KING COUNTY

ROAD STANDARD

1993

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

King County
Department of Public Works

INTRODUCED BY: BRUCE LAING

PROPOSED NO: 93-658

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 Ordinance No. 8041, Section 2, as amended and K.C.C. 14.42.010 are hereby repealed and the following is substituted.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 herby amended to read as follows:

Applicability. A. The standards
modifications of roadway features or exi
the scope of reconstructions or capital
required by King County or to the extent
project plans and specifications. These
apply to "resurfacing, restoration and r
terms are defined in the Local Agency Gu
Department of Transportation, as amended
discretion consider the standards as opt

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

SECTION 3. Ordinance No. 8041, Sec
hereby amended as follows:

References. The standards impleme
consistent with the references listed in
"King County Road Standards, ((~~1986~~)) 19

SECTION 4. Ordinance No. 8041, Sec
hereby repealed and the following is sub

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

Audrey Grego
Chair

ATTEST:

Gerald A. Peterson
Clerk of the Council

APPROVED this 30th day of December, 1993.

King County Executive

WP:wlstandard.ord

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

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CHAPTER 6. BRIDGES

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CHAPTER 8. UTILITIES

CHAPTER 9. CONSTRUCTION CONTROL AND INSPECTION

ed)

DRAWINGS

ued)

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 pr
constructing or modifying road or right-of-way facilities which require County lic

(2) To establish uniform criteria to guide the County's own construction of new County
of existing roads.

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

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

These Standards cannot provide for all situations. They are intended to assist but not
competent work by design professionals. It is expected that land surveyors, engineers,
bring to each project the best of skills from their respective disciplines. These Stand
intended to limit unreasonably any innovative or creative effort which could result in b
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 fo
county resident.

CHAPTER 1. GENERAL CONSIDERATIONS

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

se Standards shall apply prospectively to all newly constructed road and right-of-way
blic 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
quired 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
jects as those terms are defined in the Local Agency Guidelines, WSDOT, as amended;
er may at his discretion consider the Standards as optional goals.

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

rovide Roadway Improvements:

lopment 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
n accordance with these Standards. The extent of off-site improvements to serving
e based on an assessment of the impacts of the proposed land development by the
ncy.

lopment 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
f 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
an type street improvements but are subject to shoulder improvements as specified in
provided these improvements are consistent with the surrounding roads.

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

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

E. All road improvement and development projects shall include pedestrian access design. Where existing roadways are to be modified, pedestrian facilities sh 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 Divi 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.

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

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

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

Manual, current edition as amended.

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

s: The following shall be applicable when pertinent, when specifically cited in the
equired by state or federal funding authority.

Guidelines, WSDOT, as amended.

r Urban Arterial Program, WSDOT, as amended.

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

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

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

ent of Transportation 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.

ckery Contractors, Standard Rock Wall Construction Guidelines.

ety for Testing and Materials (ASTM).

for roads and road drainage shall be prepared and submitted consistent with these
cordance with administrative rule published by the Director, Department of Public
ements 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 ri and

2. The existing grade or slope in the road right-of-way or easement does r and

3. The work will not intercept a stream or wetland or otherwise impact nat as set forth in County Code regarding Sensitive Areas and the Surface W

4. Plans do not include a retention/detention facility within the right-of

5. The work is required of a short plat development, or a right-of-way use less than 100 lineal feet of existing public road improvement; and

6. King County standard drawings, submitted with required permits, are suf improvement to be constructed.

1.08 Variances

A. Variances from these Standards may be granted by the Engineer upon evidence t in the public interest and that requirements for safety, function, fire prote maintainability based upon sound engineering judgement are fully met. Detail requesting variances and appealing variance decisions are contained in an adm available from the County Road Engineer. Variance requests for subdivisions preliminary plat stage and prior to any public hearing. Variances must be ap approval of the engineering plans for construction. Any anticipated variance which do not meet the Uniform Fire Code shall also require concurrence by the Marshal.

B. Questions regarding interpretation of these Standards may be directed to the Development Coordinator, at 296-6640 or the Roads and Engineering Services Va 3783.

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

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

the financial guarantee may be reduced during construction, as determined by the
cy. At no time will the financial guarantee amount be reduced to less than 30 percent
l amount or $1,000.00, whichever is greater.

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

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

e portion of the roadway adjoining the traveled way for parking, turning or other
ry to through-traffic movement.

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

street having one end open to traffic and the other temporarily or permanently
cle turnaround.

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

rson, firm, partnership, association, joint venture or corporation or any other entity
prove residential, commercial, or industrial property or to subdivide for the purpose
.

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

"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 acce a vehicle turnaround.

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

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

"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, as direct access to abutting properties. A loop may be designated for one-way or

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

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

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

"Private Access Tract": A privately owned and maintained tract providing vehicula residential properties.

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

"Professional Engineer": A professional civil engineer licensed to practice in th

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

"Reviewing Agency": King County Department of Development and Environmental Servi agency for plats and proposed developments.

"Right-of-Way": Land, property, or property interest (e.g., an easement), usually for 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.

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

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

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

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

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

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

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

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

y part of these King County Road Standards as established by ordinance shall be found
arts shall remain in effect.

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, roa geometrics. Other given elements such as access, arterial spacing and averag (ADT) are typical.

B. Within each functional classification, roads are further characterized as "cu A "curb" type road typically requires curb and gutter with inlets and undergr "shoulder" type road typically requires a shoulder and open ditch drainage.

1. Land developments in urban areas, as defined by the current King County Map, shall provide "curb" type road improvements. Exceptions to this m Reviewing Agency on residential access streets which are located in lon neighborhoods as designated by adopted community plans and where a patt roads is firmly established. Exceptions for two-lot urban short plats Section 1.03.

2. Land developments in rural areas as defined by the current King County shall provide "shoulder" type road improvements unless otherwise approv Agency. Certain exceptions to the "shoulder" type standard may apply w developments and rural activity centers (unincorporated rural towns suc City) where urban densities and uses may make a "curb" type road approp developments, the specifically authorized land uses, adopted community district design guidelines may provide for either a "curb" or "shoulder

3. Land developments in transitional areas as defined by the current King Plan Map shall provide "curb" or "shoulder" type road improvements as s 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.

NCIPAL ARTERIALS		MINOR ARTERIALS		COLLECTOR ARTERIALS OR "COLLECTORS"			
-community highways connecting st community centers & facilities		Intra-community highways connecting community centers and facilities.		Intra-community highways connecting residential neighborhoods with community centers & facilities.			
rolled with very restricted ss 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
ee 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
ee 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
ee 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
ee 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

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

distances. (See Section 2.11.)
ll apply unless otherwise approved by the Engineer. (See Section 2.12.)
ll apply at intersections and driveways unless otherwise approved by the Engineer. (See Section 2.13.)
quire greater width. For guardrail installations, shoulders shall be two feet wider.
rterials where bikeways are not required by the Non-Motorized Plan.
rtical curb and gutter at minimum width of 36 feet curb to curb.
evations greater than 6 percent.

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

			LOCAL ACCESS STREETS			
CLASSIFICATION	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 specfic 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 a
(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.
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 (or easement) may be reduced to minumum 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.

treets[1] (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

ple-dwelling, business, and industrial developments. Within the above parameters, geometric design requirements
nsistent with the WSDOT Design Manual.
eometric elements and does not imply posted or legally permissible speed. Curves shall be designed within parameters of B,

ort 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.

l be two feet wider.
ced to minimum roadway width, plus sidewalk, provided that potential serving utilities and necessary drainage are otherwise
s 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 classifi percent superelevation may be used, upon approval of the Engineer, for design existing arterials, as necessary, to meet terrain and right-of-way conditions off lengths on arterials, rural residential and commercial access streets sha accordance with the WSDOT Design Manual.

B. Superelevation is not required in the design of horizontal curves on urban re streets; however, horizontal curves must be designed based on design speed an section as indicated in Table 2.2. Table 2.2 is based on AASHTO "Low Speed U methodology. Superelevation may be used on urban residential streets as nece 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	5
Horizontal Curvature for 6 percent Superelevation, Radius (Ft.)	273	380	509	656	84
Horizontal Curvature for 8 percent (maximum allowable on arterials) Superelevation, Radius (Ft.) (requires approval of the Engineer)	250	350	465	600	76
Stopping Sight Distance (Ft.)	200	250	325	400	47
Entering Sight Distance (Ft.)	430	490	555	620	68
Passing Sight Distance (Ft.) for a 2-Lane Road	1,100	1,300	1,500	1,650	1,80

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
rmal 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 unit length of the private road system to the nearest public road is conside potential is the number of dwelling units that can possibly be served b physical barriers, zoning or other legal constraints are considered; an

8. Maintained by a capable and legally responsible owner or homeowners' as legal entity made up of all benefited property owners, under the provis 19.24.050; and

9. Clearly described on the face of the plat, short plat, or other develop clearly signed at street location as a private street, for the maintena County is not responsible.

C. King County will not accept private streets for maintenance as public streets brought into conformance with current County road standards. This requireme surface paving of any streets originally surfaced with gravel.

D. King County will not accept private streets within short plats when the roads the plat are private and already have the potential to serve more than the nu in Section 2.06 B.7. Short plats proposed on properties to which the access 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

2. Such alignment is consistent with or will establish a reasonable circu

3. There is reasonable assurance of obtaining the prescribed additional r adjoining property with topography suitable for completion of a full-s

B. A half street shall meet the following requirements:

1. Right-of-way width of the half street shall equal at least 30 feet; an

2. If feasible, half street shall be graded consistent with locating cent road section on the property line; and

3. Traveled way shall be surfaced the same as the designated road type to 20 feet, sidewalk shall be constructed as required for the designated

y 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

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

treet is eventually completed to a whole street, the completing builder shall he original half street as necessary to produce a proper full-width street of ction.

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

brows. See Drawing No. 1-007.

l-de-sac street serves more than six lots or extends more than 150 feet from centerline street to farthest extent of surfaced traveled way a widened "bulb" shall be s follows:

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

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

sac Island: Optional feature for any cul-de-sac when bulb paved diameter is 80 feet or andatory when bulb paved diameter exceeds 80 feet. If provided, island shall have oth vertical curb. Minimum diameter shall be 20 feet and there shall be at least 22 paved traveled way in a shoulder type section; 30 feet of paved traveled way in a curb ction around the circumference. Island shall be grassed or landscaped. It shall be ned by the adjoining lot owners.

equired on cul-de-sacs, sidewalks shall be constructed on one side and on the bulb, ting on a property line at or near half-way around the bulb.

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

C. The Engineer or Reviewing Agency may require an off-street walk or an emerger 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 si than 150 feet, a temporary bulb shall be constructed near the plat boundary. be 80 feet in diameter with sidewalks terminated at the point where the bulb of the temporary cul-de-sac and extension of the sidewalk shall be the respor 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 cor Drawing No. 1-009. 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, subacce horizontal curvature and stopping sight distance, apply.

1. Serves a maximum of 30 lots, with a maximum length of 400 feet, no deac

2. Minimum tract width 20 feet with a pavement surface of 18 feet (includi based on a five-foot structure setback. For differing structure setbac configuration shall be designated to provide for safe turning access to

3. Paved surface shall have a thickened edge on one side and cross slope Drawing No. 1-011.

4. Public streets to which an alley connects or which provide access to th properties served by the alley shall be 28-foot minimum paved width wit entry shall be provided by a driveway cut.

5. Modifications to existing alleys serving commercial or industrial prope with the above, will be determined on a case-by-case basis subject to a Reviewing Agency.

B. Private access tracts shall conform to Section 2.03 for urban minor access ro

1. Serves a maximum of six parcels.

2. Minimum tract width of 26 feet with a maximum length of 150 feet, measu intersecting street to furthest extent of paved tract.

t width shall be a minimum of 22 feet.

ow Speed Curves

f intersection (measured at 10 feet	Minimum 85 degrees
road classification right-of-way)	Maximum 95 degrees
centerline radius (2-lane)	55 Feet
curb radius	
rban streets and roads	35 Feet
assified neighborhood	
ollector or higher	
ural streets and roads	35 Feet
rban residential access	25 Feet
treet intersections where	
he highest classification	
nvolved is subcollector	
right-of-way line radius	25 Feet

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

ghest classification involved is:	Minimum centerline offset shall be:
rincipal arterial	1,000 Feet
inor arterial	500 Feet
ollector arterial	300 Feet
eighborhood collector	150 Feet
ny lesser street classification	100 Feet

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

t Distance. See Sections 2.02, 2.03, 2.04 and 2.12 for design requirements. See 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 s feet or less, upon showing that no practical alternative exists. Exceptions require verification by the Fire Marshal that additional fire protection requ Grades exceeding 12 percent shall be paved with asphalt concrete (AC) or port (PCC). Any grade over 20 percent must be PCC.

B. Grade transitions shall be constructed as smooth vertical curves except in in 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 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 2.1 and 2.2 shall be increased by the values shown below for any downgrade av or steeper (Source: AASHTO Policy on Geometric Design, Table III-2). Interp design speeds and grades.

SSD ADJUSTMENT VALUES (FT)

DESIGN SPEED (MPH)	DOWNGRADE 3 Percent	6 Percent
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 that called for in Section 2.03 may be approved by the Reviewing Agency if no exists and if acceptable road lighting is provided throughout the curve and i franchised utility.

Stopping Sight Distance.

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

imum stopping sight distance on proposed intersection approaches for all other
ications 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.

cle 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 cont Planning, phone 684-1622 and the local school district to determine bus zone (stop) 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-ou 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 Surfacing requirements may also be affected, particularly on shoulders. See Sectio 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 i shall meet the following standard: It shall be graded and, as minimum treatm width including shoulders (28 feet) with crushed surfacing material as provic Alternative V and Drawing No. 1-004. Half streets shall be surfaced not less Where connecting to a public street the connecting area shall be paved betwee right-of-way line (extended) of the public street, with 25 foot or 35 foot ra Section 2.10. Paving shall be in accordance with Section 4.01A with applicab than Alternative V.

B. Any rural minor access street (residential) approved under subsection A above street 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 Eng 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 co improvement of a commercial/industrial driveway or any classification of street tha federal highway, minimum intersection spacing, entering sight distance and landing accordance with these Standards shall be satisfied in addition to the requirements permits. In the instance State or Federal standards exceed these Standards, State shall govern.

age Easements and Right-of-Way Reduction

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

eduction on subcollectors, local access (residential) and minor access (commercial)

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

on Requirements

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

ess requirement <u>may</u> be satisfied through use of connecting a new street to an existing
djacent neighborhood if:

other practical alternative exists, or

isting street was previously stubbed indicating intent for future access, or

easement has been recorded specifically for said purpose.

ess requirement <u>may not</u> be satisfied through use of an existing roadway network in the
ent neighborhood if:

more practical alternative exists, or

isting streets do not meet Section 2.03

ns are not intended to preclude the state statute on land-locking.

B. This section does not preclude a commercial project from gaining access thro 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 dwelling units per acre and which meet the access requirements of Section 2.20 may family dwelling units, if approved by the Reviewing Agency. Prior to approval, th require a traffic circulation study showing a balanced traffic flow of less than 1 past any access point. Street trees shall be mandatory along subcollectors servir 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 ther specified in the following subsections. See Section 2.13 for entering sight irements.

r Approval of New Driveways:

ys directly giving access onto arterials may be denied if alternate access is le.

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

ance of driveway approaches shall be the responsibility of the owner whose property rve.

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

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

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

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

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

3. No portion of driveway width shall be allowed within 5 feet of side pr 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 tract length shall be 20 feet from right-of-way line. Rad apron shall have 10-foot radii.

      (2) Minimum tract width in rural areas shall be 20 feet; 30 fe required. Minimum tract length shall be 20 feet from righ returns on paved apron shall have 10-foot radii.

      (3) Driving surface (rural areas) shall be 18 feet, paved or g apron from the edge of pavement of intersecting street to

      (4) The Reviewing Agency may allow use of an easement if the o roadway is through an adjacent parcel not owned by the app residential short plats to satisfy minimum lot width requi

   b. Driveways may utilize full width of narrow "pipe-stem" parcels o 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 construc 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% distance on a crest and 12% within any 10 feet of distance in a sag ve shall be graded to match into possible future widened road section wit graded shoulder or sidewalk. The design engineer for proposed develop access driveway profile when designing the serving road to ensure that transitions can be complied with considering building set back and lot

5. Driveways in rolled curb sections may be constructed abutting and flus of curb without gapping or lowering height of curb.

D. Existing driveways may be reconstructed as they exist provided such reconstr with the adjacent road.

E. Fo commercial or industrial driveways with heavy traffic volumes or signifi th Reviewing Agency may require construction of the access as a road inters

ll be based on traffic engineering analysis submitted by the applicant that considers, actors, 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:

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

cess streets and industrial access streets, one side.

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

access streets (residential) exceeding 150 feet and on any cul-de-sacs with eet walkways extending from their termini to other streets, parks, schools, bus stops, pedestrian traffic generators, one side. On cul-de-sacs, sidewalks shall extend ulb 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 ians.

ructed:

the curb unless planting strips are part of the design and are approved by the 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 wher required.

c. Within designated bus zones to provide a landing area for wheel c services.

5. With specified width greater than eight feet where Engineer or Reviewin this is warranted by expected pedestrian traffic volume.

6. With portland cement concrete surfacing as provided in Sections 3.03 an 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 with WSDOT/APWA Standard Specifications, Sections 6-02, 8-04, and 8-14. Cold 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 eithe 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 i 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 placed around fire hydrants, poles, posts, and utility castings and along wal paved areas. Joint material shall conform to the requirements of ASTM D994 (

B. A dummy joint consisting of 3/8" or 1/4" x 2" of premolded joint material sha and sidewalks at a minimum of 15 foot intervals and at sides of drainage inle sidewalks are placed by slip-forming, a premolded strip up to 1/2" thick and used.

C. Dummy joints in sidewalk shall be located so as to match the joints in the cu adjacent to curb or separated by planting strip.

D. Tool marks consisting of 1/4" V-grooves shall be made in sidewalk at five foo 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
l 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
osite side of the street. Curb ramps shall be positioned so that a ramp opening is
marked crosswalk or crossing area if unmarked.

al Handrail and Handicapped Access Ramps

nly be used where acceptable alternative access is available for handicapped access and
ed for a separate stairway. Where used, concrete steps shall be constructed in
th Drawing No. 5-008 or other design acceptable to the Engineer or Reviewing Agency and
th the WSDOT/APWA Standard Specifications. Handrails, whether for steps or other
shall be provided consistent with Drawing No. 5-008 and the WSDOT/APWA Standard
s.

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

s, asphalt paved shoulders may be used where approved by the Engineer or Reviewing
sting roads to provide for bicycle and pedestrian use as specified in Section 1.03B and
ntinuity of design. When allowed, paved shoulders shall be placed in conformance with
and 2.03.

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

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

A. Separated asphalt walkways are designed primarily for pedestrians and are typ the right-of-way or easement. Minimum width shall be five feet with asphalt in Section 4.01D.

B. Neighborhood pathways are soft surface facilities designed for pedestrians ar pathways shall be a minimum four feet wide with at least one and one-half foo obstructions on both sides and 10 foot vertical clearance. Pathways shall be so as to avoid drainage and erosion problems. Pathways shall be constructed inches of crushed surfacing top course or wood chips over cleared native mate Reviewing Agency.

C. Multi-purpose trails are typically designated for bicycle and pedestrian use right-of-way independent from any road. Multi-purpose trails shall be desig standards as described in Section 3.10.

3.09 School Access

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

3.10 Bikeways

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

Bike Path (Class I): A separate paved multipurpose trail for the principal u other nonmotorized modes. Bike paths are 10 feet wide except in high u should be 12 feet wide.

Bike Lane (Class II): A portion of the road that is designated by pavement s bicycle use. Bicycle lanes may be signed as part of a directional rout lanes are five feet wide on a curbed road and minimum four feet wide as

e (Class III): A road that provides a widened paved outer curb lane to accommodate
s 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.

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

l be provided:

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

ostantial bike usage is expected which would benefit from construction of a bicycle
y.

signing shall be implemented as follows:

t 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

cilities 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
dth, 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 ma
vertical clearance and a five-foot wide pathway zone. The trail shall
native soil or, where drainage or erosion problems are present, a minim
inches of crushed surfacing top course on graded and compacted native s
is not free draining shall be removed and replaced with free draining s
provide a maintainable and well-drained subgrade. Additional crushed s
other stabilizing materials shall be required if heavy usage is anticip
evidence of instability in the subgrade; including free water, swamp co
or organic soils, slides or uneven trails.

, Pedestrian and Bike: The minimum paved section, with alternative combinations of dential streets, shoulders, sidewalks and bikeways shall be as indicated below. These able only on visually good, well-drained, stable compacted subgrade. Any proposed materials will be subject to soils strength testing and traffic loading analysis and nd 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
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 shoul strength, shall govern. Subgrade compaction for bikeways and paved walkways shall 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 ceme 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-o surfaced as required by Drawing No. 3-003.

3. On thickened edge roadways with underground utilities, portland cement concr driveways between the thickened edge and the right-of-way line provided that 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 provide a clean, vertical edge for joining to the new asphalt. After placem section, the joint shall be sealed and the street overlaid one inch, plus a width throughout the widened area. The requirement for overlay may be waive Reviewing Agency based on the condition of existing pavement and the extent 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.

sidential 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.

rcial Access Streets

terials 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.

n 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 mounte considered self propelled. Truck mounted pavers shall only be used for pavi 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 crossw 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 an new cross section different than the existing one. The channelization shall provi 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. Channelizati 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 w distance. A deceleration taper as shown in the WSDOT/APWA Standard Plans may be us reverse curve. Standard left turn lanes shall be 12 feet wide. Type 2L arrows sha lane 25 feet and 100 feet behind the stop bar, crosswalk or stopping area. Additi 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 fo Type 2d lane markers shall be installed at 40 foot centers between the lines. Hol additional lanes shall be eight-inch white lines with Type 2e lane marker on the in foot centers. Edgelines for tapering thru traffic back to the original alignment s inch white lines.

Pavement markings for channelization shall be reflectorized hot or cold applied pla sprayed markings shall be dressed with glass beads for initial reflectance. All ma 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 lin traffic to through lanes, Type 2e lane markers shall be installed at 10 foot center paved area at a 10:1 taper.

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

gs shall be laid out with spray paint and approved by the Traffic Engineer before they
roval may require a three working day advance notice to have field lay-out approved by
r 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 to on favorable soils analyses and a design by a geotechnical engineer or other qualified in rock wall design, subject to approval by the Engineer. Terracin 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 roc 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 shal 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 minimum one-foot overlap along the top surface of the gravel. This requirement for may be waived by the Engineer if shown that soils and water conditions make it sary. See Drawing Nos. 5-004 through 5-006.

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

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

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

Facing Supporting Roadway Embankment: Embankment behind rockeries exceeding four feet ve the keyway shall be reinforced with a geosynthetic fabric or geogrid specifically for soil reinforcement, designed on a project specific basis by a qualified engineer. o. 5-007.

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

ndrails

fence or metal handrail shall be installed when rockery is three feet or greater in 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 s Steeper slopes may be approved by the Engineer upon showing that the steeper analyses, will be stable. Side slopes on projects funded by federal grants s conformance with Local Agency Guidelines.

B. Side slopes shall be stabilized by grass sod or seeding or by other planting acceptable to the Engineer.

5.03 Street Trees & Landscaping

A. Street trees and landscaping should be incorporated into the design of road i classifications of roads. Such landscaping in the right-of-way shall be coor landscaping required on developer's property under the provisions of King Cou

B. Planting strips are optional along all classifications of roads and may be co landscape mitigation requirements established during the SEPA review process. planting strips must be approved by the Engineer and must include a landscapi maintenance, utilities and traffic safety requirements are discussed.

C. Existing trees and landscaping shall be preserved where desirable and placeme be compatible with other features of the environment. In particular, maximum shall not conflict unduly with overhead utilities, or root development with u If street trees are planted, they shall conform reasonably to standards in Dr

D. New trees shall not include poplar, cottonwood, soft maples, gum, any fruit b other tree or shrub whose roots are likely to obstruct sanitary or storm sewe Code 13.04.230.

E. Street tree plans on bus routes shall be reviewed by Metro Service Planning,

5.04 Mail Boxes

A. The responsibilities for location and installation of mailboxes in connection or 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 D Works or by a private builder, to show clearly the designated loc 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 spection and enforcement procedures.

Postmaster or designated serving post office will:

signate 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.

all necessary coordination with owners or residents involved to secure agreement as mailbox location and to instruct them regarding mailbox installation. Actually nstall 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 eir 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.

Where 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 co
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 additiona
tapers. Illumination will also be required as identifiers where roads intersect ar
frequently used pedestrian areas on arterials.

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

Illumination intensity and uniformity shall conform with current King County desigr
fixtures shall be consistent with fixtures maintained by the local electrical utili

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 go
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 Sect
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 l
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
he developer/contractor shall assure proper closure at the end of each working day.

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

icades shall be used at the end of a local access street terminating abruptly without
lb or on temporarily stubbed off streets. Each such barricade shall be used together
f-road marker.

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

t Heights

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

kments for guardrail installations shall be in accordance with Figure 710-6 of the
.

Spaces

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

-breakaway structures, including rockeries and retaining walls, which may be potential
eling public shall be placed with due regard to safety. On roads with a shoulder or
ardous objects shall be placed as close to the right-of-way line as practicable and a
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 near
than eight and one-half feet from the face of the curb in business areas or five and one-
curb in residential areas. Placement of any utility structures shall be in accordance wi
Chapter 8, to include constraints on placement of poles on the outside of curves.

CHAPTER 6. BRIDGES

s

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
luding all interim addenda, of "Standard Specifications for Highway Bridges," adopted
cordance with the requirements of WSDOT/APWA Standard Specifications. Bridge and
nall be provided in accordance with those references or with WSDOT/APWA Standard Plans.
ll 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.

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

speed is 35 MPH or higher and significant pedestrian, bike and/or horseback traffic
ed, the Engineer may require that the lanes for these other modes of traffic be
m 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.

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

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

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

ria

s will be required for all bridges and new bridge plans shall provide pavement seats
slabs unless otherwise approved by the Engineer. Waiver or modification of the
or approach slabs will be considered only on the basis of adequate geotechnical
proach 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 syste of the reinforcing steel.

C. Criteria under other recognized road and bridge project classifications, such projects, set forth in WSDOT Local Agency Guidelines, may be applied under co appropriate by the Engineer.

D. The design of bridge expansion joints shall consider the presence of bicycle

6.04 Special Permits

Permit requirements for construction or reconstruction of bridges include but are n 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 th require a U. S. Army Corps of Engineers Permit.

C. Any work involving alteration of flow or bed materials below the ordinary hig water body or water course requires a Hydraulic Project approval from the Sta Fisheries or the State Department of Wildlife.

D. Any work within waters of the State requires a Water Quality Certification Wa Department of Ecology.

E. Where bridge structures lie on or over submerged lands a lease from the Washi of Natural Resources may be necessary.

F. Structures located on shoreline zones as defined in King County Code Title 25 development permit from the King County Department of Development and Environ subject to concurrence of the State Department of Ecology.

G. Bridges over waterways require the Engineer's approval of the size and shape opening, the height of the superstructure over high water, the location of pi improvement, and other hydraulic considerations.

CHAPTER 7. DRAINAGE

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

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

here technical conflicts may occur between this document and the Surface Water Design
gineer shall decide which document governs.

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

to 6 percent, grass lined ditches with grasses as specified in 7.02D shall be used for
requirement. These ditches shall be designed and constructed in accordance with
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
or grades between 3 percent and 6 percent, grass lining alone may not be sufficient to
Preferred methods to further reduce potential erosion problems include the use of
wider ditch sections. Rock-lined ditches shall be avoided whenever possible.

de is over 6 percent and not over 9 percent, the Engineer may direct use of a standard
tch or alternatively a closed (pipe) drainage system under a paved shoulder with
or turnpike shoulder. As an exception, cul-de-sacs with over 6 percent grade shall be
pipe drainage and not with rock-lined ditches.

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

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

hall be placed so as to form a firm, dense, protective mat consistent with examples in
No. 2-024 and conforming to the design surface of the ditch. Individual rocks shall
trude more than three inches from that surface.

C. Where the grade exceeds 9 percent either pipe drainage or a special rock-line provided unless otherwise approved by the Engineer. The special rock-lined c by a professional engineer, based on soils and hydraulic analyses. Design sh sizing, together with filter rock gradations and/or filter fabric, and be sub Engineer.

D. Grass seed mixture by weight may be 10 percent Colonial bentgrass, 40 percent 10% White clover, hydroseed at 120 lbs./acre, handseed at 3 lbs./1,000 square high groundwater, the following species may be substituted or added: Meadow Timothy, or Redtop.

7.03 Storm Sewers and Culverts

A. Minimum pipe size shall be 12-inch diameter. Eight-inch diameter may be perm laterals less than 66 feet long to avoid utility conflict or meet shallow gra

B. Where the time of concentration creating the greatest flow is less than 15 mi predominately serves the road, determine flow rates using the rational formul

C. Driveway culverts shall conform to Drawing No. 3-003.

D. The following pipes, specified in Section 9-05 of the WSDOT/APWA Standard Spe allowed: plain and reinforced concrete storm sewer pipe, aluminized Type 2 co spiral rib and corrugated steel with asphalt coating Type 1, spiral rib and c ductile iron, polyvinyl chloride (PVC), lined corrugated polyethylene (LCPE) polyethylene (SWPE) pipe.

E. LCPE pipe shall have a smooth interior wall meeting or exceeding Type III, Ca P33 or P34, Class C per ASTM D1248, minimum cell Class ASTM D3350, 324420C. exceed the requirements of AASHTO M294, Type S. Pipe shall be placed in acco Specifications.

F. SWPE pipe with maximum SDR of 32.5, minimum cell Class ASTM D3350, 334434C ar Specifications for ductile iron pipe with restrained mechanical joints may be steep slopes.

G. PVC pipe shall require the use of bedding material for flexible pipe specifie WSDOT/APWA Standard Specifications.

H. LCPE and SWPE shall be bedded on gravel backfill for pipe bedding as specifie WSDOT/APWA Standard Specifications. Above ground installation of SWPE does n 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 st shall have a minimum of nine runners equally spaced, a base length equal to or less eter of the pipe, and a diameter no less than 95 percent of the base inside diameter of ch is described as follows:

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

o 30-inch the above equation simplifies to: base inside diameter = nominal diameter x

h controlled outside diameter, LCPE: base inside diameter = (average outside diameter hickness)-((outside diameter tolerance)^2 + (12 percent x wall thickness)^2 + (roundness .

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

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

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

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

nctions

shall be spaced no greater than 150 feet for grades less than one percent, 200 feet for n 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 our rainfall exceeds three and one-half inches, catch basin spacing analysis is e analysis must show the depth of water at the edge of the traveled way does not exceed extend more than five feet into the traveled way for the 10-year storm event, using ed by the rational formula.

ins, 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 manh meeting all of the following conditions:

1. The mainline pipe is 48 inches or greater and at least two times the si pipe.

2. Make connections in accordance with the manufacturer's recommendations. fabricated tees, wyes and saddles shall be used, except for concrete pi constructed in accordance with Drawing No. 2-002.

