



2021 STANDARDS MANUAL

**CONSTRUCTION & DEVELOPMENT
REQUIREMENTS**

**ADOPTED BY CITY COUNCIL ON OCTOBER 1, 2007
REVISION NO. 9 – UPDATED OCTOBER 19, 2021**

DEVELOPMENT SERVICES DEPARTMENT

415 W UNIVERSITY DR • EDINBURG • TX • 78539 • 956-388-8211

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INTRODUCTION

The City of Edinburg, Texas, Standards Manual has been developed as part of the Unified Development Code adopted by the Edinburg City Council and Effective October 1, 2007. City Council more specifically adopted the standards manual during three separate readings. Ordinance No. 08-3291 was adopted on August 19, 2008, becoming effective September 19, 2008 (See Attached). In accordance with this ordinance, the City Engineer has been delegated to promulgate a standards manual which shall outline minimum standards for drainage, streets, water & sewer improvements within the City and the City's Extra Territorial Jurisdiction. Compliance with the latest edition of this Manual is required (Refer to revision sheet for latest updates).

The information presented in this Manual has been prepared in accordance with generally accepted professional engineering practices and does not relieve the Engineer, Developer or Contractor of any legal responsibilities.

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ORDINANCE NO. 08-3291

**ORDINANCE ADOPTING THE CITY OF EDINBURG'S
ENGINEERING STANDARDS'S MANUAL FOR THE
CONSTRUCTION DEVELOPMENT REQUIREMENTS
CONTAINING A REPEALER CLAUSE; CONTAINING A
SAVINGS CLAUSE; AND PROVIDING FOR
PUBLICATION AND EFFECTIVE DATE; AND
ORDAINING OTHER PROVISIONS RELATED TO THE
SUBJECT MATTER HEREOF.**

WHEREAS, the City of Edinburg approved Ordinance 07-3209 adopting the City's Unified development code on August 6, 2007; and

WHEREAS, the Unified Development Code Addresses the City's minimum standards in various sections regarding drainage, streets, water and sewer; and

WHEREAS, through the Unified Development Code, the City desires to more specifically outline and address technical specifications through a Standards Manual on drainage, streets, water and sewer; and

WHEREAS, the Unified Development Code specifically references the Engineering Standard's Manual which outlines the City's minimum standards for drainage, streets, water and sewer and delegates authority to the City of Engineer to promulgate a Standards Manual.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF EDINBURG, TEXAS, THAT:

SECTION I. The Engineering Standard's Manual is hereby adopted by the City of Edinburg setting the minimum standards referenced in the Unified Development Code for new developments within the City and the City's extraterritorial jurisdiction.

SECTION II. REPEALER CLAUSE. The Ordinance shall be cumulative of all other ordinances dealing with the same subject, and any provision of any ordinance in direct conflict with any provision of the Ordinance, including the Chapters and Sections of the City Code of Ordinances specifically listed in the caption of this ordinance, is hereby repealed to the extent of such conflict and the provisions of this Ordinance shall supersede any provisions in conflict herewith; all provisions of any other ordinance not in conflict herewith shall remain in full force and effect.

SECTION III. SAVINGS CLAUSE. If any section, part, or provision of this Ordinance is declared unconstitutional or invalid, by a court of competent jurisdiction, then, in that event, it is expressly provided, and it is the intention of the City Council in passing this Ordinance that its parts

shall be severable and all other of Ordinance shall not be affected thereby and they shall remain in full force and effect.

SECTION IV. PUBLICATION AND EFFECTIVE DATE. This Ordinance shall be published according to law and take effect on September 19, 2008, (due to third reading).

READ, CONSIDERED, PASSED AND APPROVED ON FIRST READING at a regular meeting of the City Council of the City of Edinburg, Texas, at which a quorum was present and which was held in accordance with Vernon's Texas Codes Ann., Government Code, Section 551.041, on the 15th day of July, 2008.

READ, COSIDERED, PASSED AND APPROVED ON THE SECOND READING at a regular meeting of the City Council of the City of Edinburg, Texas, at which a quorum was present and which was held in accordance with Vernon's Texas Codes Ann., Government Code, Section 551.041, on the 5th day of August, 2008.

READ, COSIDERED, PASSED AND APPROVED ON THE SECOND READING at a regular meeting of the City Council of the City of Edinburg, Texas, at which a quorum was present and which was held in accordance with Vernon's Texas Codes Ann., Government Code, Section 551.041, on the 19th day of August, 2008.

CITY OF EDINBURG

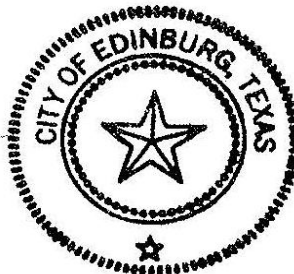
By: _____

Joe Ochoa, Mayor

ATTEST:

By: _____

Myra L. Ayala Garza, City Secretary



APPROVED AS TO FORM:

By: _____

Ric Gonzalez, City Attorney

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REVISION SHEET

R1 04/10/08	D-8, D-9, ST-1, ST-8, ST-9, ST-10, ST-11, ST-12, ST-13, ST-14, ST-15, P-1, P-2, P-3, P-4, P-5, P-6, P-9, P-10, P-11, P-13, P-18, W-4, S-3, S-4, S-5, S-6 & S-7
R2 06/16/08	DR-1, DR-2, DR-3, DR-4, DR-5, DR-6, DR-7, DR-8, DR-9, DR-10, DR-11, DR-13, DR-14, DR-15, DR-16, D-7, D-8, D-9, ST-14, ST-15, P-1, P-2, P-3, P-4, P-5, P-6, WS-1, WS-14, WS-15, W-1, W-2, W-3, W-4,
R3 07/11/08	DR-4, D-6, WS-3, WS-4, WS-5, WS-12, WS-13, & WS-33
R4 10/17/08	ST-8, ST-9, ST-10, ST-11, ST-12, ST-13, ST-14, ST-15, P-1, P-2, P-3, P-4, P-5, P-6, P-18, WS-6, W-1A, W-1B, W-2A, W-2B, & W-3
R5 01/12/10	DR-1, DR-2, DR-3, DR-4, DR-5, DR-6, DR-7, DR-8, DR-9, DR-10, DR-11, DR-12, DR-13, DR-14, DR-15, DR-16, DR-17, DR-18, DR-19, DR-20, D-1, D-2, D-3, D-6, D-7, D-8, ST-13, P-1, P-2, P-3, P-4, P-5, P-6, &
R6 02/04/10	P-4, P-5, P-6, & P-7
R7 03/10/10	D-1, D-2, D-3, D-4, D-5, D-6, D-7, D-8, D-9, D-10, D-11, D-12, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, WS-5, WS-6, WS-7, WS-8, WS-9, WS-10, WS-11, WS-12, WS-13, WS-14, WS-15, WS-16, WS-17, WS-18, WS-19, WS-20, WS-21, WS-22, WS-23, WS-24, WS-25, WS-26, WS-27, WS-28, WS-29, WS-30, WS-31, WS-32, WS-33, WS-34, WS-35, W-1, W-2, W-3, W-4, W-5, W-6, W-7, W-8, W-9, W-10, W-11, S-1, S-2, S-3, S-4, S-5, S-6, S-7, S-8, S-9, & S-10
R8 03/14/14	Cover, Revision Sheet, DR-1, DR-2, DR-3, DR-4, DR-5, DR-8, DR-9, DR-11, DR-16, DR-18, DR-19, DR-20, D-1, D-2, D-6, D-7, D-10, D-12, ST-1, ST-2, ST-3, ST-4, ST-5, ST-7, ST-9, ST-10, ST-11, ST-13, ST-14, ST-15, ST-16, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, WS-1, WS-2, WS-3, WS-4, WS-5, WS-6, WS-7, WS-8, WS-9, WS-10, WS-11, WS-12, WS-13, WS-14, WS-15, WS-16, WS-17, WS-18, WS-19, WS-20, WS-21, WS-22, WS-23, WS-24, WS-25, WS-26, WS-27, WS-28, WS-29, WS-30, WS-31, WS-32, WS-33, WS-34, W-3, W-11, W-12, W-13, W-14, W-15, W-16, S-1, S-2, S-4, S-5, S-6, S-7, S-8, S-9, S-10, S-11, S-12, SW-1, SW-2, SW-3, SW-4, SW-5, STW-1, STW-2, STW-3, STW-4, STW-5, CPS-7, CPS-8
R9 10/19/21	Cover, Revision sheet, Section 1: Drainage policy, Section 2: Streets and Roadways policy, Section 3: Water and Sewer Policy, Section 4: Construction plans policy, Section 5: Storm Water Policy.

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SECTION 1 DRAINAGE POLICY

1.01 Introduction

The purpose of this section shall govern the planning, design, construction and operation of the storm drainage facilities within the City of Edinburg and all areas designated as its extraterritorial jurisdiction. It is to define the general requirements for the design of drainage improvements and to provide typical details of these improvements. The City Engineer or Designee should be consulted if variations from these standards are anticipated. In general these sections are conditions on drainage requirements adopted by the Code of Ordinances of the City of Edinburg specified in the **Unified Development Code**. In cases where limitations or physical barriers restrict compliance with the provisions of this section, adequate alternatives shall be considered by the City Engineer.

1.02 Master Plan

All designs must be sized and located according to the City Drainage Master Plans, County Drainage Master Plans and Texas Department of Transportation (TxDOT) regulations. The City of Edinburg will periodically update its Drainage Master Plan and the Project Engineer must be familiar with the most current adopted plans. Major deviations from this plan will not be allowed.

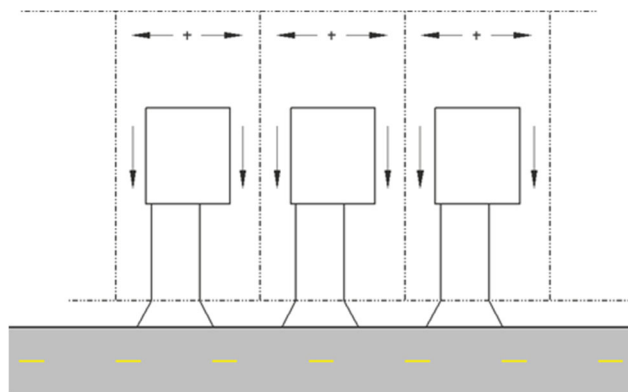
1.03 General

A. Policy

1. This Drainage Policy shall apply to all drainage improvements within the limits of the City of Edinburg (City) and its Extraterritorial Jurisdiction (ETJ). When a conflict in design arises with applicable criteria (Hidalgo County Drainage District No. 1, Texas Department of Transportation, etc.) the more restrictive criteria shall govern.
2. All drainage reports and plans shall be prepared by a Licensed Professional Engineer holding a valid license to practice in the State of Texas.
3. All proposed development within the City and its ETJ shall require a storm sewer outfall designated in accordance with the City Master Drainage Plan.

4. In instances where proposed drainage infrastructure improvements require conveyance to an outfall, the developer shall be responsible for design of the conveyance to accommodate storm water runoff from fully developed conditions within the entire subject drainage basin and all reasonable interconnects. The City may consider a cost share or reimbursement program for costs associated with the construction of the offsite conveyance.
5. All storm sewer conduit and related appurtenances maintained by the City of Edinburg shall be located within City right-of-way and/or dedicated drainage easements.
6. All drainage facilities including street gutters, inlets, pipes and related appurtenances to the drainage outfall system shall be designed to intercept and convey runoff from a 10- year frequency storm event and checked for a 25-year frequency storm event.
7. The drainage outfall system shall be designed to convey and/or detain storm water runoff from a 50-year frequency storm. The developer must comply with regulations to attain approval for connection to a drainage outfall system through a jurisdictional entity.
8. Improvements which will increase the frequency of flooding or the depth of inundation of unprotected structures in the 100-year flood plain or areas of flooding shall not be permitted for construction. The developer must comply with Unified Development Code Article 4 Environmental Standards, Division 4.200 "Flood Control and Flood Damage Prevention."
9. Off-site discharge for post development conditions shall not exceed the pre-development peak discharge for all storm events up to and including the 10-year storm event.
10. Stormwater runoff generated from developed improvements shall be detained on-site for a 50-year frequency storm event and released into the receiving system at the pre-developed, peak discharge rate for a 10-year frequency storm event.
11. For redevelopments that have no existing detention, the pre-developed peak discharge rate shall include land cover prior to any development on site.
12. All drainage systems shall be designed to provide service to and through subject property and maximize coverage to the City-approved service area.

