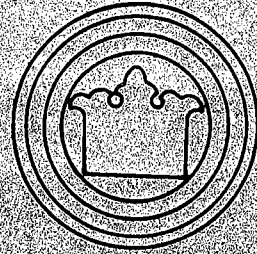




KING COUNTY
ROAD STANDARDS
1979



Department of Public Works
James W. Guenther, Director

00545

January 28, 1980

CORRECTION SHEET

Since publication of the King County Road Standards 1979 in September 1979, certain errors and omissions have been noted.

Readers of this document should post corrections as follows and affix this sheet under the cover of the Standards:

- Page 11. Section 3.03 C. Change "74 feet" to read "64 feet"
- Page 24. Section 6.06 D. Change (phone number) "422-2420" to read "442-2420"
- Page 47. Drawing No. 9 "CEMENT CONCRETE CURB" Detail.
Add total vertical dimension: "1'-4"
- Page 51. Drawing No. 13 "R, X, Y" table.
Add under "R" & "X" columns the word "TANGENT"
Add under "Y" column the dimension "36".

AN ORDINANCE approving and adopting the "King County Road Standards" as the standards for road design in King County, repealing King County Resolution No. 33864; K.C.C. 19.12.010 through 19.12.040 and K.C.C. 19.16.020.

PREAMBLE:

The King County Road Standards were last updated by King County Resolution No. 33864, dated July 10, 1967, under the title "Design Standards and Specifications for Plat Roads and Private Work on County Right of Way." The proposed new publication "King County Road Standards" updates the 1967 document, adds material to answer the questions most frequently arising during plat review, and makes the Standards applicable to construction by King County as well as private builders.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

Section 1: Repeal. King County Resolution No. 33864; K.C.C. 19.12.010 through 19.12.040 and K.C.C. 19.16.020 are hereby repealed.

Section 2: Adoption. "King County Road Standards", Attachment A, and Attachment B, are hereby approved and adopted as the King County standards for road design and construction.

Section 3: Terms.

- (1) "Standards". King County Road Standards.
(2) "Engineer": King County Road Engineer, having authorities specified in RCW 36.75.050 and 36.80, or his authorized representative.

Section 4: Applicability. These Standards shall govern all construction and upgrading of public and private roads in King County except there otherwise provided in other ordinances such as those regulating planned unit developments, short subdivisions, mobile home parks, multifamily development, commercial developments and industrial developments. The Standards are applicable both to private work within King County right of way and to construction by King County.

Section 5: Responsibility to provide. All development except that which does not create or add significantly to the traffic of an abutting road shall include provision for construction or improvement according to these Standards.

Section 6: References. The Standards intended to be consistent with the references in 1.04 of Attachment A, "King County Road Standards".
Section 7: Variances. Variances for construction shall be granted by the Engineer upon evidence that it is in the public interest, that they are based on sound engineering judgement, and that requirements for safety, appearance, and maintainability are fully met. All variances must be approved prior to construction.

Section 8: Penalties. Failure to comply with the Standards will be cause for withholding of approval of plans or plats, forfeiture of bond, and other penalties as provided by law.

Section 9: Severability. If any part of this Ordinance as established by ordinance shall be found to be invalid, the parts shall remain in effect.

Section 10: This Ordinance shall take effect 30 days from its enactment.

INTRODUCED AND READ for the first time

February 27, 1979.

PASSED this 27th day of August

KING COUNTY
KING COUNTY,

Chairman

ATTEST:

[Signature]
Clerk of the Council

APPROVE this 30th day of August

[Signature]
King County

KING COUNTY ROAD STANDARDS

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KING COUNTY ROAD STANDARDS

0. INTRODUCTION

The purpose of these Road Standards is to standardize road design elements for consistency and to assure so far as practical that the minimum requirements for motoring, bicycling, equestrian and pedestrian public are met. These requirements include safety, convenience, pleasant appearance and economical maintenance. The Standards provide guidelines for location and installation of utilities within the right-of-way.

These Standards cannot provide for all situations. They are intended to supplement, not to substitute for, competent work by design professionals. It is expected that surveyors, engineers, and architects will bring to each project the best of their respective disciplines.

The Standards are also not intended to limit unreasonably any innovative effort which could result in better quality, better cost savings, or both. Any departure from the Standards will be judged, however, on the likelihood that it will produce a compensating or comparable result, in every way adequate for the safety and convenience of the County resident.

GENERAL CONSIDERATIONS

Intended Designation: These King County Road Standards will be cited routinely in text as the "Standards".

Applicability: These Standards shall govern all construction and upgrading of public and private roads in King County except where otherwise provided in other ordinances such as those regulating planned unit developments, short subdivisions, mobile home parks, multifamily developments, commercial developments, and industrial developments. These Standards are applicable both to private work within the King County right of way and to construction by King County.

Responsibility to Provide: All development except that which does not create a significant increase in traffic shall include provision for the construction or improvement of the road according to these Standards.

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

Comprehensive Plan for King County, Washington, Resolution 28742, dated October 12, 1964, with supplements and amendments thereto.

Washington State County Arterial Design Standards, adopted May 17, 1968.

King County Code, as amended, specifically:

- Title 14, Roads and Bridges
- Title 18, Mobile Homes and Mobile Home Parks
- Title 19, Subdivisions
- Title 20, Planning
- Title 21, Zoning
- Titles 46 & 47, Traffic

Home Rule Charter for King County, approved by the electorate on November 5, 1968; specifically subsection 920.20.10.

King County Interim Transportation Plan: Focus 1990, adopted September 9, 1974.

King County General Bicycle Plan: Focus 1990, adopted April 14, 1976.

King County Code Title 20.50 Surface Water Runoff Policy, pertaining to drainage, together with current implementing guidelines prepared by Hydraulics Division, King County Department of Public Works.

Adopted Community Plans.

I. King County Urban Trail Plan.

J. State of Washington Shoreline Management Act.

K. King County Capital Improvement Program, as updated annually or

1.05

State Specifications & Plans: Except where these Standards provide detail, workmanship and materials shall be in accordance with the for State Department of Transportation publications, current editions as County:

A. Standard Specifications for Road and Bridge Construction. These to as the "State Standard Specifications."

B. Standard Plans for Road and Bridge Construction.

1.06.

Other Specifications: These include the following, which shall be a pertinent, when specifically cited in the Standards, or when require authority.

A. U.S. Department of Transportation Manual on Uniform Traffic Control amended and approved by Washington State Department of Transportation as the "MUTCD".

B. Washington Chapter APWA Standard Specifications for Municipal Engineering Construction, current edition. These will be referred to as the "Specifications".

C. Recommended Standards for Water Works, a Report of Committee of Upper Mississippi Board of State Sanitary Engineers, also known as "Standard," current revised edition.

D. Rules and regulations of the State Board of Health regarding public health as published by the State Department of Social and Health Services.

E. Standard Specifications for Highway Bridges, adopted by the American Association of State Highway and Transportation Officials (AASHTO), current edition.

F. Design criteria of Federal agencies including Department of Housing and Urban Development and the Federal Housing Administration.

1.07

Variances: Variances from these Standards may be granted by the Engineer if that such variances are in the public interest, that they are based on sound judgement, and that requirements for safety, function, appearance, and cost are fully met. Desired variances must be approved prior to construction.

: Failure to comply with these Standards will be cause for withholding or
g approval of plans or plats, forfeiture of bond, and/or other penalties as
y law.

Terms:
: King County Road Engineer, having authorities specified in RCW 36.75.050
36.80, or his authorized representative.

"c": Short street having one end open to traffic and being permanently
minated by a vehicle turnaround.

"et": Street constructed utilizing half the regular width of right of way and
mitted as an interim facility pending construction of the other half of the
et by the adjacent owner.

l "Street" will be considered interchangeable terms for the purpose of these
ndards.

ity: If any part of these Design Standards and Specifications as established
nce shall be found invalid, all other parts shall remain in effect.

2.00 PLAN FORMAT

2.01

Submittal Procedure: Plans for proposed road construction shall be submitted in accordance with King County Code Title 19. Specifically:

- A. For proposed road and drainage construction by a developer, complete plan and profile, together with a drainage plan, shall be signed and submitted by the applicant's engineer to the King County Road Engineer. Applicant's engineer shall be a Professional Civil Engineer registered in the State of Washington. Final plan and profile drawings must be approved by the County Road Engineer prior to the start of construction and record. A temporary erosion/sedimentation control plan must be approved by the County Engineer prior to construction.
- B. Plans for County force or County contract construction shall be submitted according to instructions from the County Road Engineer. Plans for construction by him and if necessary by higher funding authority prior to construction.

2.02

General Formatting: General formatting, copying, and submittal procedures:

- A. For private developers: Original sheets shall be good quality reproducible, Mylar or equal.
 - 1. Plan sheets and profile sheets or combined plan and profile sheets as required, all in sheet sizes 24" x 36" or 18" x 24"
 - 2. First submittal: 3 sets of prints of road plans, profiles, and 2 sets of prints of drainage area plans and drainage calculations.
 - 3. Final submittal: Original and 2 sets of prints of corrected detail sheets, and drainage plans and calculations; complete set of proposed construction; together with the most recent revisions marked up by the County reviewers. Upon the Engineer's approval of submittal, the Department will make a reproducible set, cost to developer, and return original set to the developer's engineer. The Department will retain this reproducible, utilizing it to make copies for distribution as required.
- B. For County design staff: As required for coordination and for approval by the authorities.

Horizontal Plan: Horizontal plan elements shall include the following:

Road alignments with 100' stationing, reading from left to right, and stationing at points of curve, tangent, and intersection, with ties to section or quarter corners at least once in each mile of traverse.

Section, township, and range.

Bearings on road centerline, keyed to State Coordinate System when data are available, or to other meridian reference, except when such data are already supplied on an associated plat map.

Curve data including radius, delta, arc length, and semitangent, on all horizontal lines, except when these data are already supplied on an associated plat map. In such case, the construction plan shall show radii on centerline.

Right of way lines and width for proposed road and intersecting roads.

All topographic features within right of way limits and sufficient area beyond to resolve questions of setback, slope, drainage, access onto abutting property, and road continuations.

All existing utilities and proposed utilities to the extent that these will be engineered or located by the builder.

Identification of all roads and adjoining subdivisions, consistent with County policy, King County Code Title 14.

Typical roadway cross-section(s) of proposed road.

Existing and proposed drainage features, indicating direction of flow, size, and kind of each drainage channel, pipe, and structure.

Scale: 1"=50'. However, 1"=100' shall be optional for development of lots one acre or larger. Details for clarification may be shown on a convenient scale.

North arrow.

When more than three sheets are used, the first sheet shall show a table of contents and an index sheet. First sheet shall also show complete area of plat with street numbers and lot numbers.

Mail box locations approved by the Post Office. See Section 6.06 and Drawing No. 18

2.04 Profile Elements: Profile elements shall include the following:

- A. Original ground line at 100' stations and at significant ground topographic features, with accuracy to within 0.1' on unpaved surface on paved surface.
- B. Final road and storm drain profile with stationing same as horizontal reading from left to right, to show stationing of points of curve intersection of vertical curves, with elevations to 0.01'.
- C. On grid of numbered lines, a continuous plot of vertical position horizontal.
- D. Road grade and vertical curve data; road to be measured at centerline.
- E. Datum used and all bench marks, which must refer to established datum available.
- F. Vertical scale 1"=5'. As exception, vertical scale shall be 1"=1"=100' horizontal scale is used on developments of lots 1-acre or less. Clarifying details may be done to a convenient scale.

2.05

Drainage Plan: A drainage plan is required by King County Code Title 22.01 implementing directive Requirements and Guidelines for Storm Drainage in King County, also referred to as "Drainage Guidelines." This drainage plan shall be either integral with the above plan and profile for the road design, if permitted, or on separate plan and data sheets. In either case the drainage plan shall include runoff calculations keyed to topographic maps; location, specific and elevation data on all hydraulic features; and facilities for retention, grease and siltation control.

& GEOMETRICS

ty roads are classified functionally as indicated in subsections 3.01 to 3.07. d on these classifications the criteria for right of way, road width, and other etrics shall be as stated. Function is the controlling element for classifica- . Access, spacing, ADT and DHV are merely typical.

ddition to the several functional classifications, roads are categorized as n and rural.

Urban Roads are those roads serving single and multifamily residential, commercial, institutional, industrial, and similar relatively dense develop- ments and which are within the urban boundary so designated by the Statewide National Functional Classification System of the Washington State Department of Transportation. Urban roads may, however, be constructed to rural road criteria when they are within areas zoned A, F-R, S-E, G, or S-R when land is developed with lots averaging 35,000 square feet or larger.

Rural Roads are County roads which do not conform to the above definition of urban roads. However, the construction or improvement of rural roads which serve commercial or residential development with density equivalent to three dwelling units per acre or greater shall be done in accordance with urban road criteria.

rain classification is a basis for further breakdown of geometric requirements.

Flat terrain is that condition where highway sight distances, as governed by both horizontal and vertical restrictions, are generally long or could be made to be so without construction difficulty or major expense.

Rolling terrain is that condition where the natural slopes consistently rise above and fall below the highway grade line and where occasional steep slopes offer some restriction to normal highway horizontal and vertical alinement.

Mountainous terrain is that condition where longitudinal and transverse changes in the elevation of the ground with respect to a highway are abrupt and where the roadbed is obtained by frequent benching or side hill excavation.

rain classification pertains to the general character of the specific route ridor. Roads in valleys or passes of mountainous areas that have all the characteristics of roads traversing flat or rolling terrian should be classified flat or rolling. In general, rolling terrain conditions cause trucks to reduce speeds below those of passenger cars on some sections of highway and mountainous rain causes some truck operation at crawl speeds.

3.01 ARTERIAL ROADS: See Drawings No. 1 and 2.

CLASSIFICATION		MAJOR ARTERIALS		SECONDARY ARTERIALS		COLLECTOR
Function		Inter-community highways connecting largest community centers & facilities.		Intra-community highways connecting community centers & facilities.		Intra-community
Access		Controlled		Controlled		Controlled
Max. Arterial Spacing		2 to 5 miles		Under 2 miles		Under 2 miles
		RURAL	URBAN	RURAL	URBAN	RURAL
ADT (X 1,000)		1.5 to 40		1.5 to 40		1.5 to 40
DHV		Over 600		200 to 600		100 to 600
CRITERIA						
A. Design Speed* (MPH)	Flat	65	55	55	55	55
	Rolling	55	45	45	45	45
	Mountainous	45	35	35	35	35
B. Max. Superelevation (Ft./ft.)		.06	.06	.06	.06	.06
C. Horizontal Curvature		Max.D ⁰	Min.R'	Max.D ⁰	Min.R'	Max.D ⁰
	Flat	4	1430	6	1040	6
	Rolling	6	1040	9	660	9
	Mountainous	9	660	14.5	400	14.5
D. Max. Grade** (%)	Flat	4	6	4	6	6
	Rolling	5	7	5	7	7
	Mountainous	7	9	7	9	9
E. Min. Stopping Sight Dist. (Ft.)	Flat	550	410	410	410	410
	Rolling	410	310	310	310	310
	Mountainous	310	240	240	240	240
F. Min. Passing Sight Dist. (Ft.) on 2-Ln. Rd.	Flat	2300	1950	1950	1950	1950
	Rolling	1950	1650	1650	1650	1650
	Mountainous	1650	1300	1300	1300	1300
G. Min. Pavement Width (Ft.)	2-Lane	24	44	24	44	22
	4-Lane	44	44	44	44	44
	5-Lane	56	56	56	56	--
H. Min. Roadway*** Width (Ft.)	2-Lane	40	44	40	44	38
	4-Lane	60	44	60	44	60
	5-Lane	72	56	72	56	--
I. Min. Right of Way Width (Ft.)	2-Lane	100	100	84	84	60
	4-Lane	100	100	84	84	60
	5-Lane	100	100	84	84	--
J. Type of Curb or Shoulder*** & Ditch		8' Shoulder & Ditch	Vert. Curb & Gutter	8' Shoulder & Ditch	Vert. Curb & Gutter	8' Shoulder & Ditch

K. Within the above parameters, geometric design requirements shall be determined for specific projects on the State Transportation Design Manual.

* Design Speed (See Page 10) -- *** Guardrail Installations (See Page 10)

** Max. grade may be exceeded for short distances, provided no practical alternative exists without approval by the Engineer.

ETS: See Drawings No. 3 through 8.

	NEIGHBORHOOD COLLECTORS		LOCAL ACCESS STREETS		MINOR ACCESS STREETS	
	Inter-neighborhood streets connecting two or more neighborhoods and providing inter-residential travel.		Neighborhood streets with low traffic, low speed, low risk to pedestrians.		Permanent cul-de-sacs or other limited streets serving potential of 16 or fewer dwelling units with low traffic, few trucks, low speed low risk to pedestrians.	
	Access limited to abutting lots not fronting on local or minor access streets.		As main function, access to abutting properties.		Access to abutting properties.	
	RURAL	URBAN	RURAL	URBAN	RURAL	URBAN
	Under 400	Variable	100 to 400	Variable	Under 100	Variable
ing tainous (Ft./ft.)	35 35 25	35 35 25	35 30 25		.02	.02
	Max.D ^o Min.R	Max.D ^o Min.R	Max.D ^o Min.R			
ing tainous	14.5 400 14.5 400 29 200	13.5 430 13.5 430 29 200	12.5 460 19 300 29 200	Low Speed Curves See Sec. 3.06	Low Speed Curves See Sec. 3.06	Low Speed Curves See Sec. 3.06
ing tainous	6 8 11	7 10 12	7 10 12	8 12 15**B	8 12 15**B	8 12 15**B
ing tainous (Ft.)	310 240 175	310 240 175	240 200 175	See Sec. 3.06E	See Sec. 3.06E	See Sec. 3.06E
** (Ft.)	22	36	22	28	20	24****
Width (Ft.)	38	36	38	28	28	24****
Width (Ft.)	60	56	60	48	48	48
Shoulder***	8' Shoulder & Ditch	Vert.or Rolled Curb & Gutter	8' Shoulder & Ditch	Vert.or Rolled Curb & Gutter	4' Shoulder & Ditch	Vert.or Rolled Curb & Gutter
Width (Ft.)	19	19	19	19	19	19
Width (Ft.)	19	19	16	19	16	19

a basis for determining geometric elements and does not imply posted or legally permissible speed. The speed may be exceeded for short distances subject to approval by the Engineer. Such approval will be conditional and shall be on the following:

1. If an alternative exists.

2. Grades over 12% shall extend no further than 600 feet without being interrupted by an intersection or a driveway with a maximum 8 feet difference in elevation over a distance of 100 feet.

3. Grades exceeding 12% but less than 20% shall be paved with A.C. or P.C.C. Grades 20% or over shall be paved with P.C.C.

4. At bus stoppings, shoulder shall be 2 feet wider.

5. Additional stalls will be required in numbers additional to zoning requirements.

3.03 Cul-De-Sacs. See Drawing Number 8. CLASSIFICATION: A dead-ending access street.

CRITERIA

- A. Geometrics of stem section are same as for local or minor access
- B. Min. right of way width across bulb section: 100 feet.
- C. Min. pavement width across bulb: 80 feet in urban curb and gutter, 74 feet in rural shoulder and ditch.
- D. Cul-de-sac Island: Optional feature when paved diameter is 80 feet, mandatory when paved diameter exceeds 80 feet. If provided, is concrete extruded or full-depth vertical curb. There shall be a paved traveled way in a rural shoulder and ditch section, and a paved travel way in a curb and gutter section around circumference. It shall be grassed or landscaped. It shall be maintained by the adjoining property.

3.04 Commercial Streets. See Drawing Number 2

CLASSIFICATION: This is a subclassification of any street that provides access to abutting commercial or industrial properties and carries significant traffic.

CRITERIA

- A. Design Speed 35 MPH
- B. Min. Right of Way Width 60 feet
- C. Min. Pavement Width 40 feet
- D. Type of Curb Vertical Curb and Gutter
- E. Min. Stopping Sight Dist. 300 feet
- F. Max. Grade 12.0%
- G. Max. Super Elevation .06'/foot

The main difference between these and other street criteria is the minimum pavement width of 40 feet. The width must be sufficient to accommodate both through traffic and frequent local truck movements such as backing, positioning for loading.

3.05 Median. Optional design feature. A median shall be additional to, and within the specified width of traveled way. Edges shall be similar to outer road edges, urban, extruded or formed vertical curb; or rural, shoulder and ditch. Median shoulders shall be minimum 4 feet in width. Median may be grassed or surfaced with aggregate or pavement. Median shall be designed so as to provide turning radii or sight distance at intersections.

ns & Low Speed Cuves

of Intersection	INTERSECTIONS	LOW SPEED CURVES	
	85° to 95°	Up to 75°	75° & Over
Centerline Radius (2-lane)	55 Feet	100 Feet	55 Feet
Curb Radius	35 Feet	80 Feet	35 Feet
Property Line Radius	25 Feet	70 Feet	25 Feet
Stopping Sight Distance	200 Feet		

centerline offset of adjacent streets from intersection or low speed curves:

Local and minor access streets, low speed curves, and neighborhood collector streets, any combination. 150 Feet

Local and minor access streets, low speed curves, and neighborhood collector streets, crossing or connecting to any arterial; or arterials intersecting arterials. 300 Feet

opping approaches at an intersection, landing not to exceed one foot difference elevation for a distance of 30 feet approaching an arterial or 20 feet approaching residential street, measured from nearest right of way line of intersection street.

Streets

DEFINITION: Private streets are privately owned vehicular access routes each serving subdivided parcels except that a jointly-owned access serving two parcels under cited in Section 6.01 C3a is a joint-use driveway.

PERMITS AUTHORIZATION: Private streets will be permitted when so provided in ordinances or at the discretion of the Engineer when:

Plans have been approved and recorded with the County which provide for maintenance of the private streets and associated parking areas by owners in the development, and

Provision is made for the roads to be open at all times for emergency and public use vehicle use, and

Private streets will not obstruct public street circulation, and

at least one of the following conditions exists:

Existing abutting development precludes the construction of a public street, or

2. Topographic, geological or soil conditions make development undesirable, or
3. The streets are within a private community with a corporate
4. Neighborhood traffic circulation and lot access can be met by private streets than by public streets.

CRITERIA FOR CONSTRUCTION:

Private streets shall conform to these Standards except where otherwise other ordinances such as those regulating planned unit developments, mobile home parks, multifamily developments, commercial developments, developments.

- 3.08 Freeways & Expressways are higher classification roads which are usually Federal responsibility. In the event that the County has jurisdiction construction or improvement of such a facility, the work shall be done with appropriate State or Federal standards.
- 3.09 Other Road Design Criteria. Criteria under other recognized road classification as those of the Federal-Aid Rural Area Design Standards, may be applied. Criteria may be reduced for special facilities such as planned unit developments, mobile home parks under conditions deemed appropriate by the Engineer.
- 3.10 Slope, Wall, & Drainage Easements. Either the functional classification design features of a road may necessitate slope, wall or drainage easement right of way line. Such easements may be required by the Engineer in dedication or acquisition of right of way.

N, BIKE & HORSEBACK FACILITIES

Sidewalks:

shall be required on urban category, curb and gutter type streets as follows:

On all Arterial, Neighborhood Collector, and through Local Access streets, both sides.

On Cul-de-sacs, over 250 feet but less than 600 feet in length and capable of serving more than ten dwelling units, one side.

On Cul-de-sacs over 600 feet in length, both sides.

On Cul-de-sacs having walkways from termini to other streets, parks, schools, or other pedestrian traffic generators, one side.

On all perimeter roads, one side adjacent to the development.

exceptions to 4.01 A:

Where subdivision design provides an acceptable surfaced and maintained internal walkway system, a street sidewalk may be waived.

On existing roadway where construction of sidewalk would be unduly difficult or impractical, a walkway, in accordance with Section 4.02 below, shall be provided.

shall be constructed:

At least five feet wide in residential areas.

At least eight feet wide in business/commercial districts where the store fronts are within 80 feet of the street right-of-way. Where the store fronts are farther back than 80 feet then the sidewalk shall be at least 5 feet in width.

In specified width greater than eight feet where Engineer determines this is warranted by expected pedestrian traffic volume.

With portland cement concrete surfacing as provided in Section 5.01.

4.02

Asphalt Walkways shall be required on rural category, shoulder and dit
as follows:

- A. In business areas and residential areas with density of three or more dwelling units per gross acre:
 - 1. On all Arterials and Neighborhood Collector streets, both sides.
 - 2. On Local Access streets capable of serving 25 dwelling units.
 - 3. On perimeter streets except when such streets are Local Access streets capable of serving less than 25 dwelling units.
- B. In residential areas having less than three dwelling units per acre or 1/2 dwelling unit per acre:
 - 1. On all Arterials, both sides.
 - 2. On Neighborhood Collector streets, one side.
 - 3. On perimeter streets except when they are Local Access streets adjacent to development.
- C. Full width of shoulder or, if separated from street, at least five feet.
- D. Surfacing shall be as specified in Section 5.01.

4.03

Roadway Bikeways

- A. A Class II Bikeway, with lanes designated for bicycles and continuing in the same direction of vehicle travelled way, should be provided when:
 - 1. Called for in the King County General Bike Plan, the County General Bike Plan, or an approved community plan, or when traffic analysis indicates substantial bicycle usage which would benefit from a designated bikeway.
 - 2. Space or routing considerations do not warrant Class I separate bikeways, and
 - 3. Traffic speed or volume makes it difficult or hazardous for bicycles to share travelled lanes with motor traffic.
- B. For Class II bike lanes the following specifications shall apply to shoulders or to space next to curb:

Where parked cars are prohibited, bike lanes shall be preferably 8 feet wide, minimum 5 feet wide. This width may be narrowed to a minimum of 4 feet to accommodate turn lanes approaching intersections.

Where parked cars are permitted, space to be shared by both bikes and parked cars shall be preferably 13 feet wide, minimum 12 feet.

Such lanes shall be signed as needed for one-way, with traffic. They should be demarcated from vehicular travel lanes by white striping as required by the Engineer. Such lanes can be on one side, if the road network provides a workable one-way couplet of parallel routes, or on both sides.

Bike lanes where parking is prohibited shall be signed as needed to permit encroachment by motor vehicles, with caution, at driveways and intersections, and to make momentary curbside passenger or service stops but not for parking.

Class III bike routes, signed for shared usage of motor lanes or pedestrian facilities, may be provided where level of bicycle usage or intensity of motor vehicle traffic does not warrant Class II restricted bike lanes.

pedestrian Lanes

pedestrian lanes adjacent to the motor vehicle travelled way should be provided when:

Horseback riding is a predominant community activity, and

Space or routing considerations do not warrant separate off-street equestrian trails, and

Traffic speed or volume makes it difficult or hazardous for horses to share travelled lanes with motor vehicles.

For equestrian lanes adjacent to motor traffic lanes the following specifications shall apply:

Road shoulders intended for horseback use shall be surfaced full-width with minimum 2-1/2 inches of crushed surfacing base course and 1-1/2 inches of crushed surfacing top course. When constructed on existing shoulders of varying width, lanes 8 feet wide are desirable, 4 feet minimum.

Such lanes shall be signed one-way, with traffic.

- C. When right of way permits, an equestrian lane may be constructed on the right-of-way line. In such case, the criteria for an off-street facility as set forth in Section 4.06C shall apply.

4.05 Combination Roadway Bike & Equestrian Lanes

Where both bike and equestrian uses are warranted, in accordance with Section 4.04 above, the available shoulder area may be divided to provide hard shoulders next to motor-travelled way and crushed rock surface towards the ditch. A minimum 4 feet of width should be provided for each mode.

4.06 Off-Street Bikeways, Walkways, & Equestrian Trails

As a matter of policy, separate off-street facilities for bicyclists, horseback riders are encouraged wherever there is significant public use. Off-street facilities and space can be made available. Where such facilities are warranted, the following standards shall apply:

- A. Off-street bikeways shall be at least 10 feet and preferably 12 feet wide and surfaced as indicated in Section 5.01. Grades shall be as gentle as the terrain will permit.
- B. Off-street walkways shall be at least 5 feet wide and surfaced as indicated in Section 5.01.
- C. Off-street equestrian trails shall be at least 8 feet wide and surfaced as indicated in Section 5.01.
- D. Where crowding is not a factor, the walkway function can be combined with a bikeway or, less desirably, with an equestrian trail. See Section 5.01.
- E. Where bikeways, walkways, or equestrian trails intersect with motor-vehicle traffic, sight distance, marking, and signalization (if warranted) shall be provided in accordance with the MUTCD.

al Streets, Pedestrian, Bike & Equestrian Facilities:

imum Paved Section, with alternative combinations of materials, for residential streets, shoulders, sidewalks, bikeways, and equestrian trails shall be as indicated below. These sections are acceptable only on good, well-drained, stable compacted subgrade with minimum stabilometer R-value of 55 or CBR of 20 or ASTM Standard D 1883-73.

	ASPHALT CONCRETE	LT.BITUM. SURF.TREAT.	CRUSHED SURF.TOP COURSE	CRUSHED SURF.BASE COURSE	PORTLAND CEMENT CONCRETE
COLLECTOR, OR ACCESS STREETS, DS					
I	2"		1-1/2"	2-1/2"	
II	5"				
III					
e for A, F-R, Zoning only, ades not han 15.0%)		Class A	1-1/2"	2-1/2"	5"
IV					
V (See Drawing No. 7) e only as provided plat ordinance)			1-1/2"	2-1/2"	
I	2"		1-1/2"	2-1/2"	
II	5"				
III		Class A	1-1/2"	2-1/2"	
IV			1-1/2"	2-1/2"	
I le except behind urb)					4"
II y behind urb)					5"

TYPE OF FACILITIES	ASPHALT CONCRETE	LI. BITUM. SURF. TREAT.	CRUSHED SURF. TOP COURSE	CRUSHED SURF. COURSES
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4. WALKWAYS & BIKEWAYS

Alternative I	2"		1-1/2"	2-1/2"
Alternative II	3-1/2"			
Alternative III		Class A	1-1/2"	2-1/2"

When a walkway or bikeway is incorporated into a road shoulder, the road section, if higher strength, shall govern. Equestrian trails incorporated into road shoulders shall be constructed with crushed surfacing material as indicated in Alternative IV for Shoulders.

5. DRIVEWAYS may be surfaced similar to shoulders or as desired by the owner,

- (a) On curbed streets with sidewalks, driveway shall be paved with minimum 4 inch portland cement concrete from curb to back edge of sidewalk; See Alternative IV for Sidewalks.
- (b) On rural ditch section, driveway between paved travel lane and property line shall be surfaced with material other than portland cement concrete No. 10.

6. EQUESTRIAN TRAILS, when separated from other traffic modes, shall be constructed on a 4 inch graded and compacted native soil. Existing soil which is not free-draining and be replaced with free-draining soil. If heavy usage is anticipated, particularly in wet weather, the surface should be improved by adding crushed surfacing aggregate or other materials which will tend to stabilize the surface while preserving the surface under hooved traffic.

NOTE: ASPHALT TREATED BASE may be substituted for asphalt concrete in temporary leveling course in the ratio of four parts thickness of asphalt treated base to one part asphalt concrete. Four inches asphalt treated base may be substituted for four inches of crushed surfacing top and base courses.

Requirements on Poor Subgrade: The minimum material thicknesses indicated above are not acceptable if there is any evidence of instability in the subgrade. This includes free water, swamp, fine-grained or organic soil, slides, or uneven settlement. If there are any of these characteristics, the soil shall be sampled and tested sufficiently to establish how well it can support the proposed construction. Any deficiencies, including an R value of less than 55 or a CBR of less than 20, shall be fully considered in the design. Remedial measures may include a stronger paved section, a strengthening of subgrade by adding or substituting Gravel Base Class B, more extensive drainage, or a combination of such measures. Both the soils test report and the resulting pavement design shall be subject to review and approval by the Engineer.

