and secured by a temporary easement pending forward extension of the street. Right-of-way may be reduced to 70 feet, provided utilities and necessary drainage are accommodated on permanent easements established at the development. See Section 2.19.

Minimum diameter of surfacing across bulb: 80 feet of paving in curb type road; 80 feet total diameter for shoulder type road to include 64 feet of paving and eight-foot shoulders with compacted subgrade and surfacing material.

Island: Optional feature for any cul-de-sac when bulb paved diameter is 80 feet or more. Mandatory when bulb paved diameter exceeds 80 feet. If provided, island shall have a minimum width of 20 feet and shall be at least 22 feet wide on the paved traveled way in a shoulder type section; 30 feet of paved traveled way in a curb type section around the circumference. Island shall be grassed or landscaped. It shall be maintained by the adjoining lot owners.

When required on cul-de-sacs, sidewalks shall be constructed on one side and on the bulb, extending to the property line at or near half-way around the bulb.

A cul-de-sac shall not be longer than 600 feet measured from centerline of intersecting street to center of the bulb section. Proposed exceptions to this rule will be considered by the Engineer based on pertinent traffic planning factors such as topography, sensitive areas and development. The cul-de-sac length may extend to 1,000 feet if 50 or fewer potential lots are served and there is provision for emergency turnaround near mid-length.

- C. The Engineer or Reviewing Agency may require an off-street walk or an emergency connect a cul-de-sac at its terminus with other streets, parks, schools, bus pedestrian traffic generators, if the need exists.
- D. If a street temporarily terminated at a property boundary serves more than 150 feet, a temporary bulb shall be constructed near the plat boundary. The bulb shall be 80 feet in diameter with sidewalks terminated at the point where the bulb meets the street. The design of the temporary cul-de-sac and extension of the sidewalk shall be the responsibility of the developer who extends the road. See Drawing No. 1-008.
- E. The maximum cross slope in a bulb shall not exceed 6 percent.
- F. Partial bulbs or eyebrows shall have a minimum paved radius and an island conforming to Drawing No. 1-009. The island shall be offset two feet from edge of traveled way.

2.09 Alleys and Private Access Tracts

- A. An alley is considered a private road. Requirements of Section 2.03, subarticles 1 through 4, regarding horizontal curvature and stopping sight distance, apply.
 - 1. Serves a maximum of 30 lots, with a maximum length of 400 feet, no dead ends.
 - 2. Minimum tract width 20 feet with a pavement surface of 18 feet (including sidewalks) based on a five-foot structure setback. For differing structure setbacks, the configuration shall be designated to provide for safe turning access to the street.
 - 3. Paved surface shall have a thickened edge on one side and cross slope to the street. See Drawing No. 1-011.
 - 4. Public streets to which an alley connects or which provide access to the properties served by the alley shall be 28-foot minimum paved width with a driveway cut entry shall be provided by a driveway cut.
 - 5. Modifications to existing alleys serving commercial or industrial properties shall conform with the above, will be determined on a case-by-case basis subject to approval by the Reviewing Agency.
- B. Private access tracts shall conform to Section 2.03 for urban minor access roads.
 - 1. Serves a maximum of six parcels.
 - 2. Minimum tract width of 26 feet with a maximum length of 150 feet, measured from the intersecting street to furthest extent of paved tract.

width shall be a minimum of 22 feet.

Low Speed Curves

at intersection (measured at 10 feet road classification right-of-way) centerline radius (2-lane)	Minimum 85 degrees Maximum 95 degrees 55 Feet
curb radius urban streets and roads classified neighborhood collector or higher	35 Feet
rural streets and roads urban residential access	35 Feet 25 Feet
street intersections where the highest classification involved is subcollector	
right-of-way line radius	25 Feet

at adjacent intersecting streets, whether crossing or T-connecting, shall be as

the highest classification involved is:

Minimum centerline offset shall be:

principal arterial	1,000 Feet
minor arterial	500 Feet
collector arterial	300 Feet
neighborhood collector	150 Feet
any lesser street classification	100 Feet

at approaches at an intersection, landings shall be provided with grade not to exceed one
percent in elevation for a distance of 30 feet approaching an arterial or 20 feet
approaching a residential or commercial street, measured from future right-of-way line (extended) of
the street as provided in Section 2.02, 2.03 or 2.04. See Drawing No. 5-002.

at sight distance. See Sections 2.02, 2.03, 2.04 and 2.12 for design requirements. See
Section 2.2 for specific entering sight distance values based on required design speed.

- E. Low Speed Curves, applicable to subaccess and minor access streets only. See 2.04.

	Up to 75°	75° &
1. Minimum centerline radius (2-lane)	100 feet	55
2. Minimum curb radius	80 feet	35
3. Minimum right-of-way line radius	70 feet	25

2.11 Maximum Grade and Grade Transitions

- A. Maximum grade as shown in Sections 2.02, 2.03, and 2.04 may be exceeded for 5 feet or less, upon showing that no practical alternative exists. Exceptions require verification by the Fire Marshal that additional fire protection requirements. Grades exceeding 12 percent shall be paved with asphalt concrete (AC) or portland cement concrete (PCC). Any grade over 20 percent must be PCC.
- B. Grade transitions shall be constructed as smooth vertical curves except in instances where the difference in grade is one percent or less and upon approval of the Engineer.

2.12 Stopping Sight Distance (SSD) applies to street classifications as shown in Section 2.1. See Tables 2.1 and 2.2 for specific SSD values based on required design speed.

- A. Height of eye is 3.5' and height of object is 0.5'.
- B. Minimum SSD for any downgrade averaging three percent or steeper as provided in Tables 2.1 and 2.2 shall be increased by the values shown below for any downgrade averaging three percent or steeper (Source: AASHTO Policy on Geometric Design, Table III-2). Interpolate for design speeds and grades.

SSD ADJUSTMENT VALUES (FT)

<u>DESIGN SPEED (MPH)</u>	<u>DOWNGRADE</u>	<u>3 Percent</u>	<u>6 Percent</u>
60		50	110
50		30	70
40		20	40
30		10	20
20		0	10

- C. Sag vertical curves on subaccess and minor access streets with stopping sight distance that is called for in Section 2.03 may be approved by the Reviewing Agency if no other alternatives exist and if acceptable road lighting is provided throughout the curve and adjacent to any franchised utility.

Stopping Sight Distance.

g sight distances for the design speeds of proposed commercial access streets, neighborhood collector streets and arterials must be met when intersecting arterials.

imum stopping sight distance on proposed intersection approaches for all other configurations of intersecting roadways shall be 125 feet.

ance (ESD)

ance applies on driveways and on streets approaching intersections as set forth in and 2.04. Entering sight distance criteria will not apply on local access streets or s (commercial). Specific ESD values for required design speeds are listed in Section d 2.2.

icle eye height is 3.5 feet, measured from 10-foot back from edge of traveled way. ehicle height is 4.25 feet.

in Section 2.05, Tables 2.1 and 2.2 apply to an intersection or driveway approach to a under average conditions. In difficult topography the Engineer may authorize a the ESD based on factors mitigating the hazard. Such factors may include an osted or average running speed less than the design speed or the provision of lanes and/or a median space allowing an intermediate stop by an approaching vehicle turn.

ficant number of trucks will be using the approach road, the Engineer may increase the t distance requirements by up to 30 percent for single-unit trucks and 70 percent for combinations.

esign Feature)

be additional to, not part of, the specified width of traveled way. Edges shall be ad edges: either extruded or formed vertical curb; or shoulder and ditch; except that all be minimum four feet in width. Twenty feet of driveable surface (which includes ved shoulders, if any) shall be provided on either side of the median. Median may be , or surfaced with aggregate or pavement. Median shall be designed so as not to limit ght distance at intersections. No portion of a side street median may extend into the arterial street. The Engineer may require revisions to medians as necessary to ess points and to maintain required sight distance. Non-yielding or non-breakaway t be installed in medians. Street trees may be planted in median subject to approval

2.15 One-Way Streets

Local access streets, including loops, may be designated one-way upon a finding by topography or other site features make two-way traffic impractical.

2.16 Bus Zones and Turn-Outs

During the design of arterials and neighborhood collectors, the designer shall contact Metro Planning, phone 684-1622 and the local school district to determine bus zone (stop) and bus operation needs. The road project shall provide wheel chair accessible landing zones as per Section 3.02 of the Standards and where required shall include turn-out zones. Pedestrian and handicapped access improvements within the right-of-way to and from turn-out from nearby businesses or residences shall also be provided as part of the project. Surfacing requirements may also be affected, particularly on shoulders. See Section 4.01A of the Standards. Metro's publication, "Metro Transportation Facility Design Guidelines,"

2.17 Exception to Paving on Rural Minor Access Streets (Residential)

- A. A rural minor access street (residential) as described in Section 2.03 that shall meet the following standard: It shall be graded and, as minimum treatment, shall have a width including shoulders (28 feet) with crushed surfacing material as provided in Alternative V and Drawing No. 1-004. Half streets shall be surfaced not less than 14 feet. Where connecting to a public street the connecting area shall be paved between the right-of-way line (extended) of the public street, with 25 foot or 35 foot radius. Paving shall be in accordance with Section 4.01A with applicable standards, not less than Alternative V.
- B. Any rural minor access street (residential) approved under subsection A above shall be paved unless it is upgraded to public street standards at the expense of the adjoining lot owners, to include hard surface paving, and accepted by the Engineer. Ownership and maintenance.

2.18 Intersections with State or Federal Highways

In the event that the County has jurisdiction on a development that requires the construction or improvement of a commercial/industrial driveway or any classification of street that intersects a federal highway, minimum intersection spacing, entering sight distance and landing shall be in accordance with these Standards shall be satisfied in addition to the requirements of the State or Federal permits. In the instance State or Federal standards exceed these Standards, State or Federal standards shall govern.

Age Easements and Right-of-Way Reduction

Functional classification or particular design features of a road may necessitate slope, drainage, wall or drainage easements beyond the right-of-way line. Such easements may be required by the Engineer or Reviewing Agency in conjunction with dedication or acquisition of

Right-of-way reduction on subcollectors, local access (residential) and minor access (commercial)

For developments served by underground utilities within easements, the right-of-way may be reduced to the minimum roadway width plus sidewalk, as allowed in Sections 2.03 and 2.04, with the approval of the Reviewing Agency. Where it is desired to reduce right-of-way to a minimum width, the right-of-way, plus easement, shall allow for construction and maintenance of the following as shown on the plan: sidewalks, planter strips, drainage facilities, sign placement, and also allow sidewalk and mailbox locations. On subcollectors, installation of fixed objects, other than underground utility structures, greater than four inches in diameter within four feet of the right-of-way line shall not be permitted.

Access Requirements

For a second access to a residential subdivision, short subdivision, binding site plan or subdivision agreement, no residential street shall serve more than 100 lots or dwelling units unless the street is stubbed in at least two locations with another street that functions at a level consistent with Section 2.03.

The access requirement may be satisfied through use of connecting a new street to an existing street in an adjacent neighborhood if:

1. A more practical alternative exists, or

2. The existing street was previously stubbed indicating intent for future access, or

3. An easement has been recorded specifically for said purpose.

The access requirement may not be satisfied through use of an existing roadway network in the adjacent neighborhood if:

1. A more practical alternative exists, or

2. Existing streets do not meet Section 2.03

3. The provisions are not intended to preclude the state statute on land-locking.

B. This section does not preclude a commercial project from gaining access through development. Traffic impacts for such projects will be analyzed during the

2.21 Exception for Maximum Dwelling Units on Urban Subcollectors

Proposed subcollectors serving new urban area developments with an average density of seven to eight dwelling units per acre and which meet the access requirements of Section 2.20 may be approved for family dwelling units, if approved by the Reviewing Agency. Prior to approval, they shall require a traffic circulation study showing a balanced traffic flow of less than 100 vehicles per hour past any access point. Street trees shall be mandatory along subcollectors serving seven to eight dwelling units per acre and shall be in conformance with Section 5.

CHAPTER 3. DRIVEWAYS, WALKS, & TRAILS

lope, and detail shall be as indicated in Drawings No. 2-001, 3-003, 3-004, 3-005 and other specified in the following subsections. See Section 2.13 for entering sight requirements.

Approval of New Driveways:

Driveways directly giving access onto arterials may be denied if alternate access is available.

Abandoned driveway areas on the same frontage shall be removed and the curbing and sidewalk, or shoulder and ditch section, shall be properly restored.

Maintenance of driveway approaches shall be the responsibility of the owner whose property is affected.

Driveways serving a commercial establishment on a shoulder and ditch type road, where development of residential lands and highway traffic assume urban characteristics as determined by the Reviewing Agency, the frontage shall be finished with curb, gutter, and sidewalk, with pipe culvert, all in accordance with these Standards. Alternatively, the Reviewing Agency may require the entire frontage area to be graded and paved to the right-of-way line with asphalt or concrete. In such case, surface drainage shall be intercepted and carried through a closed system as set forth in Chapter 7. Access shall be limited by means of a six-inch curb. See Extruded Asphalt or Cement Concrete Curb detail, Drawing No. 3-002.

Driveways crossing an open ditch section, culverts shall be adequately sized to carry anticipated stormwater flows and in no case be less than 12 inches in diameter. The property owner making the installation shall be responsible for determining proper pipe size. The Reviewing Agency may require the owner to verify the adequacy of pipe size.

Width of New Driveways. Refer to Drawing No. 3-006.

Residential driveway shall typically serve only one parcel. A driveway serving more than one parcel shall be classed as a commercial driveway or a private street, except as provided in 3.a. and 3.b. below.

On lots 75 feet or less, no more than one driveway per lot shall be constructed; on lots over 75 feet, two or more driveways per lot may be permitted, subject to approval by the Reviewing Agency.

3. No portion of driveway width shall be allowed within 5 feet of side property in residential areas or 9 feet in commercial areas except as follows:
 - a. A joint use driveway tract may be used to serve two parcels:
 - (1) Minimum tract width in urban areas shall be 20 feet with a cross slope in one direction and curb or thickened edge on one side. Minimum tract length shall be 20 feet from right-of-way line. Radial apron shall have 10-foot radii.
 - (2) Minimum tract width in rural areas shall be 20 feet; 30 feet required. Minimum tract length shall be 20 feet from right-of-way line. Radial returns on paved apron shall have 10-foot radii.
 - (3) Driving surface (rural areas) shall be 18 feet, paved or gravel, from the edge of pavement of intersecting street to the edge of the tract.
 - (4) The Reviewing Agency may allow use of an easement if the driveway roadway is through an adjacent parcel not owned by the applicant to satisfy residential short plats to satisfy minimum lot width requirements.
 - b. Driveways may utilize full width of narrow "pipe-stem" parcels subject to approval by Reviewing Agency.
 - c. On cul-de-sac bulbs as necessary for proposed residential access.
 4. Grade transitions, excluding the tie to the roadway, shall be constructed with smooth curves. Ties to the roadway shall be constructed as shown in Drawings. Maximum change in driveway grade, within the right-of-way, shall be 8% over a distance on a crest and 12% within any 10 feet of distance in a sag valley. Driveways shall be graded to match into possible future widened road section with a 4-foot graded shoulder or sidewalk. The design engineer for proposed development shall provide access driveway profile when designing the serving road to ensure that grade transitions can be complied with considering building set back and lot width requirements.
 5. Driveways in rolled curb sections may be constructed abutting and flush with the edge of curb without gapping or lowering height of curb.
- D. Existing driveways may be reconstructed as they exist provided such reconstruction is consistent with the adjacent road.
- E. For commercial or industrial driveways with heavy traffic volumes or significant driveway use, the Reviewing Agency may require construction of the access as a road intersection.

ll be based on traffic engineering analysis submitted by the applicant that considers, factors, intersection spacing, sight distance and traffic volumes.

g any other provisions, driveways will not be allowed where they are prohibited by y Council action or where they are determined by the Engineer or Reviewing Agency to d or impede the operation of traffic on the roadway.

red on urban category, curb and gutter type streets as follows:

arterials, neighborhood collectors, subcollectors, multiple-dwelling and business streets, both sides.

ccess streets and industrial access streets, one side.

r access streets (commercial), both sides unless alternative routes are provided for ans.

r access streets (residential) exceeding 150 feet and on any cul-de-sacs with et walkways extending from their termini to other streets, parks, schools, bus stops, r pedestrian traffic generators, one side. On cul-de-sacs, sidewalks shall extend ouble to intersect off-street walkway. Other extended off-street walkways may be d by the Reviewing Agency to provide direct connections for ease and safety of ans.

structed:

the curb unless planting strips are part of the design and are approved by the r as part of a landscaping plan.

planting strips where planting strips are to be constructed.

t five feet wide on residential and commercial access streets. This means five feet f mailboxes or other obstructions, except where approved as a variance. Width shall be six and one-half feet on arterials if curb is next to traveled lane (but not necessary designated parking or bike lanes). The additional width, one and one-half feet or ay be finished to match the sidewalk or may be finished with contrasting texture, concrete, brick, or paving blocks as approved by the Reviewing Agency or Engineer.

t eight feet wide:

n business/commercial districts where most of the store frontage is within 80 feet of ne street right-of-way.

- b. Within the curb radius returns of all arterial intersections when required.
 - c. Within designated bus zones to provide a landing area for wheel chair services.
- 5. With specified width greater than eight feet where Engineer or Reviewing Agency determines this is warranted by expected pedestrian traffic volume.
 - 6. With portland cement concrete surfacing as provided in Sections 3.03 and 3.04 and specifications for joints in Section 3.04 and Drawing No. 3-001.

3.03 Curbs, Gutters and Sidewalks

- A. Subgrade compaction for curbs, gutters, and sidewalks shall meet a minimum 90% density.
- B. Concrete for curbs, gutters, and sidewalks shall be Class 3000, furnished and placed in accordance with WSDOT/APWA Standard Specifications, Sections 6-02, 8-04, and 8-14. Cold joints shall be set forth in WSDOT/APWA Standard Specifications Sections 5-05.3(14) and 6-02.
- C. Extruded cement concrete curb shall be anchored to existing pavement by either adhesive in conformance with WSDOT/APWA Standard Specification Section 8-04.
- D. Extruded asphalt curbs shall be anchored by means of a tack coat of asphalt in accordance with WSDOT/APWA Standard Specification Section 8-04.

3.04 Expansion and Dummy Joints. See Drawing No. 3-001.

- A. An expansion joint consisting of 3/8" or 1/4" x full depth of premolded joint material shall be placed around fire hydrants, poles, posts, and utility castings and along walls of paved areas. Joint material shall conform to the requirements of ASTM D994 (Type I).
- B. A dummy joint consisting of 3/8" or 1/4" x 2" of premolded joint material shall be placed in curbs and sidewalks at a minimum of 15 foot intervals and at sides of drainage inlets. If dummy joints in sidewalks are placed by slip-forming, a premolded strip up to 1/2" thick and 1/4" wide shall be used.
- C. Dummy joints in sidewalk shall be located so as to match the joints in the curb or adjacent to curb or separated by planting strip.
- D. Tool marks consisting of 1/4" V-grooves shall be made in sidewalk at five foot intervals intermediate to the dummy joints.

e to expansion joints around structures, reinforcing bars may be embedded in concrete of structures.

ween curb and adjacent sidewalk on integral pour construction shall be formed with 1/4" tool. On separate pour construction an expansion joint consisting of 3/8" or 1/4" x premolded joint material shall be placed between the curb or thickened edge and the walk.

vertical or rolled curb, ramped sections to facilitate passage of handicapped persons through curb and sidewalk at street intersections and other crosswalk locations. See and 4-003. Where a ramp is constructed on one side of the street, a ramp shall also be on the opposite side of the street. Curb ramps shall be positioned so that a ramp opening is not in a marked crosswalk or crossing area if unmarked.

Handrail and Handicapped Access Ramps

Handicapped ramps shall only be used where acceptable alternative access is available for handicapped access and not used for a separate stairway. Where used, concrete steps shall be constructed in accordance with Drawing No. 5-008 or other design acceptable to the Engineer or Reviewing Agency and in accordance with the WSDOT/APWA Standard Specifications. Handrails, whether for steps or other ramps, shall be provided consistent with Drawing No. 5-008 and the WSDOT/APWA Standard Specifications.

Ramps to provide handicapped access shall have a maximum slope of 12:1 with a maximum rise of 6 inches between landings. Landings shall have a minimum length of five feet and should be of sufficient width to allow wheelchairs to pass, generally five feet minimum width for two way ramps.

Asphalt paved shoulders may be used where approved by the Engineer or Reviewing Agency on existing roads to provide for bicycle and pedestrian use as specified in Section 1.03B and in accordance with the continuity of design. When allowed, paved shoulders shall be placed in conformance with Section 2.03.

Asphalt paved shoulders which may serve as walkways and bikeways, shall be provided on all sides of any arterials or other roads designated in the King County Nonmotorized Transportation Plan or as directed by the Engineer or Reviewing Agency.

If shoulders are paved on one side only, they shall be delineated by a four-inch white edge line.

3.08 Separated Walkways, Bikeways and Trails

Separated pedestrian, bicycle and equestrian trails shall be provided where designated in functional plans or where required by the Engineer or Reviewing Agency because of public usage. Separated facilities are typically located on an easement or within a right-of-way separated from the roadway by a drainage ditch or barrier. Where separate walkways, bicycle paths or equestrian trails intersect with motorized traffic, sight distance, marking and signage (where warranted) shall be as provided in MUTCD. Facilities shall be designed as follows:

- A. Separated asphalt walkways are designed primarily for pedestrians and are typically located within the right-of-way or easement. Minimum width shall be five feet with asphalt paving. See Section 4.01D.
- B. Neighborhood pathways are soft surface facilities designed for pedestrians and bicycles. Pathways shall be a minimum four feet wide with at least one and one-half foot curb or other obstruction on both sides and 10 foot vertical clearance. Pathways shall be constructed so as to avoid drainage and erosion problems. Pathways shall be constructed with a minimum of two inches of crushed surfacing top course or wood chips over cleared native material. See Reviewing Agency.
- C. Multi-purpose trails are typically designated for bicycle and pedestrian use and are located in a right-of-way independent from any road. Multi-purpose trails shall be designed to meet the standards as described in Section 3.10.

3.09 School Access

School access required as part of development approval shall be provided by an asphalt sidewalk or full width delineated shoulder unless another alternative is available. See Reviewing Agency through a road variance request.

3.10 Bikeways

- A. Bikeways are generally shared with other transportation modes, although they are typically designated exclusively for bicycle use. Bikeways are categorized below based on degree of separation from motor vehicles and other transportation modes. This classification does not indicate one type over another. Bikeways are categorized as follows:

Bike Path (Class I): A separate paved multipurpose trail for the principal use by pedestrians and other nonmotorized modes. Bike paths are 10 feet wide except in high traffic areas where they should be 12 feet wide.

Bike Lane (Class II): A portion of the road that is designated by pavement markings for exclusive bicycle use. Bicycle lanes may be signed as part of a directional route. Minimum lane widths are five feet wide on a curbed road and minimum four feet wide as otherwise specified.

(Class III): A road that provides a widened paved outer curb lane to accommodate in the same lane as motor vehicles. Lane width shall be increased at least three

ane contiguous to the traveled way but separated by a stripe. Most common in rural Typically shared with pedestrians and occasional emergency vehicle access.

: All roads not categorized above where bicycles share the roadway with motor

l be provided:

r called for in the Nonmotorized Transportation Plan, King County Transportation Plan, County Comprehensive Plan, community plan, Capital Improvement Program or Transportation report.

stantial bike usage is expected which would benefit from construction of a bicycle

signing shall be implemented as follows:

markings shall be used on bike lanes and paths according to MUTCD.

ign of all signalized intersections shall consider bicycle usage and the need for
sts to actuate the signal.

and design of bikeways in any category shall be in accordance with Section 1020 of the Manual and the AASHTO Guide for the Development of Bicycle Facilities, current edition.

es

ilities adjacent to the traveled way shall be provided where proposed by the King
orized Transportation Plan or as required by the Engineer or Reviewing Agency.

all be provided as follows:

rs adjacent to the traveled way intended for equestrian use shall be surfaced
th, minimum four feet with eight feet desirable. Surface shall be two and one-half
of crushed surfacing base course and one and one-half inches of crushed surfacing top

2. A separated equestrian trail shall be constructed with an 18 percent maximum vertical clearance and a five-foot wide pathway zone. The trail shall be constructed on native soil or, where drainage or erosion problems are present, a minimum of 4 inches of crushed surfacing top course on graded and compacted native soil. If the native soil is not free draining shall be removed and replaced with free draining soil to provide a maintainable and well-drained subgrade. Additional crushed surfacing or other stabilizing materials shall be required if heavy usage is anticipated or if there is evidence of instability in the subgrade; including free water, swamp conditions, or organic soils, slides or uneven trails.

CHAPTER 4. SURFACING

Pedestrian and Bike: The minimum paved section, with alternative combinations of residential streets, shoulders, sidewalks and bikeways shall be as indicated below. These are applicable only on visually good, well-drained, stable compacted subgrade. Any proposed materials will be subject to soils strength testing and traffic loading analysis and approval by the Engineer as outlined in Section 4.02 below. All expenses for materials shall be borne by the Developer.

	ASPHALT CONCRETE	ASPHALT TREATED BASE	BITUMINOUS SURFACE TREATMENT	CRUSHED SURF. TOP COURSE	CRUSHED SURF. BASE COURSE	PORTLAND CEMENT CONCRETE
STREETS	2" (3"*)	4"				
	2" (3"*)			1½"		.5"
al areas, and designated tion districts steeper than			Class A	1½"		.5"
						Class 4000, 7" (8"*)
l minor				1½"		2½"
llectors	2" (3"*)	4"				
	2" (3"*)			1½"		2½"
			Class A	1½"		2½"
				1½"		2½"
behind						Class 3000, 4"

TYPE OF FACILITIES	ASPHALT CONCRETE	ASPHALT TREATED BASE	BITUMINOUS SURFACE TREATMENT	CRUSHED SURF. TOP COURSE	CR SU CO
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Alternative II
(Mandatory behind rolled
curb)

D. WALKWAYS & BIKEWAYS

Alternative I	2"			1½"	
Alternative II	3½"				
Alternative III			Class A	1½"	
Alternative IV					
Alternative V	(may be used as shown on Dwg. No. 1-005 and 1-006 or where approved by Reviewing Agency).				2"

When a walkway or bikeway is incorporated into a road shoulder, the required shoulder strength, shall govern. Subgrade compaction for bikeways and paved walkways shall be 95 percent maximum density.

E. DRIVEWAYS may be surfaced as desired by the owner, except:

1. On curbed streets with sidewalks, driveway shall be paved with portland cement concrete from curb to back edge of sidewalk. See Drawings No. 3-004 and 3-005.
2. On shoulder and ditch section, driveway between edge of pavement and right-of-way shall be surfaced as required by Drawing No. 3-003.
3. On thickened edge roadways with underground utilities, portland cement concrete driveways between the thickened edge and the right-of-way line provided that they are installed at the right-of-way line.

F. STREET WIDENING/ADDING TRAVELED WAY TO EXISTING ROADS

1. When an existing asphalt paved street is to be widened, the edge of pavement shall provide a clean, vertical edge for joining to the new asphalt. After placement of the new section, the joint shall be sealed and the street overlaid one inch, plus a 1/4 inch width throughout the widened area. The requirement for overlay may be waived by the Reviewing Agency based on the condition of existing pavement and the extent of channelization.

ing shoulder is to become part of a proposed traveled way a pavement evaluation shall
This evaluation shall analyze the structural capacity and determine any need for
Designs based on these evaluations are subject to review and approval by the Engineer
Agency. The responsibility for any shoulder material thickness improvement shall be
rt of the requirement for roadway widening. The shoulder shall be replaced in width as
Sections 2.02, 2.03 and 2.04.

of an existing roadway, either to add traveled way or paved shoulder shall have the
g material as the existing roadway.

Residential Streets on Poor Subgrade

l thicknesses indicated in Section 4.01 are not acceptable if there is any evidence of
subgrade. This includes free water, swamp conditions, fine-grained or organic soil,
ttlement. If there are any of these characteristics, the soil shall be sampled and
to establish a pavement design that will support the proposed construction. Any
ding an R value of less than 55 or a CBR of less than 20, shall be fully considered in
al measures may include, but are not limited to, a stronger paved section, a
bgrade by adding or substituting fractured aggregate, asphalt treated base, installing
extensive drainage or a combination of such measures. Both the soils test report and
ent design will be subject to review and approval by the Engineer or Reviewing Agency.

Commercial Access Streets

aterials and commercial access streets shall be designed using currently accepted
nsiders the load bearing capacity of the soils and the traffic-carrying requirements of
shall be accompanied by a pavement thickness design based on soil strength parameters
ield tests and traffic loading analyses. The analysis shall include the traffic volume
he type and thickness of roadway materials and the recommended method of placement.
hall not be less than those required for neighborhood collectors.

Construction Procedures: Shall be in accordance with WSDOT/APWA Standard Specifications and the
nts:

cing top and base courses may be substituted for a structurally equivalent thickness of
stitution ratio of crushed surfacing to ATB shall be 1.6:1. Where base or top courses
ced without possible contamination, then these courses shall be substituted by ATB.

ing activities utility covers in roadway shall be adjusted in accordance with Section

ed over isolated areas of unstable subgrade, providing the final lift of asphalt shall
for a minimum of six months to allow time for the observation and repair of failures
de and ATB.

D. Asphalt pavers shall be self contained, power propelled units. Truck mounted considered self propelled. Truck mounted pavers shall only be used for paving or minor areas as approved by the Engineer, or as follows:

1. pavement widths less than eight feet; and
2. pavement lengths less than 150 feet.

4.05 Pavement Markings, Markers, and Pavement Tapers

Pavement markings, markers or striping shall be used to delineate channelization, and longitudinal lines to control or guide traffic. Channelization plans or cross-sections shall be approved by the Traffic Engineer.

Channelization shall be required when through traffic is diverted around a lane or connecting full width streets with different cross sections; and when extending a new cross section different than the existing one. The channelization shall provide a length to the posted speed limit times the distance in feet of diversion from the original alignment of travel, or the offset distance, as applicable. Channelization shall be required to redirect traffic back to their original alignment.

Left turn channelization shall include a minimum of 150 feet of full width lane to reverse curve 90 feet in length for posted speeds up to 45 mph. The reverse curve length for posted speeds greater than 45 mph. The reverse curve may be included with a distance. A deceleration taper as shown in the WSDOT/APWA Standard Plans may be used with the reverse curve. Standard left turn lanes shall be 12 feet wide. Type 2L arrows shall be placed in the lane 25 feet and 100 feet behind the stop bar, crosswalk or stopping area. Additional markings shall be required for long vehicles or anticipated left turn queues longer than the minimum.

Centerline for channelization shall consist of two four-inch yellow lines with a four-inch Type 2d lane markers shall be installed at 40 foot centers between the lines. Hold lines for additional lanes shall be eight-inch white lines with Type 2e lane marker on the inside at 40 foot centers. Edgelines for tapering thru traffic back to the original alignment shall be four-inch white lines.

Pavement markings for channelization shall be reflectorized hot or cold applied plastic. Unsprayed markings shall be dressed with glass beads for initial reflectance. All markings shall have glass beads throughout the material to maintain reflectance while the material wears.

Where pavement widening less than 300 feet in length is abruptly ended and edge lines are used to guide traffic to through lanes, Type 2e lane markers shall be installed at 10 foot centers along the paved area at a 10:1 taper.

installed at all intersections controlled by traffic signals and other areas approved by the Traffic Engineer. Crosswalks shall consist of sets of longitudinal lines eight inches wide by 10-foot separation. A set of these lines shall be installed between each lane, between each lane and at the pavement edges.

Signs shall be laid out with spray paint and approved by the Traffic Engineer before they are installed. The Traffic Engineer's approval may require a three working day advance notice to have field lay-out approved by the Traffic Engineer or to make arrangements to meet the Traffic Engineer on site during the installation.

5.01 Rock Facings

A. Rock facings may be used for the protection of cut or fill embankments up to eight feet above the keyway in stable soil conditions which will result in no settlement or outward thrust upon the walls. See Drawing Nos. 5-004 through over eight feet above the keyway or when soil is unstable, a structural wall shall be used. As an exception, rock facing heights may exceed eight feet on favorable soils analyses and a design by a geotechnical engineer or other qualified in rock wall design, subject to approval by the Engineer. Terracing to approval by the Engineer.

B. Materials

1. Size categories shall include:

Two-man rocks (200 to 700 pounds), 18"-28" in average dimension;

Three-man rocks (701 to 2000 pounds), 28-36" in average dimension

Four-man rocks (2001 to 4000 pounds), 36-48" in average dimension

Four-man rocks shall be used for bottom course rock in all rock facings height.

2. The rock material shall be as nearly rectangular as possible. No stone does not extend through the wall. The quarried trap rock shall be hard free from weathered portions, seams, cracks and other defects. The rock minimum of 160 pounds per cubic foot, measured according to WSDOT Test Specific Gravity - S.S.D. basis). Additionally, rock subjected to the Engineers Test Method CRD-C-148 ("Method of Testing Stone for Expansive in Ethylene Glycol") must have less than 15 percent breakdown.

C. Keyway

A keyway consisting of a shallow trench of minimum 12-inch depth shall be con rockery length, and slightly inclined towards the face being protected. It s full rockery width including the rock filter layer. The keyway subgrade shall acceptable to the engineer. See Drawing No. 5-004.

D. Underdrains

1. A minimum six-inch diameter perforated or slotted drain pipe shall be p excavated trench located along the inside edge of the keyway. The pipe surrounded by "Gravel Backfill for Drains" (WSDOT/APWA 9-03.12(4)) to a

above bottom of pipe. A filter fabric shall surround the gravel backfill and shall have a minimum one-foot overlap along the top surface of the gravel. This requirement for filter fabric may be waived by the Engineer if shown that soils and water conditions make it unnecessary. See Drawing Nos. 5-004 through 5-006.

Perforated pipe shall be connected to the storm drain system or to an acceptable outfall.

Construction and Placement: Rock selection and placement shall be such that there will be minimum voids on the exposed face, no open voids over six inches across in any direction. The final rock surface shall have a continuous appearance and be placed to minimize erosion of the backfill. The larger rocks shall be placed at the base of the facing so that it will be stable and have a continuous appearance. The rocks shall be placed in a manner such that the longitudinal axis of the rocks shall be at right angles to the face. The rocks shall have all inclined faces sloping toward the facing. Each course of rocks shall be seated as tightly and evenly as possible on the surface beneath. The rocks shall be placed so that there are no continuous joint planes either horizontally or vertically. After setting each course of rock, all voids between the rocks shall be filled back with quarry rock to eliminate any void sufficient to pass a two-inch square opening. See Drawing Nos. 5-004 through 5-006.

Backfill Layers: The rock filter layer shall consist of quarry spalls with a maximum size of 12 inches and a minimum size of two inches. This material shall be placed to a 12-inch minimum thickness between the entire facing and the cut or fill material. The backfill material shall be placed up to an elevation approximately six inches below the top of each course of rocks as they are set, until the uppermost course is placed. Any backfill material on the bearing surface of the rock course shall be removed before setting the next course.

Facing Supporting Roadway Embankment: Embankment behind rockeries exceeding four feet above the keyway shall be reinforced with a geosynthetic fabric or geogrid specifically designed for soil reinforcement, designed on a project specific basis by a qualified engineer. See Drawing No. 5-007.

Protective Rockery Facings: When a sidewalk is to be built over a rock facing, the top of the rock shall be sealed and leveled with a cap constructed of cement concrete Class 3000 in accordance with the applicable provisions of Section 6-02 of the WSDOT/APWA Standard Specifications, with a maximum free water content resulting in slump of not over two inches. See Drawing No. 5-006.

Handrails

A concrete or metal handrail shall be installed when rockery is three feet or greater in height. See Drawing Nos. 5-004 through 5-006 and 5-008)

5.02 Side Slopes

- A. Side slopes shall generally be constructed no steeper than 2:1 on both fill and cut. Steeper slopes may be approved by the Engineer upon showing that the steeper slopes, based on geotechnical analyses, will be stable. Side slopes on projects funded by federal grants shall conform with Local Agency Guidelines.
- B. Side slopes shall be stabilized by grass sod or seeding or by other planting methods acceptable to the Engineer.

5.03 Street Trees & Landscaping

- A. Street trees and landscaping should be incorporated into the design of road projects of all classifications of roads. Such landscaping in the right-of-way shall be coordinated with the landscaping required on developer's property under the provisions of King County Code 22.05.010.
- B. Planting strips are optional along all classifications of roads and may be required to meet landscape mitigation requirements established during the SEPA review process. If planting strips are required, they must be approved by the Engineer and must include a landscape maintenance plan. Maintenance, utilities and traffic safety requirements are discussed in Section 5.03.02.
- C. Existing trees and landscaping shall be preserved where desirable and placement shall be compatible with other features of the environment. In particular, maximum height shall not conflict unduly with overhead utilities, or root development with underground utilities. If street trees are planted, they shall conform reasonably to standards in King County Code 22.05.010.
- D. New trees shall not include poplar, cottonwood, soft maples, gum, any fruit bearing tree or shrub whose roots are likely to obstruct sanitary or storm sewer lines. See King County Code 13.04.230.
- E. Street tree plans on bus routes shall be reviewed by Metro Service Planning, King County Department of Transportation.