13. For master planned developments, stormwater detention requirements shall be reassessed if land use is changed such that calculations show increase in runoff when compared to original approval.
14. Residential lots shall be graded to provide positive drainage towards the front of the lot at a minimum slope of 1%.



15. In no instance shall site grading on residential or commercial properties adversely affect neighboring properties.
16. In the event of a difference in grade between adjacent properties, each property shall be graded to drain away from the deviation. Grade differentials in excess of 1-foot shall require an engineered retaining structure.
17. Construction activity shall not interfere with the normal operation of existing drainage systems.
18. Storm drainage designs shall account for off-site drainage patterns affected by any proposed drainage improvements.
19. Variances from procedures described in this policy shall require approval from the City Engineer and/or City Commission, as applicable.
20. All formulas and factors appearing in this policy are presented in English units unless noted otherwise.

References

Unified Development Code (UDC): (Adopted in 2007), Article 4 – Flood Prone Areas
Article 7 – Reimbursements
Article 8 – Design Requirements

2014 Standard Manual: (Adopted in 2007), Section III – Water and Sewer Policy:

City Participation with Developer and Reimbursements requirements - Refer to Article 7, Section 7.506 – Responsibility for payment of On-site and Off-site Installation cost, also in Section 3 of the 2007 Standard Manual, Water and Sewer Policy, 3.07 – Sample Reimbursement Contract.

B. Minimum Requirements for Drainage Reports and Plans

The drainage report and plans, as applicable, shall contain the minimum information described below:

1. Reports

- a. Summary of project location, existing/proposed conditions Location map
- b. Location of proposed site with respect to FEMA Floodplain Drainage Area Map
- c. All contributing areas delineated
- d. Contours
- e. Spot elevations
- f. Direction of flow
- g. Right-of-way, property lines
- h. Existing/proposed storm sewer systems; outfalls
- i. Design assumptions
- j. Runoff, detention and hydraulic calculation summary
- k. Time of concentration estimates
- l. Runoff coefficient assumptions
- m. Storage volume calculations
- n. Pipe and inlet capacities
- o. Ponded widths and depths
- p. Inlet capacities and bypass
- q. Hydraulic Grade Line (HGL)

2. Storm Sewer Plan and Profile Plan

- a. Right-of-way/property lines
- b. Storm sewer alignment
- c. Direction of flow
- d. High points
- e. Identification of existing and proposed storm sewer

- f. Identification of existing and proposed storm sewer inlets, manholes, and junctions
- g. Profile
- h. Pipe length, size, class, and slope
- i. Identification of inlets, manholes, junction boxes
- j. Flow lines at structures, outfalls; 100-foot intervals along storm sewer length
- k. Finished grade/natural ground
- l. Utility crossings, conflicts
- m. Hydraulic Grade Line (10-year)
- n. Top of curb elevations
- o. Manhole rim elevations
- p. Trench protection limits
- q. Applicable details (other than standard)

3. Bridge/Culvert Layouts

- a. Plan and Profile
- b. Hydraulic calculations
- c. Applicable details

4. Channels and Detention Basin

- a. Grading plan/Earthwork
- b. Calculations
- c. Typical Sections
- d. Hydraulic calculations
- e. Design water surface elevations
- f. Maintenance access
- g. Applicable details

1.04 Stormwater Runoff

A. Rational Method

Peak flows may be estimated with use of the Rational Method for areas less than 100-acres.

$$Q = CiA$$

where:

Q = flow (cubic feet/second)

i = intensity (inches/hour)

A = Area (acres)

For areas greater than 100-acres, including phased projects with total area greater than 100 acres, SCS Unit Hydrograph (Ty III rainfall distribution) methodology shall be utilized. In addition, applicable hydrologic software(s) may be utilized with approval from the City Engineer.

B. Rainfall and Intensity

Intensity calculations shall utilize Intensity-Duration-Frequency coefficients for Hidalgo County, Texas as presented in Table 2-1 below:

Recurrence Interval (years)	IDF Coefficients		
	e	b	d
2	0.839	62.34	12.32
5	0.822	79.15	12.23
10	0.812	92.23	12.33
25	0.802	109.97	12.60
50	0.795	123.47	12.86
100	0.789	137.99	13.32
Reference: TxDOT <i>Intensity-Frequency-Duration Coefficients for Texas Counties</i> HDM (2019)			

Table 2-1: Intensity-Frequency-Duration Coefficients for Hidalgo County, Texas.

Intensity can be calculated by the relationship presented below.

$$i = b / (t_c + d)^e$$

where:

i = intensity (inches/hour)

t_c = time of concentration (minutes)

C. Time of Concentration

Time of concentration may be estimated by considering the velocity associated with three typical flow regimes; overland/sheet flow, shallow concentrated flow and pipe or channel flow. Time of concentration shall be calculated for each applicable flow regime encountered.

$$t_c = L / 60V$$

where:

t_c = travel time (minutes)

L = watercourse length (feet)

V = average flow velocity (feet/second)

D. Velocity Estimates

Velocities for overland/sheet flow and shallow concentrated flow may be estimated with the following relationship.

$$V = K_u k S_p^{1/2}$$

where:

$K_u = 3.28$

V = velocity (feet / second)

k = intercept coefficient

S_p = slope (%)

Land Cover / Flow Regime	k
Forest with heavy ground litter; hay meadow (overland flow)	0.076
Trash fallow or minimum tillage cultivation; contour or strip cropped; woodland (overland flow)	0.152
Short grass pasture (overland flow)	0.213
Cultivated straight row (overland flow)	0.274
Nearly bare and untilled (overland flow); alluvial fans in western mountain regions	0.305
Grassed waterway (shallow concentrated flow)	0.457
Unpaved (shallow concentrated flow)	0.491
Paved area (shallow concentrated flow); small upland gullies	0.619

Table 3-2: Intercept Coefficients

Manning's Equation shall be used to estimate average flow velocities in channels and conduits.

$$V = 1.49/n R^{2/3} S^{1/2}$$

Stormwater runoff shall be calculated for fully developed conditions. Minimum inlet time of concentration shall be 10-minutes.

E. Drainage Areas

Drainage areas shall be delineated with the aid of available topographic information. Care should be taken when considering existing drainage systems that cross natural drainage divides.

For areas greater than 100-acres, including phased projects with total area greater than 100 acres, SCS Unit Hydrograph (Ty III rainfall distribution) methodology shall be utilized. In addition, applicable hydrologic software(s) may be utilized with approval from the City Engineer.

