CITY OF NEWHALL, IOWA

DESIGN STANDARDS

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prepared with assistance from:

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ORDINANCE NO. 215

AN ORDINANCE TO AMEND ORDINANCE #147, SUBDIVISION ORDINANCE FOR NEWHALL, IOWA.

WHEREAS, the City of Newhall has land use control regulations, including its Zoning Ordinance and Subdivision Ordinance, and each of these has been created and improved to provide assurances of health, safety, and quality of life for the residents of Newhall; and

WHEREAS, the City of Newhall is frequently requested to provide direction and instructions on the installation of improvements and methods of development, and to date has had no complete listing of required improvements nor a detailed description of how improvements are to be constructed; and

WHEREAS, it is the desire of the City of Newhall to provide a detailed description of instructions and requirements so that improvements and development methods can be conducted in a consistent manner, and so that builders and developers can have easy access to written directions as they affect improvements;

NOW, THEREFORE, BE IT ENACTED by the City Council for the City of Newhall, Iowa as follows:

1. Newhall Subdivision Ordinance #147 is amended to add these directions, instructions, and specifications titled as "**City of Newhall, Iowa – Design Standards**" and these Design Standards shall be applied to all applicable developments, subdivisions, and improvements effective immediately from and after passage and publication as required by statute.

2. That all ordinances, or parts of ordinances in conflict herewith are hereby repealed to the extent of such conflict.

This Ordinance was passed and approved on this 14th day of May, 2001.

Mayor

ATTEST: Janice Lawrence
City Clerk

CLERK'S CERTIFICATION

I, the undersigned, hereby certify that the foregoing was published as Ordinance No. 215 on the 16th day of May, 2001, by posting in three public places as provided by law.

Dated at Newhall, Iowa, this 16th day of May, 2001.

Janice Lawrence
JANICE LAWRENCE, Clerk
City of Newhall, Iowa

TABLE OF CONTENTS

PART 1 - GENERAL

1.01 ABOUT THESE STANDARDS:

These Design Standards are based on a standard developed by a team of private and public sector engineers for use in the design of most common public improvements, most development activities and utility work within the public right-of-way. The intent of the effort was to set a standard of design that is consistent, effective, efficient and protects public safety. The standards incorporated herein have been modified to meet the specific needs for the City of Newhall.

1.02 HOW TO USE THESE STANDARDS:

The standards contained in this document are organized into sections covering specific areas of design. It will often be necessary to use a number of sections for the design of a single project. For instance, the design of a street may require the use of standards on streets, sidewalks, storm sewers, and erosion control.

These standards are a guide for design, but not a substitute for good engineering. It is the obligation of the designer to use these standards responsibly and professionally to produce designs conforming with commonly accepted engineering practices and the Code of Professional Conduct. It will at times be desirable and/or necessary to vary from the standards in this document to produce a good product. When the need arises, please refer to the following section on variances.

1.03 VARIANCES:

When it becomes necessary or desirable to vary from the standards presented in this document, a variance may be requested to the City Engineer. Such a request shall be made in writing and will include:

1. The standard to be varied.
2. The proposed variation.
3. Justification for the variance.

A written response will be given within 14 days of the request. A variance determination may be appealed to the City Council.

1.04 AMENDMENTS:

Amendments to these standards may be requested by writing from the City Engineer with details and justification for an amendment. The City Engineer representing the City will meet with the City to discuss proposed amendments and make recommendations to the City Council.

1.05 WHOM DO I CONTACT?:

There are references made throughout this document to the "City Engineer." This is the engineer employed by the community, public official or engineering consultant retained by the community that functions as the local engineering authority. Questions regarding these design standards should be directed to the City Engineer.

PART 2 - SIDEWALKS AND TRAILS

2.01 APPROVALS:

A. Approvals must be obtained from the City for all sidewalk construction not associated with the construction of a new house or business for which a building permit has been obtained. However, the standards set forth in this document apply to all sidewalk construction.

B. Contractor/Owner must provide a Certificate of Insurance identifying the City as an "Additional Insured" party for the duration of the construction activity.

2.02 TRAFFIC CONTROL:

A. The contractor shall provide barricades to protect pedestrians.

2.03 WIDTH AND LOCATION:

A. Sidewalk width shall be as defined in Table 2.1, except as noted in Section 2.05.

TABLE 2.1

Local	4'
Collector	4'
Arterial	4' / 8'[1]
Commercial	As directed by the City Engineer
Industrial	4'
Major Bridges	4' / 8'[1]

[1] A 4' walk will be required on both sides; however, the City Engineer may require a 8' walk on one side in special circumstances.

B. Sidewalks shall be located 1 foot from the property line, except in areas in which a different offset is required to match existing walks.

C. No sidewalks shall extend to the street perpendicular to the curb except at intersections and designated mid-block crossings. Such existing sidewalks removed for construction or maintenance activities shall not be replaced.

2.04 CROSS SLOPE:

A. All sidewalks shall slope to the street at a rate of 2%.

B. The street edge of the sidewalk shall be located at least a 2% minimum grade to the existing curb or ditch grade. The installer shall maintain the highest elevation possible on the sidewalk elevation such that drainage can be maintained across the sidewalk to any existing drainage curb or ditch.

2.05 MATCHING EXISTING WALKS:

A. The width and location of a new sidewalk shall be varied to match the width and location of existing sidewalks in the area.

B. Sidewalk cross slope may be varied through a gradual transition to match existing adjoining walks. Contact the Engineer if existing adjoining walks vary significantly from existing standards.

2.06 MATERIAL AND THICKNESS:

A. Sidewalks shall be constructed of Portland cement concrete conforming to the Iowa Department of Transportation C-3 mix. Maximum slump shall be 3 inches.

B. Sidewalks up to 6 feet wide shall have a minimum thickness of 4 inches. Sidewalks greater than 6 feet wide shall have a minimum thickness of 5 inches with fiber mesh reinforcement or 6 inches of non-reinforced concrete. Sidewalks crossing driveways shall be a minimum of 6 inches thick.

2.07 JOINTS AND FINISH:

A. Sidewalks shall have a uniform texture with a broom finish.

B. Tooled joints are permissible on sidewalks less than 6 feet in width. Framing is permissible on sidewalks with tooled joints and should match existing adjoining sidewalk. The maximum depth of framing shall be 1/16 inch. The joint depth shall be ¼ the sidewalk thickness. The joint width shall be minimized.

C. Sawed joints are permissible for all widths of sidewalks. The joint depth shall be ¼ the sidewalk thickness.

D. Sidewalk joints shall be delineated through driveways.

E. Sidewalk joints shall be spaced to form square panels.

F. Preformed expansion joints, ½ inch in width, shall be installed at approximately 100 foot intervals or at property lines in new residential or commercial construction. Preformed expansion joints, ½ inch in width, shall be installed adjacent to all curb ramps. See Figure 2.1.

G. Stamped imprints indicating the contractor and date of construction are permissible. The size of the imprint shall be limited to less than 4"x6" and the depth to less than ¼".

H. Apply curing compound immediately following finishing operations or cure with moist burlap for not less than 24 hours.

2.08 CURB RAMPS:

A. Sidewalks shall provide a curb ramp for accommodation of the handicapped at all intersections and designated crossings.

B. Curb ramps shall be located in line with the public sidewalk as shown in Figure 2.1; or unless preapproved by the City.

C. Curb ramps shall be at least 48 inches wide between the curbs and should be sloped at not greater than one inch of rise per twelve inches linear distance (8%). A slope no greater than one inch of rise per eight inches linear distance (12.5%) may be used where necessary. The cross slope of curb ramps shall not exceed 2%.

D. The current standards of the Americans with Disabilities Act (ADA) will govern in all cases.

2.09 TRAILS:

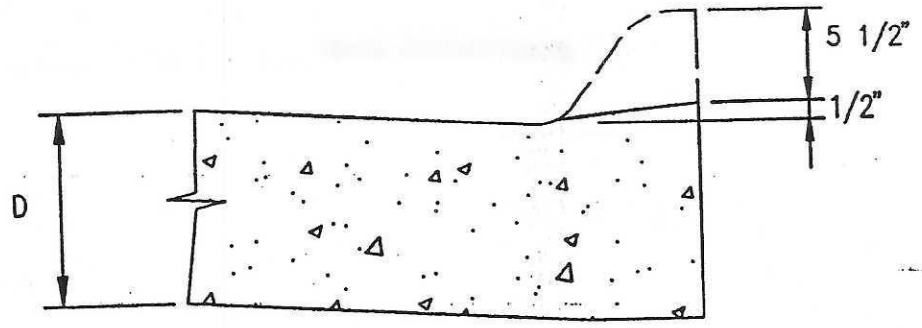
A. In general, trails shall be designed to the same standard as sidewalks.

B. Trails designed for public use shall be a minimum of eight feet wide.

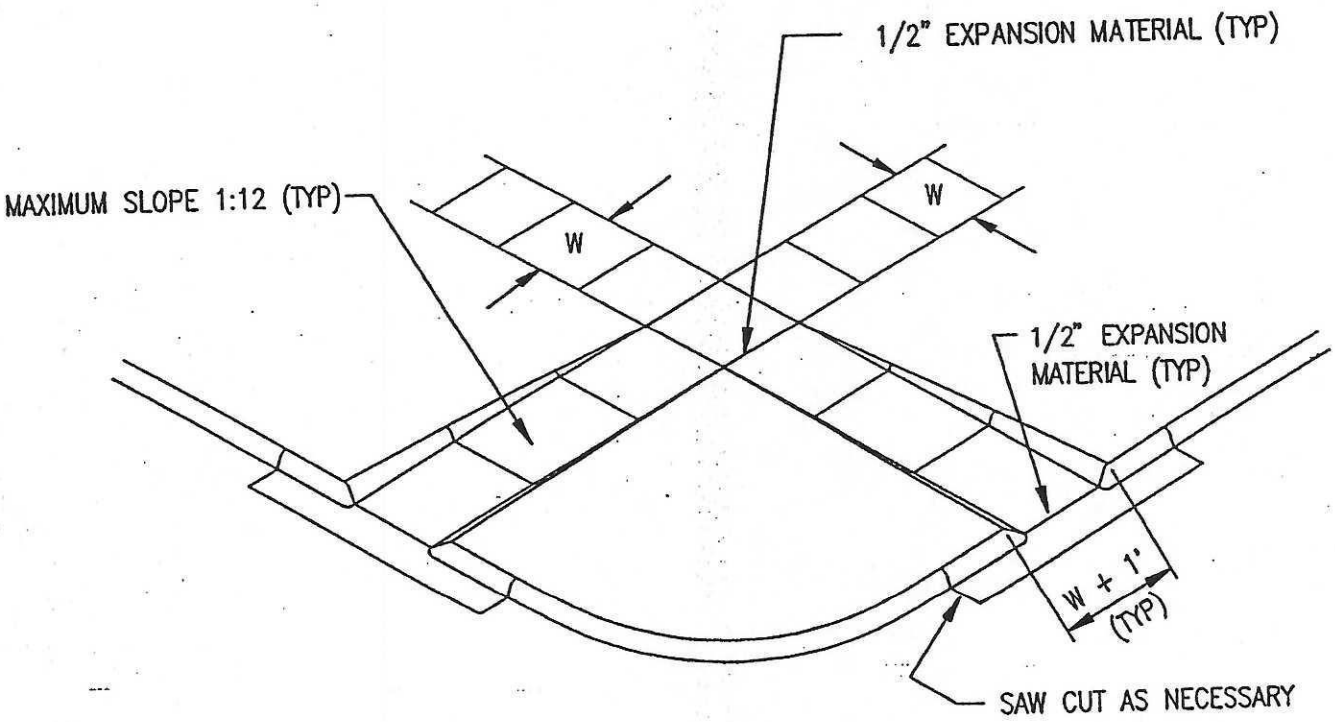
C. To the extent practicable, trails shall comply with the provisions of the Americans with Disabilities Act (ADA).

D. The trail surface shall be of one of the designs shown in Figure 2.2. Surfaces other than P.C.C. will require approval of the City Engineer. Where water is expected to overtop the trail, only non-erodible surfaces shall be used.

E. Trails designed for the use of bicycles shall be designed to the standards of the American Association of State Highway and Transportation Officials' "Guide for the Development of Bicycle Facilities."