5.04 Mail Boxes

- A. The responsibilities for location and installation of mailboxes in connection with the reconstruction of County roads are as follows:
 - 1. County Road Engineer or his representative will:
 - a. Require road improvement plans, whether for construction by the Department of Public Works or by a private builder, to show clearly the designated location of mailboxes, whether single or in clusters.

quire with this information any necessary widening or reconfiguration of sidewalks
th suitable knock-outs or open strips for mailbox posts or pedestal.

quire these plans to bear a statement on the first sheet that mailbox locations as
own on these plans have been coordinated with the serving post office at
ity/Community), Washington. This will be a prerequisite to plan approval.

quire construction of mailbox locations in accordance with these plans, through usual
pection and enforcement procedures.

Postmaster or designated serving post office will:

esignate location and manner of grouping of mailboxes when so requested by the design
gency. Note on the plans the type of mailbox delivery: NDCBU (Neighborhood Delivery
d Collection Box Unit), or Rural type box. Authenticate by stamp or signature when
ese data have been correctly incorporated into the plans.

o all necessary coordination with owners or residents involved to secure agreement as
o mailbox location and to instruct them regarding mailbox installation. Actually
install or relocate NDCBU's if these are the type of box to be used in the neighborhood.

or residents served by mailboxes, at time of original installation, will:

f using individual mailboxes, clustered or separate, install and thereafter maintain
heir own mailboxes as instructed by the post office.

f NDCBU delivery, rely on Post Office to provide and maintain NDCBU's.

s or their contractors shall:

here there are existing mailboxes and no plans to replace them with NDCBU's:

hen it becomes necessary to remove or otherwise disturb existing mailboxes within the
imits of any project, install the boxes temporarily in such a position that their
unction will not be impaired. After construction work has been completed, reinstall
oxes at original locations or at new approved locations as indicated on the plans or as
irected by the Engineer or Reviewing Agency. Use only existing posts or materials
xcept that any damage caused by the builder or his contractor is to be repaired at the
xpense of the builder.

here there are existing NDCBU's or plans to install NDCBU's:

call on Seattle Postmaster or designated serving post office to locate or relocate
NDCBU's and make the necessary installation.

B. Installation methods are as follows:

1. Mailboxes, in the general case, shall be set in accordance with Drawing Boxes shall be clustered together when practical and when reasonably served.
2. NDCBU's will be installed by the Postal Service generally in accordance 012.

5.05 Street Illumination

Continuous illumination will be required for channelization accommodating additional tapers. Illumination will also be required as identifiers where roads intersect and frequently used pedestrian areas on arterials.

Widening of arterials with existing continuous illumination will require maintaining illumination. Widening to the ultimate roadway width will require illumination design construction practices.

Illumination intensity and uniformity shall conform with current King County design fixtures shall be consistent with fixtures maintained by the local electrical utility.

5.06 Survey Monuments

- A. All existing survey monuments which are disturbed, lost, or destroyed during shall be replaced by a land surveyor registered in the State of Washington at responsible builder or developer.
- B. Survey monuments shall be placed or replaced in accordance with recognized ge surveying, and in conformance with Drawings No. 5-014 and 5-015.

5.07 Roadway Barricades

Temporary and permanent barricades shall conform to the standards described in Section on Uniform Traffic Control Devices (MUTCD) and Drawing No. 5-003.

- A. Type I or Type II barricades may be used when traffic is maintained through t constructed/reconstructed.
- B. Type III barricades may be used when roadways and/or proposed future roadways Type III barricades may extend completely across a roadway (as a fence) or fr provision must be made for access of equipment and authorized vehicles, the T be provided with movable sections that can be closed when work is not in prog

will discourage public entry. Where job site access is provided through the Type III the developer/contractor shall assure proper closure at the end of each working day.

In case, Type III permanent barricades shall be installed to close arterials or other streets hazardous to traffic. They shall also be used to close off lanes where tapers are properly delineated.

Barricades shall be used at the end of a local access street terminating abruptly without a shoulder or on temporarily stubbed off streets. Each such barricade shall be used together with a reflective traffic cone and a reflective f-road marker.

Any motor vehicle access to an easement, tract, or trail, except for maintenance or utility access, at the point of access shall be closed by a line of bollards. These shall include one or two bollards on each side of the traveled way and removable, locking bollards across the traveled way. On trails provide one bollard on centerline of trail and other bollards spaced at minimum 50 feet. On trails 10 feet wide or less. Spacing shall be 60 inches on center on trails wider than 10 feet. Bollard design shall be in accordance with Drawing No. 5-013 or other design acceptable to the reviewing Agency. No fire apparatus access roads shall be blocked in this manner without the approval of the Fire Marshal. Bollards shall be located at least 10 feet laterally from the paved edge of the road.

Guardrail Heights

Guardrail heights shall conform to WSDOT/APWA Standard Plan C-1, Beam Guardrail Type 1 and C-2, and end anchors shall conform to WSDOT/APWA Standard Plan C-6, Beam Guardrail Anchor.

Dimensions for guardrail installations shall be in accordance with Figure 710-6 of the Standard Plans.

Parking Spaces

Street parking spaces required shall conform to King County Code Title 21.50. The dimensions for off-street parking spaces shall be as provided in King County Code Title 16.74 and the Standard Plan entitled "King County Specifications for Off-Street Parking, 1982," as updated.

Breakaway structures, including rockeries and retaining walls, which may be potential hazards to the traveling public shall be placed with due regard to safety. On roads with a shoulder or on roads with hazardous objects shall be placed as close to the right-of-way line as practicable and a minimum of 10 feet from the edge of the traveled way or auxiliary lane. On urban roads with a vertical

curb section, hazardous objects shall be placed as far from the edge of the traveled way practical. Such an object shall not be placed in a sidewalk or with the object edge nearer than eight and one-half feet from the face of the curb in business areas or five and one-half feet from the face of the curb in residential areas. Placement of any utility structures shall be in accordance with Chapter 8, to include constraints on placement of poles on the outside of curves.

CHAPTER 6. BRIDGES

below, King County bridges, whether on public roads or on private roads serving all be designed and constructed to meet the minimum requirements set forth in the including all interim addenda, of "Standard Specifications for Highway Bridges," adopted in accordance with the requirements of WSDOT/APWA Standard Specifications. Bridge and shall be provided in accordance with those references or with WSDOT/APWA Standard Plans. All be designed to carry an AASHTO HS 20-44 live load or greater. All bridge work shall 21.54 regarding Special Control Areas and Flood Hazard Areas for stream and wetland ding concerns.

In all case, the bridge shall comprise the full width and configuration of the road being traveled way plus curb, sidewalks, walkway, bike lane, equestrian lane and/or shoulder on sides. Requirements of utilities shall be duly considered. Bridge roadway width shall be between curbs or between faces of rails, whichever is less, but in no case shall be less

When speed is 35 MPH or higher and significant pedestrian, bike and/or horseback traffic is present, the Engineer may require that the lanes for these other modes of traffic be separated from motor vehicle traffic by use of a bridge traffic rail and further protected by a rail. On designated bike routes, combination traffic and bicycle railings shall be used.

Bridge railings shall be made structurally continuous with bridge railings and shall meet AASHTO standards as cited in Section 6.01 above.

Minimum vertical clearances for motor traffic on the traveled way or under overpasses shall be 16.5 feet. Vertical clearance of structures above a walkway or sidewalk shall be eight feet and shall be 10 feet on designated equestrian routes.

Minimum bridge clearance above streams shall be as required by the Surface Water Design

Criteria

Reinforcement will be required for all bridges and new bridge plans shall provide pavement seats and slabs unless otherwise approved by the Engineer. Waiver or modification of the approach slabs will be considered only on the basis of adequate geotechnical data. Approach slabs shall be constructed in accordance with WSDOT/APWA Standard Plan A-2.

- B. New bridge decks and approach slabs shall be designed with a protective system of the reinforcing steel.
- C. Criteria under other recognized road and bridge project classifications, such as projects, set forth in WSDOT Local Agency Guidelines, may be applied under conditions appropriate by the Engineer.
- D. The design of bridge expansion joints shall consider the presence of bicycle traffic.

6.04 Special Permits

Permit requirements for construction or reconstruction of bridges include but are not limited to the following:

- A. Bridges over navigable waters require U. S. Coast Guard permits.
- B. Bridges involving deposition of material in waters of the United States or the District of Columbia require a U. S. Army Corps of Engineers Permit.
- C. Any work involving alteration of flow or bed materials below the ordinary high water body or water course requires a Hydraulic Project approval from the State Department of Fisheries or the State Department of Wildlife.
- D. Any work within waters of the State requires a Water Quality Certification Waiver from the State Department of Ecology.
- E. Where bridge structures lie on or over submerged lands a lease from the Washington Department of Natural Resources may be necessary.
- F. Structures located on shoreline zones as defined in King County Code Title 25 require a development permit from the King County Department of Development and Environment subject to concurrence of the State Department of Ecology.
- G. Bridges over waterways require the Engineer's approval of the size and shape of the opening, the height of the superstructure over high water, the location of pile caps, and other hydraulic considerations.

CHAPTER 7. DRAINAGE

Drainage facilities shall be designed consistent with King County Code 9.04 and the King County Surface Water Design Manual, latest edition. Structures shall be placed and constructed as shown on Standard Drawings.

Materials, construction, and testing are specified in the WSDOT/APWA Standard Specifications. The Engineer may amend, delete, or add specifications or Standard Drawings.

Where technical conflicts may occur between this document and the Surface Water Design Manual, the Engineer shall decide which document governs.

Standards shall only apply in design of drainage ditches not requiring drainage review under the Surface Water Design Manual.

For grades up to 6 percent, grass lined ditches with grasses as specified in 7.02D shall be used for erosion control. These ditches shall be designed and constructed in accordance with Standard Specifications 1-001, 1-004 and 1-007. If grass cannot be readily established by usual seeding methods such as sodding or seeding with slope mat protections shall be used as alternatives. For grades between 3 percent and 6 percent, grass lining alone may not be sufficient to prevent erosion. Preferred methods to further reduce potential erosion problems include the use of wider ditch sections. Rock-lined ditches shall be avoided whenever possible.

For grades over 6 percent and not over 9 percent, the Engineer may direct use of a standard ditch or alternatively a closed (pipe) drainage system under a paved shoulder with or without a turnpike shoulder. As an exception, cul-de-sacs with over 6 percent grade shall be designed with pipe drainage and not with rock-lined ditches.

Standard rock lining shall be in accordance with the Surface Water Design Manual and Section 9-13.6 of the WSDOT/APWA Standard Specifications. Rock gradation shall be as follows:

Passing 8-inch square sieve	100 percent
Passing 3-inch square sieve	40 percent max.
Passing 3/4-inch square sieve	10 percent max.

Rocks shall be placed so as to form a firm, dense, protective mat consistent with examples in Standard Specifications No. 2-024 and conforming to the design surface of the ditch. Individual rocks shall not protrude more than three inches from that surface.

- C. Where the grade exceeds 9 percent either pipe drainage or a special rock-lined pipe shall be provided unless otherwise approved by the Engineer. The special rock-lined pipe shall be designed by a professional engineer, based on soils and hydraulic analyses. Design shall include pipe sizing, together with filter rock gradations and/or filter fabric, and be submitted to the Engineer.
- D. Grass seed mixture by weight may be 10 percent Colonial bentgrass, 40 percent tall fescue, 10% White clover, hydroseed at 120 lbs./acre, handseed at 3 lbs./1,000 square feet. In areas with high groundwater, the following species may be substituted or added: Meadow fescue, Timothy, or Redtop.

7.03 Storm Sewers and Culverts

- A. Minimum pipe size shall be 12-inch diameter. Eight-inch diameter may be permitted for laterals less than 66 feet long to avoid utility conflict or meet shallow grade requirements.
- B. Where the time of concentration creating the greatest flow is less than 15 minutes and the pipe predominately serves the road, determine flow rates using the rational formula.
- C. Driveway culverts shall conform to Drawing No. 3-003.
- D. The following pipes, specified in Section 9-05 of the WSDOT/APWA Standard Specifications, are allowed: plain and reinforced concrete storm sewer pipe, aluminized Type 2 corrugated metal with spiral rib and corrugated steel with asphalt coating Type 1, spiral rib and corrugated ductile iron, polyvinyl chloride (PVC), lined corrugated polyethylene (LCPE) and smooth-walled polyethylene (SWPE) pipe.
- E. LCPE pipe shall have a smooth interior wall meeting or exceeding Type III, Class C per ASTM D1248, minimum cell Class ASTM D3350, 324420C. SWPE pipe shall exceed the requirements of AASHTO M294, Type S. Pipe shall be placed in accordance with the Standard Specifications.
- F. SWPE pipe with maximum SDR of 32.5, minimum cell Class ASTM D3350, 334434C and shall meet the Standard Specifications for ductile iron pipe with restrained mechanical joints may be used on steep slopes.
- G. PVC pipe shall require the use of bedding material for flexible pipe specified in the Standard Specifications.
- H. LCPE and SWPE shall be bedded on gravel backfill for pipe bedding as specified in the Standard Specifications. Above ground installation of SWPE does not require bedding.

SWPE shall be tested using the deflection test procedure described in Section 7-17.3 APWA Standard Specifications. Unless otherwise specified the mandrel for the test shall have a minimum of nine runners equally spaced, a base length equal to or less than the diameter of the pipe, and a diameter no less than 95 percent of the base inside diameter of the pipe which is described as follows:

When controlled inside diameter, PVC and SWPE: $\text{base inside diameter} = \text{average inside pipe inside diameter} - (\text{inside diameter tolerance})^2 + (\text{out of roundness tolerance})^2)^{.5}$.

For 30-inch the above equation simplifies to: $\text{base inside diameter} = \text{nominal diameter} \times$

When controlled outside diameter, LCPE: $\text{base inside diameter} = (\text{average outside diameter} - \text{wall thickness}) - ((\text{outside diameter tolerance})^2 + (12 \text{ percent} \times \text{wall thickness})^2 + (\text{roundness}$

tolerance and tolerances shall be as specified by applicable ASTM standards. Pipe sections and mandrel test shall be replaced except that reshaping SWPE and LCPE sections to meet specifications shall be allowed if the original deformation is less than 20 percent.

Connections shall be rubber gasketed and metal pipe shall be gasketed and securely banded. Leak testing shall be conducted if required by the Engineer.

When the length of a pipe exceeds eight feet or the Engineer questions the pipe selection, then the pipe material must be made by a professional engineer.

Projecting ends of culverts within the right-of-way.

Connections

Manholes shall be spaced no greater than 150 feet for grades less than one percent, 200 feet for grades one and three percent; and 300 feet for grades three percent and greater. Where the tributary road surface exceeds 35 feet, the cross slope exceeds four percent, or the annual rainfall exceeds three and one-half inches, catch basin spacing analysis is required. The analysis must show the depth of water at the edge of the traveled way does not exceed 18 inches and shall not extend more than five feet into the traveled way for the 10-year storm event, using the method prescribed by the rational formula.

Basins, rather than inlets, to collect water from road surfaces, unless approved by the

- C. Connections to pipe systems may be made without placing a catch basin or manhole meeting all of the following conditions:
1. The mainline pipe is 48 inches or greater and at least two times the size of the connecting pipe.
 2. Make connections in accordance with the manufacturer's recommendations. Fabricated tees, wyes and saddles shall be used, except for concrete pipe connections which shall be constructed in accordance with Drawing No. 2-002.
 3. There shall be a catch basin or manhole on the connecting pipe within ten feet of the external wall of the main line. See Drawing No. 2-002.
 4. Offset angle of connecting pipe to mainline, horizontally and vertically shall not exceed 45 degrees.
- D. Connections to an existing system shall avoid directing project runoff through quality/quantity control facilities. Receiving systems may have separate connections, one connecting to quality/quantity facilities and one by-passing them. Connections shall use a bypass system where available.
- E. Use Type 2 catch basins where the depth to the invert of the pipe exceeds five feet.
- F. Manholes may be used in lieu of catch basins if they do not collect surface water.
- G. Roof and yard drains, or other concentrated flow from adjacent property shall be directed to the surface of roadways or sidewalks.
- H. Catch basins or manholes are required when joining differing types of pipes.

7.05 Frames, Grates, and Covers

- A. Unless otherwise specified, use vaned grates with standard frame in the travel lanes and shoulders. Vaned grates shall not be located within cross walks.
- B. At sag vertical curves, or before intersections with a grade 4% or greater, use vaned frames. Where through curb inlets cannot be used, three vaned inlets shall be used, one located at the approximate low point and another on either side at 25 foot intervals, not greater than 0.1 foot above the low point.
- C. Use rolled curb frame and (vaned) grates along rolled curbs and in asphalt travel lanes. See Drawing No. 2-024.

ins that do not collect runoff shall use locking manhole covers. See Drawing No. 2-
g catch basins which no longer collect runoff shall have their frame and grates
solid covers (See Drawing No. 2-015).

in covers and grates shall be locking. Manufacturer as approved by the Engineer.

ay be used when approved by the Engineer. At a minimum slit drains shall have catch
her end unless used as a driveway culvert. The maximum distance between catch basins
drain shall be 50 feet.

ontrol as required in the Surface Water Design Manual.

s shall be constructed of material designed specifically for erosion control. The
posed of rot-proof woven or non-woven polymeric fibers and be free of chemical
g that may reduce permeability. The fabric shall meet the following test requirements:
b tensile strength per ASTM D-1682, minimum 40 lbs puncture strength per ASTM D-751
0 Equivalent Opening Size (EOS) based on U.S. standard sieves.

ion 8.03.

8.01 Franchising Policy and Permit Procedure

- A. Utilities to be located within existing and proposed County road right-of-way in accordance with current franchise and/or permit procedure and in compliance with current standards. In their use of the right-of-way, utilities will be given consideration in carrying requirements of the road which are, namely, to provide safe, efficient passage for motor vehicles, pedestrians, and other transportation uses. Aesthetics shall be given consideration. As a matter of policy, undergrounding of electric utilities will be encouraged, particularly in urban development. Also, utilities are subject to standards relating to drainage, erosion/sedimentation control and sensitive areas as set forth in Section 21.54 and the Surface Water Design Manual.
- B. All permits for new placement and replacement of existing utility poles and structures above grade shall be accompanied by written certification from a professional engineer or agent authorized by the utility to certify that the installations conform to standards and that the proposed work is in conformity with sound engineering principles relating to safety.
- C. Requests for exceptions to these Standards will be processed in accordance with procedures as referenced in Section 1.08.

8.02 Standard Utility Locations Within the Right-of-Way

Utilities within the right-of-way on new roads or on roads where existing topography and storm drains are not in conflict, shall be located as shown in typical sections, Drawings 1-006, and as indicated below. Where existing utilities or storm drains are in place, utilities shall conform to these Standards as nearly as practicable and yet be compatible with the existing conditions. Above ground utilities located within intersections shall be placed so as to avoid conflicts with curbs and curb ramps.

- A. Gas and Water Lines:
 - 1. Shoulder-and-Ditch Section:
If practical: Outside of ditch line.
Otherwise: In shoulder three feet from edge of traveled lane.
 - 2. Curb and Gutter Section:
Preferable: One and one-half feet back of curb, or at distance which will clear
of street trees if these are present or anticipated.

se: In the street as close to the curb as practical without encroaching on the storm drainage system. Mains and service connections to all lots shall be completed prior to placing of surface materials.

ted Side of Centerline:
outh and West. WATER: North and East.

36 inches minimum cover from finished grade, ditch bottom or natural ground.

ter service lines shall:

ed with minimum 36-inch cover from finished grade, ditch bottom or natural ground.

d right-of-way only as necessary to make side connections.

one connection, not extend more than 60 feet along or through the right-of-way, or the width of the existing right-of-way.

eter boxes, when placed or re-placed, shall be located on the right-of-way line tely adjacent to the property being served, unless otherwise approved by the Engineer. ox locations within the right-of-way may be approved by the Engineer based on site ons which make routine service access difficult or impractical.

rs: In the general case, five feet south and west of centerline; depth 36-inch minimum nished grade, ditch bottom or natural ground.

f individual sanitary sewer service lines which are force mains the pipe shall:

imum two inches I.D., or as required by the utility to maintain internal scouring y.

etallic, contain wire or other acceptable proximity detection features; or be placed in iron or other acceptable metal casing.

ed with minimum three-foot cover from finished grade, ditch bottom or natural ground, 10 degrees of perpendicular to road centerline, and extend to right-of-way line.

ed or bored under road unless otherwise approved by the Engineer.

water lines shall be separated in accordance with good engineering practice such as the Sewage Work Design, Washington Department of Ecology, latest edition.

- F. Gravity systems, whether sanitary or storm drainage, shall have precedence over planning and installation except where a non-gravity system has already been previously approved permit and subject to applicable provisions of such permits
- G. Electric utilities, power, telephone, cable TV: Preferable: Underground with cover, either side of road, at plan location and depth compatible with other drains. Otherwise: Every new placement and every replacement of existing utility structures above grade shall conform to the following:
1. Utility poles or other obstacles may be placed within the right-of-way back from the traveled way or auxiliary lane as practicable.
 - a. On shoulder type roads, poles or obstacles shall be located back in accordance with criteria in Drawing No. 5-001 unless protected by suitable impact attenuating device or placed more than three and one-half feet from face of guardrail, as allowed by an approved variance.
 - b. On vertical curb type roads with a speed limit less than 40 miles per hour, obstacles shall be placed clear of sidewalks and at least eight feet from face of curb in business areas and five and one-half feet from curb in residential areas. On urban roads with a speed limit of 40 miles per hour or more, obstacles shall be placed in accordance with Drawing No. 5-001.
 - c. Notwithstanding the other provisions regarding pole locations and standards, no pole shall be located so that it poses a hazard to traffic. Utilities shall place and replace poles with primary consideration for safety.
 2. The above constraints on pole and obstacle location will not apply to utility poles by moving vehicles, "breakaway" structures whose break-off resistance does not exceed that of a 4" x 4" wood post or a 1-1/2-inch standard (hollow) iron pipe or to "breakaway" poles installed to manufacturer's specifications.
 3. Deviations from these pole and obstacle clearance criteria may be allowed by variance when justified by suitable engineering study considering traffic volume. Utility may request a variance from pole and obstacle clearance criteria. Contiguous damaged or weakened poles may be replaced at existing locations in accordance with emergency procedures, however, sequential permits resulting in replacement of a pole line shall not be allowed. A pole or other obstacle causing repeated damage from errant vehicles shall be relocated or protected.
 4. Locations of poles shall also be compatible with driveways, intersections and other features (i.e., they shall not interfere with sight distances, road signs, etc.)

s, etc.). To the extent possible, utilities shall share facilities so that a minimum of poles is needed.

road uses leave insufficient overhang, anchor, and tree-trimming space for overhead lines, consideration will be given to variance from the Standards or to acquisition of additional easements and/or right-of-way for this purpose. Costs incurred for said acquisition shall be borne by the developer, builder, or other party initiating the road construction. However, the associated cost of relocating the utility shall not be borne by the county.

Under other provisions, underground systems shall be located at least five feet away from the line and where they will not otherwise disturb existing survey monumentation.

Installation

The WSDOT/APWA Standard Specifications, particularly Section 7-17.3(3) will generally apply unless otherwise stated below.

On Existing Traveled Roads

When cutting through existing pavement, the open cut shall be a neat-line cut made by either saw cutting or jackhammering a continuous line. Trench sides shall be kept as nearly vertical as possible. Compaction and restoration must be done as detailed below and immediately after the trench is backfilled, so as to cause least disruption to traffic. Cement concrete pavement shall be cut one foot outside the edge of the trench on each side.

Parallel to road alignment:

All trench backfill under roadway shall be mechanically compacted to 95 percent of maximum density except for trenches over eight feet in depth. Throughout the length of any pipe run, manhole to manhole, in which any part is over eight feet deep, backfill at depths over four feet shall be compacted to 90 percent maximum density by either water settling (see Subsection 8.03C below) or mechanical compaction. The top four feet of the trench line shall then be mechanically compacted to 95 percent. All densities shall be determined by testing specified in Section 2-03.3(14)D of WSDOT/APWA Standard Specifications.

In any trench in which 95 percent density cannot be achieved with existing backfill, the top four feet shall be replaced with gravel base as specified in the WSDOT/APWA Standard Specifications, Section 9-03.10. This new material shall then be mechanically compacted to 95 percent.

Restoration of a trench within an asphalt pavement shall include a minimum of six and one-half inches of crushed surfacing material and asphalt concrete Class B the same

thickness as the existing asphalt pavement or a minimum of two inches greater. Pavement shall then be overlaid full width with a minimum of two inches of compacted asphalt concrete Class B. Any exceptions to this overlay shall be on a case-by-case basis, subject to approval by the Engineer, considering the conditions of the pavement. Concrete pavement shall be restored to meet the requirements of 6-02 of the WSDOT/APWA Standard Specifications. Any concrete pavement affected by the trenching shall have all affected panels replaced.

3. In cuts transverse to road alignment:

- a. In general, utility trenching through existing pavement across the road shall be discouraged. It will not be permitted unless it can be shown that boring or jacking are not possible due to conflicts or soil conditions. A utility can be installed just prior to reconstruction or overlay.
- b. Without exception, the entire trench shall be backfilled with crushed stone course meeting the requirements of Section 9-03.9(3) of the WSDOT Standard Specifications. Backfill shall be placed and compacted mechanically with a County inspector present. If the capability can be demonstrated with compaction equipment or quality of backfill to achieve 95 percent compaction in lifts, the depth of backfill lifts may be increased up to one foot. After compaction, an immediate cold mix patch shall be placed and maintained to a thickness acceptable to the Engineer. On asphalt pavement, a permanent hot mix patch shall be placed and sealed with a paving grade asphalt within 30 days. On concrete pavement shall be restored with an eight-sack mix, using Type III cement, within 30 calendar days.

C. On Proposed Roads (e.g., New Subdivisions): Backfill compaction for trenches on roads not open to public travel may be achieved throughout the entire depth of the trench by mechanical compaction as described in B.2 above, or by the following alternative water settling:

1. Prior to electing to use the water settling method of compaction, a review shall be done to determine suitability of the use of the water method and a plan shall be submitted by a professional engineer. Compaction plan is subject to approval by the Inspection Section.
2. Where water settling of trenches is done, the jetting method shall be used. For trenches eight feet deep the Engineer may direct the backfill to be placed in two lifts, each be jetted separately. Jets shall be inserted at not more than four feet apart throughout the length of the backfilled area and shall be slowly forced down to the bottom of the trench and held until the trench backfill is saturated with water.

tion shall be to the crown of the pipe, to native ground on side slopes, and
ently to each preceding lift. The jetting operations shall be completed as soon as
able after the pipe laying and as part of the backfilling operations.

he water-settled trench has set for several days and the backfill is visibly dry, firm,
bilized, any depression in the trench shall be filled and mounded up over the trench.
l then be further compacted by the use of acceptable vibratory compaction equipment
ng 95 percent of maximum density compaction.

imum size of hose and equipment shall be such as to provide not less than 35 pounds per
inch pressure at the discharge. The jet shall be rigid iron pipe with a minimum inside
r of one inch.

of water will depend upon local conditions. Hydrants or surface water sources shall be
d when such sources of water exist within 700 feet of the operations. Hauled water may
ized when the water settling operation is more than 700 feet from a hydrant.

Density Backfill:

tive to mechanical compaction, trench backfill above the bedding and below the base
may be accomplished by use of controlled density backfill (CDF) in a design mixture
he Engineer. On crossings required to be opened to traffic prior to final trench
steel plates may be used as approved by the Engineer.

ent with the above and prior to placing any surface materials on the roadway, it shall
responsibility of the developer to provide density test reports certified by a
ional engineer. A minimum of one test shall be taken within every 500 feet of trench
and at depths up to 50 percent of trench depth, or as directed by the Engineer.
ion of laterals or service line trenches shall be tested where directed by the
r. Testing of CDF shall be in accordance with ASTM D4832.

er compaction method the installer elects, the backfill below four feet must test to be
s than 90 percent maximum density and the upper four feet of backfill must test not
an 95 percent maximum density. Where this cannot be achieved, all affected backfill in
o four feet shall be removed and replaced by gravel base and mechanically compacted to
ent as in B.2 above.

and Inspection:

ent with Section 9.02 of these Standards, any developers, utilities, or others
ng to trench in existing or proposed traveled County roads shall notify King County

Land Use Inspection or Utility Inspection office not less than one work the work. This notification shall include:

- a. Location of the work
- b. Method of compaction to be used
- c. Day and hour when compaction is to be done
- d. Day and hour when testing is to be done.

Phones are as follows:

King County Land Use Inspection Section	296-6645 (north)
	296-6646 (s)
King County Utility Inspection Section	296-8122

2. As set forth in Section 9.03 of these Standards, failure to notify may retesting by King County at the expense of the Developer or Utility. F may be suspended pending satisfactory test results.

8.04 Final Utility Adjustment (To Finish Grade)

- A. All utility covers which are located on proposed asphalt roadways shall be to subgrade elevation prior to placing crushed surfacing material.
- B. Final adjustment of all covers and access entries shall be made following finishing:
 1. Saw-cutting or neat-line jackhammering of the pavement around lids and not be larger than 12 inches beyond the radius of the cover.
 2. Removing base material, surfacing course, and frame; adding raising brick and cover no higher than finished grade of pavement and no lower than original pavement.
 3. Filling and mechanically compacting around the structure and frame with material or ATB, or pouring in five inch minimum thickness of cement concrete within two inches of the top.
 4. Filling the remaining two inches with asphalt concrete Class B hot mix, to provide a dense, uniform surface.
 5. Final adjustment of all covers and access entries shall be completed with paving.

oration of Surface Drainage and Erosion Control

oration of the road as described above, the responsible utility shall care for adjacent
with Sections 1-04.11 "Final Cleanup" and 8-01 "Roadside Seeding" in the WSDOT/APWA
ions. In particular:

oads shall be cleaned and swept both during and after the installation work.

ls shall be final graded, seeded and mulched after installation of utility. In limited
and mulching by hand, using approved methods, will be acceptable.

ith erodible soil and subject to rapid flows may require seeding, jute matting,
ock lining to control erosion.

f downstream drainage facilities, whether ditches or pipe and catch basins, which
the utility installation shall be cleaned out and the work site restored to a stable
part of site cleanup.

CHAPTER 9. CONSTRUCTION CONTROL AND INSPECTION

9.01 Basis for Control of the Work

- A. Work performed in the construction or improvement of County roads, whether by developer, by County forces, or by County contractor, shall be done in accordance with Standards and approved plans and specifications (Section 1.07). It is emphasized that no work shall be started until such plans are approved. Any revision to such plans shall be approved by the Engineer before being implemented.
- B. The Engineer will have authority to enforce the Standards as well as other rules and specifications. He will appoint project engineers, assistants, and inspectors to inspect the work and they will exercise such authority as the Engineer may direct.
- C. Provisions of Section 1-05 of the WSDOT/APWA Standard Specifications shall apply. The "Engineer" therein construed to be the County Road Engineer as defined in Section 1.01.

9.02 Subdivision, Commercial and Right-Of-Way Land Use Inspection

On all road and drainage facility construction, proposed or in progress, which relate to commercial and right-of-way development, control and inspection will be done by the Land Use Inspection Section, (LUIS), acting for the County Road Engineer. Unless otherwise instructed, all construction events which require monitoring or inspection by LUIS are identified in the following notification to LUIS (telephone 296-6645 (north) and 296-6646 (south)):

- A. Preconstruction Conference: Three working days prior notice. Conference must be held prior to start of construction and include contractor, designing engineer, utilities, and other interested parties. Plan approvals and permits must be in hand prior to the conference.
- B. Clearing and Temporary Erosion/Sedimentation Control: One working day notice prior to start of work involving drainage and installation of temporary water retention/detention structures and erosion control. Such work to be in accordance with Section 7.06 and the approved plans.
- C. Utility and Storm-Drainage Installation: One working day notice prior to start of installation of storm sewers and underground utilities such as sanitary, water, gas, power, etc. See Section 8.03F Notification and Inspection for additional information.
- D. Utility and Storm Drainage Backfill and Compaction: One working day notice prior to start of backfill and compaction of storm sewers and underground utilities.
- E. Subgrade Completion. One working day notice at stage that underground utilities are complete, to include placement of gravel base if required. Inspection and testing of subgrade, backfill, and compaction tests and certifications described in Sections 8.03 and 9.04.

Walk Forming: One working day notice to verify proper forming and preparation prior to concrete placement.

Walk Placement: One working day notice to check placement of concrete.

Compaction Placement: One working day notice to check placement and compaction of crushed aggregate base course and top course.

Three working days notice in advance of paving with asphalt or portland cement concrete.

Three working days notice prior to each of critical stages such as placing foundation, framing, placement and assembly of major components, and completion of structure and final inspection. Tests and certification requirements will be as directed by the Engineer.

Final Inspection: 15 working days prior to overall check of road or drainage project including final completion of paving and associated appurtenances and improvements, cleaning of site, and all necessary clean-up. Prior to approval of construction work, acceptance for release of construction performance bonds, the developer/contractor shall pay any required bonds, submit any required maintenance and defect financial guarantees, provide a final report of construction, monumentation and submit one photo mylar or ink-on-mylar set and sets of blue line final plans (as-built) reflecting all minor and design plan changes of the road and drainage structures. The Reviewing Agency shall specify the number of blue line sets as warranted by the project. Mylars and blue line drawings shall not have shading or adhesive addition. If original plans were completed on a CADD system, the developer/contractor shall provide in addition to mylars, a copy of the CADD drawing files in DOS/AUTOCAD format.

Maintenance Inspection: 30 days prior to the end of the maintenance period. Prior to release of maintenance guarantee, there shall be successful completion of the maintenance period as defined in Section 1.09, repair of any failed facilities and the payment of any outstanding fees.

Requirement to Notify for Land Use Inspection

Notification by the developer as noted above is essential for the County to verify through field inspection that the work meets the standard. Failure to notify in time may oblige the County to arrange for re-inspection and testing after-the-fact, with certification, either by a professional engineer or a Materials Engineer. Costs of such testing and certification shall be borne by the developer. At the time that such action is directed by the Engineer, the Engineer may prohibit or limit further development until all directed tests have been completed and corrections made to the work. If necessary, the County may take further action as set forth in King County Code 22.03, Enforcement.

More specific requirements for barricades, see Section 5.07 and Drawing No. 5-003. Barricades must be legible and visible and should be removed at the end of each work day if not needed during regular construction hours.

Closures and Detours: When temporary road closures cannot be avoided the contractor shall post "To Be Closed" signs a minimum of five days prior to the closing. Locations of the signs shall be shown on a detour plan. A detour plan must be submitted to the Department of Public Works, Traffic and Planning Section at least 10 days in advance, and approved prior to closing any County road. In addition, the contractor must notify, in writing, local fire, school, law enforcement authorities, Metro and any other affected persons as directed by the Engineer at least five days prior to closing.

If the construction of a proposed development is determined by the Reviewing Agency to require special routing of large trucks or heavy construction equipment to prevent impacts to roads, residences or businesses, the developer/contractor shall be required to develop an approved haul route.

The haul route plan must be prepared and submitted to the Reviewing Agency and approved prior to beginning or continuing construction. The haul route plan shall address routing, signage, flagging, and daily maintenance.

If the developer/contractor's traffic fails to use the designated haul route, the Reviewing Agency may suspend or limit further work on the development until such time as the requirements of the haul route plan are complied with.

Restoration: When identified as a need by the SEPA review process or by the Engineer, a restoration agreement shall be obtained by the franchised utility, developer or property owner. Restoration procedures to be performed upon completion of the haul operation.