F. Runoff Coefficients

Runoff coefficients shall be determined for each drainage area. Where non-homogeneous conditions exist, a weighted coefficient shall be determined with application of the following formula:

$$C_W = (C_1 A_1 + C_2 A_2 + C_3 A_3 + \dots + C_n A_n) / A_{Total}$$

where:

C_W = Weighted Runoff Coefficient

C_n = Runoff Coefficient n-th term

A_n = Area of n-th term (acres)

A_{Total} = Total Area (acres)

Table 3-3 presents typical ranges for "C". Runoff coefficients utilized for 25-year and 50-year storm frequencies shall be adjusted by 10% and 20%, respectively.

Type of Drainage Area	Runoff Coefficient, C
Business	
Downtown areas	0.70 - 0.95
Neighborhood areas	0.50 - 0.70
Residential:	
Single-family areas	0.30 - 0.50
Multi-units, detached	0.40 - 0.60
Multi-units, attached	0.60 - 0.75
Suburban	0.25 - 0.40
Apartment dwelling areas	0.50 - 0.70
Industrial:	
Light areas	0.50 - 0.80
Heavy areas	0.60 - 0.90
Parks, cemeteries	0.10 - 0.25
Playgrounds	0.20 - 0.40
Railroad yard areas	0.20 - 0.40
Unimproved areas	0.10 - 0.30
Lawns:	
Sandy soil, flat, 2%	0.05 - 0.10
Sandy soil, average, 2 - 7%	0.10 - 0.15
Sandy soil, steep, 7%	0.15 - 0.20
Heavy soil, flat, 2%	0.13 - 0.17
Heavy soil, average, 2 - 7%	0.18 - 0.22
Heavy soil, steep, 7%	0.25 - 0.35
Streets:	
Asphaltic	0.70 - 0.95
Concrete	0.80 - 0.95
Brick	0.70 - 0.85
Drives and walks	0.75 - 0.85
Roofs	0.75 - 0.95
Reference: FHWA, <i>Urban Drainage Design Manual</i> HEC-22,(2009)	

Table 3-3: Runoff Coefficients

In order to assist designers, a flow rate determination table is included in Appendix A.

1.05 Street Flow

To maintain safe passage of vehicular and pedestrian traffic and to ensure properties are kept reasonably safe from flooding, the designer shall be responsible for determining the depth and width of stormwater runoff. Calculated ponding widths and depths shall be presented on storm sewer plan sheets.

The width of spread on a pavement section shall be contained to provide passage of vehicular traffic as specified in Table 4-1 below.

Functional Classification	Clear Lanes
Local Collector Minor	(a)
Arterial	1 - 11 foot
Principal Arterial	2 - 11 foot (1 each way)
	2 - 11 foot (1 each way)
(a) No width requirement; depth not to exceed top of curb	

Table 4-1: Spread Limits for Roadways

In all cases, depth of flow shall be maintained at or below top of curb. For inlets located at sag points, the designer shall consider the effects resulting depths on existing and/or proposed adjacent grades.

Flow in a gutter section can be calculated with adaptation of Manning's Equation⁽¹⁾.

$$Q = (K_U/n) S_x^{1.67} S_L^{0.5} T^{2.67}$$

Spread width can be determined by the formula

$$T = (Q_n / K_U S_x^{1.67} S_L^{0.5})^{0.375}$$

where:

$K_U = 0.56$

N = Manning's roughness coefficient

Q = flow (cubic feet / second)

T = spread width (feet)

S_x = cross slope (foot / foot)

S_L = longitudinal slope (foot / foot)

Table 4.2 presents acceptable values of Manning's roughness coefficient.

Type of Gutter or Pavement	Manning's n
Concrete gutter, troweled finish	0.012
Asphalt Pavement	
Smooth Texture	0.013
Rough Texture	0.016
Concrete gutter-asphalt pavement	
Smooth	0.013
Rough	0.015
Concrete Pavement	
Float finish	0.014
Broom finish	0.016
For gutters with small slope, where sediment may accumulate, increase above values of "n" by	0.002
Reference: FHWA, Design Charts for Open Channel Flow HDS-3 (1961)	

Table 4-2: Manning's Roughness Coefficient, n

Depth of flow in a gutter section can be calculated by the formula

$$D = TS_x$$

where:

D = depth of flow (feet)

T = spread width (feet)

S_x = cross slope (foot / foot)

The above formulas are applicable for pavement sections with a uniform, straight cross slope. The designer is referred to consult Reference 1 in Appendix A when composite pavement sections or parabolic crowns are encountered.

1.06 Inlet Design

Curb and grate inlets shall be used to facilitate the drainage of pavement sections and open areas. Placement of inlets shall consider the safety of pedestrian, vehicular and bicycle traffic. Inlets shall be placed at low points and at intervals necessary to meet maximum permissible spread limits and inlet capacities. In any case, inlet spacing shall not exceed 600-feet, with a maximum surface run of 300-feet from crest to sag of the roadway profile. In the event a longitudinal roadway profile exceeds 300-feet from crest to sag, inlets shall be spaced at a maximum of 300- feet. Flows shall be intercepted upstream of street intersections where practical.

Runoff across roadway intersections consisting of a minor or principal arterial street is prohibited. For inlets on grade, by-pass flows shall be limited to 10% of previously intercepted flows. When curb inlet extensions are required, no more than two extensions shall be used conjunction with a primary inlet. Inlet hydraulics shall be presented on plan sheets. The use of inlets other than curb- opening or grate inlets shall require approval

from the City Engineer.

A. Curb Inlet Capacity

Capacities for inlets may be determined by the following equations.

1. Curb Opening Inlets on Grade

$$L_T = K_U Q^{0.42} S_L^{0.3} (1/n S_X)$$

where:

L_T = curb opening length for 100% interception (feet)

K_U = 0.6

Q = flow in gutter (cubic feet/second)

S_L = longitudinal slope (foot/foot)

n = Manning's roughness coefficient

S_X = cross slope (foot/foot)

2. Curb Inlets on Grade with Depressed Curb Opening

$$L_T = K_U Q^{0.42} S_L^{0.3} (1/n S_e)$$

In this case the cross slope, S_X is replaced by an equivalent cross slope, S_e that accounts for the depressed gutter section. The equivalent cross slope is calculated by

$$S_e = S_X + S'_w E_o$$

where:

S_e = equivalent cross slope (foot / foot)

S_X = pavement cross slope (foot / foot)

S'_w = gutter cross slope; gutter depression/gutter width (foot / foot)

E_o = ratio of flow in depressed section to total gutter flow upstream of inlet

3. Curb Inlets - Sag Location

Curb opening inlets operate under weir or orifice flow conditions.

