

## SECTION 1

### STREETS AND ROADWAYS

#### 1-1 General

The purpose of this section is to define the general requirements of street rights-of-way, pavement widths, pavement thickness, geometric alignments and construction details. As conditions are encountered beyond the scope of this section, coordination with the City of Belton Public Works Department is required to establish new requirements and procedures.

#### 1-2 Master Plan

All street design must be coordinated with the City of Belton Comprehensive Master Plan and Thoroughfare Plan.

The Master Plan and Thoroughfare Plan were developed for orderly growth and major deviations from these plans will not be permitted.

#### 1-3 Rights-of-Way

Refer to the City of Belton Subdivision Ordinance. The majority of street rights-of-way will be from 50 to 80 feet for most paving widths. Details are provided with this section to depict those widths. Wider rights-of-way may be required if topography challenges, construction of boulevards or state participation projects are anticipated. Judgments will be made at that time by the City of Belton authorities, as conditions require. Also, rights-of-way may be increased or lessened subject to the placement and size of utilities to serve adjacent and connecting properties. Additionally, all alleys shall have a minimum right-of-way width of 20 feet.

#### 1-4 Geometrics

- A. Provision must be made for the extension of major streets; minor streets shall be provided for circulation of traffic through a subdivision or development; and adequate local residential streets provided to accommodate the development.

SUBDIVISION ORDINANCE

EXHIBIT 1.1  
STREET DESIGN STANDARDS

B.

	<u>Major Thoroughfare</u>	<u>Minor Thoroughfare</u>	<u>Collector</u>	<u>Local/ Residential</u>
Right-of-way	As per Master Plan	As per Master Plan	60 - 80 feet	50 feet
Pavement (back to back)	As per Master Plan	As per Master Plan	37 - 61 feet	24, 28, 31 or 37 feet
Grade-Maximum	5%	5%	7%	10%
Grade-Minimum	0.75%	0.75%	0.75%	0.50%
Sight Distance-Minimum Design Speed (AASHTO Standard)	60 mph	50 mph	40 mph	40 mph
Horizontal Curvature (Minimum Radius)	1800 feet	1000 feet	450 feet	200 feet
Radius for Curb Return at Intersections	50 feet	30 feet	20 feet	20 feet

C. Vertical Curves

Center line grade changes with an algebraic difference of 2 percent or more shall be connected with vertical curves with a minimum of 200 feet in length. AASHTO Design guidelines shall be used to determine the proper vertical curve length based on design speed.

Whenever a cross slope is necessary or desirable from one curb to the opposite curb, such cross slope shall not exceed twelve (12) inches in thirty-one (31) feet.

D. Street Intersections

The most desirable street intersection is 90 degrees. However existing street patterns may necessitate less perfect conditions. No major street shall intersect any other major street at an angle of less than 60 degrees. No minor street shall intersect a major street at less than 45 degrees. No local residential street shall intersect any other street at less than 60 degrees.

Curb radii at intersections shall be a minimum of 15 feet for local residential and minor streets and a minimum of 20 feet for all major streets. All radii are measured to the back curb.

Where sidewalks are adjacent to the street intersection, handicapped ramps shall be constructed to State and Federal Standards (See detail sheets.)

E. Cul-de-Sacs and Dead-end Streets

1. The maximum length of a cul-de-sac or dead-end street with a permanent turnaround shall usually be six hundred (600) feet, except under unusual conditions with the approval of the Planning and Zoning Commission.
2. Turnarounds are to have a minimum right-of-way width of one hundred (100) feet and a minimum forty (40) foot outside radius for single-family and two-family uses, and a minimum right-of-way width of one hundred twenty (120) feet and a minimum fifty (50) foot outside radius for all other uses.
3. Temporary dead-end streets may be approved by the Planning and Zoning Commission if adequate, all-weather turnaround is provided. "Adequate, all-weather turnaround" is defined as a turnaround that is sufficient size to accommodate fire and sanitation vehicles and is of a construction quality comparable to standard road cross-sections.

- F. All streets shall be constructed with 24-inch standard concrete curb and gutter as detailed in this section; exception will be the rural section or mountable curb, also shown herein.

1-5 Pavement Thickness

A. Materials

Pavement sections may be a combination of lime stabilization, crushed limestone base and hot mix asphaltic concrete known as flexible pavement. Pavements also may be constructed of reinforced or jointed concrete paving which is known as rigid pavement. No seal coating of new construction will be allowed.