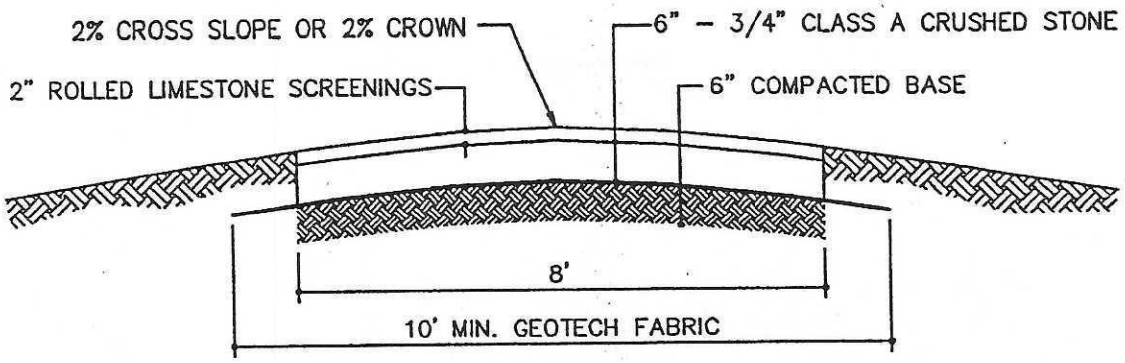


SIDEWALK CURB PROFILE

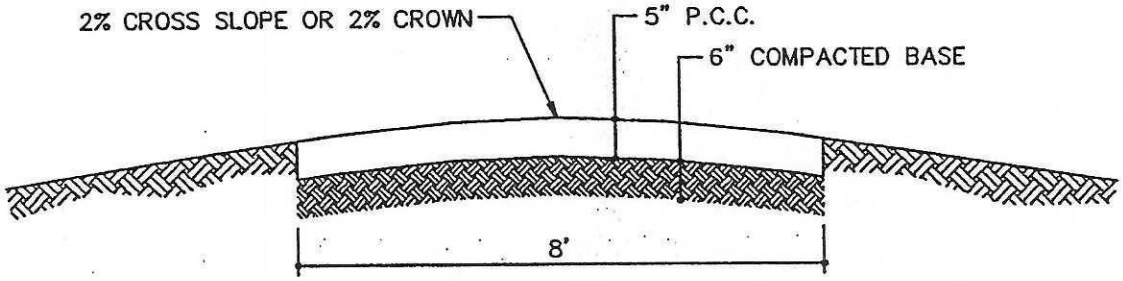


CURB DROP FOR SIDEWALK

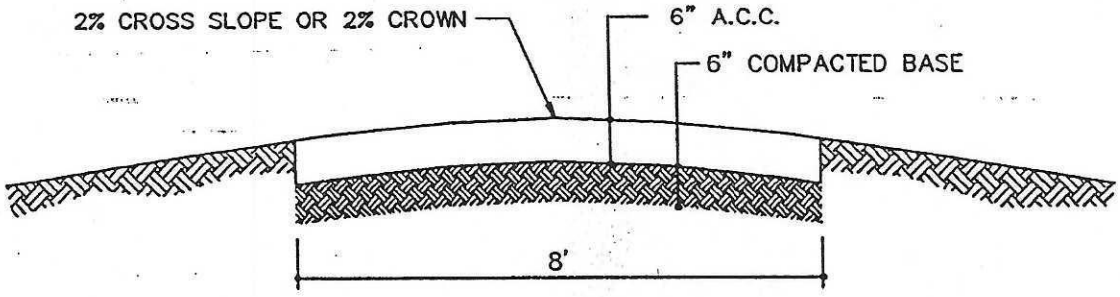
FIGURE 2.1



AGGREGATE SURFACE



PORTLAND CEMENT CONCRETE



ASPHALT CEMENT CONCRETE

TYPICAL TRAIL SURFACES

FIGURE 2.2

PART 3 - DRIVEWAYS

3.01 APPROVALS AND PERMITS:

A. An access permit must be obtained before driveway construction or reconstruction work is done within the street right-of-way not associated with the construction of a new house or business for which a building permit has been obtained. However, the standards set forth in this document apply to all driveway construction. A sketch with dimensions shall be submitted showing the driveway in relation to intersections, side lot lines and other driveways.

B. A permit must be obtained from the Iowa Department of Transportation before placing a driveway within any State highway right-of-way.

C. Contractor/Owner must provide a Certificate of Insurance identifying the City as an "Additional Insured" party for the duration of the construction activity.

3.02 TRAFFIC CONTROL:

A. The contractor/owner doing the work is responsible for all traffic control and work site safety. If construction activities extend onto the street, traffic control shall meet the standards for Work Zone Traffic Control defined in the current edition of the "Manual on Uniform Traffic Control Devices." Traffic control plans may be required.

B. The contractor/owner shall provide adequate barricades and/or fencing to protect pedestrians continuously from the start of construction to the completion of work.

3.03 DRIVEWAY MATERIAL, THICKNESS AND FINISH:

A. The driveway slab extending from the street to private property shall be constructed of Portland cement concrete conforming to the specifications of the Iowa Department of Transportation C-3 or M-3 mixes. Maximum slump shall be 3 inches. The concrete driveway slab shall be a minimum of 6 inches thick.

B. Driveways shall have ½-inch preformed expansion joint material at the front and back of sidewalk. Driveways across from "T" intersections shall have one-inch pre-formed expansion joint material at the front and back of the sidewalk.

C. The finish shall be a broom finish or astroturf drag.

D. Apply curing compound immediately following finishing operations or cure with moist burlap for not less than 24 hours.

E. All driveways must be hard surfaced from the street to the property line for new residents. Other existing driveway replacement surfaces (ACC, seal coat, or special materials) may be approved, upon application to the City, contingent upon satisfactory compliance of all other requirements of this section, and any other conditions required by the City.

3.04 NEW AND REPLACEMENT CULVERTS:

A. New driveways constructed on streets without curb and gutter shall have culverts as approved by the City. Replacement of existing culverts must be approved by the City.

B. A written request for installation of a new or replacement culvert must be submitted to the City, and must be accompanied by a drawing that shows:

1. culvert dimensions, length, diameter, and culvert material

2. culvert location in relationship to property lines, street centerline and utilities

C. All culvert installation shall be reviewed and approved by the City.

D. All culverts must have a minimum diameter of 18". All culverts must be constructed of 10 gauge corrugated metal pipe (CMP) or other material approved by the City.

E. Culverts are the responsibility of the property owner. The City accepts no responsibility for maintenance, repair, replacement, or procurement of contractors. Failure to install culvert in accordance with City requirements will result in removal and replacement at property owner's expense.

3.05 CURB REMOVAL AND JOINT AT PAVEMENT:

A. Curb drops shall be constructed as detailed in Figure 3.1 for new subdivisions or other areas with existing "standard" curb and gutter.

3.06 GENERAL CONDITIONS FOR ALL CLASSIFICATIONS OF DRIVEWAYS:

A. There shall be a minimum of twenty (20) feet between the end of the radius of a street intersection and the beginning of a driveway curb cut as measured at the curb line in all instances. Additional distance between the radius of a street intersection and the beginning of a driveway curb cut may be required by the City Engineer where deemed necessary because of high traffic volumes or other safety concerns.

B. A six (6) foot minimum distance between each drive curb cuts at the curb line will be required.

C. The curb return shall not be constructed closer than three (3) feet to the side property line extended.

3.07 SINGLE FAMILY (Figure 3.2):

A. One driveway with maximum dimensions of twenty-four (24) feet measured at the street side of the sidewalk and thirty (30) feet at the curb line will be allowed.

B. A maximum of two driveways per property will be allowed, regardless of single or double frontage (regular or corner lot).

C. If two driveways are desired on a single frontage lot, two driveways with maximum dimensions of twelve (12) feet measured at the street side of the sidewalk and eighteen (18) feet at the curb line will be allowed.

D. If two driveways are desired on a double frontage (corner) lot, one on each frontage, one driveway with maximum dimensions of twenty-four (24) feet measured at the street side of the sidewalk and thirty (30) feet at the curb line and one driveway with maximum dimensions of twelve (12) feet measured at the street side of the sidewalk and eighteen (18) feet at the curb line will be allowed. The major driveway is required to be located on the lower classified street.

E. Shared driveways for adjacent single-family residences are encouraged and in some instances may be required. To promote this goal, shared

driveway maximum widths of thirty (30) feet at the street side of the sidewalk and thirty-six (36) feet at the curb line will be allowed.

F. Sections 3.06 B and 3.06 C may be varied by the City Engineer in certain instances in the existing developed areas of the City, as necessary.

3.08 TWO-FAMILY RESIDENCES (Figure 3.3):

A. A maximum of one driveway per dwelling unit will be allowed, regardless of single or double frontage (regular or corner lot).

B. One driveway per dwelling unit with maximum dimensions of twenty-four (24) feet measured at the street side of the sidewalk and thirty (30) feet at the curb line will be allowed, except as noted in 3.07 F.

C. If garages are constructed on the common lot line, a single driveway with maximum widths of thirty (30) feet at the street side of the sidewalk and thirty-six (36) feet at the curb line will be allowed.

D. Sections 3.06 B and 3.06 C may be varied by the City Engineer in certain instances in the existing developed areas of the city, as necessary.

3.09 ALL OTHER DRIVEWAYS EXCEPT SINGLE OR TWO FAMILY RESIDENCES:

A. Single Frontage (Figure 3.4)

1. One driveway with maximum dimensions of thirty-four (34) feet measured at the street side of the sidewalk and forty-two (42) feet at the curb line will be allowed.

2. If two driveways are desired, two driveways with maximum dimensions of twenty-four (24) feet measured at the street side of the sidewalk and thirty-two (32) feet at the curb line will be allowed.

3. If the single frontage length is greater than or equal to one hundred and fifty (150) feet, two driveways with maximum dimensions of thirty-four (34) feet measured at the street side of the sidewalk and forty-two (42) feet at the curb line will be allowed.

B. Corner Lots (Figure 3.5)

1. On corner lots, driveways shall be constructed as far away from the intersection as possible and still remain upon the property. In no case shall there be less than twenty (20) feet between the end of the

radius of a street intersection and the beginning of a driveway curb cut as measured at the curb line.

2. In no instance shall more than three driveways be allow on a double frontage property with no more than two on any single frontage.

3. One driveway per frontage with maximum dimensions of thirty-four (34) feet measured at the street side of the sidewalk and forty-two (42) feet at the curb line will be allowed.

4. If one frontage length is greater than or equal to one hundred and fifty (150) feet, two driveways with maximum dimensions of thirty-four (34) feet measured at the street side of the sidewalk and forty-two (42) feet at the curb line will be allowed on the longer frontage.

3.10 STATE HIGHWAY AND INDUSTRIAL AREAS (NON-RESIDENTIAL) (FIGURE 3.6):

A. Type A drives are for high traffic volume, joint or common property driveways requiring protection for left turn movements. Type A drives shall be 45 feet wide at the property or sidewalk line. This width contains one 16-foot lane in a 4-foot painted or raised median and two 12-foot lanes out.

B. Type B drives are for high traffic volume, joint or common property driveways. Type B drives shall be 41 feet wide at the property or sidewalk line. This width contains one 16-foot lane in and two 12-foot lanes out.

C. Type C drives are for lower volume single property driveways. Type C drives shall be 28 feet wide at the property or sidewalk line. This width contains one 14-foot lane in and one 14-foot lane out.

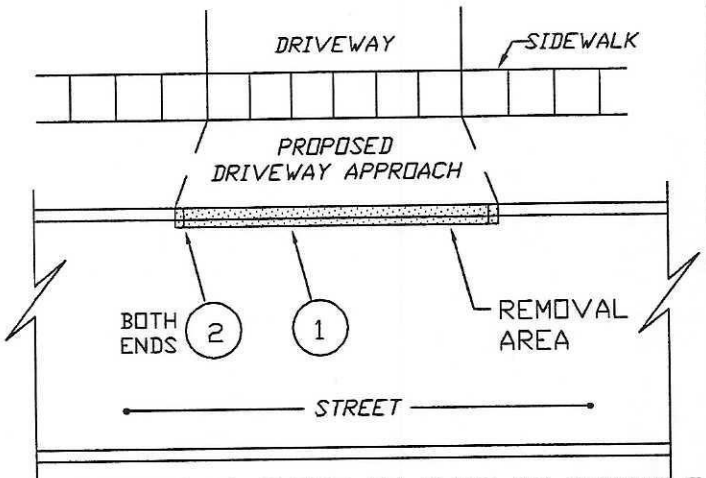
D. The maximum radius for all driveways is 25 feet.

3.11 DOUBLE FRONTAGE LOTS – FRONT AND BACK:

A. Each frontage of lots with frontage on two parallel streets shall comply with the applicable standards for single frontage lots contained in Sections 3.07, 3.08 and 3.09.

B. Some subdivisions may prohibit access onto the higher classification street. Check the subdivider's agreement in each case.