- a. Weir Condition - Capacity of a curb opening inlet under weir conditions can be estimated by the following relationship.

$$Q_i = C_w (L + 1.8W) d^{1.5}$$

where:

C_w = 2.3

L = length of curb opening (feet)

W = lateral width of depression (feet)

d = depth at curb measured from normal cross slope (feet)

This formula is applicable for depths less than the curb opening plus the depth of the depression.

where:

h = curb opening height (feet)

a = depth of depression (inches)

or

$$d \leq h + a/12$$

- b. Orifice Condition – Curb openings act as orifices at depths greater than approximately 1.4 times the opening heights. The capacity can be computed using the following relationship:

$$Q_i = C_o h L (2g d_o)^{0.5}$$

or

$$Q_i = C_o A_g [2g (d_i - h/2)]^{0.5}$$

where:

C_o = 0.67 (orifice coefficient)

d_o = head on center of orifice throat (feet)

L = length of orifice opening (feet)

A_g = clear area of opening (square feet)

d_i = depth at lip of curb opening (feet)

h = height of curb opening orifice (feet)

For curb opening inlet other than vertical face use:

$$d_o = d_i - (h/2)\sin\theta$$

h = orifice throat width (feet)

d_o = effective head on center of orifice throat (feet)

B. Grate Inlet Capacity

1. Grate Inlets in Sag Locations – Inlets may be calculated as weir or orifice flow.
 - a. Weir flow may be calculated using the following relationship:

$$Q_i = C_w P d^{1.5}$$

where:

P = perimeter of the grate (feet) disregarding curb side

C_w = 3.0

d = average depth across grate (feet)

- b. As an orifice, flow may be calculated using the following relationship.

$$Q_i = C_o A_g (2gd)^{0.5}$$

where:

C_o = 0.67 (orifice coefficient)

A_g = clear opening area of grate (square feet)

g = 32.2 (feet/second/second)

- c. Grate inlet design shall incorporate a 50% factor to account for clogging.
2. When the use or analysis of combination inlets is required, the designer shall consult Reference 1 in Appendix A.

1.07 Storm Sewer Design

A. Design Considerations

Storm sewer systems shall be designed to convey runoff from a 10-year frequency storm event and checked for a 25-year frequency storm event. Storm sewer systems shall utilize rubber- gasketed, Class III reinforced concrete pipe (RCP) with a minimum size of 24 inches. Manholes or junction boxes shall be utilized at all changes in pipe size and direction in both horizontal and vertical planes. Manhole spacing shall be maintained as presented in Table 6.1.

Pipe Size (inches)	Maximum Spacing (feet)
12 to 24	300
27 to 36	400
42 to 54	500
60 and greater	1000
Reference: FHWA, <i>Urban Sewerage Design Manual</i> HEC-22 (2009)	

Table 6-1: Suggested Manhole Spacing⁽¹⁾

Pipes shall be matched at soffits when practical. In instances where radial alignment is required, pipe joints shall not be deflected beyond manufacturer's suggested tolerances. Pipe slopes shall be designed to provide a minimum velocity of 3-feet per second and a maximum velocity of 12-feet per second. Table 6-2 on page 2 presents the minimum slopes necessary to achieve the minimum velocity.

Diameter (inches)	Slope (foot/foot)	Slope (%)
24	0.00174	0.174
27	0.00148	0.148
30	0.00129	0.129
36	0.00101	0.101
42	0.00082	0.082
48	0.00069	0.069
54	0.00059	0.059
60	0.00051	0.051
66	0.00045	0.045
72	0.00040	0.040
Based on Manning's Equation; $v = 3\text{fps}$, $n = 0.013$		

Table 6-2: Minimum Pipe Slopes

All outfalls shall incorporate the use of a concrete sloped-end treatment as per the City of Edinburg standard drainage detail. Where outlet velocities exceed maximums, velocity dissipation shall be required.

Minimum depth of cover for all storm sewer pipe shall be 3-feet from finished grade to the crown of the pipe. Depth of cover not meeting this requirement shall require structural calculations as approved by the City Engineer.

Trench protection shall be required for storm sewer system installations exceeding depths of 5- feet.

B. Hydraulic Grade Line Analysis

A hydraulic grade line (HGL) analysis is required for all proposed storm sewer system improvements.

The analysis shall include determination and presentation of the 10-year HGL. The HGL shall be shown on all storm sewer profile plans. The hydraulic grade line shall be maintained at or below the throat of the inlet. Computations shall include determination of major and minor losses.

Starting water surface elevations shall be calculated from the best available data. The designer shall document all assumptions. For starting water surface elevations where an outfall is provided at a channel, a backwater analysis shall be utilized where no water surface data is available. Similarly, starting water surface elevations at ties to existing storm sewer systems shall utilize best available data and shall be reviewed and approved by the City Engineer.

1. Major Losses due to friction may be calculated by the relationship:

$$H_f = S_f L$$

where:

H_f = loss due to friction (feet)

S_f = friction slope (feet)

L = length of conduit (feet)

$$S_f = (Qn / K_Q D^{2.67})^2$$

Q = flow (cubic feet/second)

n = Manning's roughness coefficient

$K_Q = 0.46$

D = pipe diameter (feet)

Manning's roughness coefficient may be assumed as 0.013 for concrete pipe.