3. There shall be a catch basin or manhole on the connecting pipe within t external wall of the main line. See Drawing No. 2-002.

4. Offset angle of connecting pipe to mainline, horizontally and verticall 45 degrees.

D. Connections to an existing system shall avoid directing project runoff throug quality/quantity control facilities. Receiving systems may have separate con one connecting to quality/quantity facilities and one by-passing them. Conne bypass system where available.

E. Use Type 2 catch basins where the depth to the invert of the pipe exceeds fiv

F. Manholes may be used in lieu of catch basins if they do not collect surface w

G. Roof and yard drains, or other concentrated flow from adjacent property shall 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 trave shoulder. Vaned grates shall not be located within cross walks.

B. At sag vertical curves, or before intersections with a grade 4% or greater, u frames. Where through curb inlets cannot be used, three vaned inlets shall b located at the approximate low point and another on either side at 25 foot ho not greater than 0.1 foot above the low point.

C. Use rolled curb frame and (vaned) grates along rolled curbs and in asphalt tu 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.

trol 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.

CHAPTER 8. UTILITIES

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 In their use of the right-of-way, utilities will be given consideration in co carrying requirements of the road which are, namely, to provide safe, efficie passage for motor vehicles, pedestrians, and other transportation uses. Aest consideration. As a matter of policy, undergrounding of electric utilities w encouraged, particularly in urban development. Also, utilities are subject t relating to drainage, erosion/sedimentation control and sensitive areas as se 21.54 and the Surface Water Design Manual.

B. All permits for new placement and replacement of existing utility poles and o above grade shall be accompanied by written certification from a professional agent authorized by the utility to certify that the installations conform to that the proposed work is in conformity with sound engineering principles rel safety.

C. Requests for exceptions to these Standards will be processed in accordance wi 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 topograph 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 pla conform to these Standards as nearly as practicable and yet be compatible with the Above ground utilities located within intersections shall be placed so as to avoid of 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 w 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:

mum 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 ov planning and installation except where a non-gravity system has already been previous approved permit and subject to applicable provisions of such permits

G. Electric utilities, power, telephone, cable TV: Preferable: Underground wit cover, either side of road, at plan location and depth compatible with other drains. Otherwise: Every new placement and every replacement of existing uti 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 accordance with criteria in Drawing No. 5-001 unless protected by suitable impact attenuating device or placed more than three and face of guardrail, as allowed by an approved variance.

   b. On vertical curb type roads with a speed limit less than 40 miles obstacles shall be placed clear of sidewalks and at least eight a face of curb in business areas and five and one-half feet from cu areas. On urban roads with a speed limit of 40 miles per hour or obstacles shall be placed in accordance with Drawing No. 5-001.

   c. Notwithstanding the other provisions regarding pole locations des standards, no pole shall be located so that it poses a hazard to Utilities shall place and replace poles with primary consideratio safety.

2. The above constraints on pole and obstacle location will not apply to l by moving vehicles, "breakaway" structures whose break-off resistance d 4" x 4" wood post or a 1-1/2-inch standard (hollow) iron pipe or to "br installed to manufacturer's specifications.

3. Deviations from these pole and obstacle clearance criteria may be allow variance when justified by suitable engineering study considering traff Utility may request a variance from pole and obstacle clearance criteri contiguous damaged or weakened poles may be replaced at existing locati accordance with emergency procedures, however, sequential permits resul replacement of a pole line shall not be allowed. A pole or other obsta repeated damage from errant vehicles shall be relocated or protected.

4. Locations of poles shall also be compatible with driveways, intersectio features (i.e., they shall not interfere with sight distances, road sig

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

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

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

Installation

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

On Existing Traveled Roads

ching through existing pavement, the open cut shall be a neat-line cut made by either ting or jackhammering a continuous line. Trench sides shall be kept as nearly vertical sible. Compaction and restoration must be done as detailed below and immediately after nch is backfilled, so as to cause least disruption to traffic. Cement concrete t 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 in greater. Pavement shall then be overlaid full width with a minim compacted asphalt concrete Class B. Any exceptions to this overla on a case-by-case basis, subject to approval by the Engineer, cor conditions of the pavement. Concrete pavement shall be restored 6-02 of the WSDOT/APWA Standard Specifications. Any concrete pav 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 th be discouraged. It will not be permitted unless it can be shown as boring or jacking are not possible due to conflicts or soil co utility can be installed just prior to reconstruction or overlay

   b. Without exception, the entire trench shall be backfilled with cru course meeting the requirements of Section 9-03.9(3) of the WSDOT Specifications. Backfill shall be placed and compacted mechanica with a County inspector present. If the capability can be demons compaction equipment or quality of backfill to achieve 95 percent lifts, the depth of backfill lifts may be increased up to one foo compaction, an immediate cold mix patch shall be placed and maint acceptable to the Engineer. On asphalt pavement, a permanent hot thickness as the existing asphalt or a minimum of two inches, whi shall be placed and sealed with a paving grade asphalt within 30 concrete pavement shall be restored with an eight-sack mix, using III cement, within 30 calendar days.

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

   1. Prior to electing to use the water settling method of compaction, a rev be done to determine suitability of the use of the water method and a c submitted by a professional engineer. Compaction plan is subject to ap Inspection Section.

   2. Where water settling of trenches is done, the jetting method shall be u eight feet deep the Engineer may direct the backfill to be placed in tw each be jetted separately. Jets shall be inserted at not more than fou 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 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.

nsity 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
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 te
subgrade elevation prior to placing crushed surfacing material.

B. Final adjustment of all covers and access entries shall be made following fin

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 bri
and cover no higher than finished grade of pavement and no lower than o
pavement.

3. Filling and mechanically compacting around the structure and frame with
material or ATB, or pouring in five inch minimum thickness of cement co
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 wi
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.

9.01 Basis for Control of the Work

A. Work performed in the construction or improvement of County roads, whether b developer, by County forces, or by County contractor, shall be done in accor Standards and approved plans and specifications (Section 1.07). It is empha be started until such plans are approved. Any revision to such plans shall Engineer before being implemented.

B. The Engineer will have authority to enforce the Standards as well as other r specifications. He will appoint project engineers, assistants, and inspecto inspect the work and they will exercise such authority as the Engineer may d

C. Provisions of Section 1-05 of the WSDOT/APWA Standard Specifications shall a "Engineer" therein construed to be the County Road Engineer as defined in Se

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

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

A. Preconstruction Conference: Three working days prior notice. Conference mu of construction and include contractor, designing engineer, utilities, and o Plan approvals and permits must be in hand prior to the conference.

B. Clearing and Temporary Erosion/Sedimentation Control: One working day notic work involving drainage and installation of temporary water retention/detent control. Such work to be in accordance with Section 7.06 and the approved p

C. Utility and Storm-Drainage Installation: One working day notice prior to tr storm sewers and underground utilities such as sanitary, water, gas, power, See Section 8.03F Notification and Inspection for additional information.

D. Utility and Storm Drainage Backfill and Compaction: One working day notice compaction of storm sewers and underground utilities.

E. Subgrade Completion. One working day notice at stage that underground utili are complete, to include placement of gravel base if required. Inspection t 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 ete.

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

cing Placement: One working day notice to check placement and compaction of crushed e course and top course.

e 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 tings, placement and assembly of major components, and completion of structure and Tests and certification requirements will be as directed by the Engineer.

ction Inspection: 15 working days prior to overall check of road or drainage project ude completion of paving and associated appurtenances and improvements, cleaning of em, and all necessary clean-up. Prior to approval of construction work, acceptance for ad release of construction performance bonds, the developer/contractor shall pay any submit any required maintenance and defect financial guarantees, provide a f monumentation and submit one photo mylar or ink-on-mylar set and sets of blue line ted plans (as-built) reflecting all minor and design plan changes of the road and ems. The Reviewing Agency shall specify the number of blue line sets as warranted by mprovement. 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 dition to mylars, a copy of the CADD drawing files in DOS/AUTOCAD format.

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

re to Notify for Land Use Inspection

by the developer as noted above is essential for the County to verify through work meets the standard. Failure to notify in time may oblige the County to arrange g and testing after-the-fact, with certification, either by a professional engineer or erials Engineer. Costs of such testing and certification shall be borne by the time that such action is directed by the Engineer, the Engineer may prohibit or limit development until all directed tests have been completed and corrections made to the Engineer. If necessary, the County may take further action as set forth in King 3, Enforcement.

9.04 Embankment Construction Control in Developments

The provisions of Section 2-03 of the WSDOT/APWA Standard Specifications apply in a development construction unless otherwise instructed by the Engineer. The followir mentioned for clarification and emphasis:

A. Embankment and Cut Section Compaction: Compaction of the top two feet of fil inches of cut subgrade shall meet a minimum 95 percent of maximum density in WSDOT/APWA Standard Specifications Section 2-03.3(14)C - Method B. Subgrade feet shall be compacted to 90 percent of maximum density.

B. Testing for Density

1. Prior to placing any surfacing material on the roadway, it will be the developer/contractor to provide density test reports reviewed and appro engineer. Optimum moisture content and maximum density shall be determ in Section 2-03.3(14)D of WSDOT/APWA Standard Specifications or by othe approved by the County Road Engineer. In fill sections, a minimum of o for every 1,000 cubic yards or fraction thereof and on each lift of emb sections, the interval shall be every 100 feet of roadway. For work to show consistent uniform density as required by tests referenced above.

2. In cases where tests do not meet the minimum standard, corrective actio as adding water, aerating, replacing material or applying more compacti by the developer's engineer. Retests shall show passing densities prio lift of subgrade fill.

3. For trenching in existing roads, see Section 8.03.

C. Finishing Subgrade

After the subgrade preparation has been completed, it shall be thoroughly che developer/contractor using a level, string line, crown board, or other means subgrade conforms to the typical section or special plan conditions prior to material.

9.05 Traffic Control in Development Construction

A. Interim Traffic Control: The developer/contractor shall be responsible for i during construction on or along traveled County roads. When road or drainage performed on County roads that are open to traffic, the developer/contractor submit a traffic control plan for approval by the Reviewing Agency prior to b Traffic control shall follow the guidelines of Section 1-07.23 of the WSDOT/A Specifications. All barricades, signs and flagging shall conform to the requi

ıore specific requirements for barricades, see Section 5.07 and Drawing No. 5-003.
legible and visible and should be removed at the end of each work day if not
er construction hours.

Closures and Detours: When temporary road closures cannot be avoided the
ractor 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
ubmitted to the Department of Public Works, Traffic and Planning Section at least 10
n advance, and approved prior to closing any County road. In addition, the
ractor must notify, in writing, local fire, school, law enforcement authorities, Metro
ny other affected persons as directed by the Engineer at least five days prior to

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

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

er/contractor's traffic fails to use the designated haul route, the Reviewing Agency
r limit further work on the development until such time as the requirements of the
complied with.

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

unty Contract Road Inspection

rformed by County forces or by contract for the County will be inspected under the
ngineer.

ible for timely notification of utilities in advance of any construction in right-of-
ents. The utility One-Call Center phone number 1-800-424-5555 should be prominently
k site.

DRAWINGS

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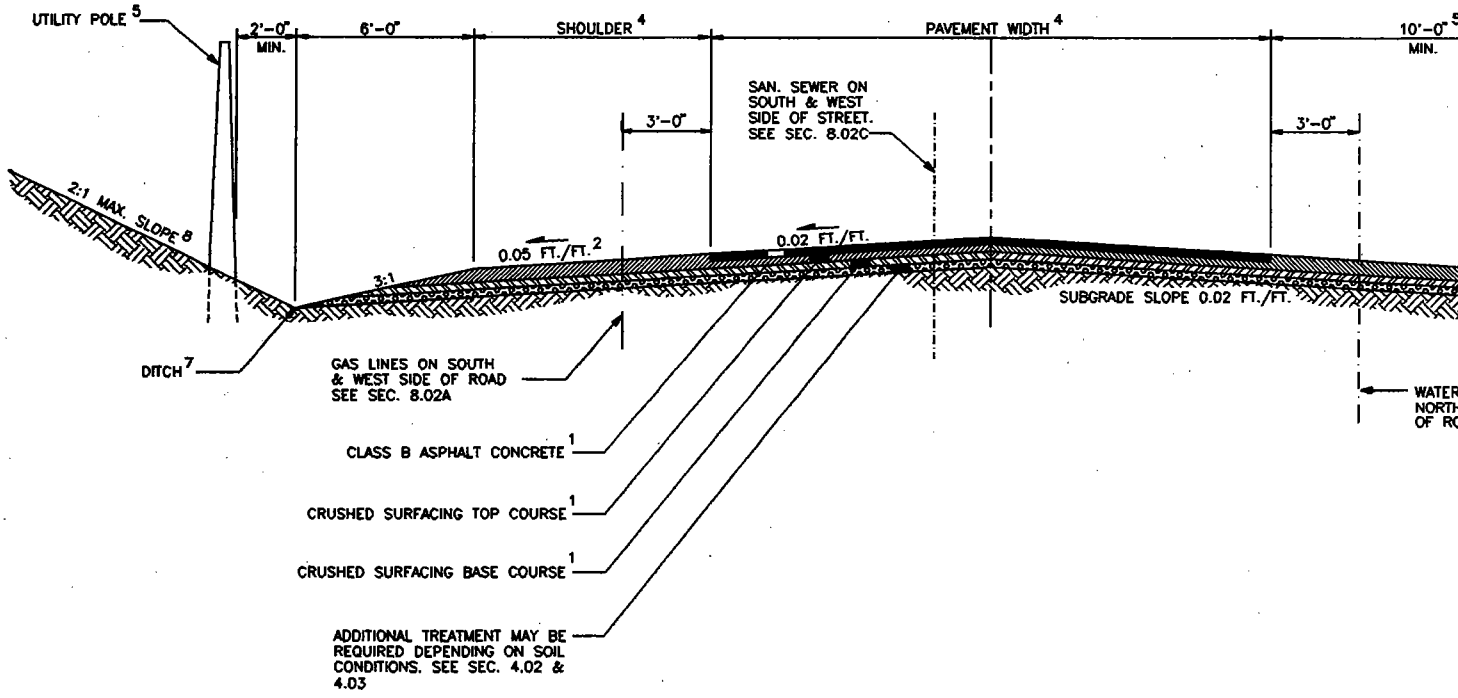
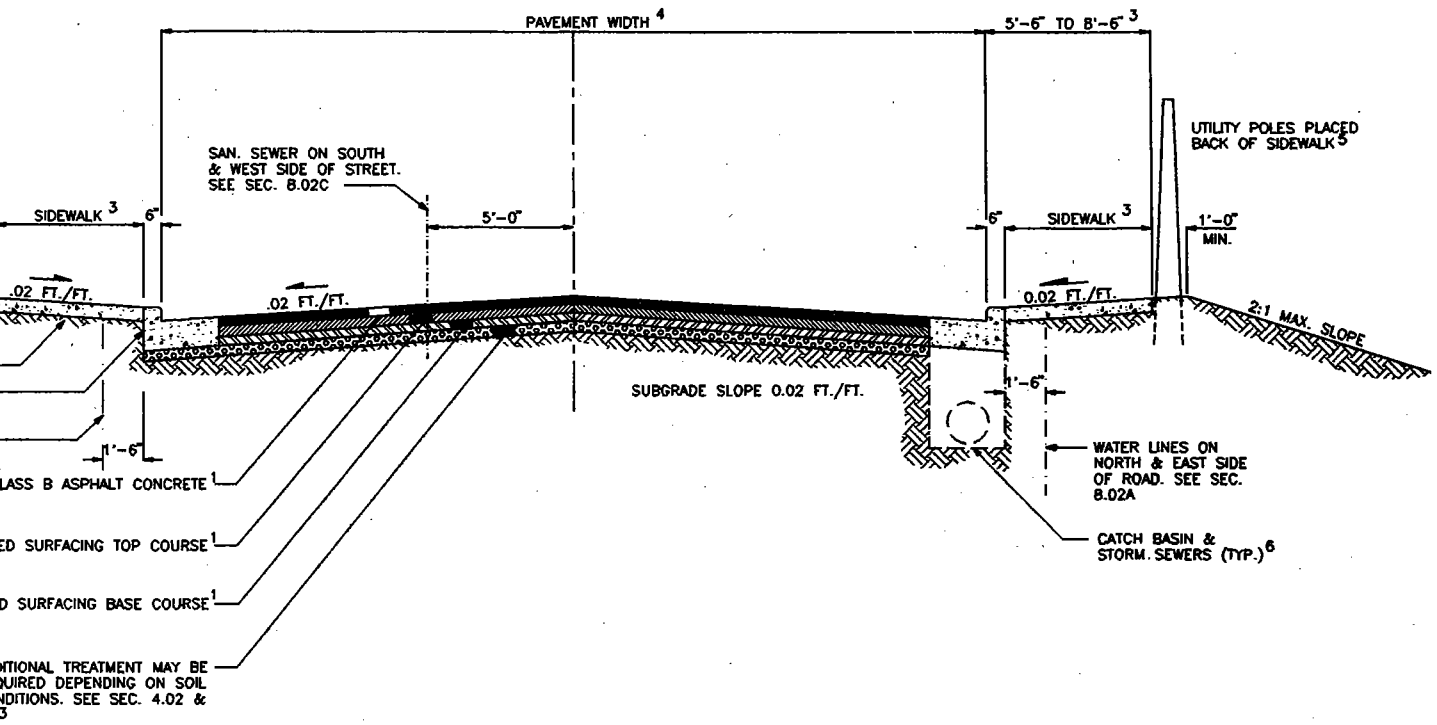


NOTES:

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.

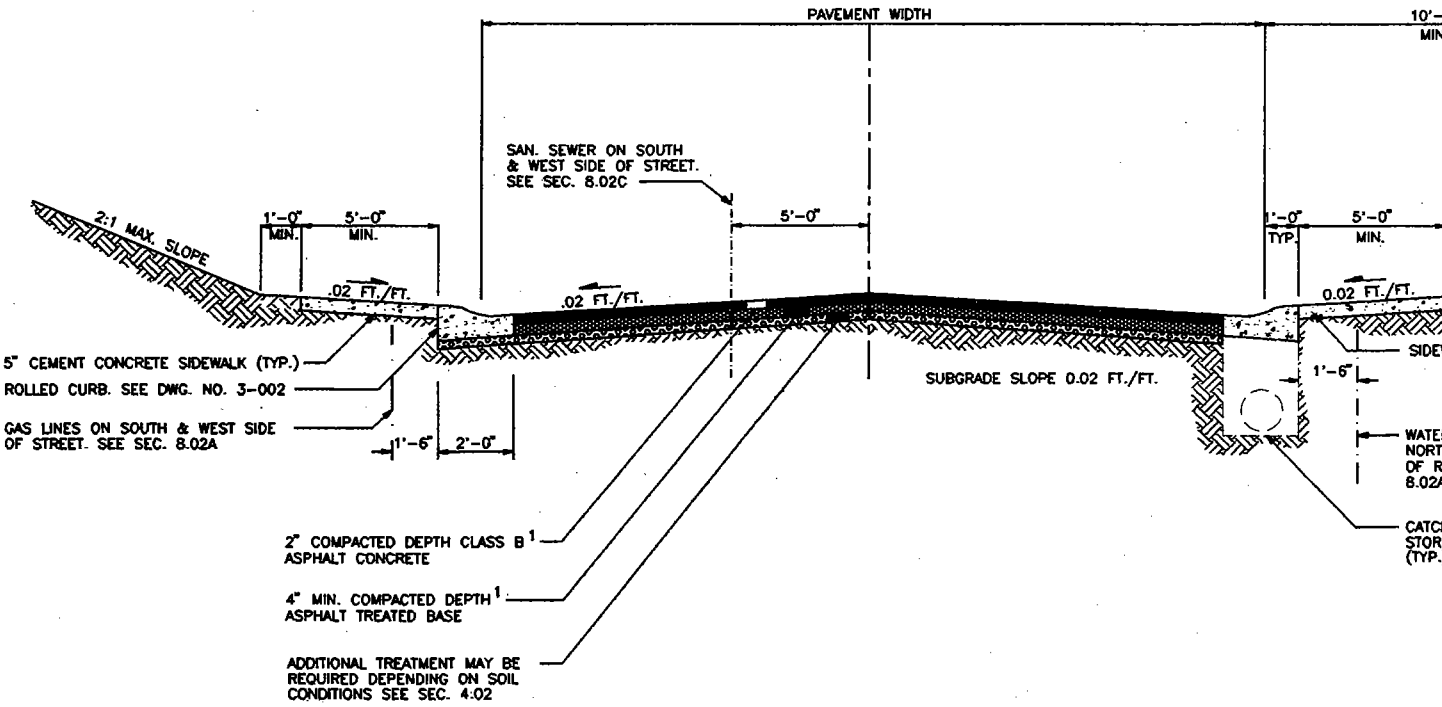
2.02, 2.03, 2.04, AND 2.11.

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.
OLES SEE SEC. 8.02G AND DWG. NO. 5-001.
BASIN AND STORM SEWER LOCATIONS.
PE REQUIREMENTS.

DATE	REVISION	BY	APPR'D

WORKS NGTON	VERTICAL CURB TYPE ROADWAY	DWG. NO. 1-002



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.

DATE	REVISION	BY

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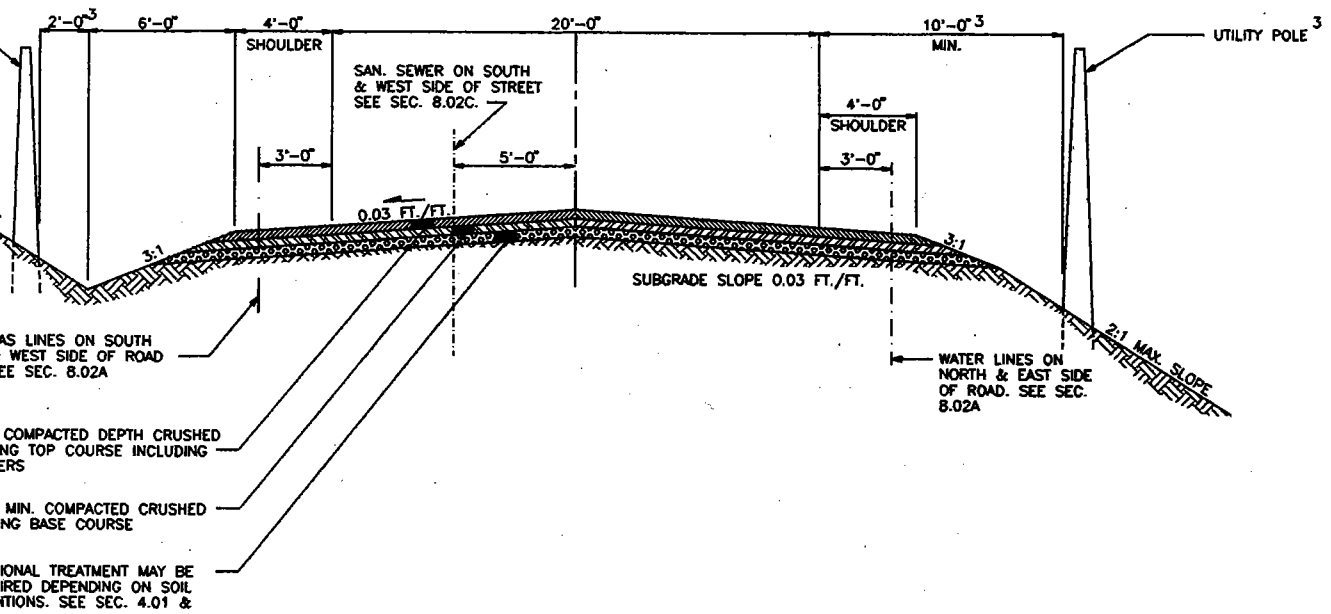
KING COUNTY, WASHINGTON

ROLLED CURB TYPE ROADWAY



PTABLE ONLY ON RURAL MINOR ACCESS STREETS
RIVATE STREETS. SEE SECS. 2.03 & 2.17.

S. 2.03 & 2.11.

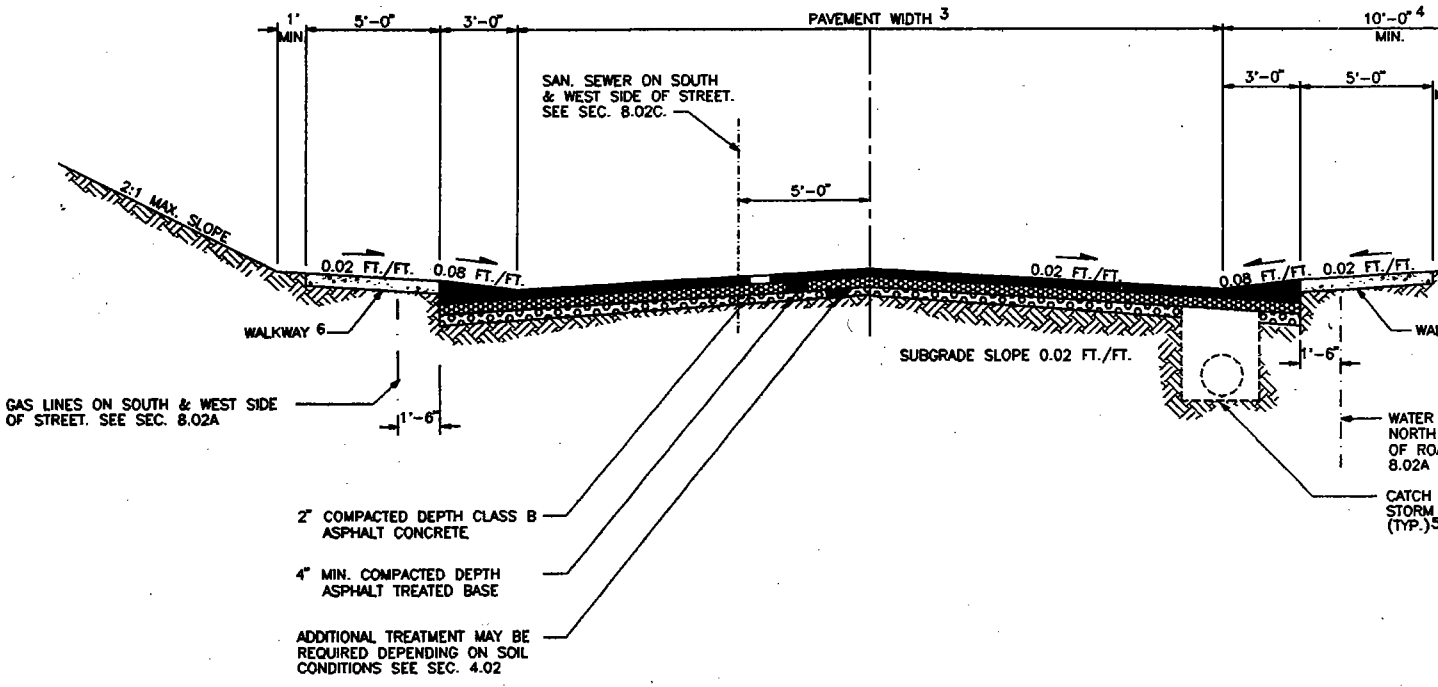
POLES SEE SEC. 8.02G & DWG. NO. 5-001.

OCATIONS MAY VARY TO MEET REQUIREMENTS OF
NUAL.

LOPE REQUIREMENTS.

DATE	REVISION	BY	APPR'D

C WORKS NGTON	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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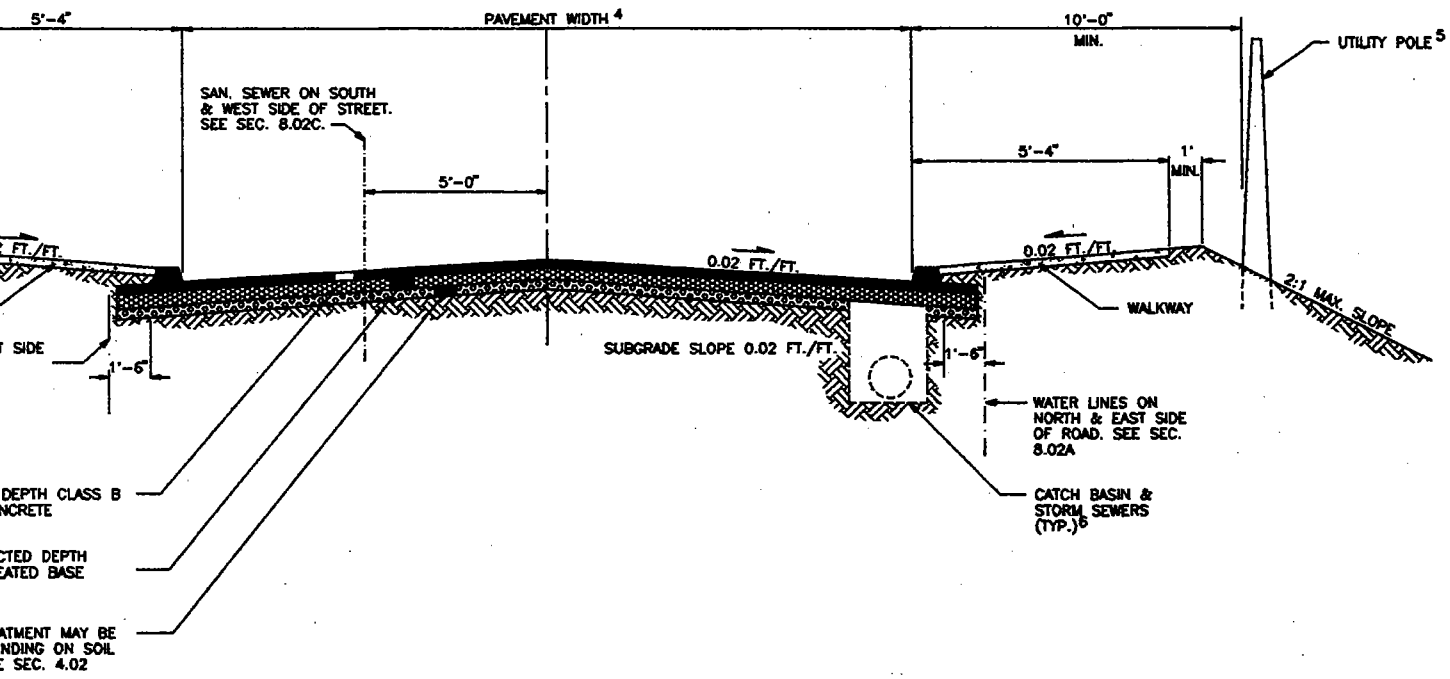
KING COUNTY, WASHINGTON

THICKENED EDGE ROADWAY



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

AIL SEE DWG. NO. 3-002.

ECS. 2.03 AND 2.09.

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

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

CH BASIN AND STORM DRAIN LOCATIONS.