All crushed limestone base material used shall be Texas Department of Transportation Item 347, Type A Grade 2 or better. The material should be compacted in maximum six-inch lifts to a minimum of 95 per cent of ASTM D 1557 Method D density at or near optimum moisture content.

Hot mix asphaltic concrete surface material shall be Texas Department of Transportation Item 340, Type C or Type D.

B. Design

All pavements shall be designed by a geotechnical engineer or pavement design engineer based on representative soils data taken in the field and that satisfy requirements of this section.

All pavement designs shall follow those procedures used by the Texas Department of Transportation (TxDot) or The American Association of State Highway and Transportation Officials (AASHTO) for flexible and rigid pavements. All sub-grade and pavement materials shall be assigned a TxDot Triaxial Classification for design purposes.

Pavement structure behind the curb and gutter shall extend a minimum of eighteen inches (18") in length at a minimum depth of four inches (4") under curb unless more is recommended by the pavement design engineer.

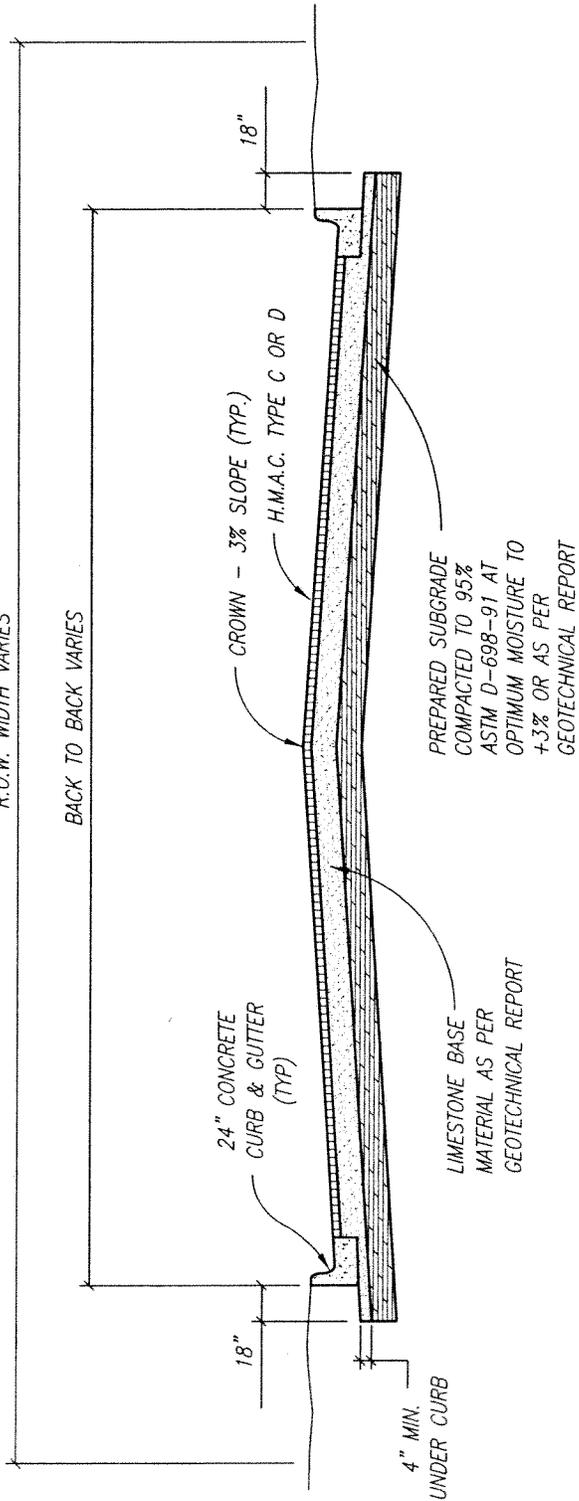
EXHIBIT 1.2

<u>Street Type</u>	<u>18 - Kip Axle Repetitions *</u>
major thoroughfare	> 500,00 to Unlimit
minor thoroughfare	400,000
collectors	100,000 - 250,000
local residential street	25,000
cul-de-sac	14,000