2. Minor Losses result from flow disturbances at junctions such as inlets, manholes or junction boxes. Minor losses may be calculated with application of the formula

$$H_m = K (V^2 / 2g)$$

where:

H_m = minor losses (feet)

K = constant of proportionality

V = velocity (feet / second)

g = gravitational acceleration constant (32.2 feet/second/second)

$$K = K_O C_D C_d C_Q C_p C_B$$

K = constant of proportionality

K_O = initial head loss coefficient based on relative access hole size

C_D = correction factor for pipe diameter (pressure flow only)

C_d = correction factor for flow depth

C_Q = correction factor for relative depth

C_p = correction factor for plunging flow

C_B = correction factor for benching

Relative Manhole size, K_O

This is estimated as a function of the relative structure size and angle of deflection between the inflow and outflow pipe.

$$K_O = 0.1(b/D_O)(1 - \sin\theta) + 1.4(b/D_O)^{0.15} \sin\theta$$

θ = angle between pipes (degrees)

b = manhole/junction diameter (feet)

D_O = diameter of outlet pipe

Pipe Diameter, C_D

A change in head loss due to differences in pipe diameter is only significant in pressure flow situation where the depth in the structure to outlet pipe diameter ratio (depth/ D_O) is greater than 3.2, otherwise C_D is set to equal to 1.0.

$$C_D = (D_O/D_I)^3$$

D_O = diameter of outlet pipe

D_I = diameter of incoming pipe

Flow Depth, C_d

This formula is applicable in cases of free surface flow or low pressures where depth/ D_O is less than 3.2, otherwise C_d is equal to 1.0. Depth in the access hole is estimated as HGL at upstream end of outlet pipe.

$$C_d = 0.5 (d_{mh}/D_O)^{0.6}$$

d_{mh} = depth in mh/junction

D_O = diameter of outlet pipe

Relative Flow, C_Q

This formula is applied when 3 or more pipes enter the structure at approximately the same elevation, otherwise C_Q is equal to 1.0.

$$C_Q = (1 - 2 \sin \theta)(1 - Q_I/Q_O)^{0.75} + 1$$

where:

θ = angle between pipes

Q_I = flow in incoming pipe Q_O = flow in outgoing pipe

Plunging Flow, C_p

This corresponds to the effect of another inflow pipe or surface flow from an inlet, plunging into the structure, on the inflow pipe for which the head loss is being calculated. It is applicable if $h > d_{mh}$ and if the plunging flow is at a higher elevation and inflow and outflow pipes are at the bottom of the manhole / junction. This correction factor is also applied at curb and grate inlets functioning as junctions.

$$C_p = 1 + 0.2 (h/D_O) ((h - d_{mh})/D_O)$$

where:

h = elevation difference between the invert of plunging flow pipe to center of outflow pipe

D_O = outlet pipe diameter

d_{mh} = depth of water in manhole relative to outlet pipe invert

Benching, C_B

The correction factor is applied to address benching configurations for either submerged or unsubmerged conditions.

Bench Type	C_B	
	Submerged ⁽¹⁾	Unsubmerged ⁽²⁾
Flat or Depressed	1.00	1.00
Floor Half Bench	0.95	0.15
Full Bench	0.75	0.07
(1) pressure flow $d_{mh}/D_o \geq 3.2$		
(2) free surface flow $d_{mh}/D_o \leq 1.0$		
Reference: FHWA, <i>Urban Sewerage Design Manual</i>		
HEC-22 (2009)		

Table 6.3: Bench correction factor, C_B

3. Exit Losses

Exit losses shall be accounted for at all outfalls.

$$H_E = 1.0 (V_o^2/2g - V_r^2/2g)$$

where:

V_o = average velocity at outlet (feet / second)

V_r = velocity of receiving stream (feet / second)

- All hydrologic and hydraulic design computations may be completed with the aid of design software approved by the City Engineer.

1.08 Detention Design

A. Design Considerations

Stormwater runoff generated from developed improvements shall be detained on-site for a 50- year frequency storm event and released into the receiving system at the pre-developed rate for a 10-year frequency storm event. The Modified Rational Method (MRM) shall be used to determine stormwater storage requirements for areas less than 10-acres. For areas greater than 10-acres, the MRM may be used to estimate storage requirements. However, final detention design shall implement appropriate hydrograph routing procedures that account for the storage characteristics of the basin and discharge characteristics of the outlet structure. Applicable software programs may be implemented with approval from the City Engineer.

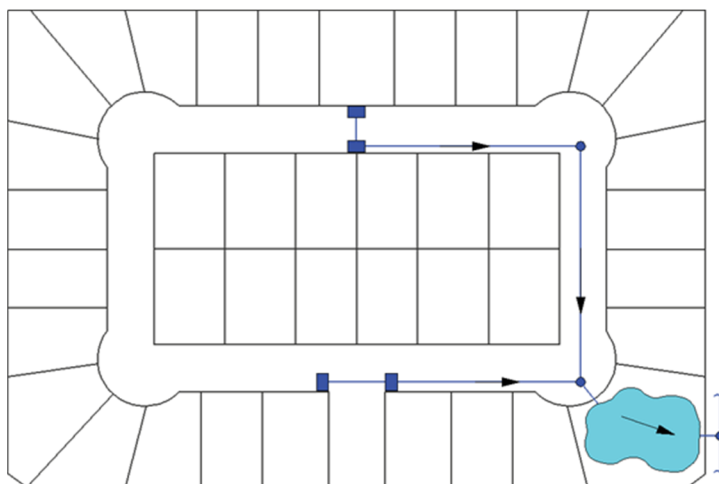
Existing drainage facilities (i.e. City of Edinburg Drains, Regional Stormwater Detention Facilities, etc.) shall not take the place of dedicated facilities unless previously included in the City of Edinburg's Master Drainage Plan.

Methods of on-site detention shall include ponds or engineered sub-surface systems with

an outlet structure connecting into an approved drainage system. Detention pond areas shall be vegetated to prevent erosion and deposition of silts. Common Bermuda, Winter Rye or a combination of the grasses may be used. Vegetated areas shall include provisions for irrigation systems. Detention areas may be incorporated into landscape and greenbelt areas if vegetation does not adversely affect required design volumes or impede hydraulic efficiency. Areas designated as dual use areas (detention/landscape, detention/green space, etc.) shall display appropriate signage indicating so.

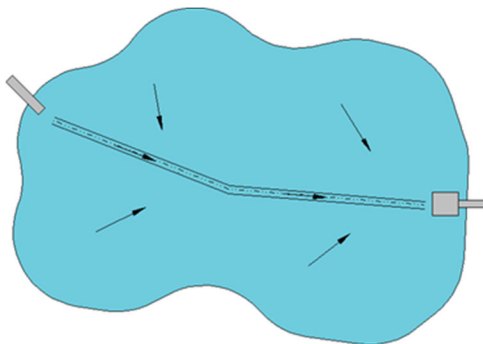
Maintenance of detention areas shall be the responsibility of the property owner's or home owner's association as applicable. The City shall have the authority to assume the responsibility of maintaining the detention areas and impose applicable fees in the event the property owner or home owner's association fails to comply with the maintenance requirements.