HED SURFACING, ALTERNATIVE V, OR AS REQUIRED

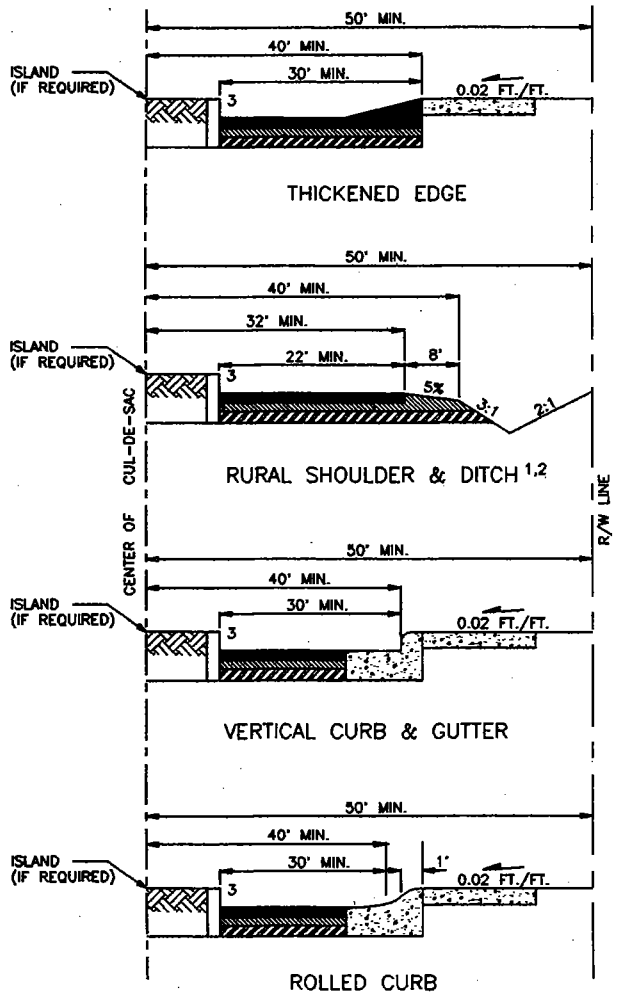
SLOPE REQUIREMENTS.

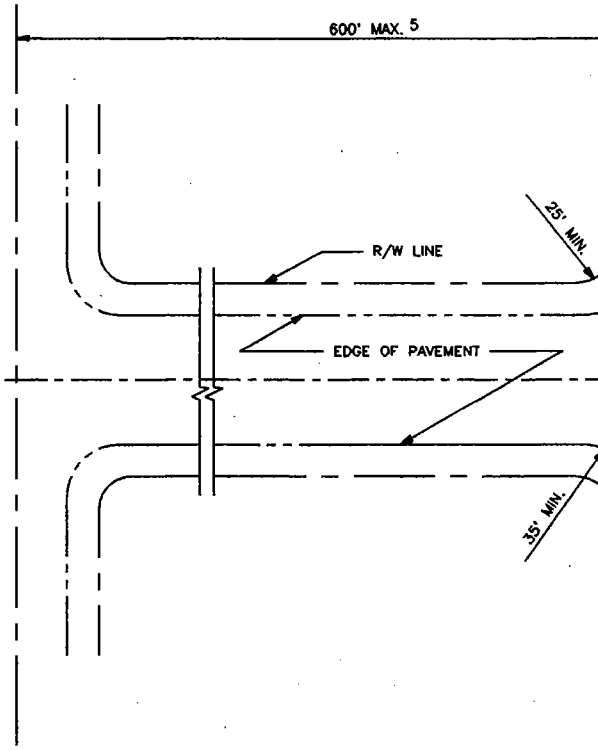
DATE	REVISION	BY	APPR'D

C WORKS
NGTON

EXTRUDED CURB ROADWAY

DWG. NO. 1-006





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 AR
5. SEE SEC 2.08 FOR CUL-DE-SAC LENGTH EXCEPTI
6. SEE SECS. 2.03, 2.08, AND 2.09 FOR RIGHT-OF-W REQUIREMENTS

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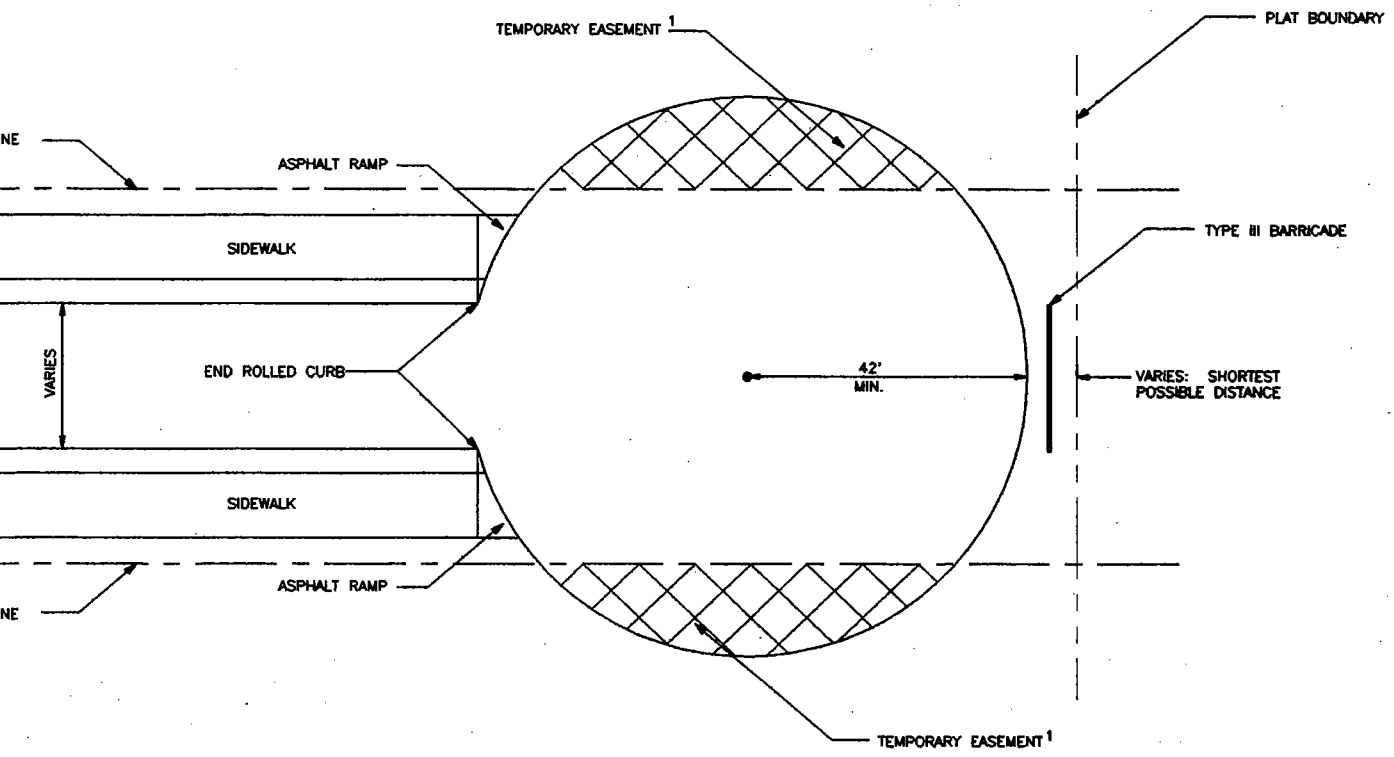
CUL-DE-SACS

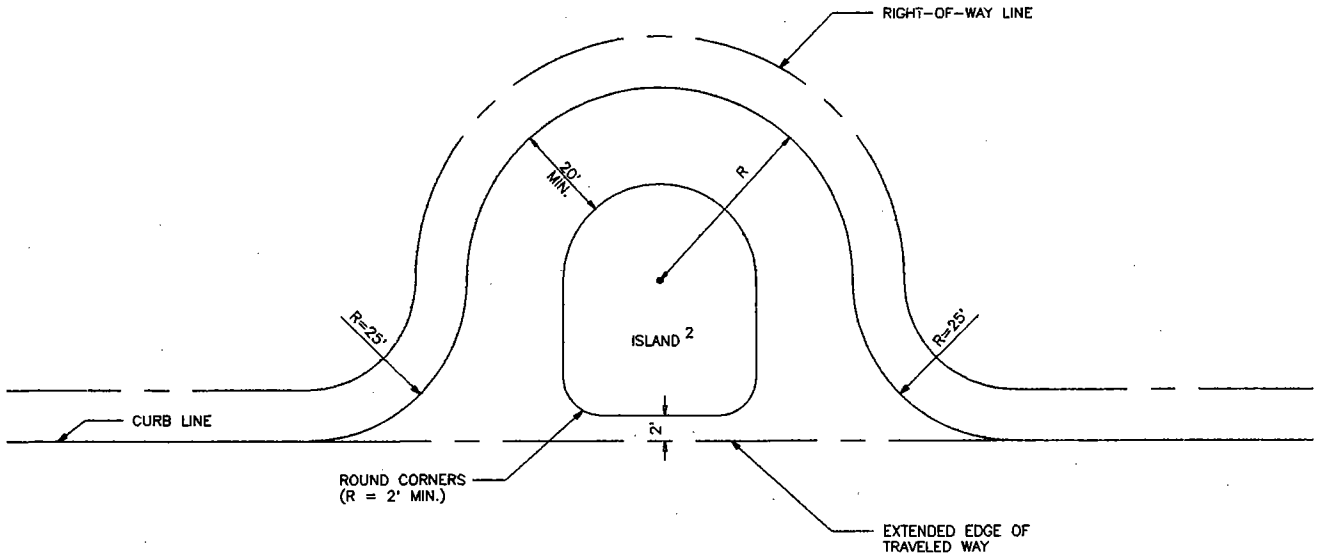


EC. 2.08.

CADE REQUIRED AT END OF BULB.
EC. 5.07.

DATE	REVISION	BY	APPR'D

C WORKS NGTON	TEMPORARY CUL-DE-SAC	DWG. NO. 1-008



NOTES:

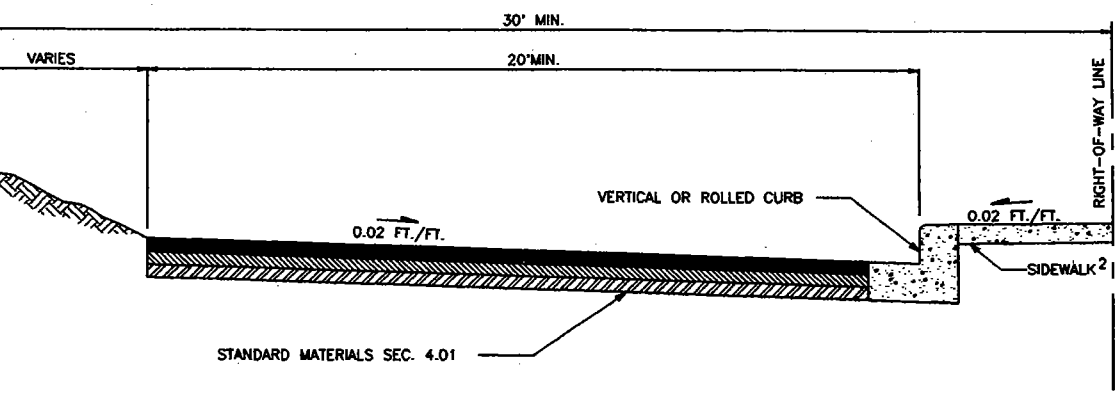
1. SEE SEC. 2.08F.
2. ISLAND REQUIRED ON EYEBROWS WITH R GREATER THAN 25 FEET.
3. MIN. ISLAND DIAM. SHALL BE 10 FEET.

DATE	REVISION	BY	APPR'D

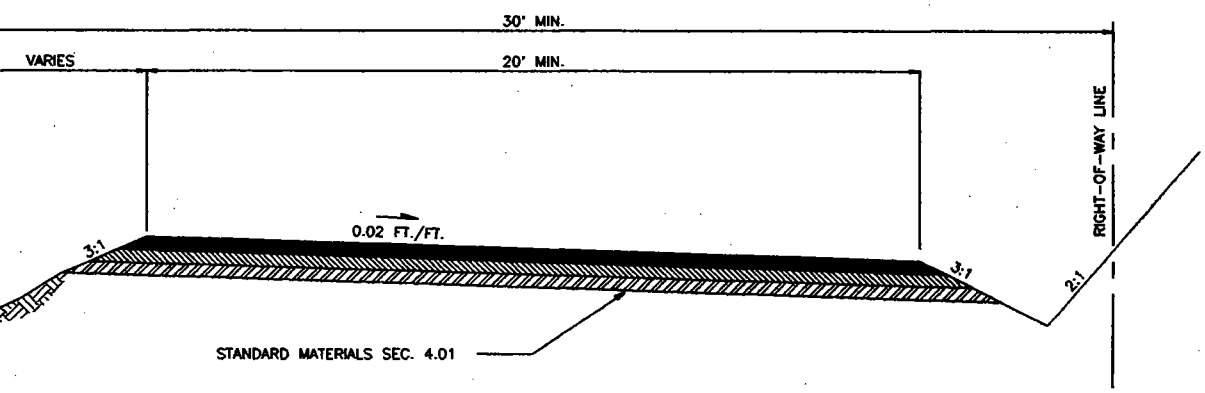
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

EYEBROW

DWG. NO. 1-009



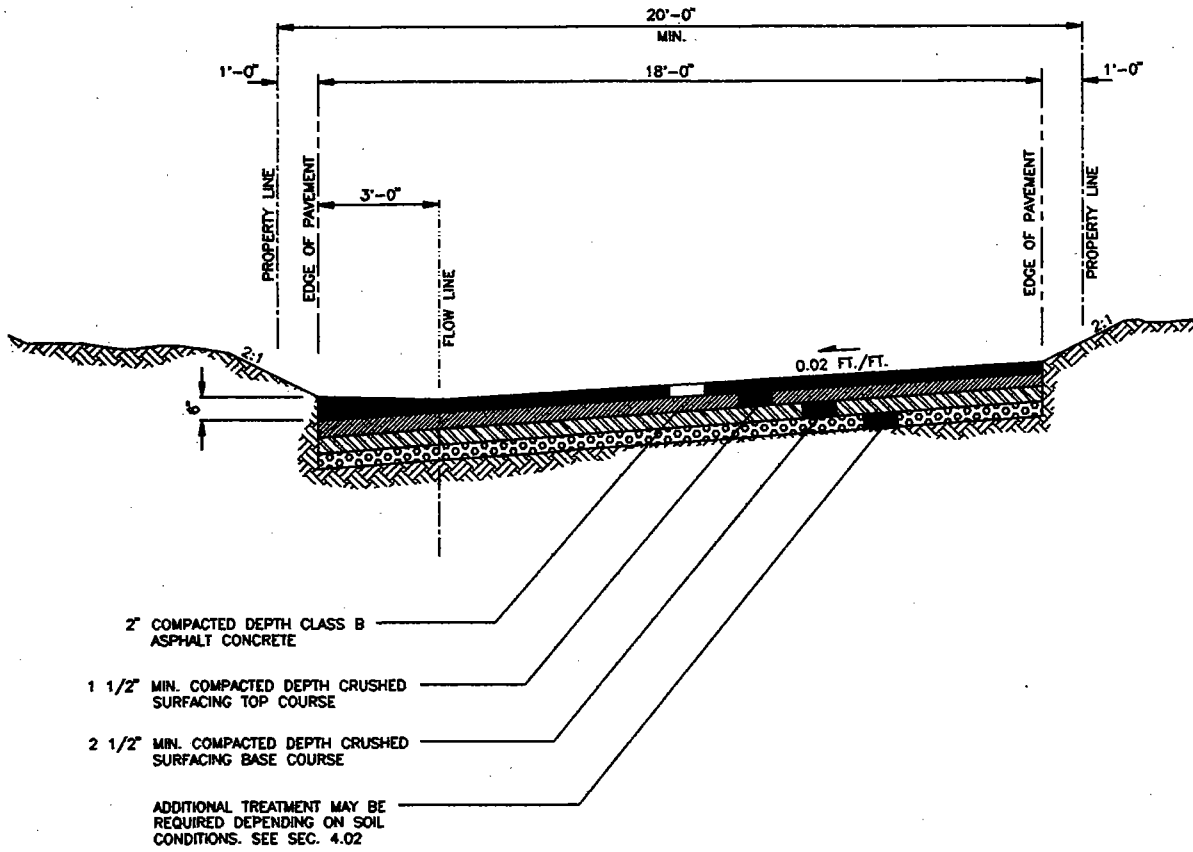
URBAN



RURAL

O BE CONSTRUCTED AS SHOWN
CTION AS APPROPRIATE.

WORKS NGTON	HALF-STREET	DWG. NO. 1-010



NOTE:
SEE SEC. 2.09

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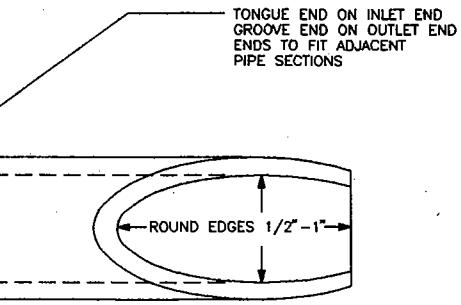
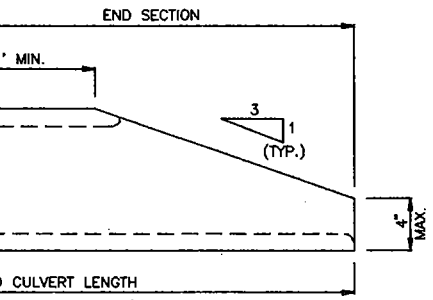
ALLEY PAVEMENT DETAIL

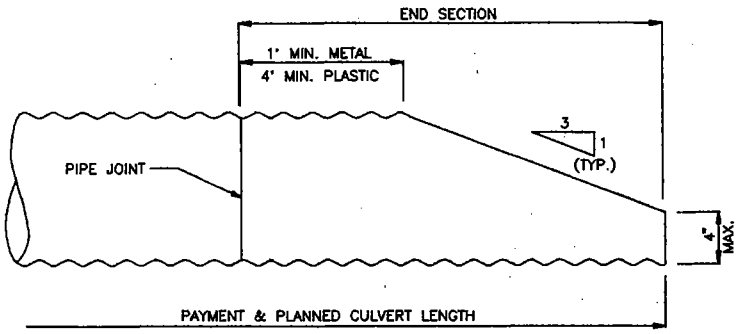


PLAN



LEVATION

RETE PIPE



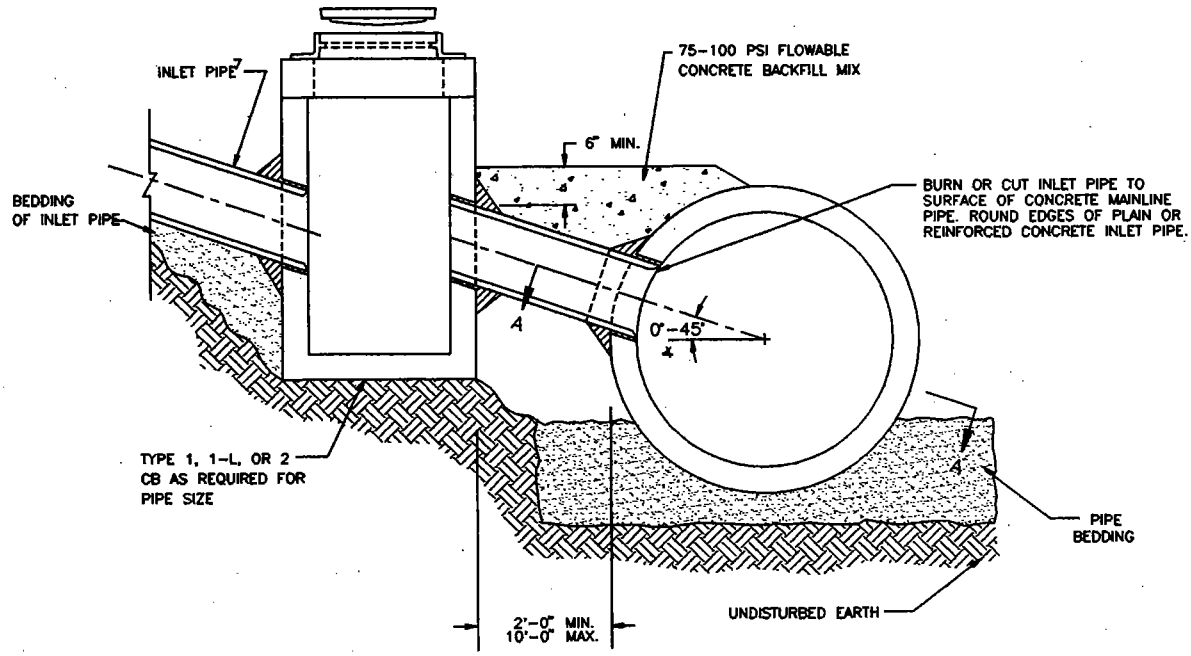
METAL & PLASTIC PIPE

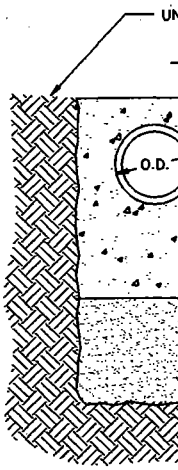
NOTE:

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.

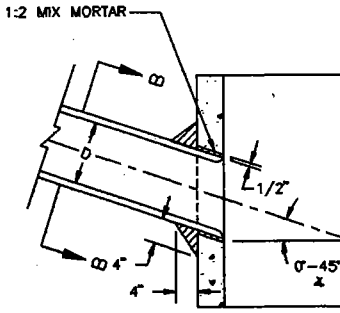
DATE	REVISION	BY	APPR'D

C WORKS NGTON	BEVELED END PIPE SECTION	DWG. NO. 2-001





SECTION



SECTION

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. ℄ 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 ∠ 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.

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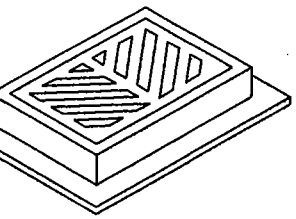
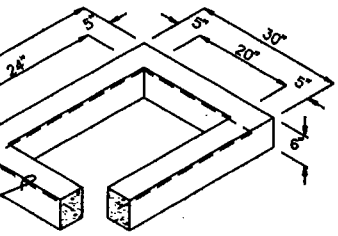
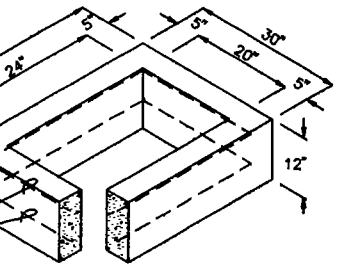
FIELD–TAPPING OF CONCRETE PIPE



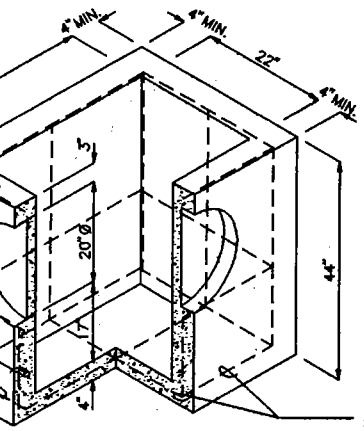
FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



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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WORKS
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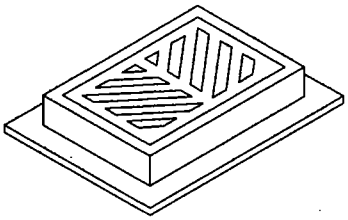
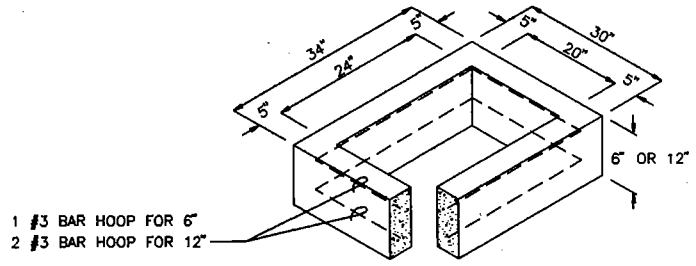
CATCH BASIN TYPE 1

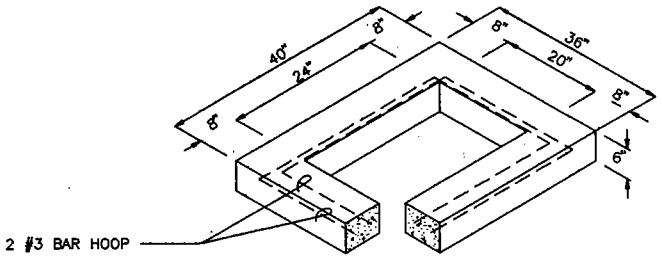
DWG. NO. 2-003



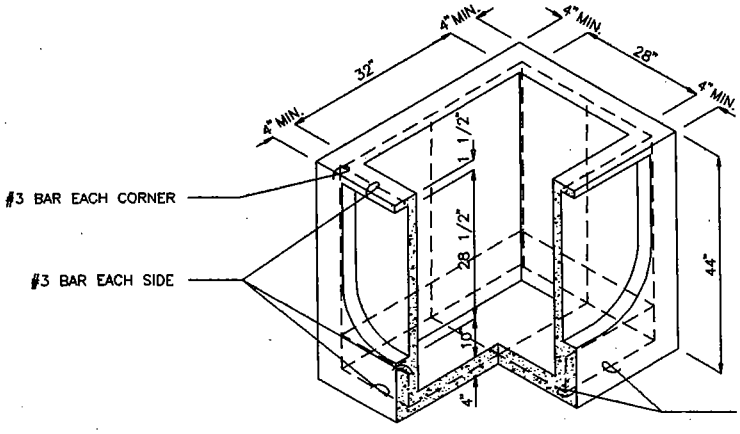
FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



RISER SECTION



6" REDUCING SECTION



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

NOTES:

1. CATCH BASINS SHALL BE CONSTF
C478 (AASHTO M 199) & C890
PLANS OR NOTED IN THE WSDOT
2. AS AN ACCEPTABLE ALTERNATIVE
FABRIC HAVING A MIN. AREA OF
PER FOOT MAY BE USED. WELD
TO ASTM A497 (AASHTO M 221).
PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE
CLASS 4000.
4. PRECAST BASES SHALL BE FURN
KNOCKOUTS. KNOCKOUTS SHALL
OF 2" MIN. ALL PIPE SHALL BE
PROVIDED KNOCKOUTS. UNUSED
BE GROUTED IF WALL IS LEFT IN
5. KNOCKOUT OR CUTOUT HOLE SIZ
DIAM. PLUS CATCH BASIN WALL.
6. KNOCKOUTS MAY BE ON ALL 4
KNOCKOUTS MAY BE EITHER ROU
7. THE TAPER ON THE SIDES OF TH
AND RISER SECTION SHALL NOT
8. CATCH BASIN FRAME AND GRATE
WITH STANDARD SPECIFICATIONS
REQUIREMENTS OF FEDERAL SPE
MATING SURFACES SHALL BE FIN
NON-ROCKING FIT WITH ANY CO
9. FRAME AND GRATE MAY BE INST
OR CAST INTO RISER.
10. MAX. DEPTH FROM FINISHED GRA
BE 5'-0".
11. EDGE OF REDUCING SECTION OR
THAN 2" FROM VERTICAL EDGE

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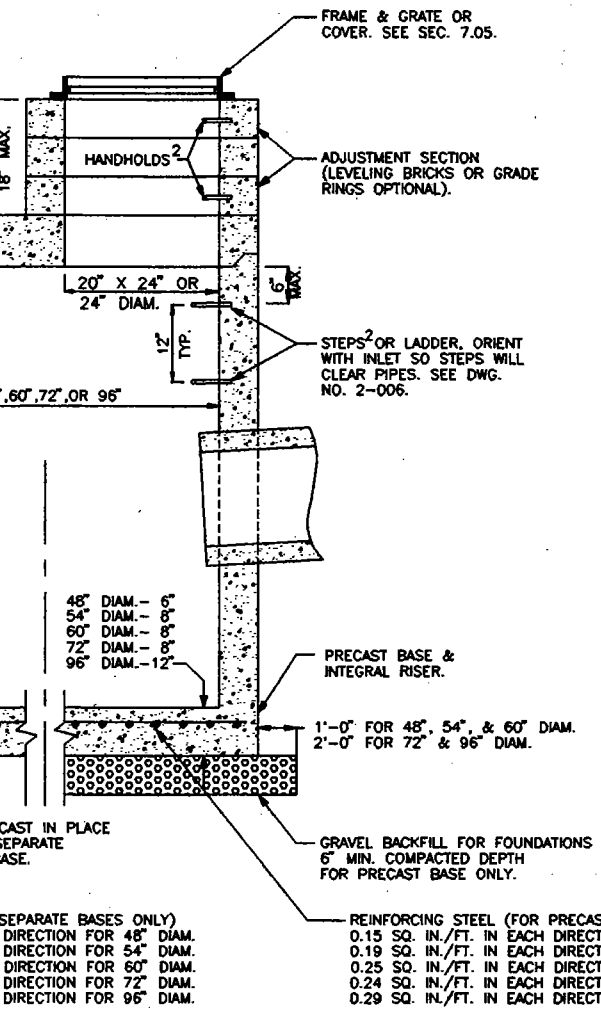
KING COUNTY, WASHINGTON

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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C WORKS
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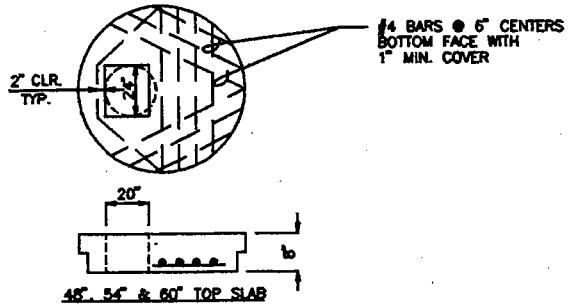
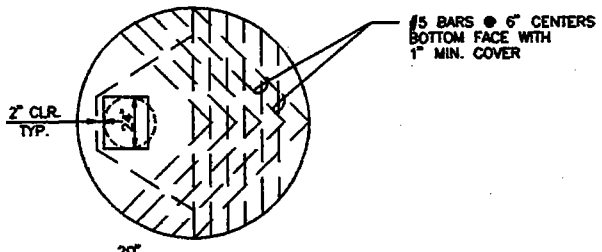
CATCH BASIN TYPE 2 48", 54", 60", 72", & 96"