\* Based on Traffic counts and projections

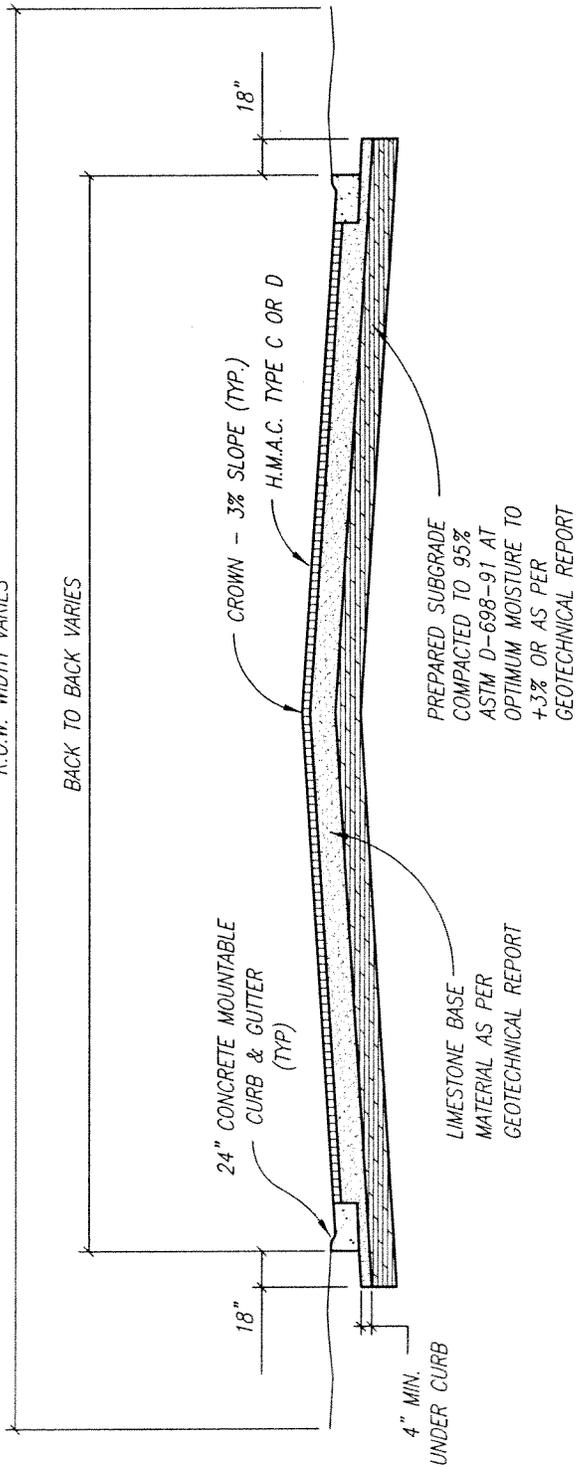
Natural subgrade - loose or disturbed material beneath pavements to be constructed should be compacted to 95 per cent of ASTM D 698, Method D density in maximum six-inch lifts at optimum moisture.

Concrete used for concrete pavements shall have a 28 day compressive strength of 3,500 PSI and a 14 day flexural strength of 500 PSI.