On-site detention facilities shall be situated in dedicated areas.



Typical Residential Detention Pond Layout

Side slopes shall not exceed 3:1 (H:V). Detention pond depths at or exceeding 2.5 ft shall require a safety buffer in the form of benching or 4 ft tall fencing around the perimeter of the pond.



Typical Dry Stormwater Detention Pond

The bottom of the basin shall be graded to drain towards the outlet structure. A pilot

channel shall be placed along the flow line from inlet to outlet to ensure positive flow.

Trash racks shall be incorporated into outlet structure design.

A minimum width of 6-feet shall be maintained around the perimeter of the pond to allow for routine maintenance and/or repair. Detention area design shall consider proximity and elevation of adjacent building structures. Bank areas shall be graded to drain away from such structures.

No freeboard above design pool elevation shall be required, however, the design of detention areas shall incorporate diversion of overflows into street rights-of-way or drainage/flowage easements in the event of an extreme event or outlet structure failure.

For single family residential developments with 5 lots or less, detention storage may be achieved within shallow swales along the perimeter of the lot. Shallow swale side slopes shall not exceed 2:1. Storm water runoff may be conveyed via storm sewer networks, flumes and curb cuts within the lot. The bottom of swale shall be graded to drain towards the outlet structure to an approved drainage system.

B. Modified Rational Method

The Modified Rational Method may be used to estimate storage volumes. The MRM produces a trapezoidal runoff hydrograph based on the Rational formula. Storage requirements are based upon differences in volume between pre and post development runoff hydrographs for various storm durations. Calculations are best carried out in tabular form.

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Duration	Intensity	Q_{in}	Vol_{in}	Q_{out}	V_{out}	Storage
(min)	(in/hr)	(cfs)	(ft ³)	(cfs)	(ft ³)	(ft ³)

Column A: Duration in minutes

Column B: Intensity for respective duration (50-year event)

Column C: Developed conditions peak discharge ($C_{dev} \times i_{50} \times \text{Area}$)

Column D: Developed conditions Runoff Volume ($Q_{in} \times \text{Duration} \times 60$)

Column E: Pre-developed peak discharge ($C_{pre} \times i_{10} \times \text{Area}$)

Column F: $(0.5 \times [\text{duration} + t_{c \text{ dev}}] \times Q_{out} \times 60)$

Column G: Required storage ($V_{in} - V_{out}$)

The calculations are carried out iteratively until a duration yielding the greatest storage volume is achieved. The following example illustrates application of the MRM.

C. Modified Rational Method Example

Site Area: 5.3-acres

Pre-developed Conditions

C = 0.25

 $t_c = 60$ min $i_{10} = 3.22$ in/hr $Q_{peak} = 4.27$ cfsPost-developed Conditions

C = 0.60

 $t_c = 20$ min $i_{50} = 7.91$ in/hr $Q_{peak} = 30.18$ cfs

Duration (min)	Intensity (in/hr)	Q_{in} (cfs)	Vol_{in} (ft ³)	Q_{out} (cfs)	V_{out} (ft ³)	Storage (ft ³)
10	10.83	41.31	24,786	4.27	3,840	20,945
20	7.91	30.18	36,212	4.27	5,121	31,092
30	6.34	24.20	43,566	4.27	6,401	37,165
40	5.35	20.42	48,997	4.27	7,681	41,317
50	4.66	17.77	53,321	4.27	8,961	44,360
60	4.14	15.81	56,925	4.27	10,241	46,684
70	3.75	14.29	60,027	4.27	11,521	48,506
80	3.43	13.07	62,757	4.27	12,801	49,956
90	3.16	12.07	65,200	4.27	14,081	51,119
100	2.94	11.24	67,416	4.27	15,362	52,055
110	2.76	10.52	69,447	4.27	16,642	52,806
120	2.60	9.91	71,325	4.27	17,922	53,403
130	2.45	9.37	73,072	4.27	19,202	53,870
140	2.33	8.89	74,708	4.27	20,482	54,226
150	2.22	8.47	76,248	4.27	21,762	54,486
160	2.12	8.09	77,704	4.27	23,042	54,662
170	2.03	7.75	79,085	4.27	24,322	54,762
180	1.95	7.44	80,400	4.27	25,603	54,797
190	1.88	7.16	81,655	4.27	26,883	54,772
200	1.81	6.90	82,856	4.27	28,163	54,693
210	1.75	6.67	84,009	4.27	29,443	54,566
220	1.69	6.45	85,117	4.27	30,723	54,394

Required storage = 54,797 ft³ = 1.25 ac-ft with a controlled release of 4.27 cfs.

1.09 Channel Design

City maintained/dedicated Channels shall be designed to convey and or detain stormwater runoff resulting from the 50-year storm. Typical channel sections shall incorporate maximum side slopes of 3:1 (H:V). Side slopes shall be vegetated to prevent erosion and degradation of slopes.

- A. Utility crossings within the banks of a channel are discouraged. In instances where such crossings are unavoidable, utilities shall be designed to maximize the cross-sectional area of the channel in the vicinity of crossing. Utility crossings shall be protected from floating debris and scour.
- B. Water surface profiles shall be prepared utilizing standard-step backwater calculations or hydraulic modeling software such as HEC-RAS. Calculations shall account for losses at bridge and culvert crossings.
- C. Typical channel sections shall incorporate the use of a pilot channel with a minimum 10-foot maintenance bench on either side (12' preferred). Maintenance benches shall be graded to slope toward the pilot channel at a minimum slope of 12:1 (H:V). Access to maintenance benches shall be provided at end sections of the channel at grades not exceeding 5%.
- D. Culverts shall be sized to convey the 50-year storm and shall be designed in accordance with criteria as specified in Chapter 8 of the Texas Department of Transportation Hydraulic Design Manual.⁽⁵⁾

1.10 Development in Flood Prone Areas

- A. Also Refer to the UDC, Article 4 – Environmental Standards.
- B. All new development shall be located above base flood elevation as determined in Zones “A’s”, as per UDC guidelines.
- C. No fill shall be placed within a special flood hazard area unless the effect of the fill on water storage and water quality is fully mitigated in one or more of the following ways:
- D. Excavation of a volume of soil comparable to the volume that was filled to bring the surface of the land to the base flood elevation. However, excavation is prohibited at depths that would:
 - 1. Increase the velocity of stormwater flows,
 - 2. Cause significant new erosion; or
 - 3. Expose the water table to contamination by pollutants which may be present in stormwater runoff.
- E. A stormwater management system is installed or improved in a location and manner that

compensates for the removal of the filled area from the floodplain.