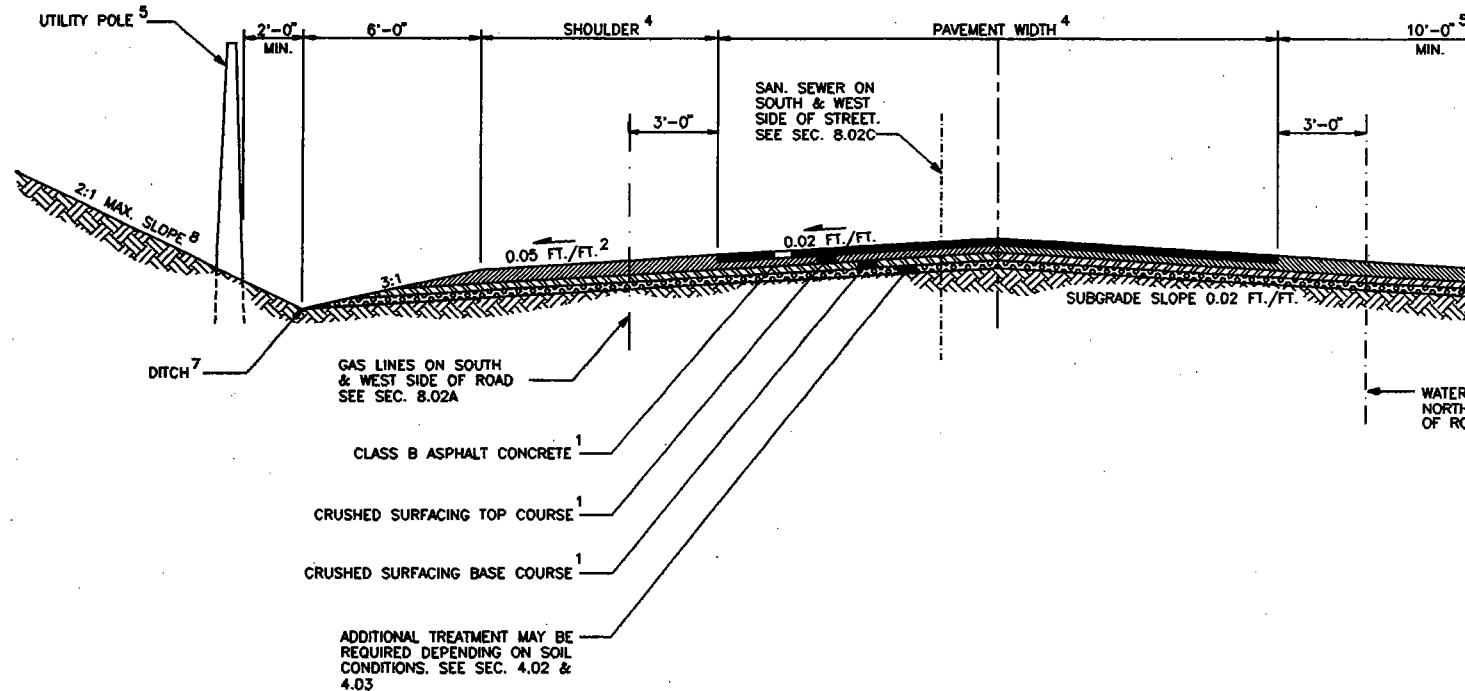
County Contract Road Inspection

Construction performed by County forces or by contract for the County will be inspected under the supervision of the Engineer.

The contractor is responsible for timely notification of utilities in advance of any construction in right-of-way areas. The utility One-Call Center phone number 1-800-424-5555 should be prominently posted at the work site.

DRAWINGS

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NOTES:

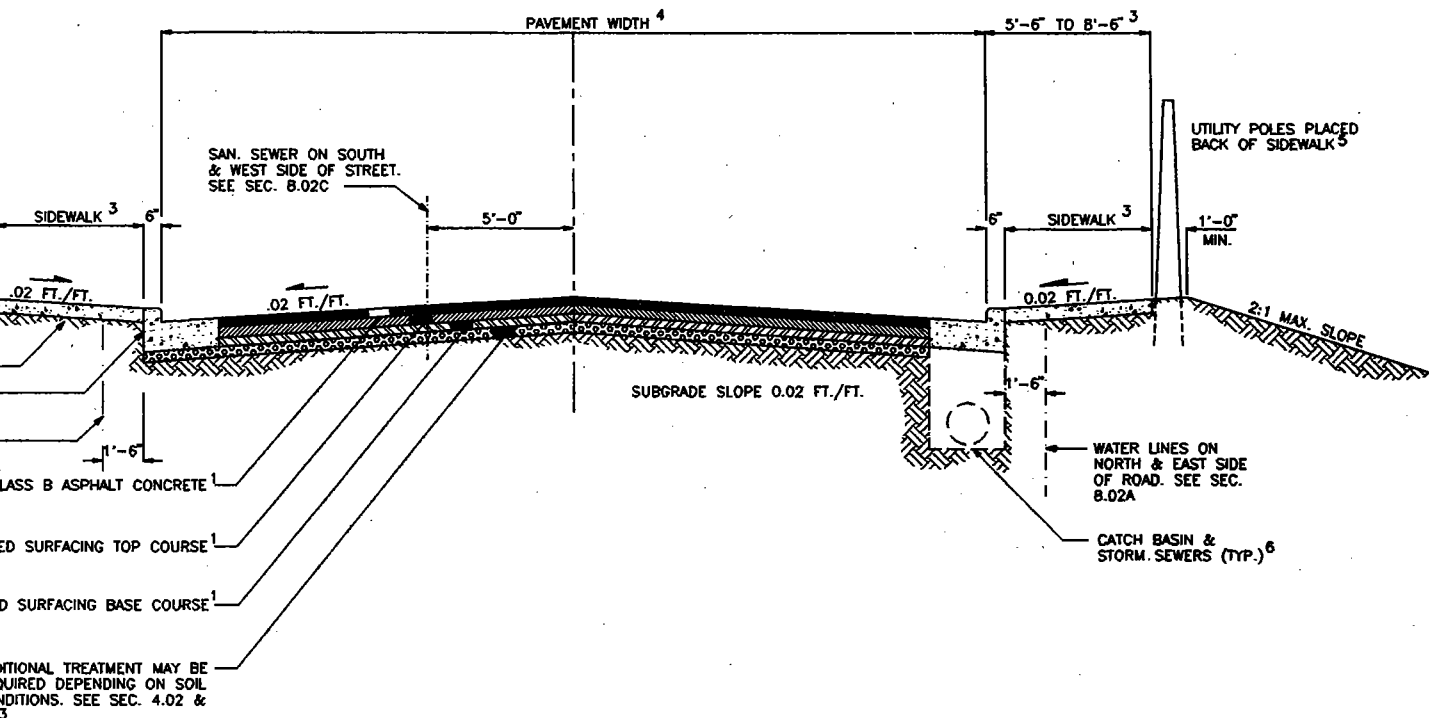
1. THIS DRAWING ILLUSTRATES A TYPICAL ASPHALT CONCRETE ROAD SECTION, ALTERNATIVE II WITH GRAVEL SHOULDERS. ACTUAL SURFACING DESIGN FOR ARTERIALS AND COMMERCIAL ACCESS STREETS SHALL BE BASED ON SOILS AND TRAFFIC ANALYSIS PER SEC. 4.03. DESIGN FOR RESIDENTIAL ACCESS STREETS SHALL BE IN ACCORDANCE WITH SECS. 4.01 AND 4.02.
2. SHOULDERS SHALL BE SURFACED AS REQUIRED BY SECS. 3.07 AND 4.01. IF PAVED, SHOULDER SLOPE SHALL MATCH CROWN SLOPE OR 0.02 FT./FT.
3. GRADES:

MINIMUM	0.5%
MAXIMUM	SEE SECS. 2.02, 2.03, 2.04, AND 2.11.
4. FOR WIDTHS OF PAVEMENT, SHOULDER, AND RIGHT-OF-WAY, SEE SECS. 2.02, 2.03, 2.04.
5. FOR CLEARANCE OF UTILITY POLES SEE SEC. 8.02G AND DWG. NO. 5-001.
6. SEE SEC. 3.08 FOR SEPARATED WALKWAY IF REQUIRED.
7. DITCH SECTIONS AND/OR LOCATIONS MAY VARY TO MEET REQUIREMENTS OF THE SURFACE WATER DESIGN MANUAL. FOR RURAL NEIGHBORHOOD COLLECTORS SEE DWG. NO. 2-024 FOR TURNPIKE SHOULDER ALTERNATIVE.
8. SEE SEC. 5.02 FOR SIDE SLOPE REQUIREMENTS.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

SHOULDER TYPE ROADWAY



TYPICAL ASPHALT CONCRETE ROAD SECTION, ALTERNATIVE II.
OR ARTERIALS AND COMMERCIAL ACCESS STREETS SHALL BE
ANALYSIS PER SEC. 4.03. DESIGN FOR RESIDENTIAL ACCESS
TH SECS. 4.01 AND 4.02.

2.02, 2.03, 2.04, AND 2.11.

IDE IN BUSINESS DISTRICTS AND 6.5 FT. WIDE ON ARTERIALS IF NEXT
IF NEXT TO PARKING OR BIKE LANE, OR BEHIND PLANTING STRIP

HOULDER, AND RIGHT-OF-WAY, SEE SECS. 2.02, 2.03, AND 2.04.

POLES SEE SEC. 8.02G AND DWG. NO. 5-001.

ASIN AND STORM SEWER LOCATIONS.

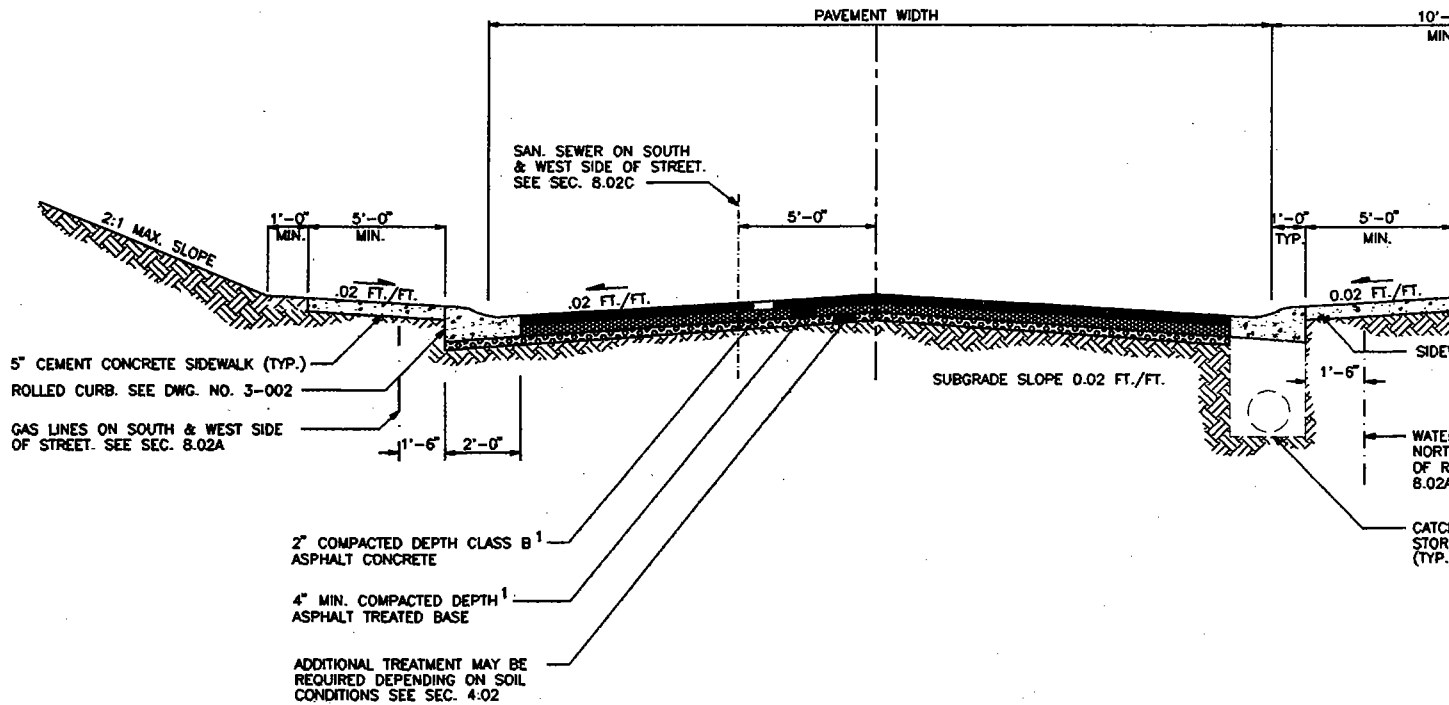
PE REQUIREMENTS.

DATE	REVISION	BY	APPR'D

WORKS
INGTON

VERTICAL CURB TYPE ROADWAY

DWG. 1-002
NO.



NOTES:

1. THIS DRAWING ILLUSTRATES A TYPICAL ASPHALT CONCRETE ROAD SECTION, ALTERNATIVE I. FOR OTHER ALTERNATIVES AND POSSIBLE REQUIREMENTS FOR FRACTURED AGGREGATE OR INCREASED THICKNESS OF SURFACING MATERIALS, SEE SECS. 4.01 AND 4.02.
2. GRADES:

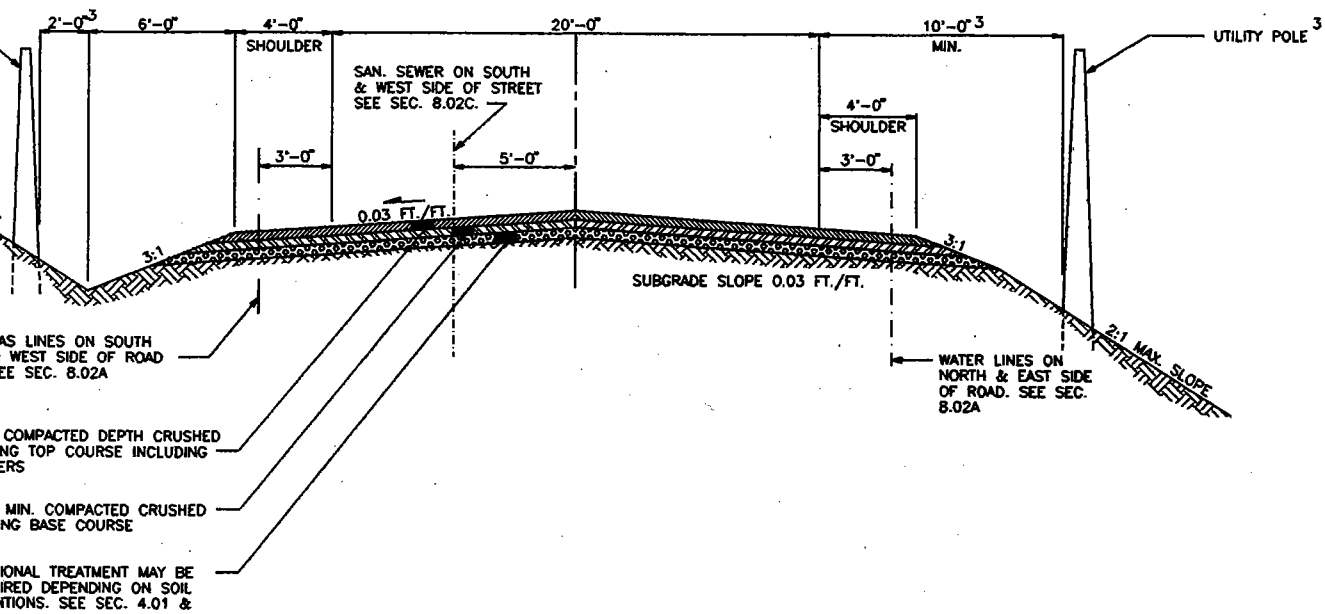
MINIMUM	0.5%
MAXIMUM	SEE SECS. 2.03 AND 2.11.
3. SEE CHAPTER 7 FOR CATCH BASIN AND STORM SEWER LOCATIONS. SEE DWG. NO.S 2-019, 2-020, AND 2-021 FOR GRATE DETAILS.
4. FOR WIDTHS OF PAVEMENT AND RIGHT-OF-WAY, SEE SECS. 2.03.
5. FOR CLEARANCE OF UTILITY POLES SEE SEC. 8.02G AND DWG. NO. 5-001.
6. SEE SEC. 5.02 FOR SIDE SLOPE REQUIREMENTS.

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KING COUNTY, WASHINGTON

ROLLED CURB TYPE ROADWAY



APPLICABLE ONLY ON RURAL MINOR ACCESS STREETS
PRIVATE STREETS. SEE SECS. 2.03 & 2.17.

SECS. 2.03 & 2.11.

UTILITY POLES SEE SEC. 8.02G & DWG. NO. 5-001.

LOCATIONS MAY VARY TO MEET REQUIREMENTS OF
ANNUAL.

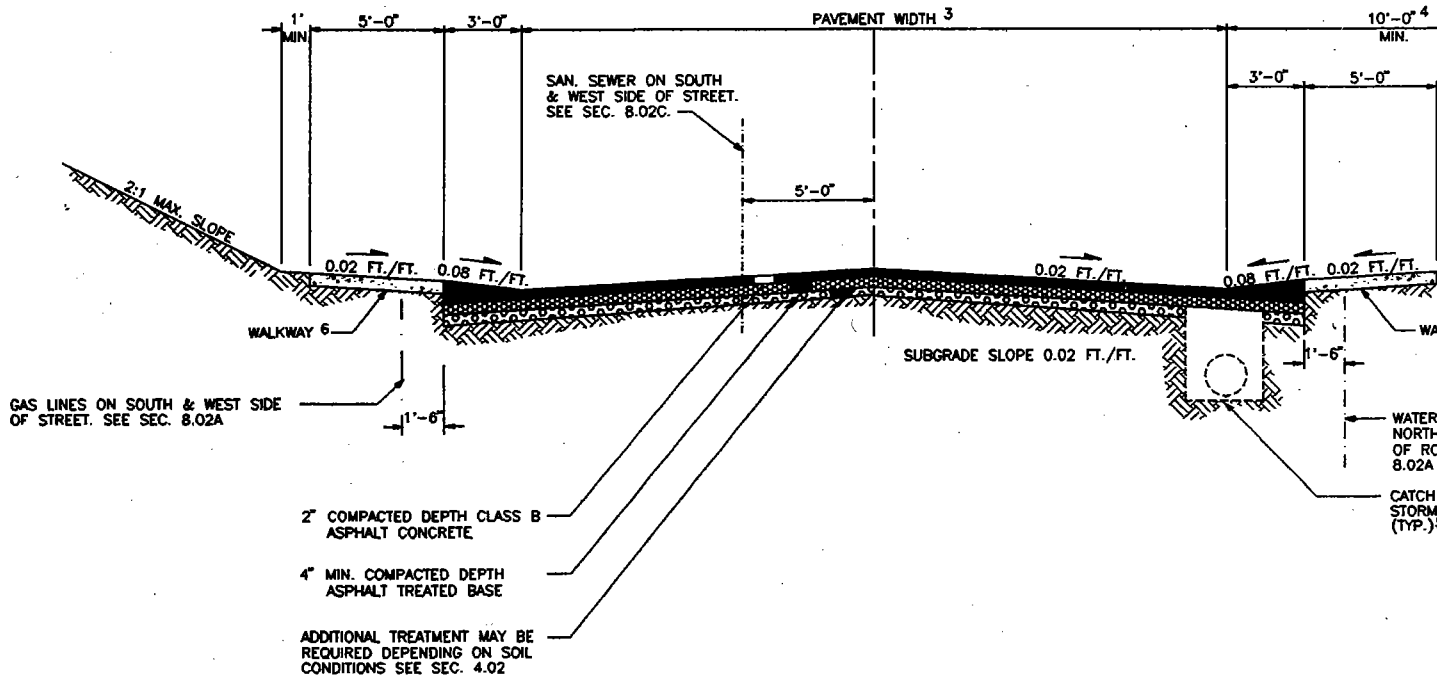
SLOPE REQUIREMENTS.

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GRAVEL SURFACE ROADWAY

DWG. NO. 1-004



NOTES:

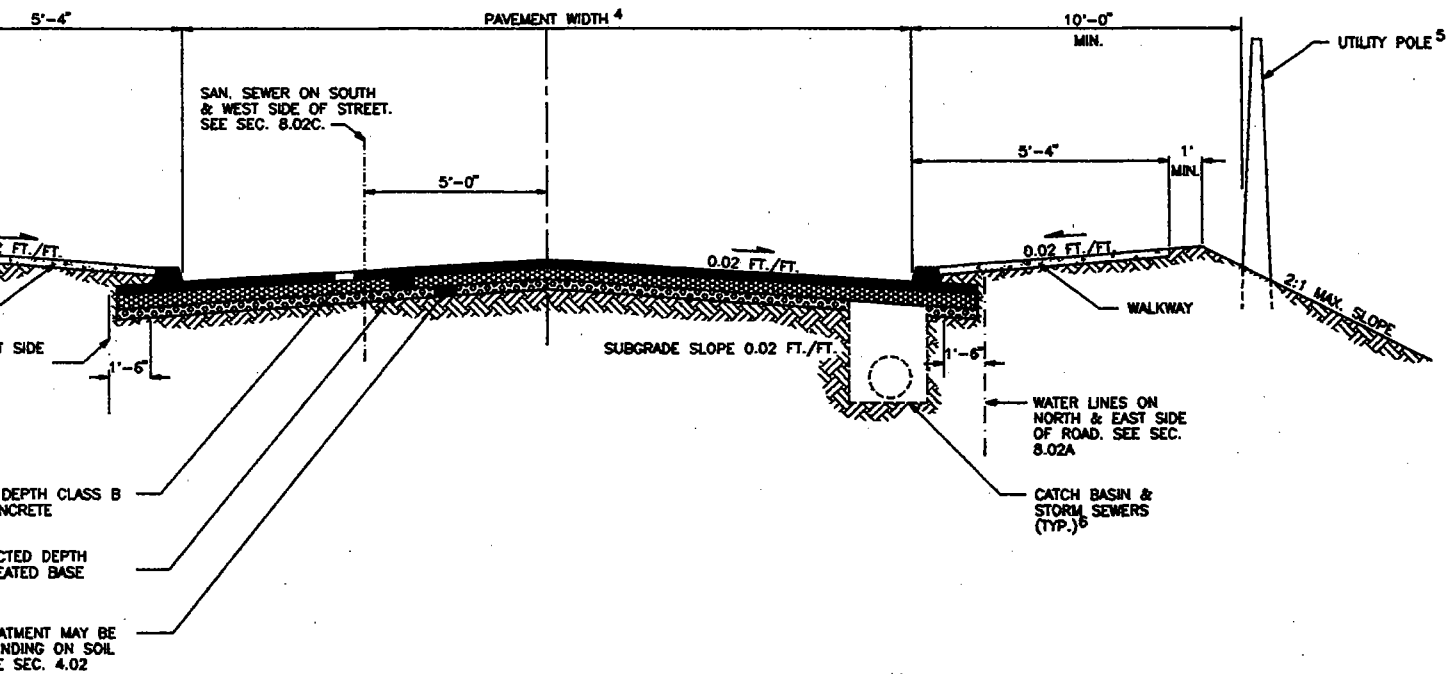
1. THIS DRAWING ILLUSTRATES A TYPICAL ASPHALT CONCRETE ROAD SECTION, ALTERNATIVE I. FOR OTHER ALTERNATIVES AND POSSIBLE REQUIREMENTS FOR FRACTURED AGGREGATE OR INCREASED THICKNESS OF SURFACING MATERIALS, SEE SECS. 4.01 AND 4.02.
2. GRADES:

MINIMUM	0.5%
MAXIMUM	SEE SECS. 2.03 AND 2.11.
3. FOR WIDTHS OF PAVEMENT AND RIGHT-OF-WAY, SEE SECS. 2.03.
4. FOR CLEARANCE OF UTILITY POLES SEE SEC. 8.02G AND DWG. NO. 5-001.
5. SEE CHAPTER 7 FOR CATCH BASINS AND STORM SEWER LOCATIONS.
6. WALKWAY SHALL BE CEMENT CONCRETE, ALTERNATIVE IV, OR CRUSHED SURFACING, ALTERNATIVE V, AS REQUIRED BY REVIEWING AGENCY. SEE SEC. 4.01.
7. FOR RURAL NEIGHBORHOOD COLLECTORS, SEE DWG. NO. 2-024 FOR TURNPIKE SHOULDER ALTERNATIVE.
8. SEE SEC. 5.02 FOR SIDE SLOPE REQUIREMENTS.



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THICKENED EDGE ROADWAY



IS A TYPICAL ASPHALT CONCRETE ROAD SECTION, ALTERNATIVE I. AND POSSIBLE REQUIREMENTS FOR FRACTURED AGGREGATE OR SURFACING MATERIALS, SEE SECS. 4.01 AND 4.02.

SEE DWG. NO. 3-002.

SECS. 2.03 AND 2.09.

AND RIGHT-OF-WAY, SEE SECS. 2.03.

BY POLES SEE SEC. 8.02G AND DWG. NO. 5-001.

CH BASIN AND STORM DRAIN LOCATIONS.

ED SURFACING, ALTERNATIVE V, OR AS REQUIRED

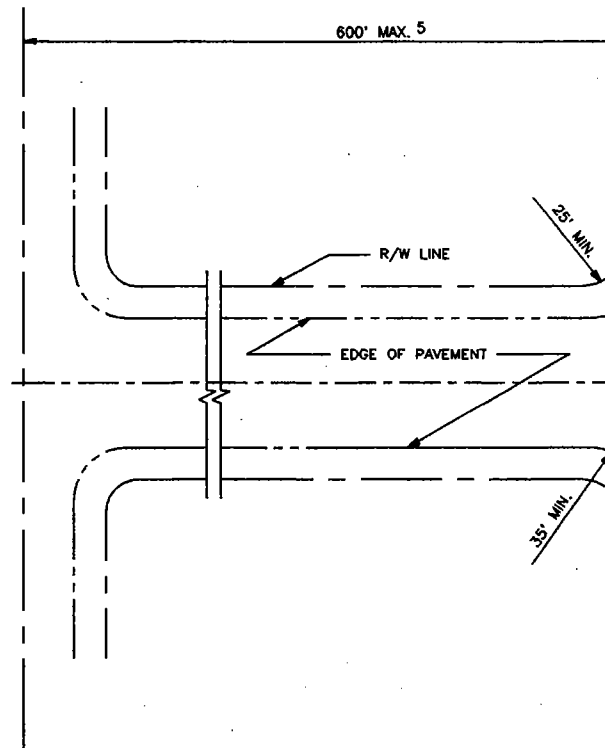
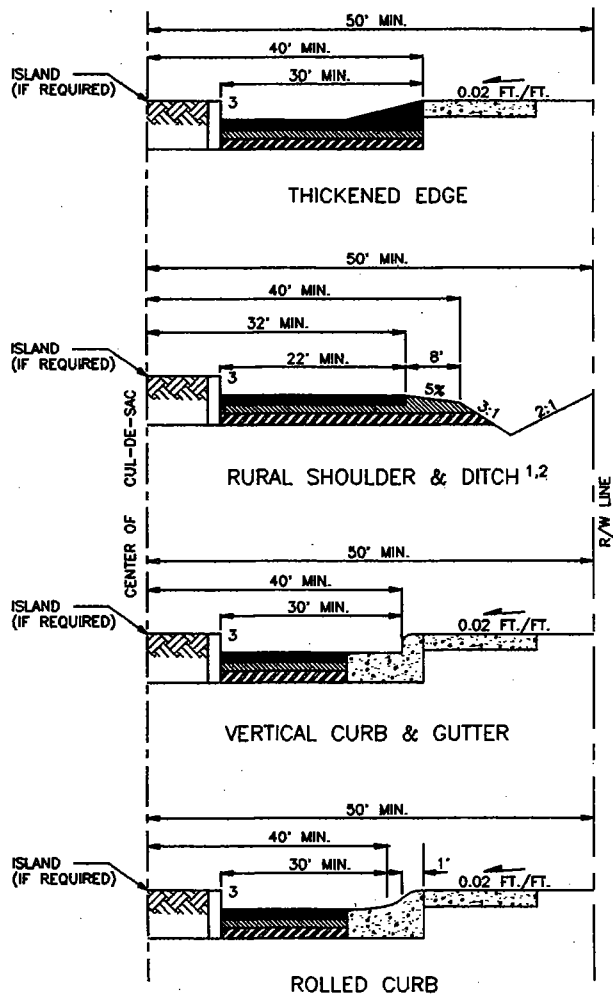
SLOPE REQUIREMENTS.

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EXTRUDED CURB ROADWAY

DWG. 1-006
NO.



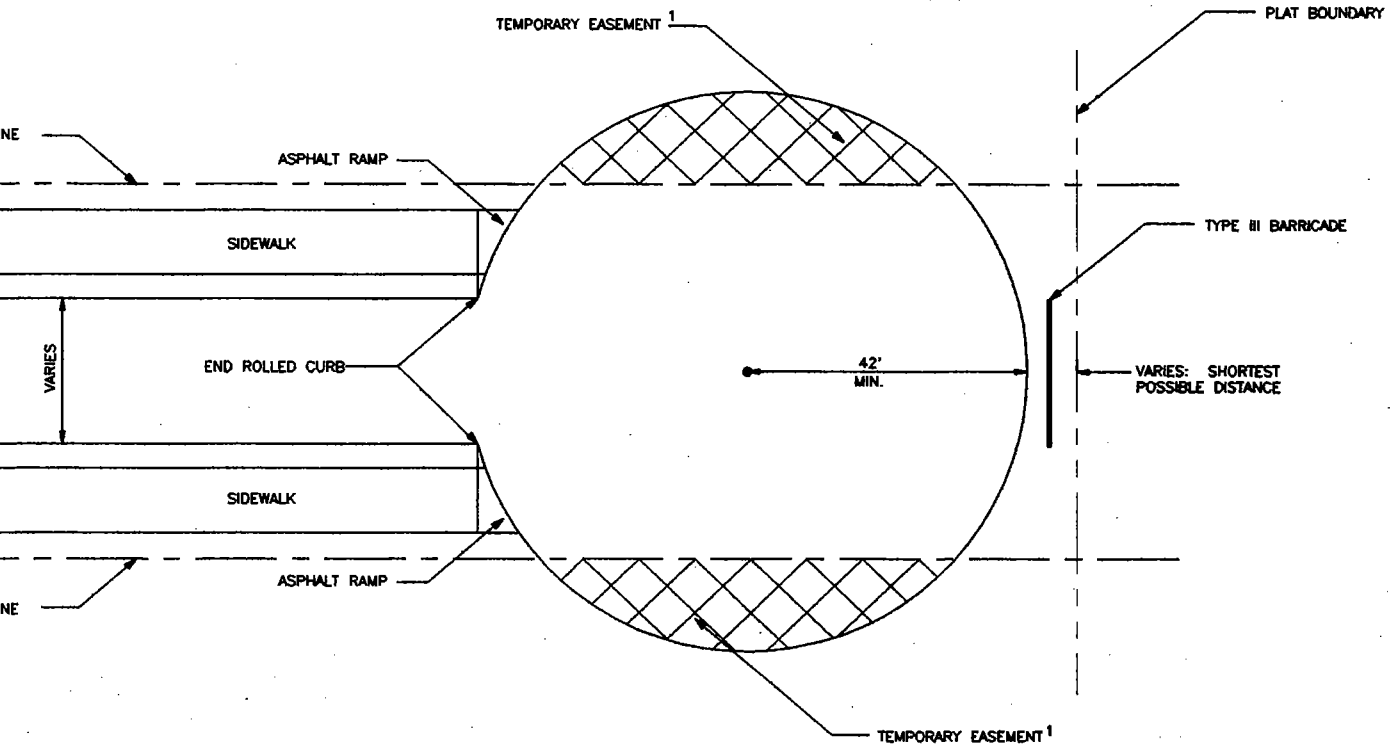
NOTES:

1. SEE SEC. 2.08.
2. EXTRUDED CURB IS ALSO ACCEPTABLE FOR OUTER TO SHOULDER AND DITCH. SEE DWG. NO. 1-006.
3. ISLAND AT CENTER OF BULB SHALL HAVE VERTICAL SEE DWG. NO. 3-002.
4. ISLAND IS MANDATORY WHEN RADIUS OF PAVED AREA IS LESS THAN 25 FEET.
5. SEE SEC 2.08 FOR CUL-DE-SAC LENGTH EXCEPTIONS.
6. SEE SECS. 2.03, 2.08, AND 2.09 FOR RIGHT-OF-WAY REQUIREMENTS



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CUL-DE-SACS



EC. 2.08.

CADE REQUIRED AT END OF BULB.

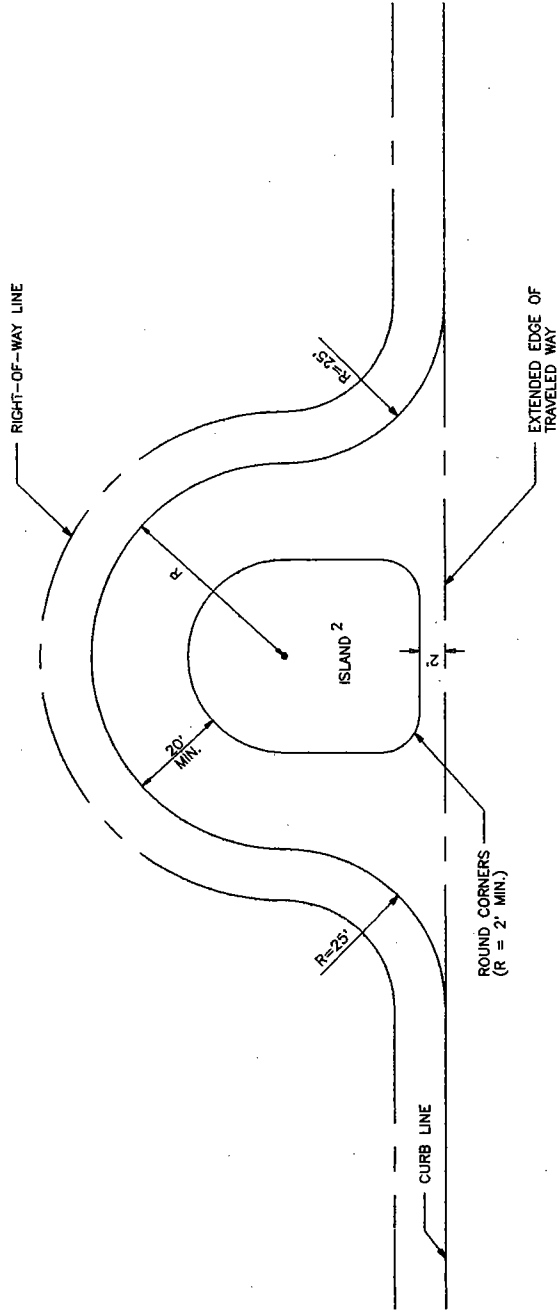
EC. 5.07.

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TEMPORARY CUL-DE-SAC

DWG. 1-008
NO.



NOTES:

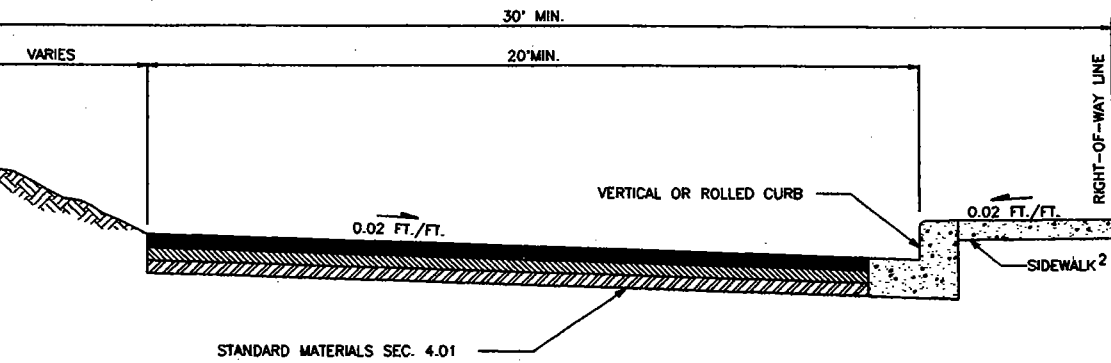
1. SEE SEC. 2.08F.
2. ISLAND REQUIRED ON EYEBROWS WITH R GREATER THAN 25 FEET.
3. MIN. ISLAND DIAM. SHALL BE 10 FEET.

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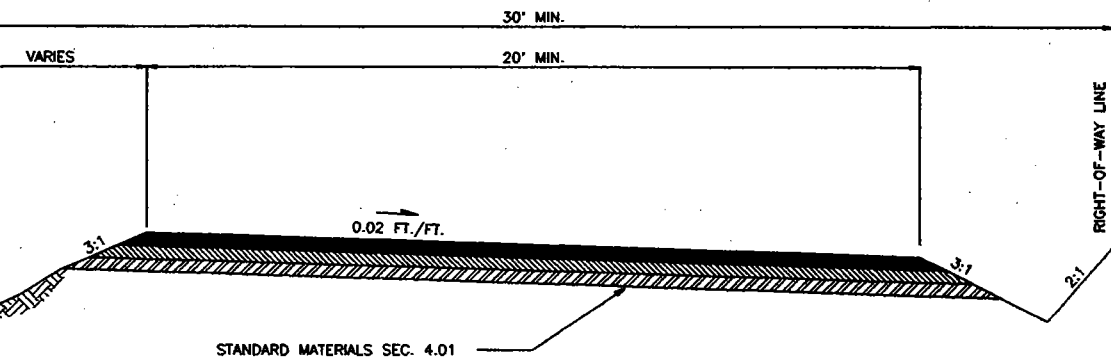
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EYEBROW

DWG. 1-009
 NO.