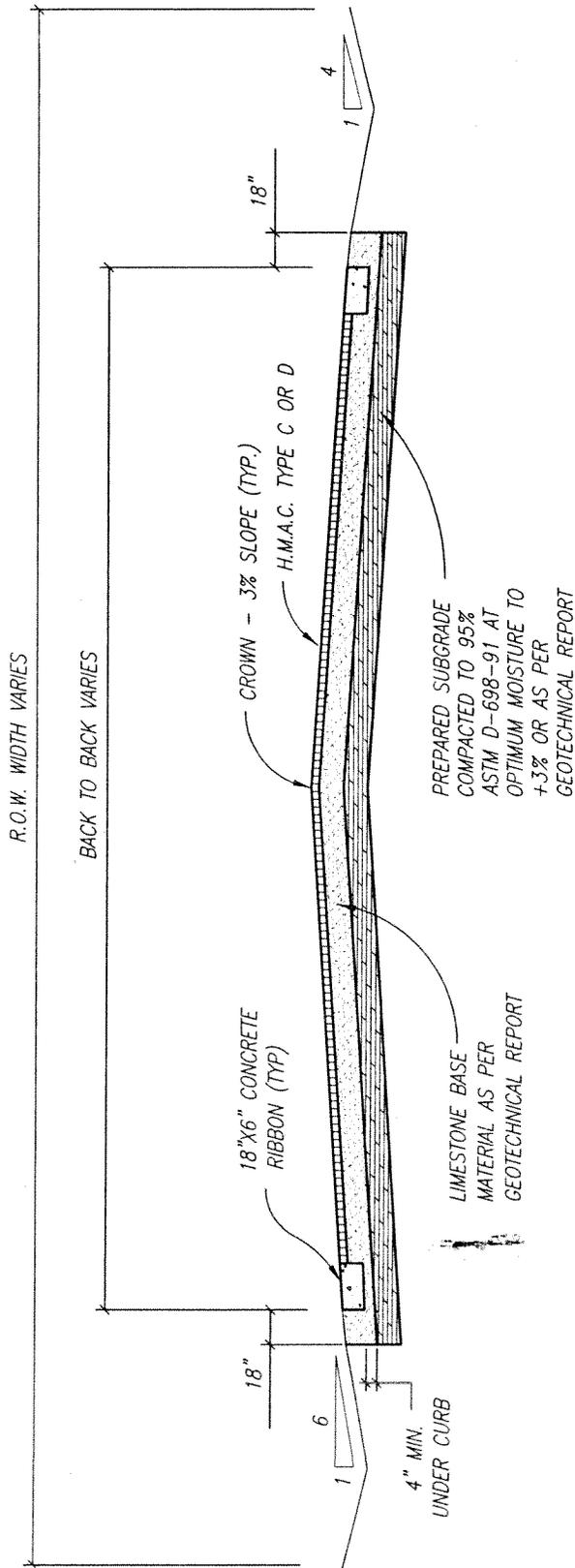
**TYPICAL PAVING DETAIL  
FOR STREETS WITH 24" CURB AND GUTTER**

NOT TO SCALE



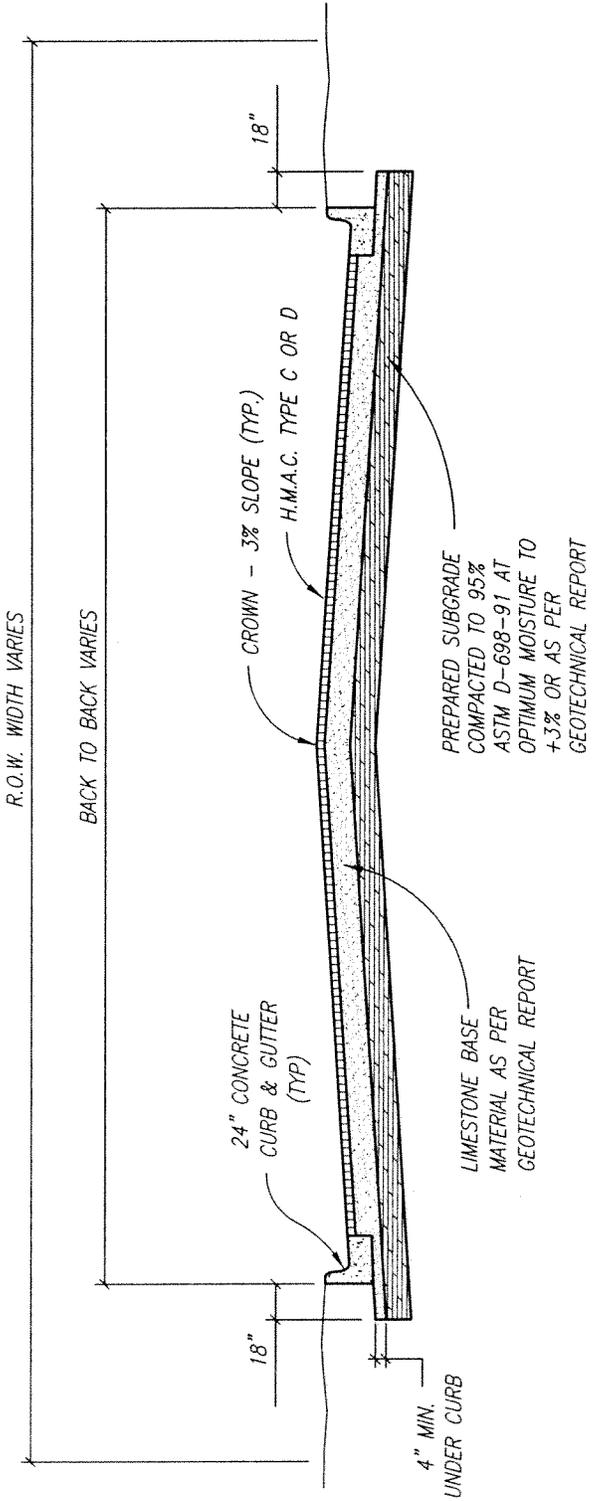
**TYPICAL PAVING DETAIL  
FOR STREETS WITH 24" MOUNTABLE CURB**

NOT TO SCALE