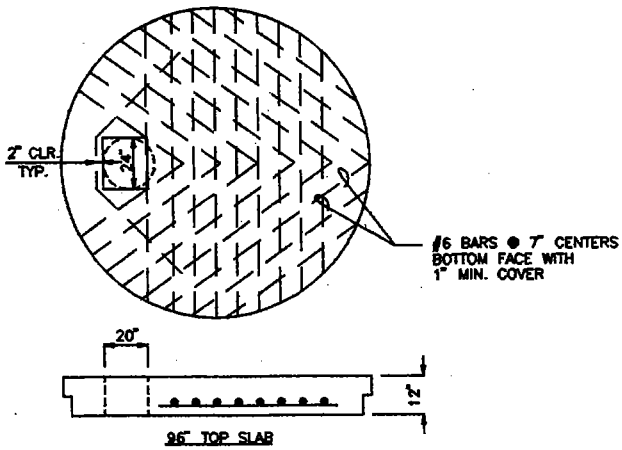
DWG. NO. 2-005



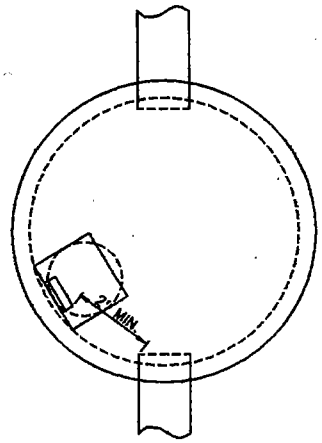
48", 54" & 60" TOP SLAB



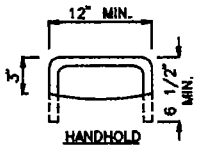
72" TOP SLAB



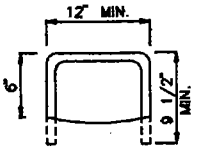
96" TOP SLAB



TYPICAL ORIENTATION
FOR ACCESS AND STEPS

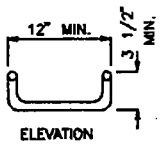


HANDHOLD

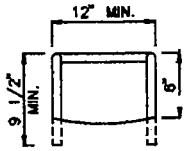


CATCH BASIN STEP

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

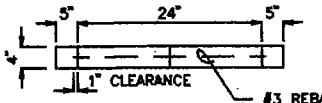


ELEVATION



PLAN

DROP RUNG
CATCH BASIN STEP



GRADE RING

NOTES:

1. PROPRIETARY CATCH BASIN HA
ACCEPTABLE. PROVIDED THAT T
ASTM C478, AASHTO M-199 A

2. CATCH BASIN STEP/HANDHOLD
APPROXIMATELY RADIAL AT THE
EXCEPT THAT ALL STEPS IN AN
PENETRATION OF OUTER WALL

3. HANDHOLDS AND STEPS SHALL
ON DETAIL OR PROTUBERANCES

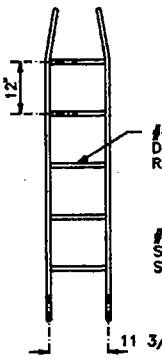
4. SLAB OPENING MAY BE 24" X

5. AS AN ACCEPTABLE ALTERNATIV
HAVING A MIN. AREA OF 0.12
BE USED. WELDED WIRE FABR

6. LADDERS OR STEPS SHALL EX
CATCH BASIN.

7. HANGING LADDERS SHALL BE
HANGING ON STEP OR BY BOL
EACH SHALL BE EMBEDDED AT

8. ADDITIONAL SAFETY FEATURES
OR UNUSUAL STRUCTURES.



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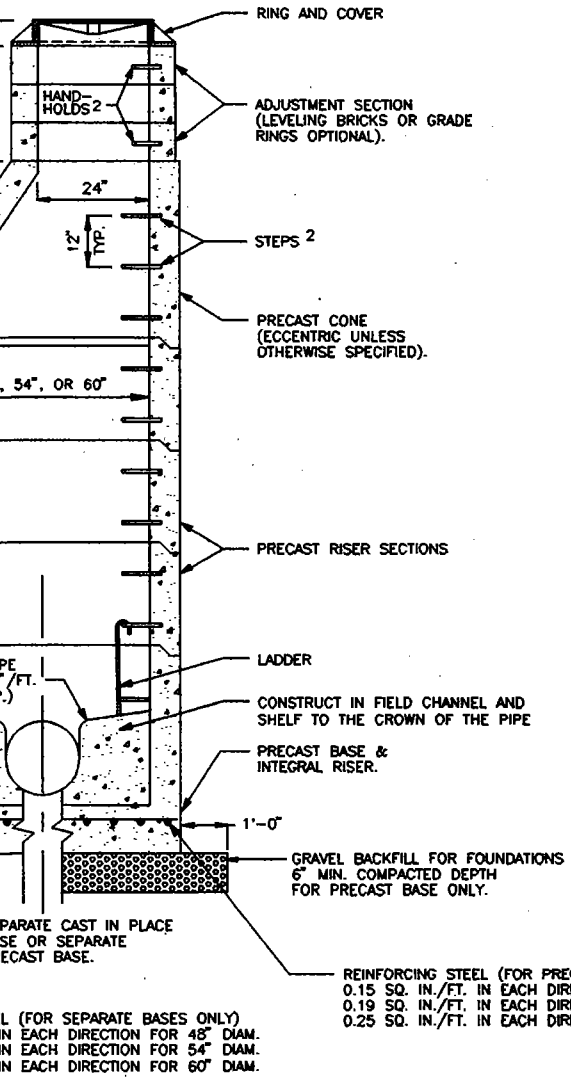
CATCH BASIN DETAILS

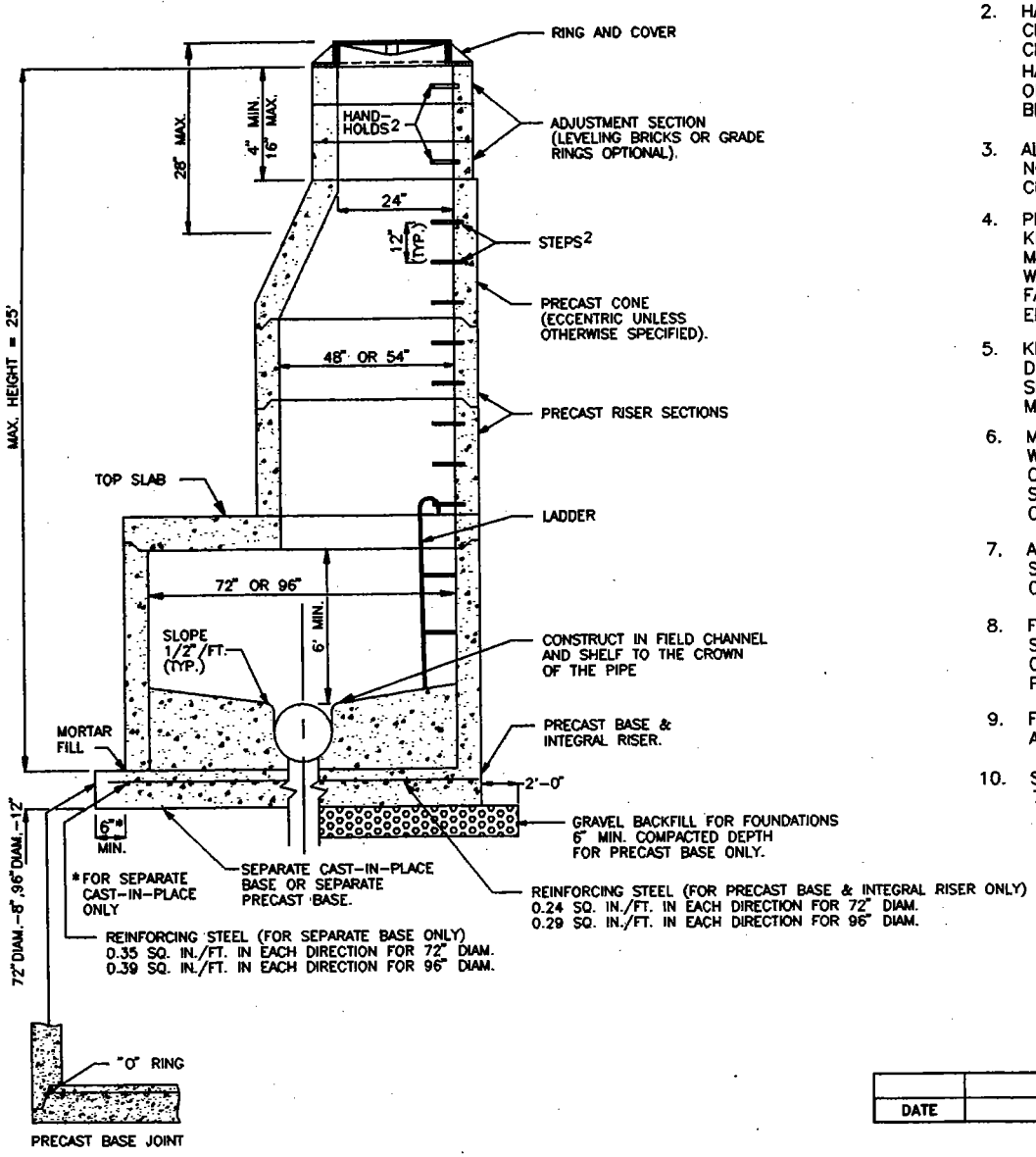


NOTES:

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.

DATE	REVISION	BY	APPR'D

C WORKS NGTON	MANHOLE TYPE 1 48", 54", & 60"	DWG. NO. 2-007



NOTES:

1. MANHOLES SHALL BE CONSTRUCTED
AASHTO M199 UNLESS OTHERWISE SH
IN THE WSDOT/APWA STANDARD SPEC
2. HANDHOLDS IN ADJUSTMENT SECTION
CLEARANCE. STEPS IN MANHOLE SH
CLEARANCE. SEE DWG. NO. 2-011,
HANDHOLDS SHALL BE PLACED IN AL
OR LEVELING BRICK COURSE WITH MI
BETWEEN THE LAST STEP AND THE T
3. ALL REINFORCED CAST-IN-PLACE CO
NON-REINFORCED CONCRETE IN CHA
CLASS 3000. ALL PRECAST CONCRE
4. PRECAST BASES SHALL BE FURNISHE
KNOCKOUTS. KNOCKOUTS SHALL HA
MIN. UNUSED KNOCKOUTS NEED NO
WALL IS LEFT INTACT. PIPES SHALL
FACTORY KNOCKOUTS UNLESS OTHER
ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE S
DIAM. PLUS MANHOLE WALL THICKNES
SIZE SHALL BE 60" FOR 72" MANHO
MIN. DISTANCE BETWEEN HOLES SHAL
6. MANHOLE RINGS AND COVERS SHALL
WITH SEC. 7.05 AND MEET THE STRI
OF FEDERAL SPECIFICATION RR-F-6
SHALL BE FINISHED TO ASSURE NON
COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL
STRENGTH OF 60,000 PSI AND BE P
OF THE BASE WITH 1" MIN. CLEARAN
8. FOR HEIGHTS OF 12' OR LESS, MIN.
SHALL EQUAL 3,300 POUNDS PER S
OVER 12', MIN. SOIL BEARING VALUE
POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING GRADE RING,
AND TOP SLABS, SEE DWG. NO. 2-
10. SEE THE WSDOT/APWA STANDARD SP
7-05.3 FOR JOINT REQUIREMENTS.

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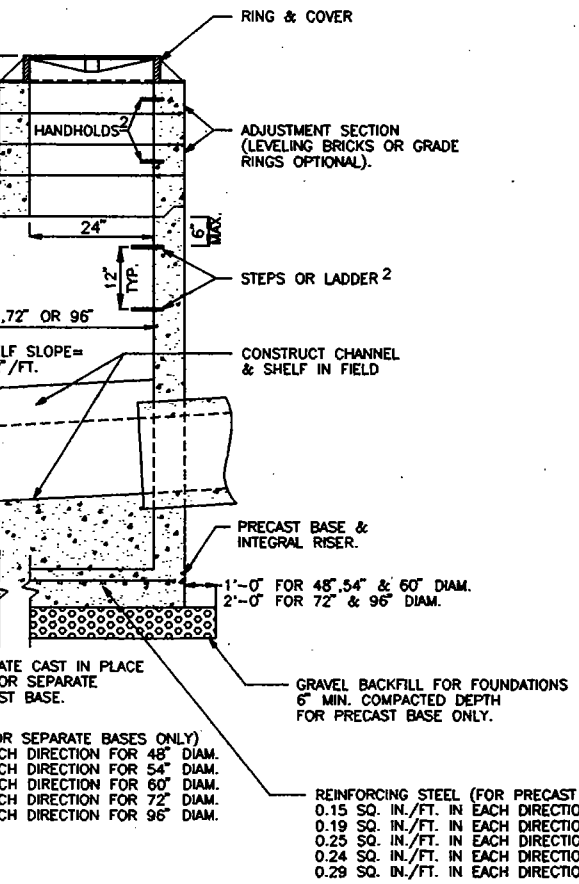
MANHOLE TYPE 2 72" & 96"



NOTES:

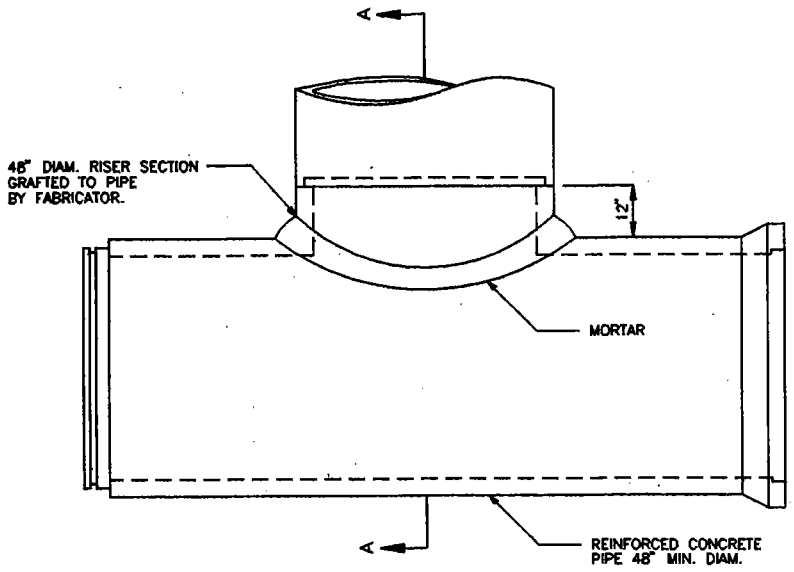
1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 2-011, "MANHOLE DETAILS." HANDHOLDS 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

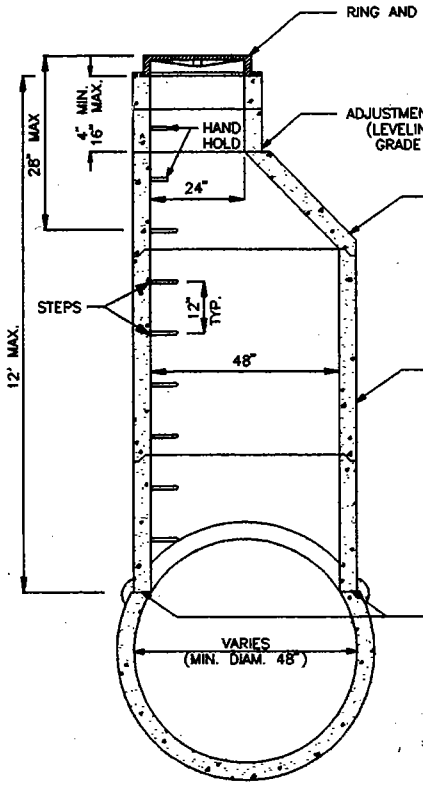
WORKS NGTON	MANHOLE TYPE 3 48", 54", 60", 72", & 96"	DWG. NO. 2-009

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

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MANHOLE TYPE 4

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

8"

TOP SLAB

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

8"

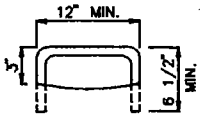
SLAB

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

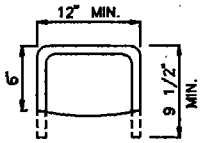
12"

SLAB

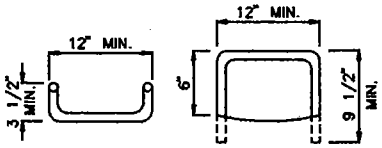
*ALL STEPS & RUNGS
1" DIAM. GALV. REBAR OR
COPOLYMER PROPYLENE.



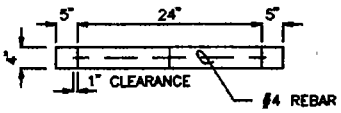
HANDHOLD



MANHOLE STEP



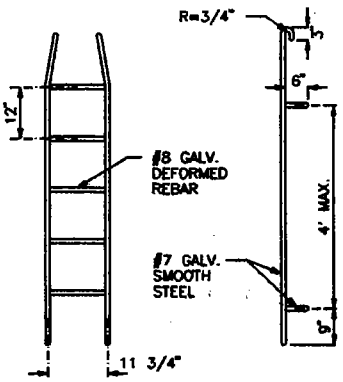
MANHOLE DROP RUNG STEP



GRADE RING

NOTES:

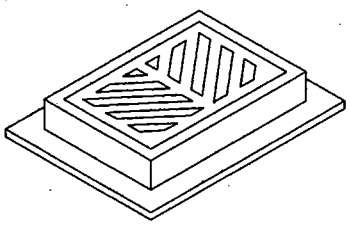
1. PROPRIETARY MANHOLE HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M199 AND MEET ALL WISHA REQUIREMENTS.
2. MANHOLE STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL 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.



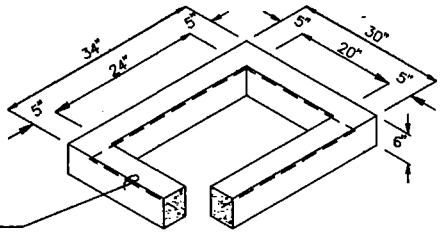
PREFABRICATED LADDER

DATE	REVISION	BY	APPR'D

WORKS NGTON	MANHOLE DETAILS	DWG. NO. 2-011

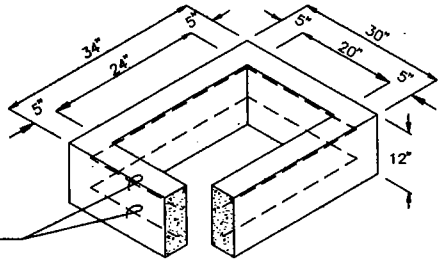


FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



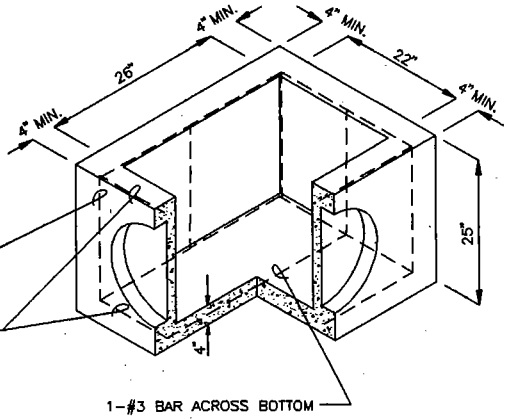
1 #3 BAR HOOP

6" RISER SECTION



2 #3 BAR HOOPS

12" RISER SECTION



#3 BAR EACH CORNER

#3 BAR EACH SIDE
TOP & BOTTOM

1-#3 BAR ACROSS BOTTOM

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

NOTES:

1. CURB INLET TO BE CONSTRUC
ASTM C478 & C890 UNLESS
OR NOTED IN THE STANDARD
2. AS AN ACCEPTABLE ALTERNATI
FABRIC HAVING A MIN. AREA
PER FOOT MAY BE USED. W
COMPLY TO ASTM A497. WIR
PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PL
CLASS 4000.
4. PRECAST BASES SHALL BE FU
KNOCKOUTS. KNOCKOUTS SH
OF 2" MIN. ALL PIPE SHALL
PROVIDED KNOCKOUTS. UNU
BE GROUTED IF WALL IS LEFT
5. KNOCKOUT OR CUTOUT HOLE
DIAM. PLUS CURB INLET WALL
6. ROUND KNOCKOUTS MAY BE
DIAM. OF 17".
7. THE MAX. DEPTH FROM THE
PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF
AND RISER SECTION SHALL N
9. CONCRETE INLET FRAME AND
WITH STANDARD SPECIFICATIO
REQUIREMENTS OF FEDERAL S
MATING SURFACES SHALL BE
NON-ROCKING FIT WITH ANY
10. FRAME AND GRATE MAY BE IN
OR CAST INTO RISER.

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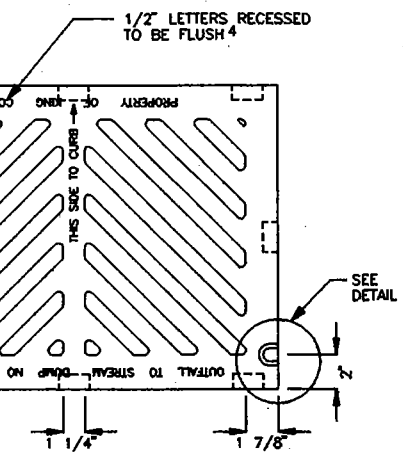
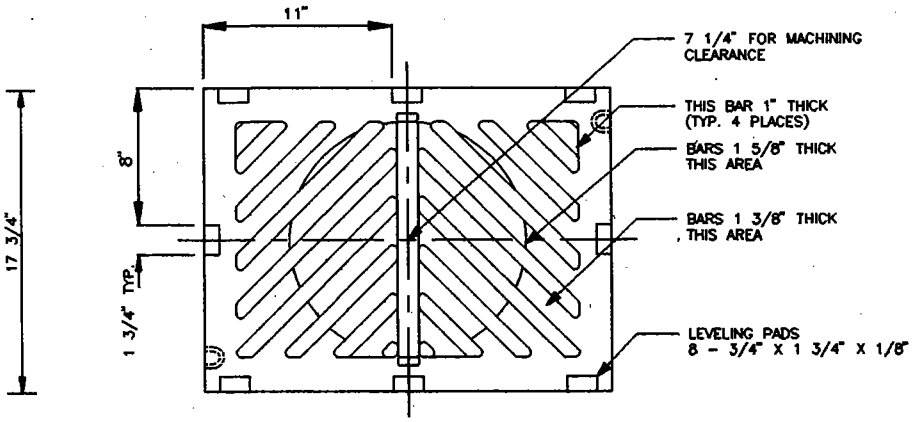
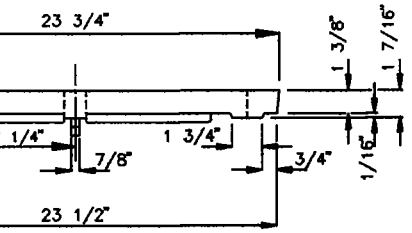
CURB INLET



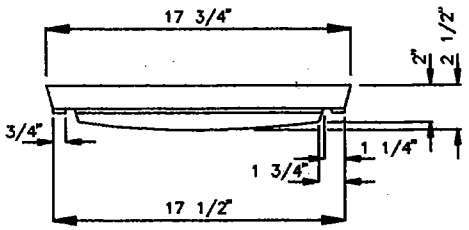
TOP VIEW



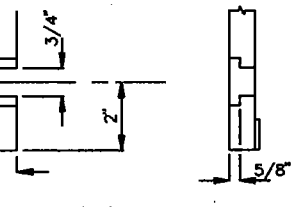
BOTTOM VIEW



SIDE VIEW



END VIEW



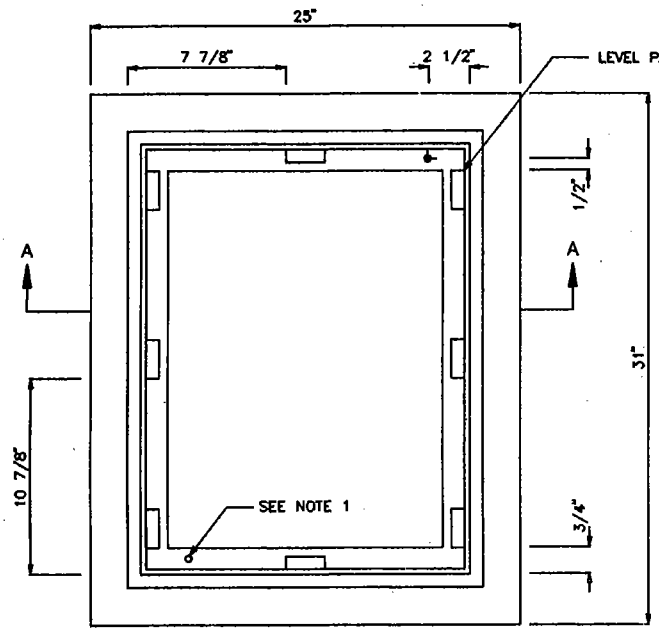
SLOT DETAIL
SEE NOTE 1

NOTES:

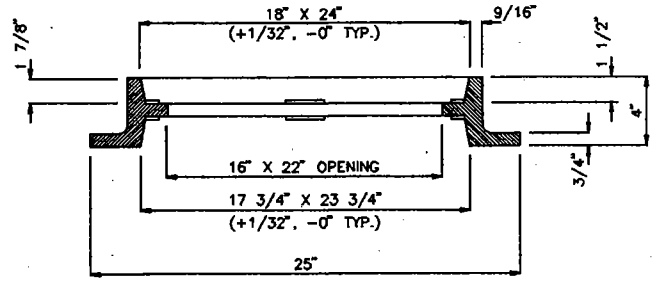
1. SLOT FORMED AND RECESSED FOR 5/8"-11 NC X 2" SOCKET HEAD (ALLEN HEAD) CAP SCREW.
2. GRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.
3. SEE SEC. 7.05.
4. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF GRATE IS ON PRIVATE SYSTEM.

DATE	REVISION	BY	APPR'D

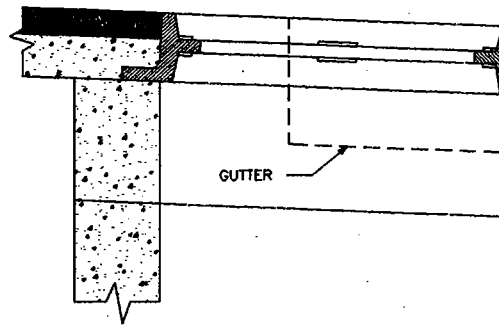
WORKS IGTON	STANDARD GRATE	DWG. NO. 2-013



PLAN

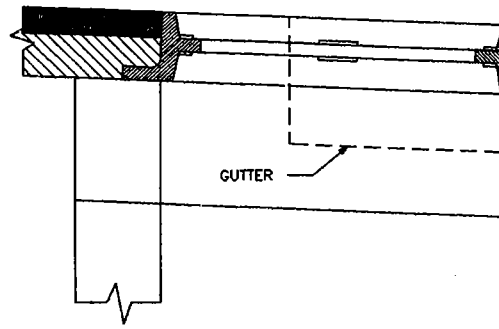


SECTION A-A



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.

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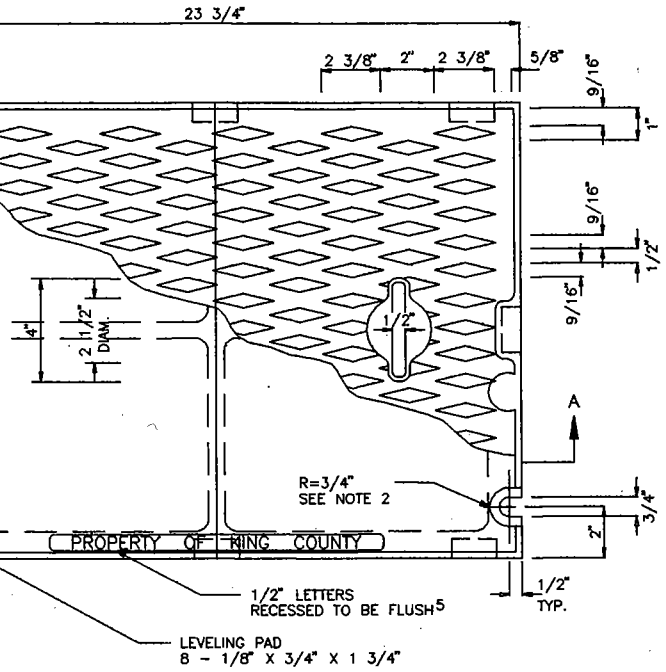
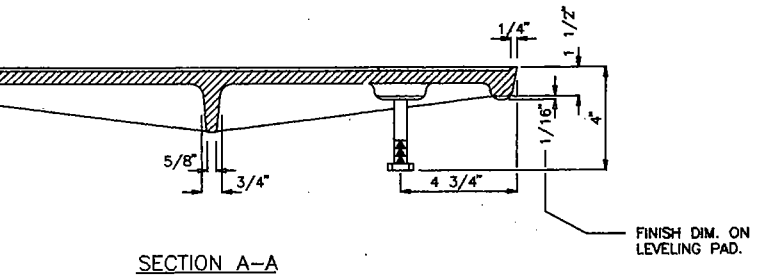
STANDARD FRAME WITH VERTICAL OR EXTRUDED CURB INSTALLATION



PLAN COVER



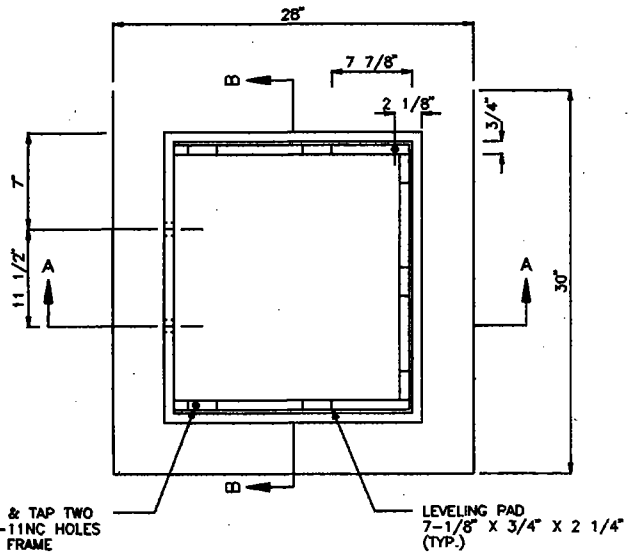
SECTION A-A

NOTES:

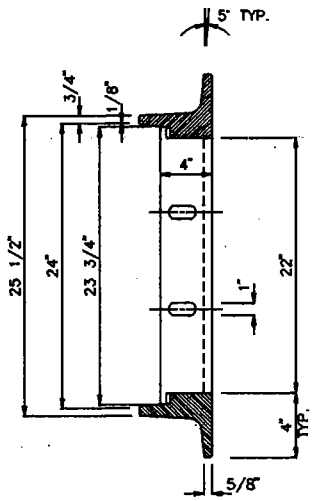
1. USE WITH FRAME (DWG. NO. 2-014) DRILLED AND TAPPED FOR LOCKING BOLTS.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS, 2" LONG.
3. MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
4. SEE SEC. 7.05.
5. THE WORDS "PROPERTY OF KING COUNTY" SHALL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

DATE	REVISION	BY	APPR'D

C WORKS NGTON	SOLID COVER	DWG. NO. 2-015



PLAN

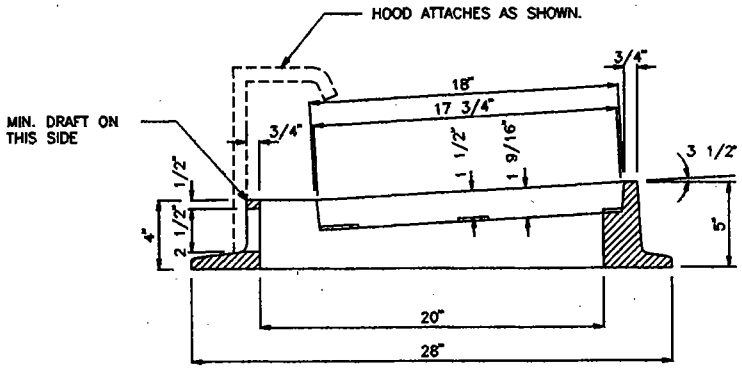


SECTION B–B

C

SEE NOTE

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



SECTION A–A

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. OR
5. SEE SEC. 7.05.