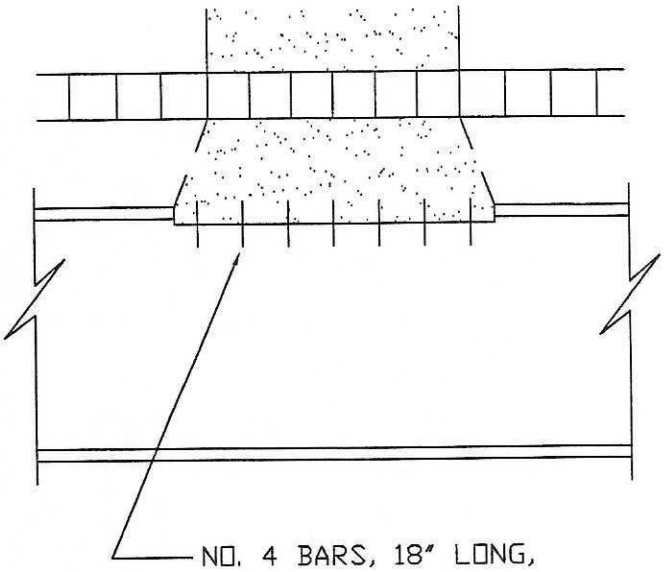
DRIVEWAY CONSTRUCTION



1. SAWCUT AS CLOSE TO CURB AS POSSIBLE, MINIMUM DEPTH=2/3 OF EXISTING PAVING
2. SAWCUT CURB AT FULL WIDTH AND 6" IN FROM BOTH ENDS
3. REMOVE SMALL SECTIONS OF CURB FIRST

* SEE NOTE BELOW.

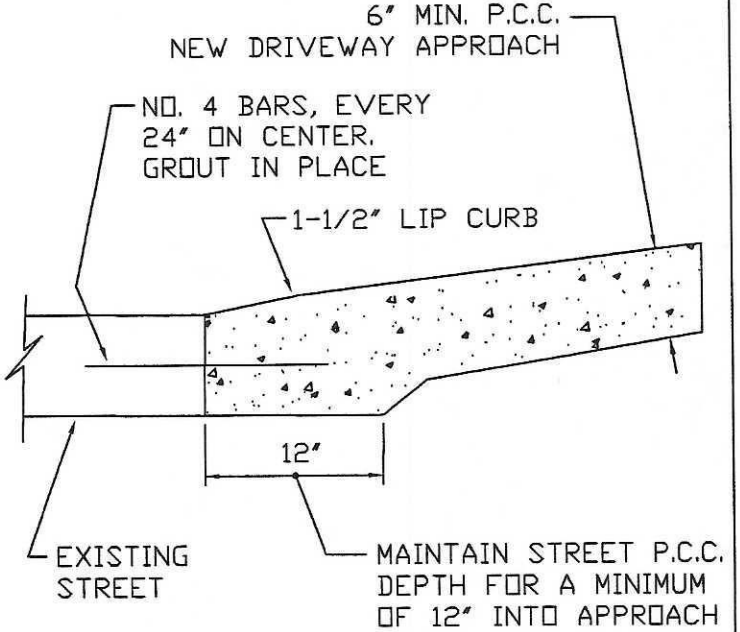
Curb Removal



NO. 4 BARS, 18" LONG, EVERY 24" ON CENTER AND 1' MAX. FROM EACH END

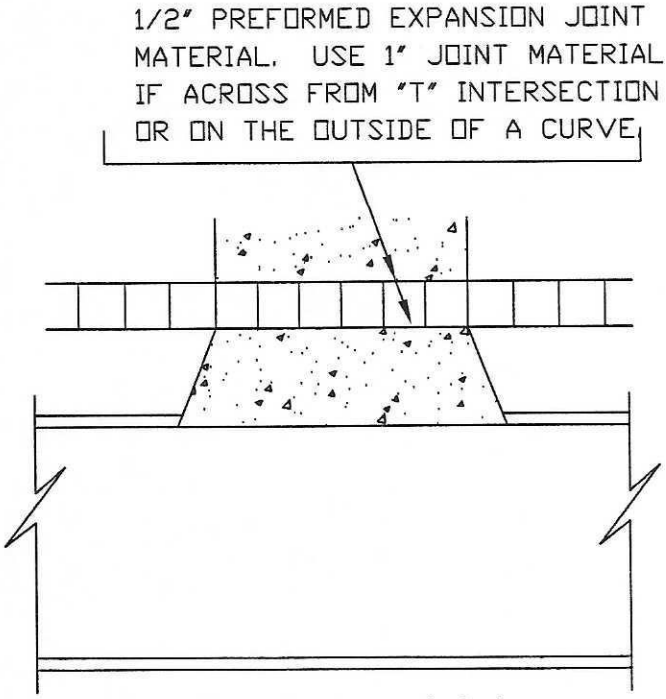
* SEE NOTE BELOW.

Rebar



* SEE NOTE BELOW.

Cross-Section View



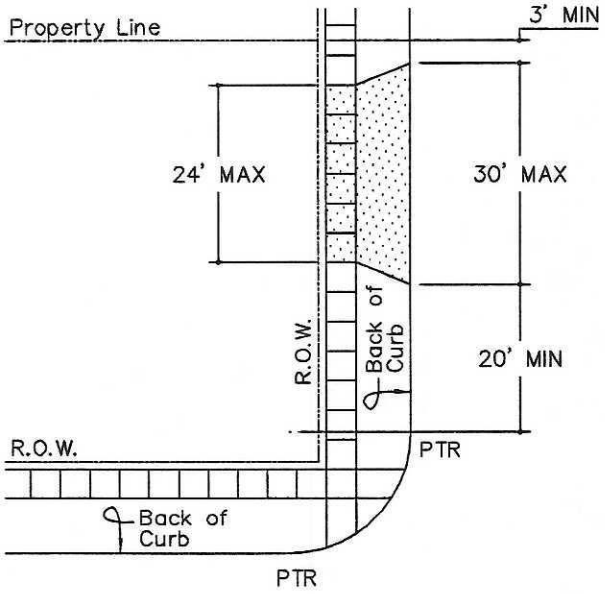
Expansion Joints

* IF 6" SLOPED CURB IS IN EXISTING AS PER FIGURE 4.3 & 4.4, THEN THESE DO NOT APPLY, EXCEPT FOR REINFORCEMENT BARS.