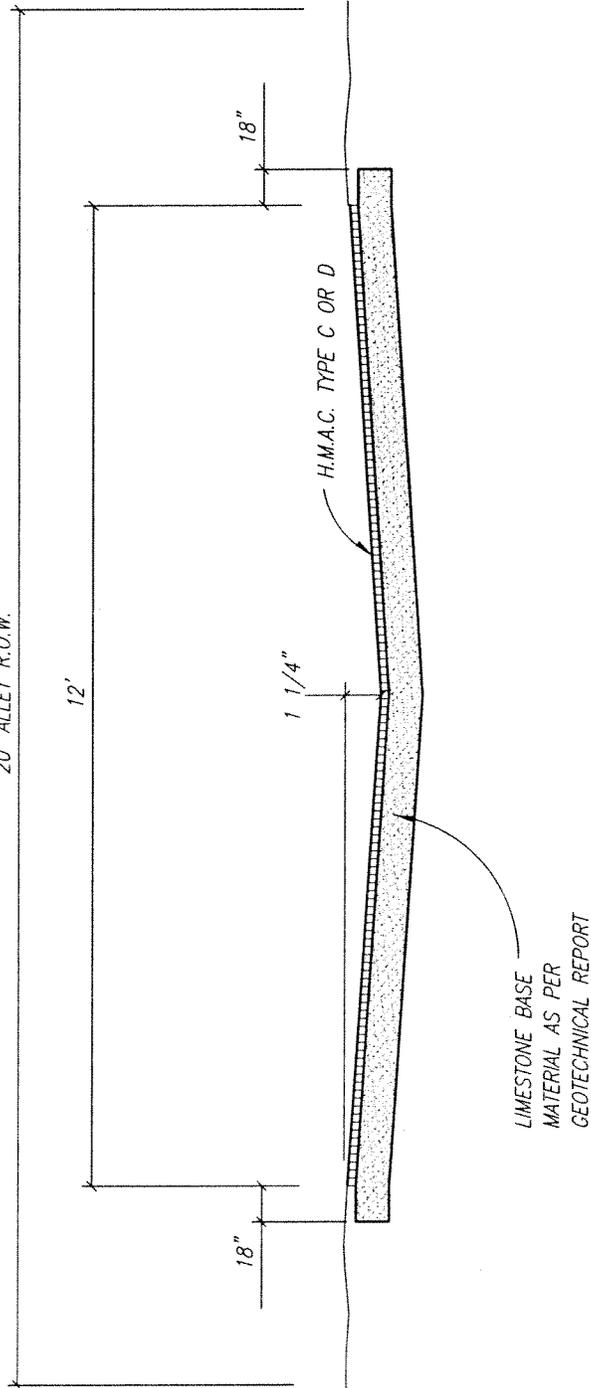
**TYPICAL RURAL PAVING DETAIL**

NOT TO SCALE



**TYPICAL PAVING DETAIL  
FOR STREETS WITH 24" CURB AND GUTTER**

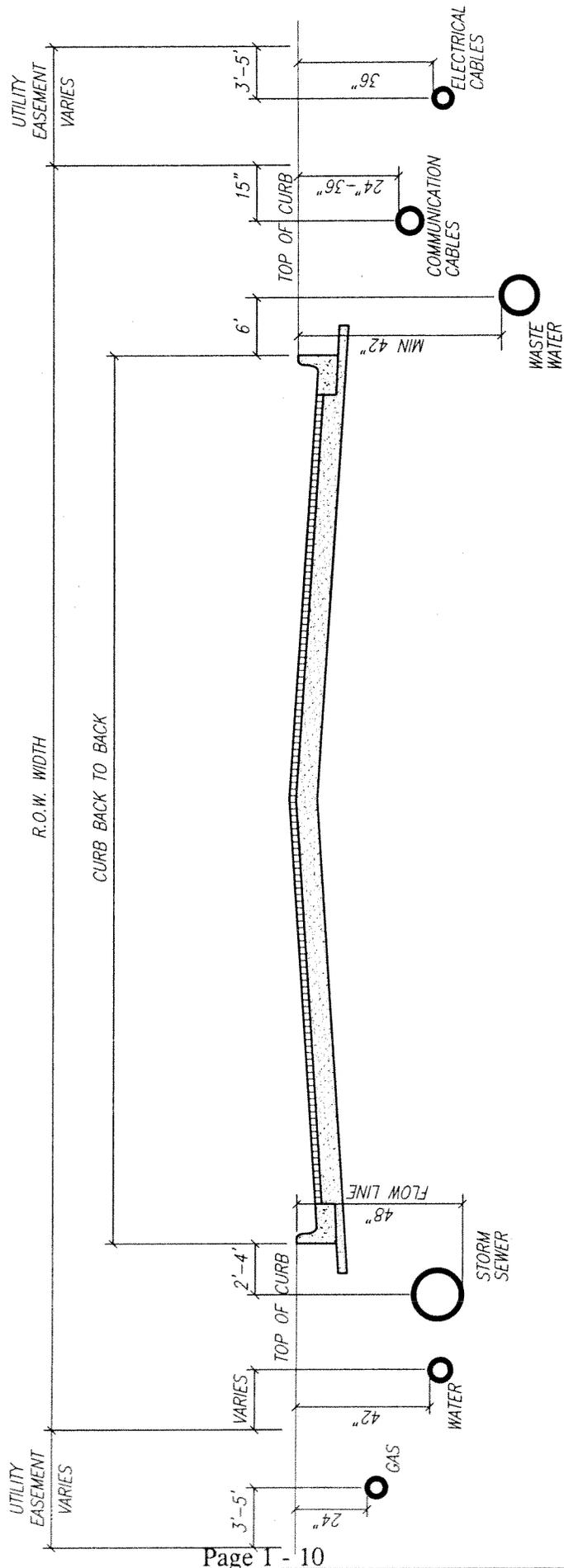
NOT TO SCALE



**TYPICAL PAVING DETAIL  
FOR 12' WIDE ALLEY IN 20' R.O.W.**