Arterials & Commercial Streets: The pavement of arterials and commercial streets shall be designed with regard to the load bearing capacity of the soils and the traffic-loading requirements of the roadway. Plans shall be accompanied by the soils and traffic analyses on which the design is based.

Construction & Lay-Down Procedures: Shall be in accordance with State Standard Specifications.

6.00 ROADSIDE FEATURES

6.01 Driveways

- A. Permissible dimensions, slope and detail shall be as indicated in Nos. 10 and 11 and as further specified in the following subsections.
- B. Conditions of Approval of New Driveways:
1. Driveways directly giving access unto arterials may be denied if access is available.
 2. All abandoned driveway areas on the same frontage shall be graded, curbing and sidewalk, or shoulders and ditch section, shall be installed.
 3. Maintenance of driveway approaches shall be the responsibility of the property whose property they serve.
 4. For a commercial establishment on a shoulder and ditch type frontage, development of adjoining lands and highway traffic assume the same as determined by the Engineer, the following rule shall apply. The frontage area shall be graded and paved to the property line with portland cement concrete. Surface drainage shall be intercepted and carried in a closed system as set forth in Section 7.00. Access to the driveway by a 6-inch curbing will be required. See Extruded Asphalt on Concrete Curb detail, Drawing No. 9.
- C. Location and Width of New Driveways. Refer to Drawing No. 12.
1. A residential driveway is one that normally serves one parcel. If, as provided in Section 6.01 C3a below, a driveway serving more than one parcel shall be classed as a commercial driveway or a private street.
 2. On frontage 75' or less, no more than one driveway shall be permitted. On frontages over 75', two or more driveways may be permitted, subject to approval by the Engineer.
 3. No portion of driveway width shall be allowed within 5' of the property lines in residential areas or 9' in commercial areas. The following rules apply:
 - a. Joint-use driveways serving two adjacent parcels may be permitted by written agreement of both property owners and approval by the Engineer.

- b. Driveways may utilize full width of narrow "pipe-stem" if this provides the only access to the lot being served.

In any case, the driveway shall be placed in front of the lot or lots which it serves.

The maximum change in driveway grade shall be:

On crest vertical curves, 8% per 10'.

On sag vertical curves, 12" per 10'.

Driveways in rolled curb sections may be constructed abutting and flush with sidewalk or back of curb without gapping or lowering height of curb.

Existing driveways may be reconstructed as they exist provided such reconstruction compatible with the reconstructed road.

Notwithstanding any other provisions, driveways shall not be allowed where they are prohibited by separate County Council action or where they are determined by the Engineer to create a hazard or impede the operation of traffic on the roadway.

Ramps
Streets with vertical curb, ramped sections to facilitate passage of handicapped persons shall be constructed through curb and sidewalk at street intersections and crosswalk locations. See Drawing No. 13. Where a ramp is constructed on one side of the street, a ramp shall also be provided at a corresponding location on the opposite side of the street.

Retaining Walls

Rock retaining walls may be used for the containment of cut or fill embankments up to a maximum height of 8 feet in stable soil conditions which will result in no significant foundation settlement or outward thrust upon the walls. See Drawing Nos. 14 through 16. For heights over 8 feet or when soil is unstable, a structural wall of acceptable design shall be used.

Materials

1. Size categories shall include:
Two-man rocks (300 to 600 pounds), 13" in least dimension;
Three-man rocks (800 to 1200 pounds), 16" in least dimension; and
Four-man rocks (1500 to 2200 pounds), 18" in least dimension.

Four-man rocks shall be used for bottom course rock in all rock retaining walls over 6' in height.

2. The rock material shall be as nearly rectangular as possible be used which does not extend through the wall. The rock shall be hard, sound, durable and free from weathered portions, sea defects. The rock density shall be a minimum of 160 pounds per cubic foot.
- C. The retaining wall shall be started by excavating a trench, not less than 12 inches or more than one (1) foot in depth below subgrade in embankment sections below the existing ground level in embankment sections.
- D. Rock selection and placement shall be such that there will be no voids in the exposed face of the wall, no open voids over six (6) inches in any direction. The final course shall have a continuous appearance to minimize erosion of the backfill material. The larger rocks shall be placed at the base of the rockery so that the wall will be stable and have a continuous appearance. The rocks shall be placed in a manner such that the logs of the rock shall be at right angles or perpendicular to the rockery. The rocks shall have all inclining faces sloping to the back of the rockery. The rocks shall be seated as tightly and evenly as possible on the backfill. After setting each course of rock, all voids between the rocks shall be filled on the back with quarry rock to eliminate any void sufficient to pass a square probe.
- E. The wall backfill shall consist of quarry spalls with a maximum size of eight (8) inches and a minimum size of two (2) inches. This material shall be placed in lifts of eight (8) inch minimum thickness between the entire wall and the backfill material. The backfill material shall be placed in lifts to a maximum of approximately six (6) inches below the top of each course of rocks as they are set until the uppermost course is placed. Any backfill material on the surface of one rock course shall be removed before setting the next course.
- F. When a sidewalk is to be built over a rock retaining wall, the top of the wall shall be sealed and leveled with a cap constructed of Cement Concrete in accordance with the applicable provisions of Section 6-02 of the Specifications, but with reduced water content resulting in slabs of a maximum of two (2) inches.

6.04

Side Slopes

- A. Side slopes shall be constructed no steeper than 1-1/2 to 1 on cut slopes. Flatter slopes are preferred and may be used at the discretion of the Engineer if there are indications that the earth is unstable and liable to sliding or sloughing.

slopes shall be stabilized by grass sod or seeding, or by other planting or facing materials acceptable to the Engineer.

Trees & Landscaping

As a matter of policy, street trees and landscaping should be incorporated into the plan for any road improvement. Existing trees and landscaping should be preserved where practicable, and placement of new trees should be compatible with other features of the environment. In particular, maximum heights and spacing should not conflict unduly with overhead utilities. If street trees are planted, they should conform reasonably to the standards shown in Drawing No. 17.

Mail Boxes, in the general case, shall be set:

Bottom or base of box 44" above road surface.

Front of mail box 1 foot back of vertical curb face or outside edge of shoulder; 6 inches behind back edge of rolled curbs.

On posts strong enough to give firm support but not to exceed 4" x 4" wood or 1-1/2" diameter pipe, or material with comparable breakaway characteristics.

Mail boxes should be clustered several together when practical and when reasonably convenient to the houses served. See Drawing No. 18.

When mail boxes are located in the sidewalk, individually or in clusters, sidewalk shall be widened to provide a clear width of not less than 5 feet.

In the case of new road construction, or reconstruction requiring mail boxes to be moved back or rearranged, the builder shall coordinate with the U.S. Postal Service. (By mail this contact is "Manager, Delivery and Collection; P.O. Box 9000; Seattle, Washington 98109." The phone number is 422-2420.) Mail box locations approved by the Post Office shall be shown on road construction plans.

Illumination

Lighting of suitable type and candlepower shall be provided at intersections and at intervals and intervals as required by the Engineer.

Survey Monuments

- A. All existing survey control monuments which are disturbed, lost during surveying or building shall be replaced by the responsible builder at his own expense.
- B. Survey control monuments shall be placed or replaced in accordance with good practice in land surveying, and in conformance with Drawing

an

facilities on County roads shall conform to Requirements & Guidelines for Control In King County, current edition. This is hereafter referred to as Guidelines." Note the requirements for a drainage plan, beginning on page 1 of the publication, and "Drainage Policies and/or Recommendations," which follows in part of the same manual. Note also Section 2.05 of the Standards.

Rural Ditch Section

Sections, ditches shall be constructed as shown in Drawing Nos. 1, 3, 4, and veway culverts as shown in Drawing No. 10.

ns In Curb & Gutter Section

ground storm drainage shall be provided for curb street section whenever the length of surface drainage exceeds 300 feet on road grade extending either direction on crest or sag of vertical curves.

orm drain pipe other than pipe connecting inlets to main storm drain shall be minimum 12-inch diameter and of specified rubber-gasketed corrugated metal or rubber-gasketed concrete pipe. Runoff shall be computed and, if the flow requires it, larger pipe shall be used.

orm drain pipe connecting inlets to main storm drain by structure, i.e., catch basin or manhole, shall be minimum 8-inch diameter rubber-gasketed corrugated metal or rubber-gasketed concrete pipe, with maximum length of 44 feet.

nections of storm drain pipe leading from an inlet location may be made into a main storm drain without structure, subject to case-by-case approval by the engineer and subject to the following requirements:

The inletting structure shall be a catch basin and not a simple inlet lacking a catch or drop section.

Outside diameter of inlet pipe shall not exceed one-half the inside diameter of the main storm drain. Inlet pipe, however, shall be not less than 8 inches nor more than 24 inches inside diameter and the main storm drain not less than 36 inches in inside diameter.

Inlet-connecting and main storm drain pipes shall be of same material and type, either rubber-gasketed corrugated metal or rubber-gasketed concrete pipe.

4. Length of inlet connection shall not exceed 25 feet.
5. Standard shop-fabricated tees, wyes, and saddles shall be connections with concrete pipe may be field-tapped in accordance with Drawing No. 21.
- E. Zinc-coated (galvanized) corrugated iron or steel pipe shall be given protective Treatment 1 in accordance with Section 9-05.4(3) of Standard Specifications.
- F. Subject to approval by the Engineer, other pipe materials and methods but not limited to plastic or to cast-in-place concrete pipe, may be used where conditions make it feasible, recognized specifications are followed, control quality, and acceptable user experience with the product.
- G. The rubber gasket requirement in 7.03 B, C, and D, above may be waived by the Engineer if it can be shown that joint leakage will not be an appreciable problem.
- H. Storm drain gradients shall be such as to assure minimum flow velocity of 2 feet per second when flowing full.
- I. Closed (underground) drain lines shall not be located within five feet to any property line separating adjacent lots or tracts. An easement shall be located entirely within a single lot or tract. The linear extent of the drain line may involve additional property.

7.04

Catch Basins, Manholes & Inlets

- A. Maximum spacing on surface drainage courses between inlets or catch basins shall be 200 feet on road grades up to 3.0%. When road grade is 3.0% or greater, maximum spacing shall be 300 feet.
- B. Maximum spacing on main storm drains between access structures, catch basins or manholes, shall be 600 feet.
- C. On storm drains with depths less than five feet to flow line, catch basins shall be one of the following:
 1. Catch Basin Type I (Drawing No. 21)
 2. Catch Basin Type I-K (Drawing No. 21)
 3. Catch Basin Type II-48" (Drawing No. 21)

storm drains with depths five feet and over to flow line, joining or inletting structures shall be selected from the following:

Catch Basin Type II - 48"	(Drawing No. 24)
Catch Basin Type II - 54"	(Drawing No. 25)
Catch Basin Type II - 72"	(Drawing No. 26)
Catch Basin Type II - 96"	(Drawing No. 27)

Reinforcing details for Catch Basins Type II are shown in Drawing No. 28.

A structure is needed for access or for juncture of storm drains, but not for attachment of silt, the structure shall be one of the following types of manholes:

Manhole Type I - 48"	(Drawing No. 29)
Manhole Type I - 54"	(Drawing No. 30)
Manhole Type II - 72"	(Drawing No. 31)
Manhole Type II - 96"	(Drawing No. 32)
Manhole Type III - 48" or 54"	(Drawing No. 33)
Manhole Type III - 72"	(Drawing No. 34)
Manhole Type III - 96"	(Drawing No. 35)

Reinforcing details for manholes are shown in Drawing No. 36.

Manhole ladders and steps are shown in Drawing No. 37.

Manhole materials (for manholes), of the APWA Standard Specifications shall be used, unless otherwise specified, to catch basins and curb inlets as well as manholes.

Subject to approval by the Engineer, drainage structure materials other than reinforced concrete may be used provided that required specifications are available to control quality and acceptable user experience with the product can be demonstrated.

Curb inlets without drop section or catch may be used provided they are connected to the main storm drain by catch basin. Curb inlets shall be King County Standard Curb Inlet Type IV-K, Drawing No. 38.

Appropriate measures shall be taken to limit surface drainage from yards and roofs so as to prevent water damage or nuisance within the right of way. Such measures may include but are not limited to the following:

Three-inch pipe laid sub-surface from yard inlet to nearest catch basin or curb inlet.

2. Three-inch pipe laid from yard inlet under sidewalk and on face. This method is not permissible when curb is on high elevation or in any situation in which street drainage can be to gutter receiving yard runoff.
3. Eight-inch pipe stubbed from catch basin or curb inlet side of sidewalk and plugged, to provide future connection to drains.

7.05

Frames, Grates, and Covers

- A. On drainage structures under vertical curb and gutter, under a sidewalk, the frame and grate shall be Olympic Foundry 18" x 24" cast iron and frame no. 5435 (Drawings No. 39 and 40) or equal. When structures serve as inlet, solid cover, Olympic Foundry Type No. 5435 (Drawing No. 41) or equal shall be used.
 1. When frame and grate or solid lid are located in or close to the edge of prevailing traffic on arterial streets, grate or lid shall be steel instead of cast iron.
 2. Frame and grate or lid shall be incorporated into curb and gutter as shown in Drawing No. 40.
- B. On drainage structures under vertical curb and gutter, a through-curb inlet, Olympic Foundry No. 5435 Special or equal (Drawing No. 42) shall be used. Under conditions limit the effectiveness of a flat surface inlet. Under conditions are road grades exceeding 12% and likelihood of closure, fall or other debris, especially in sag vertical curves.
 1. When used with this special through-curb inlet frame, the frame shall be No. 5435A shall in all cases be ductile iron.
 2. Installation of the through-curb inlet shall be as shown in Drawing No. 42.
- C. On drainage structures taking run-off from rolled curb, a rolled curb inlet, Olympic Foundry Company Gutter Inlet No. 5503, frame and grate (Drawing No. 44) shall be used. This gutter inlet shall be installed with a frame matching the back of the rolled curb and front edge of the gutter on the rolled curb surface, as shown in Drawing No. 45.
- D. On manholes functioning exclusively as access structures Olympic Foundry round 24" Cover and Frame No. 5943 or equal (Drawing No. 46) shall be used.

lids on all storm drain structures shall have the word "DRAIN" in block letters at least two inches high, recessed so as to be flush with the surface. Grates and covers furnished for King County use shall have words "PROPERTY OF KING COUNTY" in block letters 1/2 inch high recessed so as to be flush with surface.

catch basin, manhole, or inlet is located off the traveled portion of the roadway or under other conditions of limited surveillance, frame and grate or cover shall be provided with locking bolts. See Drawings No. 39, 40, 41, 47 and 48.

Unless otherwise specified, cast iron products shall conform to ASTM Designation Class 30 and ductile iron to ASTM Designation A 536 Grade 80-55-06.

Control Policies

The following elements of King County Code Title 20.50 and the Drainage Guidelines are included for emphasis:

Runoff Diversion: Surface water entering the road right of way shall be received at the naturally occurring location. Surface water existing in the right of way shall be discharged at the natural location with adequate energy dissipators to minimize downstream damage. There shall be no diversion at either of these points. In subdivisions in planning stage these rules shall apply to the total property, whether in subdivision, which is under development and not just to the proposed road right of way.

Discharge Control:

The peak discharge from the road right of way or from total subdivided property shall be as provided in Section 7.05A above shall not be increased due to the proposed construction, and

Retention or detention facilities acceptable to the Engineer shall be provided in order to handle all surface water in excess of the peak discharge.

Separation Devices: Whenever significant contamination of runoff with oil and grease is anticipated, an oil/grease separation device, as specified in Drainage Guidelines or acceptable to the Engineer, shall be installed. It shall be installed at a point where it can be maintained and where it will intercept floatable contaminants flowing off the road right of way.

D. Erosion & Siltation Control: In addition to catch basins as per 7.04, measures such as the following shall be taken as necessary in construction to prevent erosion and to prevent silt from being carried into bodies of water:

1. Excavation and grading shall be done in a manner to maintain the drainage of the worksite and to minimize the exposure of soil to the action of precipitation or flowing ground water.
2. When possible, existing natural vegetation shall be left intact.
3. Exposed slopes when completed shall be given appropriate protection as soon as practical, e.g., grass or other ground cover, riprap, or retaining walls.
4. The provisions of Section 3, Temporary Erosion/Sedimentation Control, of the Drainage Guidelines shall apply. This shall include the implementation of an effective temporary erosion/sedimentation control plan approved by the Engineer prior to starting any clearing and grubbing operations.

Reference: Except as specified below, King County bridges, whether on public or private roads serving subdivided land, shall be designed and constructed to meet the minimum requirements set forth in the latest edition, including all interim editions of "Standard Specifications for Highway Bridges," adopted by AASHTO. All new bridges shall be designed to carry an AASHTO HS 20-44 live load or greater.

Geometrics:

In the general case, the bridge roadway shall comprise the full width and configuration of the road being served -- traveled way plus curb, sidewalk, walkway, bicycle lane, equestrian lane, and/or shoulder on one or both sides. Requirements of other utilities shall be duly considered.

Where the typical speed is 35 MPH or higher and significant pedestrian, bike and/or horseback traffic can be expected, the Engineer may require that the lane for these secondary modes be separated from motor vehicle traffic by use of a bridge traffic rail and further protected by a pedestrian rail at outer edge. See Washington State Department of Transportation Highway Design Manual, particularly Section 330.04(5).

Rural area arterial bridges over 100 feet in length may be 6 feet narrower than the width of the roadway served subject to approval by the Engineer, but no narrower than 28 feet.

Traffic and pedestrian railings or combination traffic-pedestrian railings shall meet AASHTO specifications.

Overhead vertical clearances on the travelled roadway or under overpasses shall be 16.5 feet minimum.

Bridge Design Criteria: Criteria under other recognized road and bridge classifications such as those of the Federal-Aid Rural Area Design Standards, may be applied in conditions deemed appropriate by the Engineer.

8.04

Special Permits: Include but are not limited to the following:

- A. Bridges over navigable waterways require U.S. Coast Guard approval.
- B. Bridges over other waterways require the Engineer's approval in regard to location, location and shape of hydraulic opening, height of superstructure over water, location of piers, channel improvement, and other hydraulic considerations.
- C. Bridges over waterways supporting aquatic life require approval from the Washington State Departments of Fisheries, Game and Ecology.
- D. Bridges located on shorelines or in wetlands as defined in King County Title 20.40 require permit from King County Department of Planning and Development, subject to concurrence from the State Department of Ecology.
- E. Bridges crossing major rivers within King County may require a Control Zone Permit from the State Department of Ecology issued by the King County Division of Hydraulics.

g Policy

to be located within the County road right of way shall be constructed in accordance with current franchise and permit procedure and in compliance with these standards. In their use of the right of way, utilities shall be given consideration for traffic carrying requirements of the roadway which are, namely, to provide efficient and convenient passage for motor vehicles, pedestrians, and other users. Aesthetics shall be a consideration. As a matter of policy, undergrounding of utilities will be strongly encouraged, particularly in urban development.

Utilities Locations

Utilities shall be located within the right of way on new roads or in roadways where existing topography, or storm drains are not in conflict, shall be located as shown in typical Drawing Nos. 1 through 7, and as indicated below. Where existing utilities or mains are in place, new utilities shall conform to these Standards as nearly as possible and yet be compatible with the existing installations. Exceptions may be made when necessary to meet the special requirements of overhead utilities where roadway space is limited, planned unit developments, short subdivisions, theme parks, multi-family developments and commercial developments.

and water lines:

Shoulder-and-Ditch Section:

If practical: Outside of ditch line.

Otherwise: In shoulder 3 feet from edge of travel lane.

Curb and Gutter Section:

Preferable: 1.5 feet back of curb, or at distance which will clear root masses of street trees if these are present or planned for.

Otherwise: 10 feet from centerline. Mains and service connections to all lots should be completed prior to placing of surface materials.

Designated side of centerline:

GAS: South and West; WATER: North and East

Depth: 3.0 feet minimum from finished grade.

Sanitary Sewers: 5 feet south and west of centerline; depth 4 feet minimum from finished grade.

- C. Sanitary and water lines shall be separated in accordance with practice such as the Recommended Standards for Waterworks, a Code of the Great Lakes - Upper Mississippi River Board of State Sanitary Engineers known as the "10-State Standard," specifically Section 8.4.
- D. Gravity systems, whether sanitary or storm drainage, shall have no other systems in planning and installation.
- E. Electric utilities, power, telephone, cable TV:
 - Preferable: Underground, either side of road, at plan location with other utilities and storm drains.
 - Otherwise: On poles set back of ditchline or sidewalk, at locations with driveways, intersections, and other essential road features. Where practical, utilities should share facilities so that a minimum of poles and preferably on only one side of road.
- F. Notwithstanding other provisions, underground systems shall be installed five feet away from road centerline and where they will not conflict with existing survey monumentation.

9.03 Underground Pipe Materials & Installation

Water mains and sanitary sewer pipe installed in the public right of way shall conform to the provisions of Division III and Division IV of the Washington Standard Specifications, current edition, except as otherwise provided.

9.04 Scheduling of Utilities Installation & Relocation

- A. Pole utilities and underground utilities, including service connections, shall be installed or relocated prior to the start of road construction where transverse cuts and fills are minimal and location of road elements can be determined in advance. Otherwise such utilities, with connections, shall be relocated after the subgrade has been completed but before surfacing is placed.
- B. As a matter of policy, utility trenching or transverse cuts in paved areas are discouraged. They will not be permitted unless it can be shown that such as boring or jacking or relocating outside the paved area is necessary.

s the utility can be installed just prior to reconstruction or overlay of road. In instances where trenching or cutting is permitted, backfilling be done in accordance with Section 7-04.3(3) of the State Standard specifications and the road surface shall be restored at least equal to the existing pavement. If a firm and presentable surface even with the existing pavement is not achieved, the Engineer may require remedial action such as the restoration or overlaying the backfilled trench and adjacent areas of the roadway.

10.00 INSPECTION

10.01 Basis for Control of the Work

- A. Work performed in the construction or improvement of County roads for a private developer, by County forces, or by County contractors to the satisfaction of the Engineer and in accordance with approved plans (Section 2.00). It is emphasized that no work may be started until plans are approved. Any revision to such plans shall be approved by the Engineer before being implemented.
- B. The Engineer shall have authority to enforce the Standards as well as those referenced or pertinent specifications. He will appoint project assistants, and inspectors as necessary to inspect the work and exercise such authority as the Engineer may delegate.
- C. Provisions of Section 1-05 of the State Standard Specifications shall be understood that the term "Engineer" therein shall be construed to mean County Road Engineer as defined in Section 1.09 of the County Standard Specifications.

10.02 Subdivision Road Inspections

On all plat road construction, inspections will be done by the ^{CONSTR} ~~Operat~~ his designated Plat Inspectors. Unless otherwise instructed by the County Engineer, inspections will be made as follows:

- A. Inspection No. 1: temporary water detention/retention and silt traps in accordance with paragraph 7.05 above and Section 3 of "Drainage Recommendations" in latter part of Drainage Guidelines.
- B. Inspection No. 2: underground drainage, at stage that trenching and pipe are complete but prior to cover.
- C. Inspection No. 3: general roadway, at stage that drainage system, utilities, and roadway grading to suitable subgrade are complete and gravel ballast if required.
- D. Inspection No. 4: general roadway, at stage that crushed gravel base course has been placed, as well as curbing if required.
- E. Inspection No. 5: general roadway, while paving is in progress.

Inspection No. 6: overall roadway, final, after paving, clearing of drainage system and all necessary clean-up.

Structural Inspections: at critical stages of foundation, placement and assembly of components, and final completion and test, as directed by the Engineer.

Procedures Required to Notify

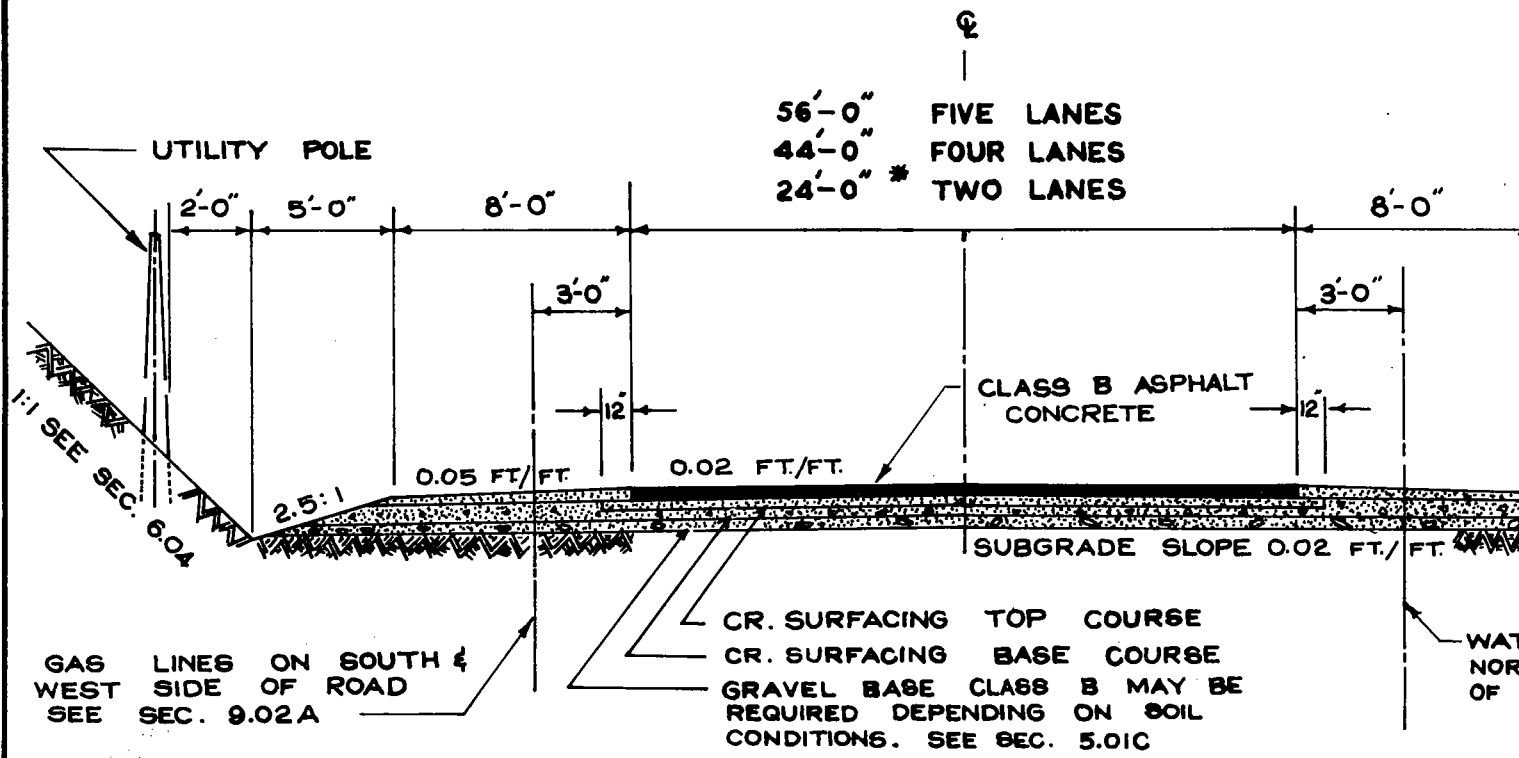
The developer shall notify the Department of Public Works in advance of each inspection. Failure to comply will necessitate appropriate testing and certification by the King County Soils and Materials Laboratory. Costs of such testing and certification shall be borne by the developer. At the time that such tests are directed by the Engineer, no further work will be permitted on the platform until all tests have been completed and all corrections have been made, to the satisfaction of the Engineer.

Appeals to Inspection Sequence

If the developer believes that the inspection sequence indicated above does not fit the requirements of his project, he should make his appeal to the Engineer in advance of the final time to permit revision of the inspection schedule.

County Forces & County Contract Road Inspection

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



* TWO-LANE COLLECTOR ARTERIALS MAY HAVE PAVEMENT WIDTH OF 22'-0"

NOTE:

THIS DRAWING ILLUSTRATES A TYPICAL ASPHALT CONCRETE ROAD SECTION. ACTUAL SURFACING DESIGN SHALL BE BASED ON SOILS AND TRAFFIC ANALYSES, PER SEC. 5.02

SHOULDERS SHALL BE SURFACED AS REQUIRED BY SECTION 4.02 AND 5.00

RIGHT OF

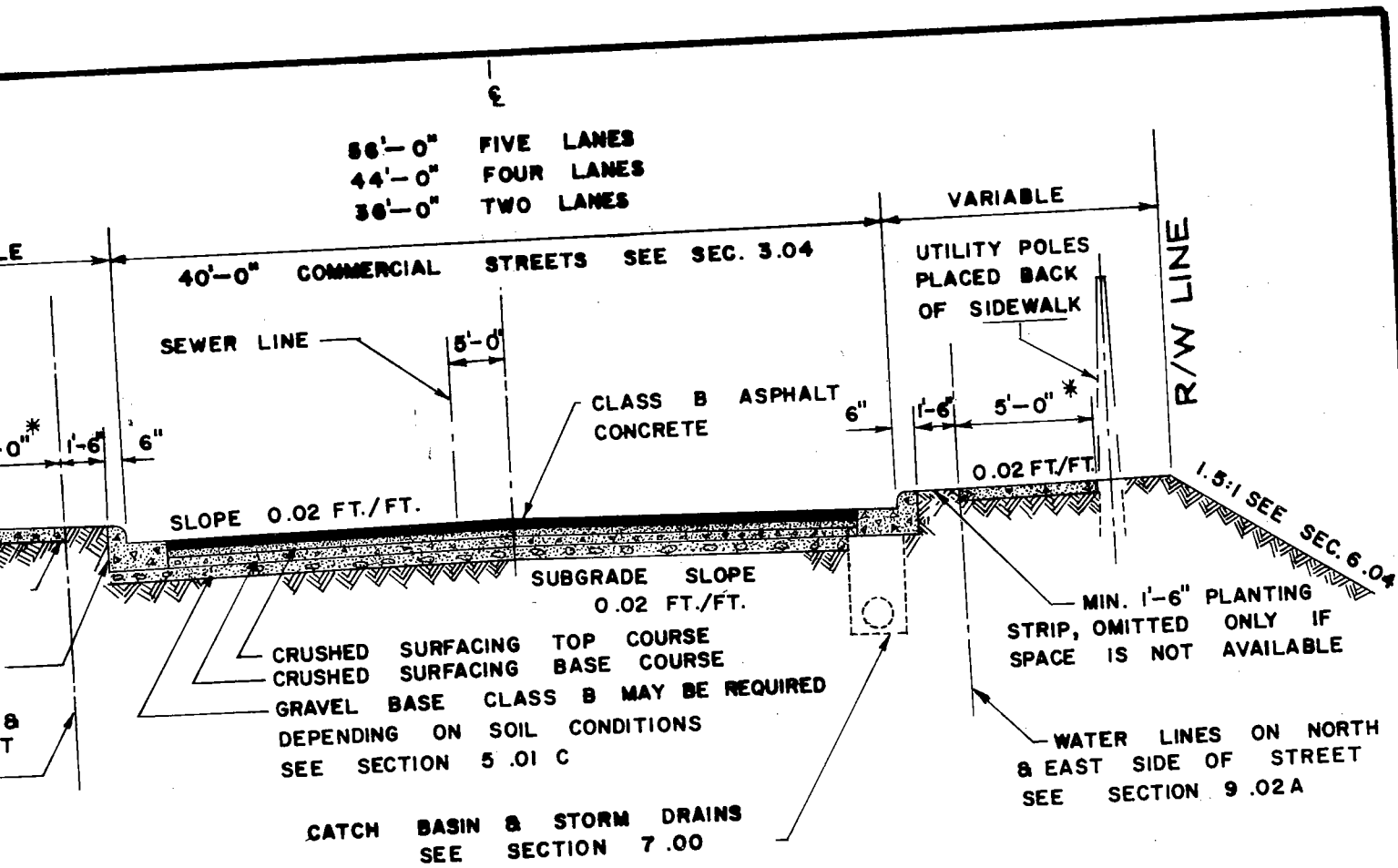
MAJOR ART
SECONDARY
COLLECTOR

DO NOT SCALE

MIN. GRADE 0.5 %
MAX. GRADE SEE SEC. 3.01

**MAJOR, SECONDARY, A
ARTERIALS RURAL D**

KING CO. WASHING



56'-0" FIVE LANES
 44'-0" FOUR LANES
 36'-0" TWO LANES

40'-0" COMMERCIAL STREETS SEE SEC. 3.04

VARIABLE

UTILITY POLES
 PLACED BACK
 OF SIDEWALK

R/W LINE

CLASS B ASPHALT
 CONCRETE

SLOPE 0.02 FT./FT.