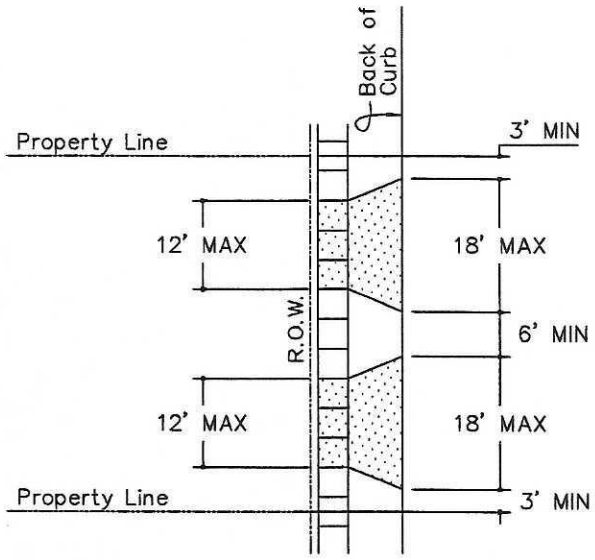
FIGURE 3.1

DRIVEWAY REGULATIONS

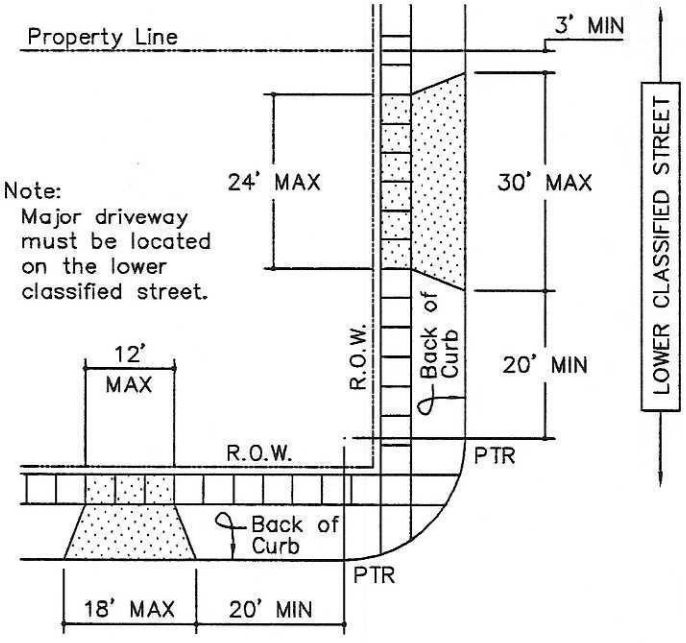
Single Family Residences



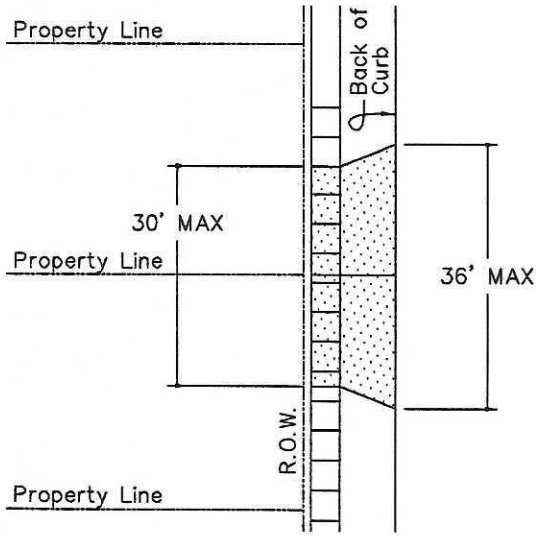
One Driveway



Two Driveways
Single Frontage



Two Driveways
Double Frontage

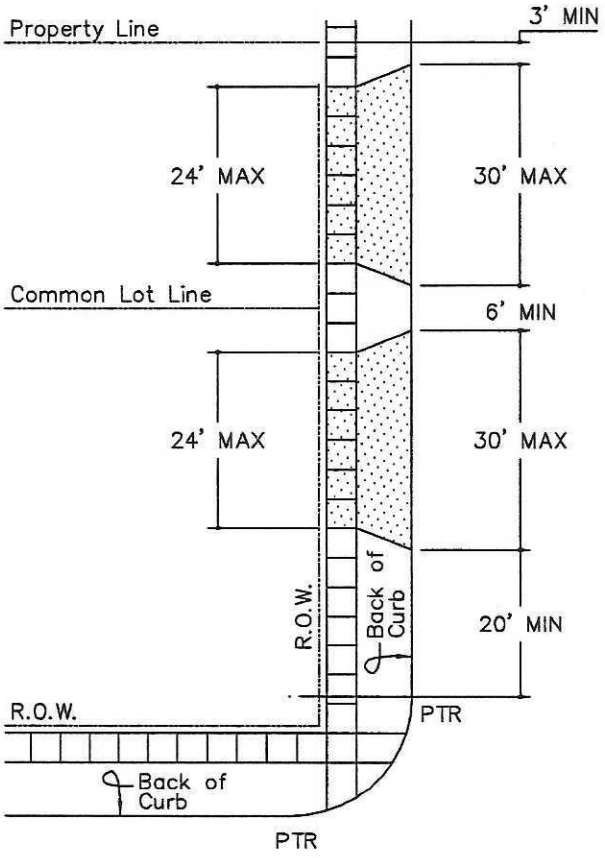


Shared Driveway
Adjacent Single Families

FIGURE 3.2

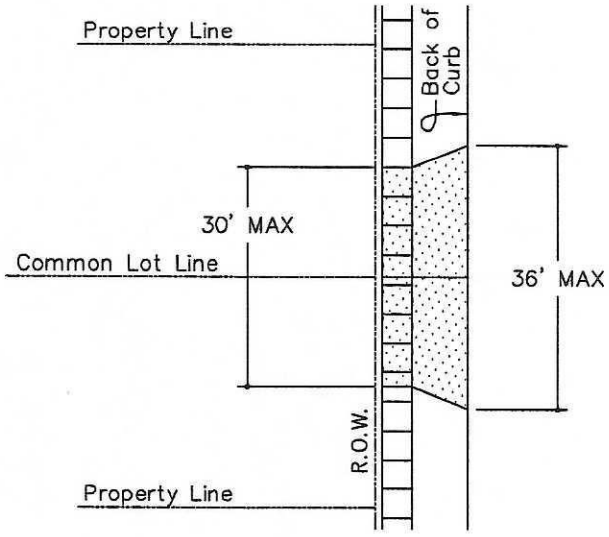
DRIVEWAY REGULATIONS

Two–Family Residences



One Driveway

Single/Double Frontage



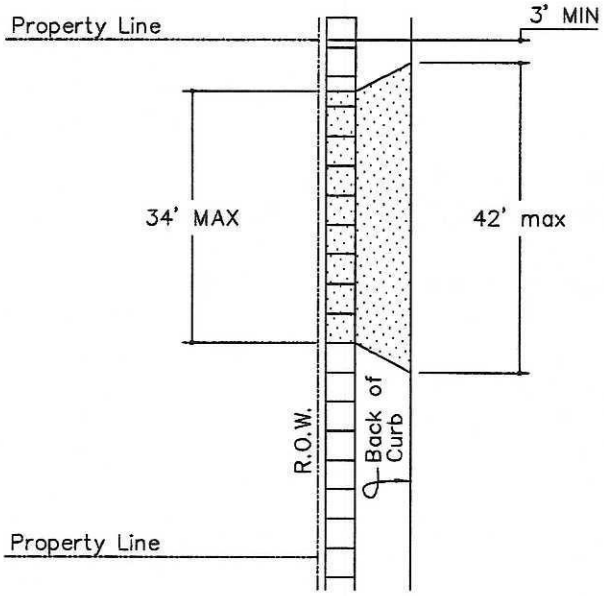
One Driveway

Garages On Common Lot Line

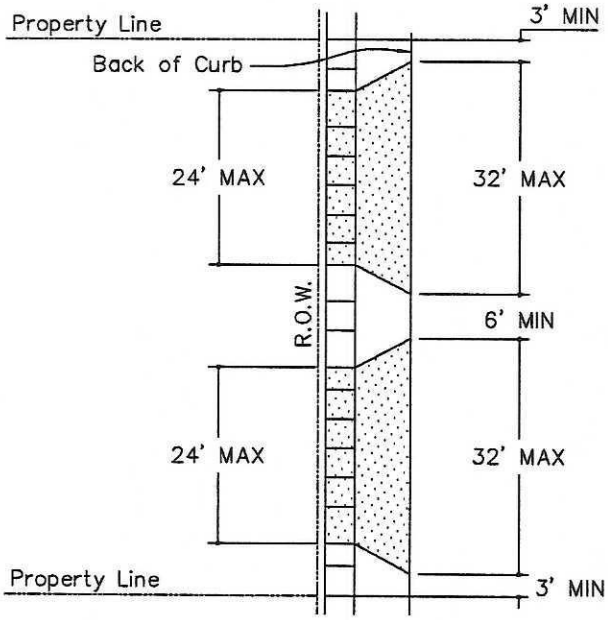
FIGURE 3.3

DRIVEWAY REGULATIONS

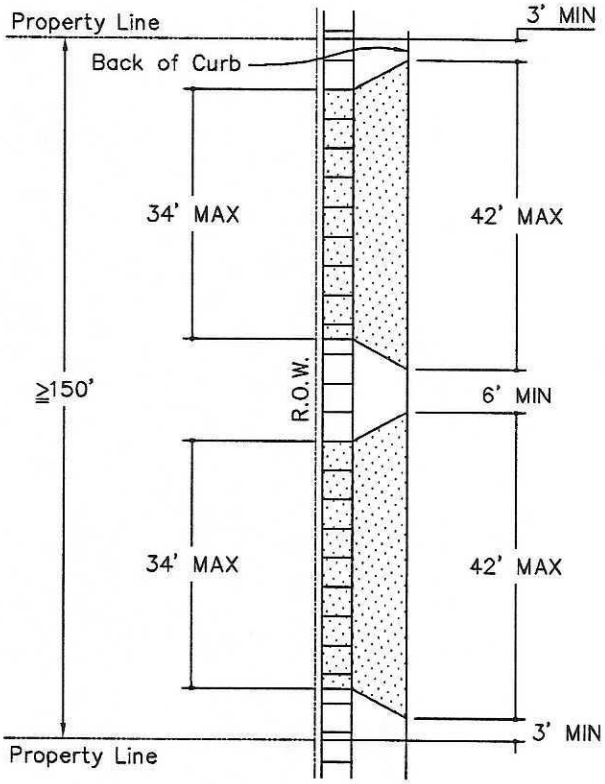
All Other Driveways Except Single/Two Family Residences



One Driveway
Single Frontage



Two Driveways
Single Frontage

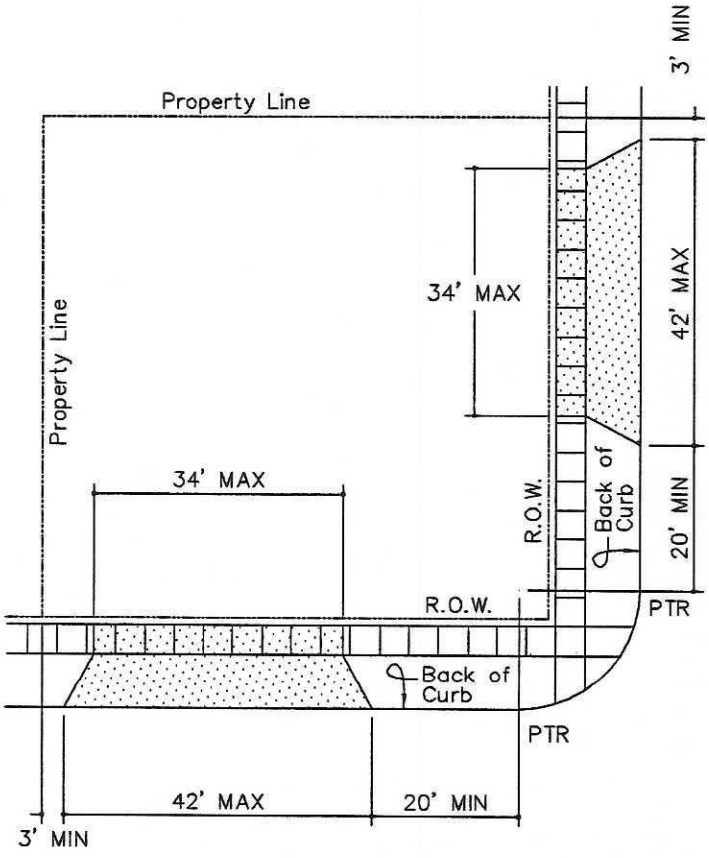


Two Driveways
Single Frontage
Lot length ≧150'

FIGURE 3.4

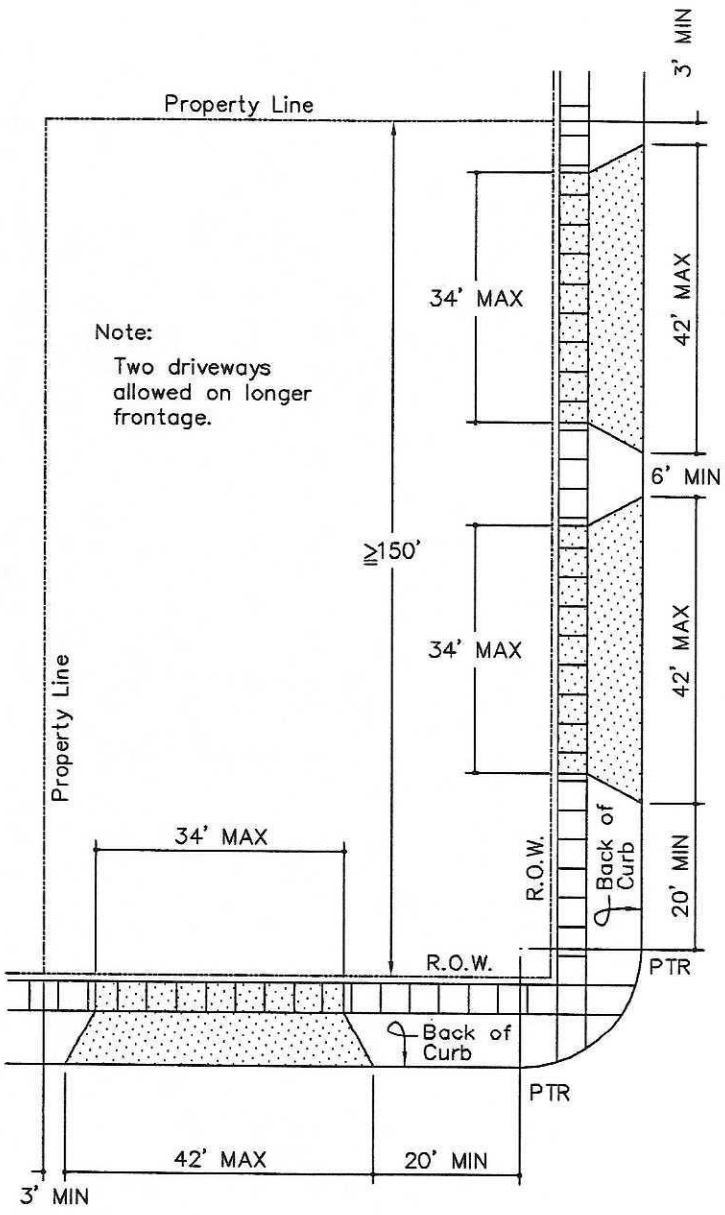
DRIVEWAY REGULATIONS

All Other Driveways – Continued



Two Driveways

Double Frontage



Two Driveways

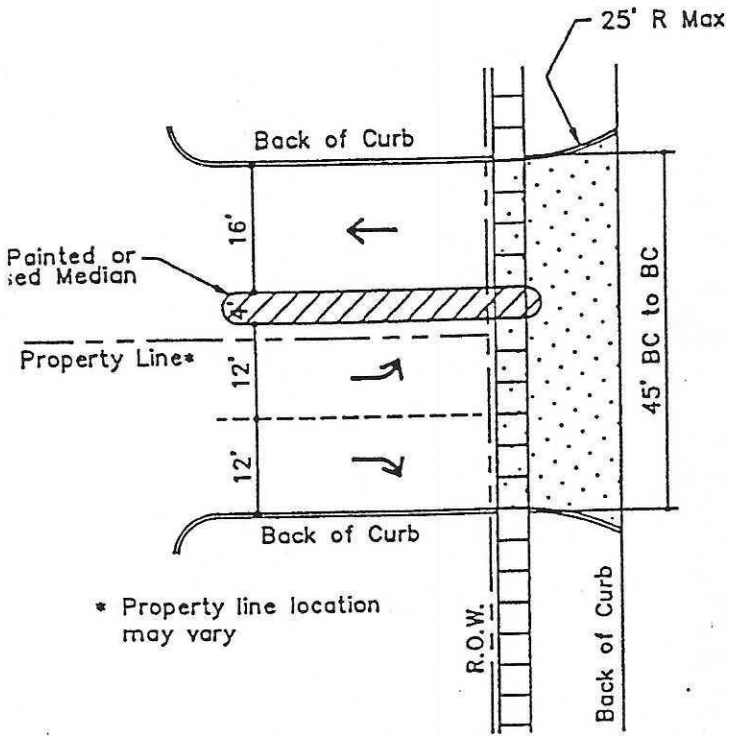
Double Frontage

Lot length ≧150'

FIGURE 3.5

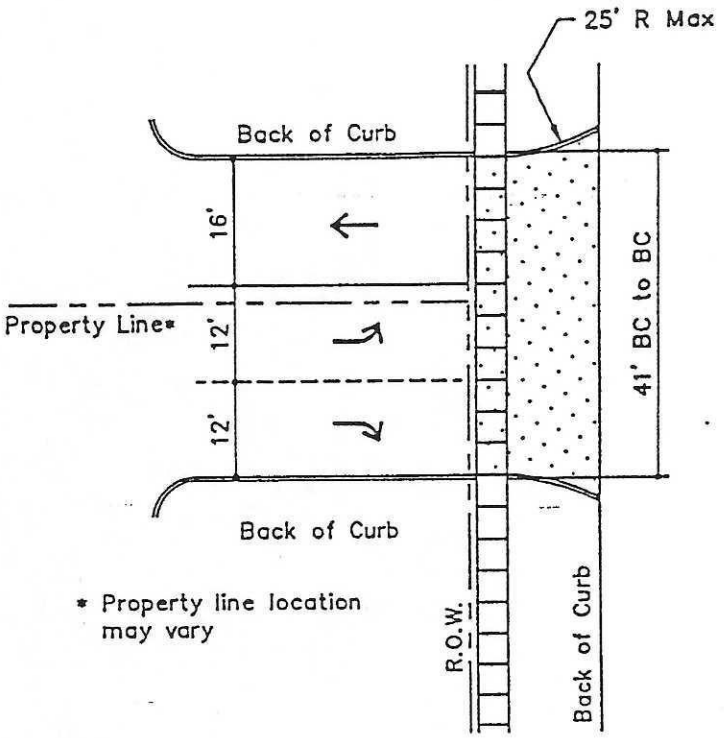
DRIVEWAY REGULATIONS

State Highways and Industrial Areas



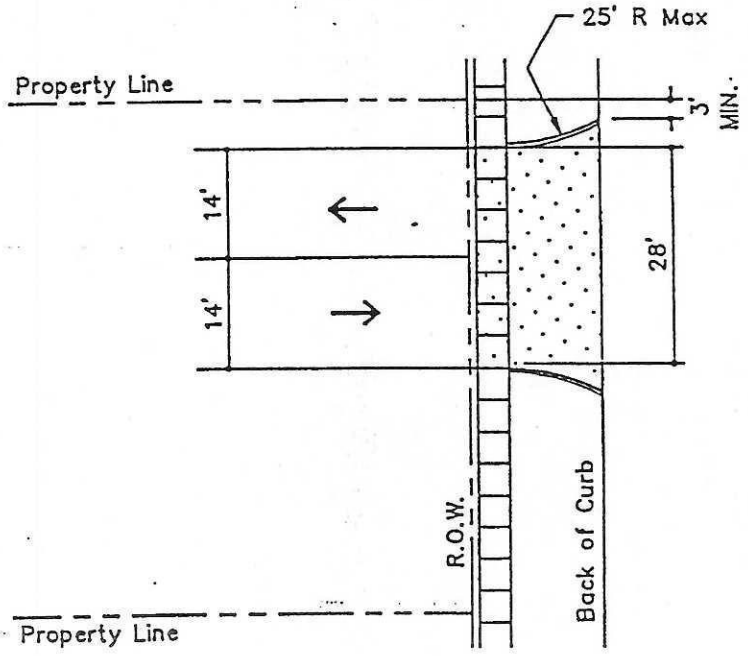
Type A

Joint/Common Property Driveway
with Painted or Raised Median



Type B

Joint/Common Property Driveway



Type C

Single Property Driveway

FIGURE 3.6

PART 4 - STREETS

4.01 APPROVALS, PERMITS, AS-BUILTS AND MAINTENANCE BONDS:

A. Plans and specifications for public street improvements must be certified by a professional engineer registered in the State of Iowa and utilize the NGVD of 1929, except for annual maintenance projects.