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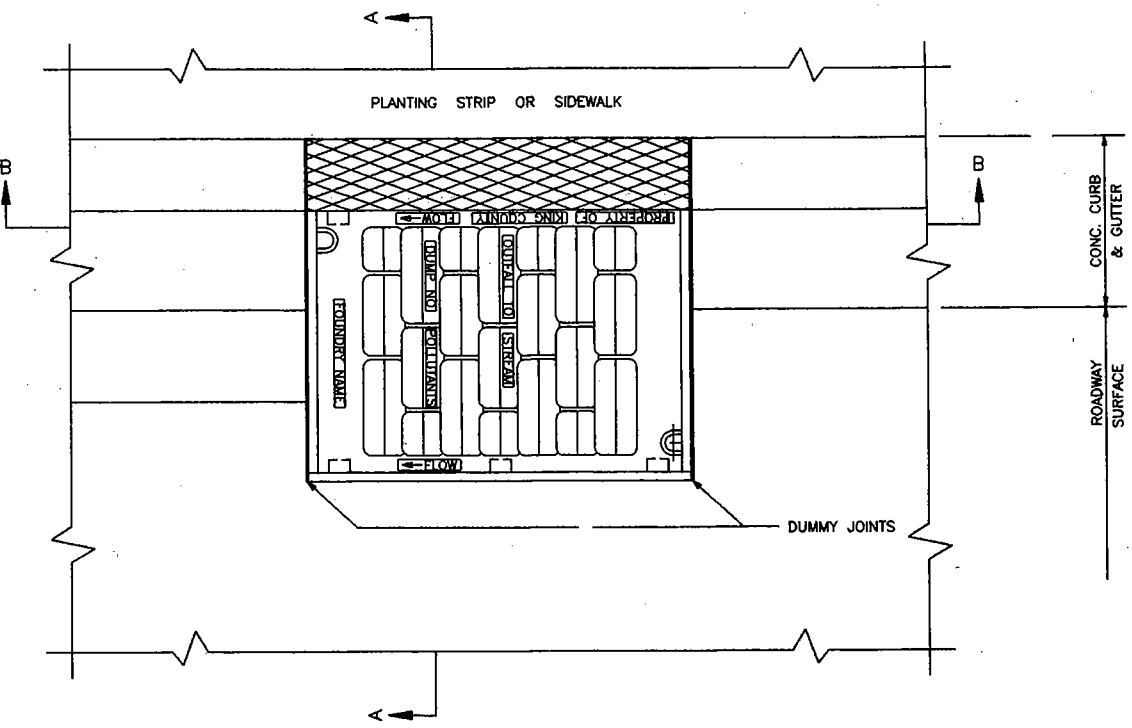
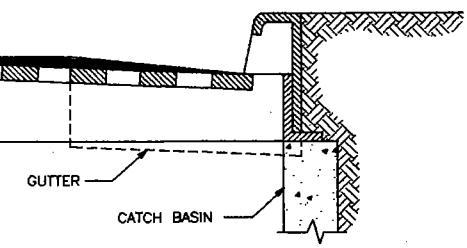
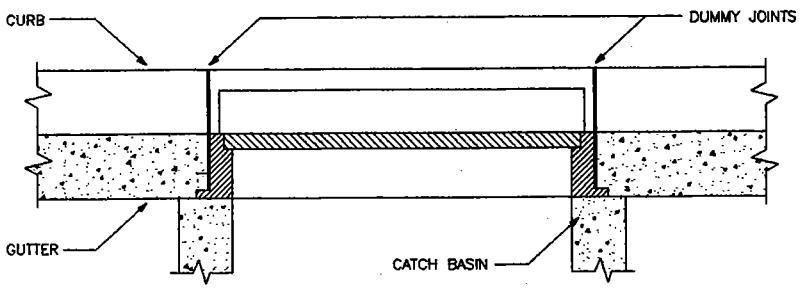
THROUGH–CURB INLET FRAME



PLAN



SECTION A–A

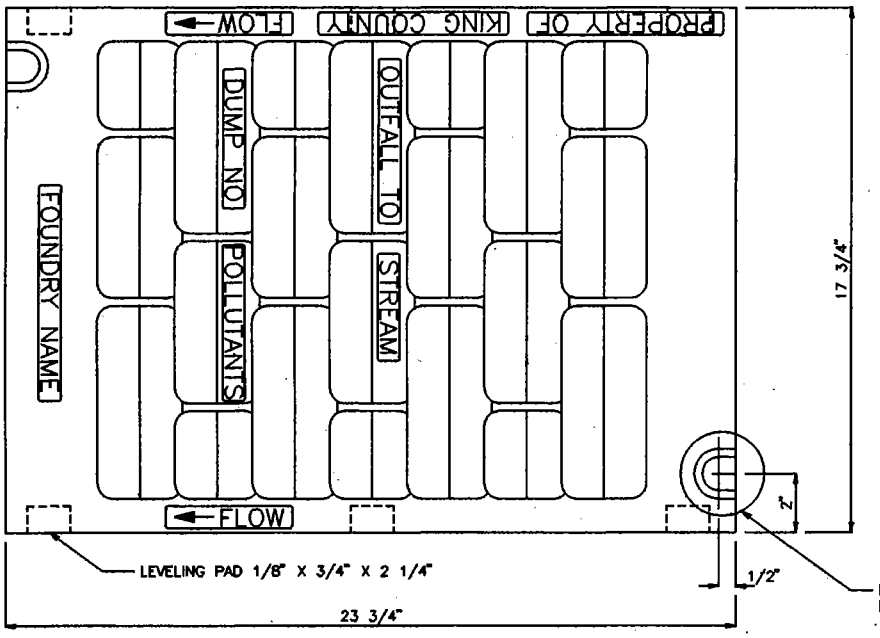


SECTION B–B

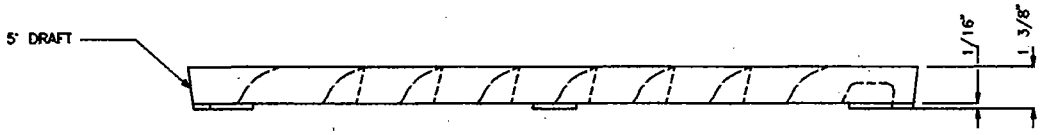
CT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
QUIREMENTS.

DATE	REVISION	BY	APPR'D

WORKS GTON	THROUGH–CURB INLET FRAME & GRATE WITH VERTICAL CURB INSTALLATION	DWG. NO. 2–017



PLAN



ELEVATION

NOTES:

1. SELF-LOCK VANE[TO APPROVAL BY
2. USE WITH TWO LO STAINLESS TYPE (ALLEN HEAD) CA SLOT DETAIL.
3. MATERIAL IS DUCT 80-55-06.
4. "OUTFALL TO STRI MAY BE LOCATED
5. SEE SEC. 7.05.
6. THE WORDS "PRO BE OMITTED IF GR

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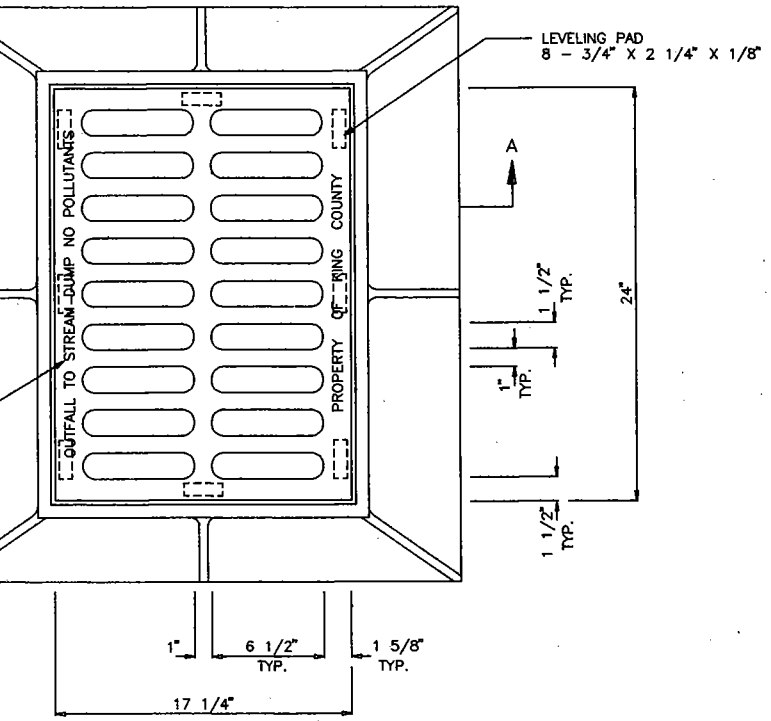
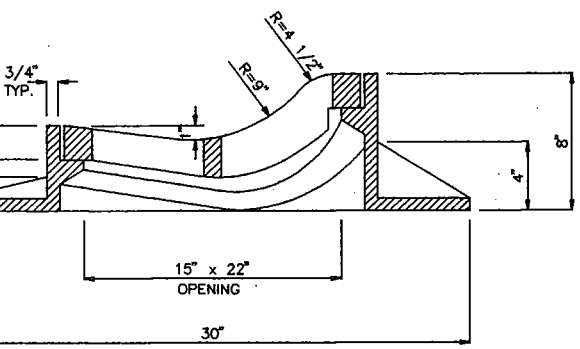
VANED GRATE



PLAN



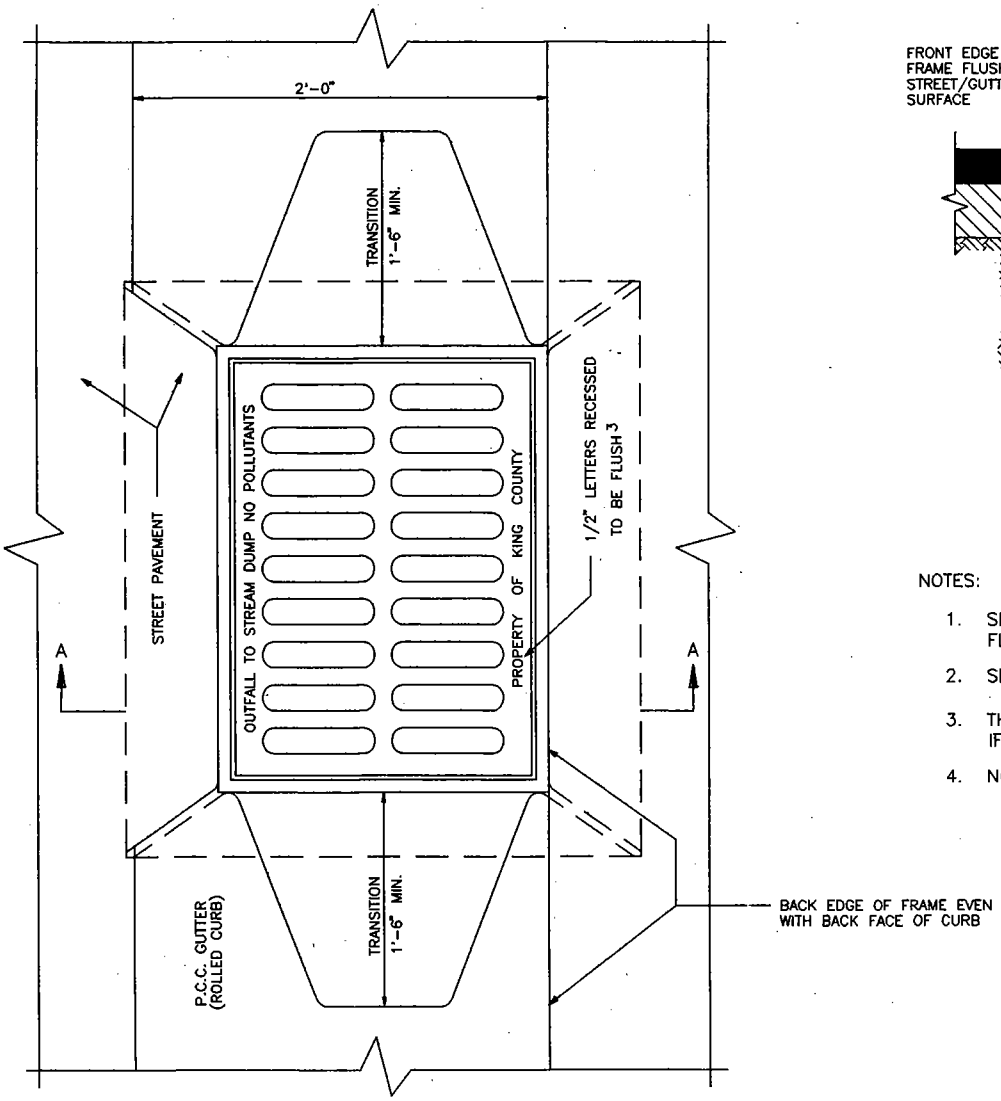
SECTION A–A

NOTES:

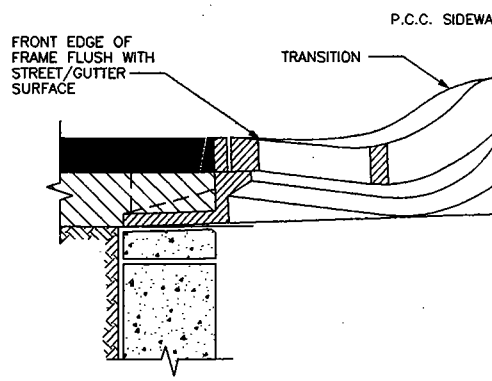
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADWAYS.

DATE	REVISION	BY	APPR'D

E WORKS NGTON	ROLLED CURB FRAME & GRATE	DWG. NO. 2–019



PLAN



SECTION A–A

NOTES:

1. SET FRAME TO GRADE AND CONSTRUCT RO
   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 RO

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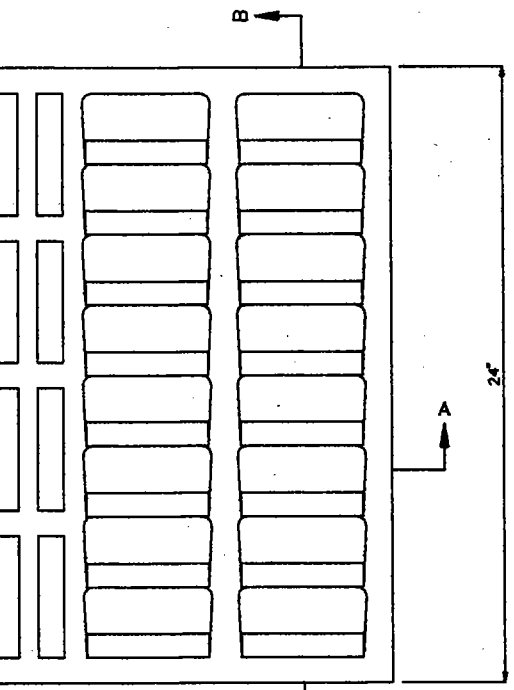
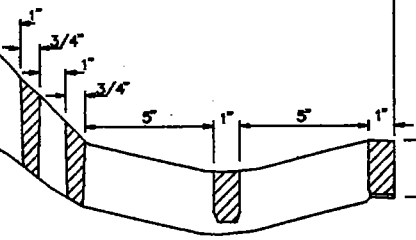
ROLLED CURB FRAME & GRATE INSTALLAT



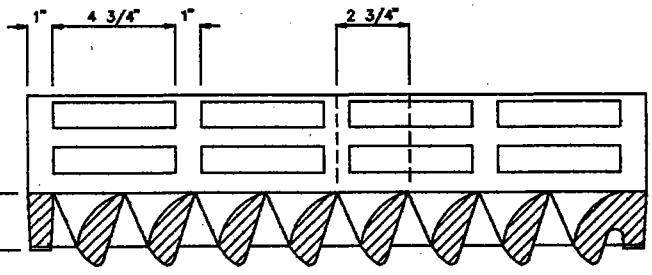
PLAN



SECTION A–A

NOTES:

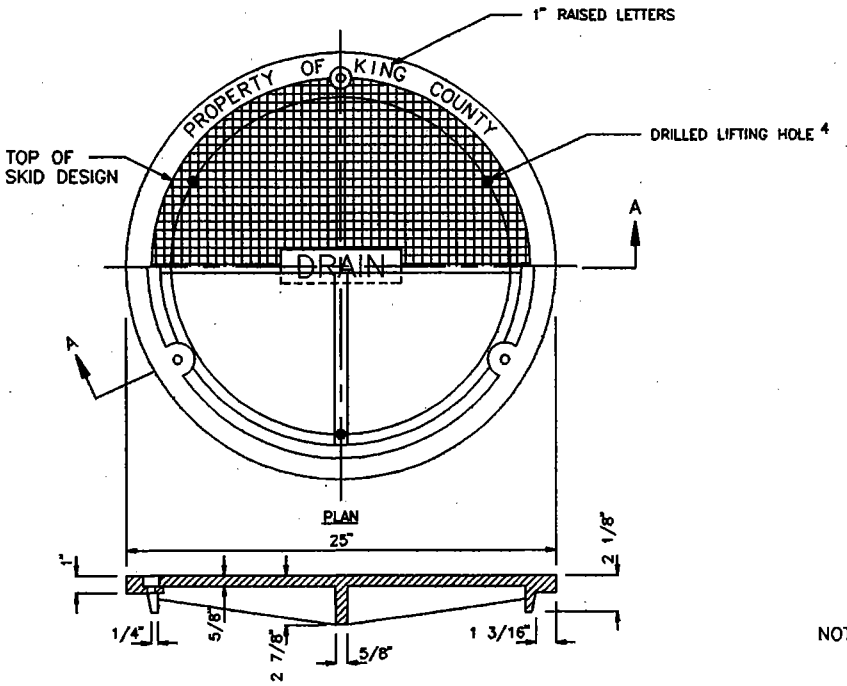
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.



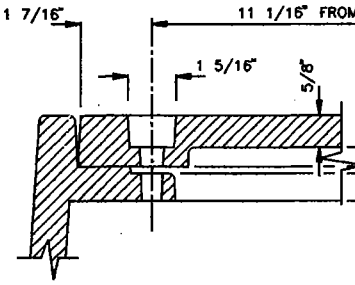
SECTION B–B

DATE	REVISION	BY	APPR'D

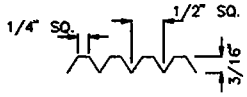
C WORKS NGTON	ROLLED CURB VANED GRATE	DWG. NO. 2–021



SECTION A–A



BOLT–DOWN DETAIL



COVER SKID DESIGN DE

NOTES:

1. USE WITH THREE LOCKING BOLTS 5/8"–11 NC STEEL SOCKET HEAD (ALLEN HEAD) CAP SCRE 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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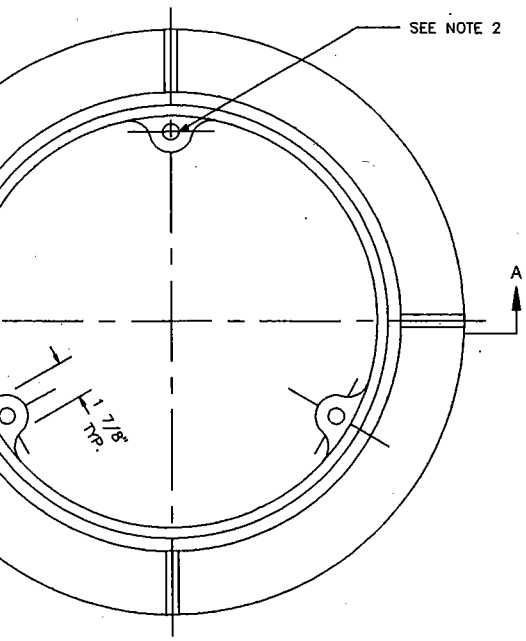
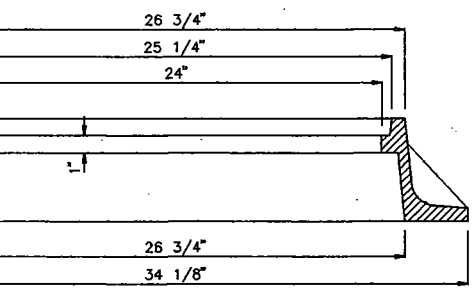
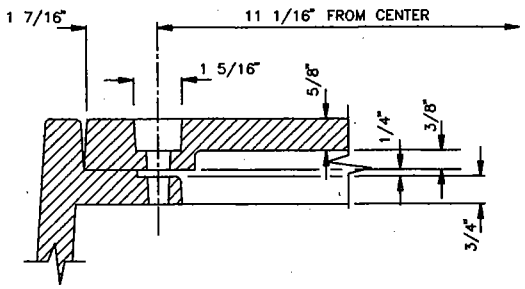
LOCKING MANHOLE COVER



PLAN



SECTION A–A



BOLT–DOWN DETAIL

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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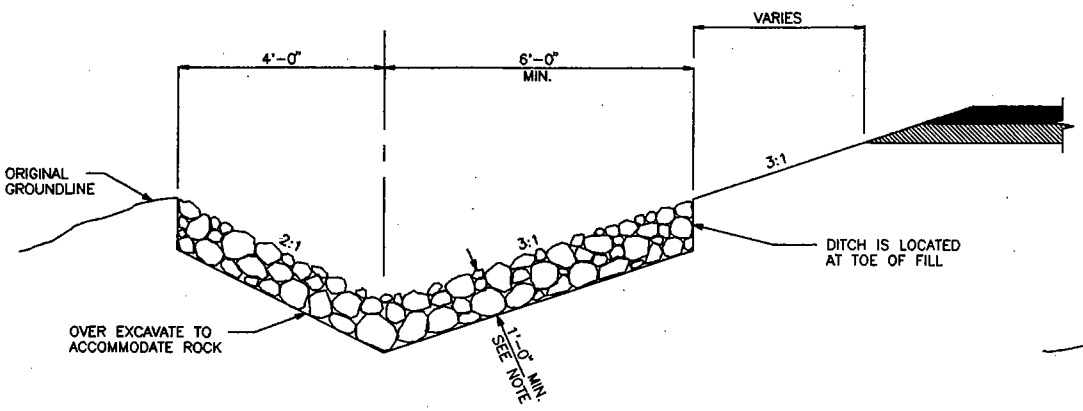
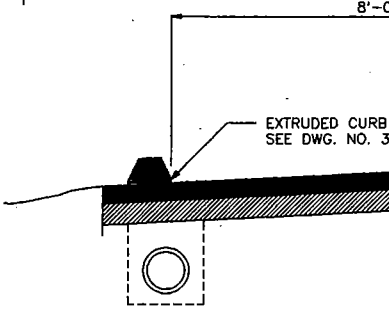
WORKS NGTON	LOCKING MANHOLE FRAME	DWG. NO. 2–023



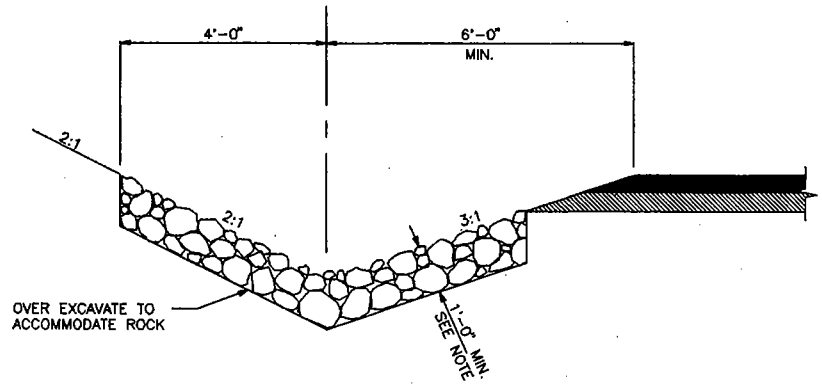
ROCK-LINED SHOULDER DITCH
IN FILL SECTION



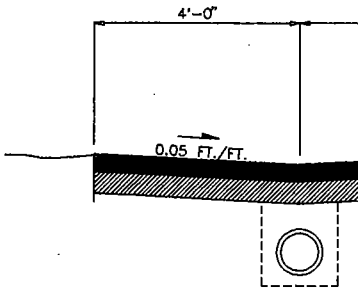
CURBED SHO

NOTES:

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



ROCK-LINED SHOULDER DITCH
IN CUT SECTION



TURNPIKE SHO

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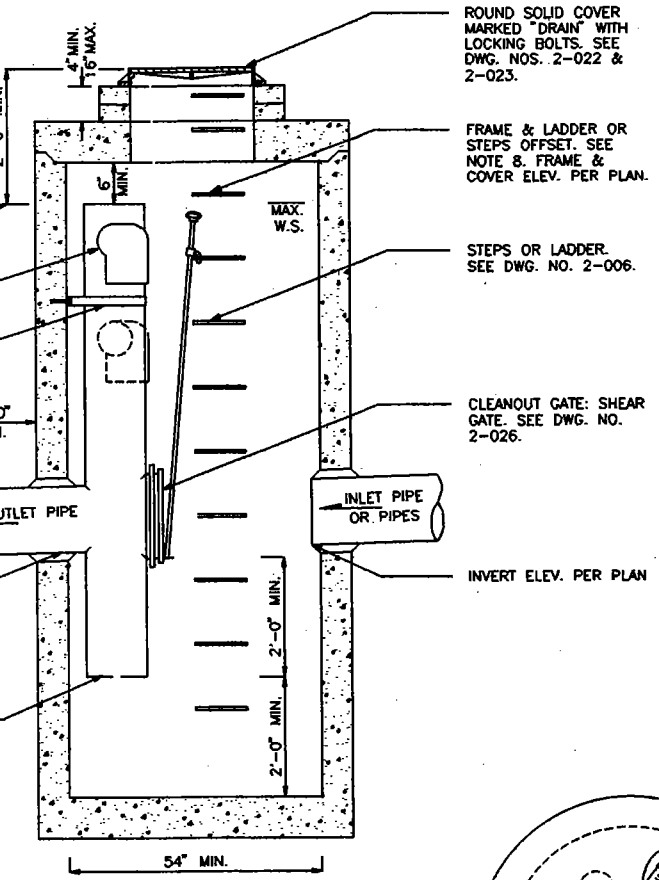
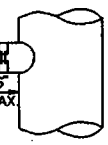
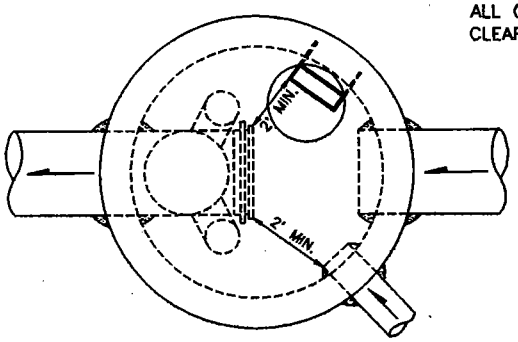
ROCK-LINED SHOULDER DITCHES & CURE
OR TURNPIKE SHOULDERS



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 FABRICTED 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 RESTICTOR/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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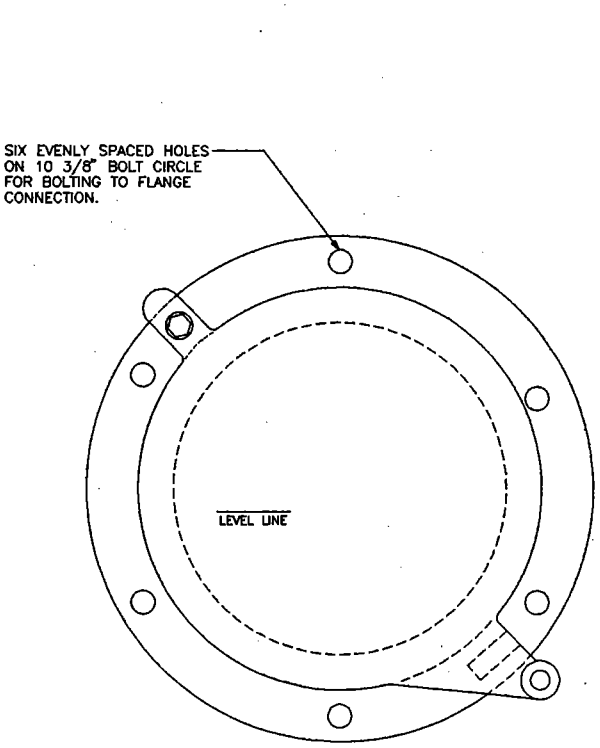
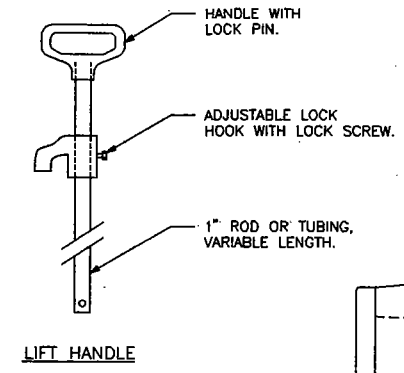
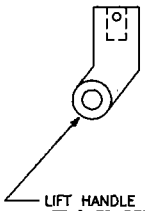
E WORKS NGTON	FLOW RESTRICTOR / OIL POLLUTION CONTROL DEVICE, TEE TYPE (FROP-T)	DWG. NO. 2-025

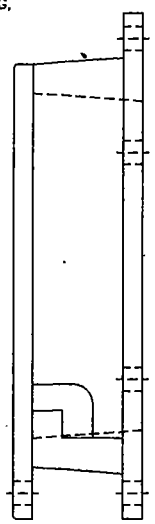


FRONT

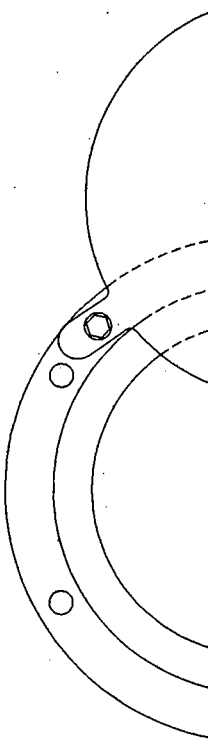


LIFT HANDLE





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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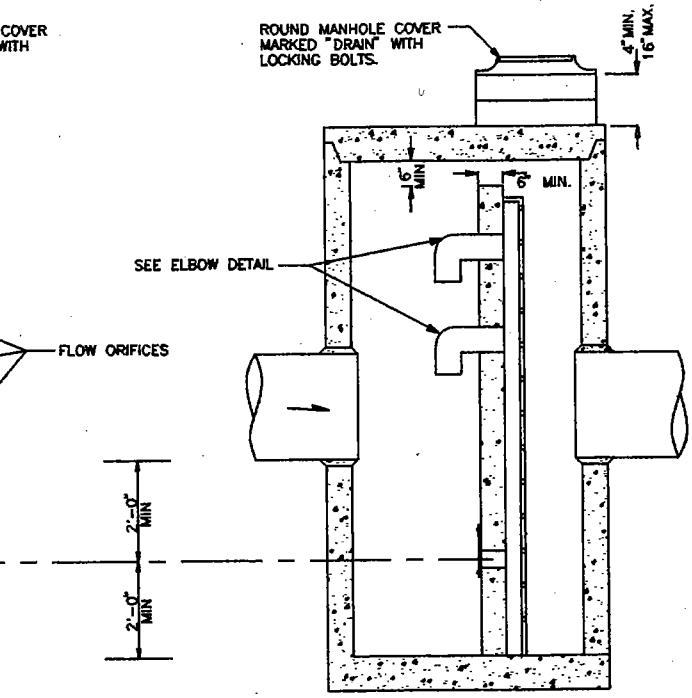
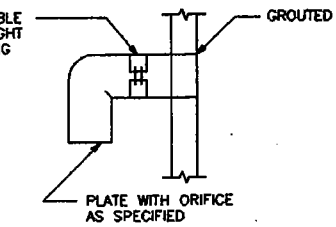
FROP-T SHEAR GATE DETAIL



SECTION B–B

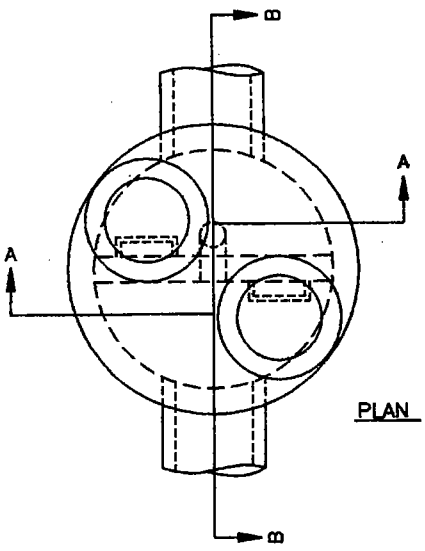
ELEVATION



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.