SUBGRADE SLOPE
 0.02 FT./FT.

CRUSHED SURFACING TOP COURSE
 CRUSHED SURFACING BASE COURSE
 GRAVEL BASE CLASS B MAY BE REQUIRED
 DEPENDING ON SOIL CONDITIONS
 SEE SECTION 5.01 C

0.02 FT./FT.

1.5:1 SEE SEC. 6.04

MIN. 1'-6" PLANTING
 STRIP, OMITTED ONLY IF
 SPACE IS NOT AVAILABLE

WATER LINES ON NORTH
 & EAST SIDE OF STREET
 SEE SECTION 9.02 A

CATCH BASIN & STORM DRAINS
 SEE SECTION 7.00

RIGHT OF WAY

MIN. GRADE 0.5 %
 MAX. GRADE SEE SEC. 3.01

DRAWING ILLUSTRATES
 ASPHALT CON-
 TION. ACTUAL SUR-
 SIGN SHALL BE
 SOIL & TRAFFIC
 PER SECTION 5.02

MAJOR ARTERIAL	100	FT.
SECONDARY ARTERIAL	84	FT.
COLLECTOR ARTERIAL	60	FT.
COMMERCIAL ARTERIAL	60	FT.

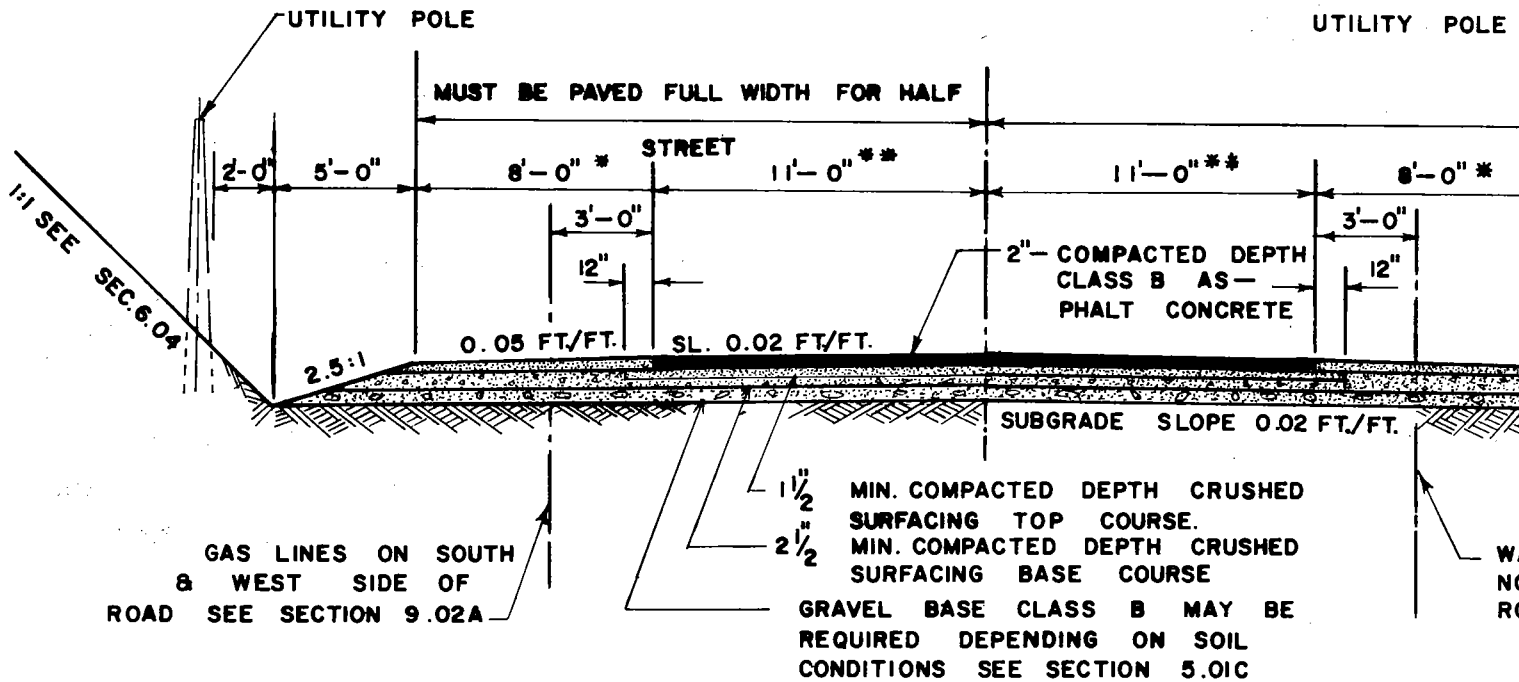
DO NOT SCALE

**MAJOR, SECONDARY, COLLECTOR ARTERIALS
 AND COMMERCIAL STREETS
 URBAN CURB & GUTTER**

SHALL BE 8 FT.
 BUSINESS DISTRICTS. SEE SECTION 4.01C

KING CO. WASHINGTON

DWG. NO. 2



MIN. GRADE 0.5 %
 MAX. GRADE SEE SEC. 3.02

- * SHOULDERS ON MINOR ACCESS STREETS MAY BE 4'-0"
- ** LANES ON MINOR ACCESS STREETS MAY BE 10'-0"

NOTE:

THIS DRAWING ILLUSTRATES A TYPICAL ASPHALT CONCRETE SECTION, ALTERNATIVE I. FOR OTHER ALTERNATIVES AND POSSIBLE REQUIREMENTS FOR INCREASED THICKNESS OF SURFACING MATERIALS, SEE SECTION 5.00

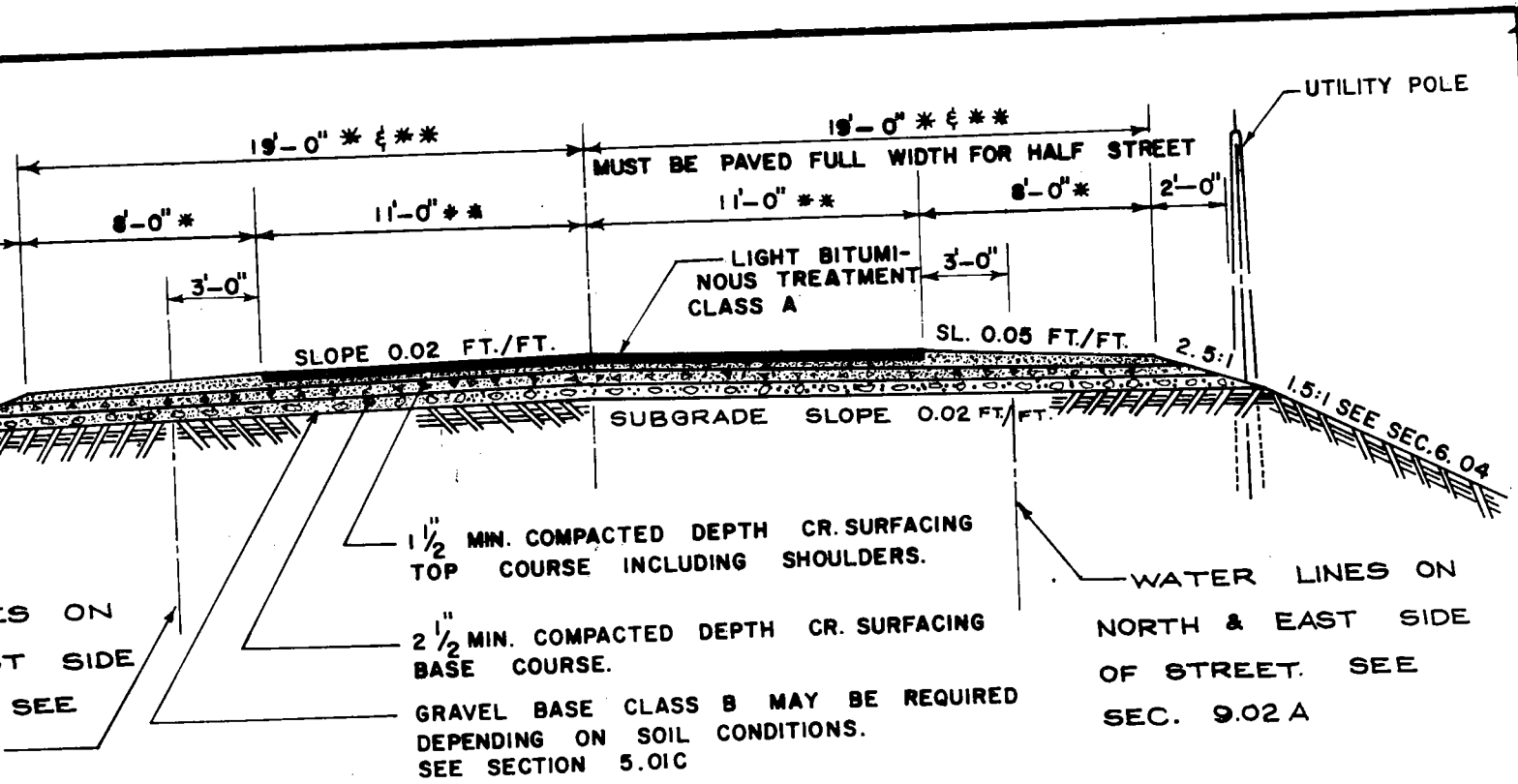
SHOULDERS SHALL BE SURFACED AS REQUIRED BY SECTIONS 4.02 AND 5.01

RIGHT OF WAY
 NEIGHBORHOOD COLL. &
 MINOR ACCESS STREET

DO NOT SCALE

**NEIGHBORHOOD
 LOCAL & MINOR A
 A.C. RURAL DITC**

KING CO. WASHIN



* SHOULDER ON MINOR ACCESS STREET MAY BE 4'-0"

** LANES ON MINOR ACCESS STREETS MAY BE 10'-0"

RIGHT OF WAY:

NEIGHBORHOOD COLLECTOR & LOCAL ACCESS
MINOR ACCESS STREETS

60'
48'

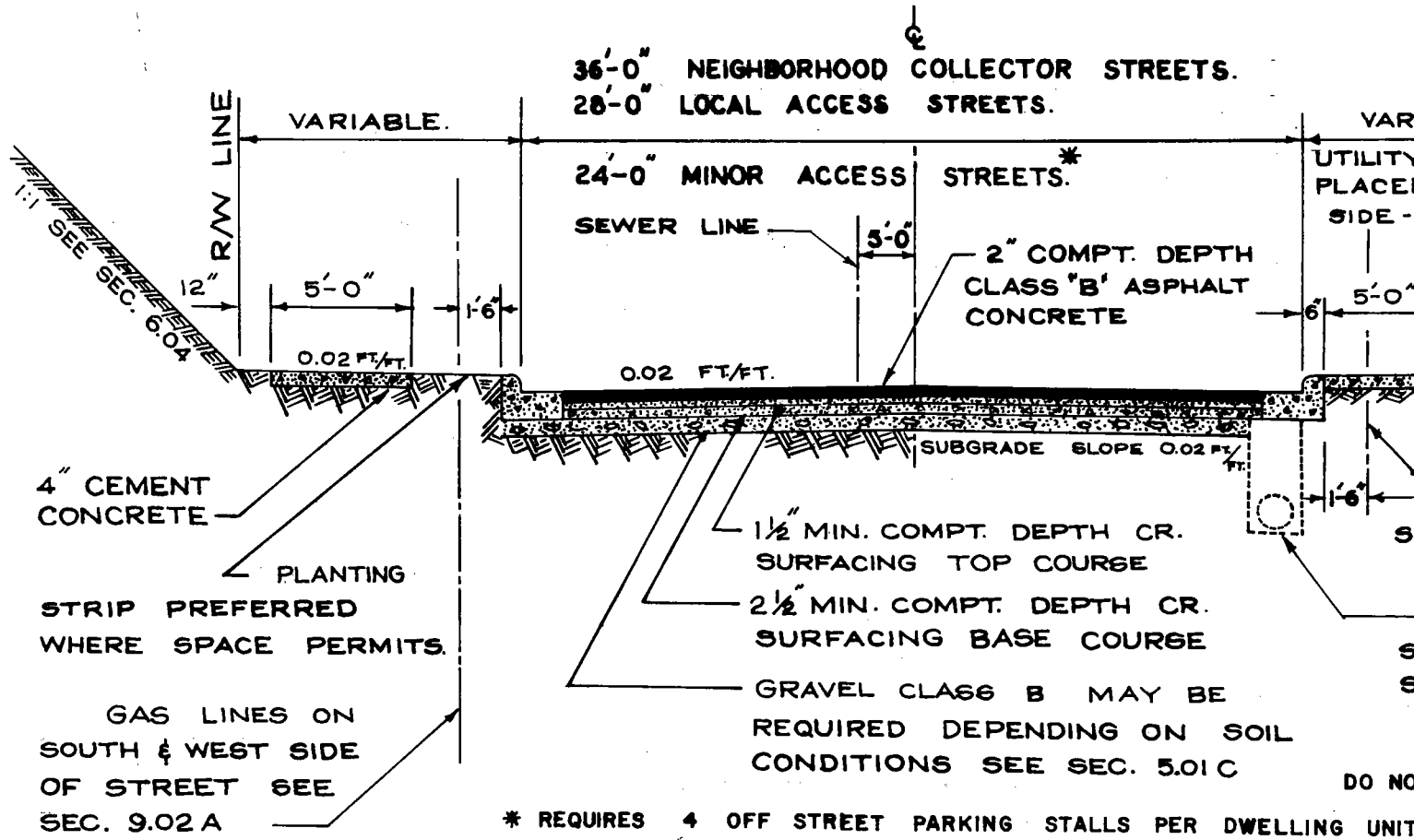
MIN. GRADE 0.5 %
MAX. GRADE SEE SEC. 3.02

DO NOT SCALE

BITUMINOUS SURFACE TREATMENT BE USED ONLY IN AREAS A, F-R, S-E OR G. IN OTHER CATEGORIES ONLY PORTLAND CONCRETE OR ASPHALT CONCRETE IS ACCEPTABLE. OTHERS SHALL BE SURFACED AS PER SECTIONS 4.02 AND 5.01

**NEIGHBORHOOD COLLECTOR
LOCAL & MINOR ACCESS STREETS
L.B.S.T. RURAL DITCH SECTION**

KING CO. WASHINGTON



MIN. GRADE :

MAX. GRADE : SEE SEC.

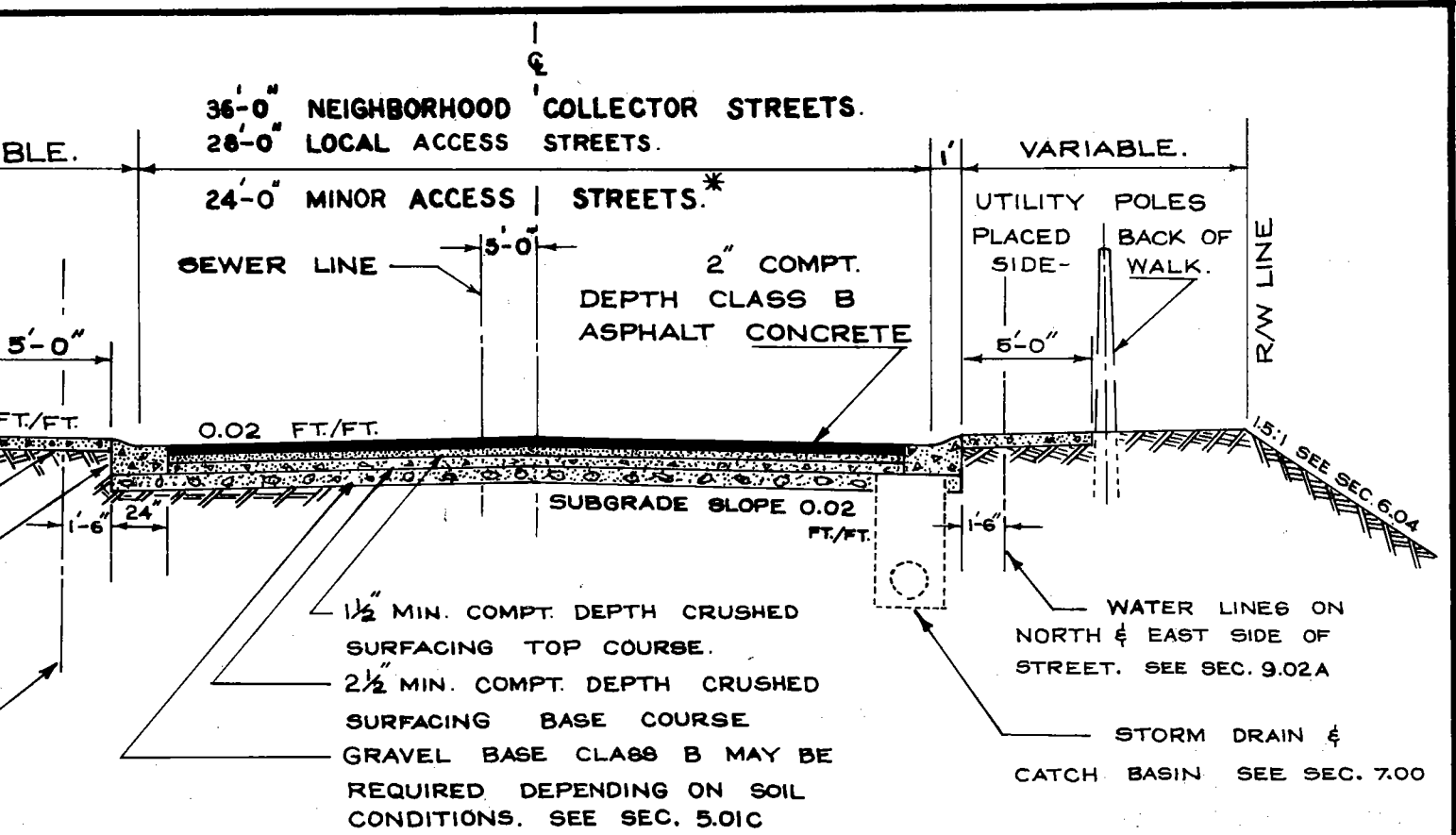
NOTE:

THIS DRAWING ILLUSTRATES A TYPICAL ASPHALT CONCRETE SECTION, ALTERNATIVE I. FOR OTHER ALTERNATIVES AND POSSIBLE REQUIREMENTS FOR INCREASED THICKNESS OF SURFACING MATERIALS SEE SEC. 5.00

RIGHT OF WAY:

NEIGHBORHOOD COLLECTOR STREETS	56'
LOCAL AND MINOR ACCESS STREETS	48'

<p>NEIGHBORHOOD LOCAL & MINOR AC URBAN CURB & GU</p>
<p>KING CO. WASHINGT</p>



REQUIRES 4 OFF STREET PARKING STALLS PER DWELLING UNIT DO NOT SCALE

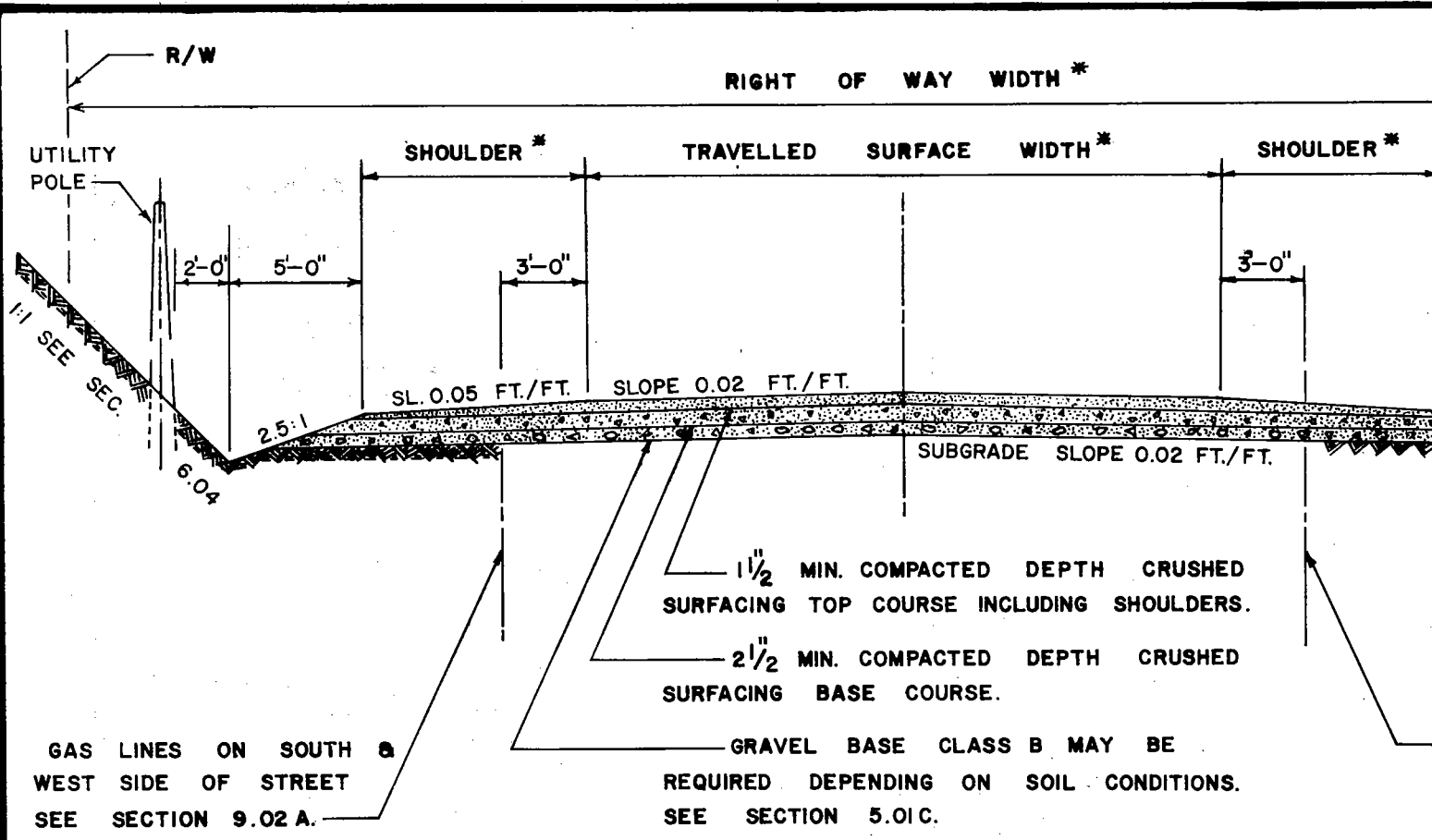
MIN. GRADE : 0.5 %
 MAX. GRADE : SEE SEC. 3.02

DRAWING ILLUSTRATES A
 HALT CONCRETE SECTION
 I. FOR OTHER ALTERNATIVES
 E REQUIREMENTS FOR IN-
 CKNESS OF SURFACING MAT-
 SEC. 5.00

WAY :
 ECTOR STREETS. 56'
 ACCESS STREETS. 48'

**NEIGHBORHOOD COLLECTOR
 LOCAL & MINOR ACCESS STREETS
 URBAN ROLLED CURB SECTION**

KING CO. WASHINGTON



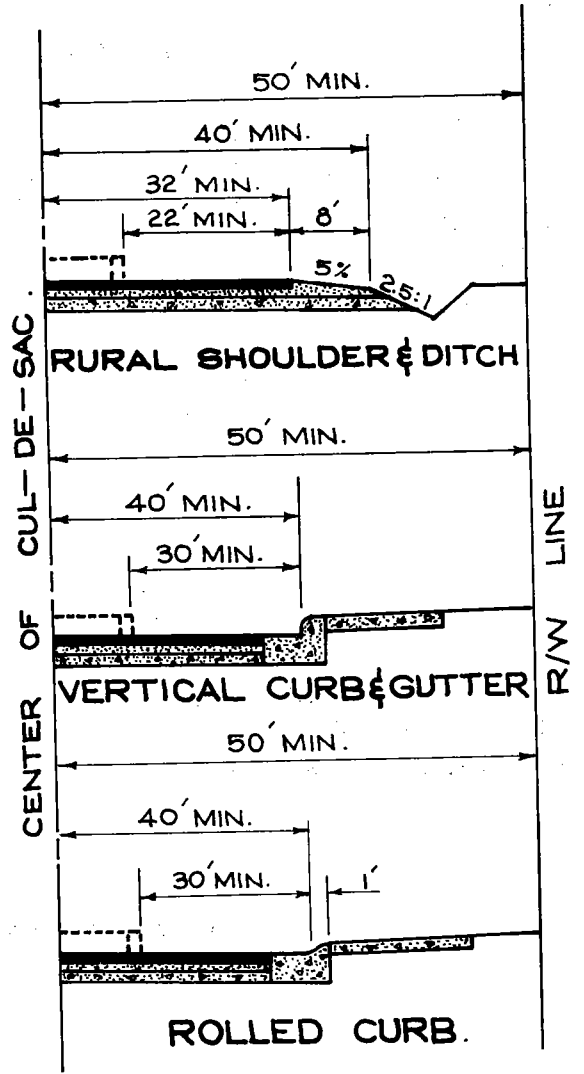
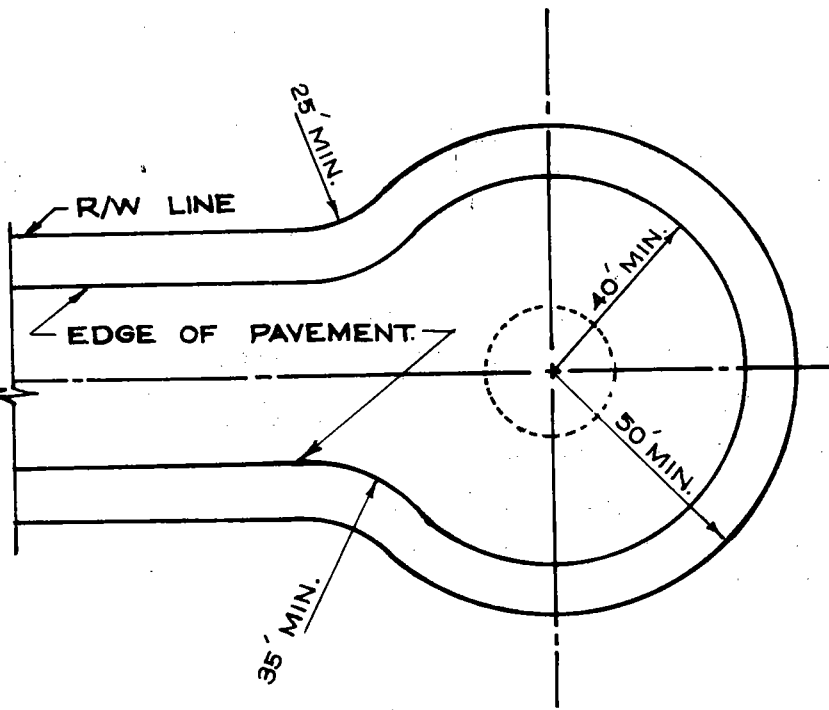
* SEE SHORT PLAT ORDINANCE FOR DIMENSIONS:

DO NOT SCALE

MIN. GRADE 0.5 %
 MAX. GRADE 12.0 %

**PRIVATE GRAVEL SURFACE
 RURAL DITCH**

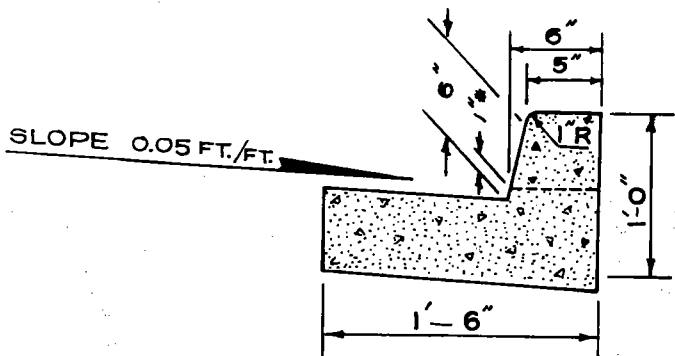
KING CO. WASH



DO NOT SCALE

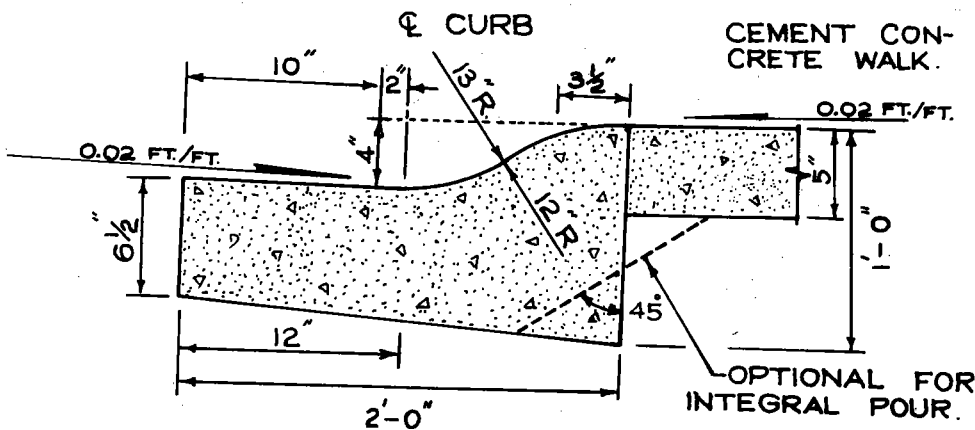
CENTER OF BULB
 EDGE OF VERTICAL CURB
 KING NO. 9
 MANDATORY WHEN
 PAVED AREA EX-

LOCAL OR MINOR ACCESS CUL-DE-SAC
 KING CO. WASHINGTON

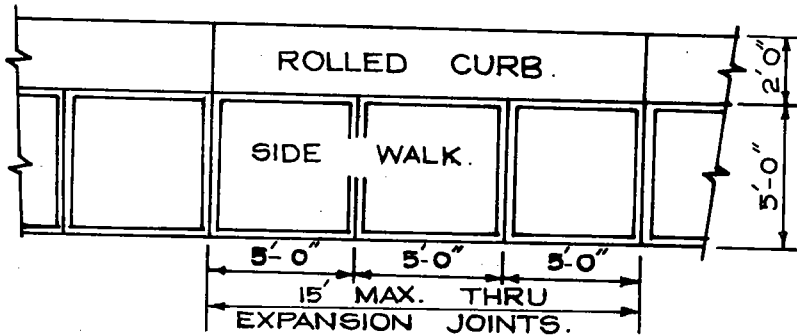


* NOTE: TOP CURB @ DRIVEWAYS.

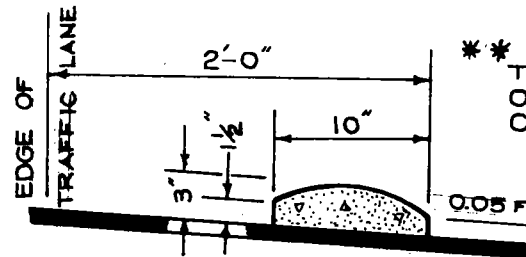
CEMENT CONCRETE CURB & GUTTER.