URBAN



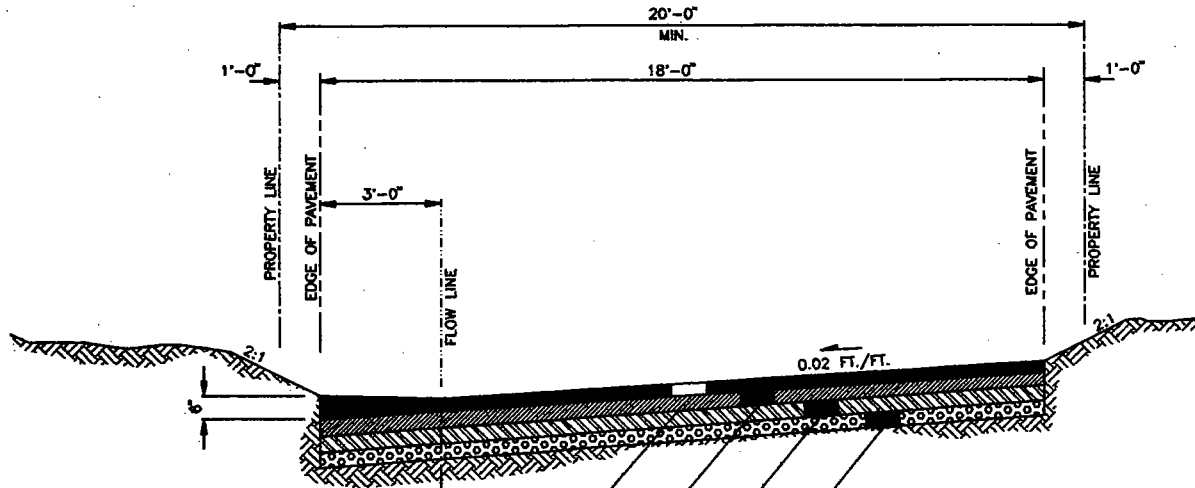
RURAL

TO BE CONSTRUCTED AS SHOWN
EXCEPT AS APPROPRIATE.

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HALF-STREET

DWG. 1-010
NO.



2" COMPACTED DEPTH CLASS B
ASPHALT CONCRETE

1 1/2" MIN. COMPACTED DEPTH CRUSHED
SURFACING TOP COURSE

2 1/2" MIN. COMPACTED DEPTH CRUSHED
SURFACING BASE COURSE

ADDITIONAL TREATMENT MAY BE
REQUIRED DEPENDING ON SOIL
CONDITIONS. SEE SEC. 4.02

NOTE:
SEE SEC. 2.09

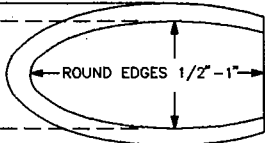
DATE	REVISION	BY



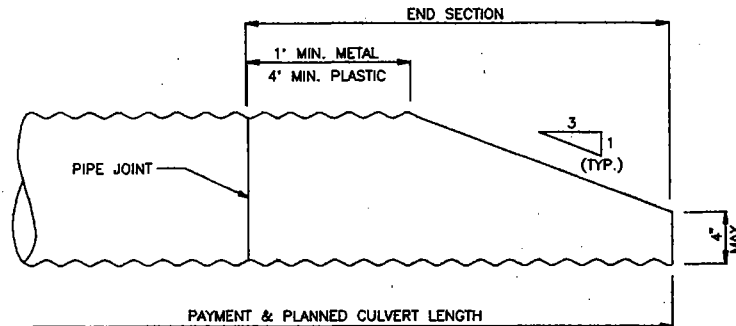
KING COUNTY PUBLIC WORKS
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ALLEY PAVEMENT DETAIL

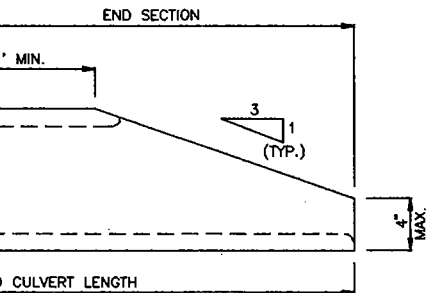
TONGUE END ON INLET END
GROOVE END ON OUTLET END
ENDS TO FIT ADJACENT
PIPE SECTIONS



PLAN



METAL & PLASTIC PIPE



ELEVATION

CONCRETE PIPE

NOTE:

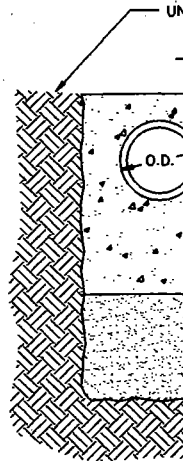
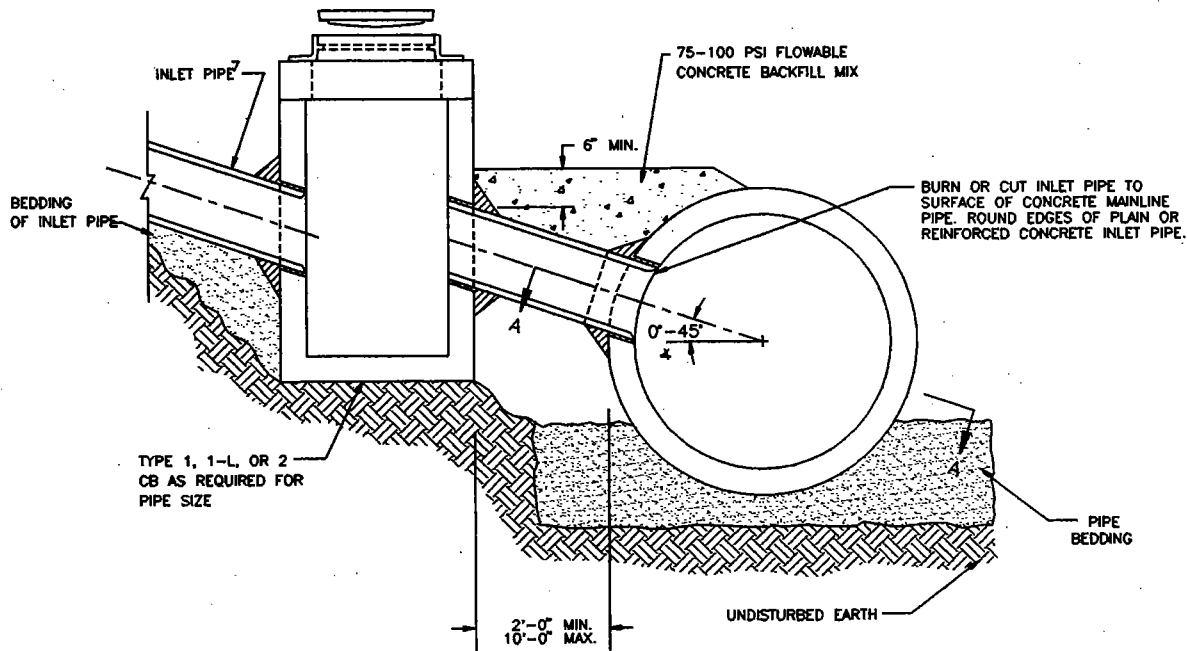
SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE
END. WHEN CULVERT IS ON SKEW, BEVELED END SHALL BE
ROTATED TO CONFORM TO SLOPE. IF SLOPE DIFFERS FROM
3:1, PIPE SHALL BE BEVELED TO MATCH SLOPE.

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BEVELED END PIPE SECTION

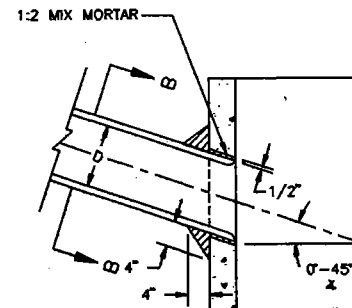
DWG. NO. 2-001



SECTION F

NOTES:

1. "D", THE INSIDE DIAM. OF THE INLET PIPE, SHALL BE 24" OR LESS. FOR LARGER VALUES OF "D", USE AN APPROVED STRUCTURE.
2. IN NO CASE SHALL THE OUTSIDE DIAM. OF THE INLET PIPE EXCEED ONE-HALF THE INSIDE DIAM. OF THE MAIN STORM SEWER.
3. ϕ OF INLET PIPE SHALL BE ON RADIUS OF MAIN STORM DRAIN.
4. THE MIN. OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAM. OF THE INLET PIPE PLUS 1 IN.
5. IF α IS GREATER THAN 45° FIELD TAPPING IS NOT ALLOWED.
6. SEE SEC. 7.04.
7. SEE SEC. 7.03 FOR ALLOWED INLET PIPE TYPE.
8. MAINLINE SHALL HAVE 48" MIN. DIAM.



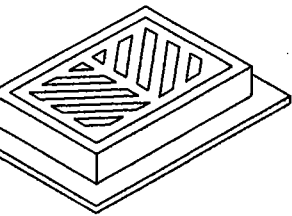
SECTION G

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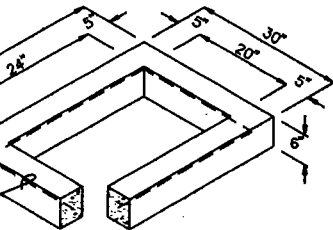


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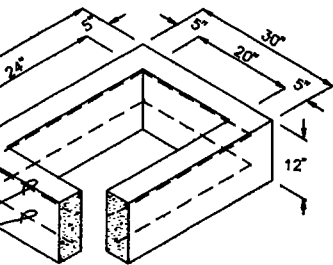
FIELD-TAPPING OF CONCRETE PIPE



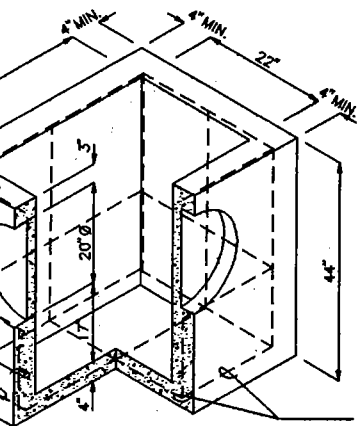
FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



6" RISER SECTION



12" RISER SECTION



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

#3 BAR EACH WAY

NOTES:

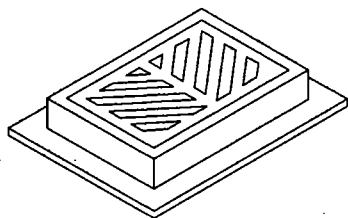
1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT/APWA STANDARD DWG. B1-b.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.

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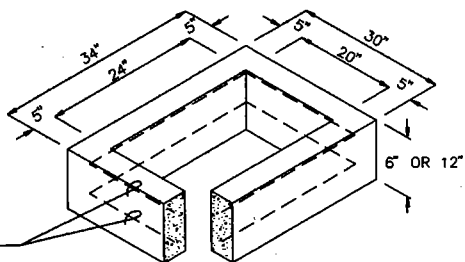
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CATCH BASIN TYPE 1

DWG. 2-003
NO.

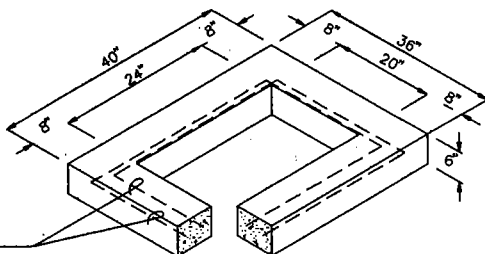


FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



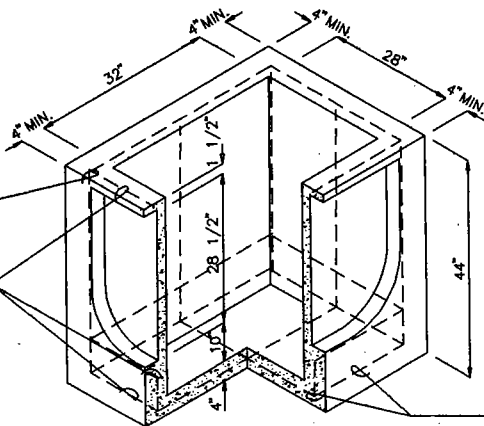
RISER SECTION

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



6" REDUCING SECTION

2 #3 BAR HOOP



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

#3 BAR EACH CORNER

#3 BAR EACH SIDE

#3 BAR EACH WAY

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF AASHTO M 199 & C890 PLANS OR NOTED IN THE WSDOT SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO WELDED FABRIC, A FABRIC HAVING A MIN. AREA OF 10 SQ. FT. PER FOOT MAY BE USED. WELDED FABRIC SHALL BE TO ASTM A497 (AASHTO M 221), PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH KNOCKOUTS. KNOCKOUTS SHALL BE 2" MIN. ALL PIPE SHALL BE PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS SHALL BE GROUTED IF WALL IS LEFT IN PLACE.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL BE 2" MIN. DIAM. PLUS CATCH BASIN WALL.
6. KNOCKOUTS MAY BE ON ALL 4 SIDES OF THE BASE. KNOCKOUTS MAY BE EITHER ROUND OR SQUARE.
7. THE TAPER ON THE SIDES OF THE BASE AND RISER SECTION SHALL NOT EXCEED 1/4" PER FOOT.
8. CATCH BASIN FRAME AND GRATE SHALL BE TO STANDARD SPECIFICATIONS WITH STANDARD SPECIFICATIONS. FINISHING REQUIREMENTS OF FEDERAL SPECIFICATIONS. FINISHING SURFACES SHALL BE FINISHED TO A NON-ROCKING FIT WITH ANY CURB OR WALKWAY.
9. FRAME AND GRATE MAY BE INSTALLED AFTER THE BASE IS CAST INTO RISER.
10. MAX. DEPTH FROM FINISHED GRADE TO TOP OF BASE SHALL BE 5'-0".
11. EDGE OF REDUCING SECTION OR BASE SHALL BE AT LEAST 2" FROM VERTICAL EDGE OF RISER.

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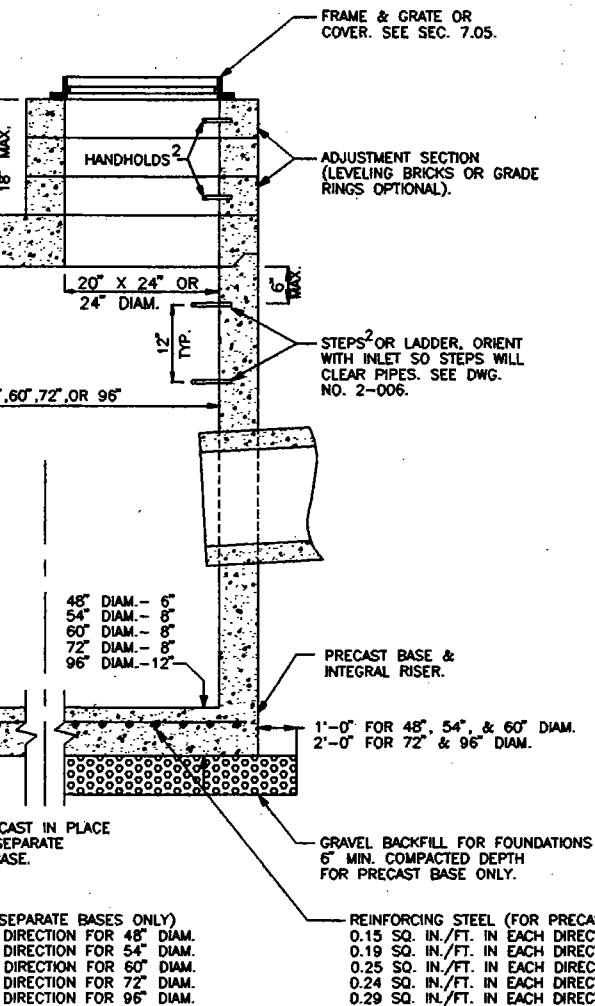


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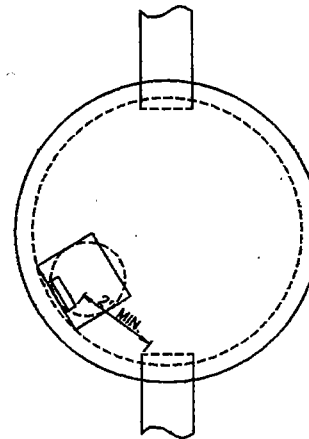
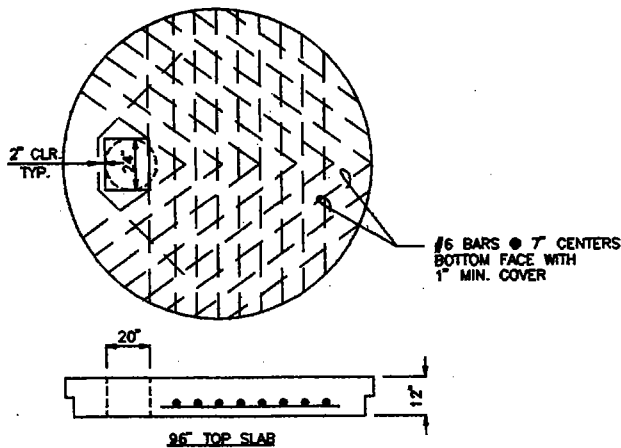
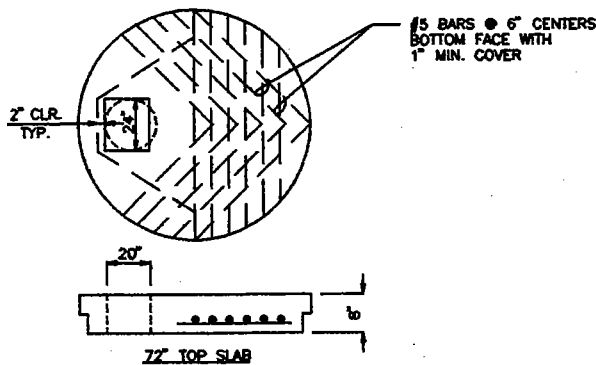
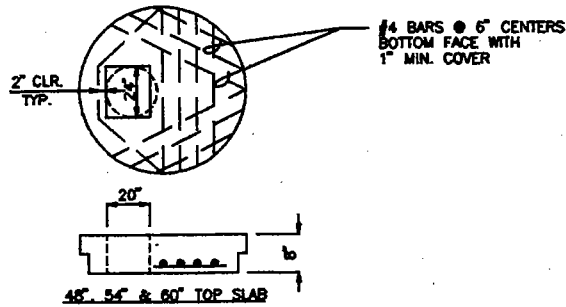
CATCH BASIN TYPE 1-L

NOTES:

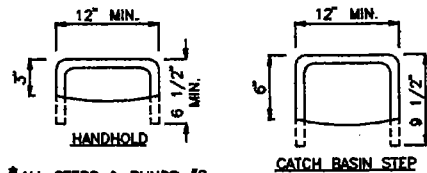
1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 2-006, CATCH BASIN DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" CATCH BASIN, 42" FOR 54" C.B., 48" FOR 60" C.B., 60" FOR 72" C.B., 84" FOR 96" C.B. MIN. DISTANCE BETWEEN HOLES SHALL BE 8" FOR 48", 54", AND 60" C.B.; 12" FOR 72" AND 96" C.B.
6. CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
8. MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING LADDER, STEPS, HANDRAILS AND TOP SLABS, SEE DWG. NO. 2-006.
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



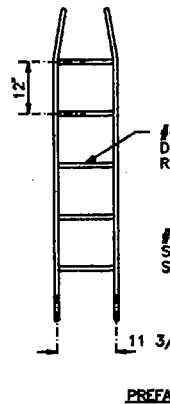
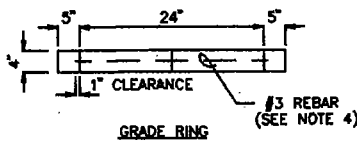
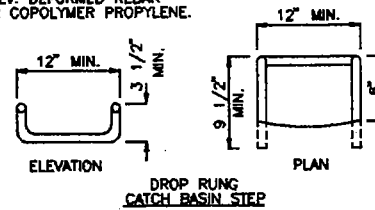
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TYPICAL ORIENTATION
FOR ACCESS AND STEPS



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



NOTES:

1. PROPRIETARY CATCH BASIN HANDHOLD IS ACCEPTABLE, PROVIDED THAT IT MEETS THE REQUIREMENTS OF ASTM C478, AASHTO M-199 AND AASHTO M-294.
2. CATCH BASIN STEP/HANDHOLD SHALL BE APPROXIMATELY RADIAL AT THE CENTER OF THE OPENING, EXCEPT THAT ALL STEPS IN AN OPENING SHALL HAVE A MIN. PENETRATION OF OUTER WALL.
3. HANDHOLDS AND STEPS SHALL BE CAST AS PART OF THE SLAB ON DETAIL OR PROTRUDANCES SHALL BE CAST INTO THE SLAB.
4. SLAB OPENING MAY BE 24" X 24" OR LARGER.
5. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQ. IN. PER SQ. FT. MAY BE USED.
6. LADDERS OR STEPS SHALL EXTEND TO THE TOP OF THE CATCH BASIN.
7. HANGING LADDERS SHALL BE PROVIDED WITH A RUNG HANGING ON STEP OR BY BOLTS. EACH RUNG SHALL BE EMBEDDED AT LEAST 2" INTO THE SLAB.
8. ADDITIONAL SAFETY FEATURES OR UNUSUAL STRUCTURES.

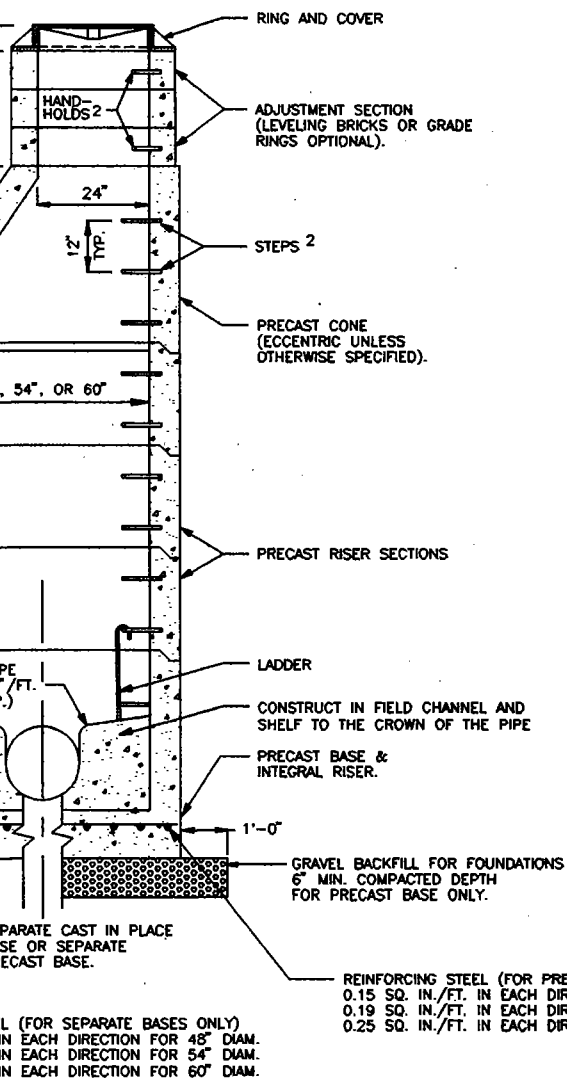
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CATCH BASIN DETAILS

NOTES:

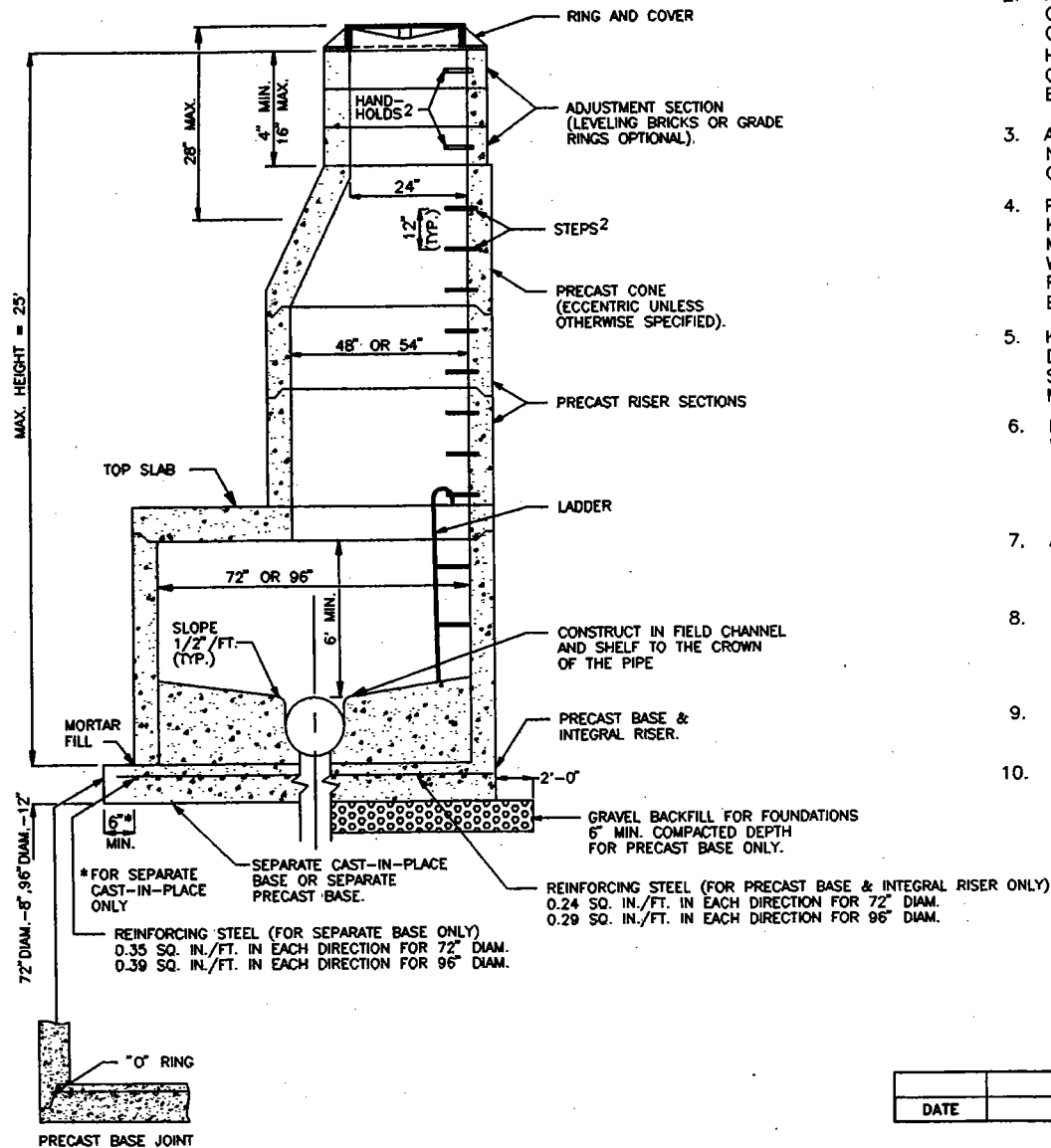


1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 2-011, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HAND HOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" MANHOLE, 42" FOR 54" MANHOLE, 48" FOR 60" M.H. MIN. DISTANCE BETWEEN HOLES SHALL BE 8".
6. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
8. FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE DWG. NO. 2-011, "MANHOLE DETAILS."
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

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NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SPECIFIED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL BE PLACED AT 24" CLEARANCE. STEPS IN MANHOLE SHALL BE PLACED AT 24" CLEARANCE. SEE DWG. NO. 2-011, FOR DETAILS. HANDHOLDS SHALL BE PLACED IN ALL ADJUSTMENT SECTIONS OR LEVELING BRICK COURSE WITH MORTAR JOINTS BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE NON-REINFORCED CONCRETE IN CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 3000.
4. PRECAST BASES SHALL BE FURNISHED WITH 2" MIN. CLEARANCE FROM KNOCKOUTS. KNOCKOUTS SHALL HAVE 2" MIN. UNUSED KNOCKOUTS NEED NO REINFORCEMENT. WALL IS LEFT INTACT. PIPES SHALL BE PLACED IN FACTORY KNOCKOUTS UNLESS OTHERWISE SPECIFIED BY ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL BE 1/2" MIN. DIAM. PLUS MANHOLE WALL THICKNESS. HOLE SIZE SHALL BE 60" FOR 72" MANHOLE AND 72" FOR 96" MIN. DISTANCE BETWEEN HOLES SHALL BE 24" MIN.
6. MANHOLE RINGS AND COVERS SHALL BE PLACED WITH SEC. 7.05 AND MEET THE STRIPING REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-63. RINGS SHALL BE FINISHED TO ASSURE NON-SLIP COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL BE 60,000 PSI STRENGTH OF 60,000 PSI AND BE PLACED WITH 1" MIN. CLEARANCE FROM THE BASE WITH 1" MIN. CLEARANCE FROM THE BASE.
8. FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. OVER 12', MIN. SOIL BEARING VALUE SHALL BE 3,300 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING GRADE RING, ADJUSTMENT SECTION, AND TOP SLABS, SEE DWG. NO. 2-011.
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SECTION 7-05.3 FOR JOINT REQUIREMENTS.



DATE	REVISION	BY



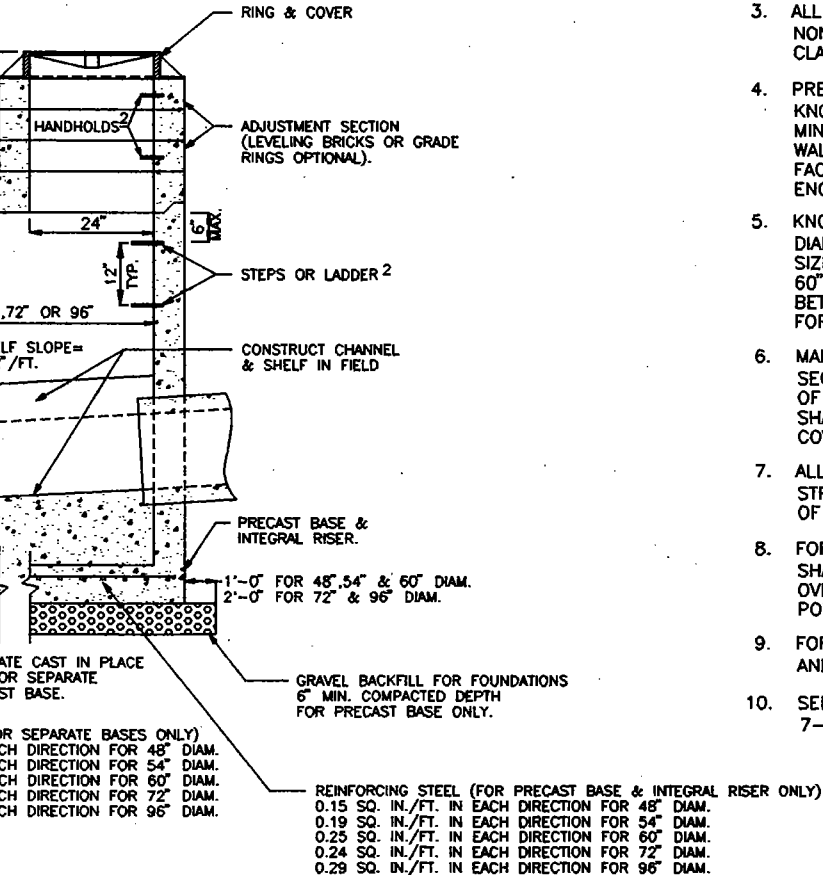
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

MANHOLE TYPE 2

72" & 96"

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 2-011, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" M.H., 42" FOR 54" M.H., 48" FOR 60" M.H., 60" FOR 72" M.H., 84" FOR 96" M.H. MIN. DISTANCE BETWEEN HOLES SHALL BE 8" FOR 48", 54", AND 60" M.H., 12" FOR 72" AND 96" M.H.
6. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
8. FOR HEIGHTS OF 12" OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12", MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE DWG. NO. 2-011, "MANHOLE DETAILS."
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



DATE	REVISION	BY	APPR'D

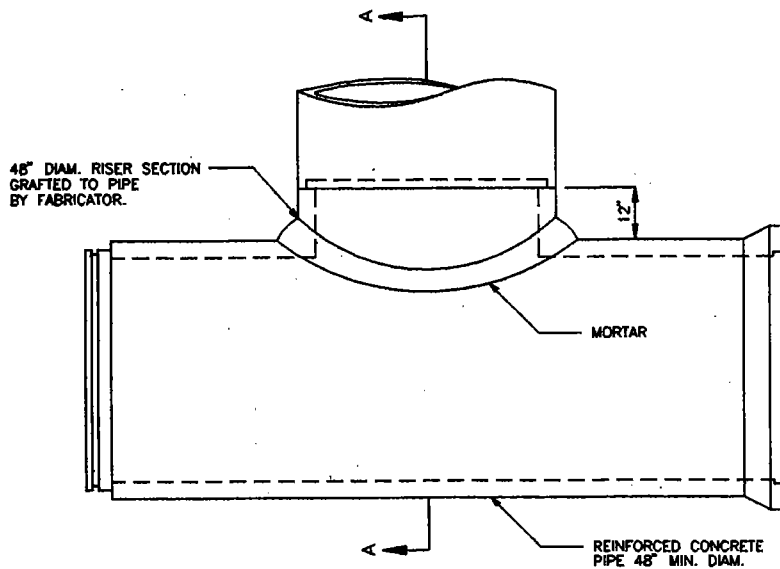
WORKS
INGTON

MANHOLE TYPE 3 48", 54", 60", 72", & 96"

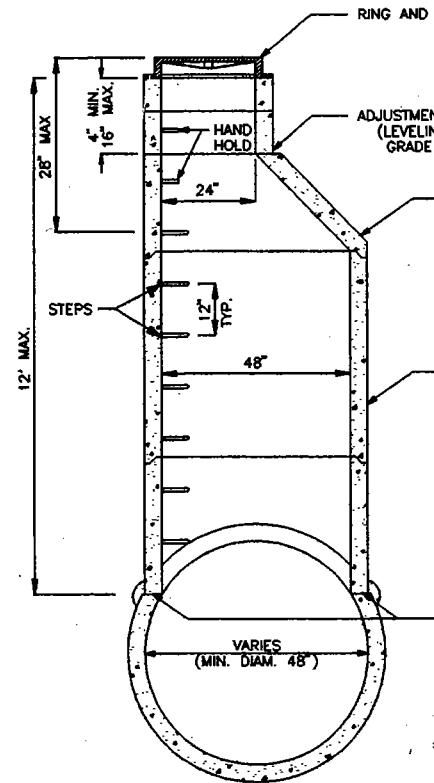
DWG. NO. 2-009

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHolds IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 2-011, "MANHOLE DETAILS."
3. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
4. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
5. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE DWG. NO. 2-011, "MANHOLE DETAILS".
6. NOT FOR USE IN TRAFFIC BEARING AREAS.



ELEVATION



SECTION A-A

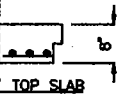
DATE	REVISION	BY



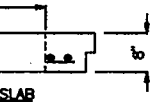
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

MANHOLE TYPE 4

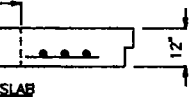
#4 BARS @ 6" CENTERS
BOTTOM FACE
1" MIN. COVER.



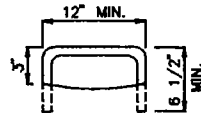
#5 BARS @ 6" CENTERS
BOTTOM FACE
1" MIN. COVER.



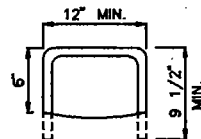
#6 BARS @ 7" CENTERS
BOTTOM FACE
1" MIN. COVER.



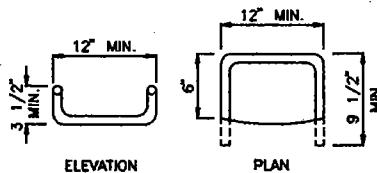
*ALL STEPS & RUNGS
1" DIAM. GALV. REBAR OR
COPOLYMER PROPYLENE.



HANDHOLD



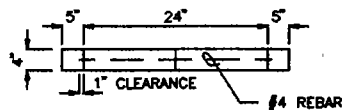
MANHOLE STEP



ELEVATION

PLAN

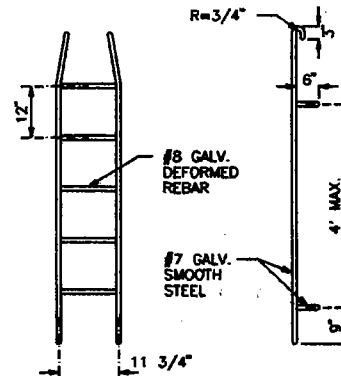
MANHOLE DROP RUNG STEP



GRADE RING

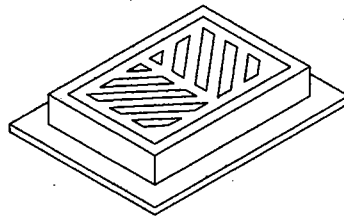
NOTES:

1. PROPRIETARY MANHOLE HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M199 AND MEET ALL WISHA REQUIREMENTS.
2. MANHOLE STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. HANDHOLDS AND STOPS SHALL HAVE "DROP" RUNGS OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF MANHOLE.
5. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE.
6. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED IN VERY DEEP OR UNUSUAL STRUCTURES.