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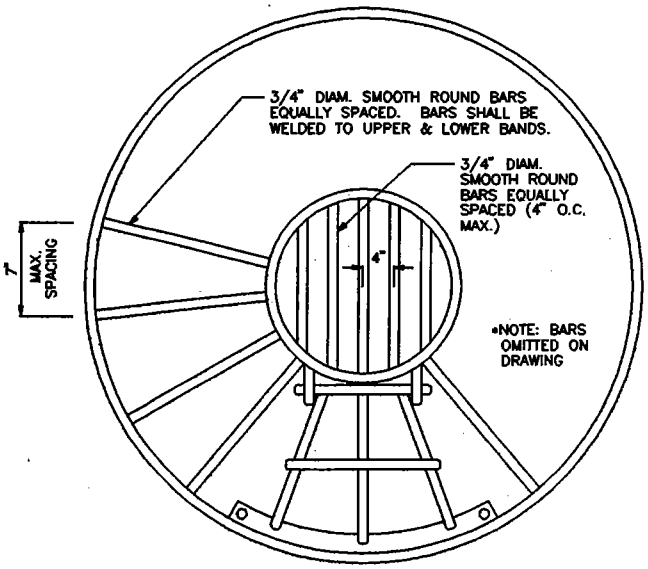
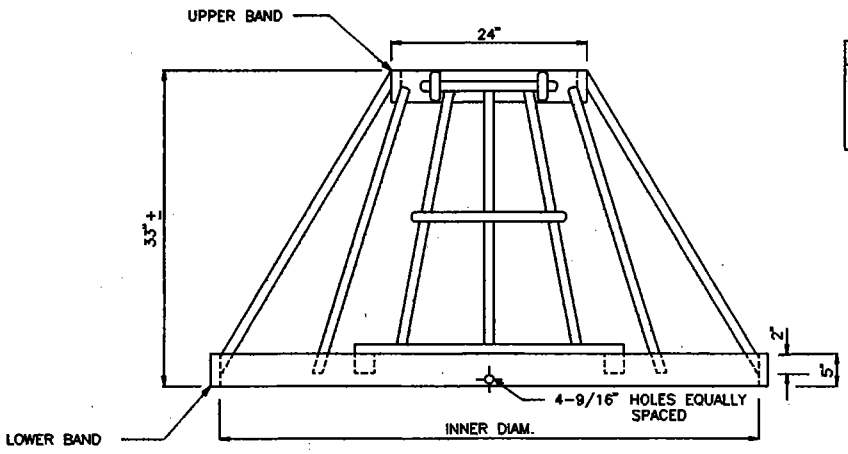
FLOW RESTRICTOR / OIL POLLUTION CONTROL DEVICE, BAFFLE TYPE (FROP-B)

DWG. NO. 2-027

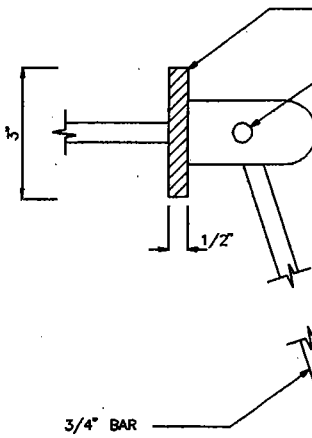


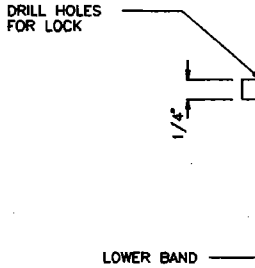
PLAN



ELEVATION

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





ENTRY G

NOTES:

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

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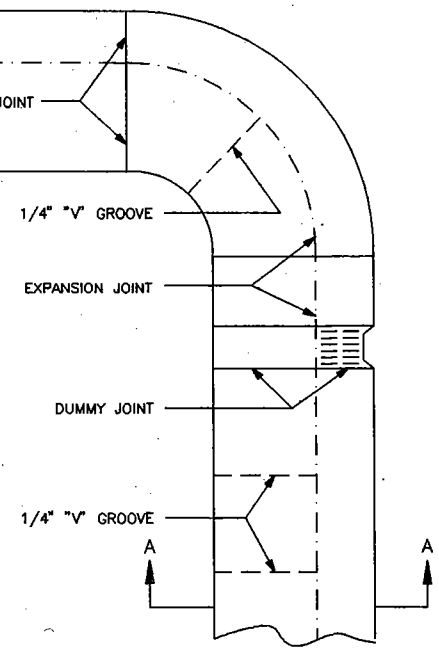
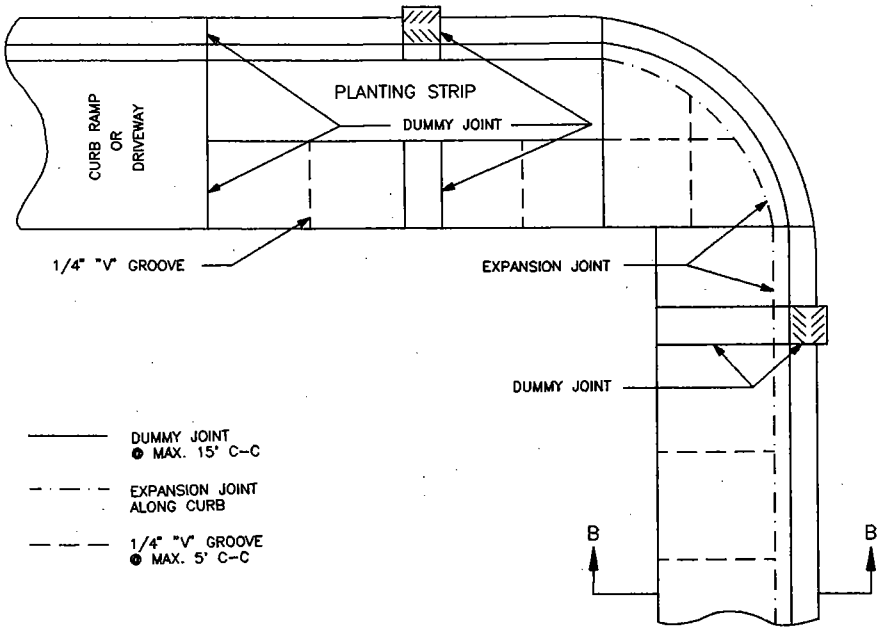
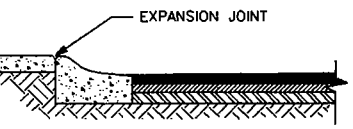
DEBRIS CAGE



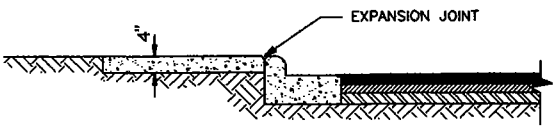
URB & SIDEWALK



VERTICAL CURB & SIDEWALK



ECTION A–A



SECTION B–B

NT REQUIREMENTS.

NSTUCTION, 1/4" EDGED GROOVE MAY
NT AT INTERFACE BETWEEN CURB AND

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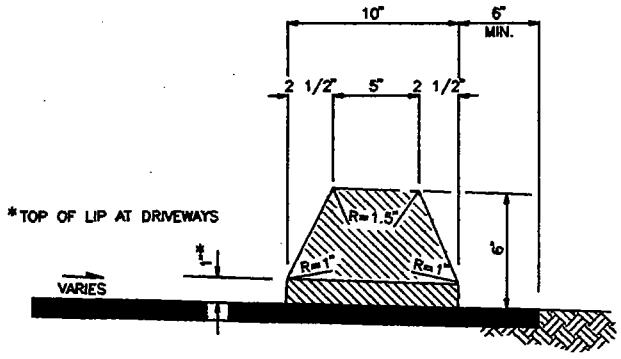
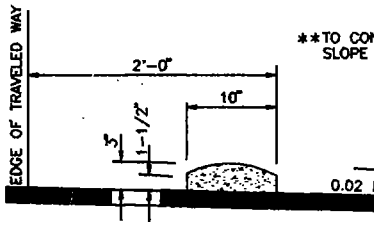
WORKS
GTON

CURB & SIDEWALK JOINTS

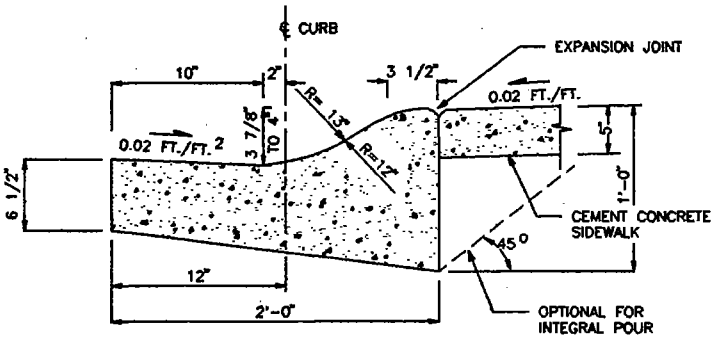
DWG. NO. 3-001



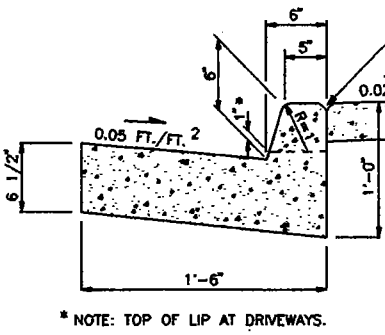
EXTRUDED ASPHALT OR CEMENT
CONCRETE CURB [3,5]



MOUNTABLE CEMENT CONCRE



CEMENT CONCRETE ROLLED CURB



CEMENT CONCRETE CURB & GUT

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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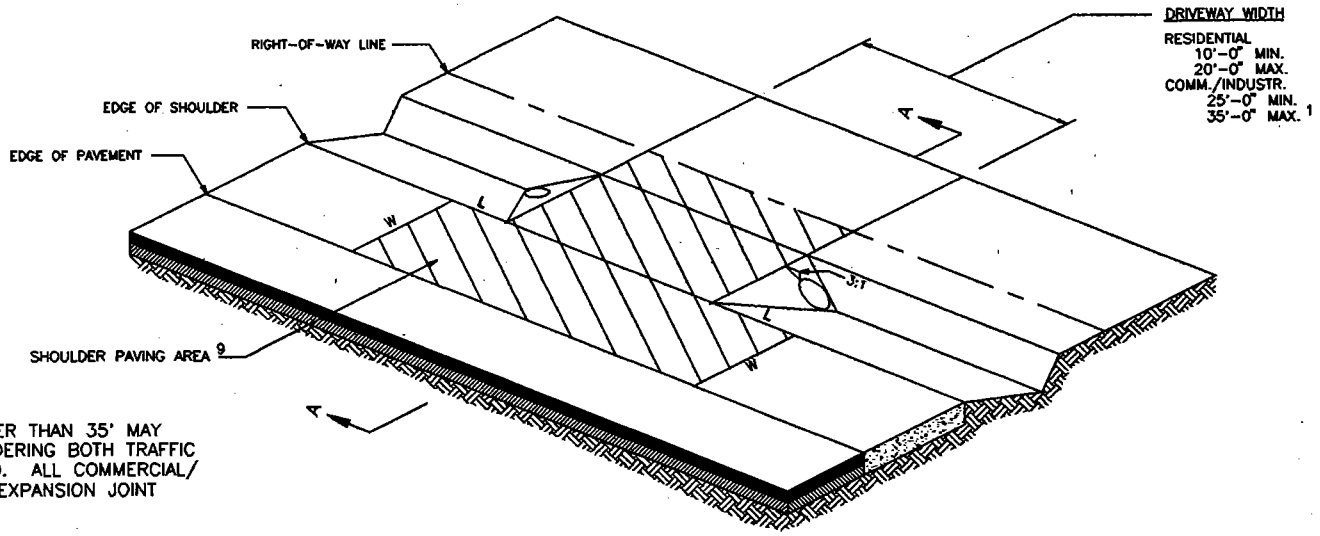
CURB DETAILS



AYS WIDER THAN 35' MAY
CONSIDERING BOTH TRAFFIC
SERVED. ALL COMMERCIAL/
AVE AN EXPANSION JOINT
3.04.

D STORM WATER RUNOFF, AND

EXISTING PIPES WITHIN 500'

BEVELED TO MATCH THE
MORE THAN 2" BEYOND SLOPE
LLS ARE NOT ACCEPTABLE.

N. COVER OF 6" TO
ES OF PIPE SHALL HAVE

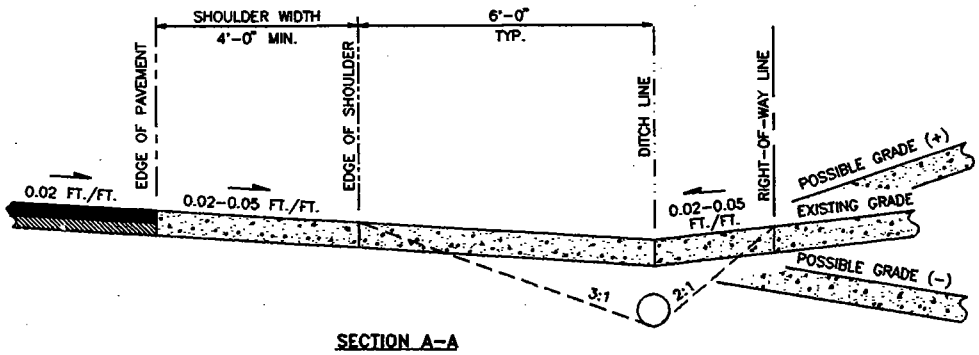
STRAIGHT UNIFORM ALIGNMENT
PER 100 FT.) WITH THE
THE UPSTREAM END.

IDE DITCH DOES NOT EXIST
NATURAL FLOW.

TO BACK EDGE OF SHOULDER,
E OF SHOULDER SHALL NOT
RIVEWAY CONSTRUCTION.

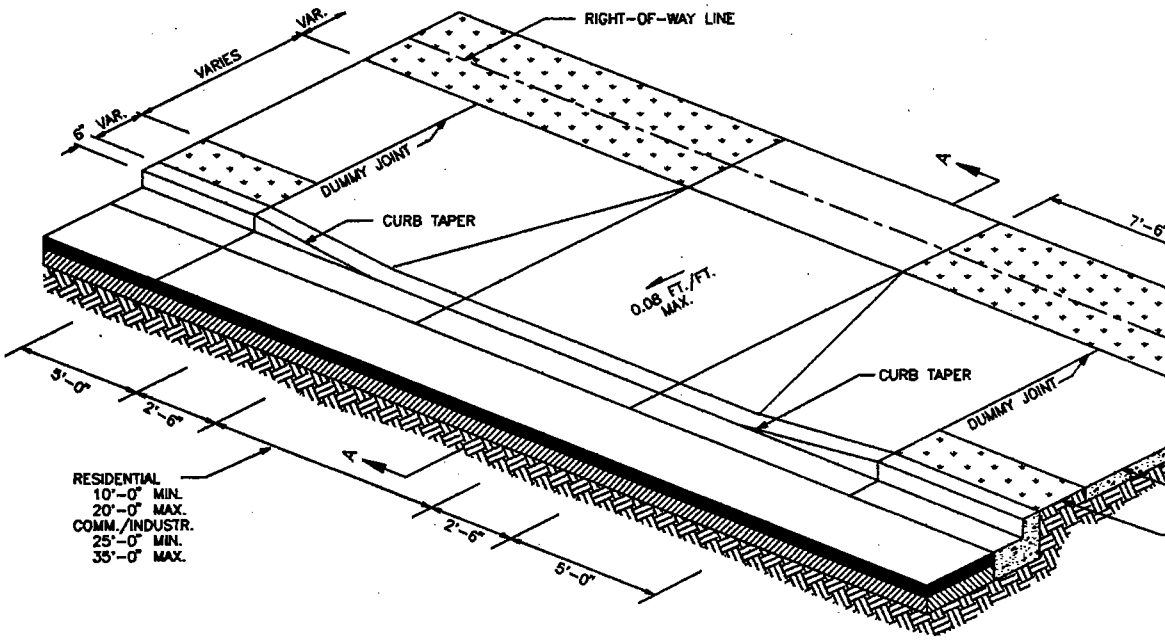
VED THROUGH RIGHT-OF-WAY
P.C.C.

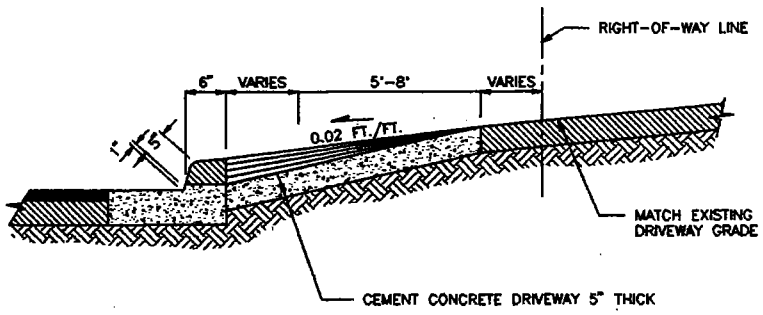
AVED BETWEEN THE EDGE OF
OR B.S.T. ONLY WITH DIMENSIONS L=W.



SECTION A-A

ORKS GTON	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 REQ

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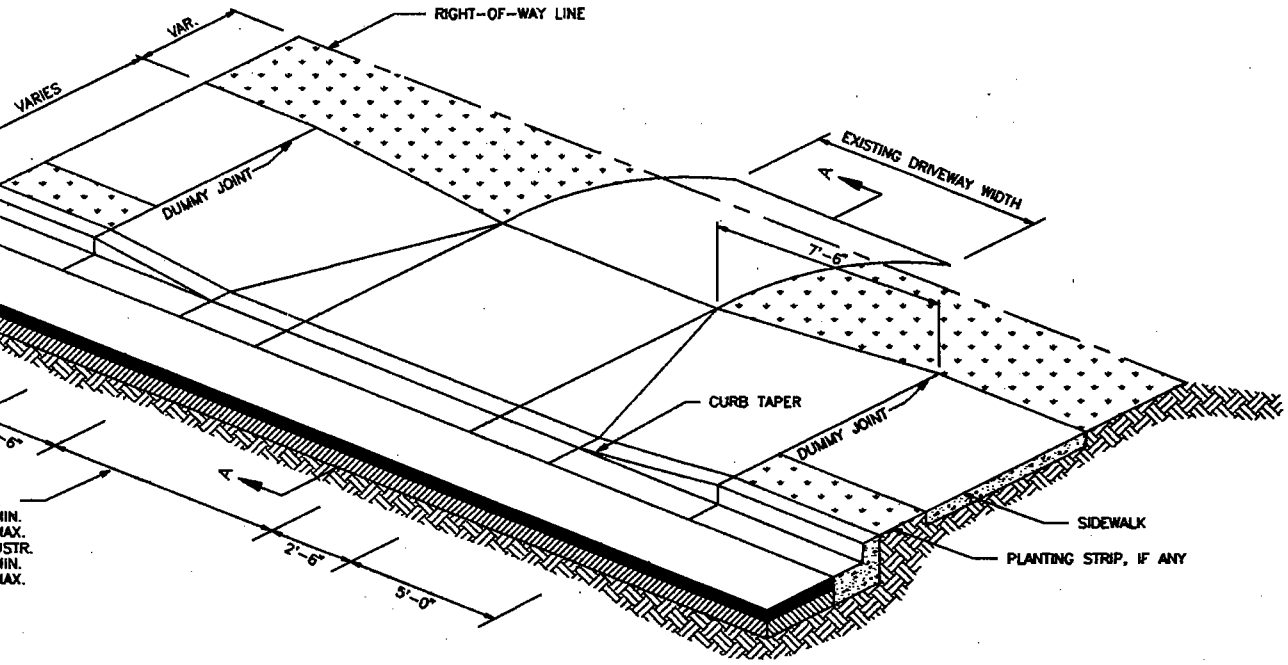
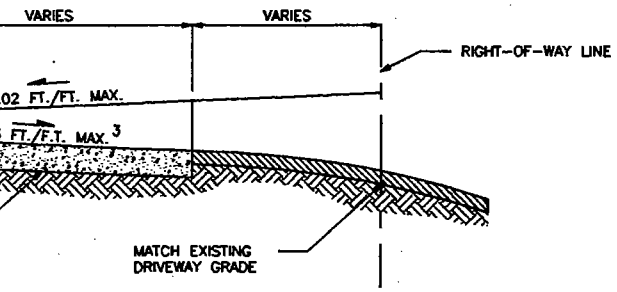
CURB & GUTTER SECTION DRIVEWAY





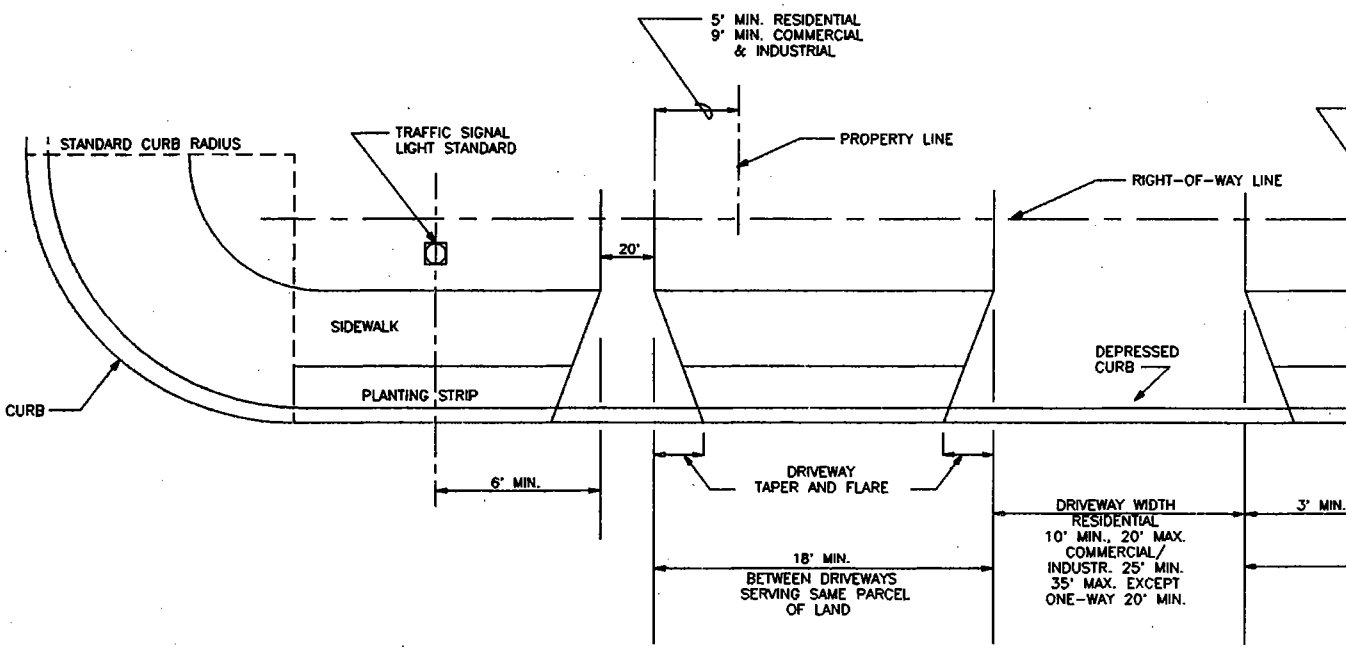
SECTION A–A

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.

DATE	REVISION	BY	APPR'D

WORKS GTON	REVERSE SLOPE DRIVEWAY	DWG. NO. 3-005



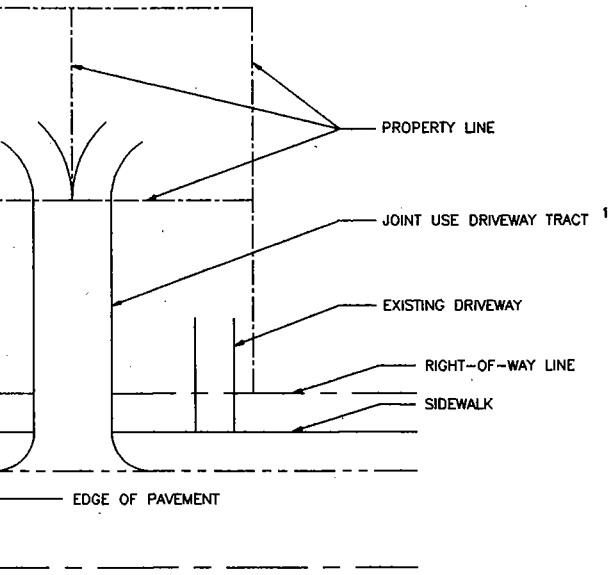
NOTES:

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.

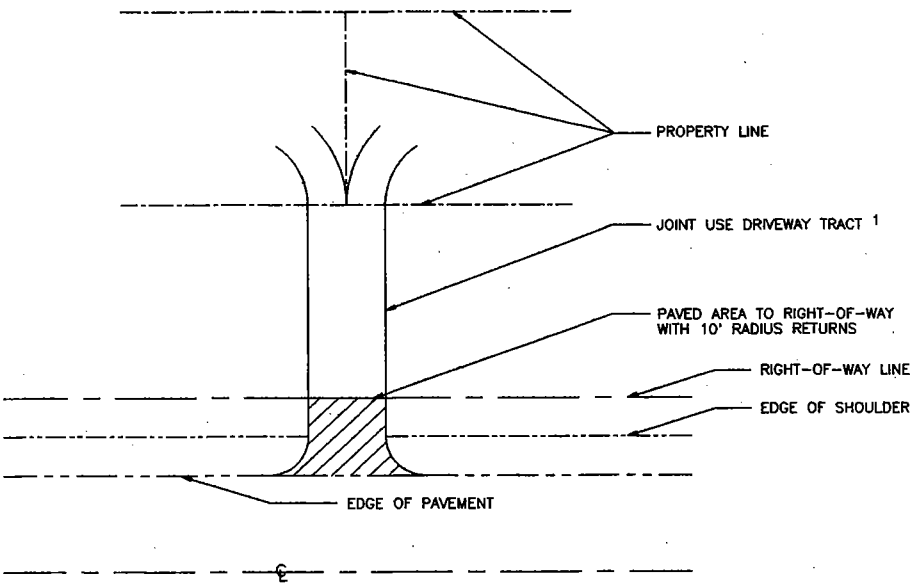
DATE	REVISION	BY

KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

LOCATION & WIDTH OF NEW DRIVEWAY



URBAN

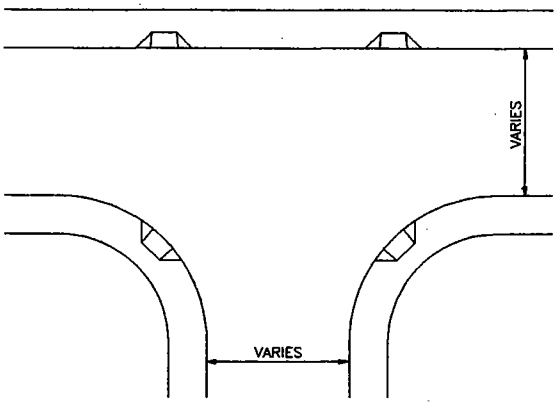


RURAL

RACT WIDTH AND PAVING REQUIREMENTS.