CEMENT CONCRETE ROLLED CURB.

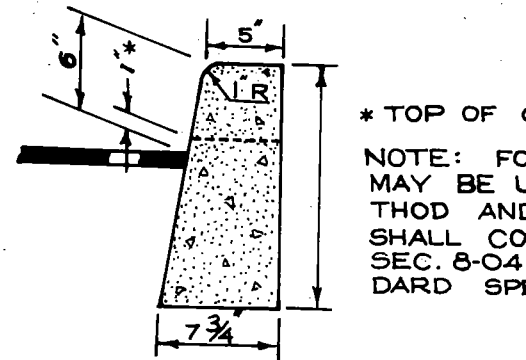


PLAN VIEW SIDEWALK & ROLLED CURB.



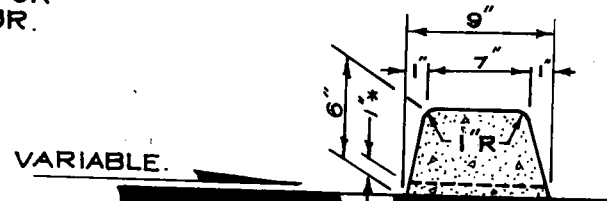
NOTE: DELETE AT DRIVEWAYS AND ALSO 10 FT. BREAKS EVERY

MOUNTABLE CEMENT CONCRETE CURB.



* TOP OF CURB @ DRIVEWAYS.
NOTE: FORMWORK MAY BE USED. METHOD AND MATERIALS SHALL COMPLY WITH SECTION 8-04 STANDARD SPECIFICATIONS.

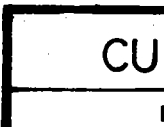
CEMENT CONCRETE CURB.

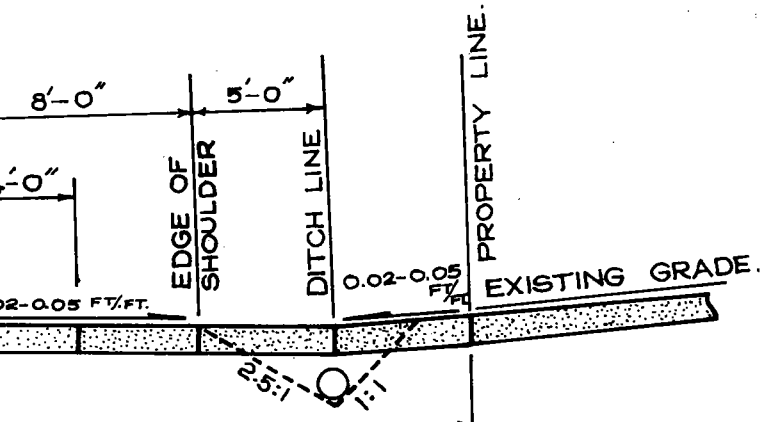
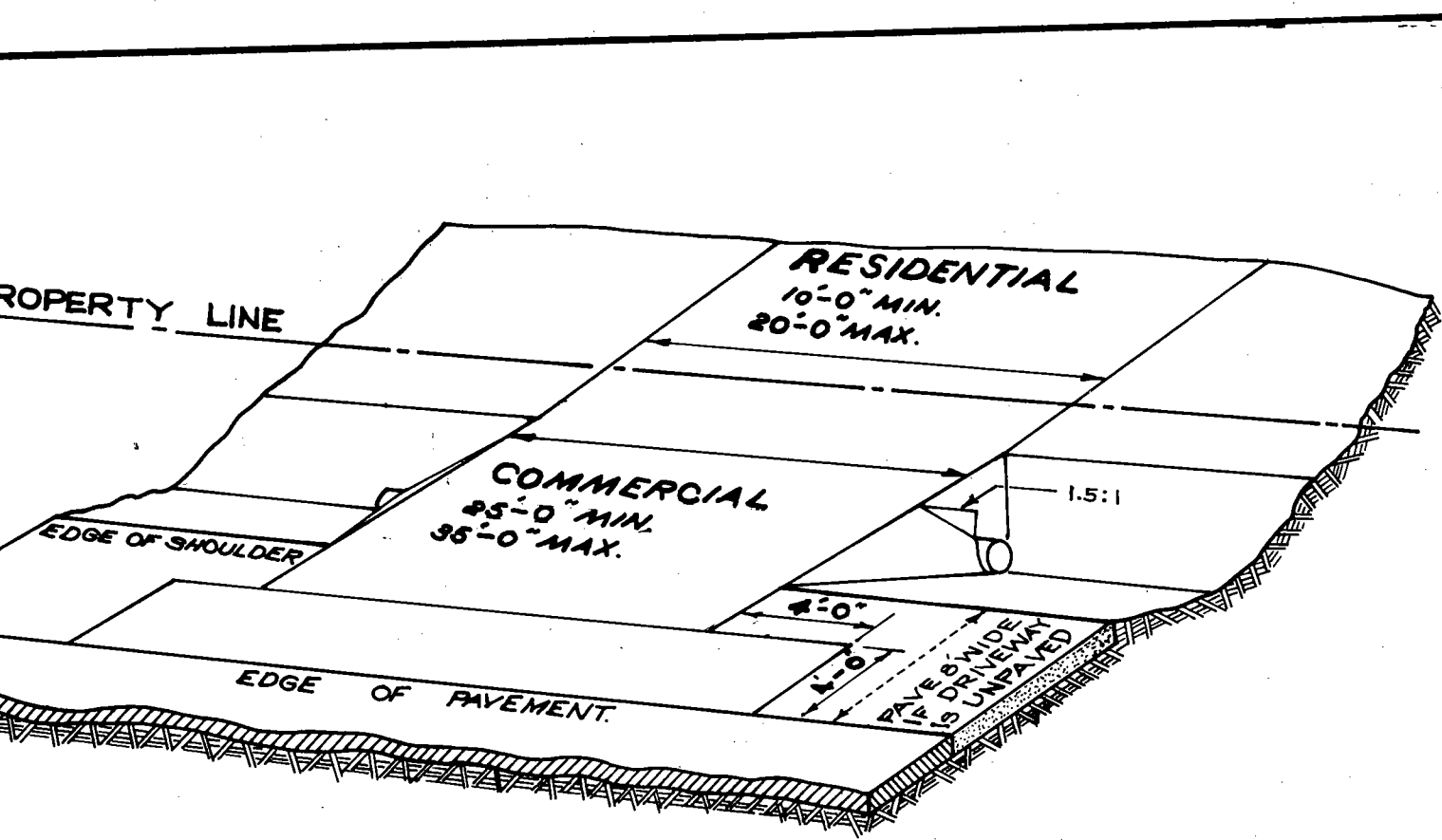


* TOP OF CURB @ DRIVEWAYS.

EXTRUDED ASPHALT OR CEMENT CURB.

DO NOT SCALE





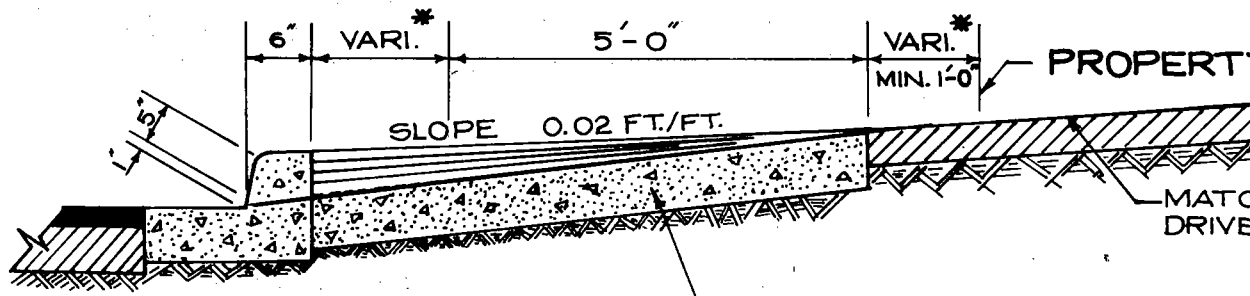
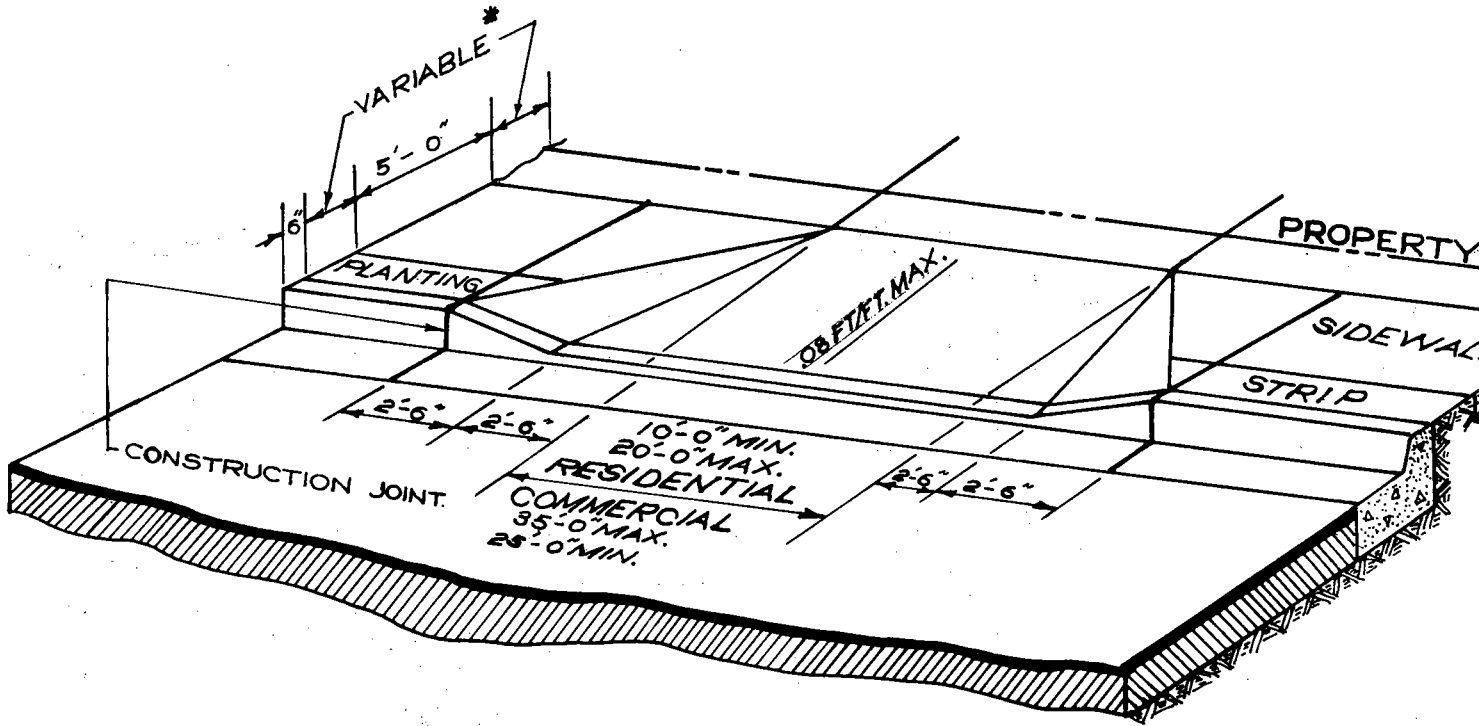
- CULVERT PIPE SHALL BE:**
1. 12" MIN. DIA.; LARGER DIA. IF DRAINAGE REQUIRES.
 2. CONCRETE INSTEAD OF METAL UNLESS CONCRETE OR MASONRY HEADWALLS OF ACCEPTABLE DESIGN ARE PROVIDED.
 3. COVERED AT LEAST 6"

DO NOT SCALE

SURFACING MAY BE SIMILAR TO SHOULDER ALTERNATIVES, BUT NOT P.C. CONCRETE. SEE SECTION. 5.01

DITCH SECTION DRIVEWAY

KING CO. WASHINGTON

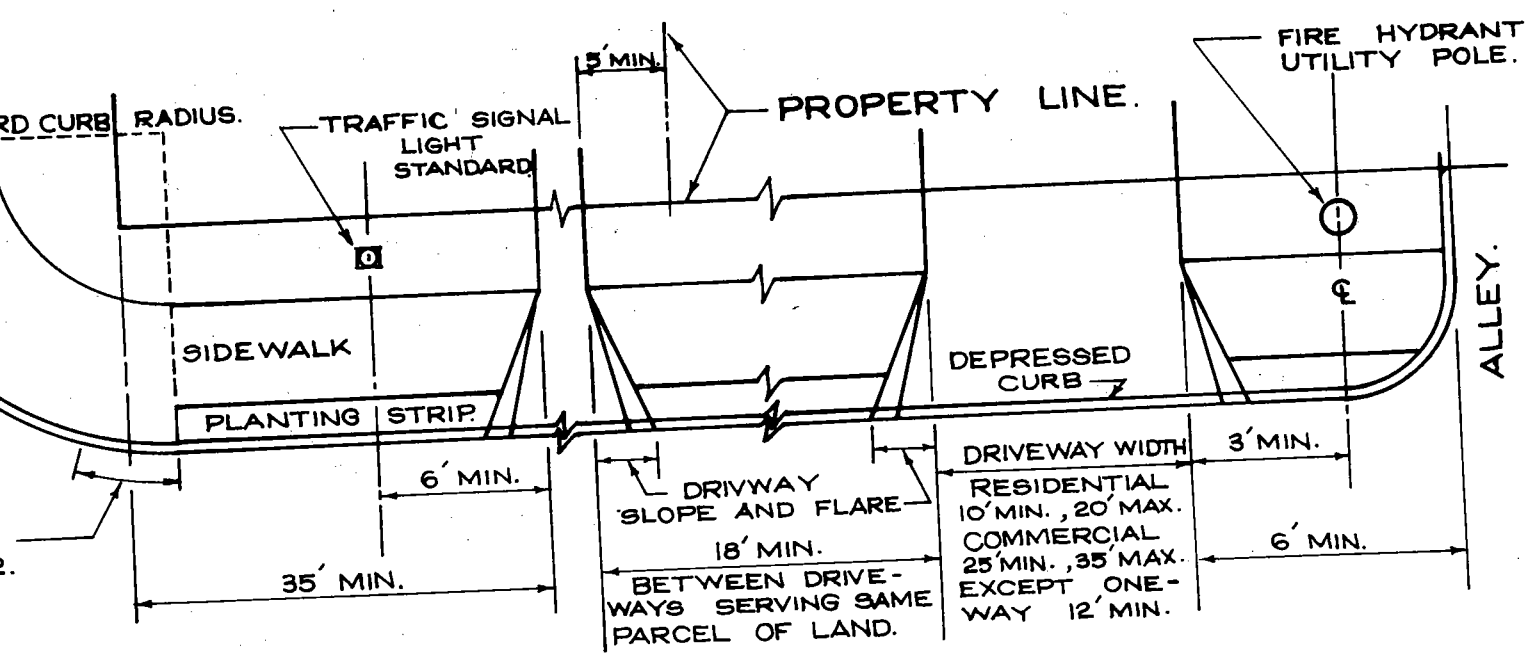


CEMENT CONCRETE DRIVEWAY 5" THICK.

* 1'-0" MIN. BETWEEN SIDEWALK AND PROPERTY LINE

DO NOT SCALE

CURB AND GUTTER SECTION
KING CO. WASHINGTON



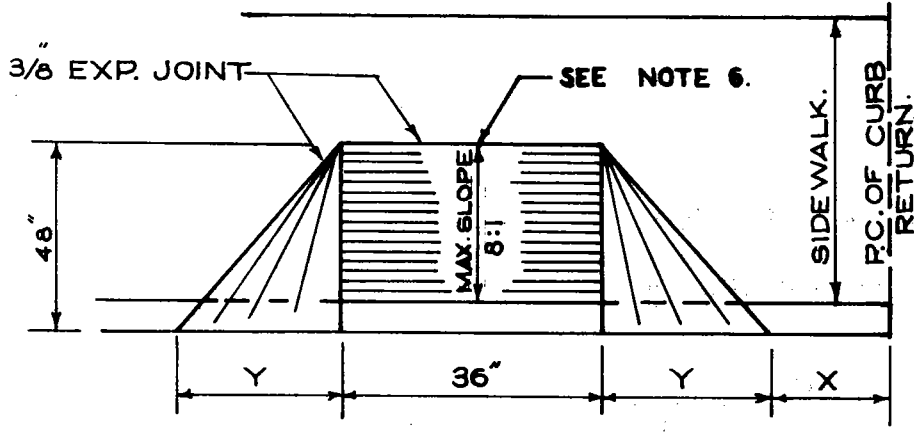
DO NOT SCALE

WHERE CURB RADIUS IS LESS THAN STANDARD 35', NO PORTION OF DRIVEWAY WIDTH (LESS FLARE AND FLARE) MAY ENCR OACH IN CURB RETURN. WHERE RADIUS IS 35' OR MORE DRIVEWAY WIDTH MAY ENCR OACH IN CURB RETURN UP TO 10' END OF CURB RETURN UP TO 10' OF ARC ON CURB RETURN, AT LEAST 75% OF ARC FREE OF ENCR OACHMENT. NOT COUNT-SECTION.

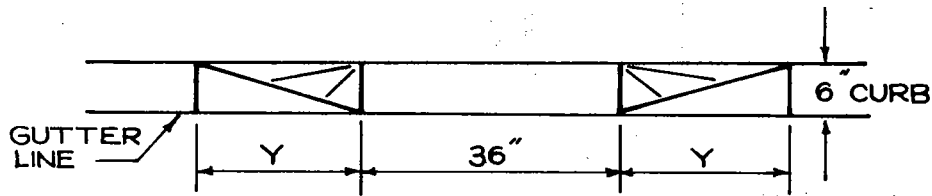
LOCATION AND WIDTH OF NEW DRIVEWAYS

KING CO. WASHINGTON

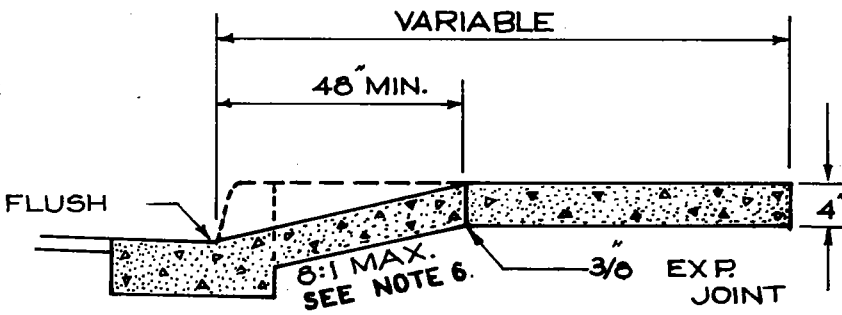
DWG. NO. 12



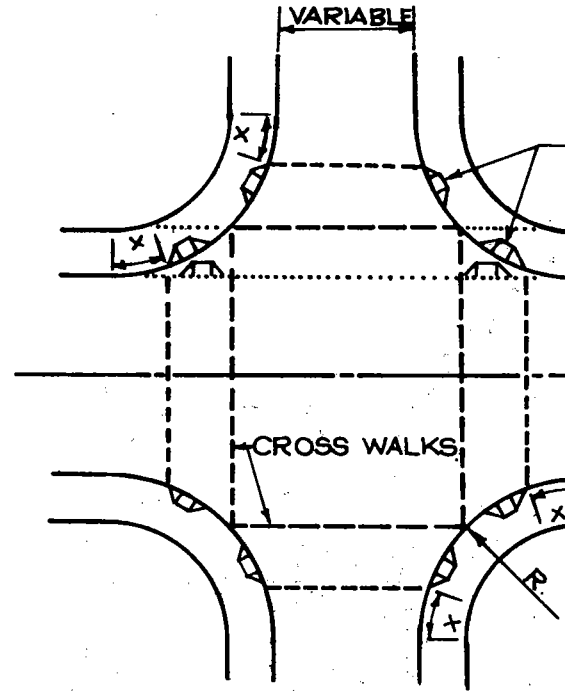
PLAN VIEW.



FRONT VIEW.



SIDE VIEW.

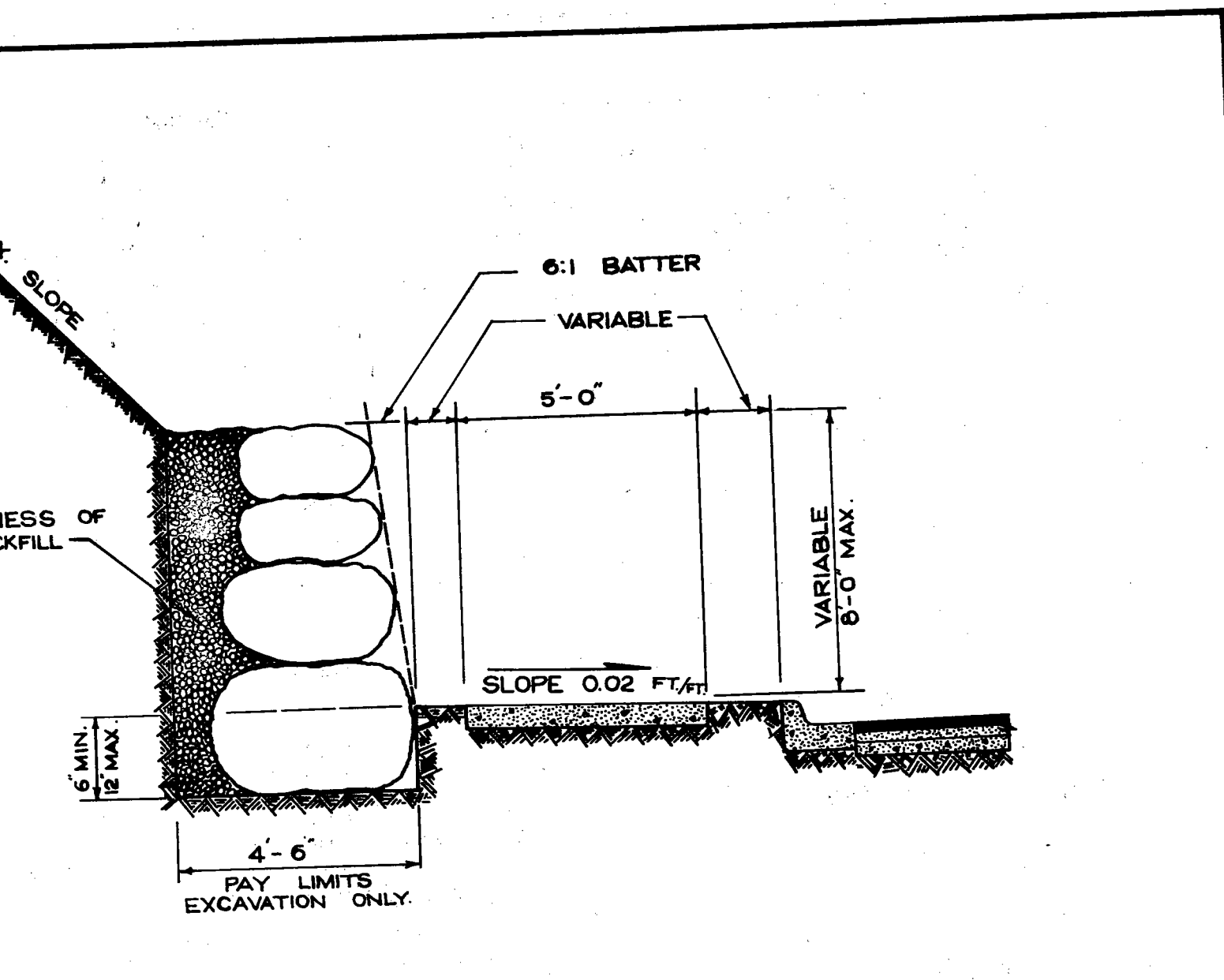


RAMP LOCATION

NOTES:

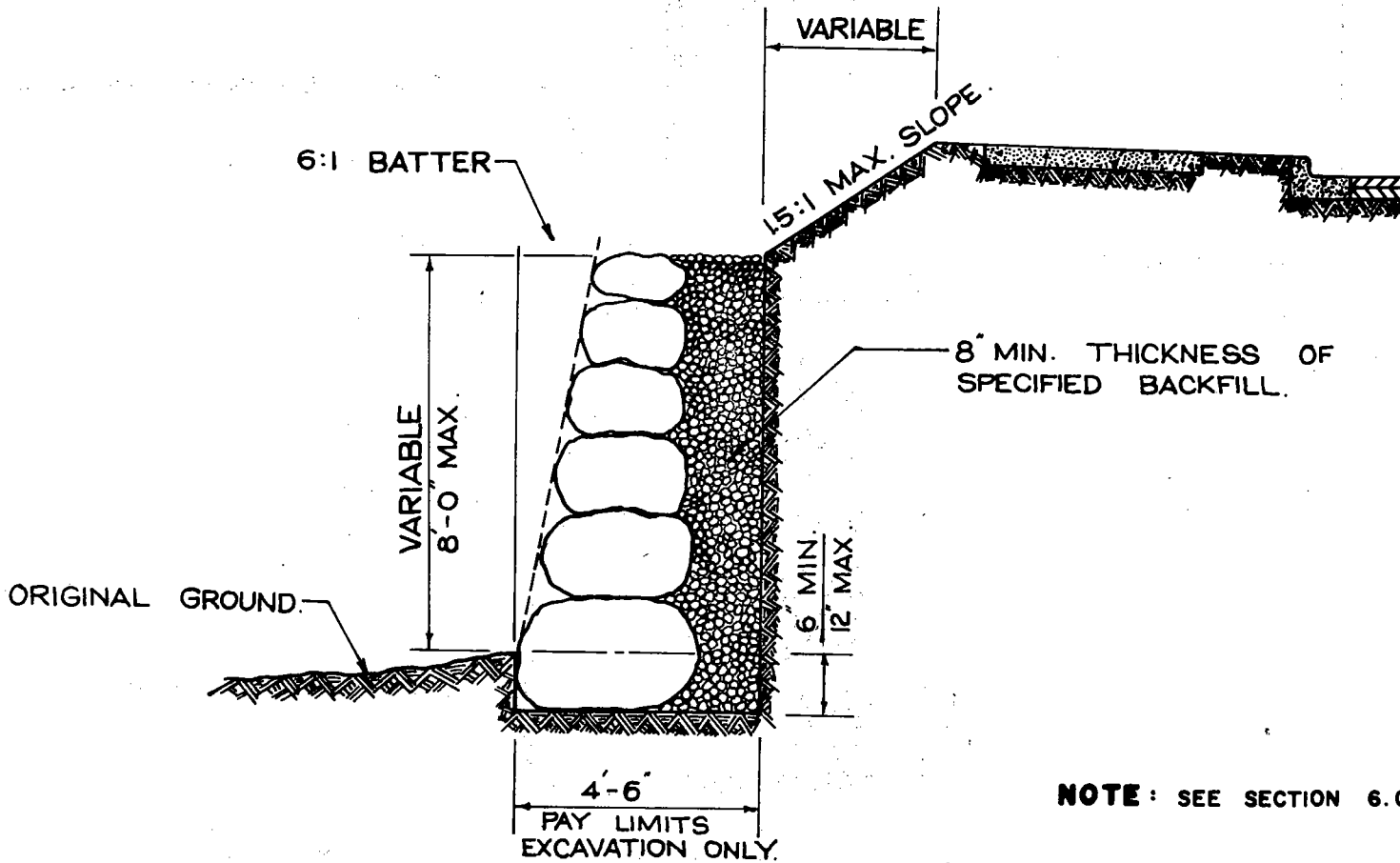
1. CATCH BASIN AND INLETS SHALL BE CONSTRUCTED TO PROVIDE A WHEEL CHAIR RAMP (24" MIN. CLEARANCE).
2. CARE SHALL BE TAKEN TO AVOID CONFLICTING WITH HYDRANTS AND OTHER UTILITIES.
3. THE RAMP MAY HAVE A CURB SURFACE APPROVED BY THE ENGINEER.
4. CROSS WALKS ARE NOT ALWAYS REQUIRED.
5. X AND Y ARE MEASURED AT CURB.
6. WHILE 8:1 IS MAX. STEEPNESS OF RAMP, A 12:1 RAMP MAY BE MADE 12:1 WHEREVER SPACE PERMITS.
7. WHEN RAMPS ARE CONSTRUCTED AT CORNERS, THEY SHALL BE ON OPPOSITE SIDE OF STREET.

DO NOT SCALE



SEE SEC. 6.03

**ROCK RETAINING WALL
 CUT SECTION**
 KING CO. WASHINGTON

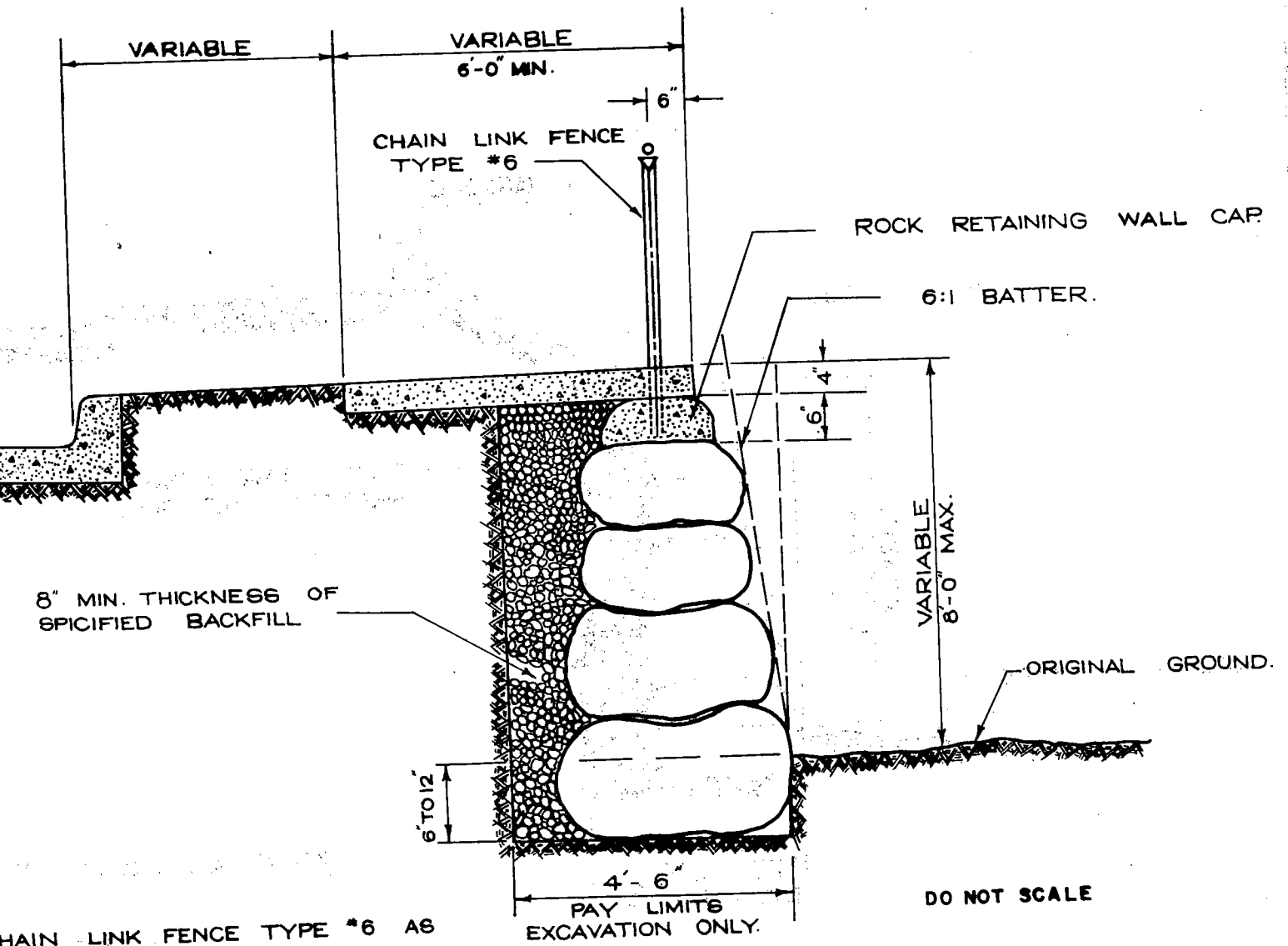


NOTE: SEE SECTION 6.0

DO NOT SC

**ROCK RETAINING WALL
FILL SECTION**

KING CO. WAS



CHAIN LINK FENCE TYPE #6 AS

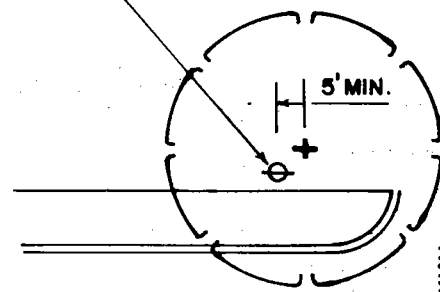
HANDRAIL AS ALTERNATE.
HANDRAIL REQUIRED WHEN
IS 3' OR MORE IN HEIGHT.
6.03

ROCK RETAINING WALL UNDER SIDEWALK

KING CO. WASHINGTON

DWG. NO. 16

FIRE HYDRANT;
UTILITY POLE



5' MIN.