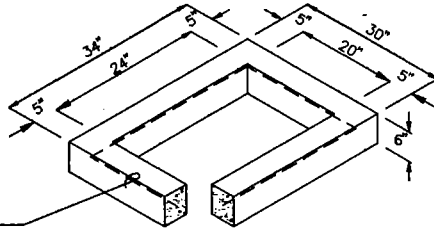


PREFABRICATED LADDER

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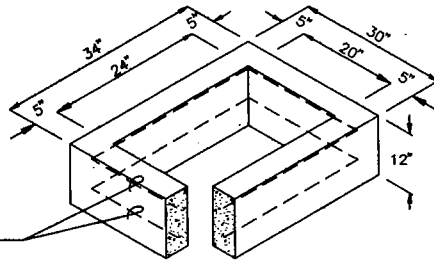


FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



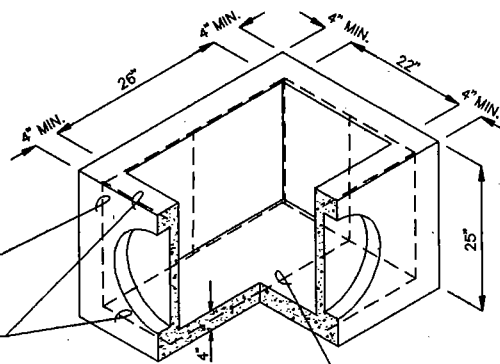
6" RISER SECTION

1 #3 BAR HOOP



12" RISER SECTION

2 #3 BAR HOOPS



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

#3 BAR EACH CORNER

#3 BAR EACH SIDE
TOP & BOTTOM

1-#3 BAR ACROSS BOTTOM

NOTES:

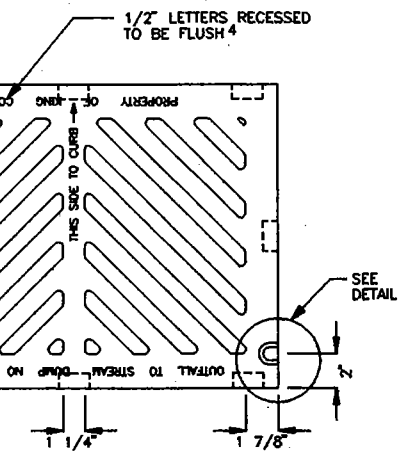
1. CURB INLET TO BE CONSTRUCTED TO ASTM C478 & C890 UNLESS OTHERWISE NOTED IN THE STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATE TO WIRE MESH FABRIC HAVING A MIN. AREA OF 1.5 SQ. FT. PER FOOT MAY BE USED. WIRE MESH SHALL COMPLY TO ASTM A497. WIRE MESH SHALL BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FULLY REINFORCED. KNOCKOUTS SHALL BE MIN. 2" MIN. ALL PIPE SHALL BE FULLY PROVIDED KNOCKOUTS. UNLESS OTHERWISE NOTED, ALL KNOCKOUTS SHALL BE GROUTED IF WALL IS LEFT OPEN.
5. KNOCKOUT OR CUTOUT HOLE SHALL BE MIN. 12" DIAM. PLUS CURB INLET WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE USED IF MIN. DIAM. OF 17".
7. THE MAX. DEPTH FROM THE TOP OF THE CURB TO PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE CURB AND RISER SECTION SHALL NOT EXCEED 1:4.
9. CONCRETE INLET FRAME AND CURB SHALL BE CAST WITH STANDARD SPECIFICATION FOR CONCRETE. FINISH REQUIREMENTS OF FEDERAL SPECIFICATION FOR CURB MATING SURFACES SHALL BE USED TO OBTAIN A NON-ROCKING FIT WITH ANY CURB MATING SURFACE.
10. FRAME AND GRATE MAY BE CAST INTO RISER OR CAST INTO CURB.

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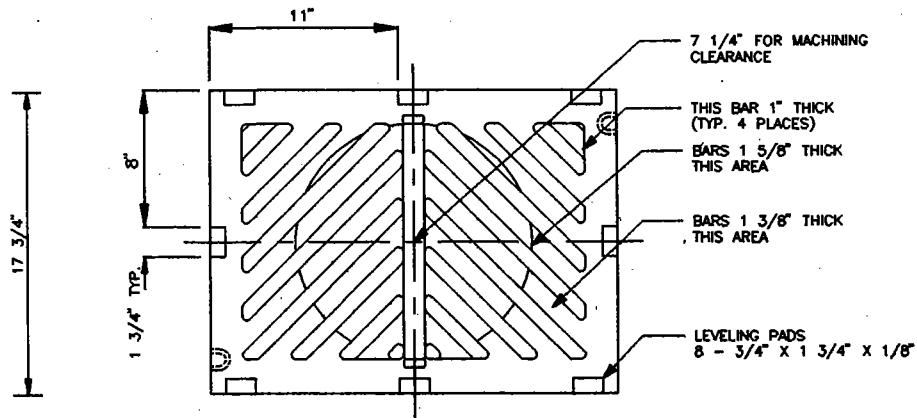


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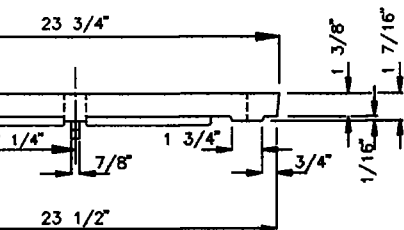
CURB INLET



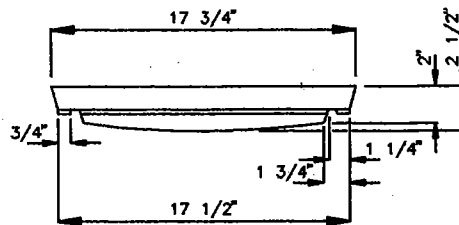
TOP VIEW



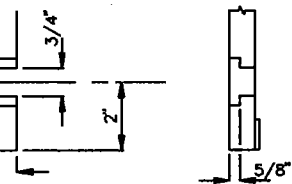
BOTTOM VIEW



SIDE VIEW



END VIEW



SLOT DETAIL

SEE NOTE 1

NOTES:

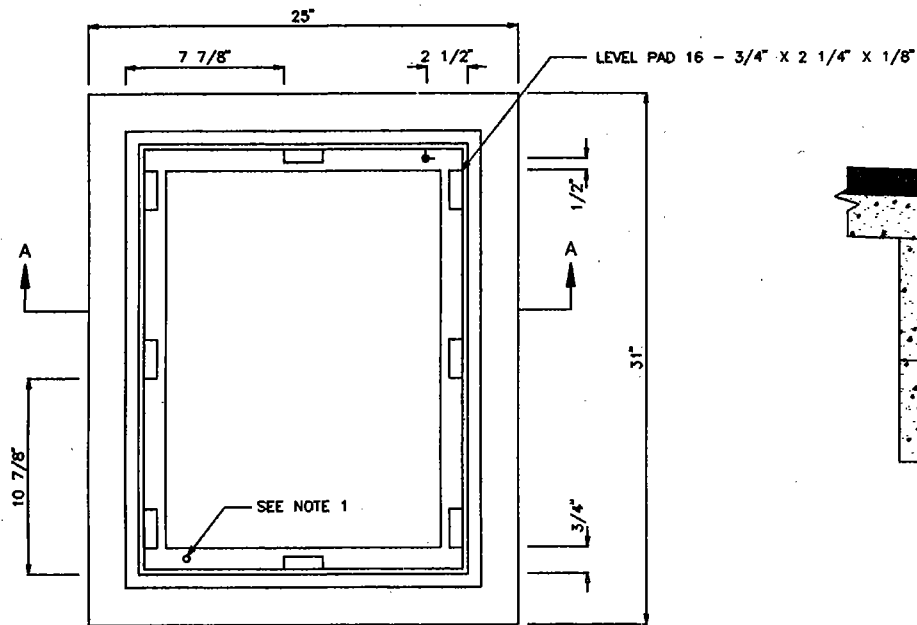
1. SLOT FORMED AND RECESSED FOR 5/8"-11 NC X 2" SOCKET HEAD (ALLEN HEAD) CAP SCREW.
2. GRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.
3. SEE SEC. 7.05.
4. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF GRATE IS ON PRIVATE SYSTEM.

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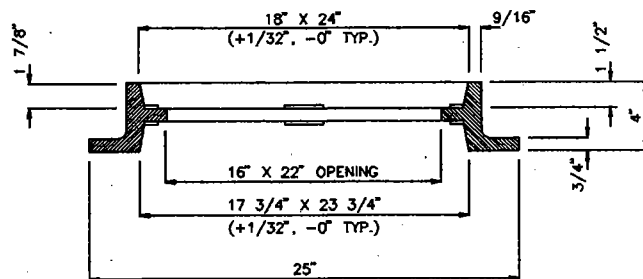
WORKS
INGTON

STANDARD GRATE

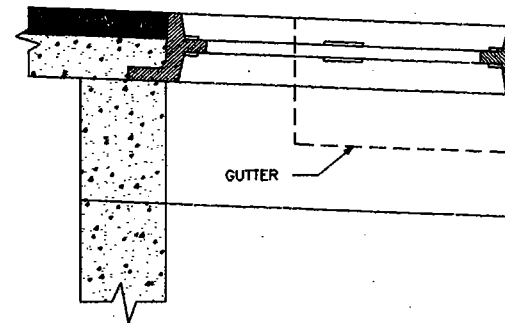
DWG. NO. 2-013



PLAN

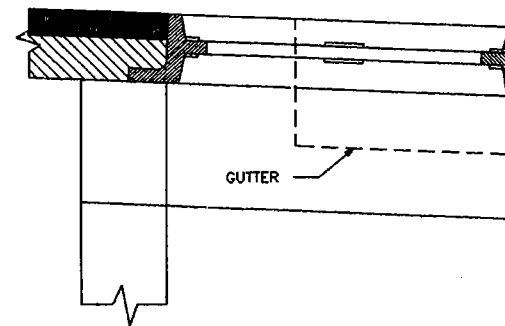


SECTION A-A



VERTICAL CURB

SEE NOTE 4



EXTRUDED CURB

SEE NOTE 4

NOTES:

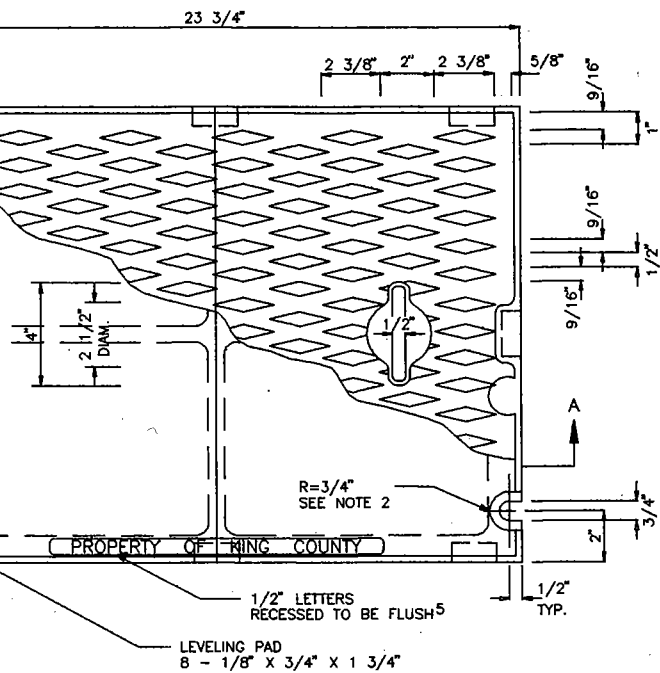
1. DRILL AND TAP FOR, AND PROVIDE, TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG WHEN USED WITH SOLID COVER (DWG. NO. 2-015) OR WHEN SPECIFIED BY ENGINEER.
2. FRAME MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
3. SET FRAME TO GRADE AND CONSTRUCT ROAD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

DATE	REVISION	BY

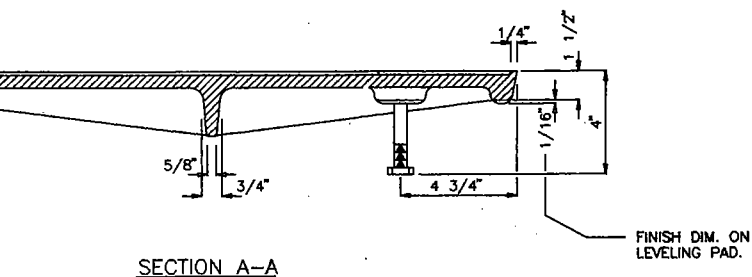


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STANDARD FRAME WITH VERTICAL OR
EXTRUDED CURB INSTALLATION



PLAN COVER

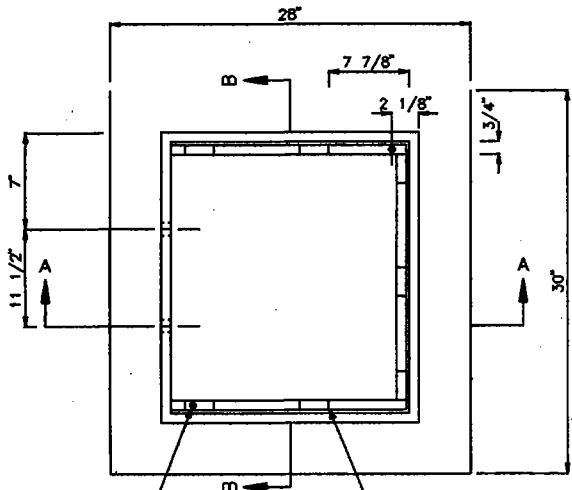


SECTION A-A

NOTES:

1. USE WITH FRAME (DWG. NO. 2-014) DRILLED AND TAPPED FOR LOCKING BOLTS.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS, 2" LONG.
3. MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
4. SEE SEC. 7.05.
5. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF COVER IS ON A PRIVATE SYSTEM.

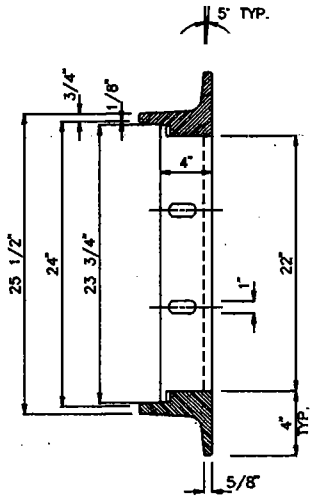
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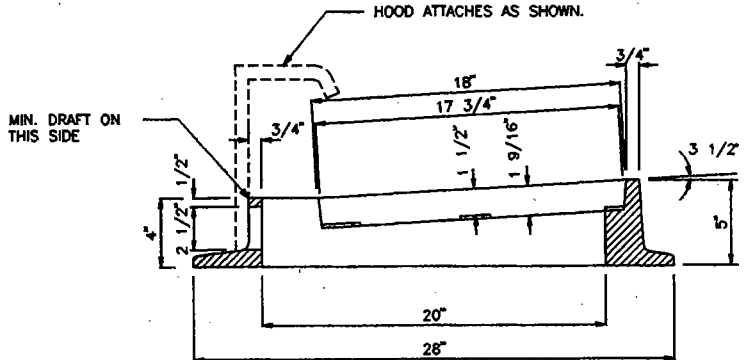
DRILL & TAP TWO
5/8" - 11NC HOLES
THRU FRAME

LEVELING PAD
7-1/8" X 3/4" X 2 1/4"
(TYP.)

PLAN



SECTION B-B



SECTION A-A

2 - 1" DIAM. HOLE
FOR 3/4" BOLT, WA
& NUT, SEE NOTE 2

NOTES:

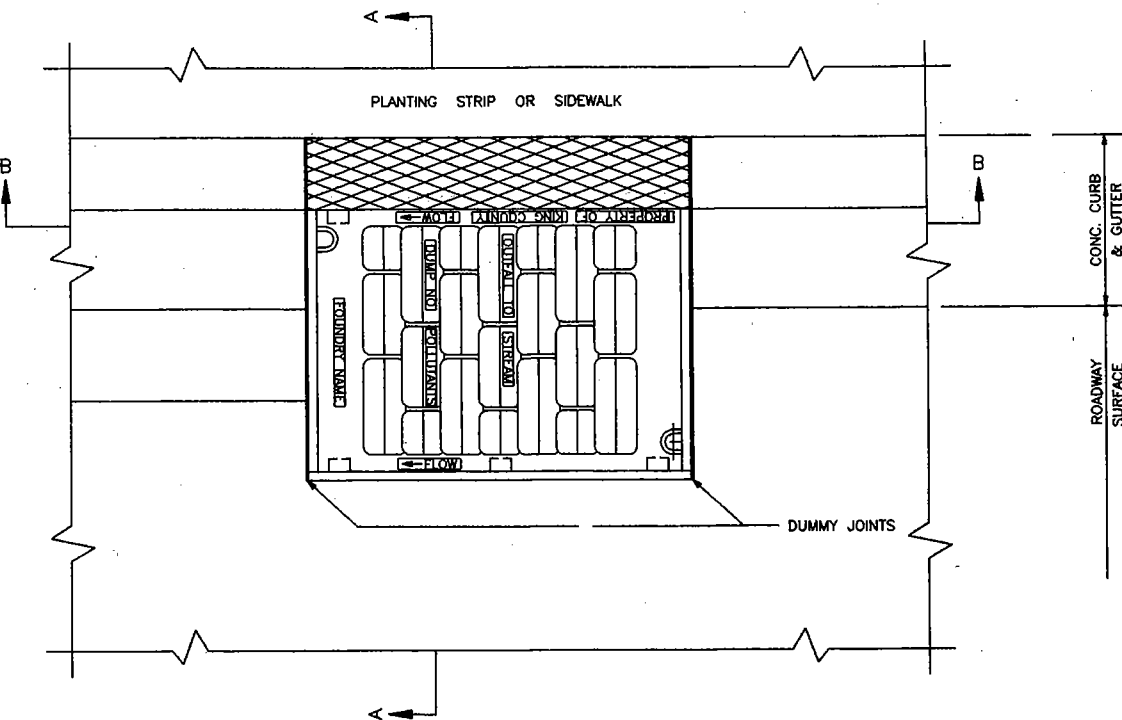
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30
2. SEE DWG. NO. 2-018 FOR VANED GRATE.
3. PATTERN ON TOP SURFACE OF HOOD SHALL
4. BOLT, WASHER, AND NUT SHALL BE GALV. OF
5. SEE SEC. 7.05.

DATE	REVISION

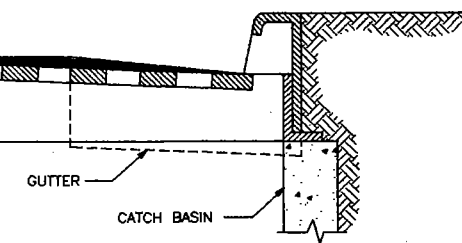


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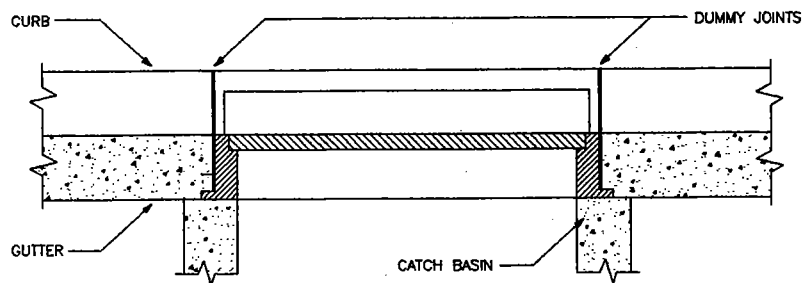
THROUGH-CURB INLET FRAME



PLAN



SECTION A-A



SECTION B-B

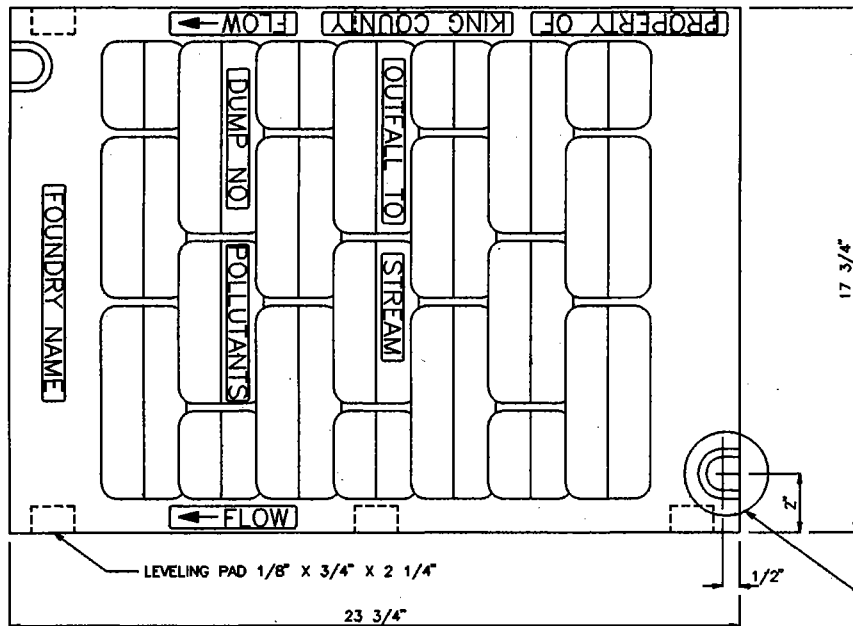
ADJUST ROAD AND GUTTER TO BE FLUSH WITH FRAME.
SEE SPECIFICATIONS FOR ALL REQUIREMENTS.

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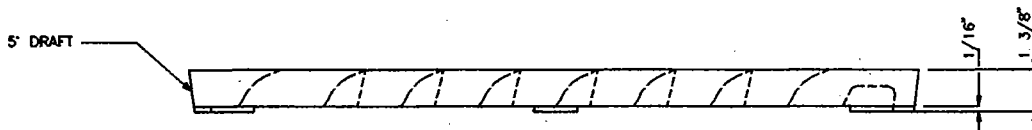
WORKS
STATION

THROUGH-CURB INLET FRAME & GRATE WITH VERTICAL CURB INSTALLATION

DWG. NO. 2-017



PLAN



ELEVATION

NOTES:

1. SELF-LOCK VANES TO APPROVAL BY
2. USE WITH TWO LOCK STAINLESS TYPE 304 (ALLEN HEAD) CAPS FOR SLOT DETAIL.
3. MATERIAL IS DUCTILE IRON 80-55-06.
4. "OUTFALL TO STREAM" MAY BE LOCATED
5. SEE SEC. 7.05.
6. THE WORDS "PROPERTY OF KING COUNTY" BE OMITTED IF GRATE IS FOR PRIVATE USE.

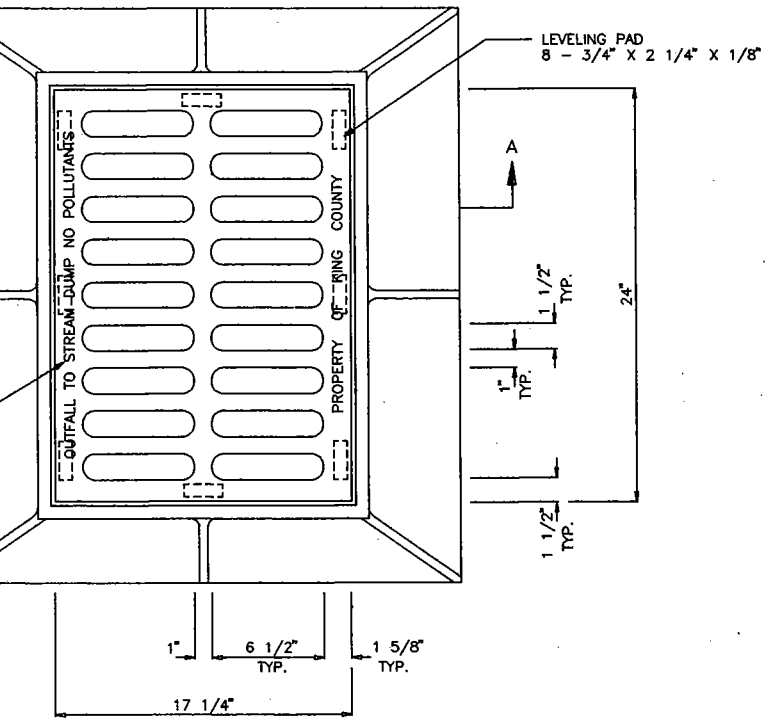
FOR SLOT DETAIL SEE DWG. NO. 2-013

DATE	REVISION	BY

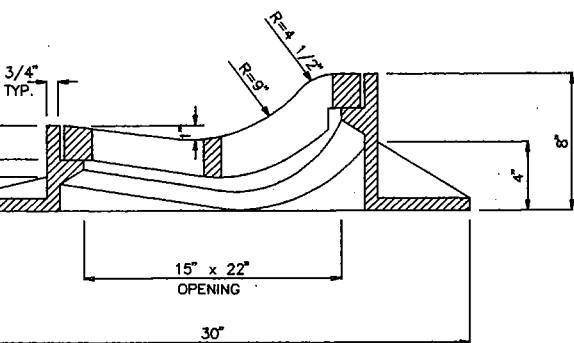


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VANED GRATE



PLAN

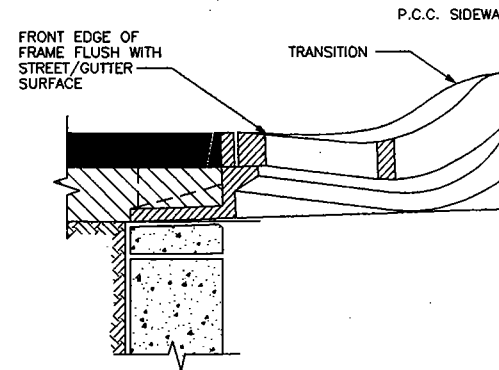
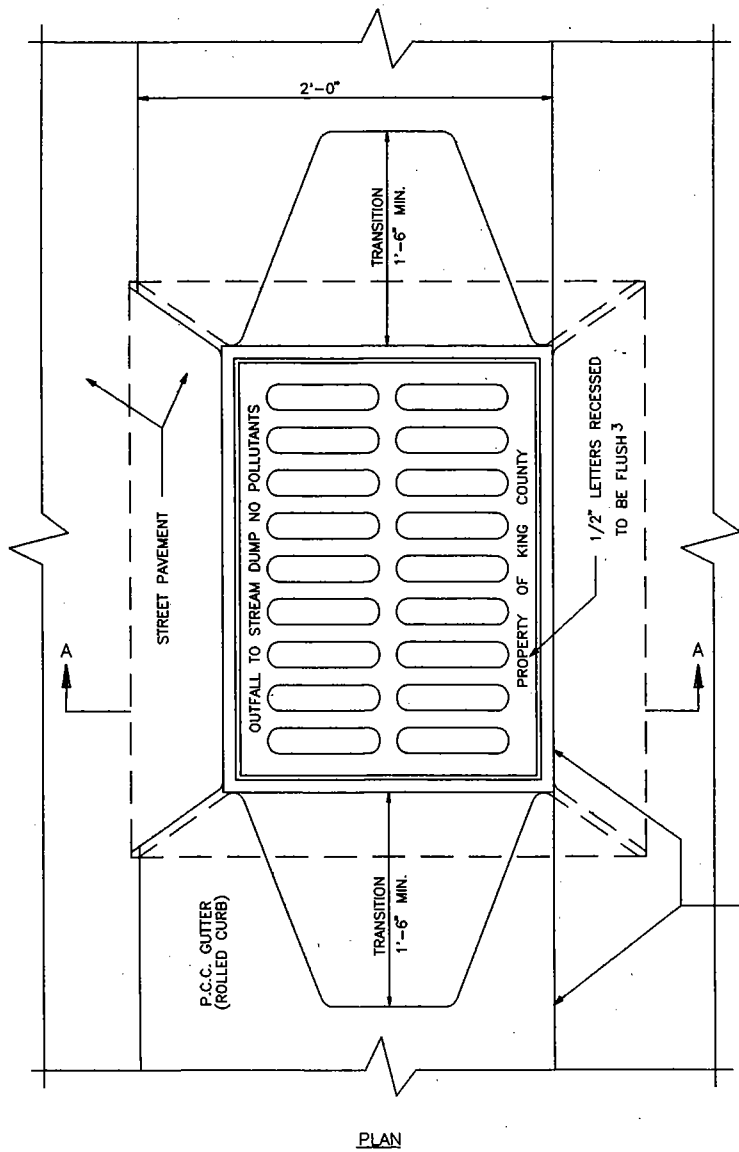


SECTION A-A

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADWAYS.

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SECTION A-A

NOTES:

1. SET FRAME TO GRADE AND CONSTRUCT ROLLER FLUSH AT FRONT AND BACK OF FRAME.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" IF GRATE IS ON A PRIVATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADS.

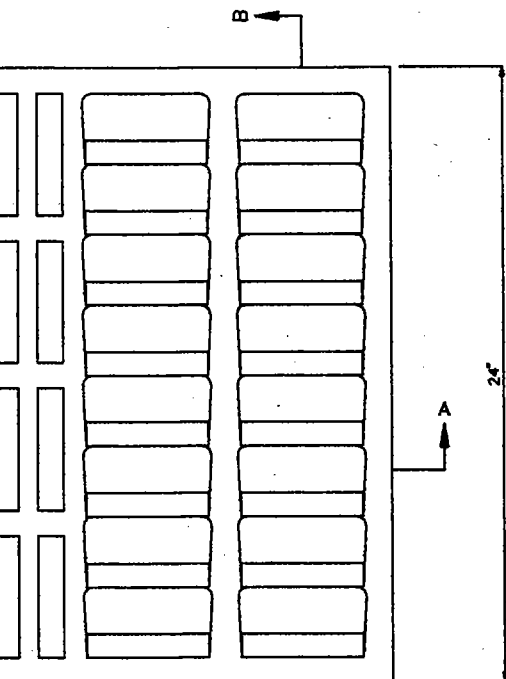
BACK EDGE OF FRAME EVEN WITH BACK FACE OF CURB

DATE	REVISION	BY



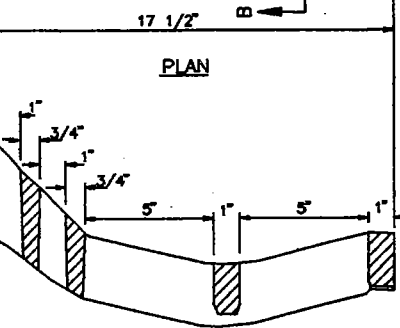
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

ROLLED CURB FRAME & GRATE INSTALLATION

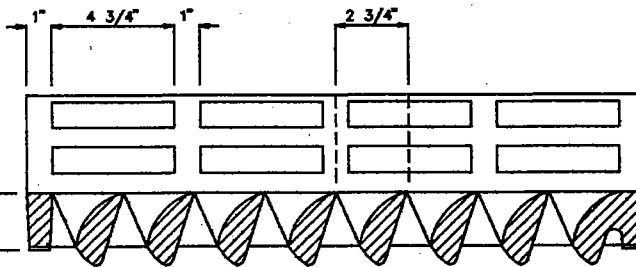


NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.

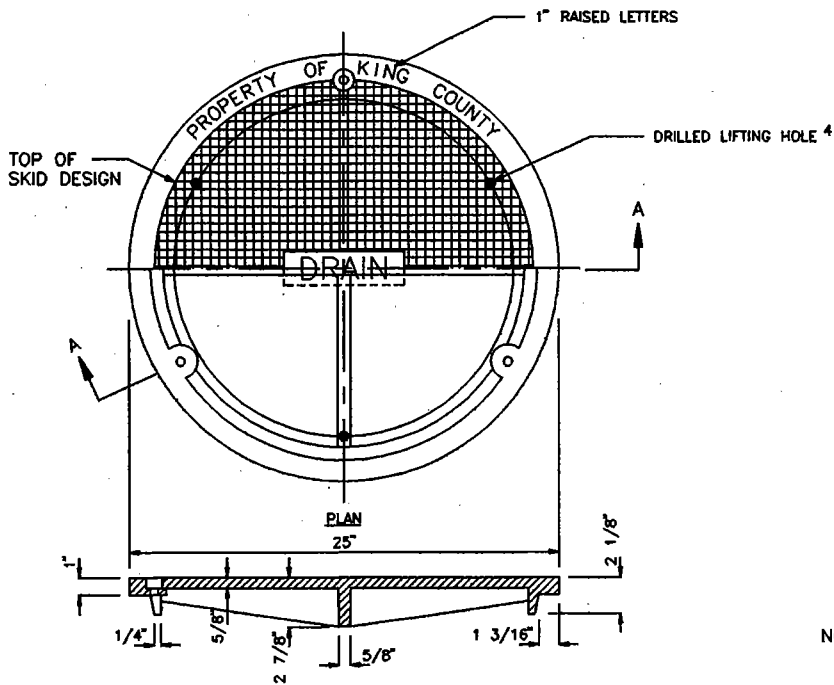


SECTION A-A

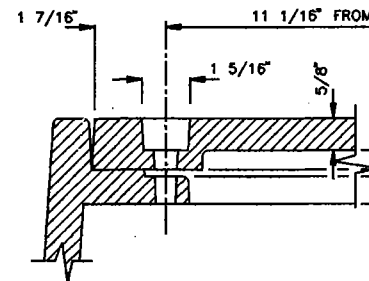


SECTION B-B

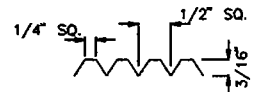
DATE	REVISION	BY	APPR'D



SECTION A-A



BOLT-DOWN DETAIL



COVER SKID DESIGN DETAIL

NOTES:

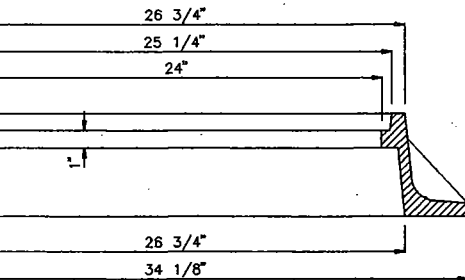
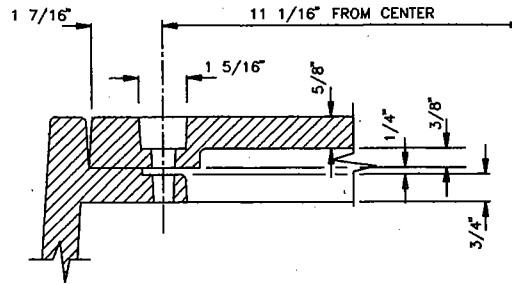
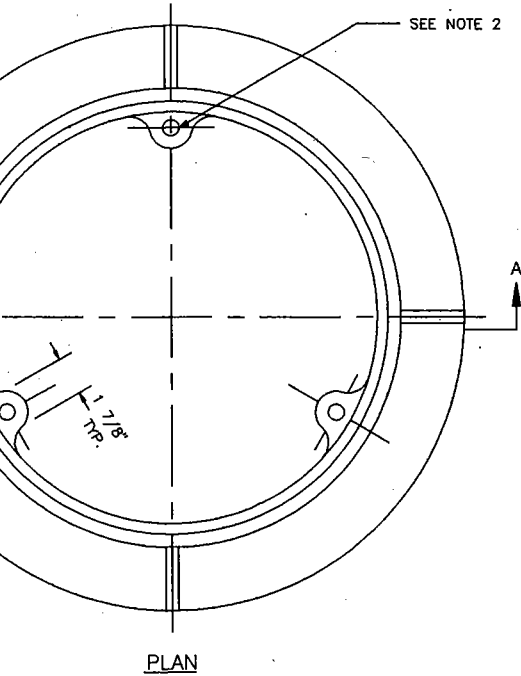
1. USE WITH THREE LOCKING BOLTS 5/8" - 11 NC STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS. HOLES SPACED 120° AT 11 1/16" RADIUS.
2. MATERIAL IS DUCTILE IRON ASTM A536 GRADE
3. SEE SEC. 7.05.
4. DRILL THREE 1 INCH HOLES SPACED AT 120°

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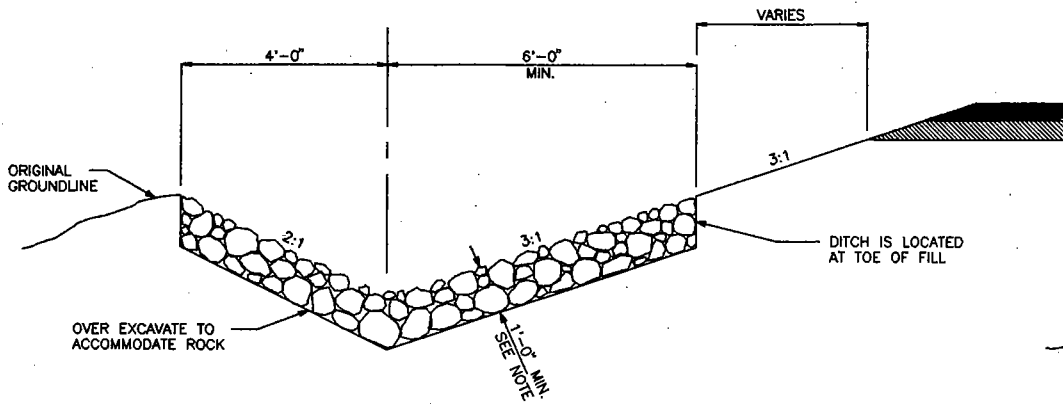
LOCKING MANHOLE COVER



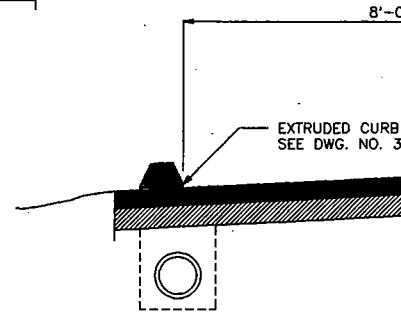
NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. DRILL AND TAP THREE 5/8"-11 NC HOLES THROUGH FRAME AT 120° AND 11 1/16" RADIUS.
3. SEE SEC. 7.05.