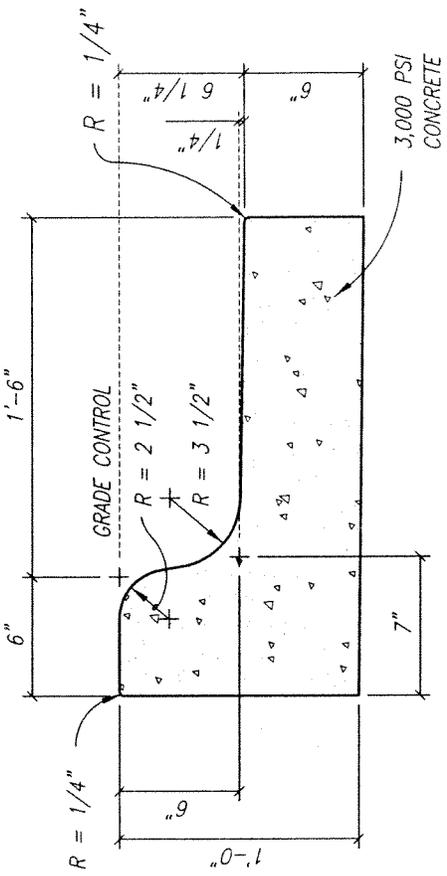
NOT TO SCALE

NOTE:  
 ALL VERTICAL DISTANCES ARE FROM  
 TOP OF CURB TO THE TOP  
 CENTERLINE OF PIPE, EXCEPT STORM  
 SEWERS WHICH ARE MEASURED FROM  
 TOP OF CURB TO FLOW LINE.