ALLEYWAY.

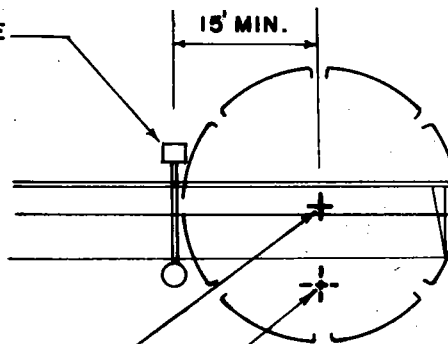
10' MIN.

SIDEWALK NEXT TO

50' MIN.

LUMINAIRE

15' MIN.



DRIVEWAY.

PARKING
STRIP

10' MIN.

50' MIN.

NOTE 1.

(1). TREES MAY BE PLANTED EITHER IN PLANTING STRIP OR BEHIND THE SIDEWALK.

(2). MIN. PLANTING STRIP WIDTH (DISTANCE BETWEEN SIDEWALK AND NEAREST EDGE OF CURB) FOR PLANTING TREES = $2\frac{1}{2}$ FT.

(3). MIN. DISTANCE FROM CENTER OF TREE TO NEAREST EDGE OF CURB = $2\frac{1}{2}$ FT.

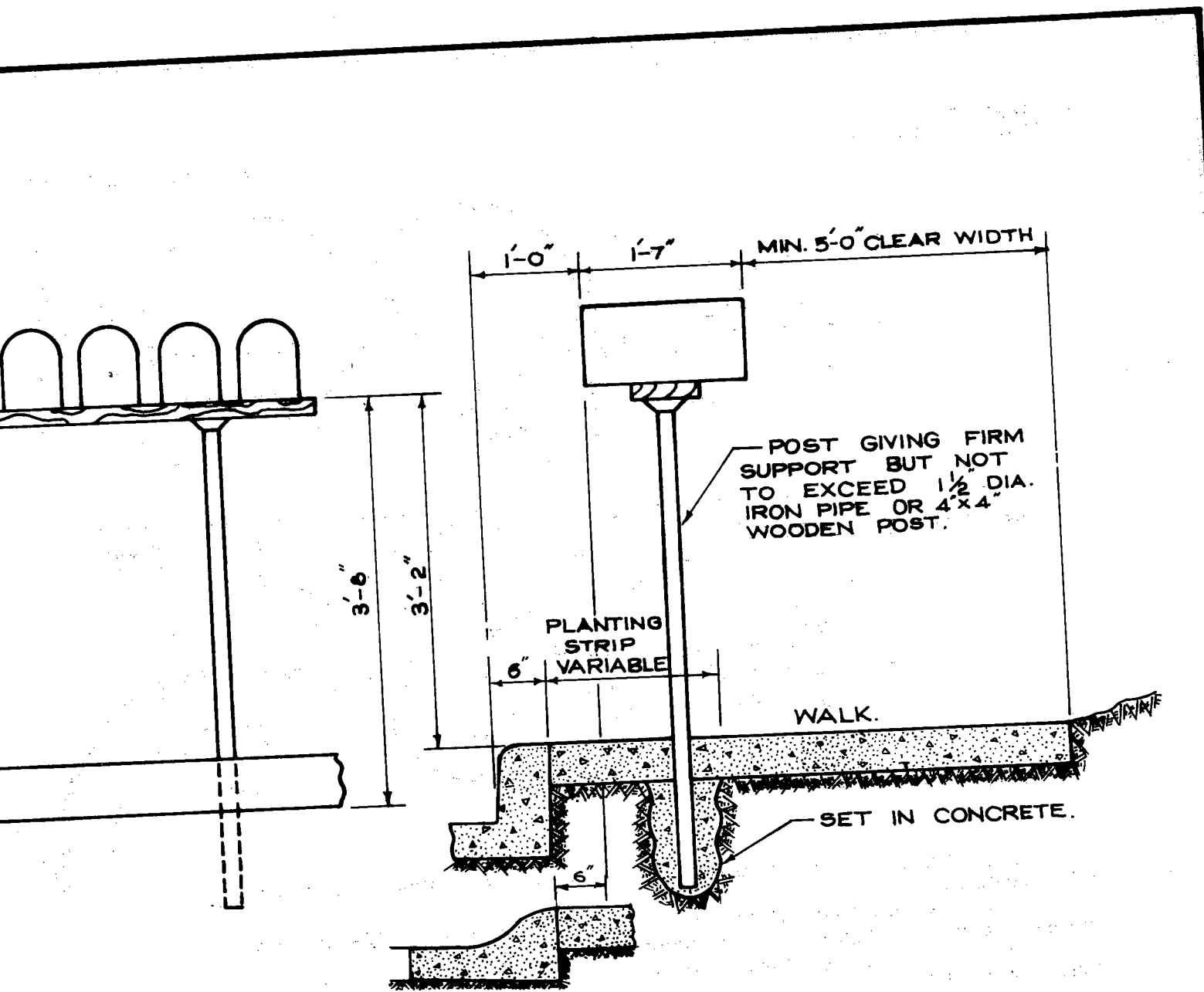
(4). TREES SHALL BE STAKED IN A MANNER NOT TO OBSTRUCT SIDEWALK TRAFFIC.

(5). MIN. CLEAR SIDEWALK WIDTH SHALL BE 5 FT.

(6). SEE SECTION 6.05

STREET TREE

KING CO. WA



EC. 6.06

DO NOT SCALE

RESIDENTIAL MAILBOX MOUNTING
SUGGESTED ARRANGEMENT

KING CO. WASHINGTON

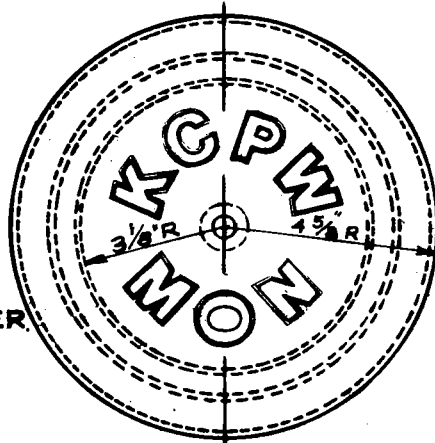
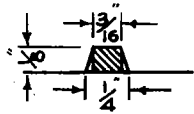
DWG. NO. 18

THE CASTINGS SHALL BE GRAY IRON CASTING ASTM. DESIGNATION A-48, CLASS 40. THE COVER AND SEAT SHALL BE MACHINED SO AS TO HAVE PERFECT CONTACT AROUND THE ENTIRE CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.

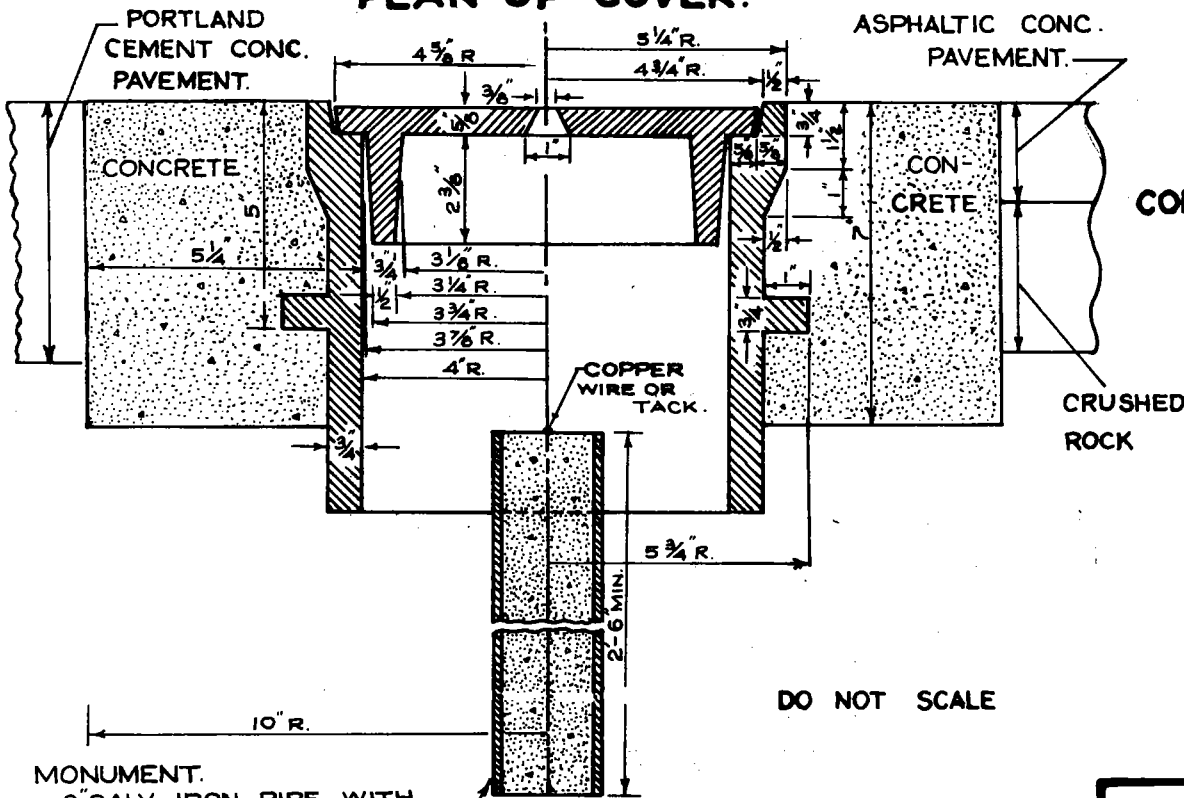
APPROXIMATE WEIGHTS STANDARD

CASE	60	LBS.	PLAN.
COVER	19	LBS.	
TOTAL	79	LBS.	

SECTION OF LETTER.



PLAN OF COVER.



**ALTERNATE :
CONCRETE SURVEY
MONUMENT.**

NOTES:

- COPPER WIRE OR TACK.
- CONCRETE SHALL BE CLASS A MIX
- A 12" LENGTH OF NO. 8 DEFORMED STEEL BAR SHALL BE PLACED IN THE MONUMENT

DO NOT SCALE

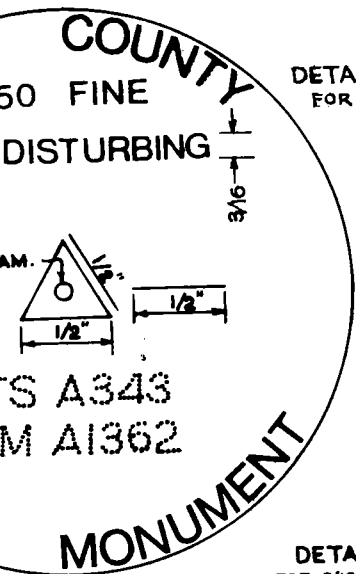
ELEVATION.

MONUMENT.
2" GALV. IRON PIPE WITH CONCRETE CORE FOR GENERAL USE. (TO BE SET BY ENGINEER)
ALTERNATIVELY, CONCRETE SURVEY MONUMENT, DETAIL AT RIGHT, MAY BE USED

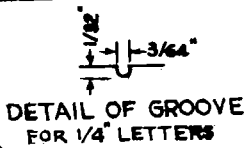
SECTION.

ROADWAY
MONUMENT WITH

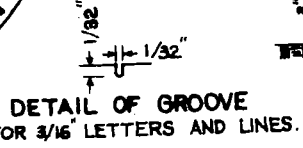
KING CO. WASH



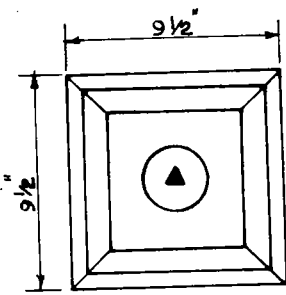
PLAN.
S DISC.



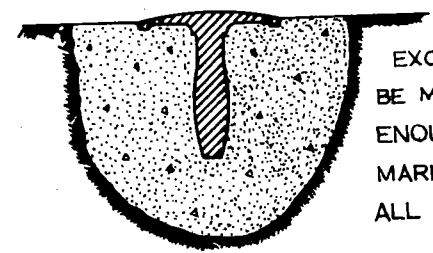
DETAIL OF GROOVE
FOR 1/4" LETTERS



DETAIL OF GROOVE
FOR 3/16" LETTERS AND LINES.

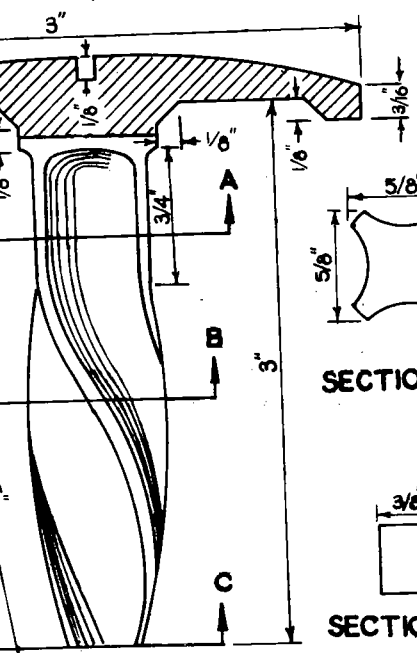


PLAN

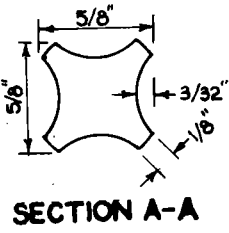


EXCAVATION TO
BE MADE LARGE
ENOUGH TO CLEAR
MARKER 1 1/2" AT
ALL POINTS.

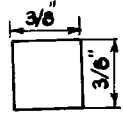
LEDGE ROCK OR
CONCRETE INSTALLATION.



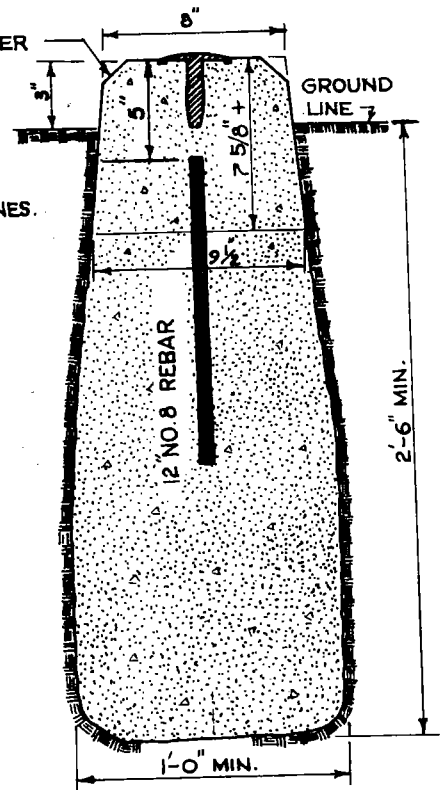
ELEVATION.
BRASS DISC.



SECTION A-A



SECTION C-C



SECTION.
GENERAL INSTALLATION.

THE BRASS DISC SHALL BE CAST OF
YELLOW BRASS SAE 41.
CONCRETE SHALL BE CLASS A. MIX.
THE HOLE SHALL BE 2.5' MIN. IN
DEPTH OR 0.5' BELOW THE DEEPEST
RECORDED FROST LINE. ALL LOOSE
MATERIAL SHALL BE REMOVED FROM
THE BOTTOM OF THE HOLE SO THAT
THE CONCRETE IS PLACED ON
FIRM, UNDISTURBED EARTH.
THE TOP OF THE CONCRETE
SHALL BE TROWELED SMOOTH AND
THE BRASS DISC SET IN THE
CENTER WITH ITS TOP EDGE FLUSH
AND LEVEL.
COORDINATES OR ELEVATIONS
SHALL NOT BE PLACED ON THE
BRASS DISCS.

DO NOT SCALE

**OFF - ROAD
SURVEY MONUMENT**

KING CO. WASHINGTON

PLAIN OR REINFORCED
CONCRETE PIPE OR C.M.P.

BEDDING OF INLET PIPE

BACKFILL WITH 1:3:5 MIX
CONCRETE OR COMPACT SOIL
TO RELATIVE DENSITY
REQUIRED BY SPECIFICATIONS.

ELEVATION "S" SEE
NOTE (3). RIGHT.

UNDISTURBED EARTH

SECTION B-B

CASE-1

1:3:5 MIX CONCRETE
ENCASEMENT

CONCRETE
PIPE OR R.C.P.

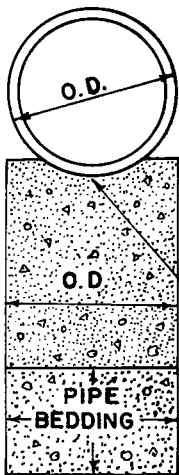
CHIP PIPE TO
SURFACE OF
CONCRETE AND
ROUND EDGES

CASE-2

CATCH BASIN ABOVE STORM

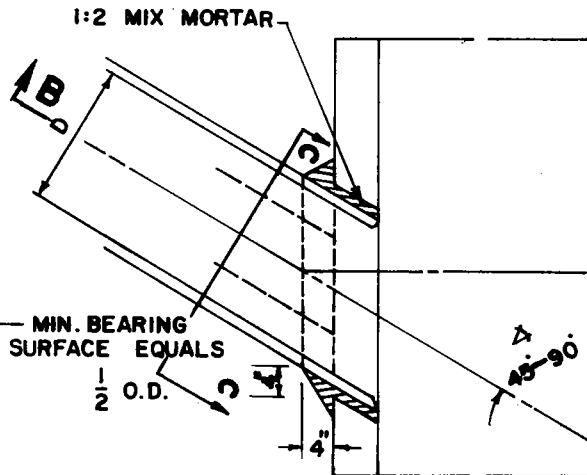
NOTE:

ALL CONNECTOR PIPES (WITHIN
THE ANGLES SPECIFIED FOR CASE 2)
SHALL BE ENCASED WHEN LAID WITHIN
THE MAIN LINE EXCAVATED TRENCH, OR
WHEN LAID ON FILL WHICH HAS NOT
BEEN DENSIFIED.



SECTION C-C

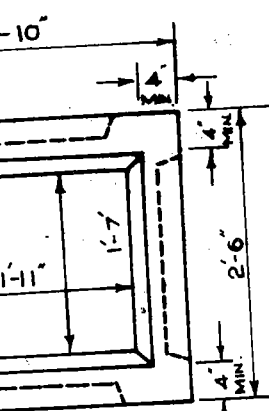
CASE-1 SIDE INLET



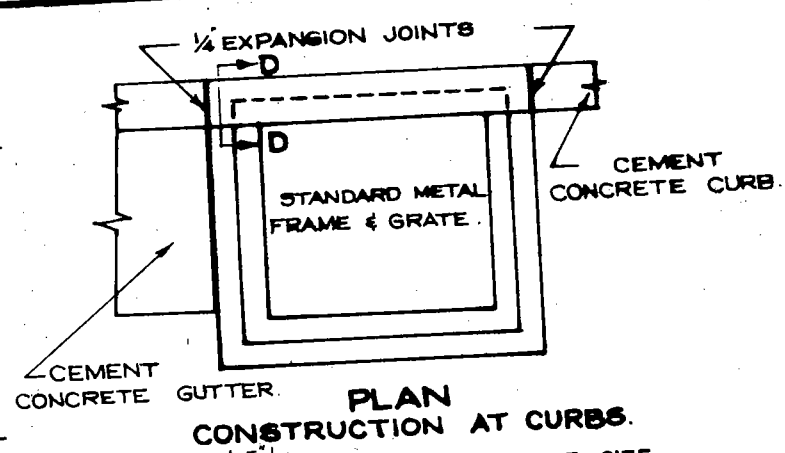
SECTION A-A

**FIELD-TAPP
CONCRETE**

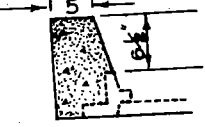
KING CO. WASHING



SECTION C-C

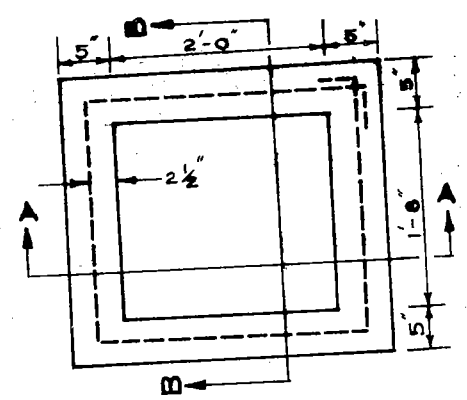


PLAN CONSTRUCTION AT CURBS.



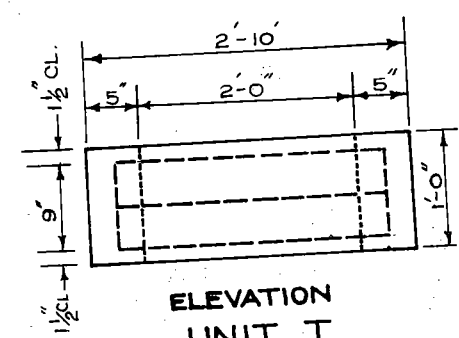
SECTION D-D

MAX. PIPE SIZE
 AT SECTION A-A = 18"
 AT SECTION B-B = 15"
 (MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION)

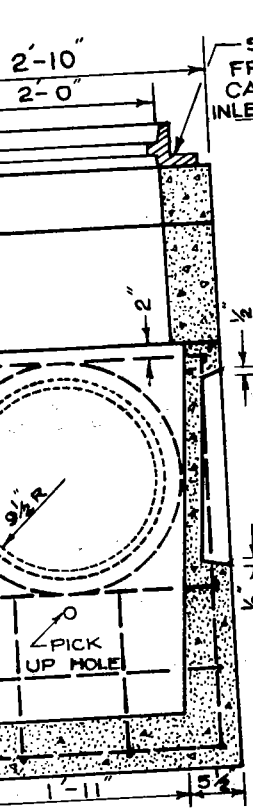


PLAN

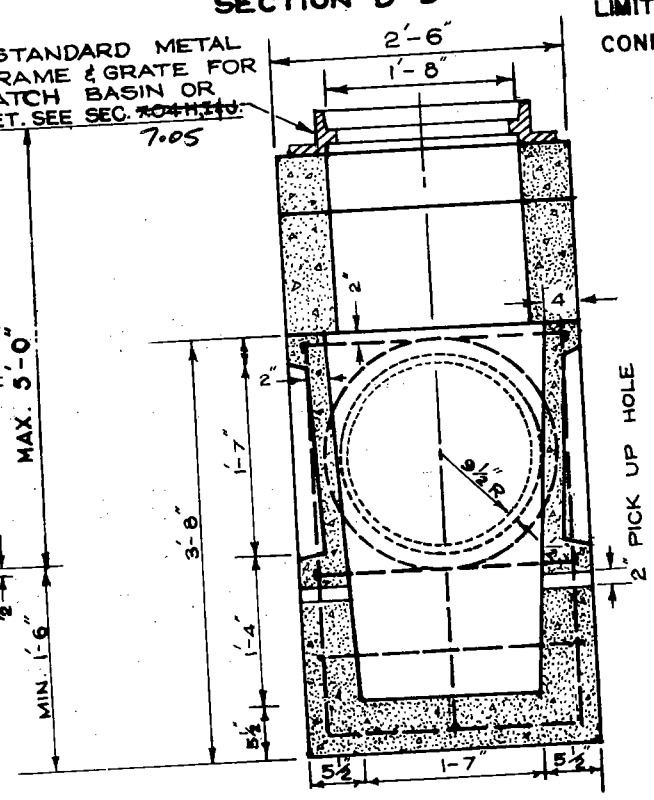
ELEVATION UNIT S



ELEVATION UNIT T



SECTION A-A



SECTION B-B.

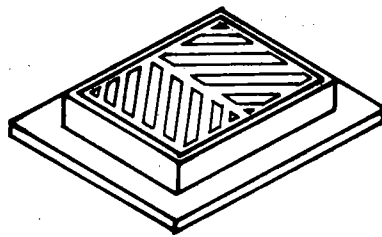
NOTE: FOR DETAILS OF REINFORCEMENTS AND INSTALLATION SEE APWA STD. SPECIFICATIONS SECTION 63

DO NOT SCALE

CATCH BASIN TYPE I

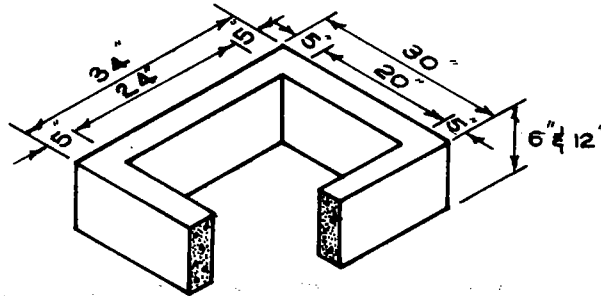
KING CO. WASHINGTON

DWG. NO. 22

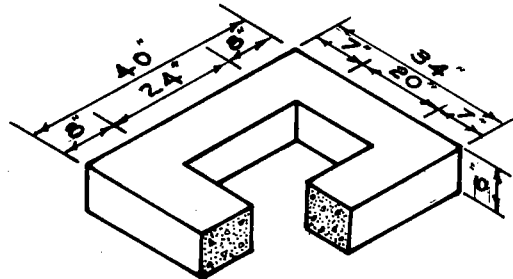


FRAME AND GRATE.

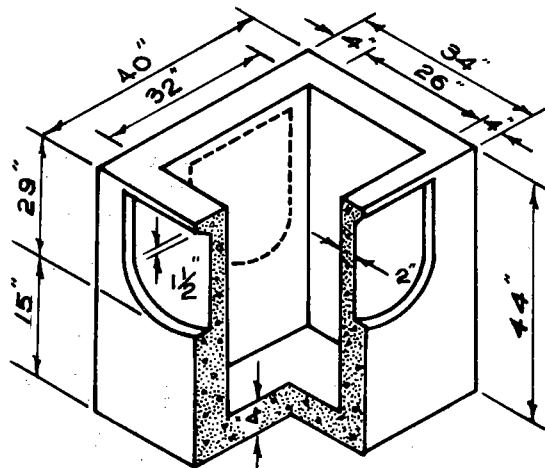
SEE SEC. ~~7.04~~
7.05



EXTENSION SECTION.



REDUCING SLAB.



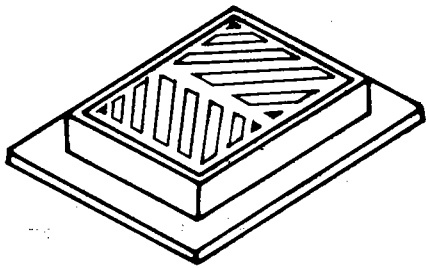
BASE SECTION

MAX. PIPE SIZE 18"
(MAX. PIPE SIZE MAY BE LIMITED BY
FOR DETAILS OF REINFORCEMENTS
SEE APWA STD. SPECIFICATIONS SE

CATCH B

KING C

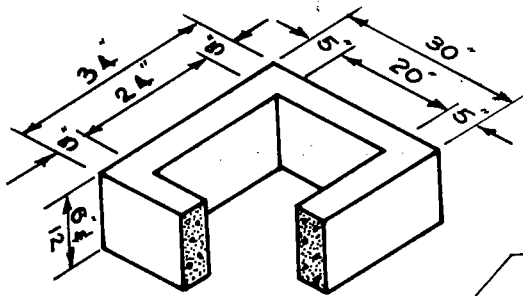
GRATE.
(H.T. 42)



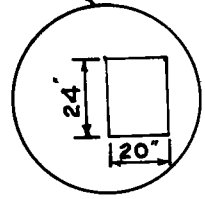
NOTE:

FOR DETAILS SEE
APWA STD. SPECIFICATIONS SECTION 63

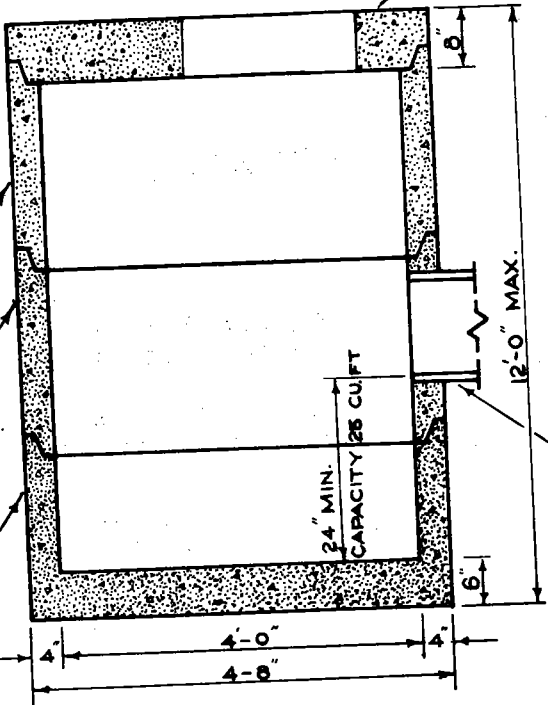
SECTION.