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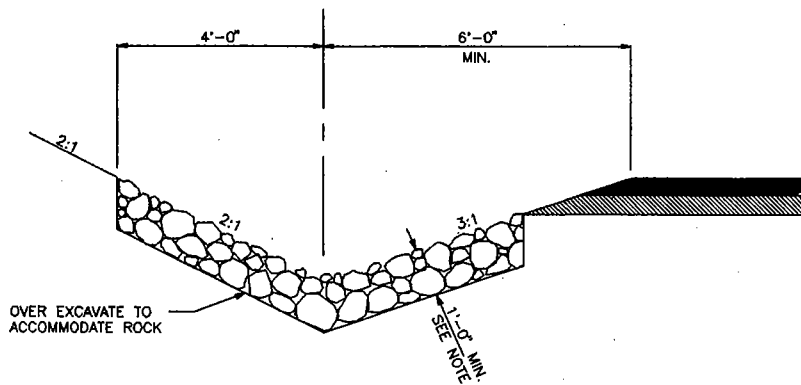
ROCK-LINED SHOULDER DITCH
IN FILL SECTION



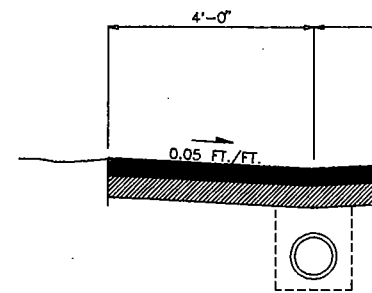
CURBED SHO

NOTES:

1. DEEPER ROCK FILL MAY BE SPECIFIED.
2. SEE SEC. 7.02.



ROCK-LINED SHOULDER DITCH
IN CUT SECTION



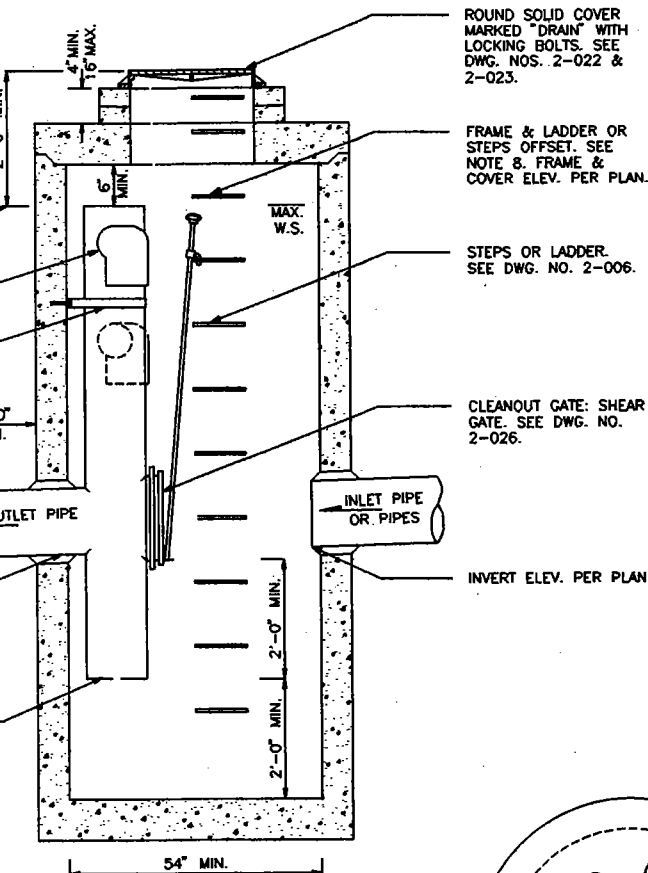
TURNPIKE SHO

DATE	REVISION	BY

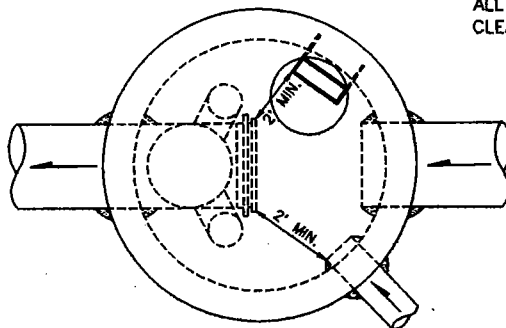


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ROCK-LINED SHOULDER DITCHES & CURB
OR TURNPIKE SHOULDERS



CATCH BASIN TYPE 2
DIAM. AS REQUIRED
SEE DWG. NO. 2-005.



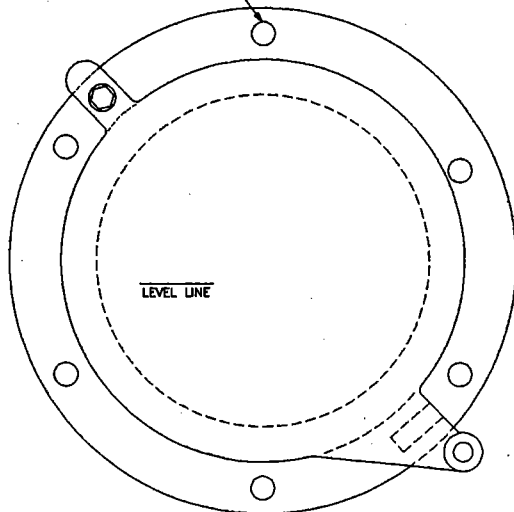
PLAN

NOTES:

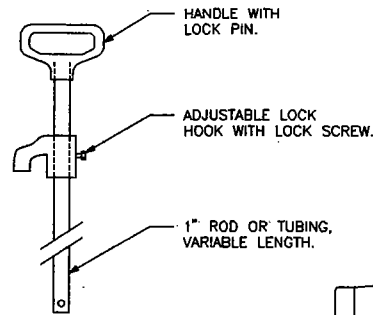
1. PIPE SIZES AND SLOPES: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR CATCH BASIN TYPE 2, 54" MIN. DIAM.
4. PIPE SUPPORTS AND RESTRICTOR/SEPARATOR SHALL BE OF SAME MATERIAL, AND BE ANCHORED AT 3' MAX. SPACING BY 5/8" DIAM. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED 2" IN WALL.
5. THE RESTRICTOR/SEPARATOR SHALL BE FABRICATED FROM .060" ALUMINUM, OR .064" ALUMINIZED STEEL, OR .064" GALVANIZED STEEL PIPE; IN ACCORDANCE WITH AASHTO M 36, M 196, M 197 AND M 274. GALVANIZED STEEL SHALL HAVE TREATMENT 1.
6. OUTLET SHALL BE CONNECTED TO CULVERT OR SEWER PIPE WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE, OR GROUTED INTO THE BELL OF CONCRETE PIPE.
7. THE VERTICAL RISER STEM OF THE RESTRICTOR/SEPARATOR SHALL BE THE SAME DIAM. AS THE HORIZONTAL OUTLET PIPE, WITH AN 8" MIN. DIAM.
8. FRAME AND LADDER OR STEPS OFFSET SO THAT:
 - A. CLEANOUT GATE IS VISIBLE FROM TOP.
 - B. CLIMB DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
 - C. FRAME IS CLEAR OF CURB.
9. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4".
10. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE.

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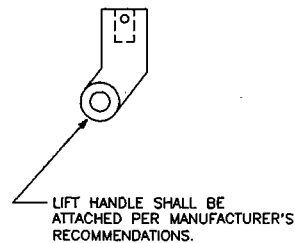
SIX EVENLY SPACED HOLES
ON 10 3/8" BOLT CIRCLE
FOR BOLTING TO FLANGE
CONNECTION.



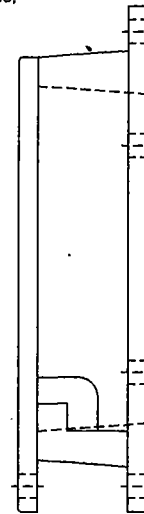
FRONT



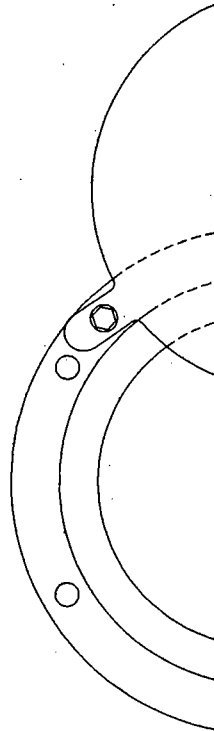
LIFT HANDLE



LIFT HANDLE SHALL BE
ATTACHED PER MANUFACTURER'S
RECOMMENDATIONS.



SIDE



MAXI

NOTES:

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

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FROP-T SHEAR GATE DETAIL

COVER
WITH

ROUND MANHOLE COVER
MARKED "DRAIN" WITH
LOCKING BOLTS.

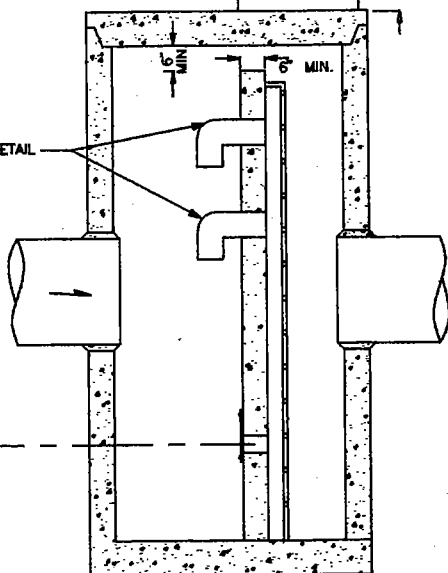
4" MIN.
16" MAX.

SEE ELBOW DETAIL

FLOW ORIFICES

2'-0"
MIN

2'-0"
MIN



SECTION B-B

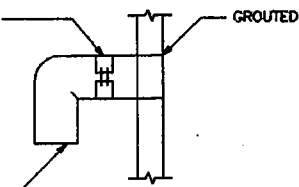
ELEVATION

BLE
GHT
G

GROUTED

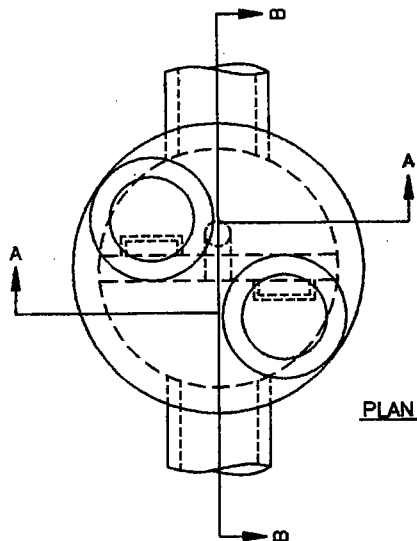
PLATE WITH ORIFICE
AS SPECIFIED

ELBOW DETAIL



NOTES:

1. PIPE SIZE, SLOPES AND ALL ELEVATIONS: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. CATCH BASIN: TYPE 2, TO BE CONSTRUCTED IN ACCORDANCE WITH DWG. NO. 2-005 AND AASHTO M199 UNLESS OTHERWISE SPECIFIED.
4. COVERS: ROUND, SOLID MARKED "DRAIN," WITH LOCKING BOLTS SEE DWG. NO. 2-022 & 2-023.
5. ORIFICES: SIZED AND LOCATED AS REQUIRED, WITH LOWEST ORIFICE MIN. 2" FROM BASE.
6. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
7. PRECAST BAFFLE WALL SHALL BE KEYED AND GROUTED IN PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4" MIN. GALVANIZED STEEL AND ATTACHED WITH 1/2" STAINLESS STEEL BOLTS. OMIT ORIFICE PLATE IF ONLY FOR OIL SEPARATION.
9. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR GALVANIZED STEEL. SEE DWG. NO. 2-025. GALVANIZED STEEL SHALL HAVE TREATMENT 1.



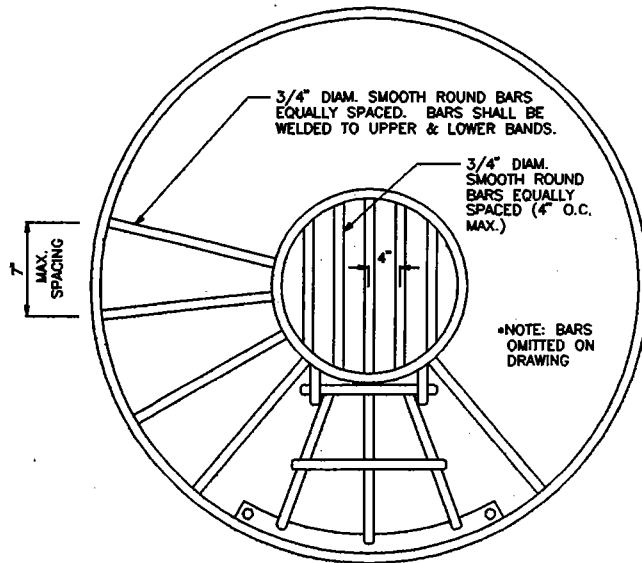
PLAN

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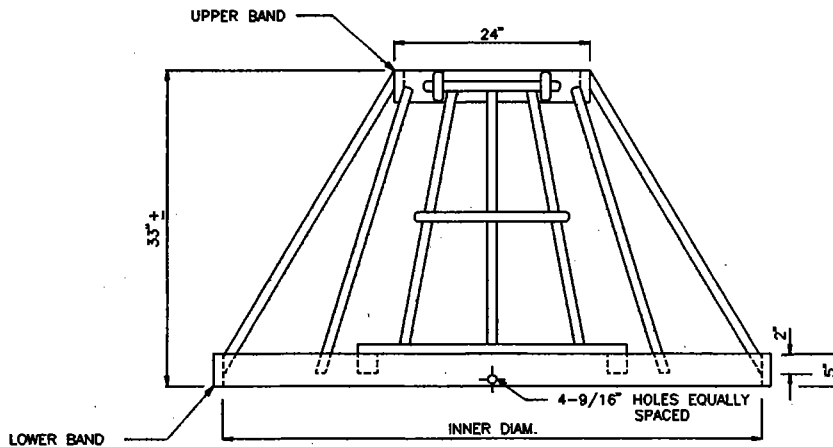
FLOW RESTRICTOR / OIL POLLUTION
CONTROL DEVICE, BAFFLE TYPE (FROP-B)

DWG. 2-027
NO.



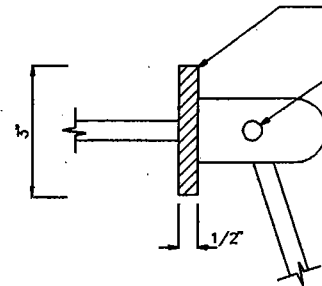
*NOTE: BARS OMITTED ON DRAWING

PLAN



ELEVATION

CB	INNER DIAM.
48"	58"
54"	65"
60"	72"
72"	86"
96"	114"



3/4" BAR

DRILL HOLES FOR LOCK



ENTRY G

LOWER BAND

NOTES:

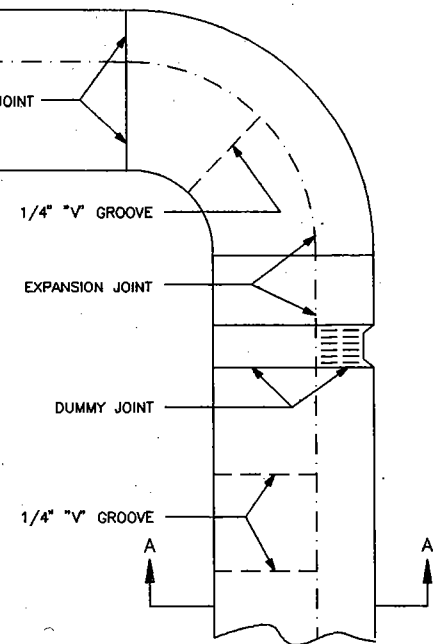
1. ALL STEEL IN PLATES, BARS AND BANDS REQUIREMENTS OF ASTM A36.
2. DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED WITH ASTM A123 (AASHTO M111).

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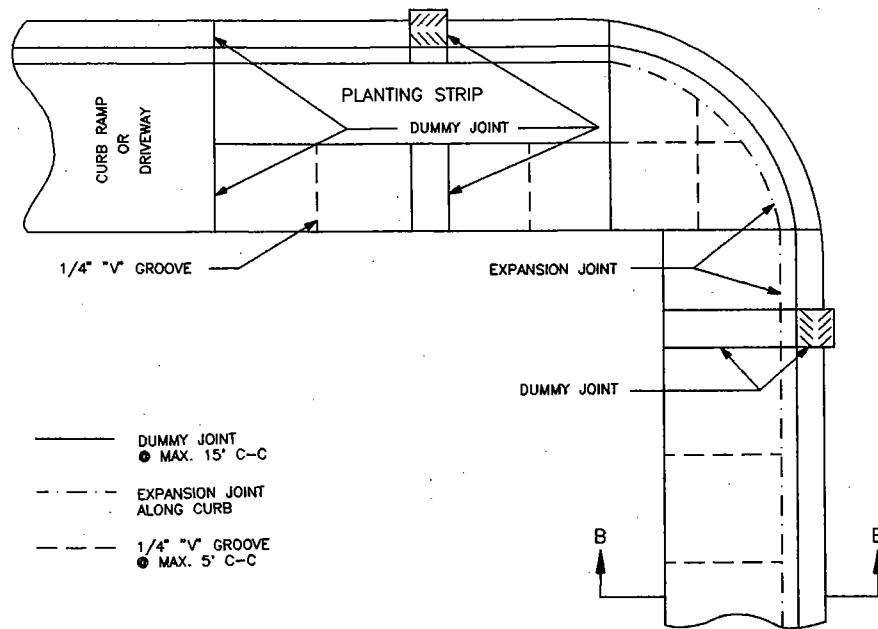


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DEBRIS CAGE

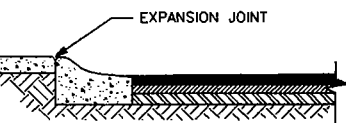


CURB & SIDEWALK

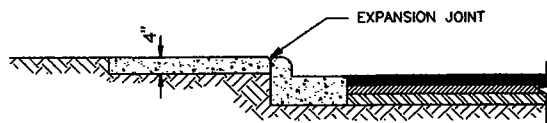


VERTICAL CURB & SIDEWALK

- DUMMY JOINT
● MAX. 15' C-C
- - - EXPANSION JOINT
ALONG CURB
- - - 1/4" "V" GROOVE
● MAX. 5' C-C



SECTION A-A



SECTION B-B

CONSTRUCTION REQUIREMENTS.

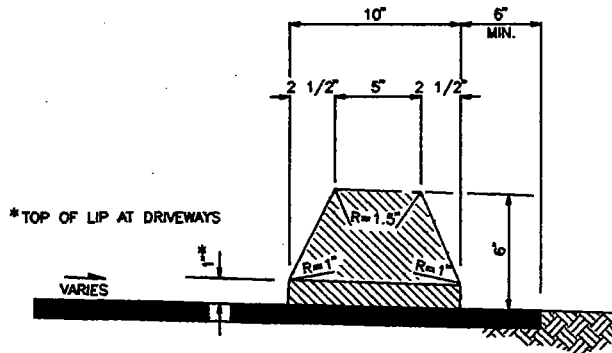
CONSTRUCTION, 1/4" EDGED GROOVE MAY BE OMITTED AT INTERFACE BETWEEN CURB AND SIDEWALK.

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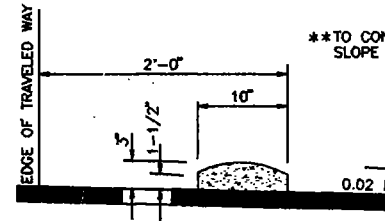
WORKS
STATION

CURB & SIDEWALK JOINTS

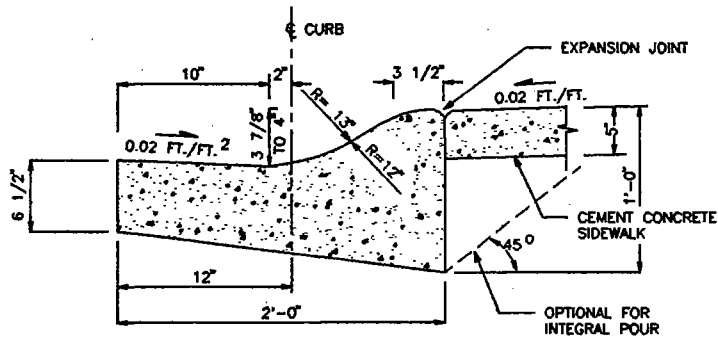
DWG. NO. 3-001



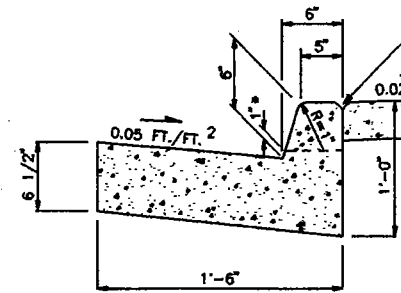
EXTRUDED ASPHALT OR CEMENT
CONCRETE CURB 3.5



MOUNTABLE CEMENT CONCRETE CURB



CEMENT CONCRETE ROLLED CURB



CEMENT CONCRETE CURB & GUTTER

NOTES:

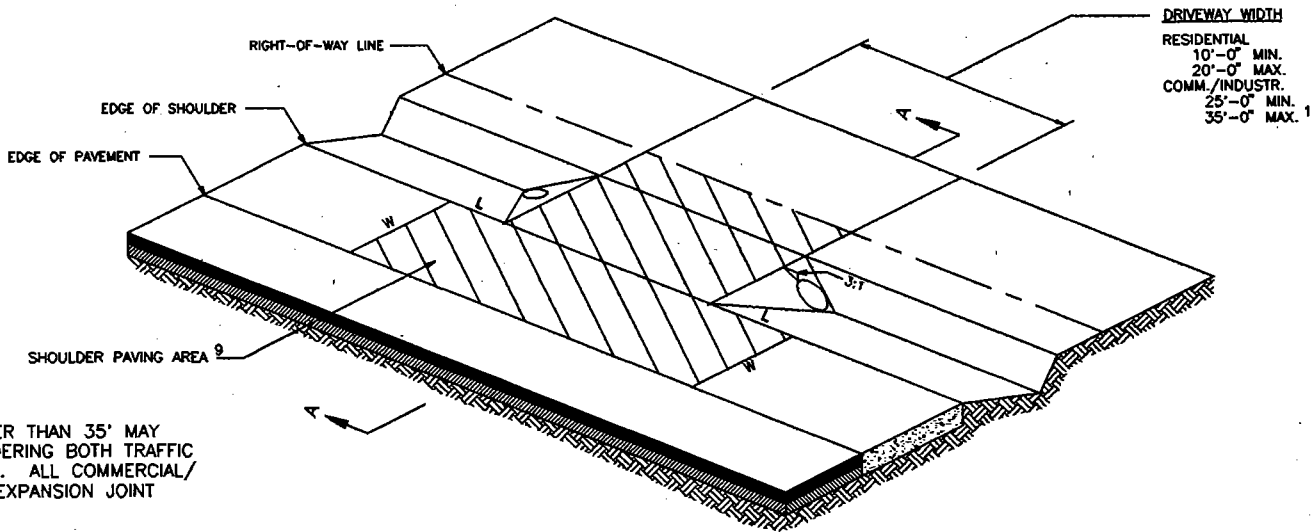
1. SEE SEC. 3.04 K.C.R.S. FOR JOINT REQUIREMENTS.
2. ROLL GUTTER TO MATCH POSITIVE SUPERELEVATION.
3. SEE DRAWING NO. 1-006 FOR CONFIGURATION OF FILL & WALKWAY BEHIND CURB IF REQUIRED.
4. FOR INTEGRAL POUR CONSTRUCTION, 1/4" EDGED GROOVE MAY REPLACE EXPANSION JOINT AT INTERFACE BETWEEN THE CURB AND ADJACENT SIDEWALK.
5. SEE SEC. 3.03 FOR EXTRUDED CURB ANCHORAGE.

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CURB DETAILS



WAYS WIDER THAN 35' MAY
 BE CONSIDERED BOTH TRAFFIC
 SERVED. ALL COMMERCIAL/
 DRIVE AN EXPANSION JOINT
 3.04.

AND STORM WATER RUNOFF, AND
 EXISTING PIPES WITHIN 500'

BEVELED TO MATCH THE
 MORE THAN 2" BEYOND SLOPE
 ALLS ARE NOT ACCEPTABLE.
 COVER OF 6" TO
 END OF PIPE SHALL HAVE

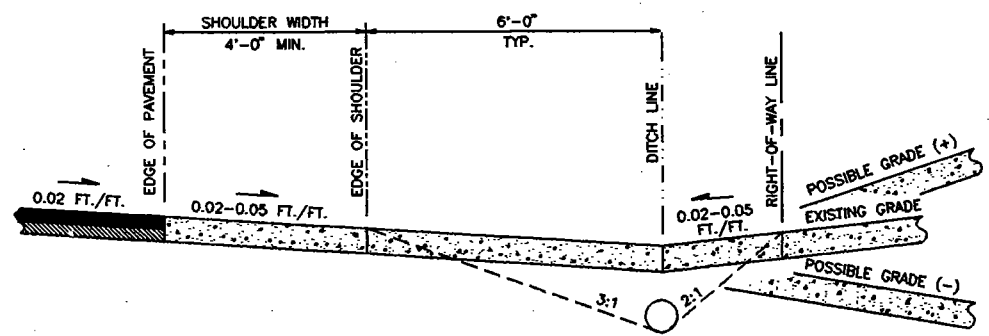
STRAIGHT UNIFORM ALIGNMENT
 PER 100 FT.) WITH THE
 THE UPSTREAM END.

IF DITCH DOES NOT EXIST
 FOR NATURAL FLOW.

TO BACK EDGE OF SHOULDER,
 THE EDGE OF SHOULDER SHALL NOT
 BE USED FOR DRIVEWAY CONSTRUCTION.

LOCATED THROUGH RIGHT-OF-WAY
 AT P.C.C.

LOCATED BETWEEN THE EDGE OF
 DRIVEWAY OR B.S.T. ONLY WITH DIMENSIONS L=W.

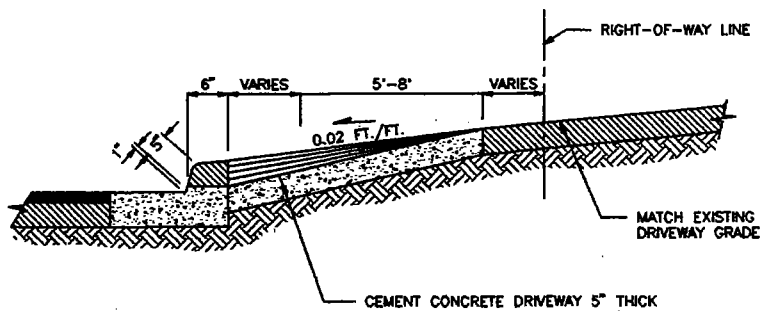
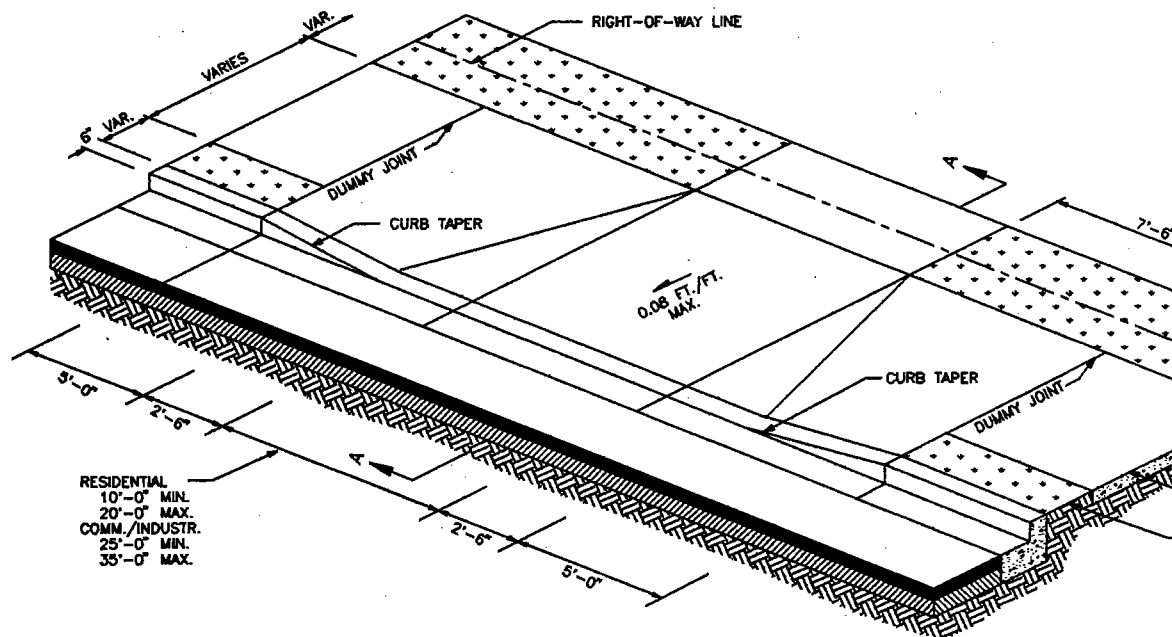


SECTION A-A

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SHOULDER & DITCH SECTION DRIVEWAY

DWG. NO. 3-003



SECTION A-A

NOTES:

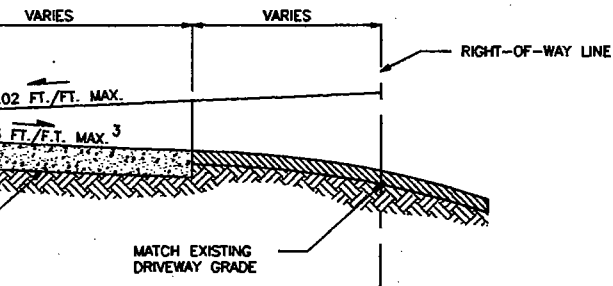
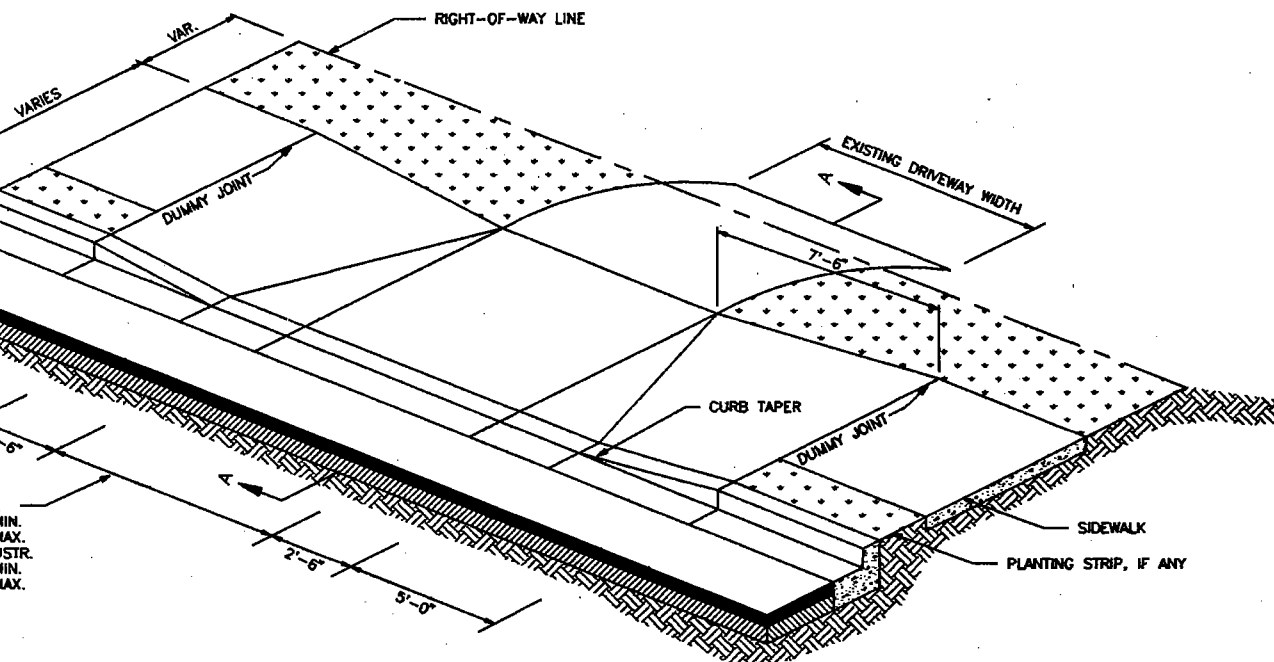
1. COMMERCIAL/INDUSTRIAL DRIVEWAYS BE APPROVED BY THE ENGINEER CO SAFETY AND NEEDS OF THE ACTIVITY COMMERCIAL/INDUSTRIAL DRIVEWAYS EXPANSION JOINT LOCATED MID-WID
2. SEE SEC. 3.01.
3. SEE SEC. 4.01 FOR SURFACING REC

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CURB & GUTTER SECTION DRIVEWAY



NOTES:

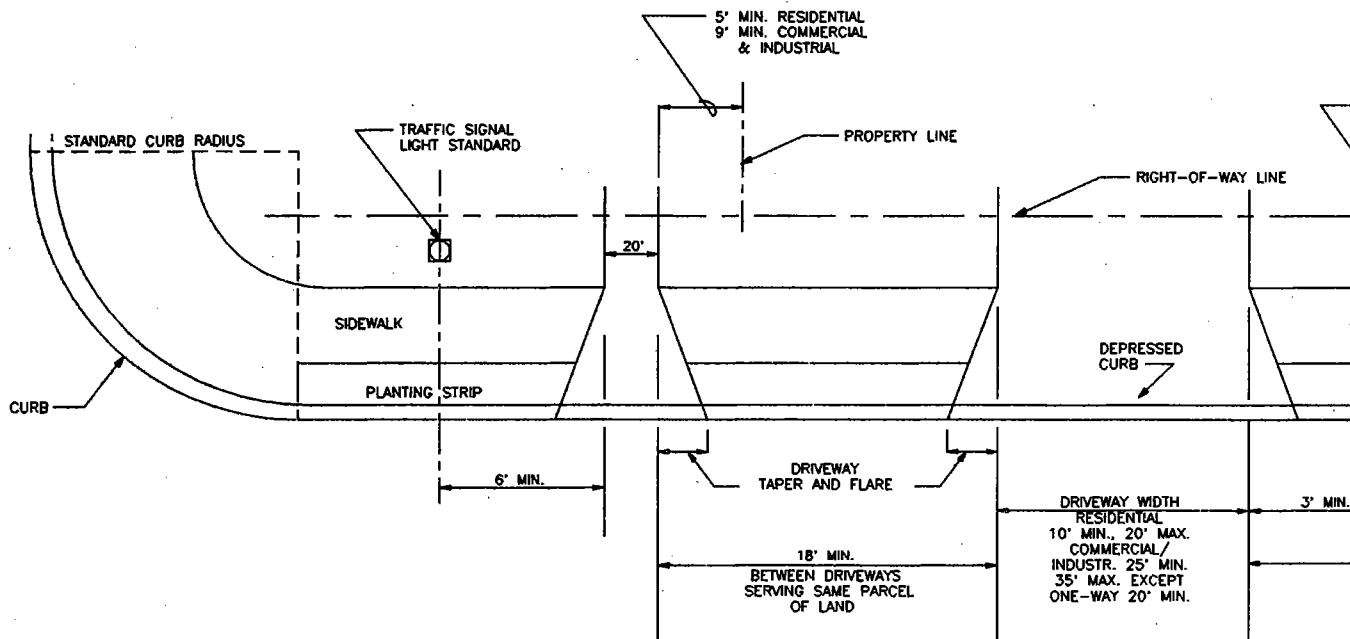
1. A REVERSE SLOPE DRIVEWAY IS SUBJECT TO APPROVAL BY ENGINEER CONSIDERING NEED FOR AND COMPATIBILITY OF THIS FEATURE.
2. COMMERCIAL/INDUSTRIAL DRIVEWAYS WIDER THAN 35' MAY BE APPROVED CONSIDERING TRAFFIC SAFETY AND NEEDS OF THE ACTIVITY SERVED. ALL COMMERCIAL/INDUSTRIAL DRIVEWAYS SHALL HAVE AN EXPANSION JOINT LOCATED MID-WIDTH. SEE SEC. 3.04.
3. A STORM SEWER INLET SHALL BE LOCATED WITHIN 20' BUT NO CLOSER THAN 10' UPGRADE FROM NEAREST EDGE OF CURB TAPER.
4. SEE SEC. 3.01.
5. SEE SEC. 4.01 FOR SURFACING REQUIREMENTS.