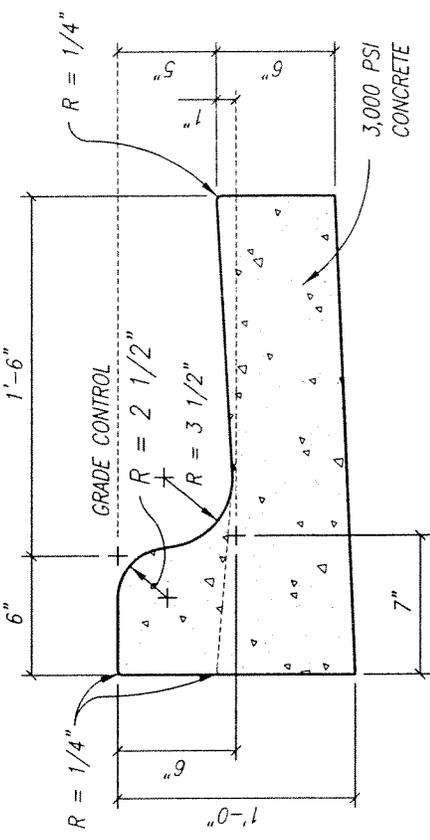


**TYPICAL LOCATION OF UTILITIES  
 WITHIN STREET R.O.W.  
 AND UTILITY EASEMENTS**

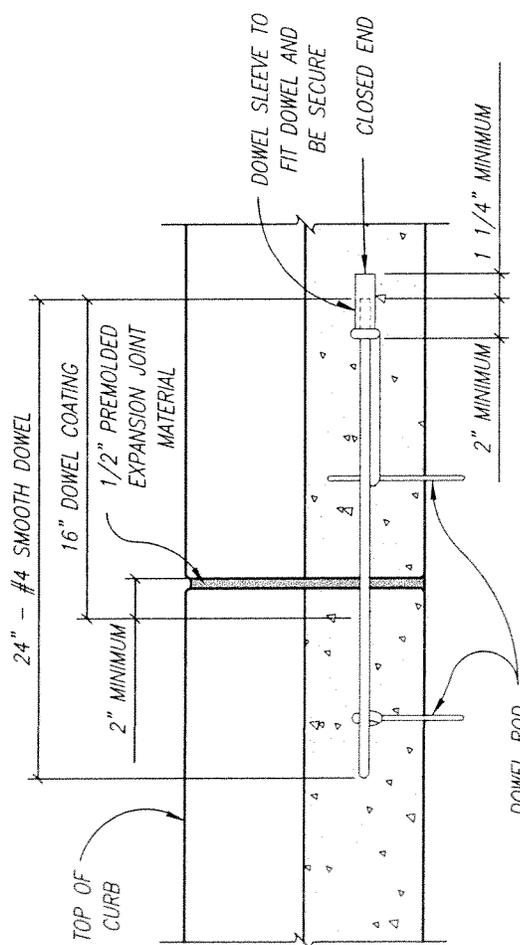
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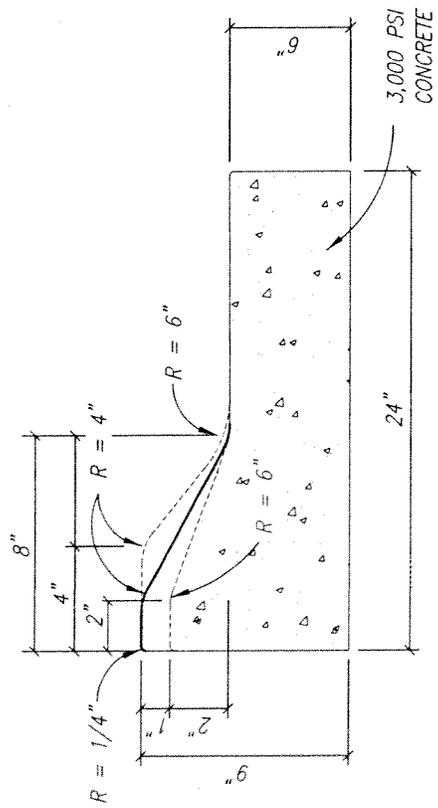
**SPILL CURB**  
NOT TO SCALE