TOP SLAB SEE DWG. NO. 28



SEC-09B



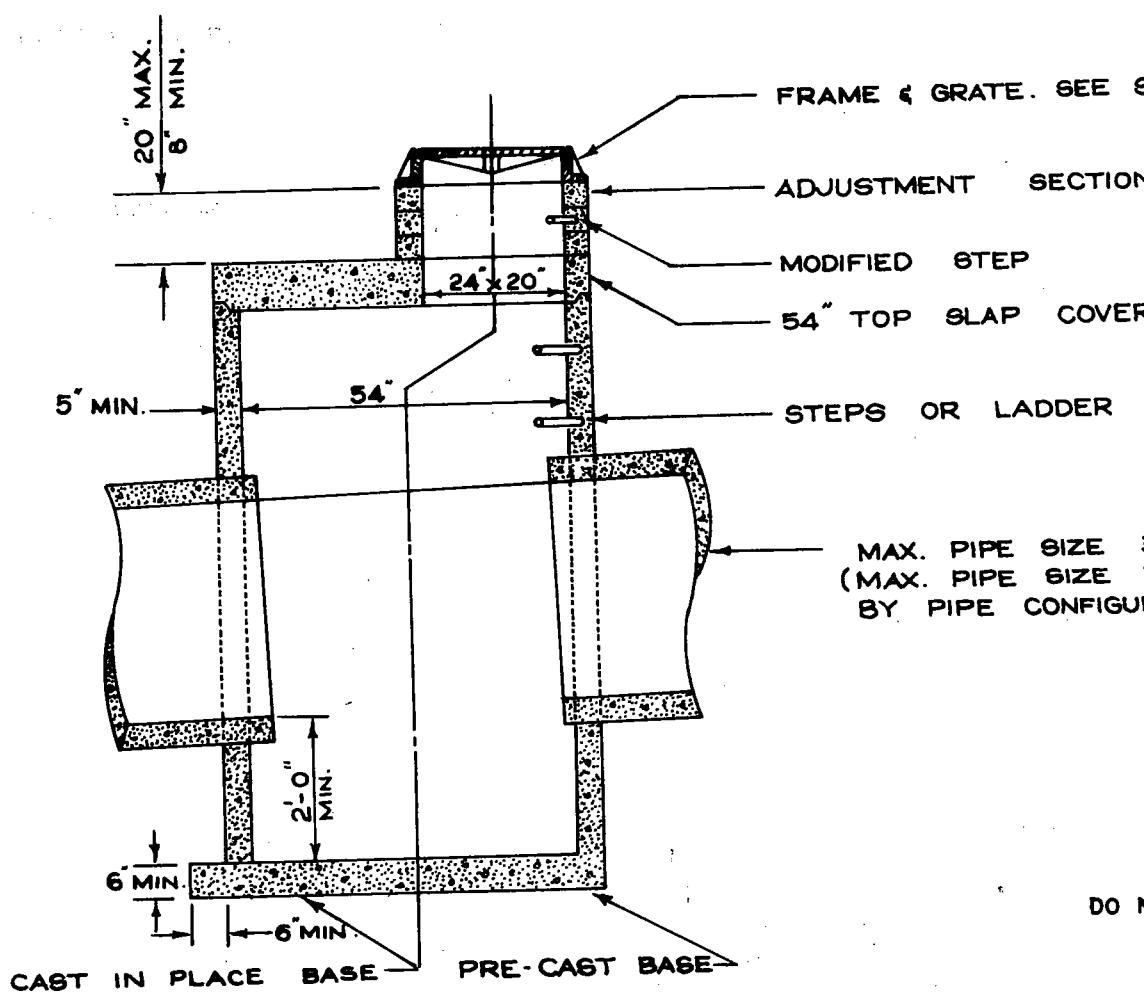
OUTLET PIPE.

MAX. PIPE 21" I.D.
(MAX. PIPE SIZE MAY BE LIMITED
BY PIPE CONFIGURATION)

DO NOT SCALE

BASE 2.09A

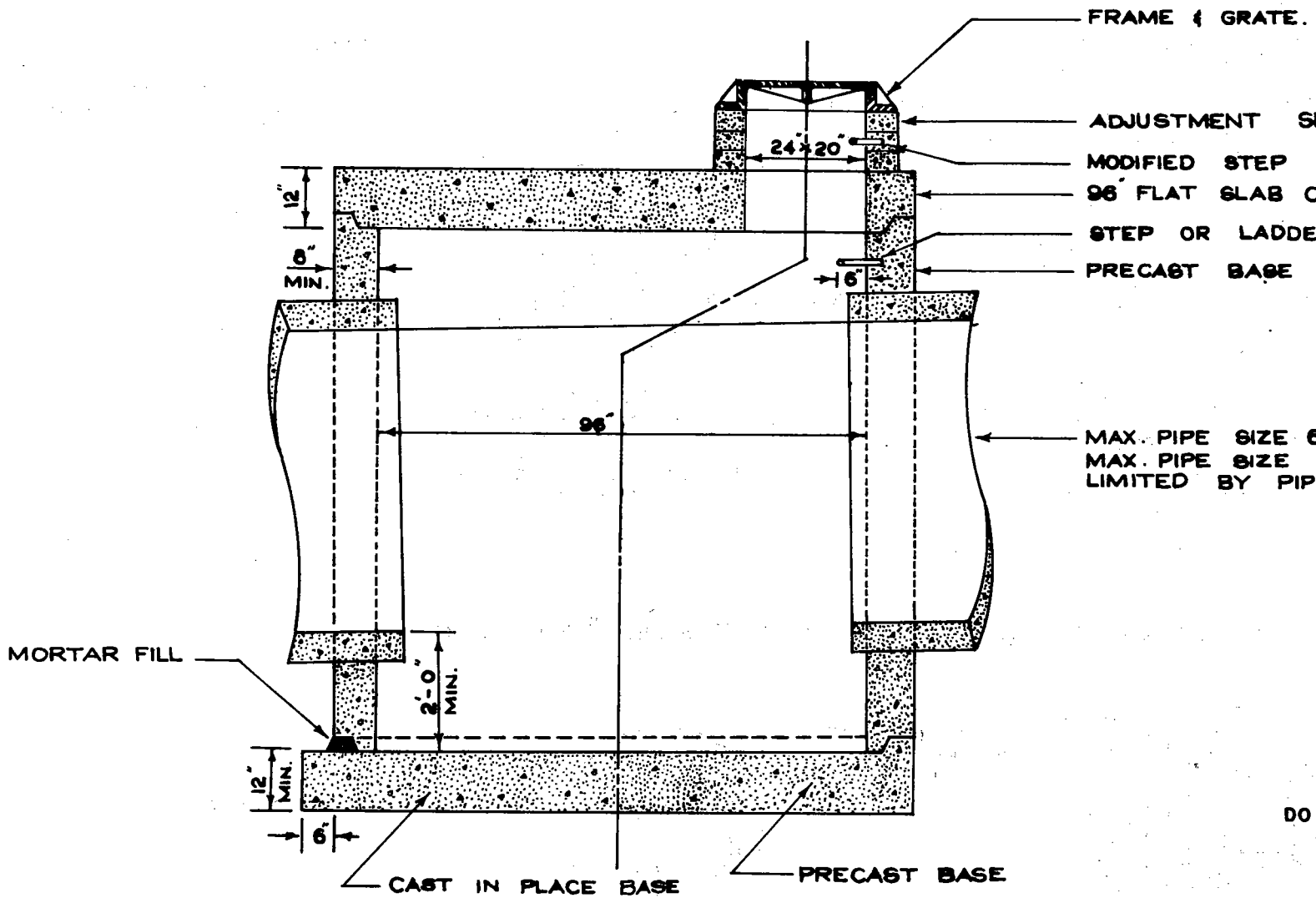
CATCH BASIN TYPE II-48"
KING CO. WASHINGTON



FOR CATCH BASIN SPECIFICATIONS SEE APWA STD.
SPECIFICATIONS FOR MUNICIPAL PUBLIC WORKS
CONSTRUCTION SECTION 63.

CATCH BASIN T

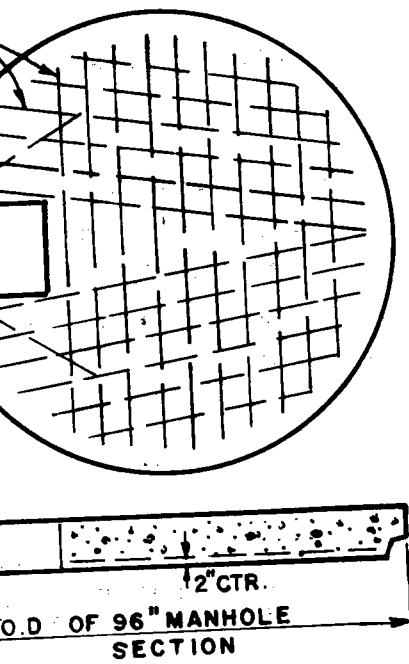
KING CO. WA



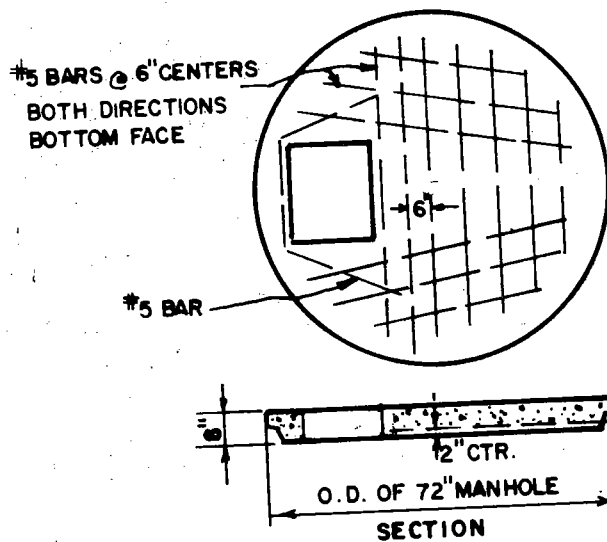
FOR CATCH BASIN SPECIFICATIONS. SEE STANDARD SPECIFICATIONS FOR MUNICIPAL PUBLIC WORKS SECTION 63.

CATCH BASIN TYPE
KING CO. WASH.

SLAB WITH 24" x 20" OPENING



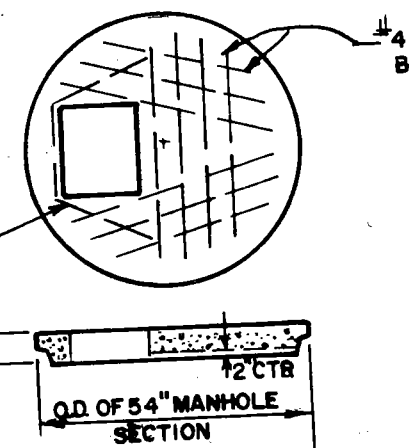
72" SLAB WITH 24" x 20" OPENING



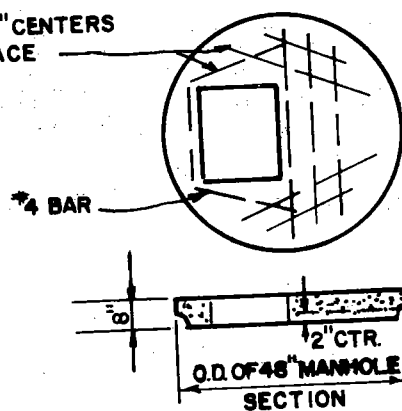
NOTE:

FOR DETAILS SEE
APWA STD. SPECIFICATIONS
SEC. 63

SLAB WITH 24" x 20" OPENING



48" SLAB WITH 24" x 20" OPENING



DO NOT SCALE

REINFORCING DETAILS
FOR
CATCH BASIN TOP SLABS

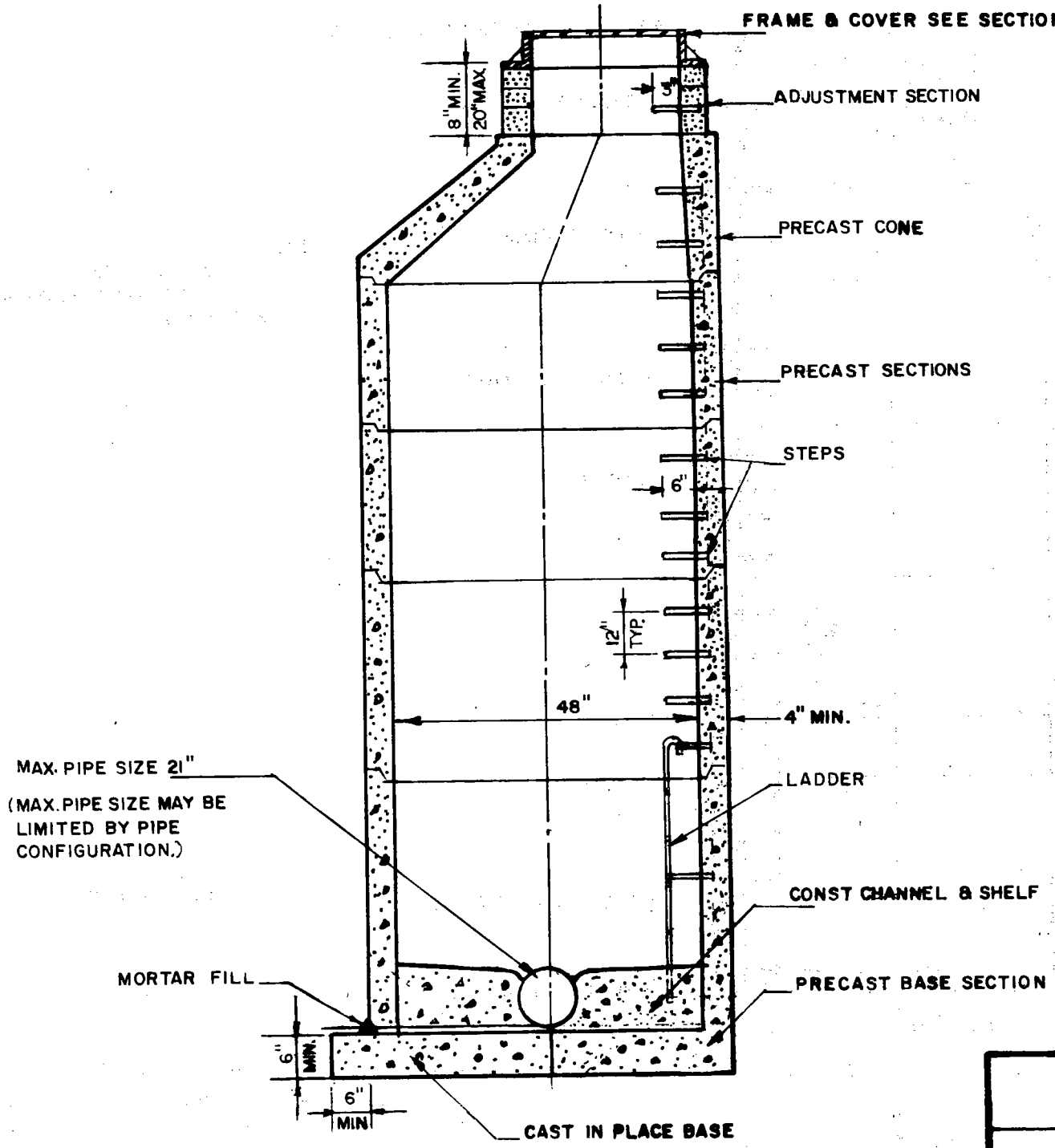
KING CO. WASHINGTON

DWG. NO. 28

FRAME & COVER SEE SECTION 7.04-K
7.05

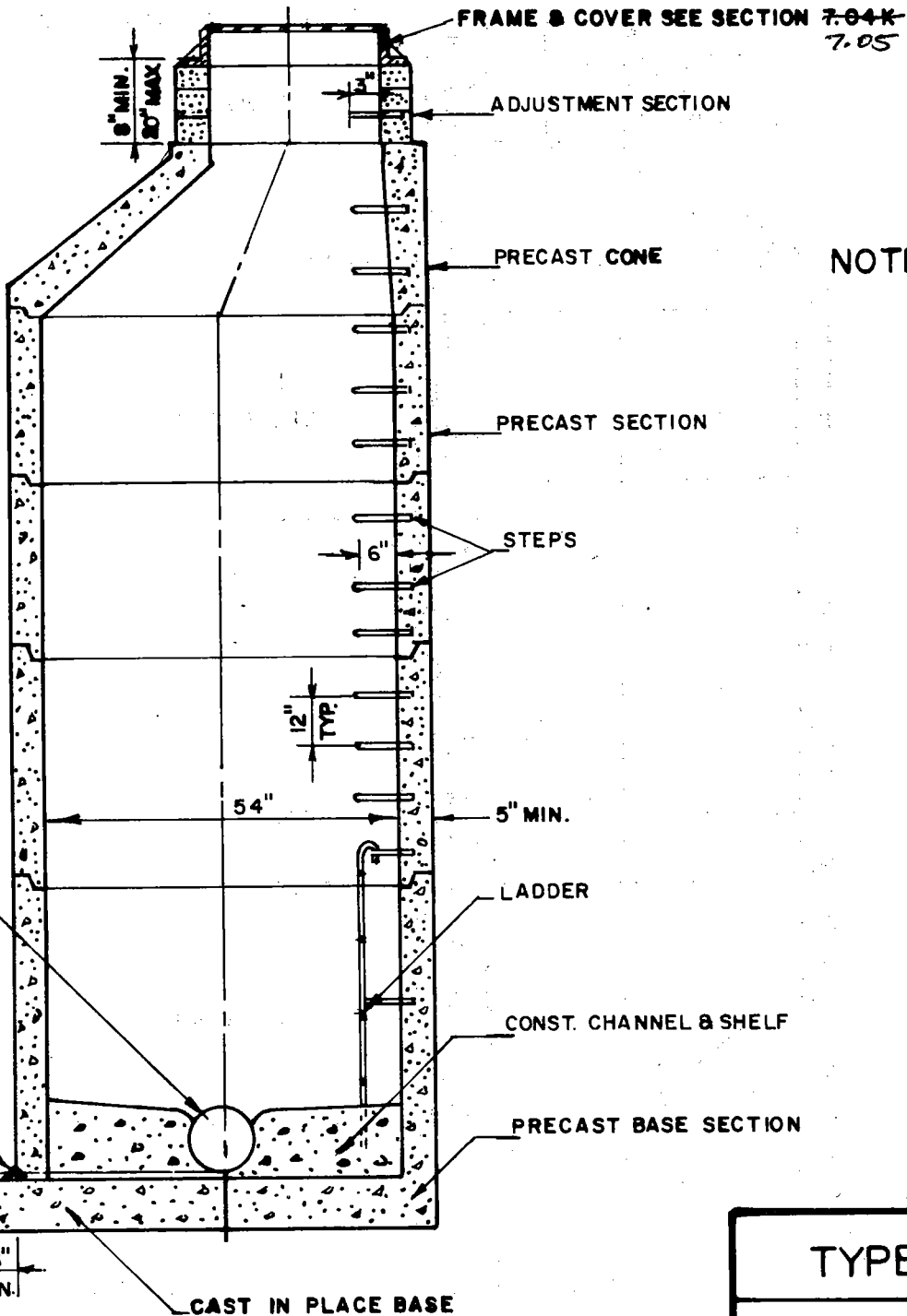
NOTE:

FOR I
APW
SECT



TYPE I-48

KING C

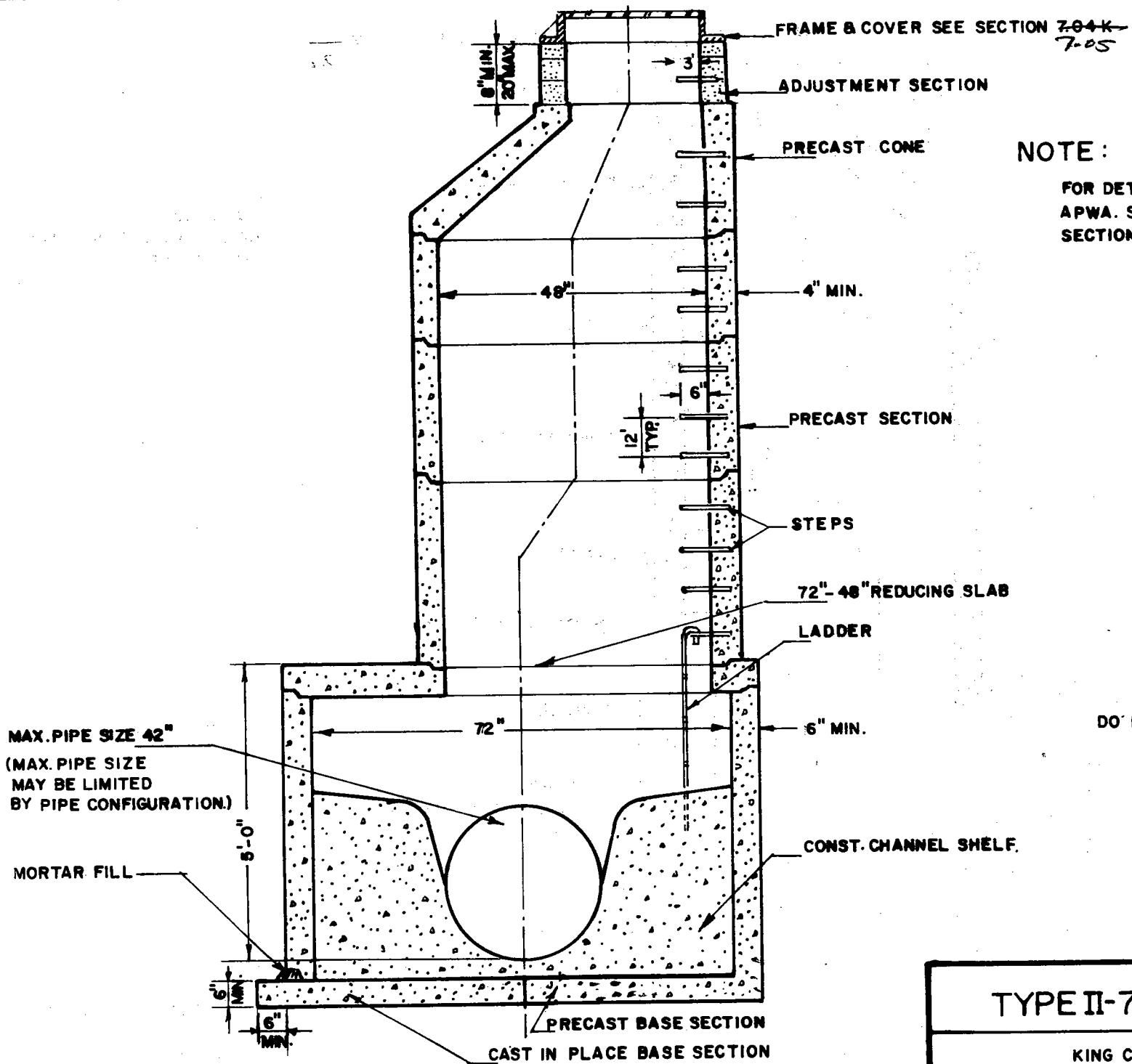


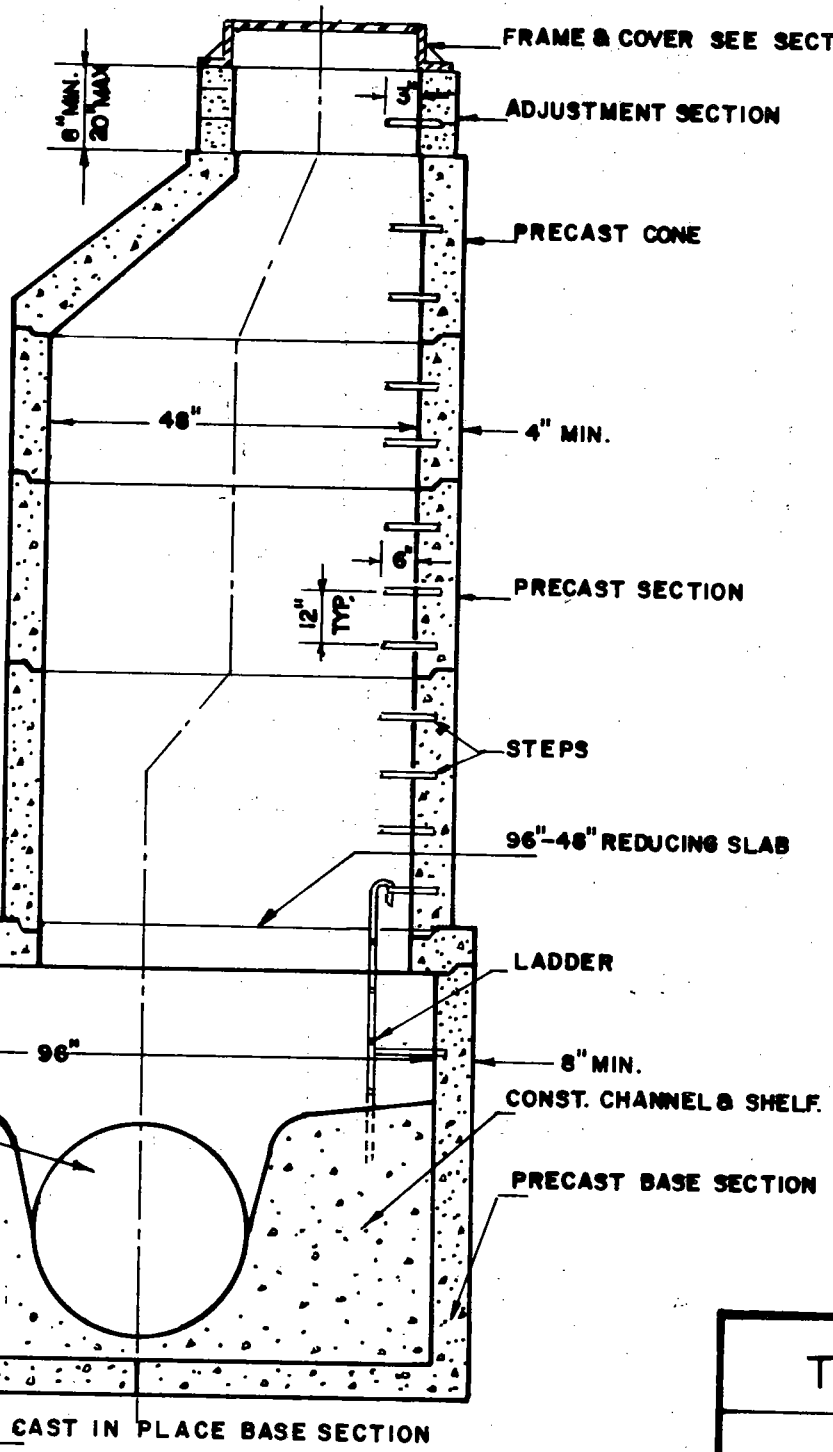
NOTE:
 FOR DETAILS SEE
 APWA STD. SPECIFICATIONS
 SECTION 63.

DO NOT SCALE

TYPE I-54" MANHOLE

KING CO. WASHINGTON





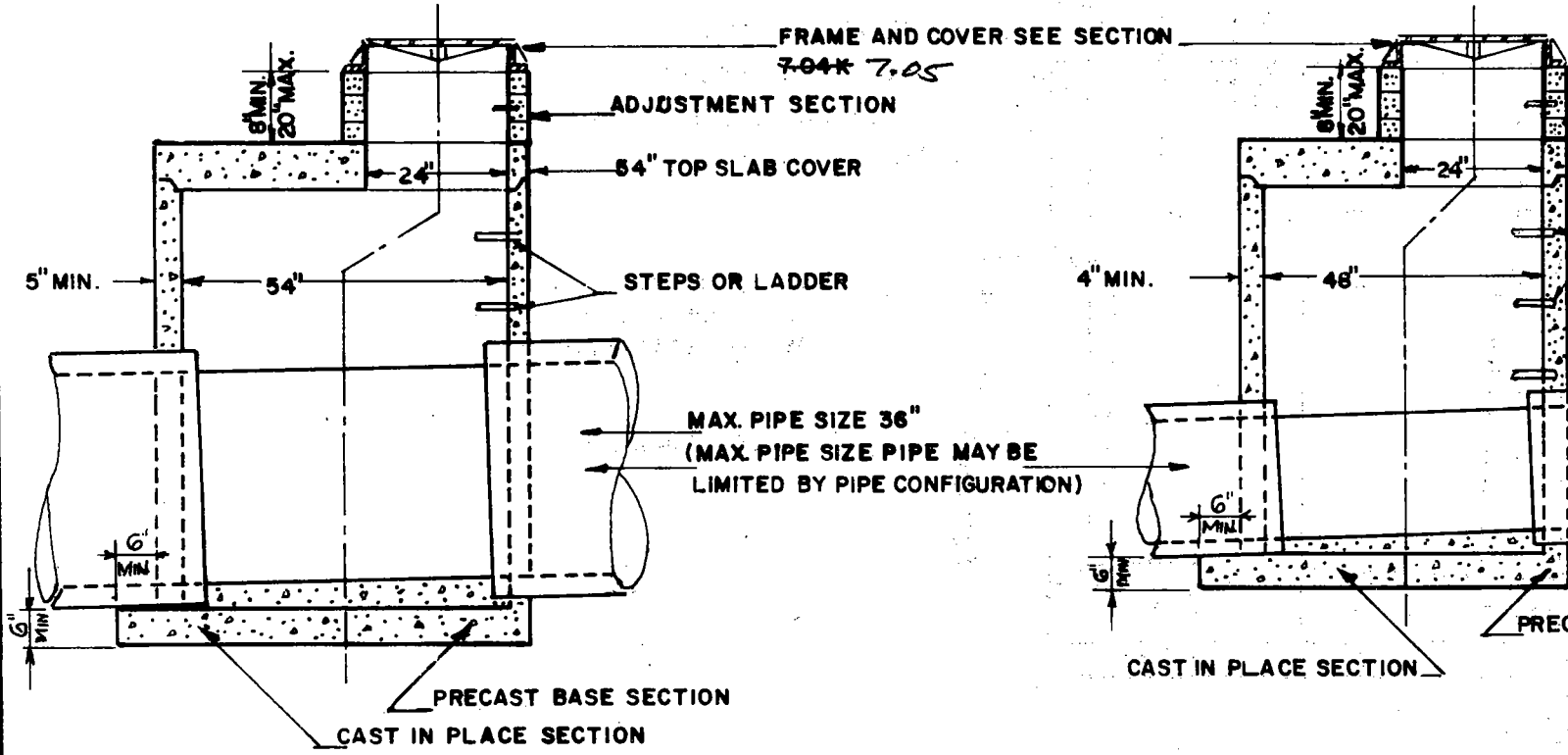
NOTE:
 FOR DETAILS SEE
 APWA STD. SPECIFICATIONS
 SECTION 63.