B. Plans and specifications for public street improvements must be reviewed and approved by the City prior to construction.

C. Other local, state and federal permits may be required, depending on the circumstances. It shall be the responsibility of the Engineer of Record to acquire all applicable permits. A copy of all permits shall be provided to the City before construction.

D. The Engineer of Record is responsible to submit "Record of Construction" drawings to the Engineer on reproducible vellum or mylar.

E. A five-year maintenance bond covering defective materials and workmanship is required for all street improvements.

4.02 DESIGN RESOURCES:

A. "A Policy on Geometric Design of Highways and Streets," American Association of State Highway and Transportation Officials, current edition.

B. Iowa Department of Transportation Manuals Current editions with revisions:

- Standard Road Plans
- Road Design Details
- Road Design Manual
- Road Design Aids Manual

C. Iowa Department of Transportation "Urban Design Guides" and "Alternative Urban Design Guides," current edition.

D. Iowa Department of Transportation "Standard Specifications for Highway and Bridge Construction", current edition.

4.03 STREET CLASSIFICATION:

Streets will be classified according to their functional use as described below. Existing facilities may not fully comply.

Arterial Streets provide a continuous route for the expeditious movement of large volumes of all types of through-traffic across and beyond the city and between high traffic generation points. The geometric design and traffic-control measures are used to facilitate the safe movement of through traffic. Local street access to arterial streets will be limited. Direct access from abutting properties will not be permitted.

Collector Streets provide for the movement of traffic between arterial routes and local streets as well as providing limited direct access to abutting property. Moderate amounts (≤2500 vehicles per day) of low speed (≤25 MPH) traffic, including bus traffic, may be carried on collector streets.

Local Streets serve as a means of access to abutting property. They are intended to be a low speed (≤25 MPH) and short trip routes, with usually less than 500 vehicles per day.

Industrial Streets are intended to carry commercial or industrial traffic.

4.04 RIGHT-OF-WAY WIDTH:

A. The minimum right-of-way width shall be provided as follows:

1. Arterial rights-of-way shall be 100 feet in width,
2. Collector rights-of-way shall be 66 feet,
3. Local rights-of-way shall be 60 feet in width,
4. Cul-de-sac rights-of-way shall be 100 feet in diameter for local and 120 feet in diameter for industrial,
5. Industrial rights-of-way shall be 80 feet.

B. These widths do not provide for medians or boulevards if they are planned within the right-of-way.

4.05 TRAFFIC LANE WIDTHS AND LENGTH RESTRICTIONS:

A. All pavement widths hereinafter specified shall be the measured width from back-to-back of the curb.

B. Local streets will have a minimum pavement width of 29 feet.

C. Industrial streets will have a minimum pavement width of 31 feet.

D. Collector streets shall have a minimum pavement width of 34 feet with provisions for bike lanes, except where turning lanes are present or 31 feet where bike lanes are not desired.

E. Arterial streets shall have a minimum pavement width of 39 feet with provisions for bike lanes, except where turning lanes are present or 36 feet where bike lanes are not desired.

F. Cul-de-sacs are not generally acceptable, but may be reviewed by the City on a case by case basis. They shall be paved with the outer edge being 10 feet inside the circumference of the right-of-way. The other radius from the stem of the cul-de-sac to the head shall be a minimum of 20 feet. Cul-de-sacs shall have a maximum length of 900 feet from the center of the bulb to the center line of the adjoining street.

4.06 SEPARATE TURNING LANES:

A. Separate turning lanes may be included on arterial streets but will generally not be included in other street design. Where separate turning lanes are required on the basis of a capacity analysis, use a 12-foot width for arterial streets and an 11-foot width for collector streets.

4.07 MEDIANS AND BOULEVARDS:

A. Medians or boulevards on arterial streets shall have a minimum width of 16 feet. At intersections, medians may be used to provide for a separate left turn storage lane.

B. Medians or boulevards which are included as a part of local or collector streets shall have a minimum width of 4 feet if paved or 9 feet if grassed. Paved medians on local and collector streets are discouraged.

4.08 DESIGN SPEED:

A. A design speed will be used to design the geometric features for arterial streets. The design speed will not be less than 35 miles per hour; however, posted speed limits may be less. The design speed will be used to establish geometric features including sight distance, intersections, etc. to current AASHTO standards.

4.09 CLEAR ZONES:

A. On streets with curbs, the clear zone shall be 3 feet for streets with a posted speed limit of 25 mph or less and 10 feet for streets with a posted speed limit greater than 25 mph. On streets without curbs, the clear zone shall be 10' for two-lane and four-lane facilities.

B. Variances to clear zone requirements will be considered for overhead electrical facilities where compliance will significantly impact existing trees. In no case will a clear zone of less than 18 inches be allowed. A clear zone variance must be approved by the City.

4.10 STREET GRADES:

A. The maximum street grade for arterial, industrial and cul-de-sac streets shall be 8%, for collector streets 8% and for local streets 8%.

B. When two streets intersect, the grade of the lower classification street shall be minimized to allow safe stopping and starting in adverse weather.

C. The minimum grade for streets shall be 0.5%, except around the bulbs of cul-de-sacs where the minimum grade shall be 0.7%.

4.11 CURVE RADIUS:

A. The minimum center line radius for curves shall be as follows:

Arterial - 1,000'
Collector - 350'
Local - 150'
Cul-de-sacs - 150'
Industrial – 150'

B. Under no circumstances will variances be granted for radii less than 75 feet.

4.12 PAVEMENT CROSS SECTION:

A. All pavements shall have a 2% parabolic crown cross section as shown in Figure 4-1 or 4-1.A.

4.13 CURB AND GUTTER SECTION:

A. For P.C.C. pavement, curbs may be only "Integral 6" Standard Curb" as shown in Figure 4-3.

B. For P.C.C. pavement, curbs shall be integral cast Portland cement concrete. There shall be no separation between the curb and gutter section and the pavement.

C. For A.C.C. pavement, curbs may be 6" Standard Curb unit as shown in Figure 4-4.

4.14 INTERSECTION CORNER RADIUS:

A. The corner radius at intersections will depend on the functional classification of the intersecting streets. These are the minimum criteria:

arterial - arterial	50 feet
arterial - collector	30 feet
arterial - local	25 feet
collector - collector	25 feet
collector - local	25 feet
local - local	25 feet
industrial	50 feet or as per IDOT WB-50 or greater requirements, depending on usage

Corner radiuses may be enlarged on routes that will have significant truck or bus traffic.

B. See Figure 4-2 for typical intersection joint detail for P.C.C. pavements.

4.15 PAVEMENT MATERIAL AND THICKNESS:

A. The pavement slab shall be constructed of non-reinforced Portland Cement Concrete conforming to the IDOT specifications C-3 mix or M-3 mix or an Asphalt Cement Concrete mixture conforming to IDOT specifications

B. The minimum required pavement thicknesses are as follows:

Street Class	Portland Cement Concrete *	Asphalt Cement Concrete *
Arterial	9 inches minimum	10 inches minimum
Collector and Industrial	8 inches	9 inches minimum
Residential	7 inches	8 inches minimum

Pavement thickness and subgrade requirements are intended as a guide. Arterial and Industrial street projects shall be designed on the basis of soil conditions and projected traffic loadings.

* Depends on subbase materials required

TABLE 4.1
Summary of Design Criteria

DESIGN STANDARD	ARTERIAL	COLLECTOR	LOCAL	CUL-DE-SACS	INDUSTRIAL
Minimum right-of-way width	100'	66'	60'	100'-120'	80'
Minimum pavement width (1)	36'	31'	29'	29' street 25' bulb	31'
Maximum grade	8%	8%	8%	8%	8%
Minimum grade	0.5%	0.5%	0.5%	0.7%	0.5%
Minimum curve radius	1,000'	350'	150'	150'	150'
Minimum pavement Thickness (P.C.C.) (2) (New Subdivision)	9**	8	7	7	8**
Minimum pavement thickness (A.C.C.) (2) (Existing Streets)	10**	9	8	8	9**

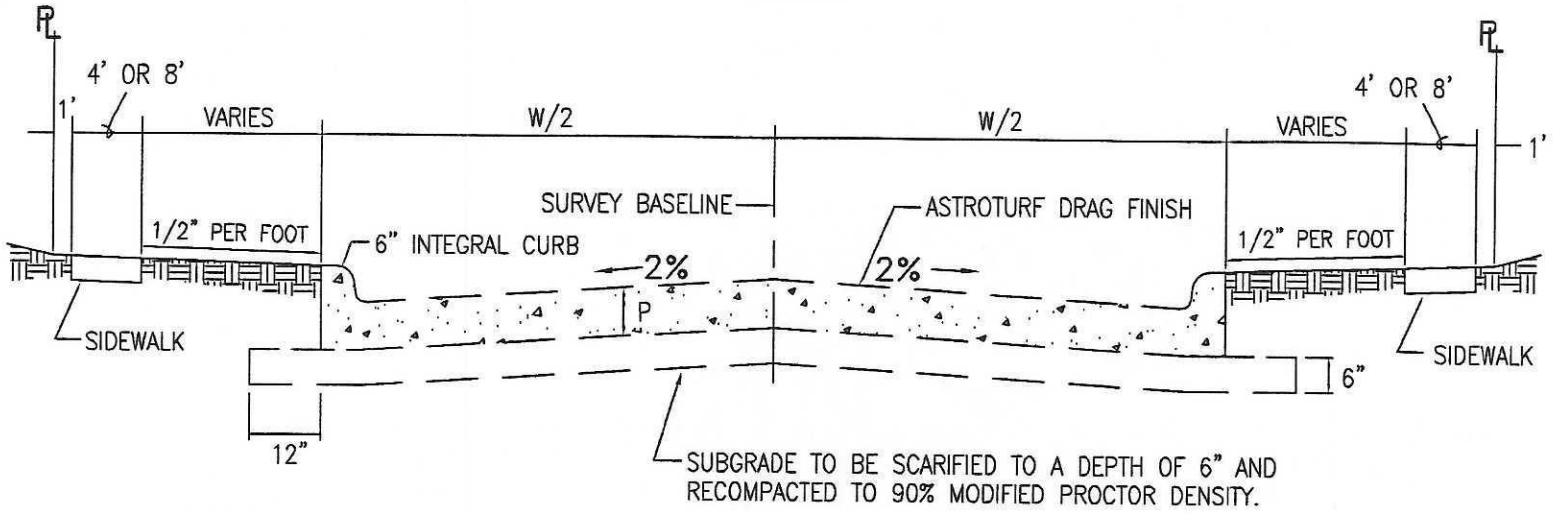
**See 4.15B.

(1) Assumes curb and gutter.