**CATCH AND LAYDOWN CURB**  
NOT TO SCALE



**CURB DOWEL DETAIL**  
NOT TO SCALE

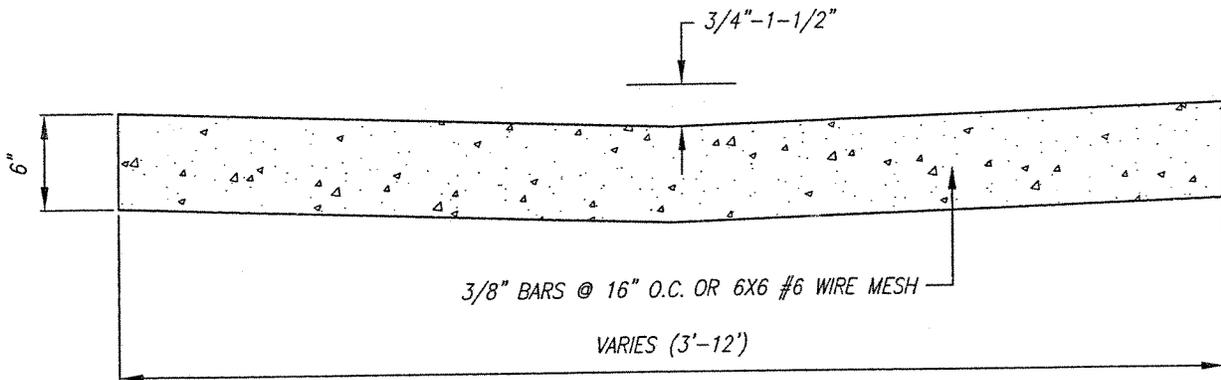
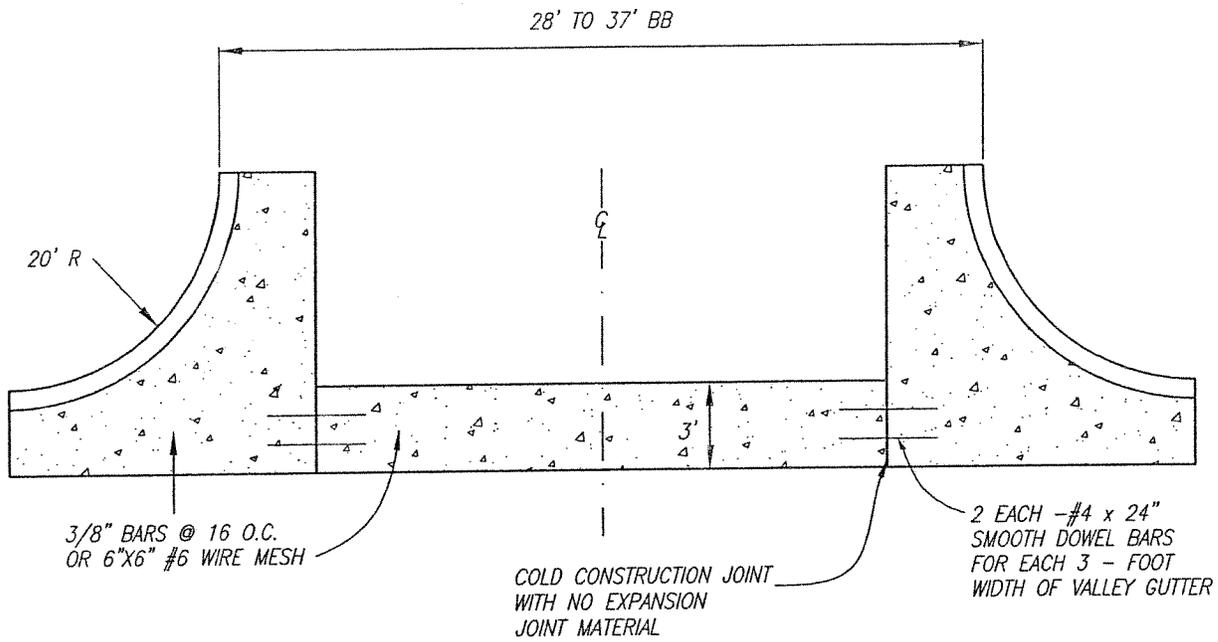


**MOUNTABLE CURB**  
NOT TO SCALE

NOTE:  
EXPANSION JOINT INTERVALS  
NOT TO EXCEED 40'-0".

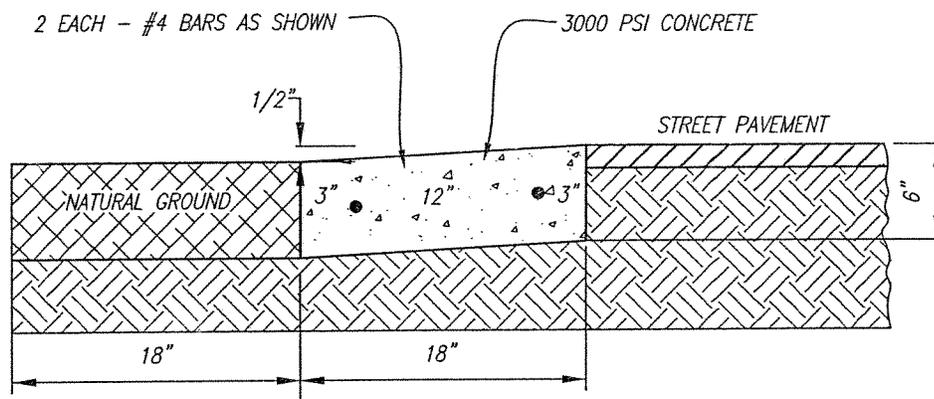
NOTES:

1. ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
2. TRANSITIONS BETWEEN CURBS OR CURBS AND GUTTERS OR DIFFERING CROSS SECTION SHALL BE ACCOMPLISHED OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER.



**TYPICAL STREET INTERSECTION**  
**CONCRETE COMPONENTS**

NOT TO SCALE



**RIBBON CURB**

NOT TO SCALE

NOTES:

1. ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
2. TRANSITIONS BETWEEN CURBS OR CURBS AND GUTTERS OR DIFFERING CROSS SECTION SHALL BE ACCOMPLISHED OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER.
3. EXPANSION JOINT INTERVALS NOT TO EXCEED 40' -0" WITH SMOOTH DOWEL BARS AS SHOWN ON CURB AND GUTTER DETAIL SHEET.