DO NOT SCALE

TYPE II-96" MANHOLE
 KING CO. WASHINGTON

54" MANHOLE

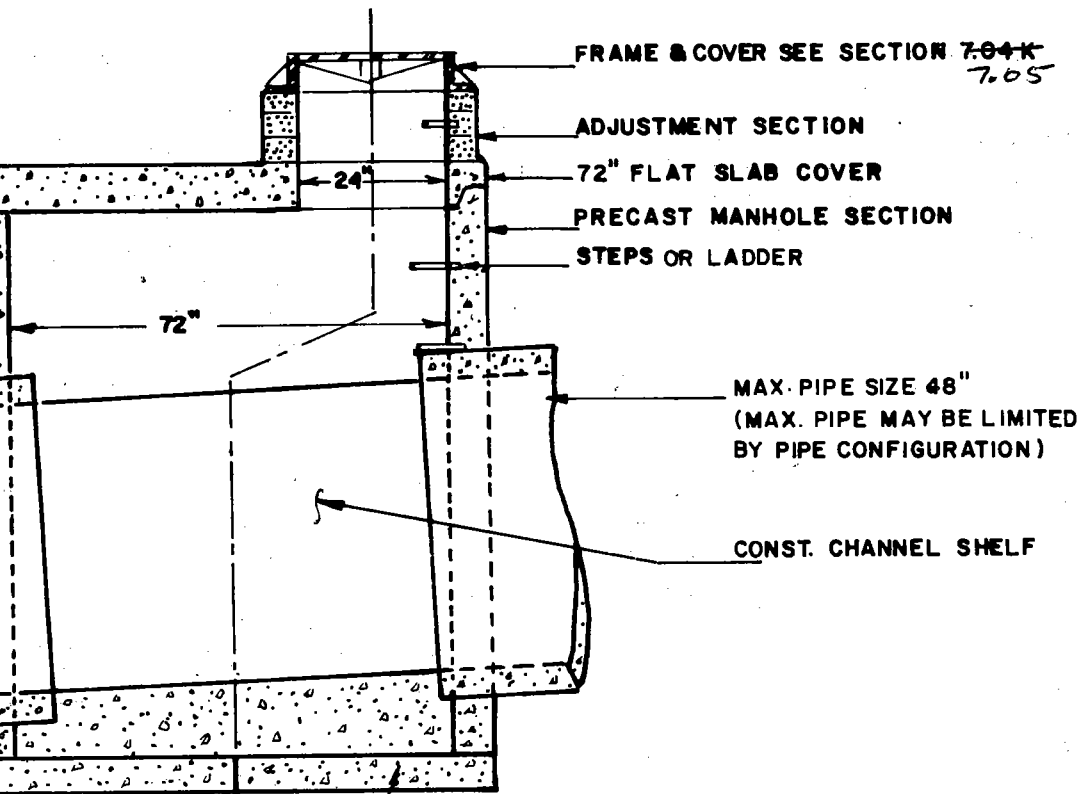
48" MANHOLE



NOTE:

FOR DETAILS SEE APWA STD. SPECIFICATIONS SECTION 63

<p>TYPE III-48</p> <p>TYPE III-54</p>
<p>KING CO. WA</p>



DO NOT SCALE

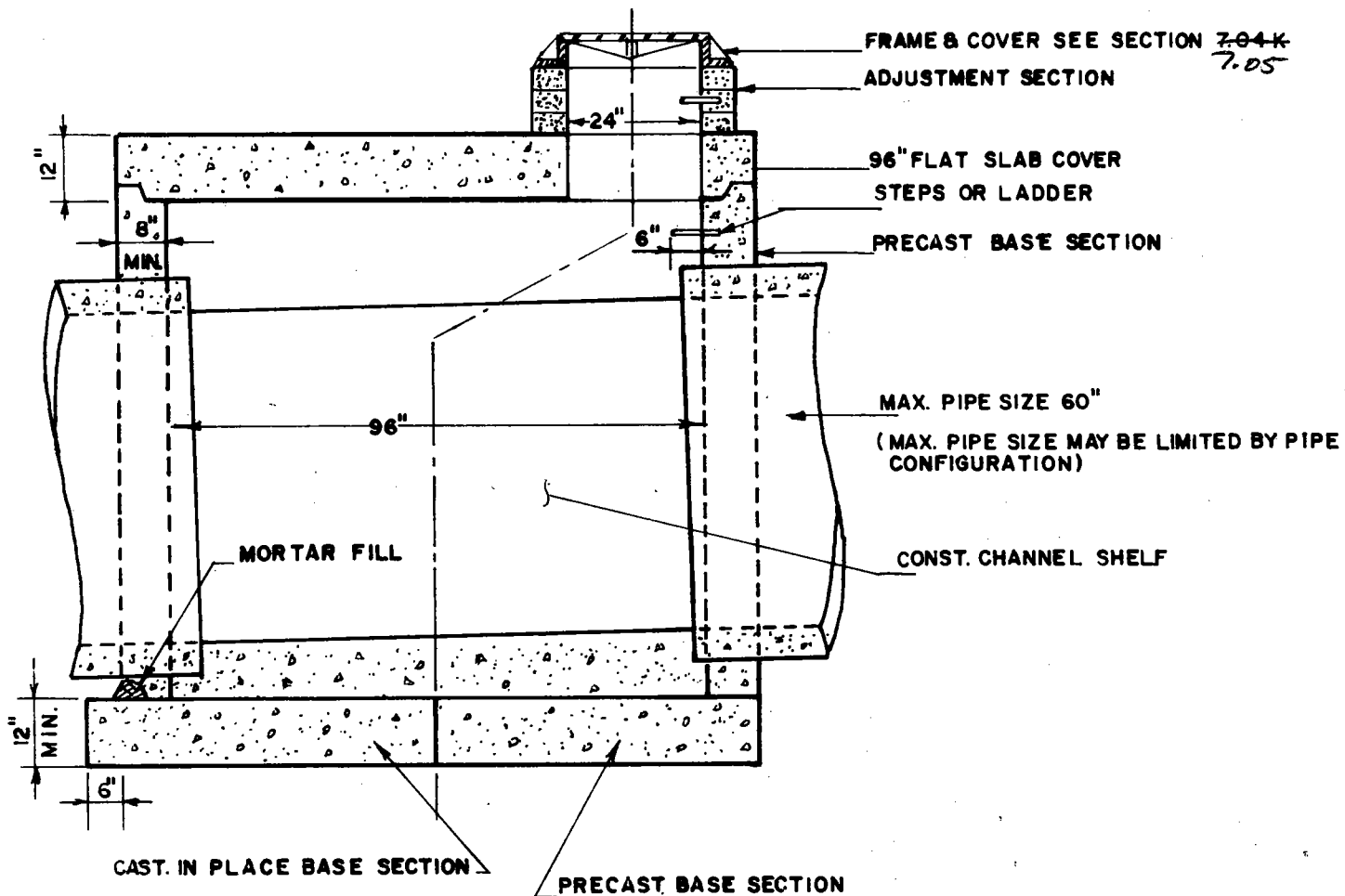
IN PLACE BASE SECTION

PRECAST BASE SECTION

FOR DETAILS SEE APWA STD. SPECIFICATIONS
SECTION 63.

TYPE III - 72" MANHOLE

KING CO. WASHINGTON



DO NOT SCALE

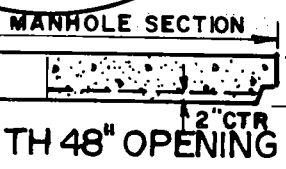
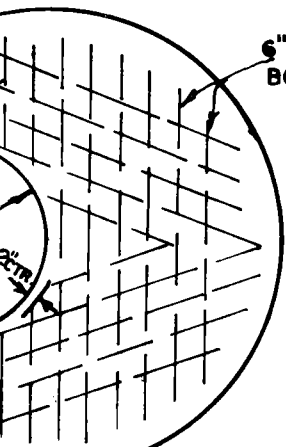
NOTE :

FOR DETAILS SEE APWA STD. SPECIFICATIONS SEC. 63

TYPE III-96

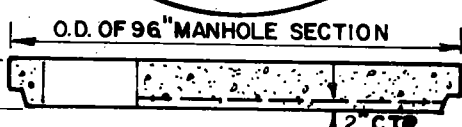
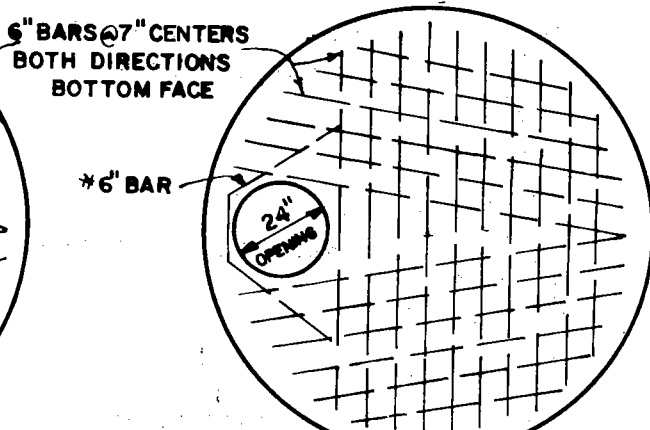
KING CO. V

WITH 48" OPENING

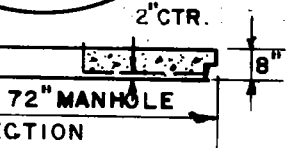
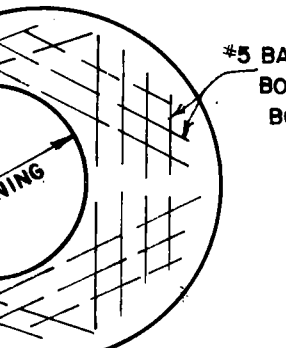


TH 48" OPENING

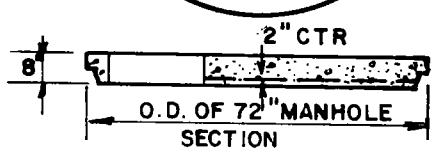
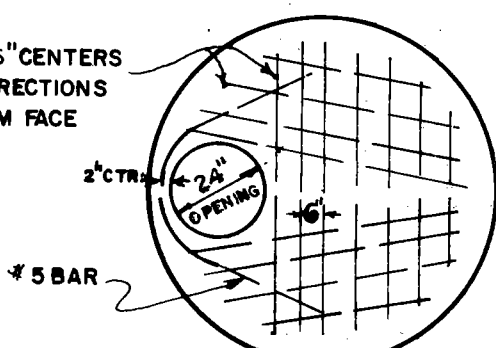
96" SLAB WITH 24" OPENING



72" SLAB WITH 24" OPENING

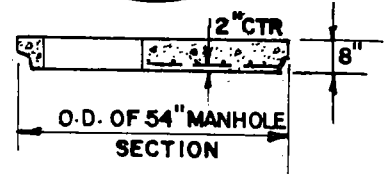
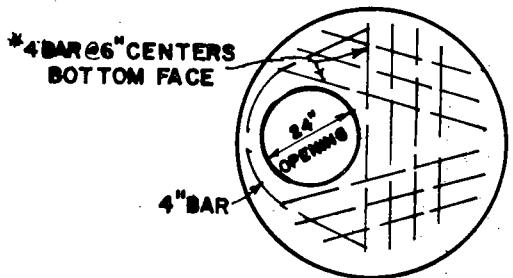


72" MANHOLE SECTION



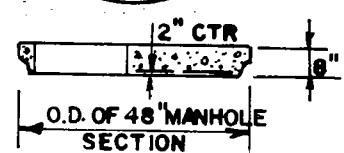
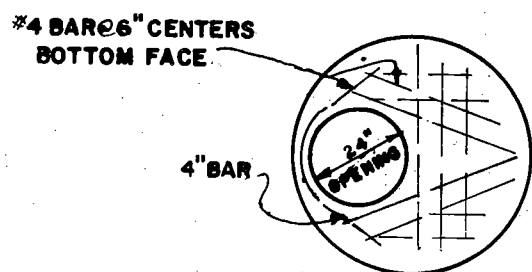
O.D. OF 72" MANHOLE SECTION

54" SLAB WITH 24" OPENING



O.D. OF 54" MANHOLE SECTION

48" SLAB WITH 24" OPENING



O.D. OF 48" MANHOLE SECTION

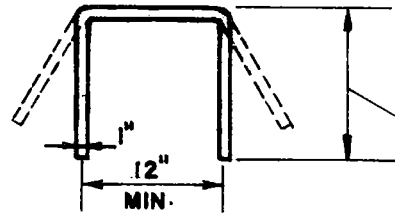
PWA STD. SPECIFICATIONS SEC. 63

DO NOT SCALE

REINFORCING DETAILS FOR MANHOLE TOP SLABS

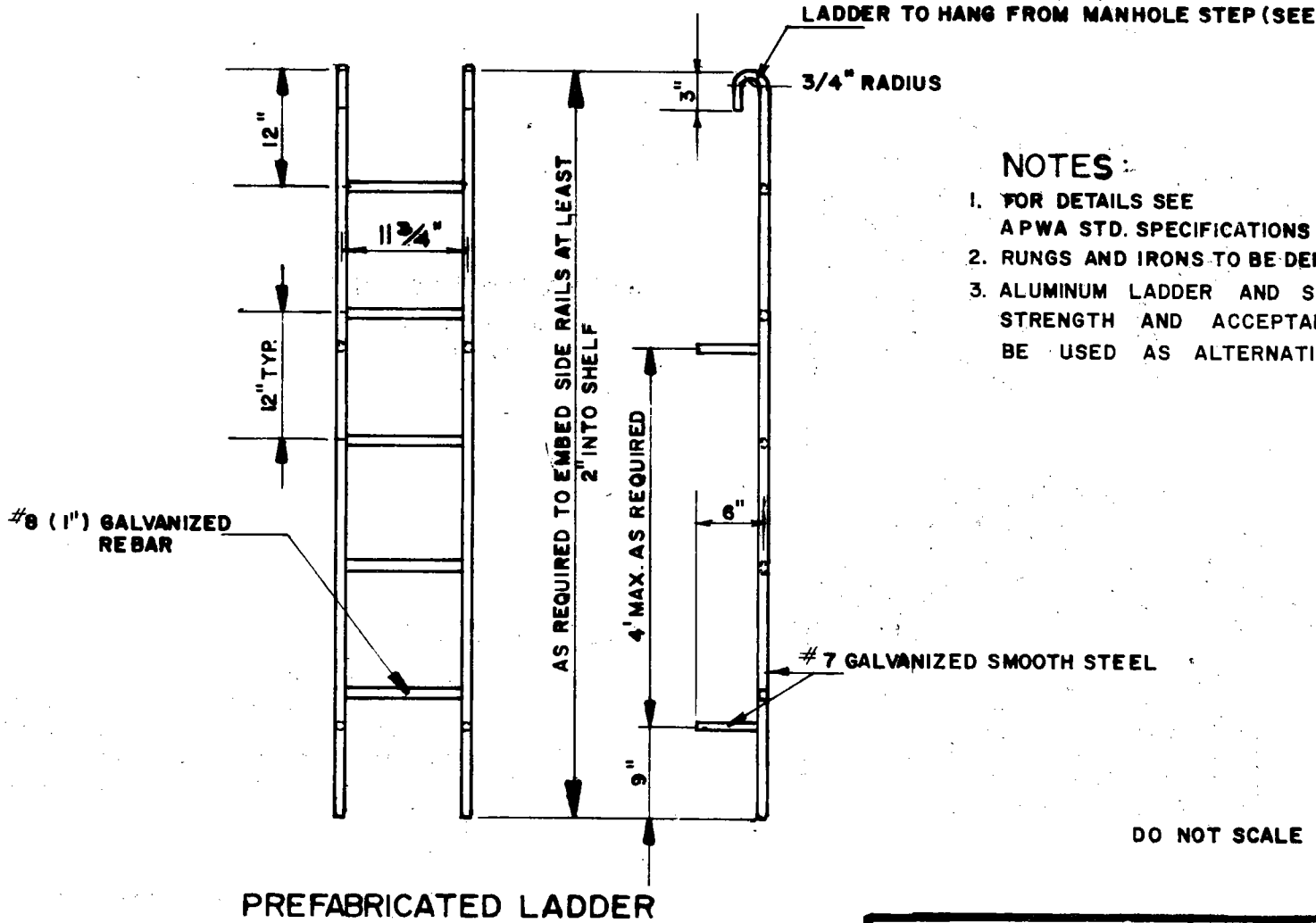
KING CO. WASHINGTON

LEGS MAY BE PARALLEL OR APPROX. RADIAL AT OPTION OF MANUFACTURER EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL BE SIMILAR



12" FOR BLOCK OR BRICK MANHOLE
9 1/2" FOR PRECAST MANHOLE

MANHOLE STEP

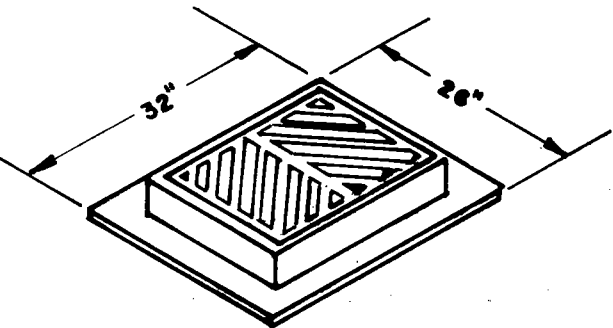


NOTES:

1. FOR DETAILS SEE APWA STD. SPECIFICATIONS
 2. RUNGS AND IRONS TO BE DE
 3. ALUMINUM LADDER AND S
- STRENGTH AND ACCEPTA
BE USED AS ALTERNATI

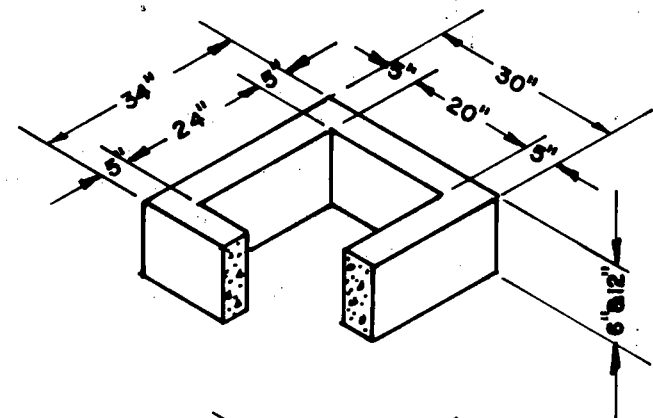
LADDER AND MANH

KING CO. WASHINGTON



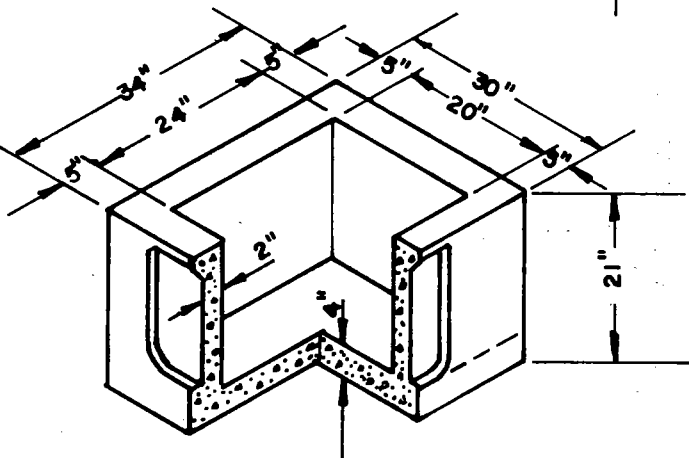
FRAME AND GRATE

SEE SEC. 7.05



EXTENSION SECTION.

UNIT "S" 6"
UNIT "T" 12"



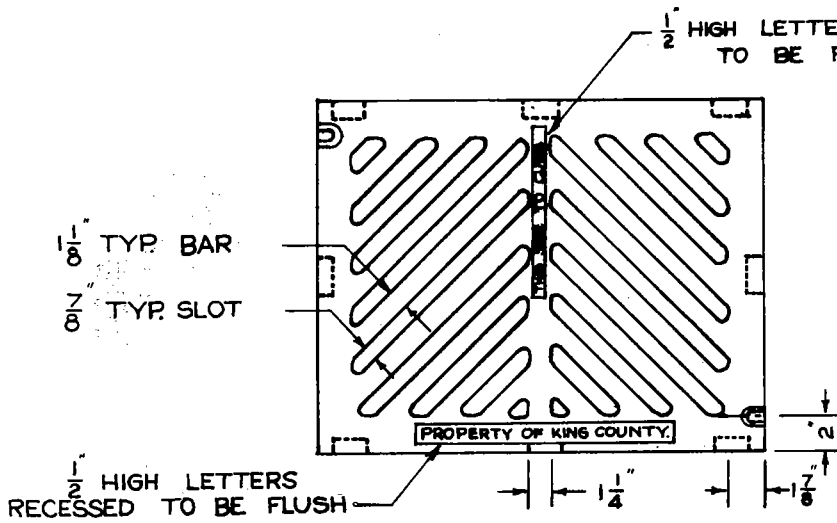
BASE SECTION

MAX. PIPE SIZE 12"
(MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION)
UNIT IS DESIGNED TO PICK UP SURFACE DRAINAGE
A SHORT DISTANCE FROM CATCH BASIN.
FOR DETAILS SEE APWA STD. SPECIFICATIONS SEC. 6

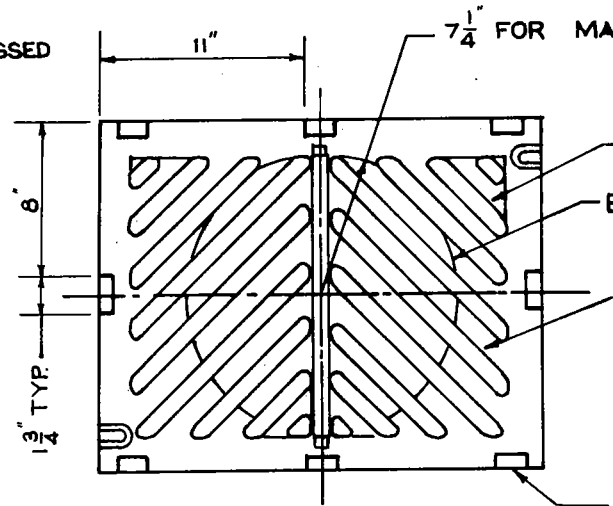
DO NOT SCALE

CURB INLET TYPE IV-K

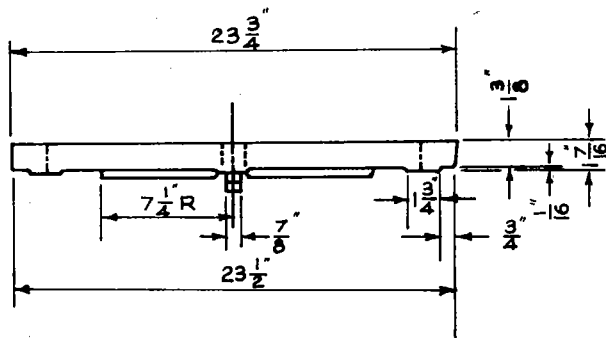
KING CO. WASHINGTON



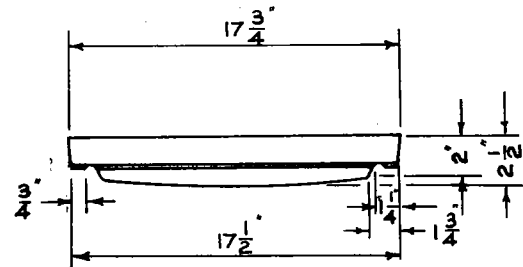
TOP VIEW.



BOTTOM VIEW.



SIDE VIEW.

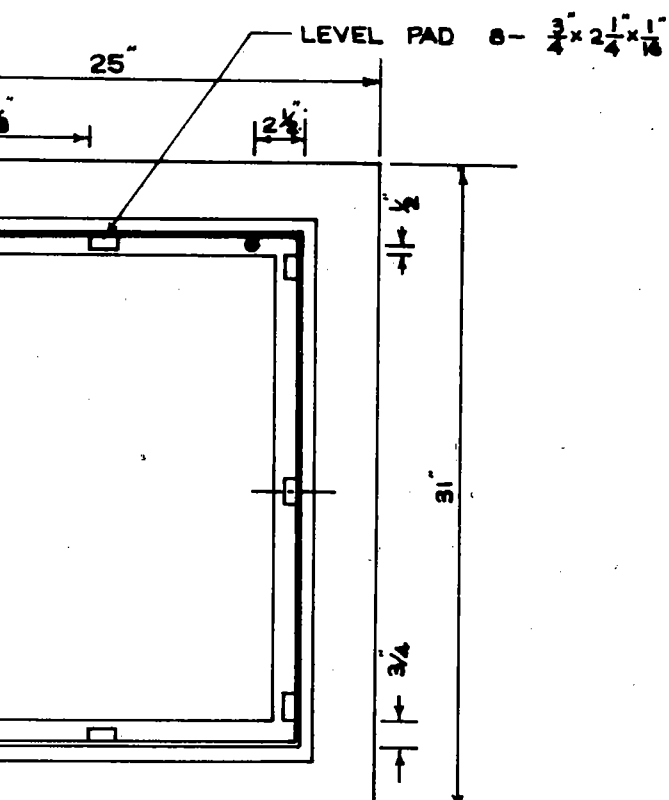


END VIEW.

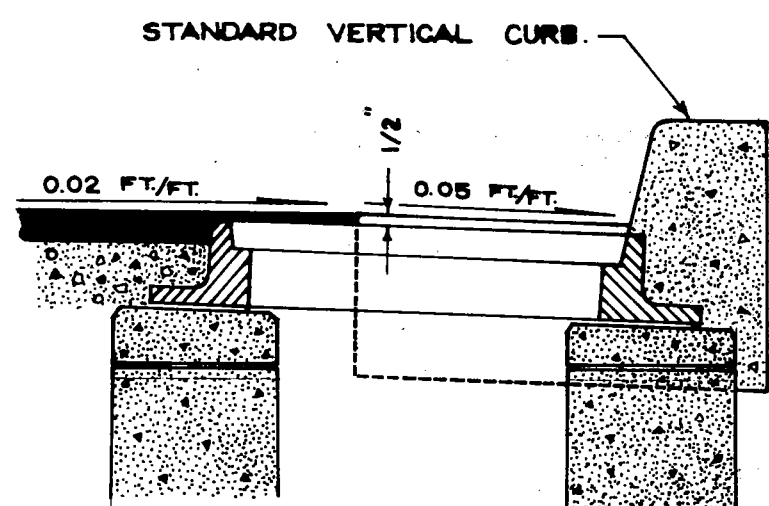
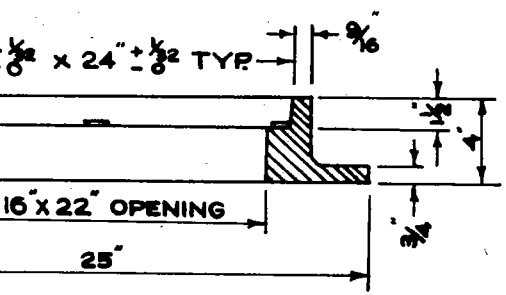
GRATE NO. 5435A OLYMPIC FDY. CO.
OR EQUAL SEE SEC. 7.05 A, B, & G

STANDARD GRATE N

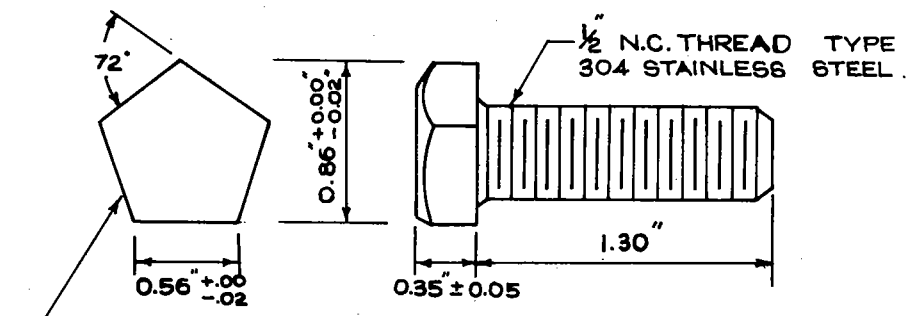
KING CO. WASHINGTON



AP. $\frac{1}{2}$ - 20NF 2 HOLES SPECIFIED BY ENGINEER.



MATERIAL CAST IRON PER ASTM. A 48 CLASS 30.

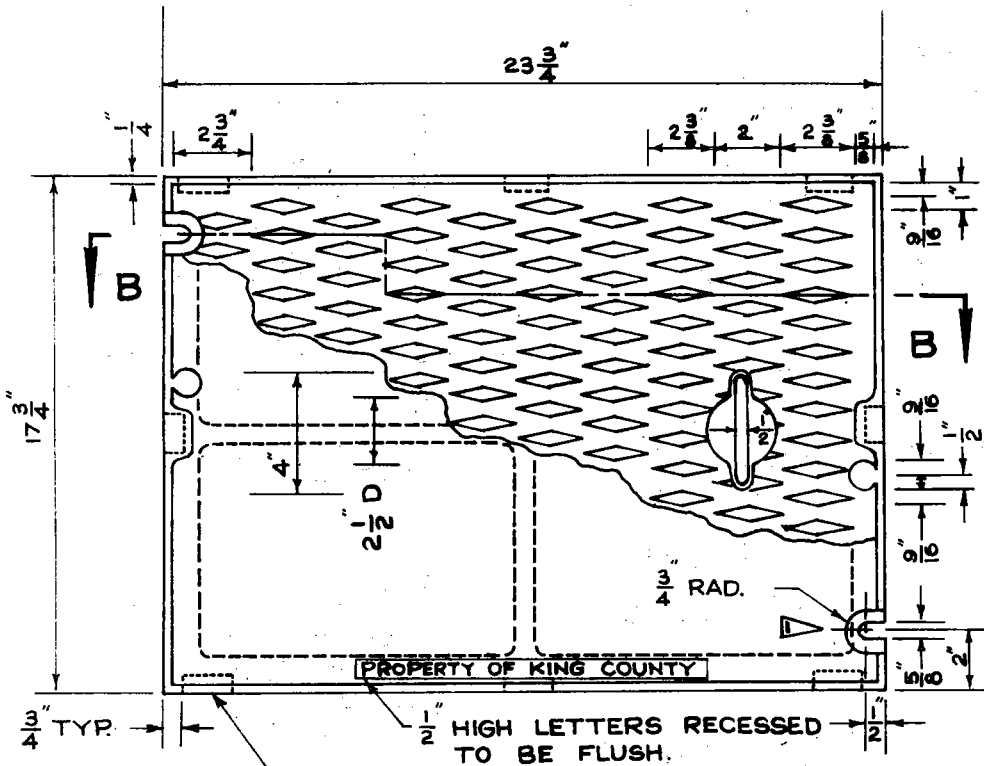


2- $\frac{1}{2}$ " x 13 x $\frac{1}{2}$ " PENTAGONAL HEAD BOLTS PROVIDED WHEN SPECIFIED BY ENGINEER.

DO NOT SCALE

STANDARD FRAME 5435 WITH VERTICAL CURB INSTALLATION

KING CO. WASHINGTON



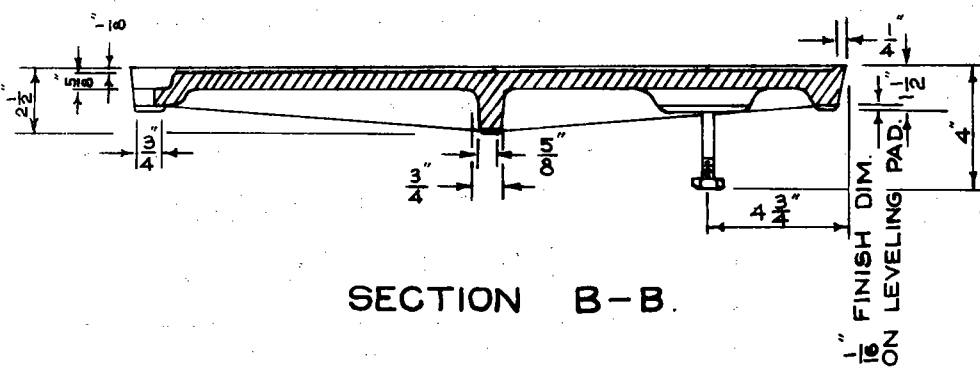
PROPERTY OF KING COUNTY

1/2" HIGH LETTERS RECESSED TO BE FLUSH.

LEVELING PAD 8-1/8" x 3/4" x 1/4" TYR.

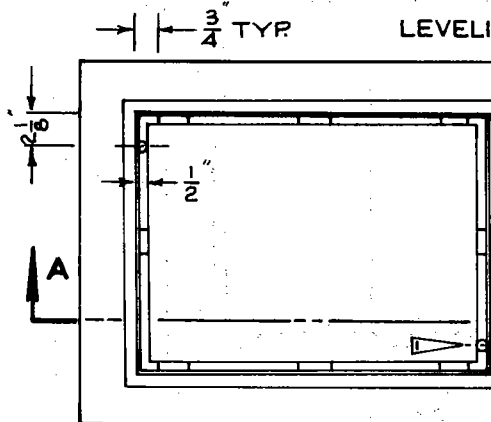
FOR 1/2" - 20 NF x 2" LG. SOC. HD. CAP SCR. & 1/2" NOM. SAE FL. WASHER WHEN SPECIFIED BY ENGINEER.

COVER ESTIMATE WT. 92#



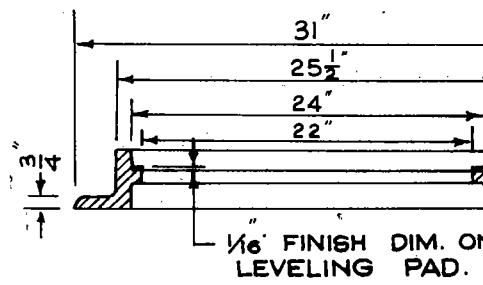
SECTION B-B.

1" FINISH DIM. ON LEVELING PAD.