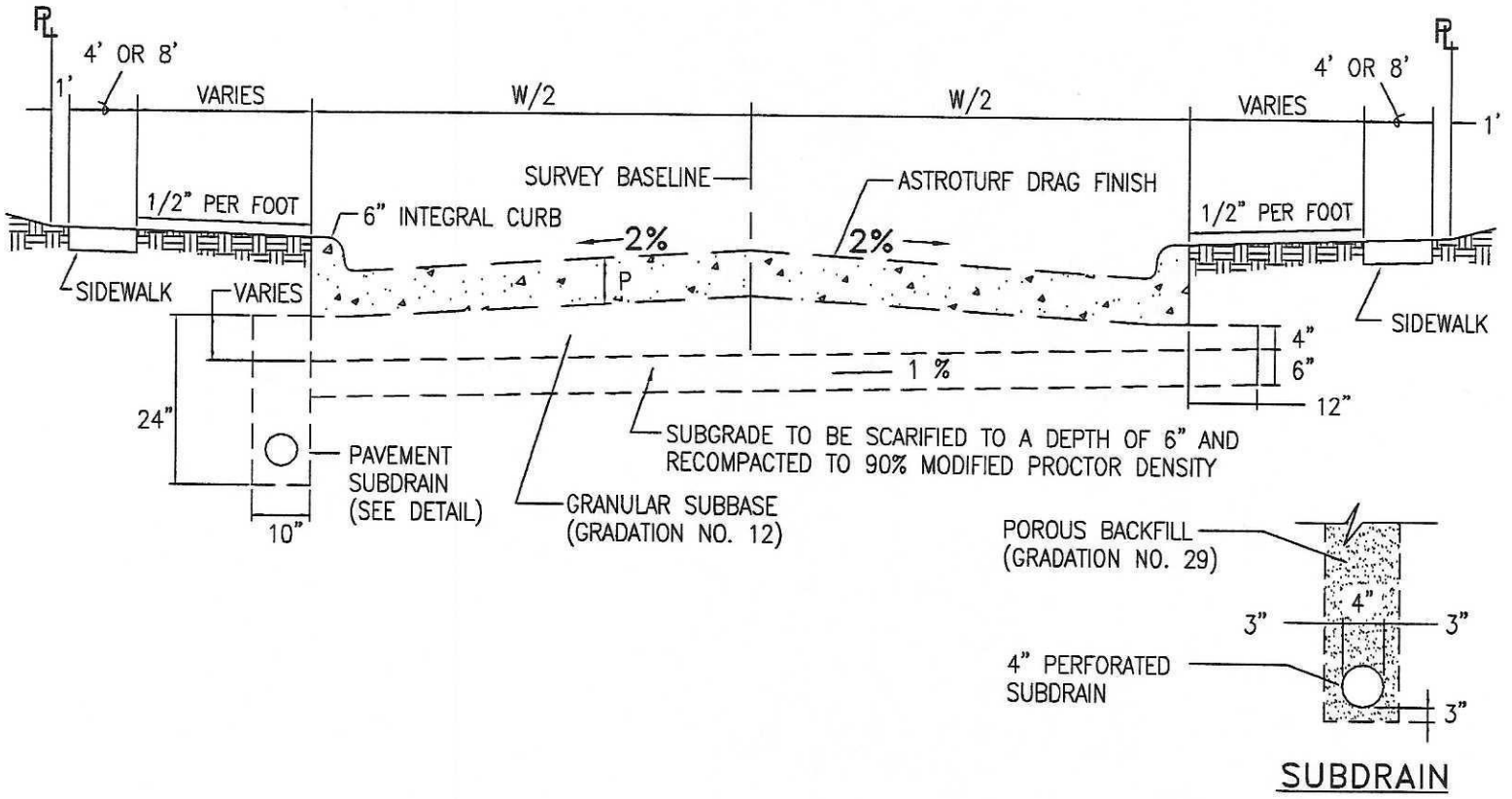
(2) May have additional granular subgrade requirements depending on existing soils and anticipated traffic conditions.

4.18 FULLY HYDRIC SOILS:

SCS MAP SYMBOL	SCS MAP UNIT NAME
54	Zook silty clay loam, 0 to 2 percent slopes
1160	Walford silt loam, benches, 0 to 1 percent slopes
118	Garwin silty clay loam, 0 to 2 percent slopes
122	Sperry silt loam, 0 to 1 percent slopes
133	Colo silty clay loam, 0 to 2 percent slopes
152	Marshan loam, 32 to 40 inches to sand and gravel, 0 to 2 percent slopes
160	Walford silt loam, 0 to 1 percent slopes
279	Taintor silty clay loam, 0 to 2 percent slopes
382	Maxfield silty clay loam, 0 to 2 percent slopes
453	Tuskeego silt loam, 0 to 2 percent slopes
621	Houghton muck, 0 to 2 percent slopes
727	Udolpho loam, 0 to 2 percent slopes
760	Ansgar silt loam, 0 to 3 percent slopes
43	Bremer silty clay loam, 0 to 2 percent slopes
1316	Fluvaquents, ponded
133+	Colo silt loam, overwash, 0 to 2 percent slopes
135	Coland silty clay loam, 0 to 2 percent slopes
430	Ackmore silt loam, 0 to 2 percent slopes
520	Coppock silt loam, 0 to 2 percent slopes
962	Elvira silty clay loam, 0 to 2 percent slopes