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REVERSE SLOPE DRIVEWAY

DWG. 3-005
NO. 3-005



NOTES:

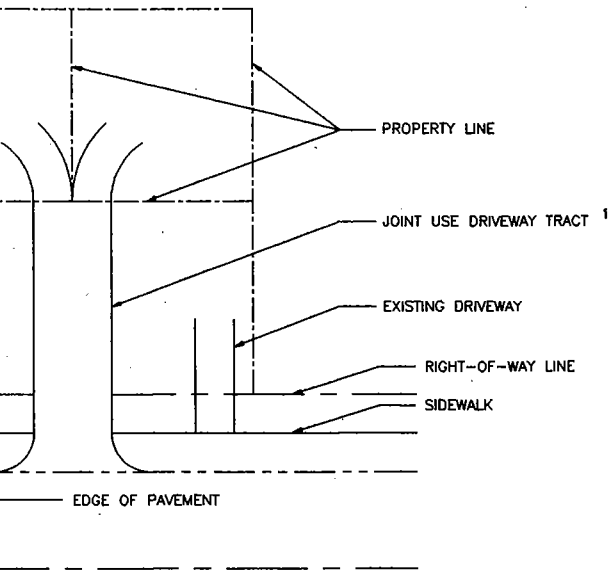
1. NO PORTION OF ANY DRIVEWAY SHALL ENCROACH IN CURB RETURN.
2. COMMERCIAL/INDUSTRIAL DRIVEWAYS MUST BE APPROVED BY THE ENGINEER, CONSIDERING BOTH TRAFFIC SAFETY AND THE ACTIVITY BEING SERVED. ALL COMMERCIAL/INDUSTRIAL DRIVEWAYS SHALL HAVE AN EXPANSION JOINT LOCATED MID-WIDTH. SEE SEC. 3.04.
3. FOR ROADWAY CLEARANCE OF UTILITY POLES AND STRUCTURES SEE SEC. 8.02G AND DWG. NO. 5-001.
4. DRIVEWAYS SHALL BE LOCATED AS FAR FROM THE INTERSECTION AS POSSIBLE.

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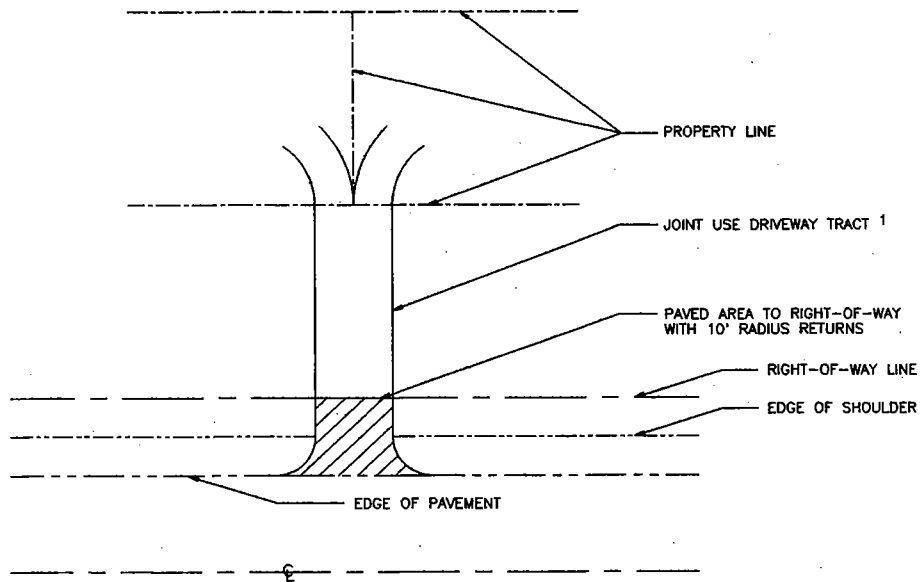


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LOCATION & WIDTH OF NEW DRIVEWAY



URBAN



RURAL

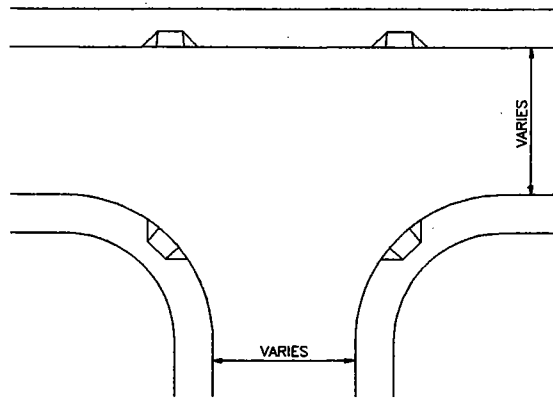
TRACT WIDTH AND PAVING REQUIREMENTS.

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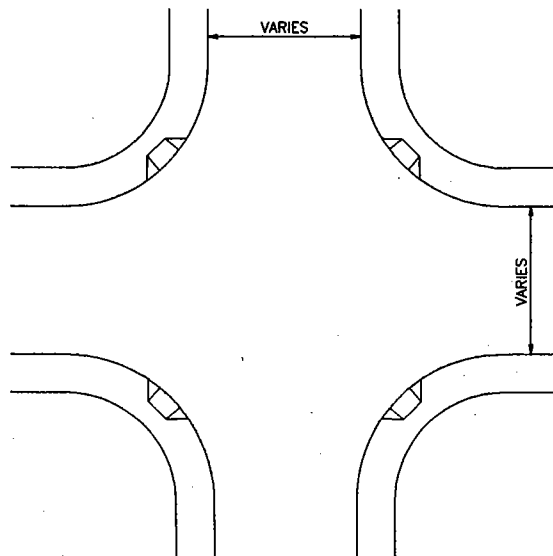
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JOINT USE DRIVEWAY TRACT

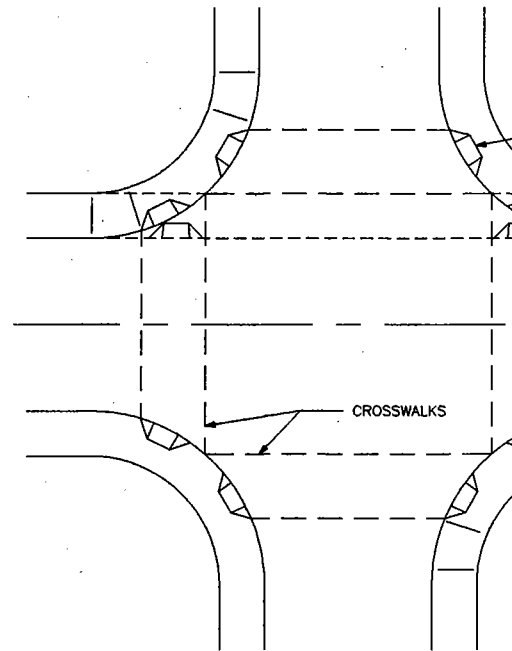
DWG. 3-007
NO.



RAMP LOCATIONS
ON RESIDENTIAL ACCESS STREETS



RAMP LOCATIONS
ON ARTERIALS AND COMMERCIAL
ACCESS STREETS



NOTES:

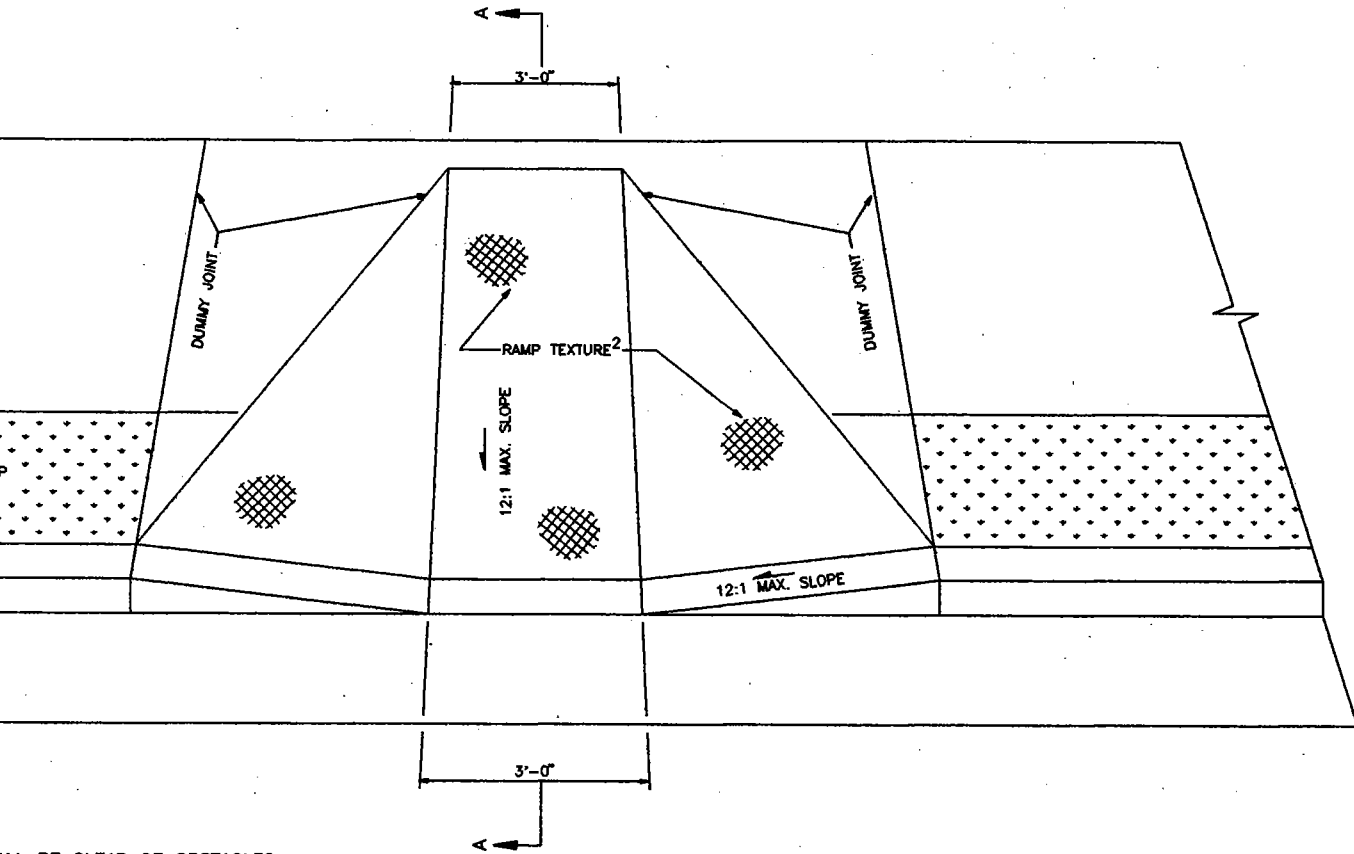
1. CATCH BASIN AND INLETS SHALL BE OUTSIDE THE (24" MIN. CLEARANCE FROM RAMP). SEE SEC. 7.0 CROSSWALK RESTRICTIONS.
2. CARE SHALL BE TAKEN TO KEEP THE RAMP FROM HYDRANTS, POLES, INLETS, AND OTHER UTILITIES.
3. CONSTRUCT RAMP IN ACCORDANCE WITH DWG. NO. 4-003.
4. CROSSWALKS ARE NOT ALWAYS MARKED.
5. WHEN RAMPS ARE CONSTRUCTED ON ONE SIDE OF STREET SHALL BE CONSTRUCTED AT CORRESPONDING LOCATION ON OPPOSITE SIDE OF STREET.

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CURB RAMP LOCATIONS



ALL BE CLEAR OF OBSTACLES
AND INLETS.

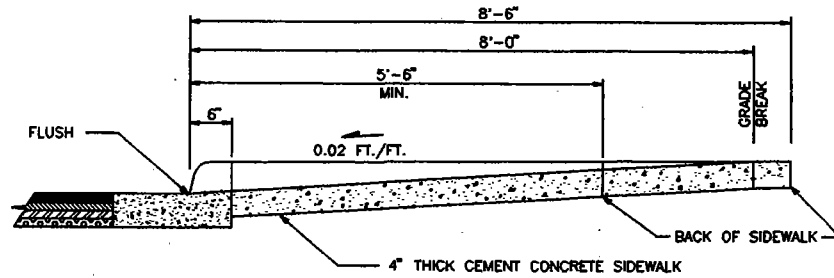
BY IMPRINT OF METAL GRID

BE PERPENDICULAR TO OR
UNLESS OTHERWISE APPROVED

CTED ON ONE SIDE OF THE
ONSTRUCTED AT CORRESPONDING
POSITE SIDE OF STREET.

ENERAL CASE, CURB RAMPS
O PER RADIUS, IN OR
HE MAIN PEDESTRIAN PATHS.

R WHERE UTILITIES ARE IN CONFLICT
4.0% CURB RAMPS MAY BE
IUS, AT MIDPOINT OF CURB
RIAN PATH.

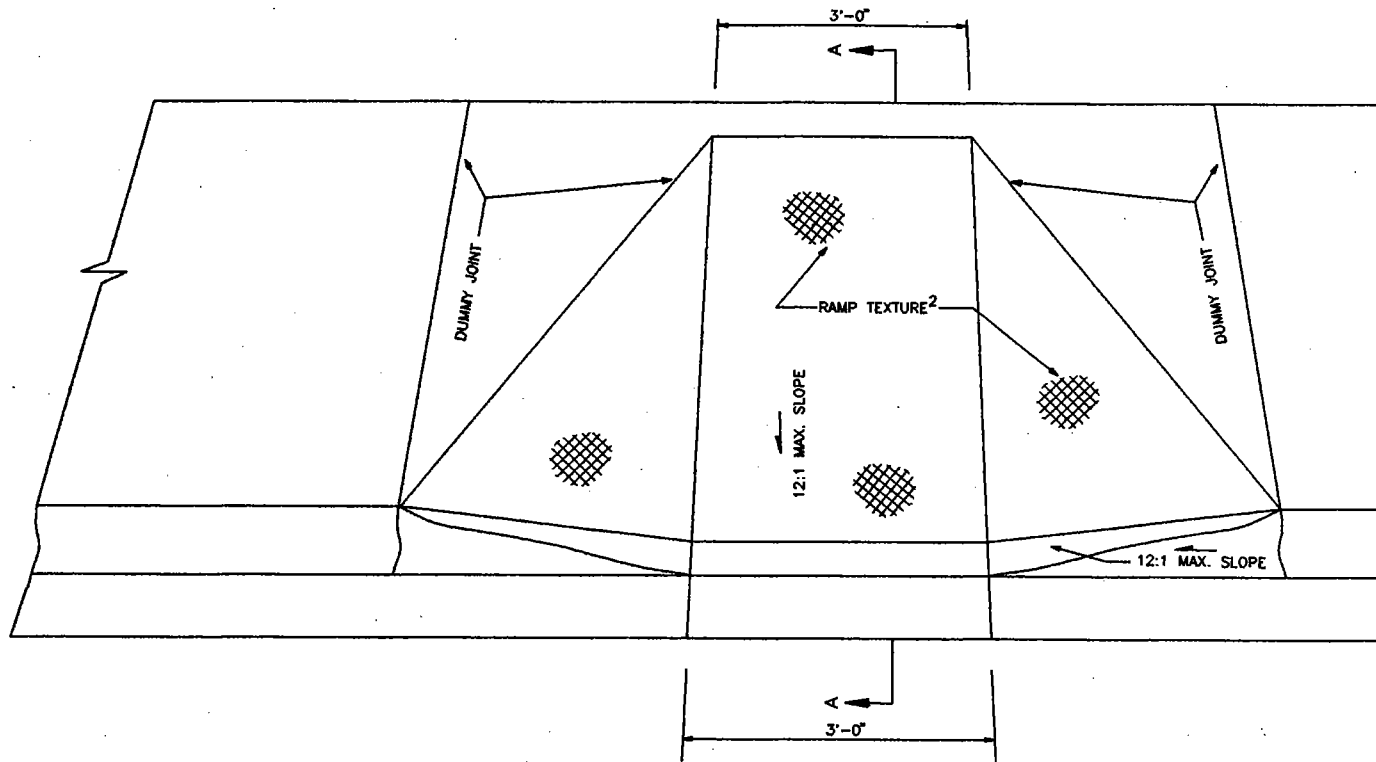


SECTION A-A

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TON

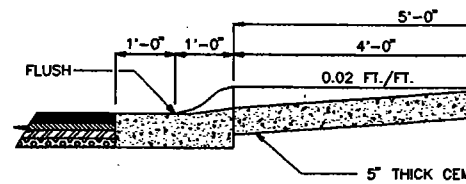
CURB RAMPS IN VERTICAL CURB

DWG. 4-002
NO.



NOTES:

1. RAMP AND APPROACHES SHALL BE CLEAR OF OBSTACLES INCL. HYDRANTS, POLES, AND INLETS.
2. RAMP SHALL BE TEXTURED BY IMPRINT OF METAL GRID WITH 1/2" SPACING.
3. RAMP CENTER LINE SHALL BE PERPENDICULAR TO OR RADIAL TO CURB RETURNS UNLESS OTHERWISE APPROVED BY ENGINEER.
4. WHEN RAMPS ARE CONSTRUCTED ON ONE SIDE OF THE STREET, RAMPS SHALL BE CONSTRUCTED AT CORRESPONDING SIDEWALK LOCATIONS ON OPPOSITE SIDE OF STREET. SEE DWG. NO. 4-001.
5. SEE SEC. 3.05.

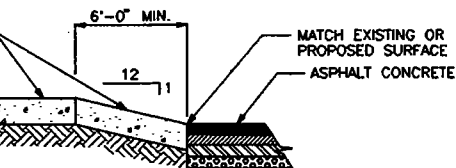
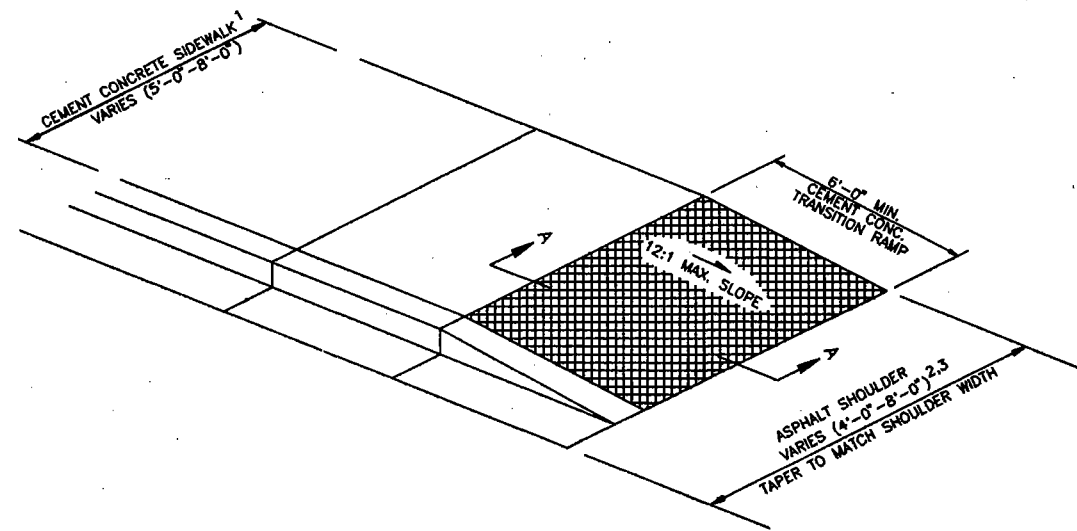


SECTION A-A



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CURB RAMPS IN ROLLED CURB



SECTION A-A

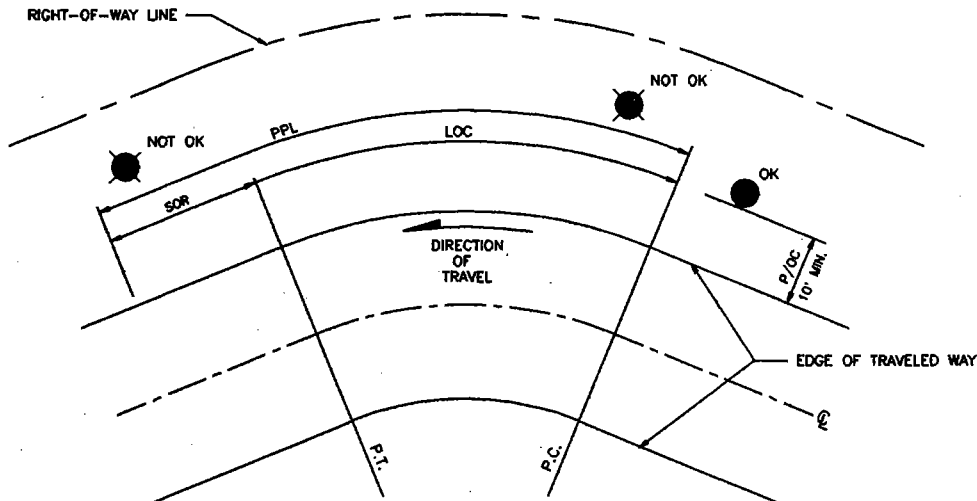
NOTES:

1. FOR WIDTHS OF SIDEWALK SEE SEC. 3.02.
2. FOR WIDTHS OF PAVEMENT AND SHOULDER SEE SECS. 2.02, 2.03, AND 2.04.
3. SHOULDER SHALL BE SURFACED AS REQUIRED BY SECTIONS 3.07 AND 4.01. IF PAVED, SHOULDER SLOPE SHALL MATCH CROWN SLOPE OR .02 FT./FT.
4. FOR CURB AND SIDEWALK JOINTS SEE DWG. NO. 3-001.
5. TRANSITION RAMP SHALL BE TEXTURED BY IMPRINT OF METAL GRID WITH 1/2" SPACING.

WORKS
INGTON

CEMENT CONCRETE SIDEWALK
TRANSITION TO ASPHALT SHOULDER

DWG. 4-004
NO.

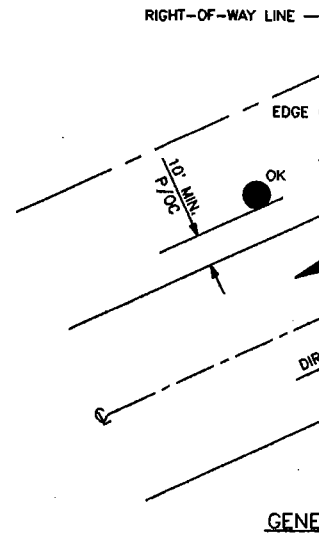


**OUTSIDE OF CURVE
POSTED 40 MPH & OVER**

- LOC: LENGTH OF CURVE (FEET) AT EDGE OF TRAVELED WAY FROM P.C. TO P.T.
- SOR: SAFETY OVERRUN (FEET) BEYOND P.T.
- PPL: PROHIBITED POLE LOCATION (FEET) (LOC + SOR) WHERE POLES OR OBSTACLES MUST BE REMOVED OR BARRICADED.

PPL (FEET) ON OUTSIDE OF CURVES WITH POSTED SPEED LIMIT OF 40 MPH & OVER.	
40 MPH	LOC + 220 (SOR)
45	LOC + 255
50	LOC + 290
55	LOC + 325

APPLIES TO ROADWAY WITH SHOULDER OR MOUNTABLE CURB ON OUTSIDE OF CURVE, WITH:
 -RADIUS LESS THAN 3500', AND
 -POSTED SPEED GREATER THAN OR EQUAL TO 40 M.P.H.



P/OC: POLE/OB
NEAREST

APPLIES: TO ROAD
OR MOUNTABLE C

- TANGENT.
- INSIDE OF
- OUTSIDE O
-POSTED
-RADIUS
MEETING

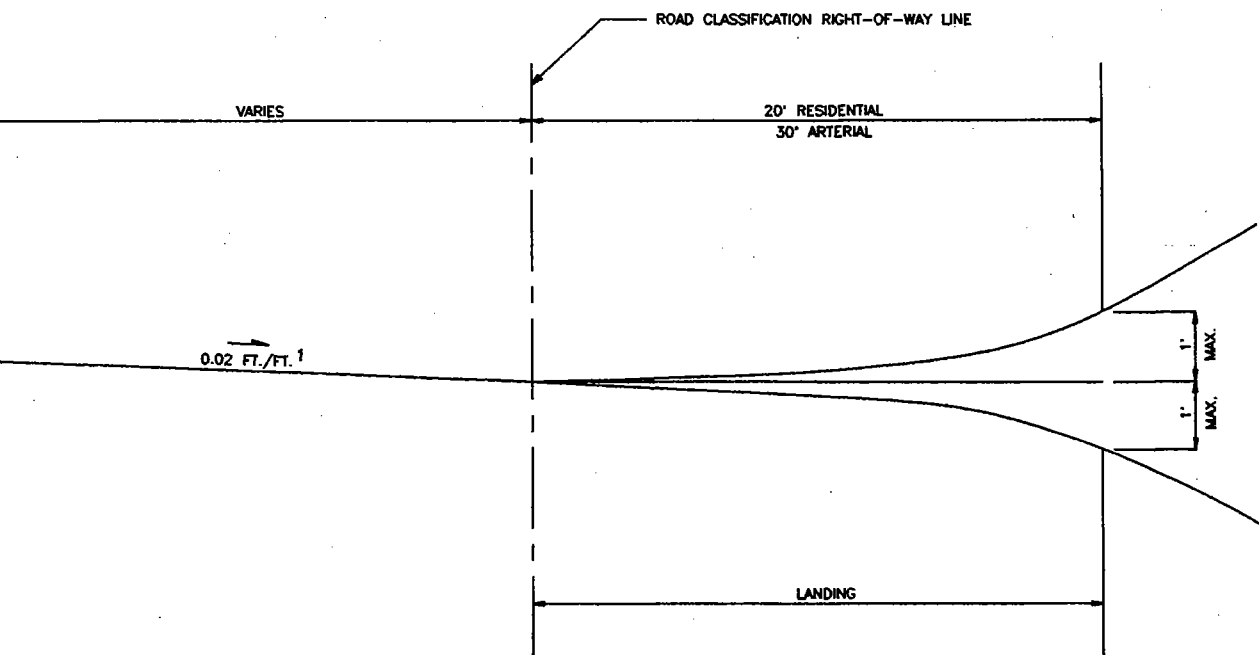
NOTES:

- THE STANDARDS SHALL APPLY TO EVERY NEW PLACEMENT AND EVERY PLANNED, NON-EMERGENCY REPLACEMENT OF EXISTING POLES AND OTHER UTILITY STRUCTURES WITHIN KING COUNTY RIGHT-OF-WAY.
- NO POLES MAY BE REPLACED ON THE OUTSIDE OF A CURVE WITH A POSTED SPEED LIMIT OF 40 MPH OR OVER UNLESS APPROVED THROUGH A VARIANCE REQUEST.
- SEE SECS. 5.11 & 8.02G.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

**CLEARANCE OF ROADSIDE OBSTACLES
ON SHOULDER TYPE ROAD**



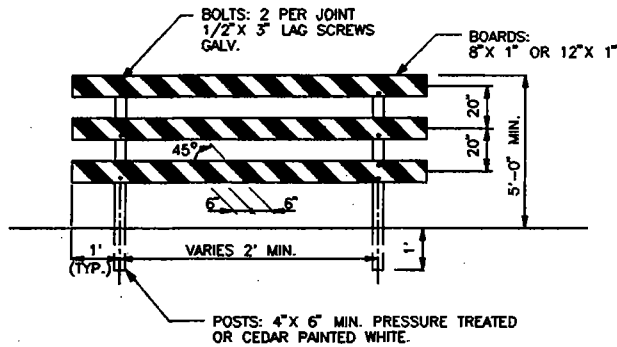
OR 2.04 FOR SUPERELEVATION REQUIREMENTS.

LANDING REQUIREMENTS.

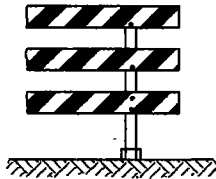
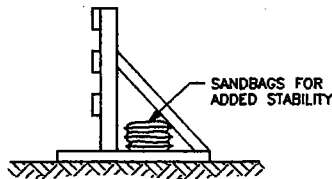
WORKS
STON

INTERSECTION LANDING

DWG. 5-002
NO.

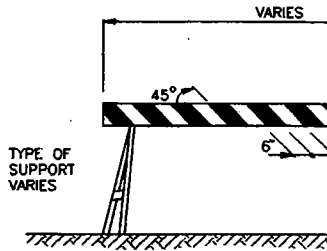


FIXED (PERMANENT)
TYPE III BARRICADE



MOVABLE (TEMPORARY)
TYPE III BARRICADE

BARRICADE NOTES:			
TYPE	I	II	III
WIDTH OF RAIL	8" MIN. 12" MAX.	8" MIN. 12" MAX.	8" MIN. 12" MAX.
LENGTH OF RAIL	2' MIN.	2' MIN.	4' MIN.
HEIGHT	3' MIN.	3' MIN.	5' MIN.
TYPE OF FRAME	DEMOUNTABLE OR HEAVY "A"	LIGHT "A" FRAME	POST OR SKIDS
FLEXIBILITY	ESSENTIALLY MOVABLE	PORTABLE	ESSENTIALLY PERMANENT



TYPE I BAR

STRIPE NOTES:

ORANGE & WHITE IF TEMPORARY.
RED & WHITE IF PERMANENT.
REFLECTORIZED
SLANT DOWNWARD, RIGHT OR LEFT,
IN DIRECTION TRAFFIC WILL PASS.
SLANT BOTH DIRECTIONS FROM MIDDLE
IF TRAFFIC PASSES BOTH ENDS.
WIDTH 6" EXCEPT 4" IF RAILS ARE
LESS THAN 3' LONG.
SLANT DOWNWARD TO MIDDLE AT END
OF CLOSED ROAD.

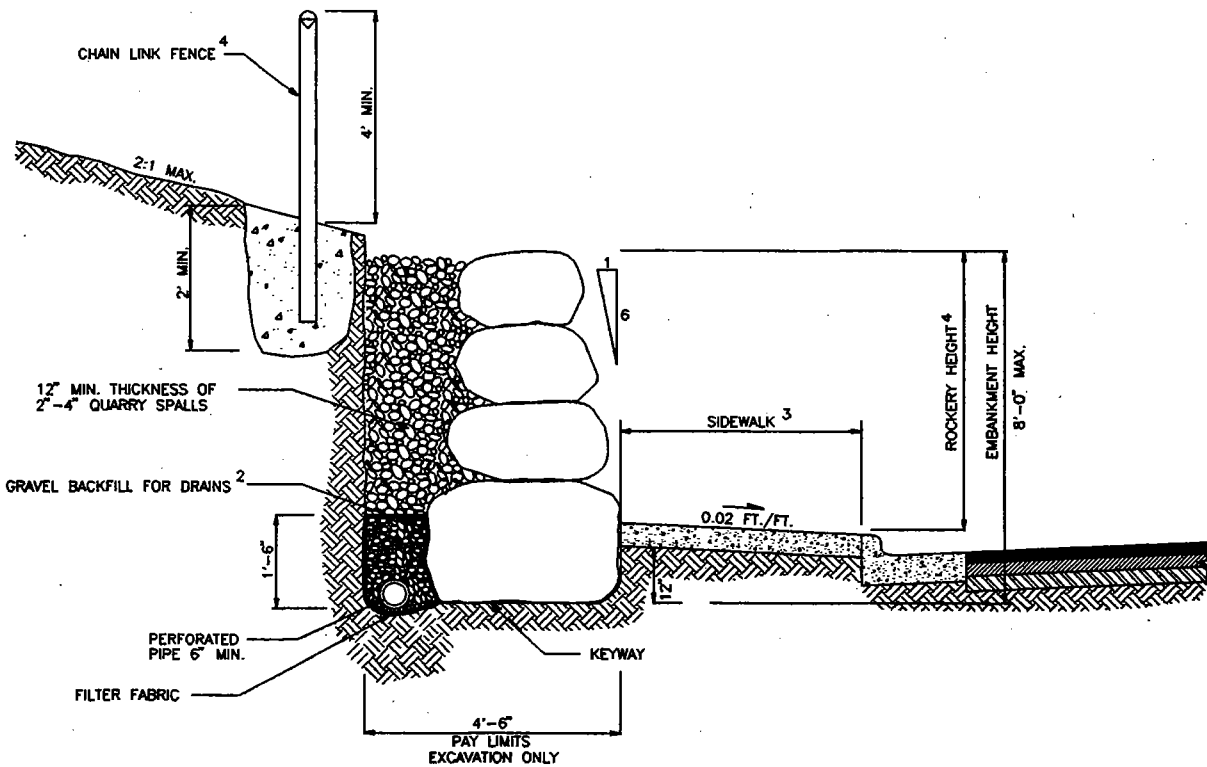
SEE SEC. 5.07 AND MUTCD SEC.6C-8.

NOTE:
FOR DIMENSIONS NOT
SHOWN, SEE TABLE.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

BARRICADES



RETAINING WALL IS BEHIND ROLLED CURB
 FACE OF ROCKERY OR RETAINING
 FACE OF 10' FROM TRAVELED WAY.

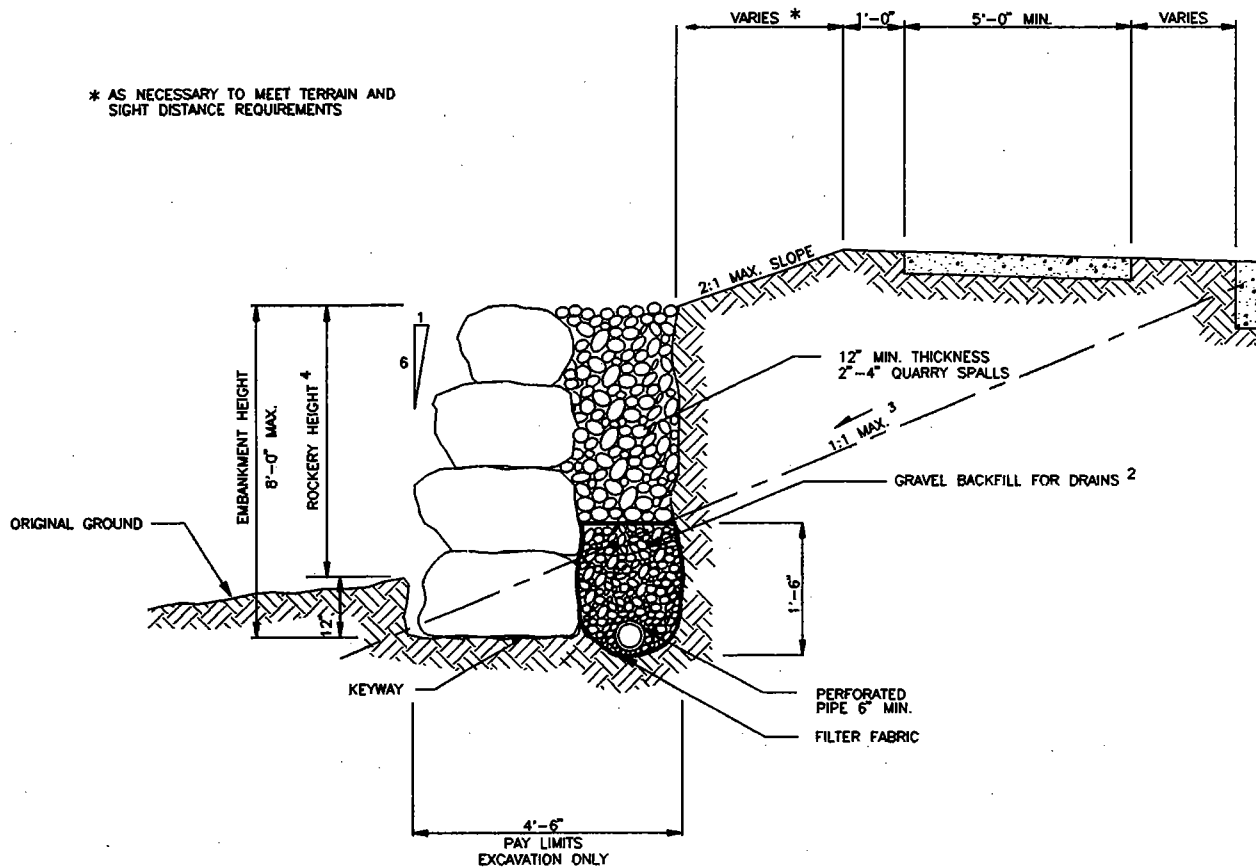
NO. 4 OR 6 (WSDOT/APWA STANDARD),
 ROCKERY HEIGHT IS THREE FEET OR GREATER.