DRILL & TAP 1/2" - 20 NF 2 HOLES

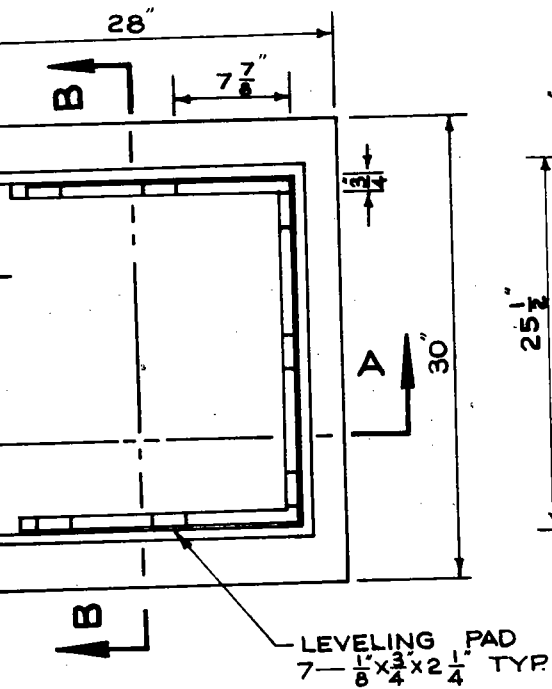
FRAME EST.



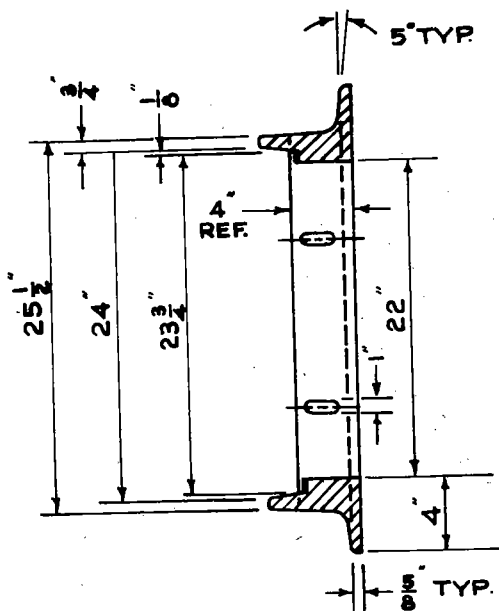
SECTION A-A

DO NOT SCALE

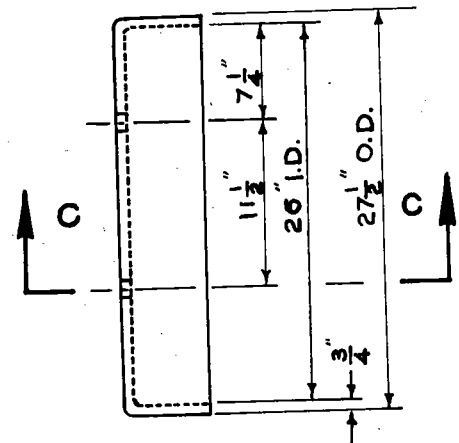
SOLID COVER NO
KING CO. WASHINGTON



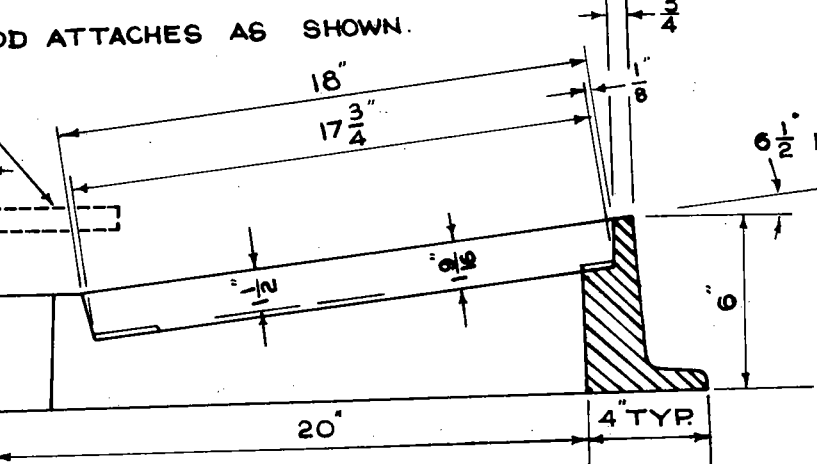
PLAN VIEW.
SCALE 1:8



SECTION B-B.
SCALE 1:8



SECTION C-C.
SCALE 1:8.



SECTION A-A.
SCALE 1:4

2-1" DIA. HOLES, FOR
3/4 BOLT, WASHER & NUT.

NOTES.

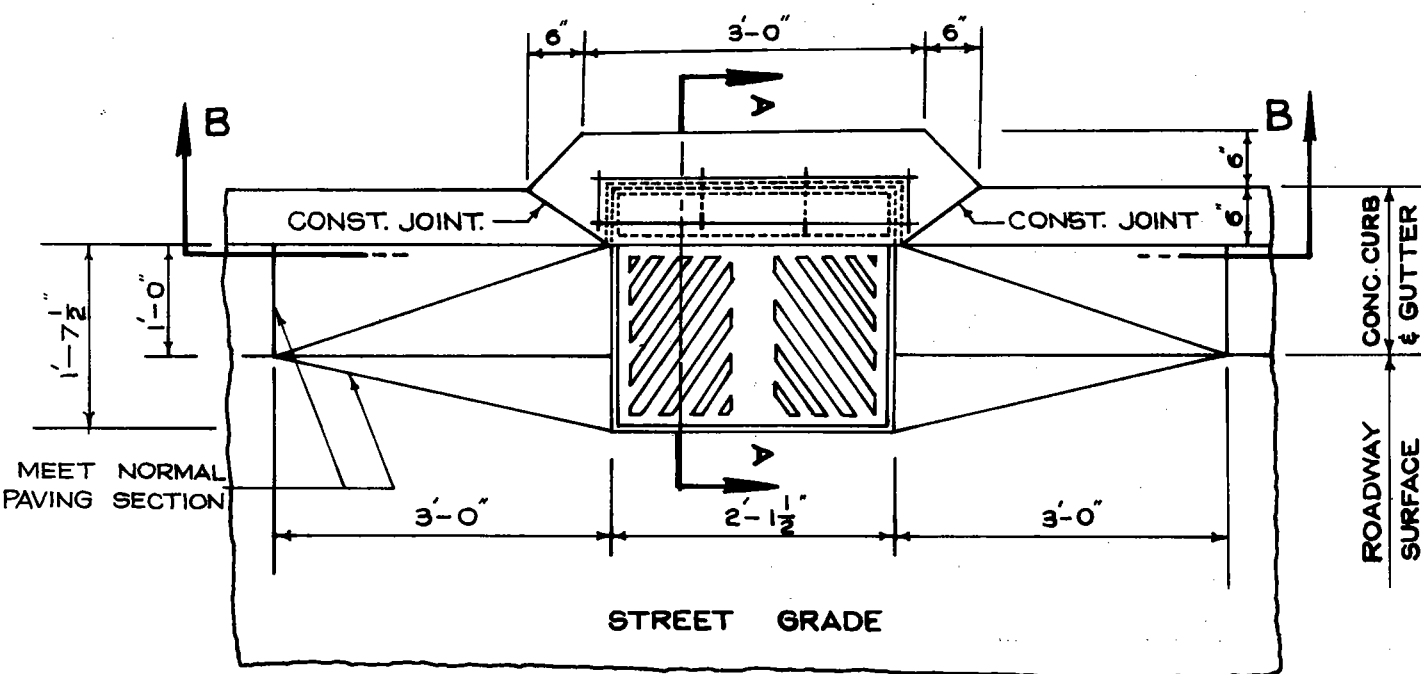
1. EST. WT. FRAME 220*, HOOD 71*.
2. USE 5435 A DUCTILE IRON GRATE AS SHOWN ON DWG. NO. 39

DO NOT SCALE

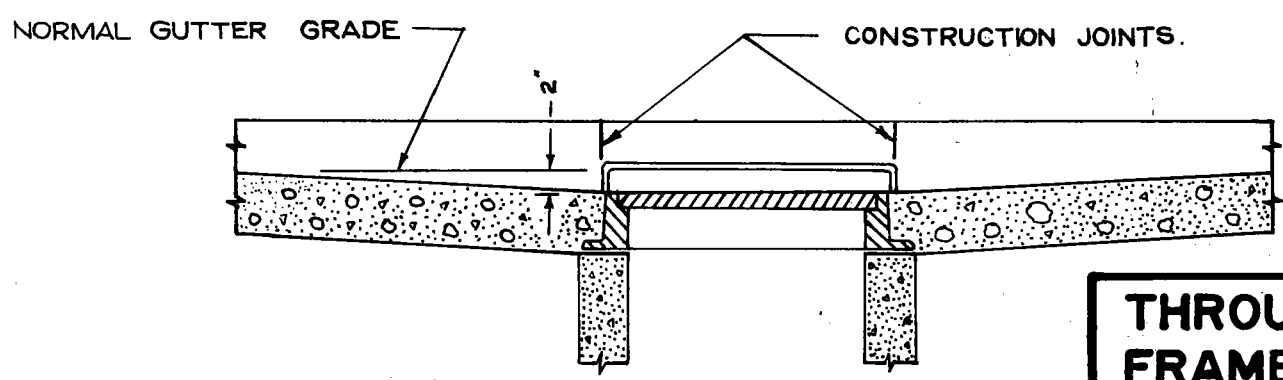
**THROUGH-CURB
INLET FRAME**

KING CO. WASHINGTON

DWG. NO. /

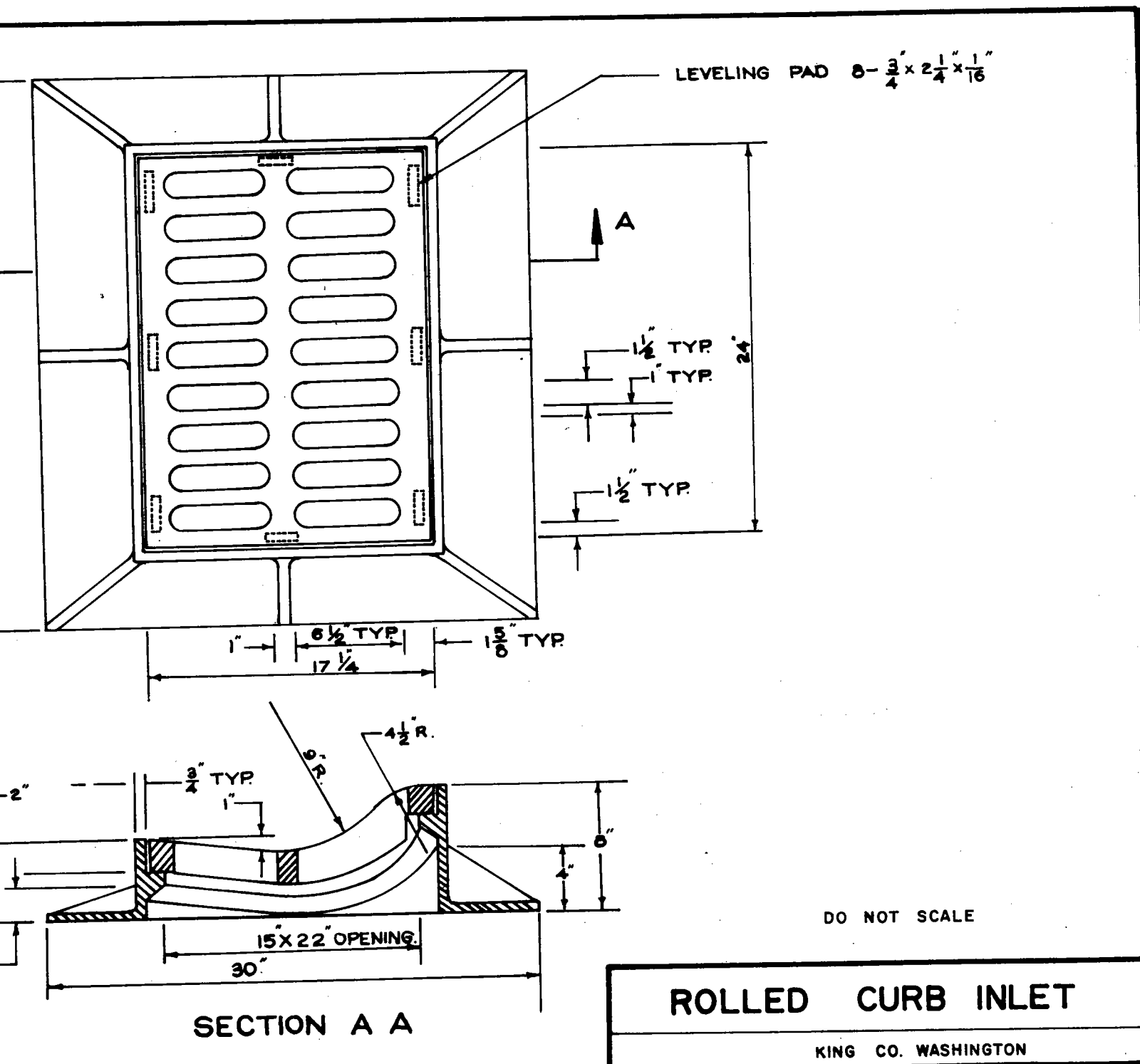


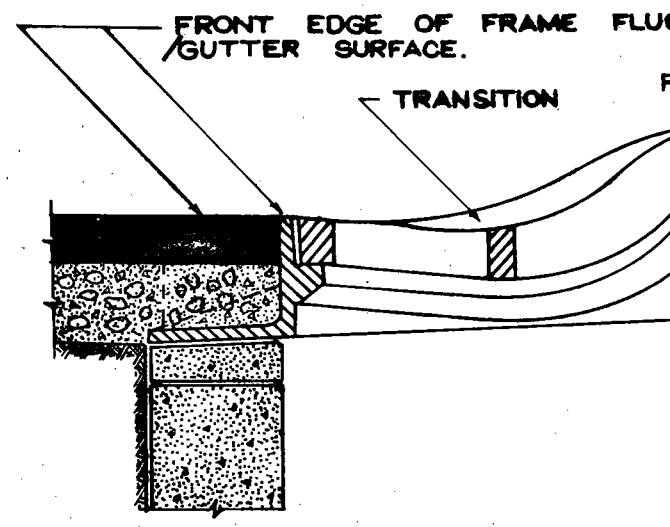
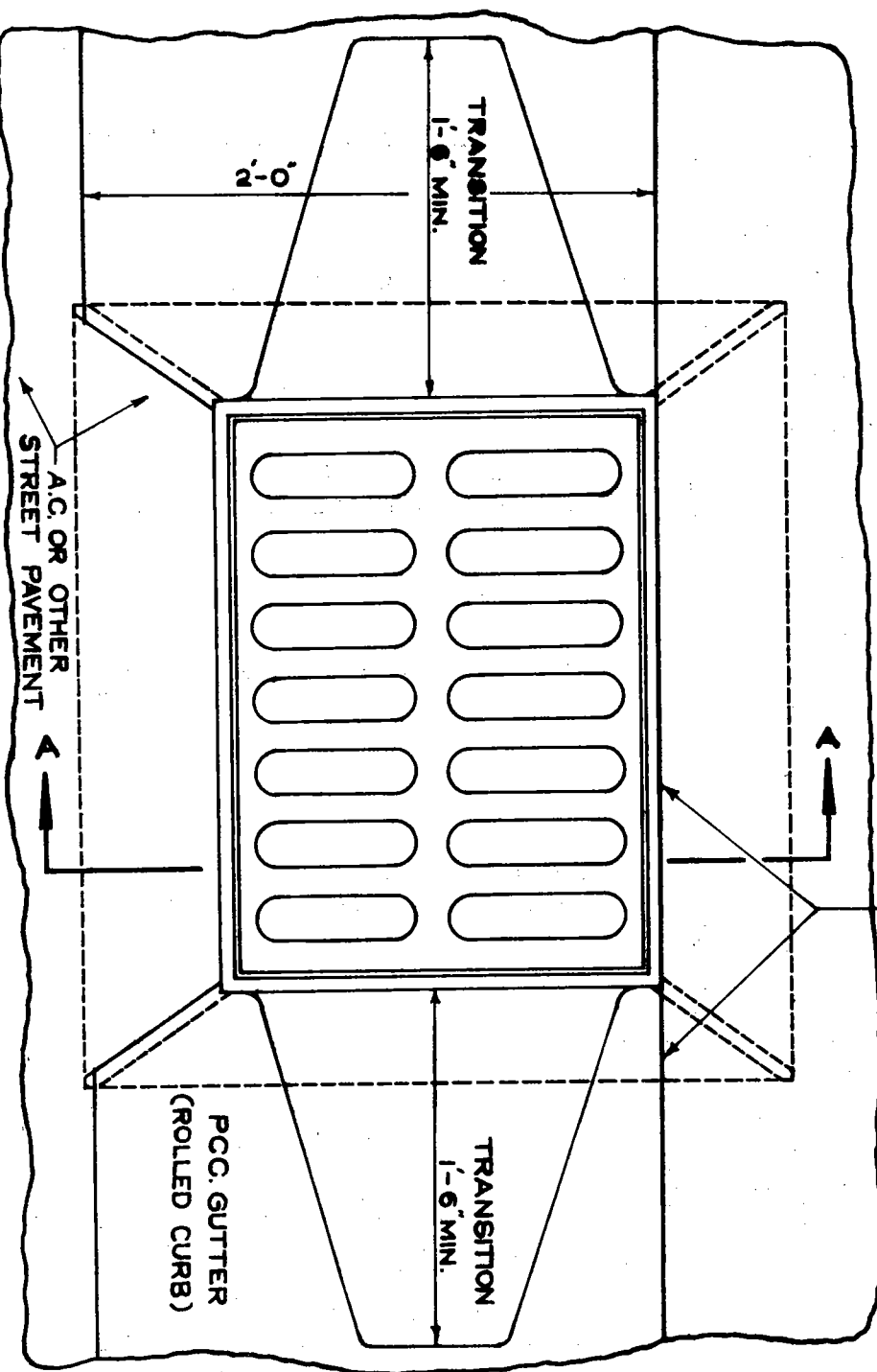
SLOPE 0.05 FT./FT.



SECTION B-B.

DO NOT SC
THROUGH - CURB IN
FRAME & GRATE WI
CAL CURB INST
 KING CO. WASHING





SECTION A A

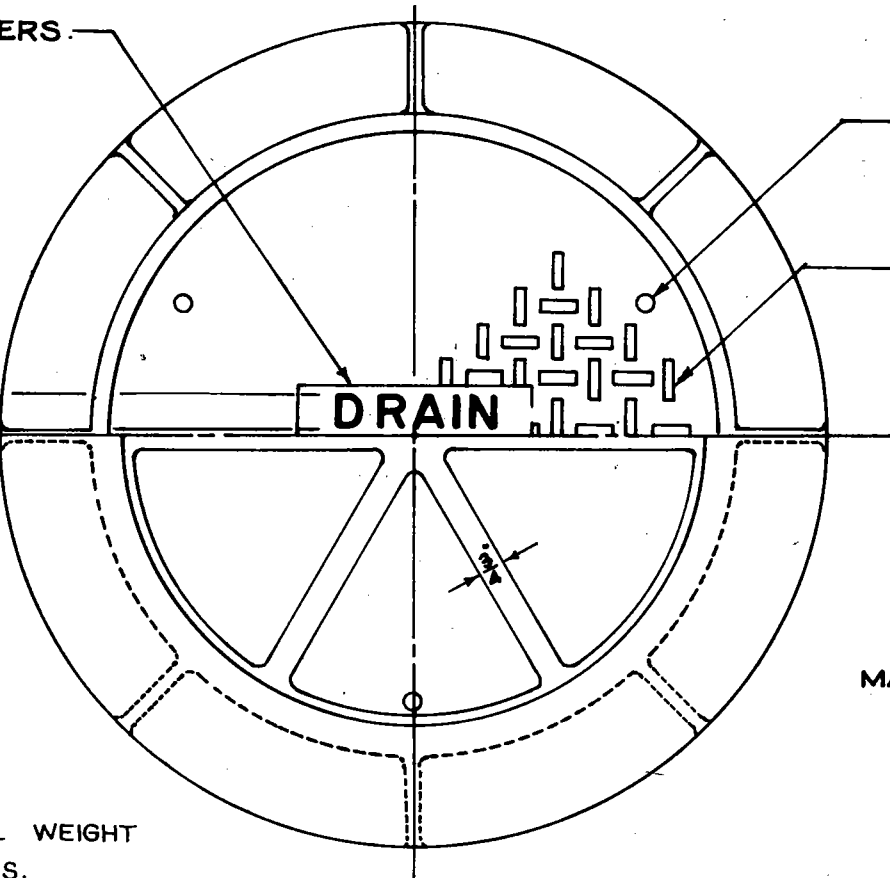
BACK EDGE OF FRAME EVEN WITH BACK
FACE OF CURB.

DO NOT SCALE

ROLLED CURB INLET
ROLLED CURB INST

KING CO. WASHINGTON

ERS.



3-1" HOLES STD. 1 HOLE - OPTIONAL.

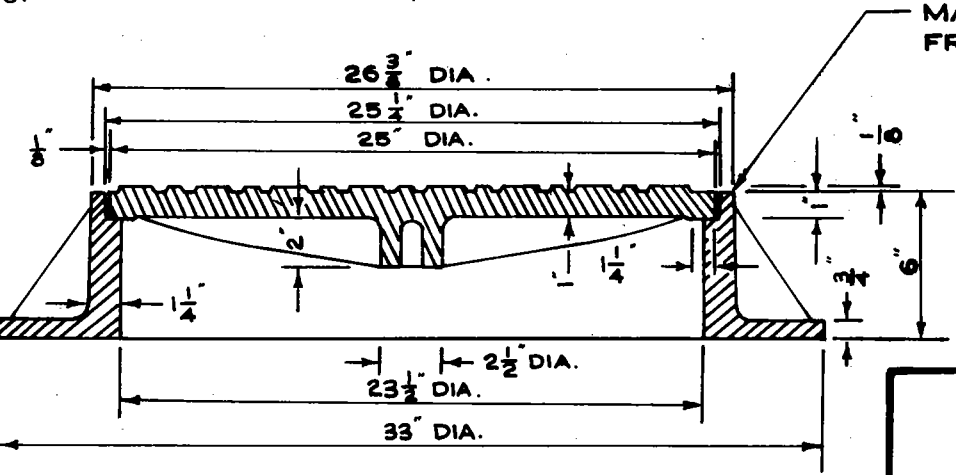
CLEATED SURFACE $\frac{1}{2} \times 3 \times \frac{3}{8}$ "

DRAIN

COVER & FRAME NO. 5943
OLYMPIC FDY. CO. OR EQUAL.

MATERIAL: CAST IRON PER ASTM. A 48
CLASS 30.

WEIGHT
S.

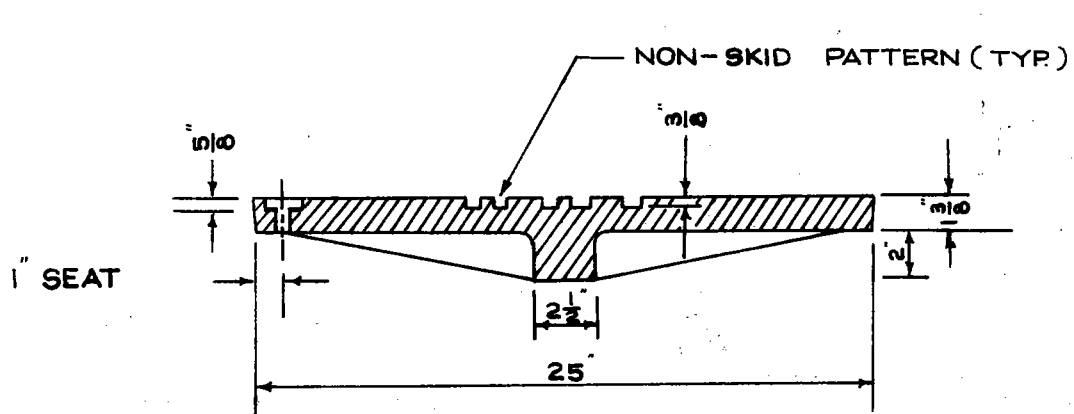
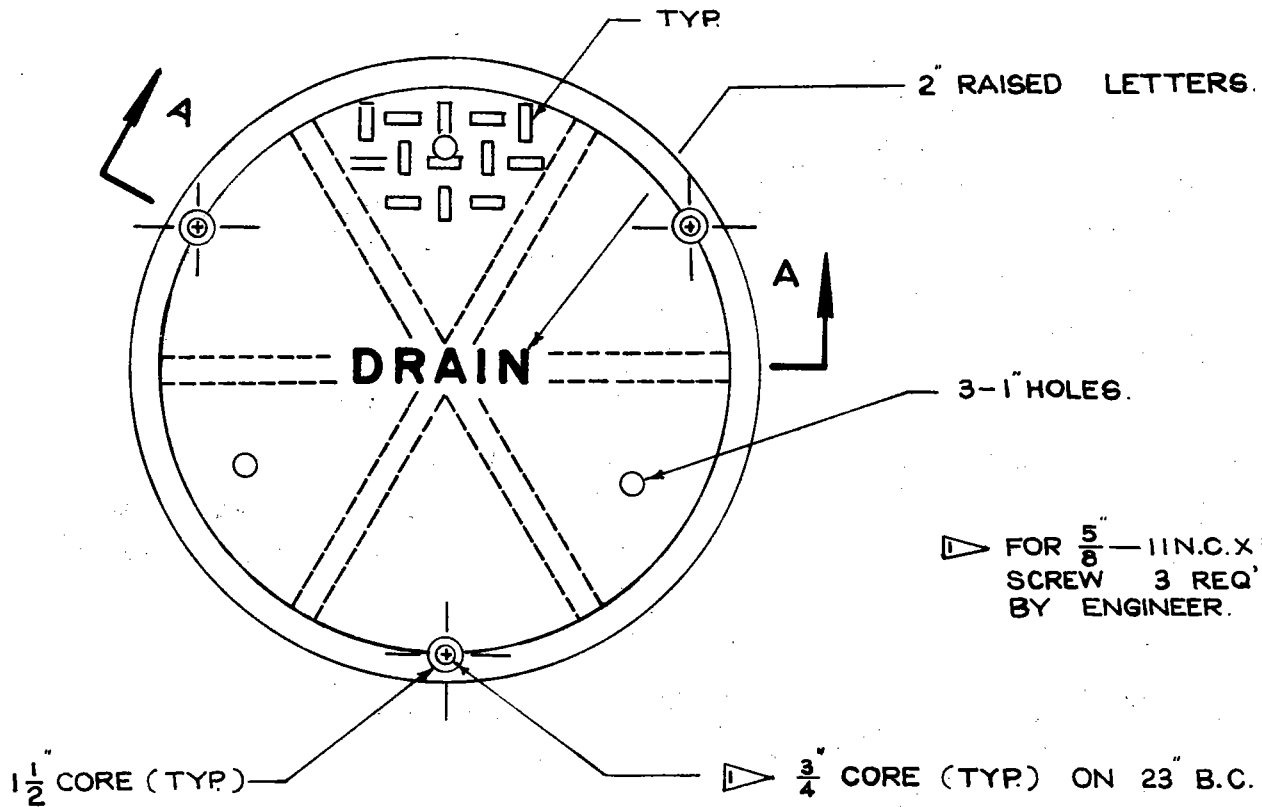


MACHINE SURFACE ON
FRAME AND COVER.

DO NOT SCALE

**MANHOLE COVER
AND FRAME**

KING CO. WASHINGTON

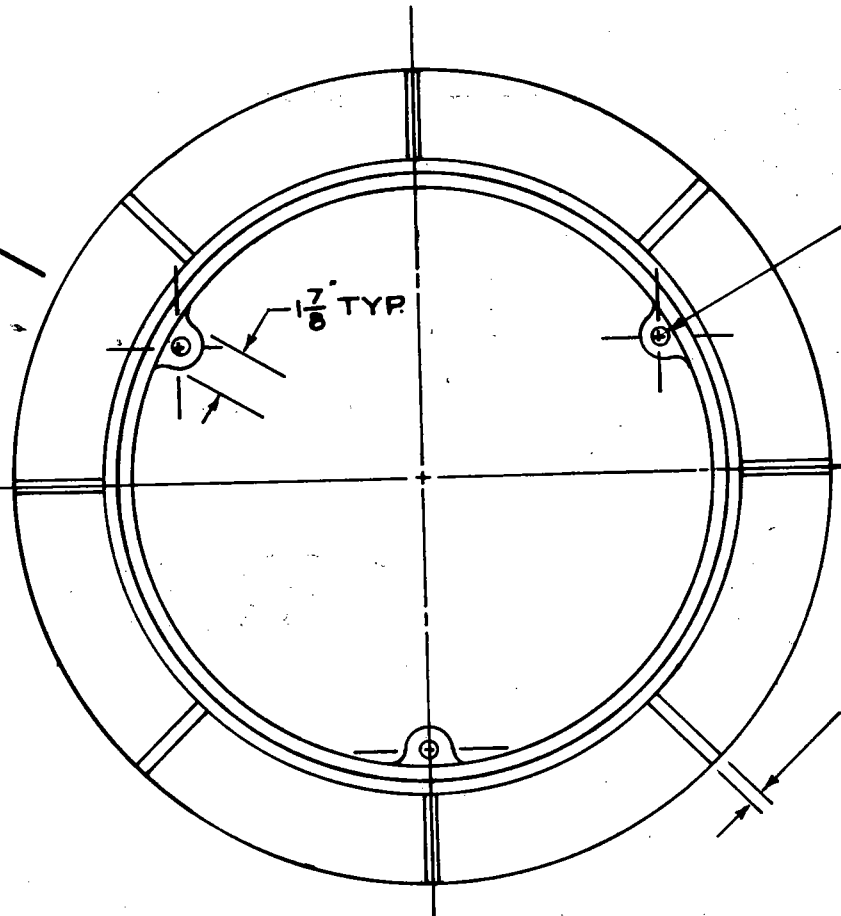


NO. 5943
 OLYMPIC FDY. C

DO NOT

LOCKING MANHOLE

KING CO. WASHIN



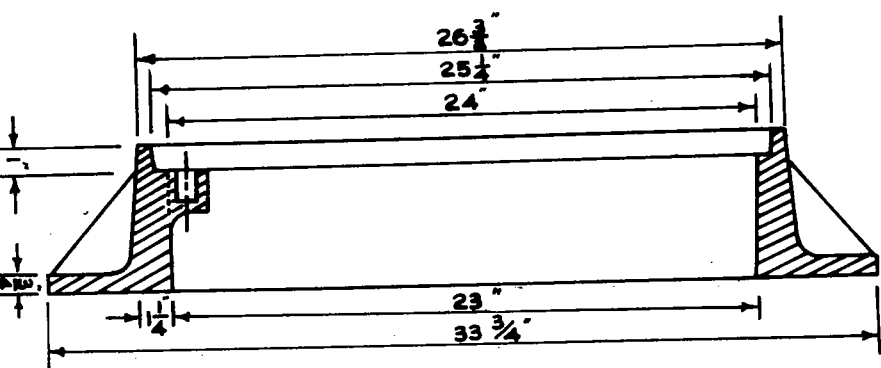
DRILL AND TAP $\frac{5}{8}$ " - 11 N.C. ON 23" B.C.
 TYP. 3 PL. WHEN SPECIFIED BY
 ENGINEER.

$\frac{7}{8}$ " TYP.

A

OLYMPIC NO. 5943-W8-L
 FOUNDRY CO. OR EQUAL

$\frac{1}{2}$ " TYP.



SECTION A-A

DO NOT SCALE

**LOCKING MANHOLE
 FRAME**

KING CO. WASHINGTON