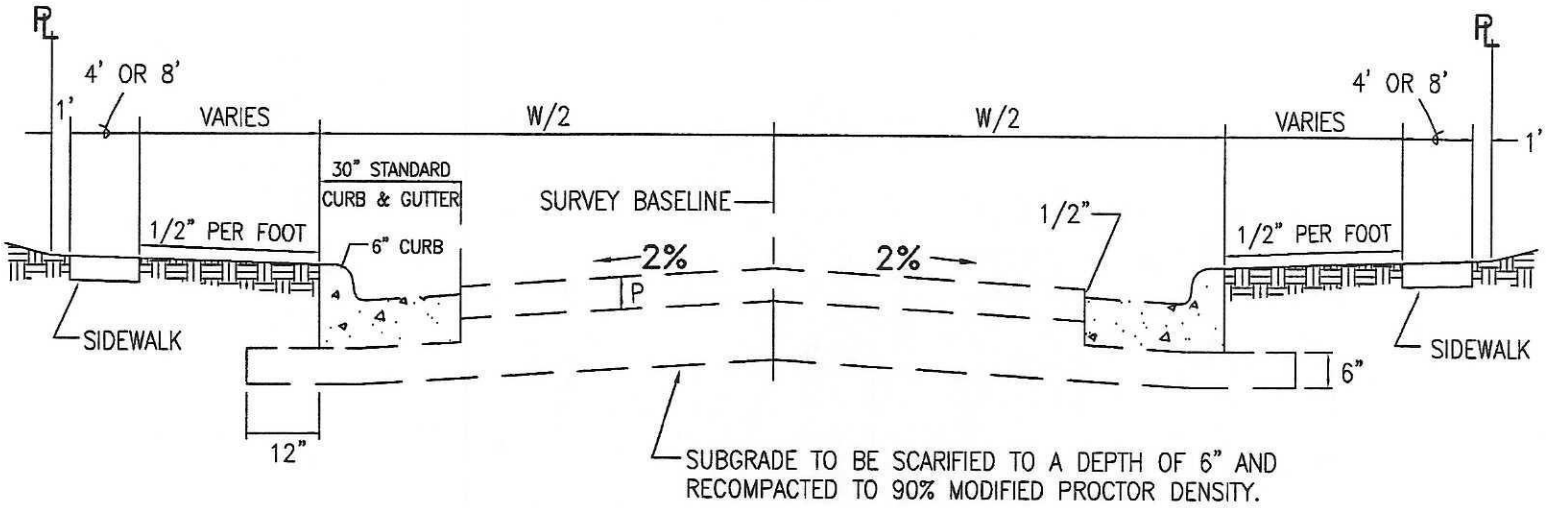
TYPICAL P.C.C. PAVEMENT CROSS-SECTION
2% PARABOLIC CROWN



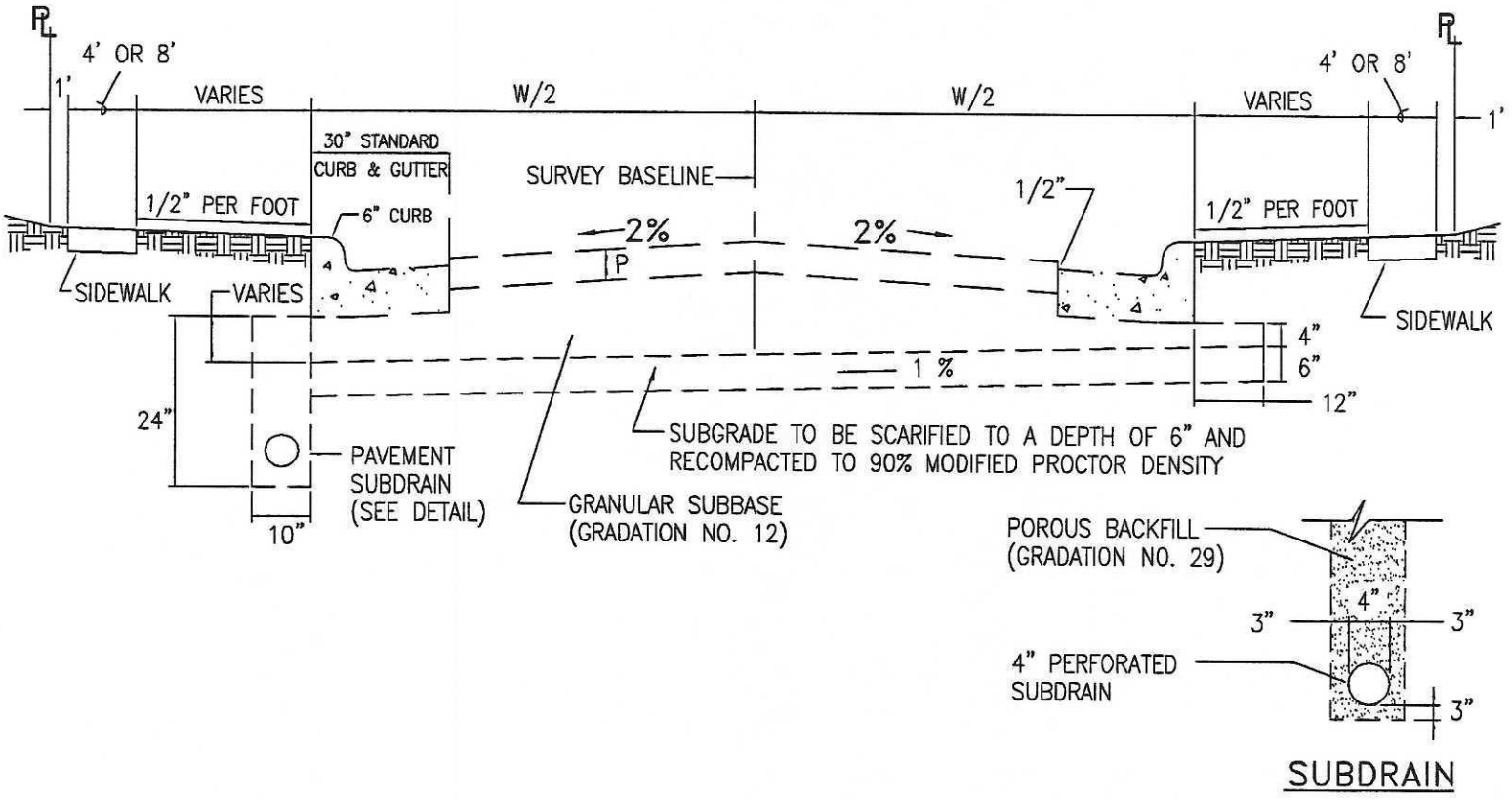
SUBDRAIN

TYPICAL P.C.C. PAVEMENT CROSS-SECTION
2% PARABOLIC CROWN
WITH SUBDRAIN

FIGURE 4.1



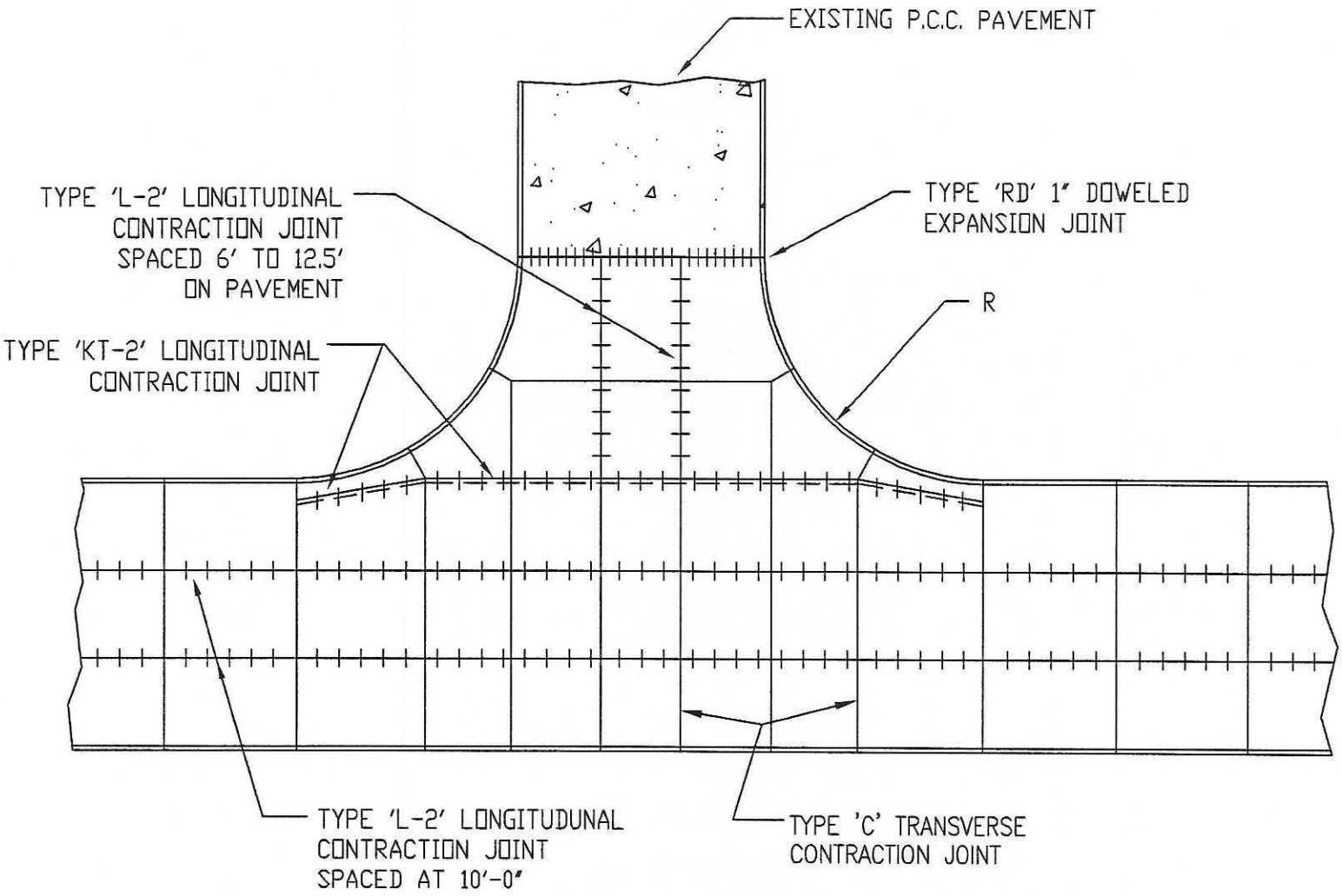
TYPICAL A.C.C. PAVEMENT CROSS-SECTION
2% PARABOLIC CROWN



SUBDRAIN

TYPICAL A.C.C. PAVEMENT CROSS-SECTION
2% PARABOLIC CROWN
WITH SUBDRAIN

FIGURE 4.1.A

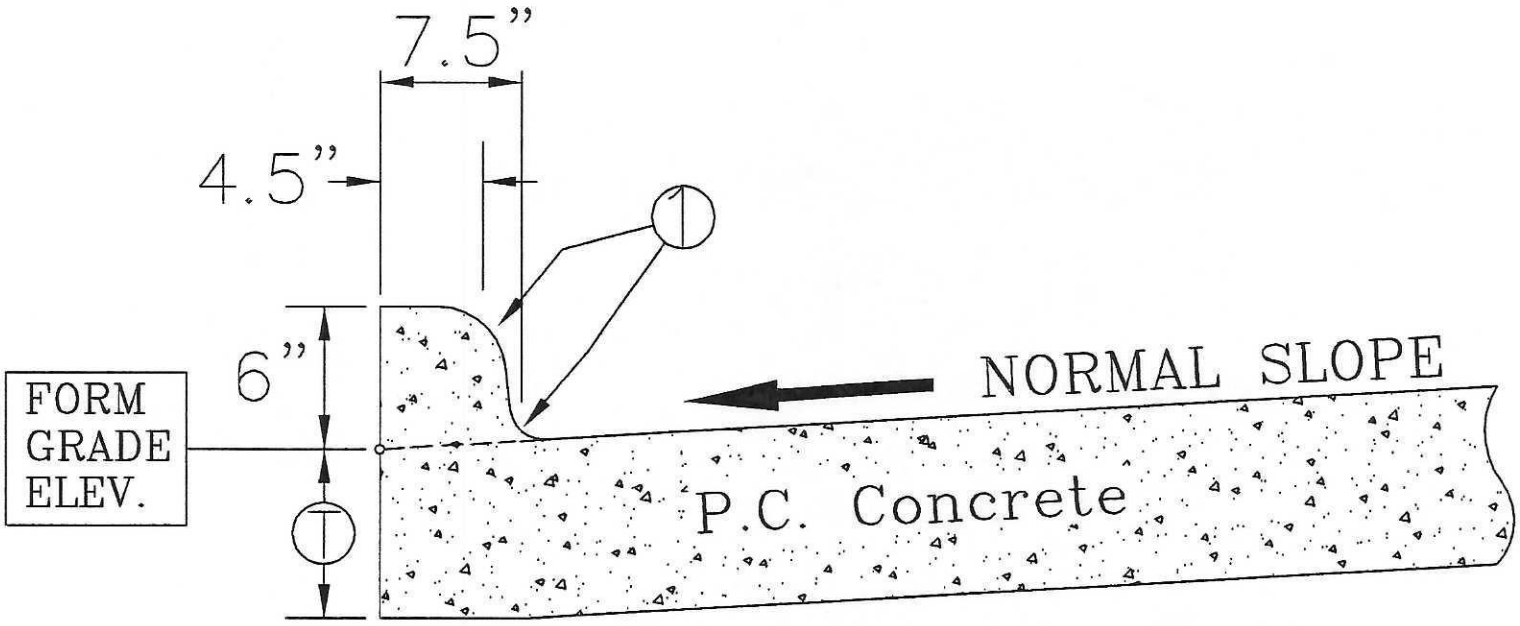


NOTES

1. TRANSVERSE CONTRACTION JOINT REQUIRED EVERY 15 FEET.
2. KEYED AND DOWELED JOINT WILL BE REQUIRED AT LONGITUDINAL INTERIOR EDGES OF EACH SEPARATELY POURED SLAB.
3. SEE I.D.O.T. STANDARD ROAD PLANS RH-50, RH-51 AND RH-52.

TYPICAL P.C.C. INTERSECTION DOWELING PLAN

FIGURE 4.2



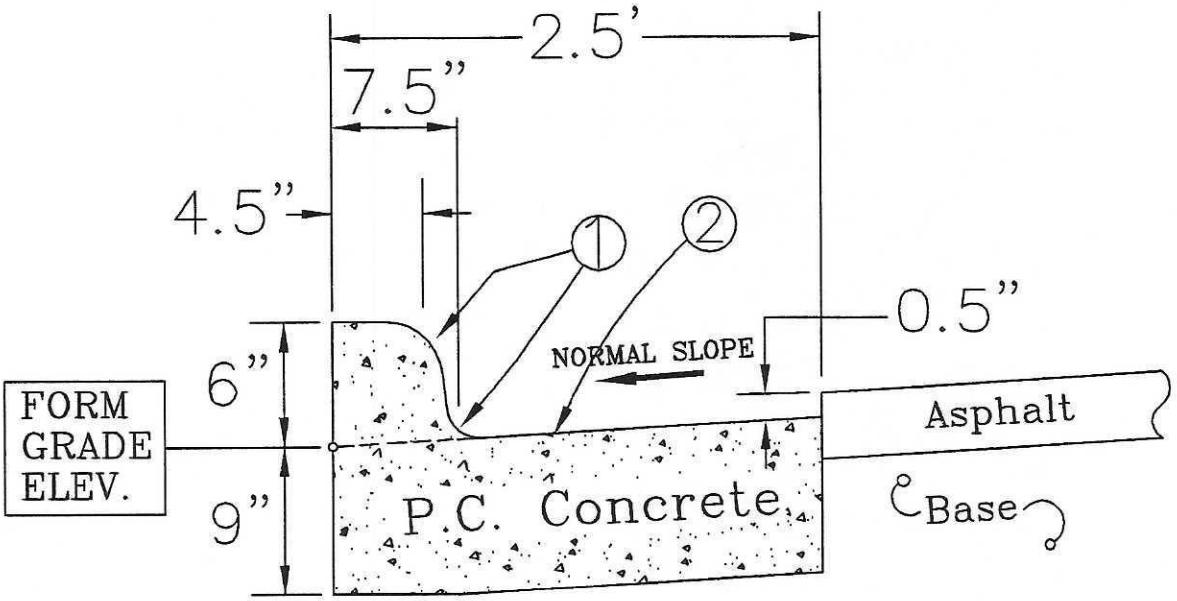
1 3" Radius

T The thickness specified for pavement

DETAILS OF INTEGRAL 6" STANDARD CURB

P.C.C. PAVEMENT
TYPICAL INTEGRAL CURBS

FIGURE 4-3



① 3" Radius

② Place "C" Joint at 20' centers.
See I.D.O.T. Std. Road Plan RH-50.

CURB & GUTTER UNIT
(STANDARD CURB - ADJACENT TO A.C.C.)

A.C.C. PAVEMENT
TYPICAL CURB & GUTTER UNITS

FIGURE 4-4

PART 5 - UTILITY WORK AND OTHER CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY

5.01 PERMIT REQUIRED:

A. A right-of-way construction permit is required to work within the public rights-of-way. Permits may be obtained from the City. Permits for utility work must be obtained by the owner of the utility. A right-of-way construction permit is required for all sanitary sewer service line repairs or replacements within the right-of-way. A right-of-way construction permit is not required for sidewalk, driveway, or mail box construction. See Parts 2 and 3 for the construction of sidewalks and driveways and, this Part, Section 5.03A for the construction of mailboxes.

B. Contractor/Owner must provide a Certificate of Insurance identifying the City as an "Additional Insured" party for the duration of the construction activity.

5.02 TRAFFIC CONTROL:

A. The permittee is responsible for all traffic control and work site safety. Traffic control shall meet the standards for Work Zone Traffic Control as defined in the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. A traffic control plan may be required by the City.

B. The permittee shall provide adequate barricades and/or fencing to protect pedestrians. All excavations shall be fenced when the contractor is not at the site.

C. There may be situations where the traffic load or site conditions will allow only a portion of the street to be closed at one time. On collector and arterial streets, contractors may be required to bore and jack in place a new utility beneath the street surface.

5.03 MISCELLANEOUS CONSTRUCTION:

A. Mail Boxes - The base of all mail boxes shall be a minimum of 12 inches from the edge of the pavement. Brick or other masonry support structures are not allowed. Contact the local post office for current regulations regarding the height and offset of the face of the box.

B. Retaining Walls - Private retaining walls are not allowed within the public right-of-way without an agreement for temporary use of public right-of-way approved by the City Council.

C. Monitoring Wells - Monitoring wells are allowed in the public right-of-way only when it can be shown that the wells cannot be located on private property. Monitoring wells are subject to special permit conditions.

5.04 CLEAR ZONES:

A. On streets with curbs, the clear zone shall be 3 feet for streets with a posted speed limit of 25 mph or less and 10 feet for streets with a posted speed limit greater than 25 mph. On streets without curbs, the clear zone shall be 10 feet for two-lane and four-lane facilities.

B. Variances to clear zone requirements will be considered for overhead electrical facilities where compliance will significantly impact existing trees. In no case will a clear zone of less than 18 inches be allowed. A clear zone variance must be approved by the City Engineer.

5.05 EXCAVATION AND BACKFILL:

A. Within public right-of-way, backfill shall consist of Class A crushed stone or suitable job excavated material placed in one foot lifts compacted to 90% Modified Proctor Density. The City is to determine under what conditions and what locations job excavated materials may be used as backfill material. Flowable mortar may be used upon approval of mix design by the City. Sand backfill is not permitted; however, sand may be used as electric, telephone, or cable utility bedding.

B. In all other areas backfill shall consist of suitable job excavated material placed in one foot lifts and compacted to 85% Modified Proctor Density.

5.06 WORK AROUND TREES:

A. Use care to prevent work within the drip line of trees.

B. When work falls within the drip line of trees, contact the City.

5.07 RESTORATION OF ASPHALT OVERLAY ON PORTLAND CEMENT CONCRETE STREETS:

A. Construct a concrete base of the same thickness as was removed using M-3 mix. An IDOT type BT-3 joint shall be used to joint the base to existing concrete. Use #5 epoxy coated bars, 24 inches in length, spaced 30 inches on center drilled and grouted 9 inches into the existing slab. The concrete base shall be flush with the existing concrete.

B. Tack and place 3/8-inch Type A asphalt and compact to the proper elevation.

5.08 RESTORATION OF PORTLAND CEMENT CONCRETE STREETS:

A. Concrete shall be removed to the nearest longitudinal joint and a minimum of half the panel between transverse joints. Only full or half panels may be removed. Full panels must be removed if the portion to remain is cracked or settled.