WORKS
 SECTION

ROCK FACING, CUT SECTION

DWG. NO. 5-004

* AS NECESSARY TO MEET TERRAIN AND SIGHT DISTANCE REQUIREMENTS



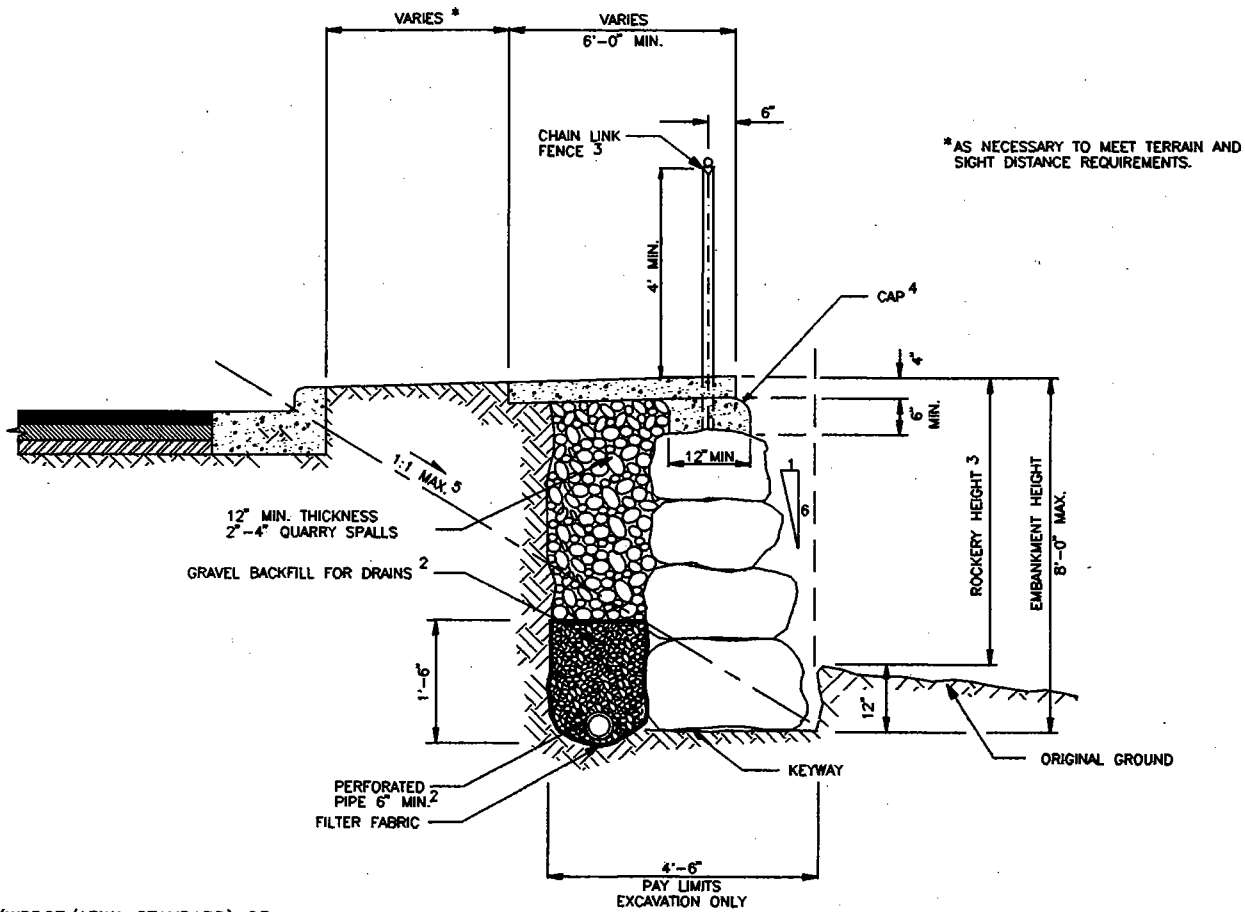
NOTES:

1. SEE SEC. 5.01.
2. WSDOT/APWA 9-03.12[4].
3. FLATTER SLOPE MAY BE REQUIRED IN LESS STABLE SOIL.
4. CHAIN LINK FENCE, TYPE NO. 4 (WSDOT/APWA STANDARD) OR HANDRAIL REQUIRED WHEN ROCKERY HEIGHT IS 3' OR GREATER. SEE DWG. NO. 5-006.
5. FOR ROCKERY HEIGHTS EXCEEDING 4', SEE DWG. NO. 5-007.
6. TRAFFIC BARRIERS MAY BE REQUIRED ON ROADS WITH SPEED LIMITS OF 40 MPH OR GREATER, WHERE ROCKERY HEIGHTS EXCEED 6'. SEE CHAPTER 7 OF THE WSDOT DESIGN MANUAL.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

ROCK FACING, FILL SECTION



4 (WSDOT/APWA STANDARD) OR
ROCKERY HEIGHT IS 3' OR GREATER.

CLASS 3000.

REQUIRED IN LESS STABLE SOILS.

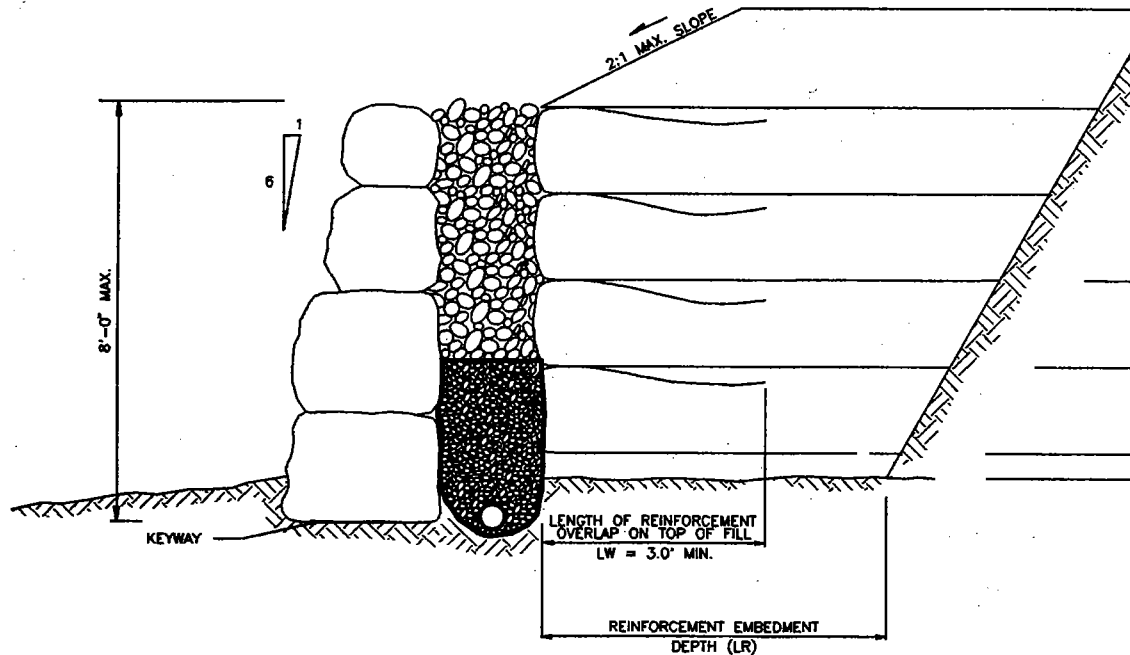
ENDING 4', SEE DWG. NO. 5-007.

REQUIRED ON ROADS WITH SPEED
LIMITER, WHERE HEIGHTS EXCEED 6'.
SEE DOT DESIGN MANUAL.

WORKS
STATION

ROCK FACING UNDER SIDEWALK

DWG. NO. 5-006



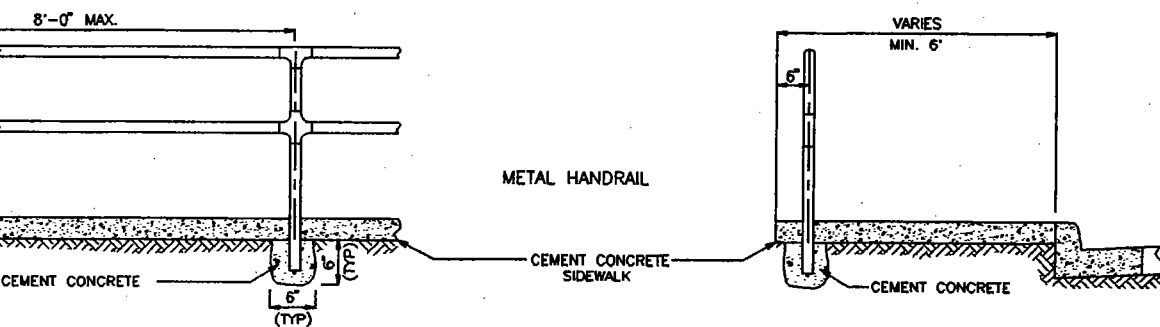
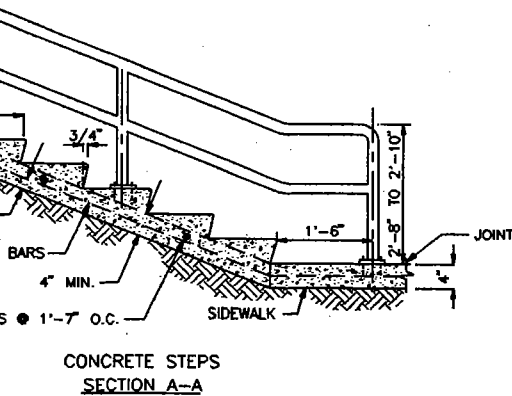
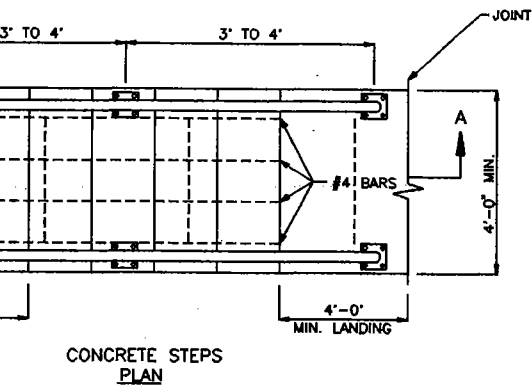
NOTES:

1. ROCKERY FACINGS ARE TO BE CONSTRUCTED TO KING COUNTY ROAD STANDARDS. SEE SEC. 5.01 AND DWGS. NO. 5-004 THROUGH 5-006.
2. THE WALL FOUNDATION IS TO BE CLEARED OF ORGANIC MATTER AND DEBRIS AND THE UNDERLYING MINERAL SOIL COMPACTED TO 95 PERCENT OF THE MAX. DRY DENSITY. THE EMBANKMENT MATERIAL IS TO BE GRAVEL BORROW MEETING THE REQUIREMENTS OF 9-03.14 OF THE WSDOT STANDARDS. THE BACKFILL IS TO BE PLACED IN THIN LIFTS, NOT EXCEEDING SIX INCHES IN THICKNESS AND COMPACTED TO 95 PERCENT OF THE MAX. DRY DENSITY.
3. GEOSYNTHETIC FABRIC OR GEOGRID REQUIREMENTS INCLUDING TYPE, VERTICAL SPACING (Z), AND EMBEDMENT (LR), WILL BE DETERMINED ON A ROCKERY BY ROCKERY BASIS BY A PROFESSIONAL ENGINEER.
4. Z_B IS HEIGHT OF FIRST LAYER OF REINFORCEMENT ABOVE COMPACTED SUBGRADE ELEVATION.
5. EMBANKMENTS BEHIND ROCKERIES EXCEEDING 4' IN HEIGHT SHALL BE REINFORCED WITH GEOSYNTHETIC FABRIC OR GEOGRID.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

ROCK FACING, FILL SECTION REINFORCEMENT



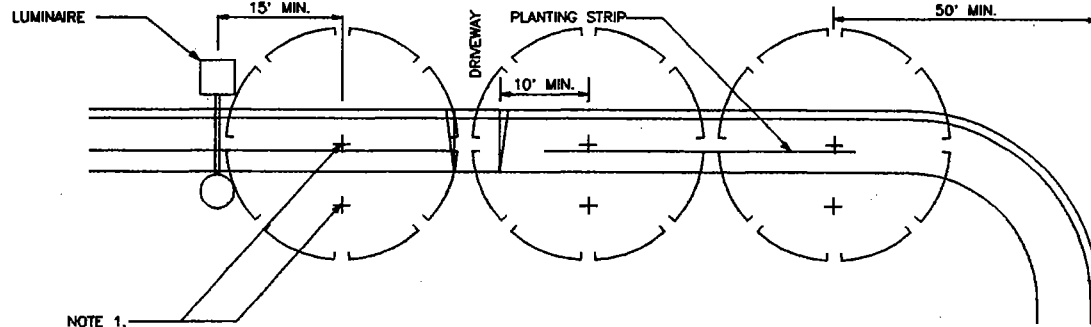
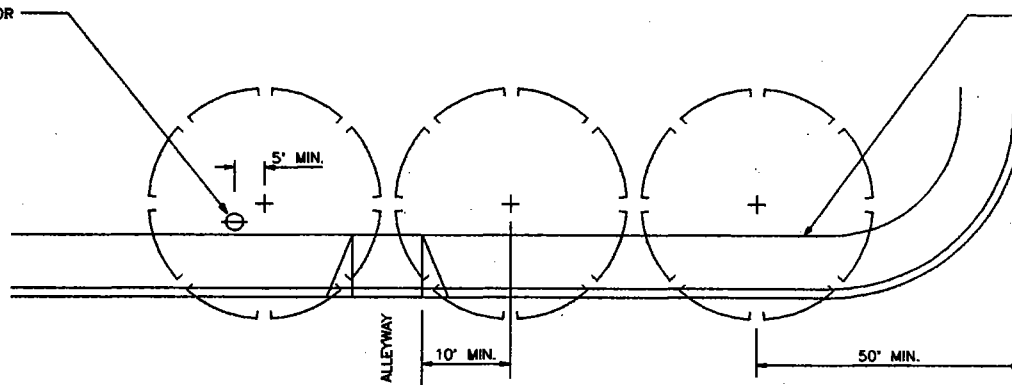
NOTES FOR CONCRETE STEPS:

1. CONCRETE: CEMENT CONCRETE CLASS 3000.
2. ALL STEPS: SAME DIMENSIONS, WITHIN $3/8$ " MAX. DIFFERENCE.
3. RISERS: 7 $1/2$ " MAX., 5" MIN.
4. TREADS: 12" MAX., 11" MIN., WITH TRANSVERSE 0.01 FT./FT. SLOPE.
5. METAL HANDRAIL REQUIRED FOR 4 STEPS OR MORE. SEE NOTES BELOW.
6. REINFORCING BARS SHALL MEET THE REQUIREMENTS OF ASTM A-615, GRADE 60 AND ARE REQUIRED FOR 4 STEPS OR MORE.
7. SEE SEC. 3.06.
8. MAX. VERTICAL DISTANCE BETWEEN LANDINGS IS 12'.

NOTES FOR HANDRAILS:

1. GALVANIZED STEEL OR ALUMINUM.
2. 1 $1/4$ " TO 2" O.D. ROUND OR OVAL PIPE.
3. WELDED, WITH SMOOTH SURFACE AND JOINTS.
4. POSTS SET IN MIN. 6" CONCRETE CLASS 3000.
5. SEE SEC. 3.06.

FIRE HYDRANT OR
UTILITY POLE



NOTE 1.

PLAN

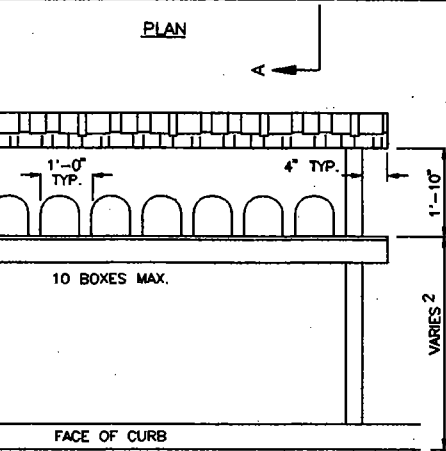
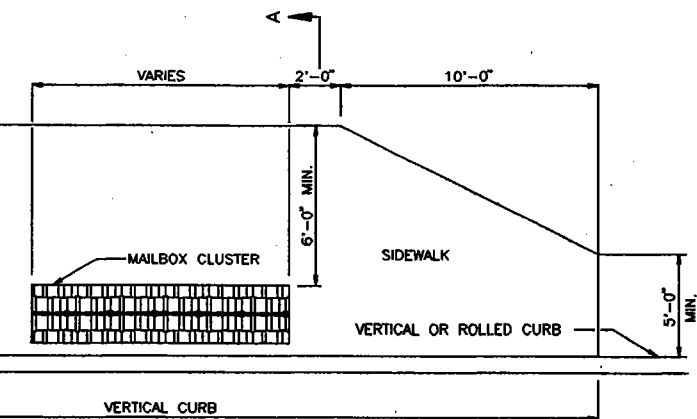
NOTES:

1. TREES SHALL GENERALLY BE PLANTED BACK OF THE SIDEWALK. PLANTING STRIPS WILL BE APPROVED ONLY AS PART OF A LANDSCAPING PLAN IN WHICH PLANT MAINTENANCE, COMPATIBILITY WITH UTILITIES, AND TRAFFIC SAFETY ARE DULY CONSIDERED.
2. IF PLANTING STRIPS ARE APPROVED:
 - A. MIN. DISTANCE FROM CENTER OF ANY TREE TO NEAREST EDGE OF VERTICAL CURB SHALL BE 4 FEET.
 - B. TREES SHALL BE STAKED IN A MANNER NOT TO OBSTRUCT SIDEWALK TRAFFIC.
 - C. IN CASE OF BLOCK-OUTS, MIN. CLEAR SIDEWALK WIDTH SHALL BE 5 FEET IN RESIDENTIAL OR 8 FEET IN BUSINESS DISTRICTS.
3. ON BUS ROUTES, PLANS SHALL BE COORDINATED WITH METRO SERVICE PLANNING. PHONE 684-1622.
4. SEE SEC. 5.03.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

STREET TREE STANDARDS



WORKS ON URBAN RESIDENTIAL ACCESS STREETS
5 MPH.

WORKS ACCORDING TO THE TYPE OF DELIVERY VEHICLE. THESE
WORKS SHOULD BE APPROVED BY THE POSTMASTER DURING PLAN REVIEW.

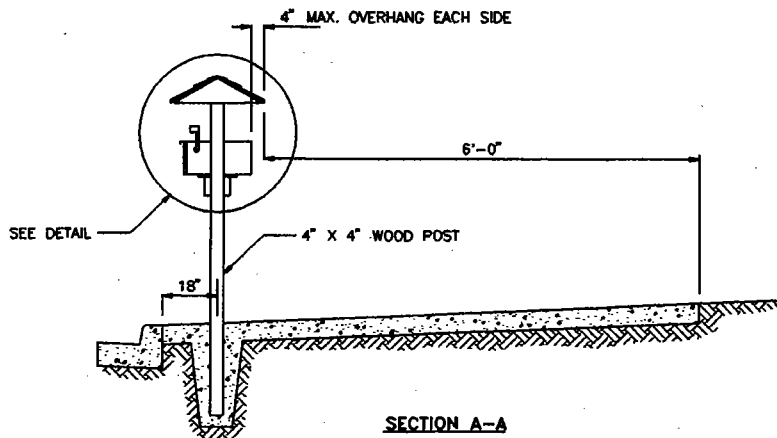
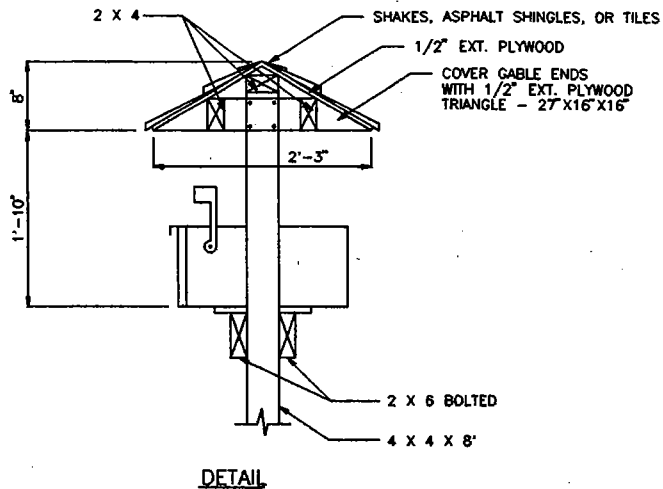
WORKS SHOULD BE APPROVED WITH A UNIFORM BOX STYLE AND
LOCATION.

WORKS ARE SUBJECT TO APPROVAL OF THE REVIEWING AGENCY.

WORKS SHOULD BE MADE OF TREATED FIR OR HEMLOCK.

WORKS IN SHOULDER SECTION SEE DWG. NO. 5-011

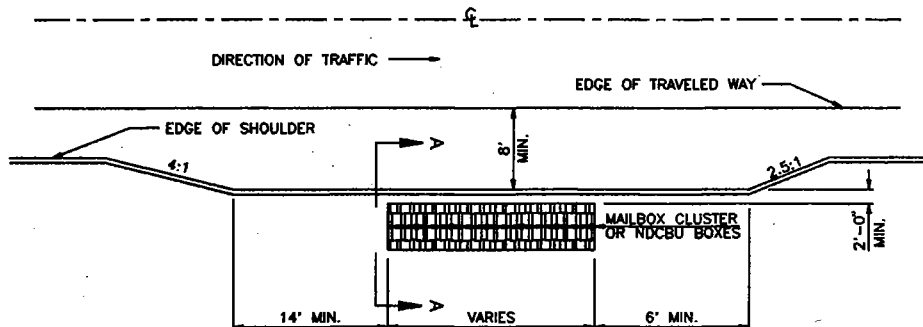
WORKS ARE SUBJECT TO APPROVAL OF



WORKS
STON

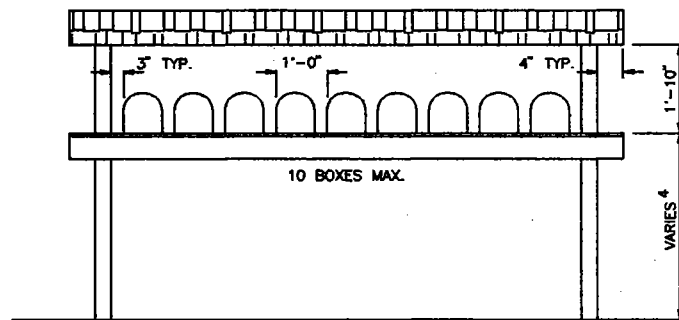
MAILBOX MOUNTING CURB TYPE LOCATION

DWG. 5-010
NO.



MAILBOX TURNOUT
FOR SHOULDER WIDTHS LESS THAN 8'-0"³

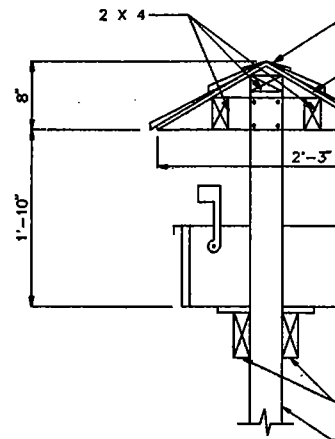
PLAN



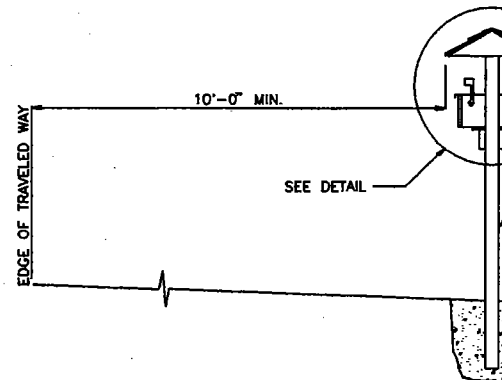
ELEVATION

NOTES:

1. SEE SEC. 5.04.
2. MAILBOX INSTALLATIONS ON PROJECTS FUNDED BY FEDERAL GRANTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH WSDOT/APWA STANDARD PLAN H-12.
3. REVIEWING AGENCY MAY APPROVE INSTALLATIONS OF MAILBOXES WITHOUT TURNOUT IF CONSTRUCTED IN CONFORMANCE WITH WSDOT/APWA STANDARD PLAN H-12.
4. MAILBOX HEIGHT VARIES ACCORDING TO THE TYPE OF DELIVERY VEHICLE. THESE HEIGHTS SHALL BE DETERMINED BY THE POSTMASTER DURING PLAN REVIEW.



DETAIL

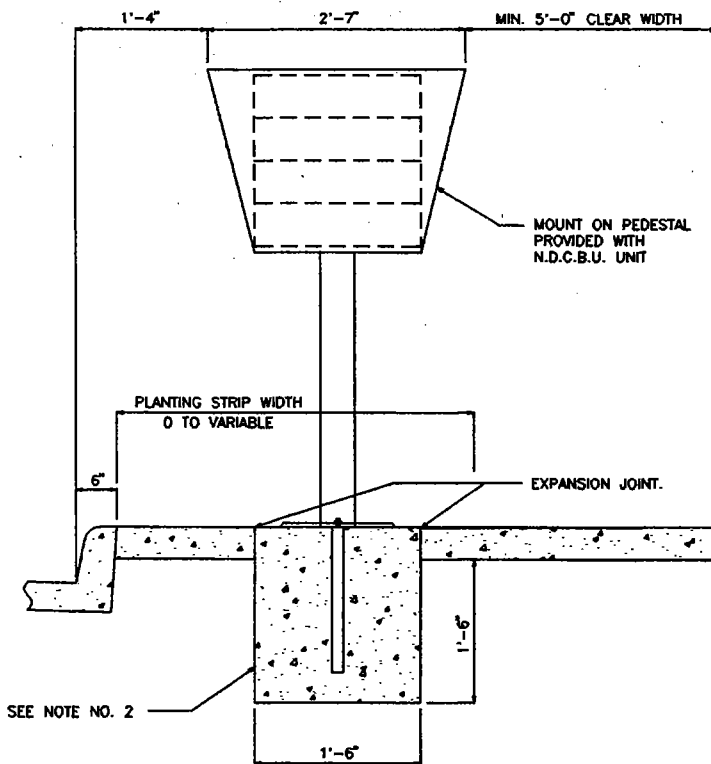
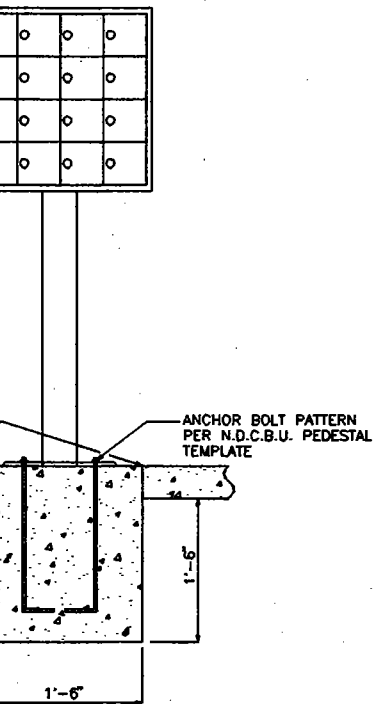


SECTION A-A



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

MAILBOX MOUNTING SHOULDER TYPE LOCAL

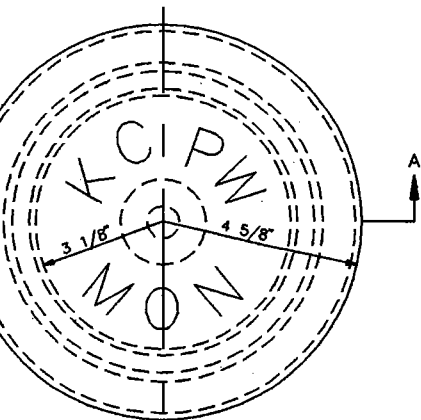


(INCLUDING CONSTRUCTION OF
S. POSTAL SERVICE.
REQUIREMENTS.

WORKS
SECTION

NEIGHBORHOOD DELIVERY & COLLECTION BOX UNIT
(N.D.C.B.U.) MAILBOX INSTALLATION

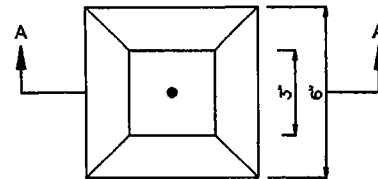
DWG. 5-012
NO.



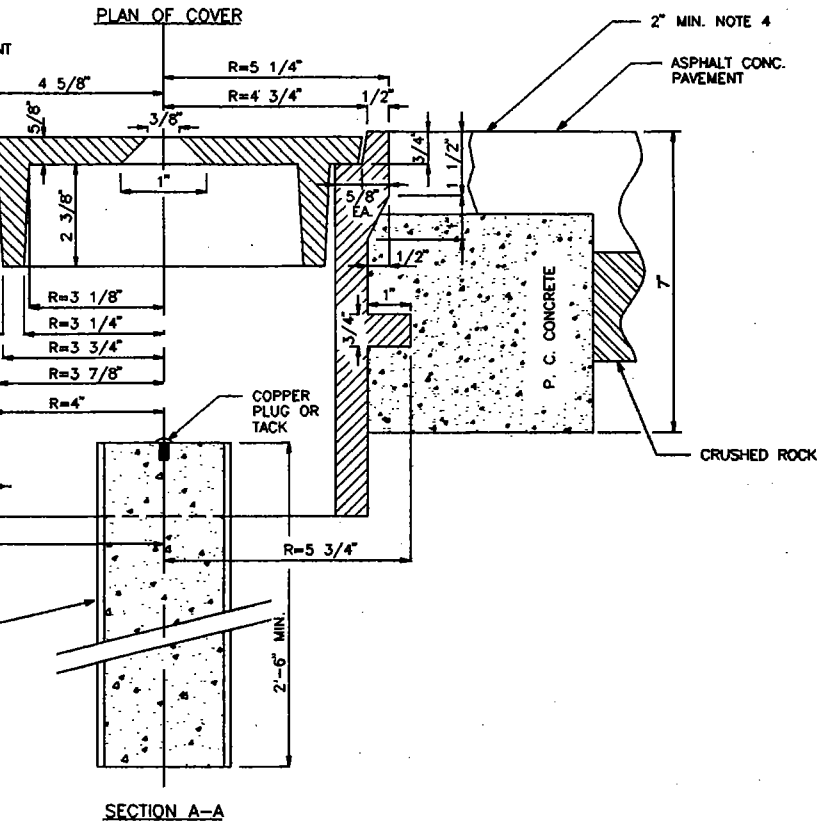
NOTES:

1. CASTINGS SHALL BE GRAY IRON ASTM A48, AASHTO M 105, CLASS 30.
2. COVER AND SEAT SHALL BE MACHINED FOR PERFECT CONTACT AROUND CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.
3. APPROXIMATE WEIGHTS, STANDARD.

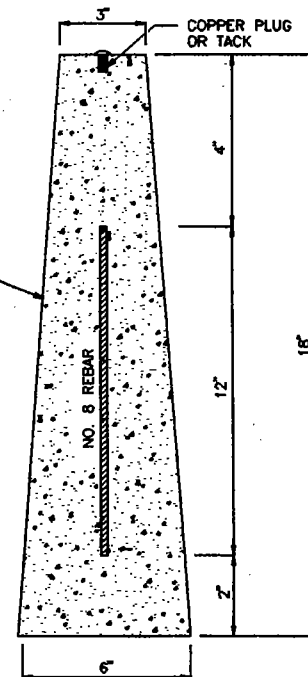
CASE	60 LBS
COVER	19 LBS
TOTAL	79 LBS
4. PAVEMENT SHALL BE ASPHALT CONCRETE OR APPROVED SUBSTITUTE.
5. CONCRETE SHALL BE CLASS 4000.



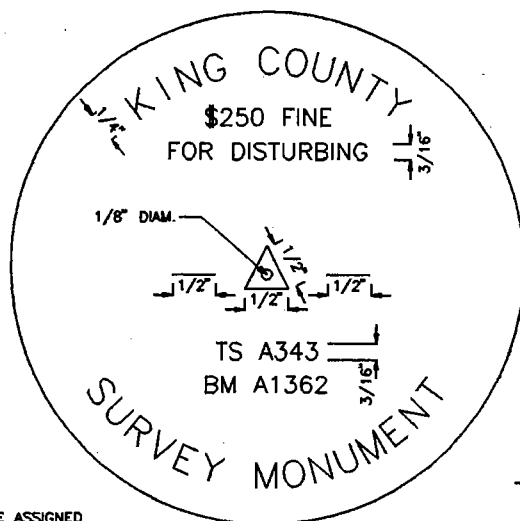
PLAN OF MONUMENT



CONCRETE
MONUMENT
(ALTERNATE)

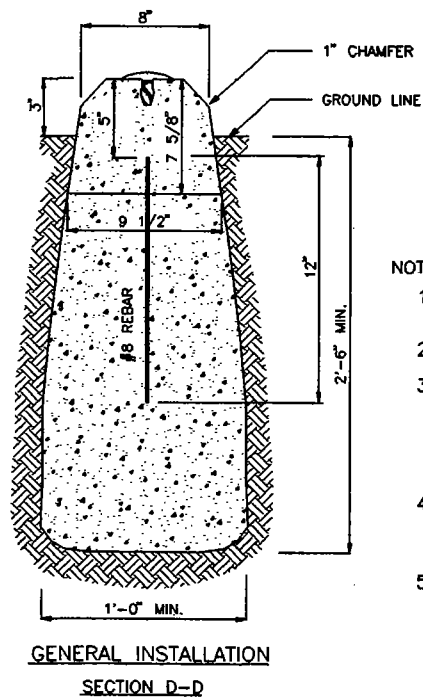
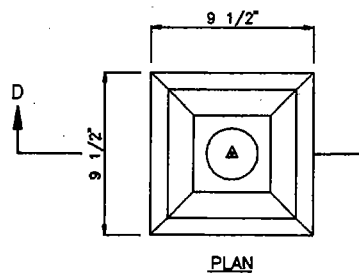
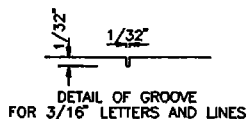
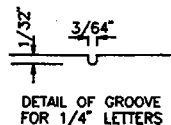


SECTION B-B



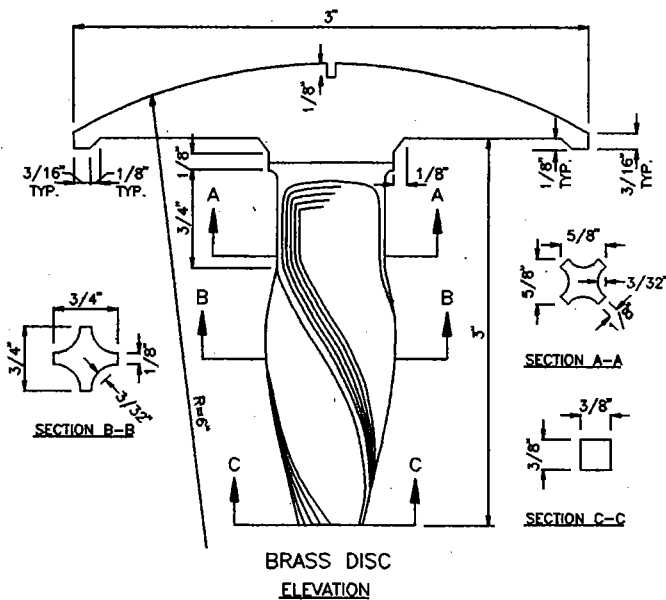
NOTE:
ONLY THE ASSIGNED
IDENTIFICATION NUMBERS
ARE TO APPEAR ON THE
BRASS DISC.

PLAN



NOTES:

1. THE BRASS DISC SHALL BE BRASS SAE 41.
2. CONCRETE SHAFT SHALL BE 12" HIGH.
3. THE HOLE SHALL BE 9 1/2" DIAMETER AND 7 5/8" DEEP. THE BOTTOM OF THE HOLE SHALL BE SMOOTH AND FREE OF LOOSE MATERIAL. THE MONUMENT SHALL BE PLACED ON FIRM, UNDISTURBED GROUND.
4. THE TOP OF THE MONUMENT SHALL BE SMOOTH AND FREE OF LOOSE MATERIAL. THE MONUMENT SHALL BE PLACED ON FIRM, UNDISTURBED GROUND.
5. COORDINATES OF THE MONUMENT SHALL BE PLACED ON THE MONUMENT.



KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

OFF-ROADWAY SURVEY MONUMENT