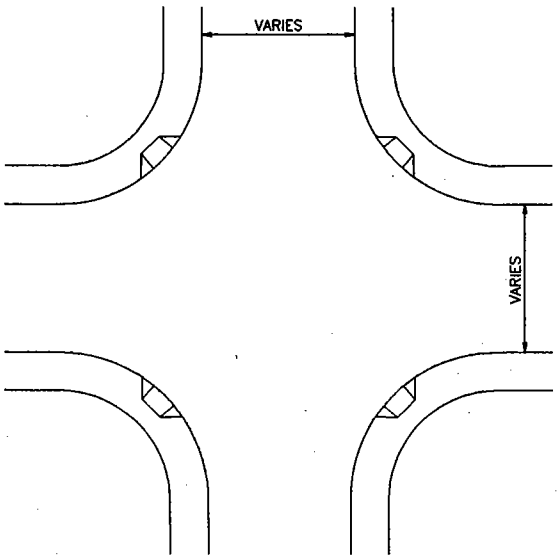
DATE	REVISION	BY	APPR'D

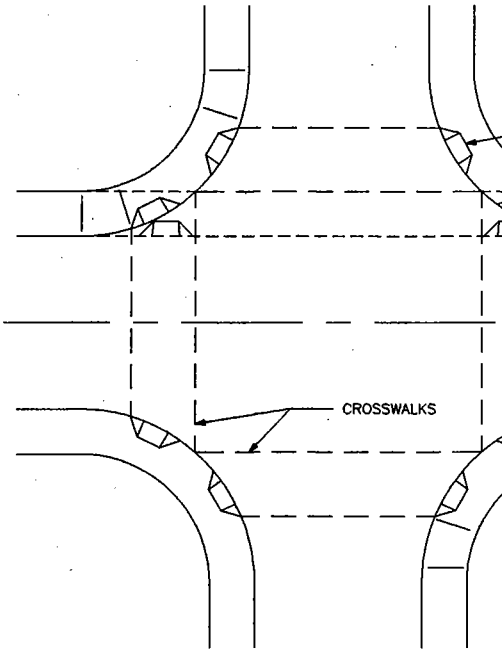
WORKS GTON	JOINT USE DRIVEWAY TRACT	DWG. NO. 3-007



RAMP LOCATIONS

ON RESIDENTIAL ACCESS STREETS





RAMP LOCATIONS

ON ARTERIALS AND COMMERCIAL ACCESS STREETS

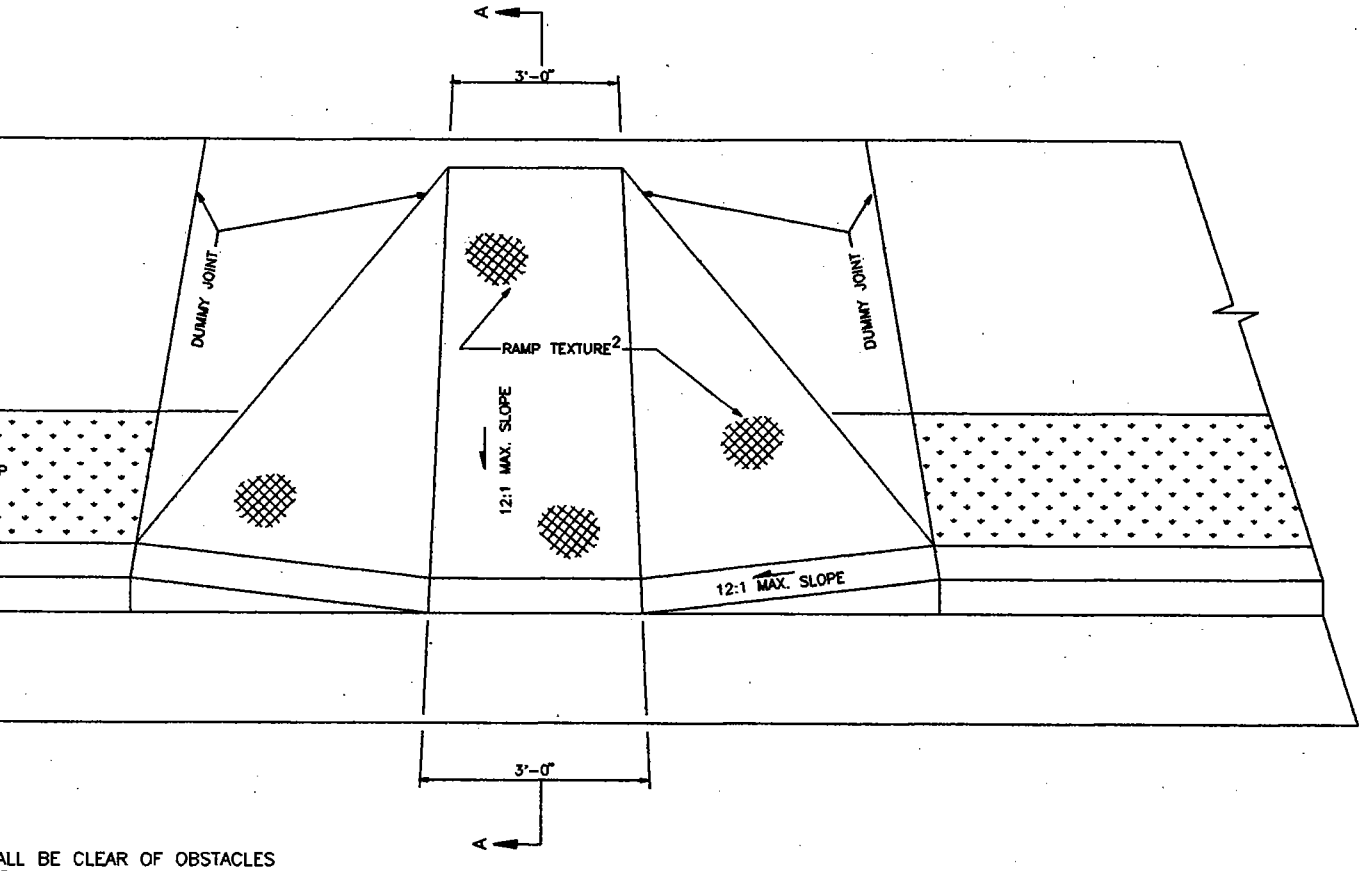
NOTES:

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. NO. 4-003.
4. CROSSWALKS ARE NOT ALWAYS MARKED.
5. WHEN RAMPS ARE CONSTRUCTED ON ONE SIDE OF SHALL BE CONSTRUCTED AT CORRESPONDING LOCA OPPOSITE SIDE OF STREET.

DATE	REVISION	BY

KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

CURB RAMP LOCATIONS



ALL BE CLEAR OF OBSTACLES
D INLETS.

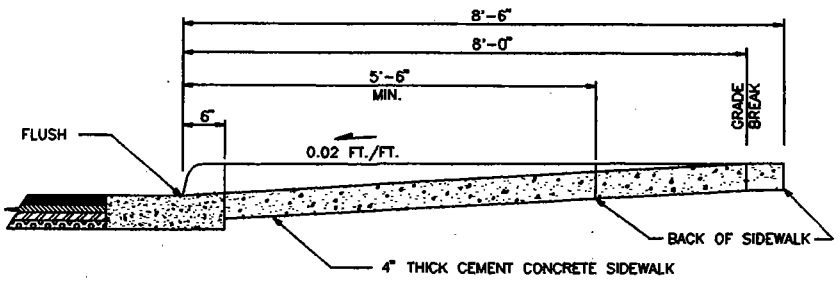
BY IMPRINT OF METAL GRID

BE PERPENDICULAR TO OR
UNLESS OTHERWISE APPROVED

CTED ON ONE SIDE OF THE
CONSTRUCTED AT CORRESPONDING
PPOSITE SIDE OF STREET.

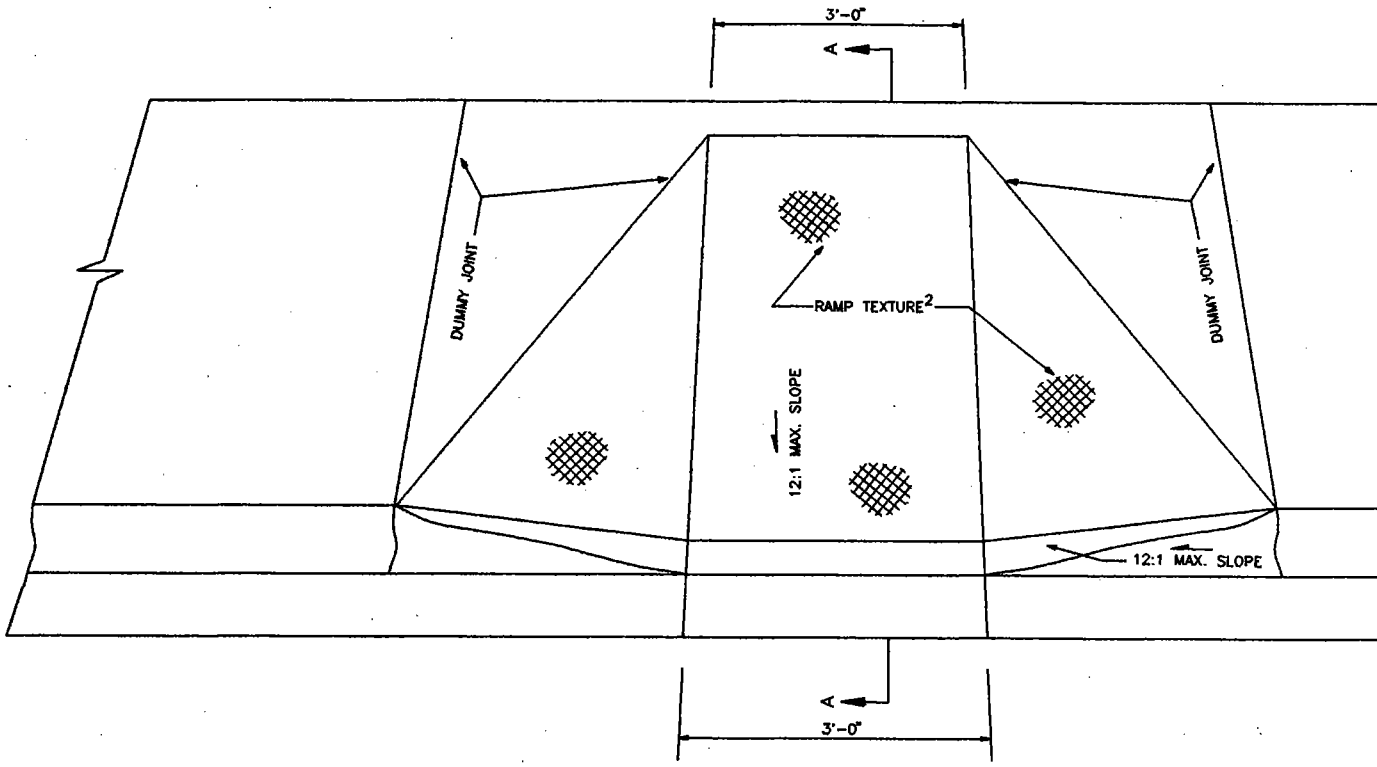
ENERAL CASE, CURB RAMPS
O PER RADIUS, IN OR
HE MAIN PEDESTRIAN PATHS.

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



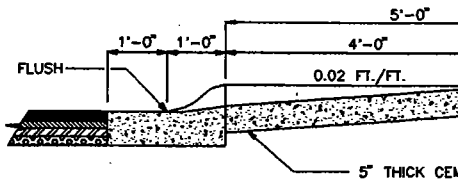
SECTION A-A

ORKS TON	CURB RAMPS IN VERTICAL CURB	DWG. NO. 4-002



NOTES:

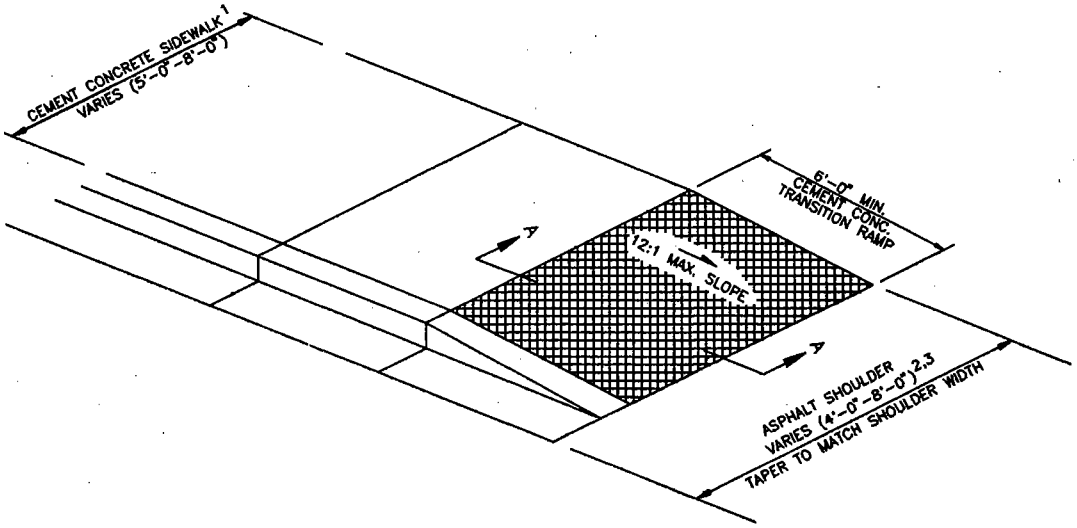
1. RAMP AND APPROACHES SHALL BE CLEAR OF OBSTACLES INCL. HYDRANTS, POLES, AND INLETS.
2. RAMP SHALL BE TEXTURED BY IMPRINT OF METAL GRID WITH 1/2" SPACING.
3. RAMP CENTER LINE SHALL BE PERPENDICULAR TO OR RADIAL TO CURB RETURNS UNLESS OTHERWISE APPROVED BY ENGINEER.
4. WHEN RAMPS ARE CONSTRUCTED ON ONE 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.

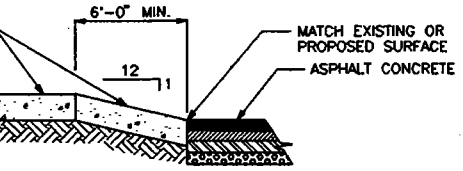


SECTION A-A

KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

CURB RAMPS IN ROLLED CURB



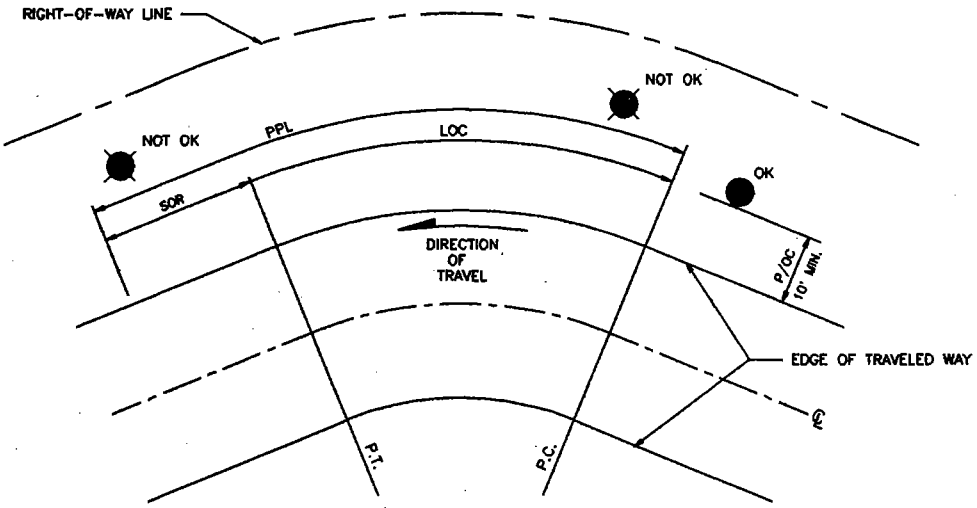


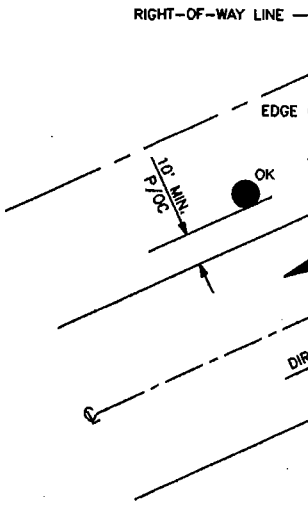
SECTION A-A

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 IGTON	CEMENT CONCRETE SIDEWALK TRANSITION TO ASPHALT SHOULDER	DWG. NO. 4-004





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.

GENE

P/OC: POLE/OB
NEAREST

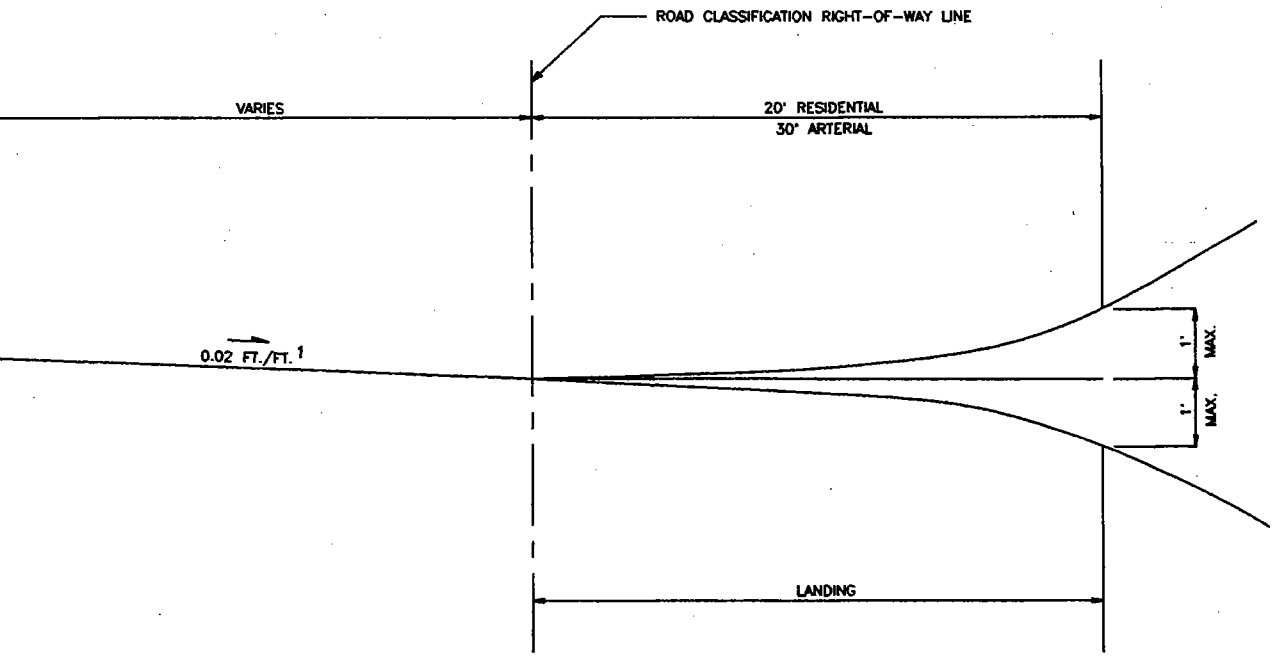
APPLIES: TO ROA
OR MOUNTABLE C
1. TANGENT,
2. INSIDE OF
3. OUTSIDE O
-POSTED
-RADIUS
MEETING

NOTES:

1. 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.
2. 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.
3. SEE SECS. 5.11 & 8.02G.

KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

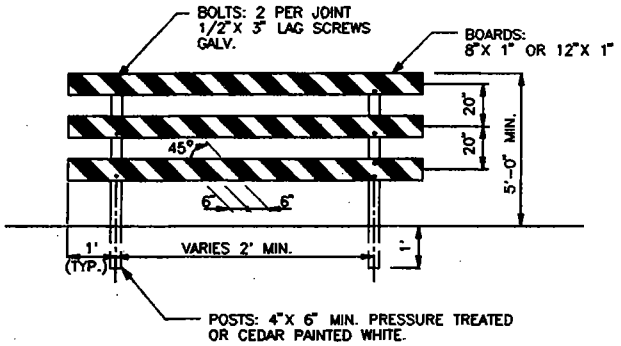
CLEARANCE OF ROADSIDE OBSTACLES ON SHOULDER TYPE ROAD



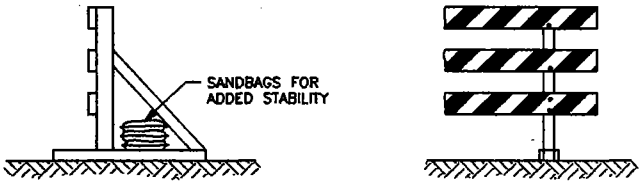
3 OR 2.04 FOR SUPERELEVATION REQUIREMENTS.

ANDING REQUIREMENTS.

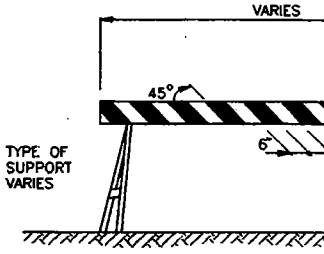
ORKS TON	INTERSECTION LANDING	DWG. NO. 5-002



FIXED (PERMANENT)
TYPE III BARRICADE



MOVABLE (TEMPORARY)
TYPE III BARRICADE



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.

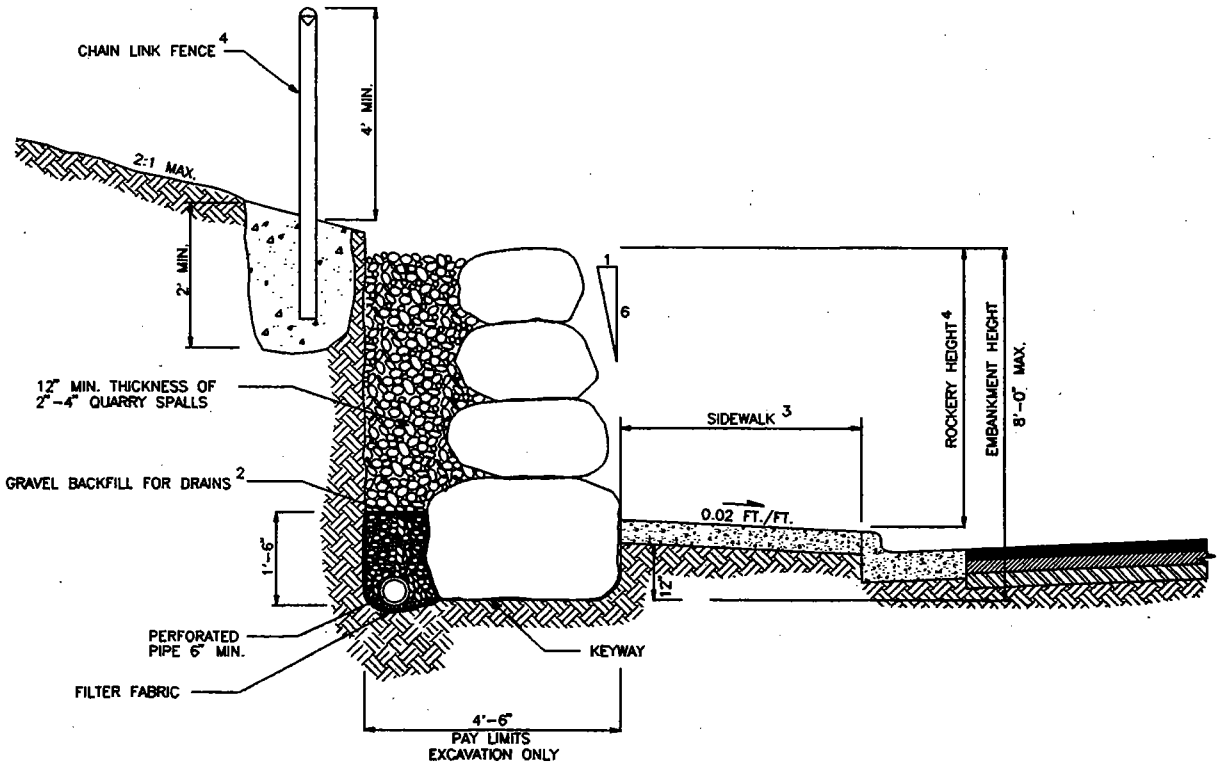
SEE SEC. 5.07 AND MUTCD SEC.6C-8.

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

NOTE:
FOR DIMENSIONS NOT
SHOWN, SEE TABLE.

KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

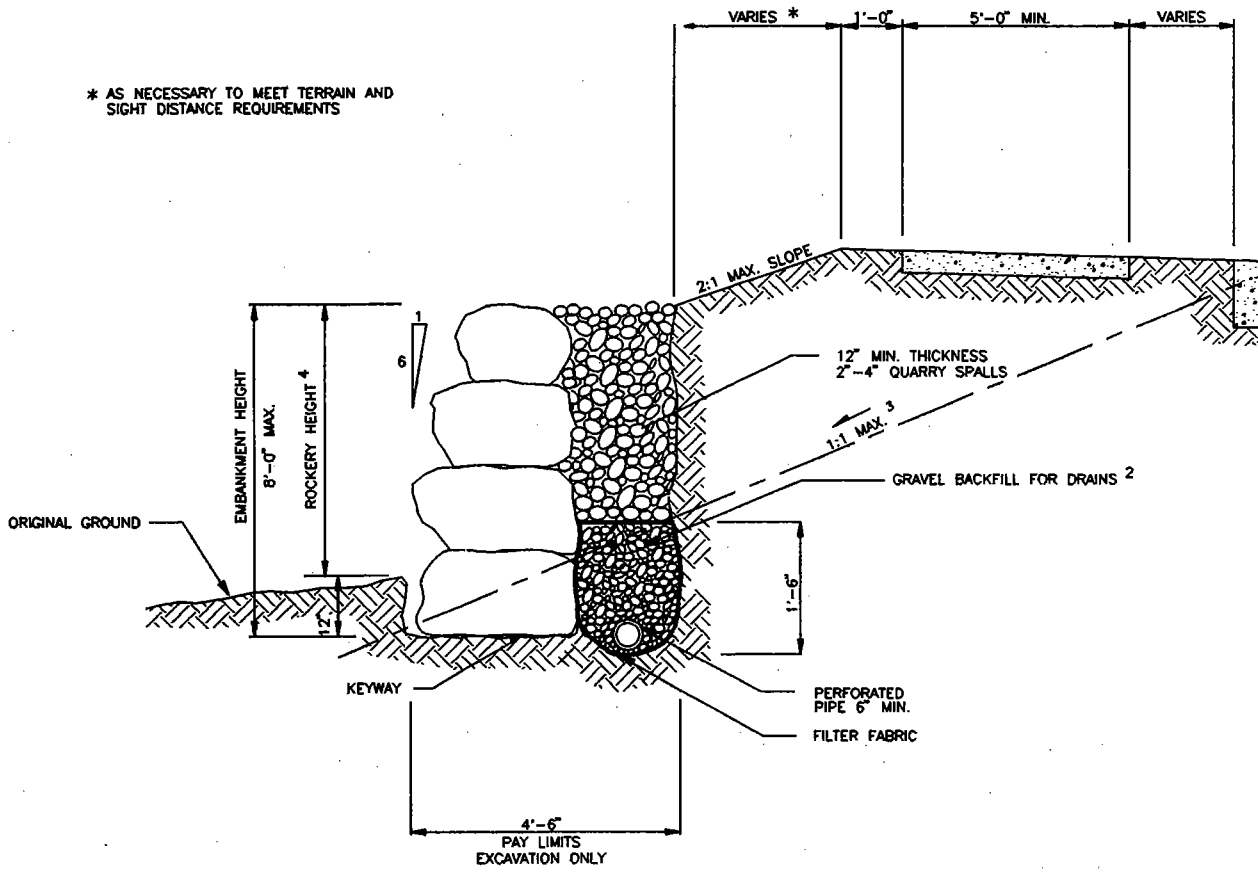
BARRICADES



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

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

ORKS TON	ROCK FACING, CUT SECTION	DWG. NO. 5-004



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.

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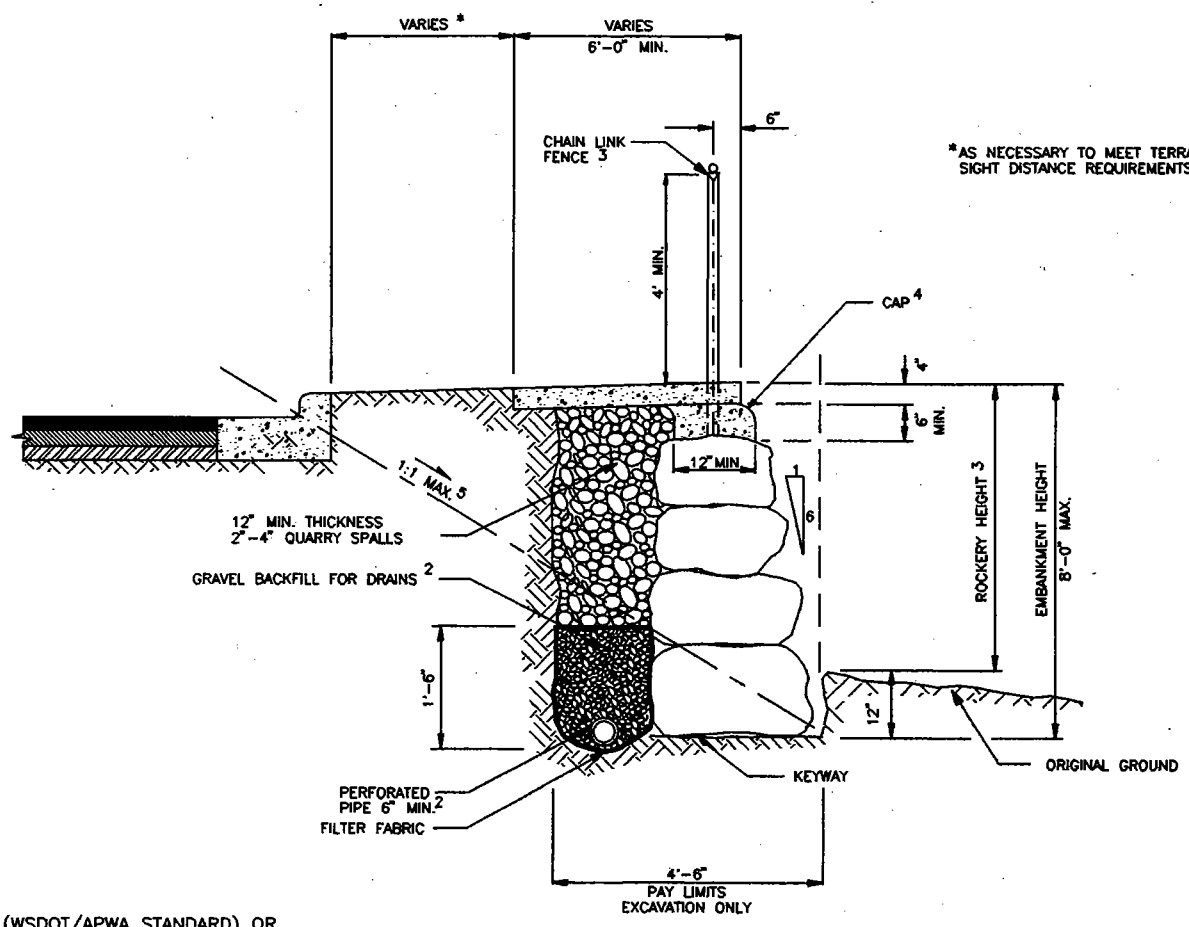
KING COUNTY, WASHINGTON

ROCK FACING, FILL SECTION



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

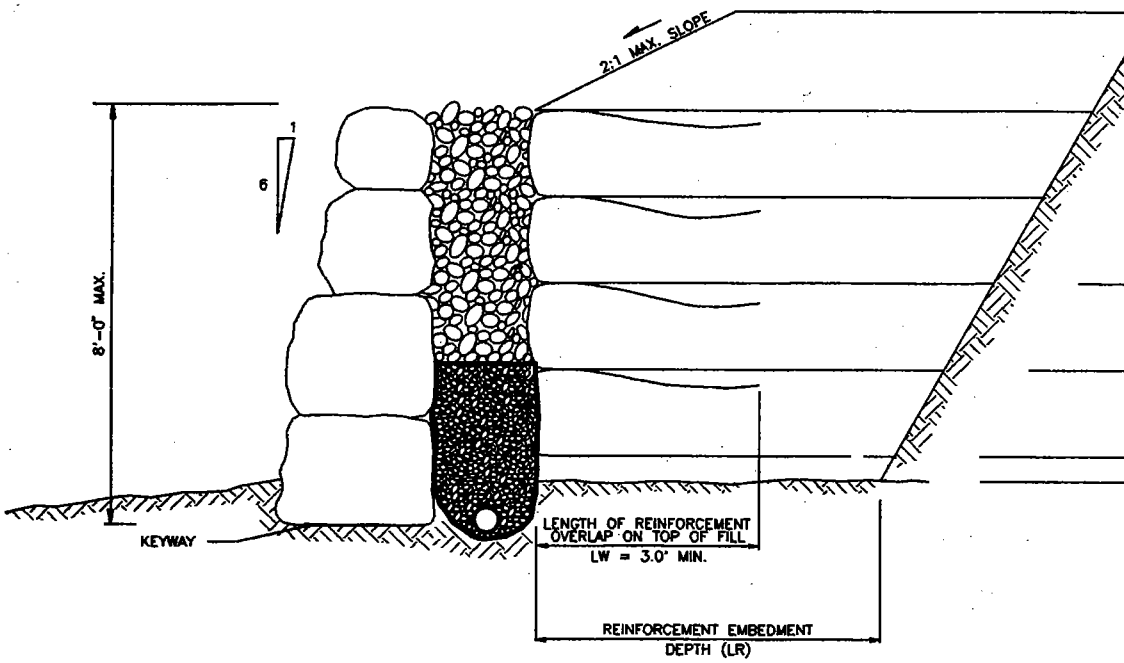
ASS 3000.