B. Concrete shall be sawn to insure a clean break at the joints.

C. An IDOT type BT-3 joint shall be used to joint to existing concrete. Use #5 epoxy coated bars, 24 inches in length, spaced 30 inches on center drilled and grouted 9 inches into the existing slab.

D. Place new concrete of the same thickness as was removed using IDOT M-3 mix.

E. All joints shall be sawn and sealed according to IDOT detail RH-51.

5.09 OTHER SURFACES:

A. Existing seal coat surfaces disturbed shall be backfilled as defined in section 5.05 above up to 12-inches below the existing surface.A minimum of 9-inches of granular material, Class A road stone, shall be placed, then a minimum of 3-inches of ACC cold mix shall be applied compacted, leveled and smoothed to match existing conditions.

B. All areas outside the paving which are disturbed shall be restored to their original condition.

C. When determined by the City, unimproved streets (rock or rock and oil, seal coated streets, or asphaltic concrete surfaced streets) may be required to be repaired or restored with Bituminous Seal Coat consisting of one or more applications of Binder Bitumen with one or more successive applications of cover aggregate. Materials, Equipment and Construction methods shall be in general conformity with Section 2307 of the current Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction.

5.10 MAINTENANCE:

A. The owner of the utility will be responsible for repair, to better or equal to; and maintenance of settled areas within the right-of-way, to include street/driveway/sidewalk pavement repairs and seeding areas.

PART 6 - WATER DISTRIBUTION SYSTEM

6.01 APPROVALS, PERMITS, AS-BUILTS AND MAINTENANCE BONDS:

A. Plans and specifications for public water distribution facilities must be certified by a professional engineer registered in the State of Iowa and utilize the NGVD of 1929.

B. Plans and specifications for public water distribution facilities must be reviewed and approved by the City prior to construction.

C. Plans and specifications for public water distribution facilities must be reviewed and approved by the Iowa Department of Natural Resources prior to construction. Other local, state and federal permits may be required, depending on the circumstances. It shall be the responsibility of the Engineer of Record to acquire all applicable permits. A copy of all permits shall be provided to the City before construction.

D. The Engineer of Record is responsible to submit "Record of Construction" drawings to the City on reproducible vellum or mylar with services located, or electronically on CAD for City record files.

E. A two-year maintenance bond covering defective materials and workmanship is required for all water main improvements.

6.02 DESIGN RESOURCES:

The design for water distribution facilities shall be in conformance with the following:

A. Requirements and Standards of the Iowa Department of Natural Resources.

B. City's Construction Specifications (these Design Standards).

C. City's Plumbing Code.

D. Conflict - In case of a conflict between the above design standards, the most restrictive requirement shall apply.

6.03 DEFINITIONS:

A. A **Distribution Main** means a water pipe, fire hydrants and valving that are owned, operated or maintained by the City which is used for the purpose of distribution of water and from which service connections are made.

B. A **Private Service Pipe** means a water pipe installed, owned, operated and maintained by the private consumer (from the consumer to the City's curb stop or service valves) as further defined by current City ordinances. Service pipes are often 1 inch in size for residential and may be 2 to 6 inch in size for commercial or 8 to 12 inch for large industrial applications.

C. A **Private Fire Hydrant** is one which is located on privately owned property, or on streets not dedicated to public use unless the water main is within a public easement. Private fire hydrants must be served by a minimum of a 6-inch pipe. A private fire hydrant is the responsibility of the property owner and is to be used for fire protection only. Where it is the owner's intention that these hydrants be used by the City Fire Department, these hydrants shall conform to the Department of Public Works specifications for fire hydrants. The City has the right to utilize the hydrants for flushing purposes.

6.04 CONSTRUCTION SPECIFICATIONS:

A. Construction must comply with these City Design Standards and the Iowa Department of Natural Resources standard construction specifications for water distribution facilities.

6.05 SYSTEM DESIGN:

A. **Size:** All mains shall be a minimum of 6 inches in diameter. A larger size may be required by the City, depending upon water demand and fire flows.

B. **Depth:** Water main shall be installed with a minimum depth of cover of 5½ feet from the top of the pipe. Generally, the maximum depth shall not exceed 7 feet.

C. **Alignment:**

1. All mains shall be looped, except for short runs to serve cul-de-sacs where the distance is less than 500 feet.

2. Water mains shall be constructed such that no services shall be extended beneath the paving of the circular turnaround on cul-de-sacs.

3. Water distribution mains will be extended to and through or across the frontage of all subdivisions and land development projects. Provisions will be made to connect water mains to serve future adjacent undeveloped land.

4. Water mains will be located so the front of each property has access for a service connection.

D. **Changes in Alignment:**

1. Thrust restraints are required at all changes in alignment exceeding 10°, at all dead ends and on fire hydrants. Thrust restraints shall be constructed as shown in Figure 6.1. Wrap pipes and fittings in plastic before pouring thrust blocks.

2. The maximum deflection at joints shall not exceed the pipe manufacturer's recommendations.

3. Where there is considerable deflection of the water main materials required for either horizontal or vertical changes in alignment, ductile iron materials shall be used. PVC water main materials shall not be bent.

E. **Separation from Sewers:**

1. There shall be no physical connection between a public or private potable water supply system and a sewer appurtenance, which would permit the passage of any sewage or polluted water in the potable supply.

2. Under normal conditions, water mains parallel to sewers shall be placed at least 10 feet horizontally from any sanitary sewer, storm sewer or manhole. Where local conditions prevent this separation, the water main may be laid closer provided the bottom of the water main is at least 18 inches above the top of the sewer and the water main is placed in a separate trench or in the same trench on a bench of undisturbed earth at a minimum horizontal separation of 3 feet from the sewer.

3. Water mains crossing sewer services, storm sewers or sanitary sewers shall be laid to provide a separation of at least 18 inches between the bottom of the water main and the top of the sewer. Where local conditions prevent this vertical separation, the water main shall not be placed closer than 6 inches above a sewer or 18 inches below a sewer under any circumstances. Additionally, one full length of water pipe crossing the sewer shall be centered at the point of crossing so that the water pipe joints will be equal distance as far as possible from the sewer. The water and sewer pipes must be adequately supported and have pressure tight joints. A low permeability soil shall be used for backfill material within 10 feet of the point of crossing.

4. No water pipe shall pass through or come in contact with any part of a sewer manhole. A minimum horizontal separation of 3 feet shall be maintained.

5. Water mains shall be separated from sewer force mains by a horizontal distance of at least 10 feet unless:

   a. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of Sections 8.2 and 8.4 of these standards, and;

   b. The water main is laid at least four linear feet from the sewer force main.

F. **Location of Valves:**

1. Four-way connections will have 3 valves. On looped systems, valves will generally be on the main line. Four valves may be required in specific instances.

2. Three-way connections will have 2 valves. On looped systems, valves will generally be on the main line. Three valves may be required in specific instances.

3. Maximum valves spacing will be 400 feet in residential and commercial areas.

4. A valve shall be placed two pipe lengths from all dead-ends to allow the extension of the pipe without shutting off the existing system. Do not tap services in the final two sections.

5. Auxiliary valves shall be provided for all fire hydrants.

6. Valves shall be located as close as possible to tees and crosses.

7. Valves should not be located within street, sidewalk, or driveway paving whenever possible.

G. **Location of Fire Hydrants:**

1. Fire hydrant maximum spacing will be a distance of 600 feet. Average spacing will generally mean one hydrant for every block in residential, commercial and industrial areas. A fire hydrant will be required at the end of every cul-de-sac regardless of the proximity of a hydrant on the intersecting through street. A fire hydrant will be required at the end of all dead end lines.

2. The location of fire hydrants may be modified at the request of the local jurisdiction's fire department.

3. See Figure 6.2 for typical fire hydrant installation.

H. **Service Pipes:**

1. Every building, including each unit of zero-lot-line residences, shall have a direct service connection to a public water main in accordance with Table 6.1.

2. No water consumer shall construct water service pipes across lots or buildings to adjoining premises, but all service pipe shall be laid within streets, alleys or public ground to the premises to be served, and enter at the front or rear of the building nearest the main.

3. Such service pipe shall be laid in a straight line at right angles to the water main, and connection made within two lines drawn parallel to the sides of the building to be served or not more than three feet outside of these sides.

4. Multiple stop boxes shall be permanently marked to identify the correct individual metered services.

5. See Figure 6.3 for typical water service installation. Service pipe must be seamless annealed copper, Type K, conforming with ASTM B-88.

6. Service shut-off (curb stop) shall be located at the public right-of-way or within frontage easements. Curb stops shall not be within street, sidewalk, or driveway paving whenever possible.

6.06 MATERIALS:

A. **Ductile-Iron Pipe:**

1. Thickness design shall conform to AWWA C150.

2. Manufacture shall conform to AWWA C151.

3. Thickness class, unless otherwise indicated or specified, shall be Class 350.

4. Cement mortar lining shall conform to AWWA C104.

5. All ductile iron pipe 12" in diameter and larger shall be wrapped with a 8 ml polyethylene encasement in accordance with ANSI/AWWA C105/A21.5 installation methods.

6. Use single rubber-gasket push-on joints or mechanical joints conforming to ANSI/AWWA C111/A21.11. Furnish with all necessary hardware and gaskets.

7. Bell-and-spigot pipe joints conforming to ANSI A21.6 or ANSI A21.8.

8. For bolted/restrained mechanical joint, use Griffin Bolt-Lok restrained joint or approved equal.

9. For unbolted/restrained mechanical joint, use Griffin Snap-Lok restrained joint or approved equal.

10. Do not use drilled & tapped retainer glands.

11. Plain end of push-on pipe factory machined to a true circle and chamfered to facilitate fitting gasket.

B. **Polyvinyl Chloride (PVC) Pipe:**

1. Allowed for use in sizes 6 to 12 inch, except where noted otherwise in the specifications.

2. PVC pipe design shall conform to AWWA C900 and all pipe shall have the same outside dimensions as ductile-iron pipe.

3. Thickness class shall be DR 18 (Class 150).

4. PVC pipe materials shall not be used in any area where there is likelihood the pipe will be exposed to significant concentrations of pollutants comprised of low-molecular-weight petroleum products or organic solvents or their vapors.

5. PVC pipe materials shall not be used around cul-de-sacs or other small radius curves.

6. PVC water main shall be marked with an insulated wire for the entire length to make electronic location possible.

    a. The insulation shall be protected to prevent accidental grounding. Make few splices, and where necessary, wrap the bare wire with electrical tape.

    b. The wire shall be installed continuously as the pipe is backfilled. The wire shall be fixed to the side of the pipe at a position of 2 o'clock or 10 o'clock and attached with duct tape every 5 feet.

    c. Bring the wire to the ground surface at each fire hydrant. Leave 18 inches of wire exposed. If there is no fire hydrant within 500 feet, bring the wire to the surface in a valve box and mark the drawings appropriately.

7. Where there is evidence there will be considerable underground construction or several large diameter service taps or connections, ductile iron pipe materials will be used.

8. Where there is considerable deflection of the water main materials required for either horizontal or vertical changes in alignment, ductile iron materials shall be used. PVC water main materials may not be deflected. PVC water main joint deflections shall be limited to manufacturer's recommendations.

C. **Fittings:**

1. All fittings shall conform to ANSI/AWWA C110/A21.10, with pressure rating of Class 350.

2. Mechanical-joint fittings shall be ductile iron compact C153/A21.53 or ductile standard C110/A21.10. Large fittings, 12-inch through 20-inch shall be ductile iron standard C110.A21. Swivel tees shall be ductile iron standard C110.A21.10. Where ductile iron is not available (i.e., offsets), cast iron standard C110.A2 shall be provided.

3. All ductile iron fittings shall be Class 350, shall be bituminous coating inside and outside, shall be furnished complete with necessary accessories including plain rubber gaskets, ductile iron glands, bolts and nuts as per C111/A21.11. Verify the gasket seats are not made irregular by improper application of the lining materials.

D. **Valves & Valve Boxes:**

1. Gate valves shall conform to AWWA C509. Use full line size gate valves with epoxy or polymer lining. Use Mueller or an approved equal with 200 psi working pressure and gaskets rated at 250 psi. The waterway must be a full sized waterway. Valves shall be capable of being repacked or replacing O-rings under pressure.

2. Butterfly valves shall conform to AWWA C504. Use Pratt, M&H or Mueller valves, or an approved equal.

3. Valves shall open left and be furnished with a 2 inch square operating nut. Use Cor-Ten steel.

4. Valve Boxes shall be 2-piece slip type Tyler Series 6655 Item 668A, or approved equal range 63" to 83." Use lids marked "water."

5. Tapping valves shall be 175 psi minimum working pressure, mechanical joint manufactured by Mueller or Clow.