IRED IN LESS STABLE SOILS.

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

EQUIRED ON ROADS WITH SPEED
ER, WHERE HEIGHTS EXCEED 6'.
OT DESIGN MANUAL.

ORKS STON	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.

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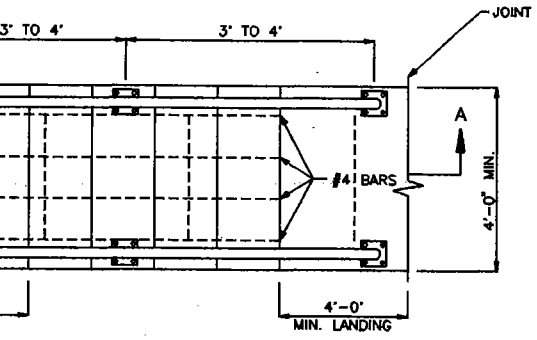
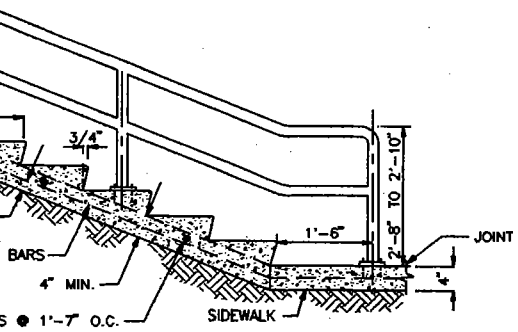
ROCK FACING, FILL SECTION REINFORCEM



CONCRETE STEPS
PLAN



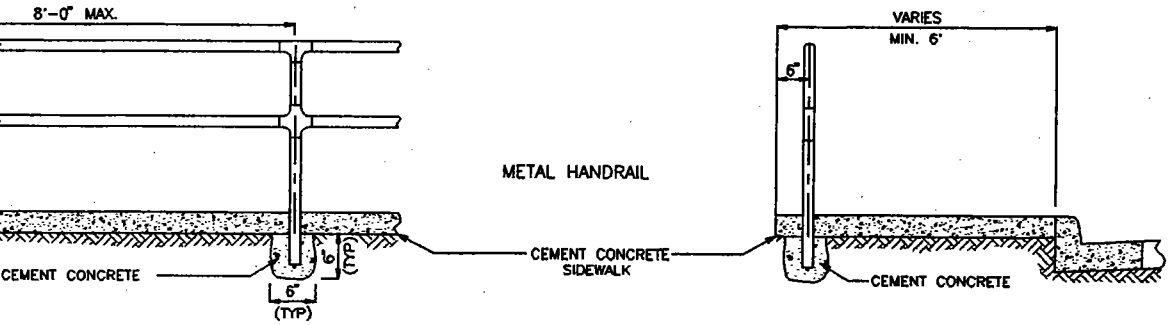
CONCRETE STEPS
SECTION A–A

NOTES FOR CONCRETE STEPS:

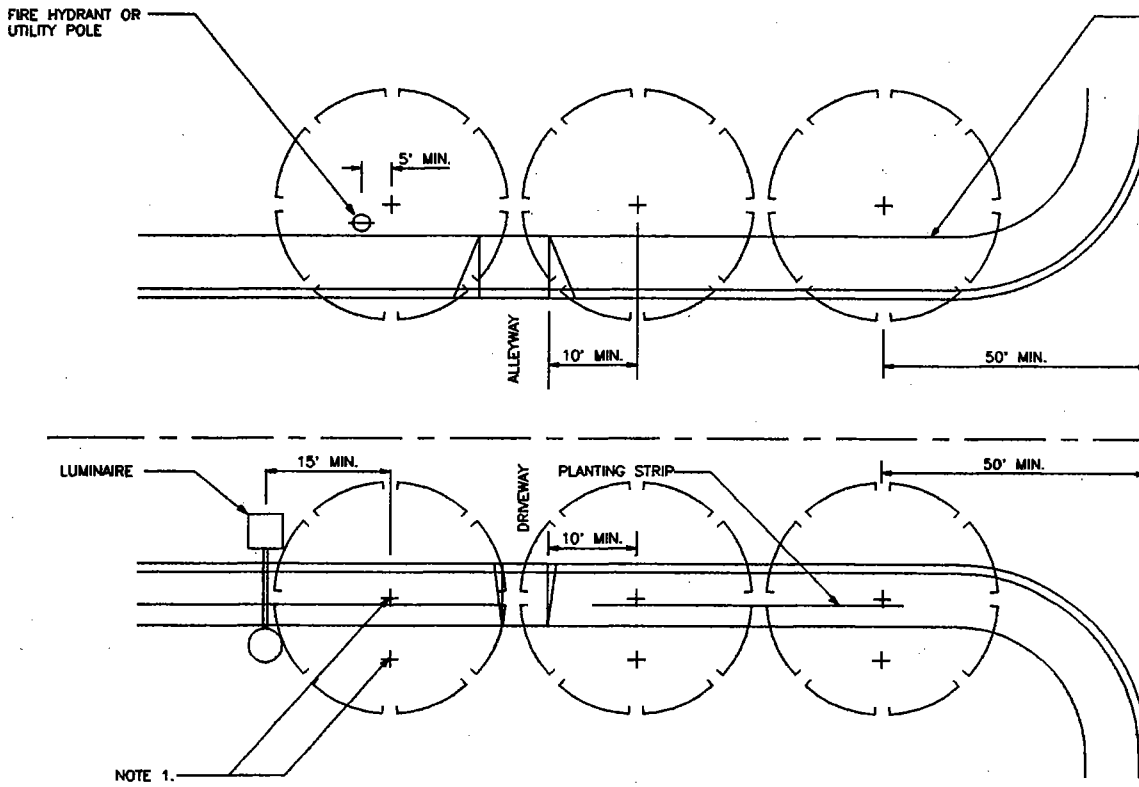
1. CONCRETE: CEMENT CONCRETE CLASS 3000.
2. ALL STEPS: SAME DIMENSIONS, WITHIN 3/8" MAX. DIFFERENCE.
3. RISERS: 7 1/2" MAX., 5" MIN.
4. TREADS: 12" MAX., 11" MIN., WITH TRANSVERSE 0.01 FT./FT. SLOPE.
5. METAL HANDRAIL REQUIRED FOR 4 STEPS OR MORE. SEE NOTES BELOW.
6. REINFORCING BARS SHALL MEET THE REQUIREMENTS 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.



ORKS TON	CONCRETE STEPS & METAL HANDRAIL	DWG. NO. 5–008



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.

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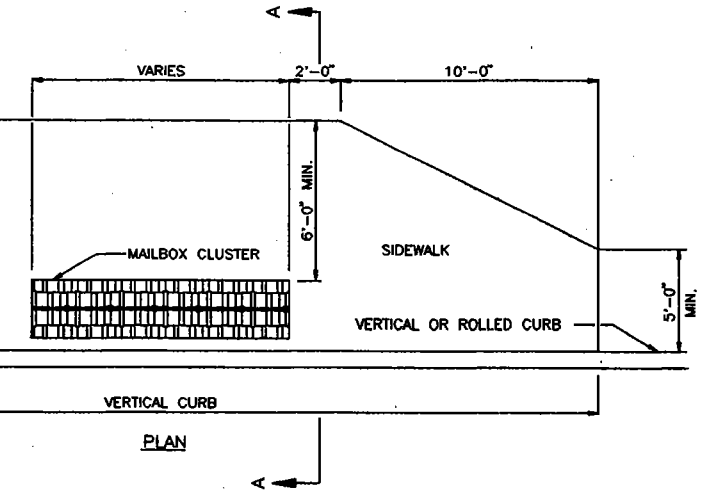
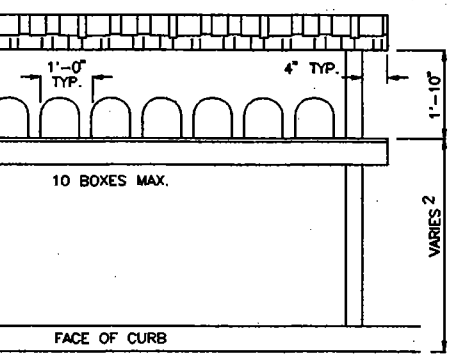
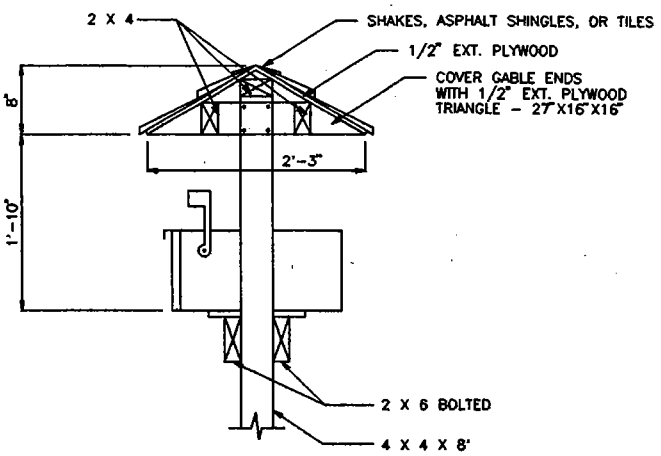
STREET TREE STANDARDS



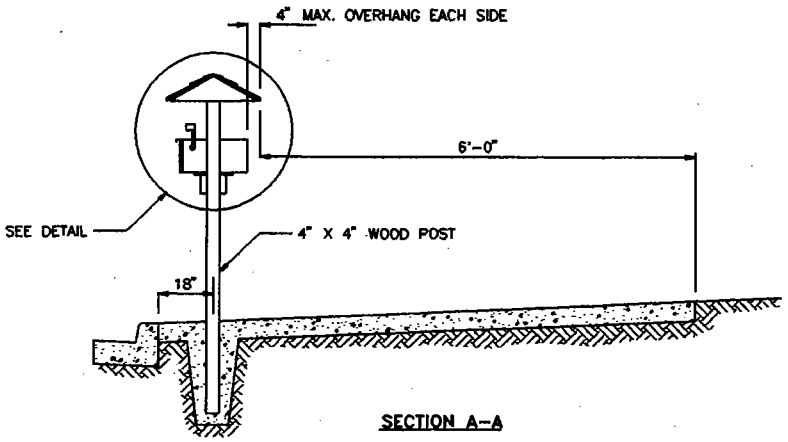
PLAN



ELEVATION



DETAIL



SECTION A-A

XES ON URBAN RESIDENTIAL ACCESS STREETS
5 MPH.

RDING TO THE TYPE OF DELIVERY VEHICLE. THESE
D BY THE POSTMASTER DURING PLAN REVIEW.

STER APPROVED WITH A UNIFORM BOX STYLE AND
CATION.

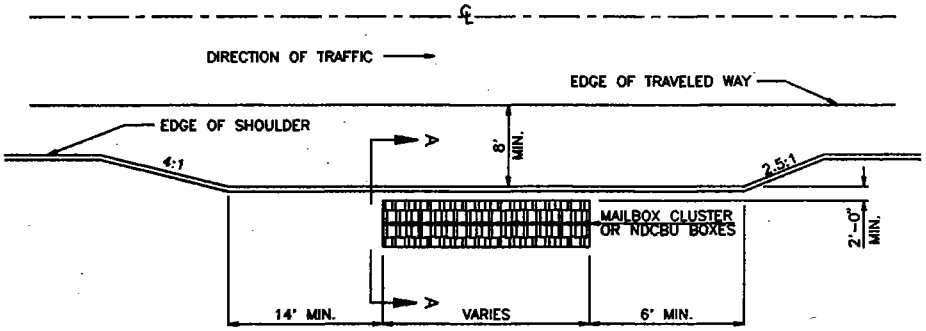
JECT TO APPROVAL OF THE REVIEWING AGENCY.

SURE TREATED FIR OR HEMLOCK.

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

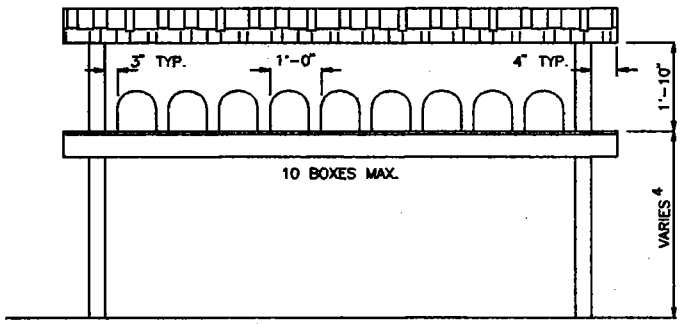
RUCTURES ARE SUBJECT TO APPROVAL OF

ORKS GTON	MAILBOX MOUNTING CURB TYPE LOCATION	DWG. NO. 5-010

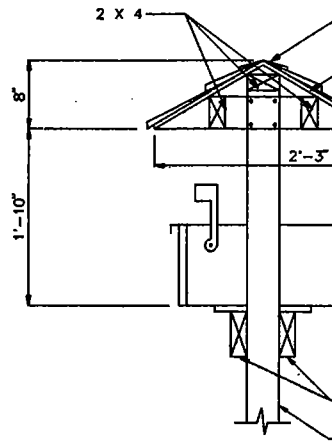


MAILBOX TURNOUT
FOR SHOULDER WIDTHS LESS THAN 8'-0" [3]

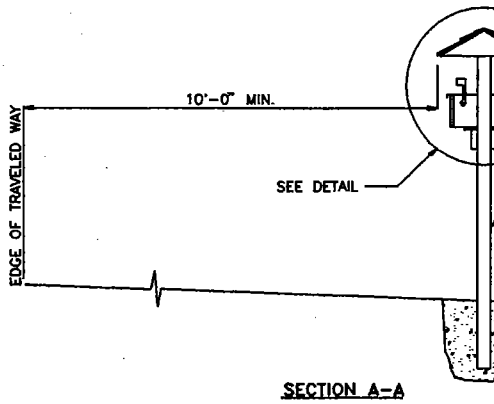
PLAN



ELEVATION



DETAIL



SECTION A-A

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.

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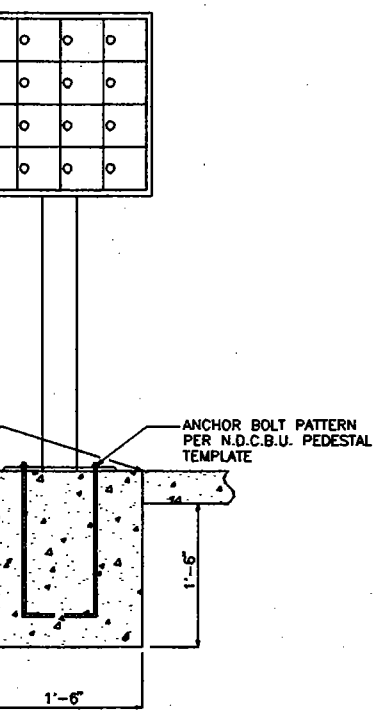
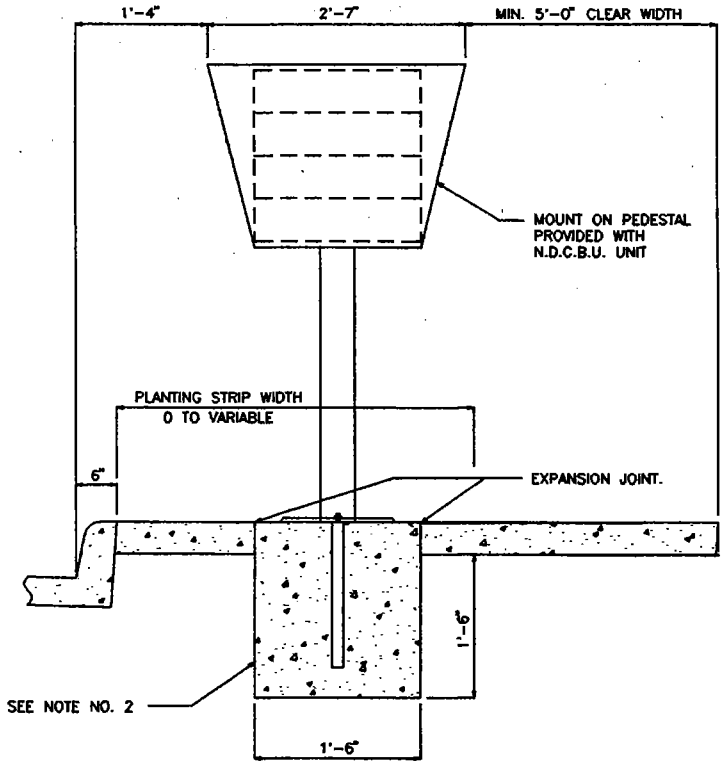
MAILBOX MOUNTING SHOULDER TYPE LOCA



FRONT

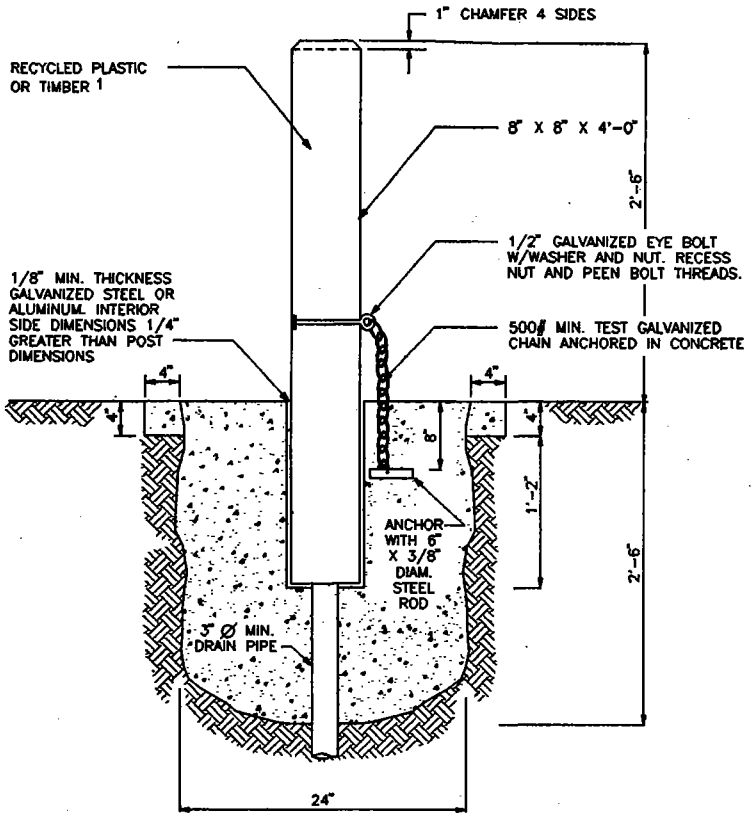


SIDE

(INCLUDING CONSTRUCTION OF
S. POSTAL SERVICE.

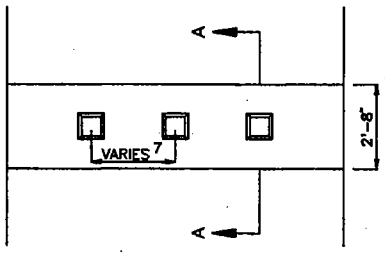
REQUIREMENTS.

ORKS TON	NEIGHBORHOOD DELIVERY & COLLECTION BOX UNIT (N.D.C.B.U.) MAILBOX INSTALLATION	DWG. NO. 5-012



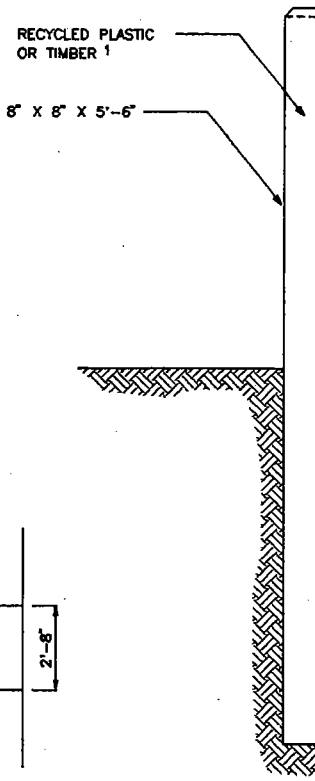
REMOVABLE BOLLARD

SECTION A-A



REMOVABLE BOLLARD

PLAN



F

NOTES:

1. RECYCLED PLASTIC BOLLARD SHALL BE WHITE. TIMBER SHALL BE DOUGLAS FIR, DENSE CONSTRUCTION GRADE, AND SHALL BE PRESSURE TREATED WITH A WATERBORNE PRESERVATIVE (ACA, CCA, ACZA) IN ACCORDANCE WITH THE REQUIREMENTS OF SEC. 9-09.3 (4) OF THE WSDOT/APWA STANDARD SPECIFICATIONS. TOP 5" OF TIMBER SHALL BE PAINTED WHITE.
2. STEEL TUBE SHALL CONFORM TO ASTM A53 GRADE A.
3. NUTS, BOLTS, & WASHERS SHALL CONFORM TO ASTM A307.
4. ALL STEEL PARTS SHALL BE GALVANIZED.
5. CONCRETE SHALL BE CLASS 3000.
6. SEE SEC. 5.08.
7. MIN. 50" SPACING ON TRAILS LESS THAN 10' WIDE. 60" SPACING ON TRAILS 10' OR WIDER.

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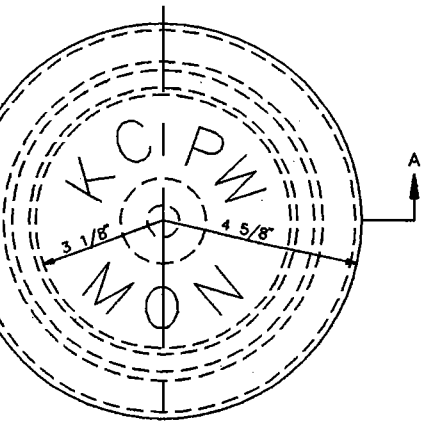
BOLLARDS

NOTES:

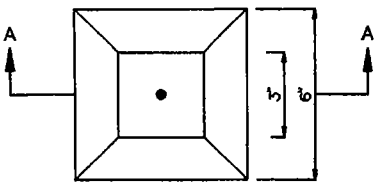
1. CASTINGS SHALL BE GRAY IRON ASTM A48, AASHTO M 105, CLASS 30.
2. COVER AND SEAT SHALL BE MACHINED FOR PERFECT CONTACT AROUND CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.
3. APPROXIMATE WEIGHTS, STANDARD.

CASE	60 LBS
COVER	19 LBS
TOTAL	79 LBS

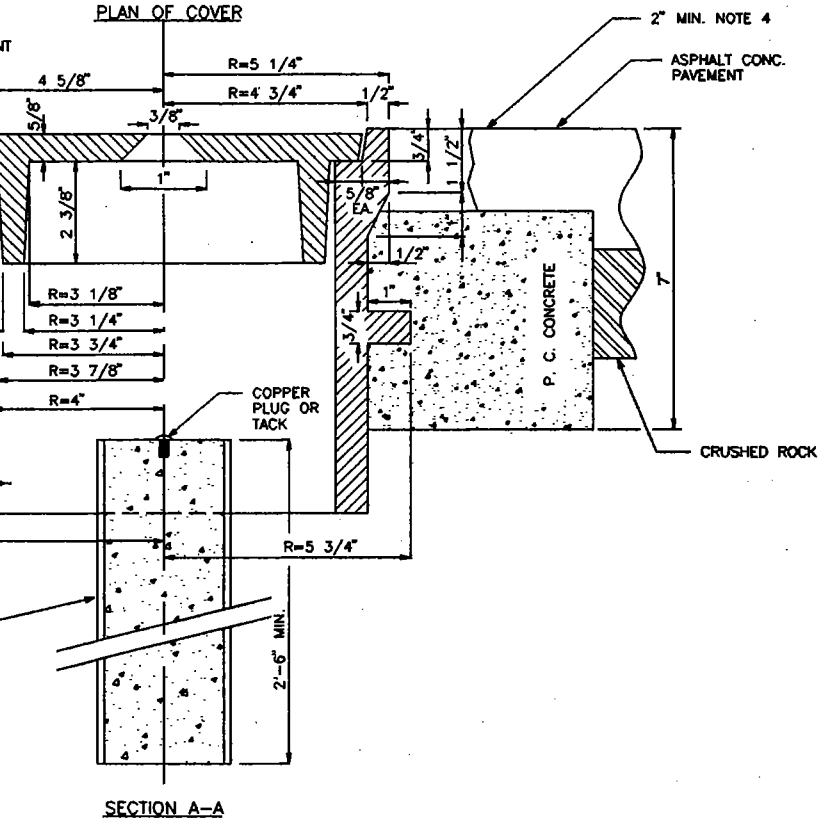
4. PAVEMENT SHALL BE ASPHALT CONCRETE OR APPROVED SUBSTITUTE.
5. CONCRETE SHALL BE CLASS 4000.



PLAN OF COVER

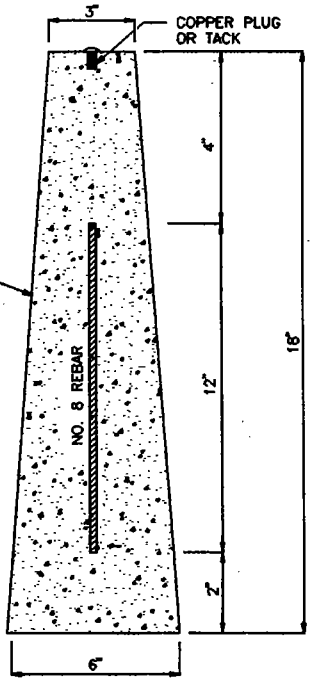


PLAN OF MONUMENT



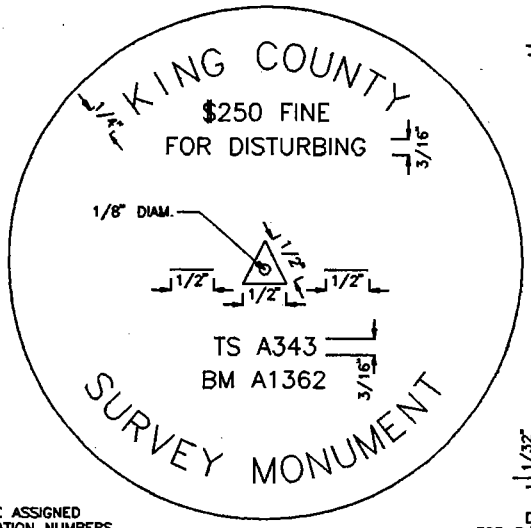
SECTION A-A

CONCRETE MONUMENT (ALTERNATE)



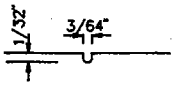
SECTION B-B

WORKS GTON	ROADWAY SURVEY MONUMENT WITH CASE & COVER	DWG. NO. 5-014

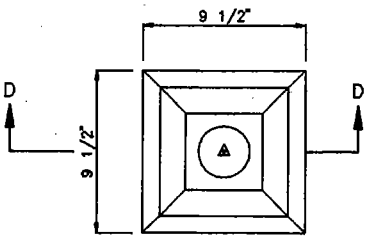


PLAN

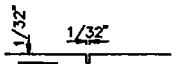
NOTE:
ONLY THE ASSIGNED IDENTIFICATION NUMBERS ARE TO APPEAR ON THE BRASS DISC.



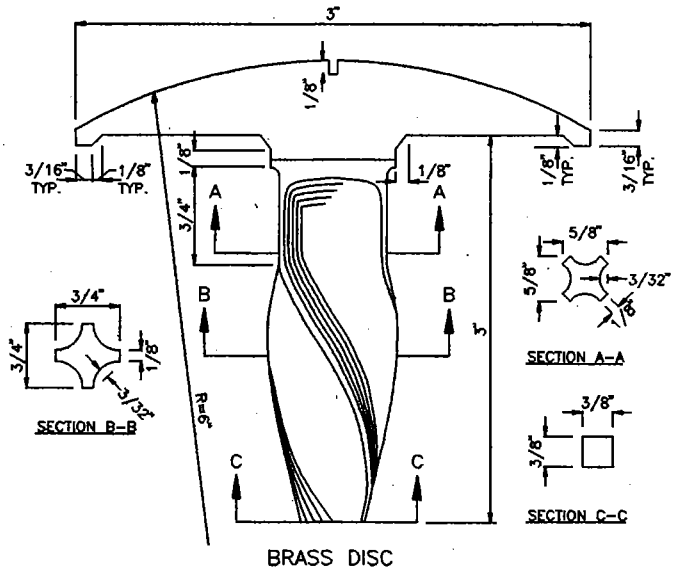
DETAIL OF GROOVE FOR 1/4" LETTERS



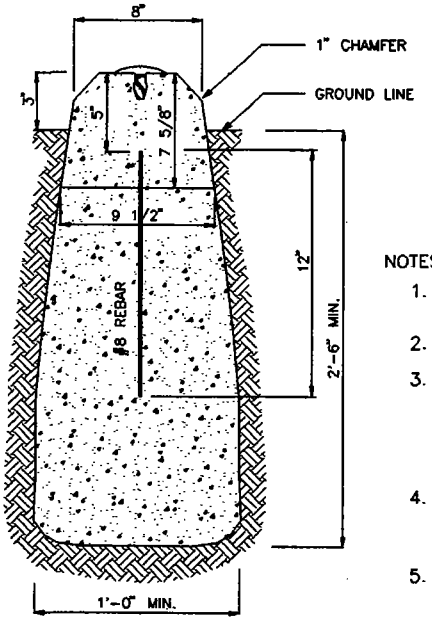
PLAN



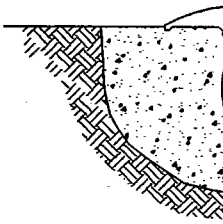
DETAIL OF GROOVE FOR 3/16" LETTERS AND LINES



BRASS DISC
ELEVATION



GENERAL INSTALLATION
SECTION D-D



LEDGE
CONCRETE

NOTES;

1. THE BRASS DIS
BRASS SAE 41.
2. CONCRETE SHA
3. THE HOLE SHA
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ON FIRM, UNDI
4. THE TOP OF TH
SMOOTH AND T
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5. COORDINATES C
BE PLACED ON

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KING COUNTY, WASHINGTON

OFF-ROADWAY SURVEY MONUMENT