- F. If the compensatory storage is provided in the floodplain, the combination of filling, compensatory storage, and detention is intended to lower the flood elevation by increasing channel capacity in accordance with UDC, Section 4.207 – Detention in Floodplains.
- G. No improvements shall be constructed which will increase the frequency of flooding or the depth of the inundation of unprotected structures in the 100-year flood plain or areas of flooding.
- H. No access easements or streets may be constructed at an elevation below the base flood elevation.
- I. Any property within the 100-year floodplain must provide an amount of floodwater storage capacity after development, which is not less than the pre-existing floodwater storage capacity of said property during the 100-year flood, regardless of whether such pre-existing flood storage capacity is due to natural or artificial causes.
- J. Parking in floodplain is permitted if the parking surfaces are located at elevations not lower than 6-inches below the base flood elevation.

1.11 Outfall System

- A. All subdivision proposals shall convey stormwater runoff to the nearest publicly maintained drainage system and provide the necessary engineering studies and/or hydraulic/hydrologic modeling to demonstrate adequacy of the conveyance stream.
- B. Maintaining the outfall system shall be the City's responsibility.
- C. Any proposed development bordering an identified open channel outfall system shall be required to dedicate 75-ft of right-of-way from center line of channel or cross-section shown in the Drainage Master Plan, whichever is most stringent will govern.
- D. Continuity of adjacent drainage ditches will be required when these are within 1,320 feet with a 75-ft right-of-way dedication for a total 150-ft cross-section or cross-section shown in the Drainage Master Plan, whichever is most stringent will govern.
- E. All proposed development within the City and its ETJ shall require a storm sewer outfall designated in accordance with the Master Drainage Plan.
- F. In areas where the City or another developer has installed the Offsite Outfall Drainage Systems, and a reimbursement policy and contract has been initiated, all proposed developments shall be required to pay their pro-rata share of those costs as per the contract prior to connecting to the existing outfall system. In general, City's participation requirements are as per the Unified Development Code, Section 7.506 – Responsibility for Payment of On-Site and Off-Site Installation Costs.

1.12 Responsibility in Development

- A. Developers must provide acceptable conveyance for storm waters from the development to the outfall at their expense. All drainage facilities shall be sized to provide capacity for the development.
- B. All construction of on-site drainage facilities are the responsibility of the developer.
- C. All on-site detention facilities must be designed in accordance with City's standards specified herein and dedicated to the city along with easements and rights-of-ways.
- D. Drainage requirements not considered through the subdivision process will be addressed at building permit process. All new construction shall meet the city's drainage requirements.
- E. A ten-year developer's reimbursement contract may be entered with the City for the costs of over-sizing the off-site system for future development. Any future development that connects to the system will be ultimately responsible for reimbursing its pro-rata share to the developer.

1.13 Open Channels

- A. Open channels shall extend up to at least the water surface elevation of the 50-year frequency channel flow, and additional channel height shall be provided as required to convey the 100-year channel flow with one (1) foot of freeboard.
- B. Unlined ditches may be permitted with the following criteria:
 - 1. Maximum side slope of 2.5:1 (Horizontal: Vertical) for stability and maintenance.
 - 2. Sides must be compacted to a minimum of 80% Standard Proctor.
 - 3. All unlined ditches must be properly seeded for stabilization.
- C. All channels shall have a one - (1) inch per foot traverse bottom slope to the centerline.

1.14 Culvert Crossings

- A. All culverts crossing under streets shall extend from property line to property line, plus sufficient length on each end to permit a 3:1 slope to extend from the street property line to a point 6 inches beneath the top of the headwall.
- B. All culverts shall have adequate reinforced concrete headwalls; wing walls for 3:1 fill slope, and aprons at each end.
- C. Submit Plan and Profile sheets, hydraulic calculations and required applicable details.

1.15 Valley Gutters

- A. All valley gutters shall be constructed of reinforced concrete.
- B. A maximum of two valley crossings may be used at an intersection.
- C. Street crowns shall be reduced for approximately 100-ft on each side of valley gutter.
- D. Widths:
 - 1. Internal to subdivision 6-ft. minimum.
 - 2. Intersection to off-street, major thoroughfares or arterials shall be 10-ft. minimum.

1.16 Additional Criteria

- A. Streets should be graded to avoid sumps and utilize the natural existing flow patterns.
- B. Testing will be required at all laterals for storm sewer crossing streets and on all manholes and inlets by an engineering/construction testing laboratory. A minimum of 95% compaction is required.

1.17 Approved Materials

Approved material listing is as follows. All deviations must be approved in writing by the City Engineer. All pipe, fittings, and materials shall be new and in accordance with Standard Specifications.

- A. Reinforced Concrete Pipe (RCP): Comply with requirements of ASTM C 76, Class III, installed with flexible plastic (Bitumen) gaskets at all joints. Gaskets shall comply with AASHTO M-198 75I, Type B, and shall be installed in strict accordance with pipe manufacturer's recommendations.
- B. ADS (ADS HP STORM) HP Pipe or equivalent: Comply with the requirements must meet or exceed ASTM F2736 and AASHTO MP-21-11 requirements for 12" to 30" pipe and ASTM F2881 and AASHTO MP-21-11 requirements for 36" to 60" pipe all with smooth interior and annular exterior corrugations. Material of pipe polypropylene compound and fittings shall be impact modified copolymer meeting the material requirements of ASTM F2736 for the perspective diameter. Watertight must comply with ASTM D3212 requirements. Spigots shall conform to ASTM F477 requirements. Testing shall be in accordance with ASTM F2487 requirements. Installation of pipe shall be in accordance to the ASTM D3221 requirements with a minimum 3- foot cover. Backfill will require design parameters established by Geotechnical Professional Engineer prior to plan approval (500-ft interval bores is suggested); minimum City standard must be met for backfill trench. Manning's "n" value for use in design shall be 0.012.

C. Manholes:

1. Cast-in-Place Manholes

- a. Cast-in-place Manholes shall be constructed of 4000 psi concrete.

2. Pre-cast Concrete Manholes

- a. In accordance with ASTM C-478.

D. Inlets:

1. Pre-Cast Type A

2. Pre-Cast Type C-C Grated

E. Cast Iron Frames, Covers, and Grates: As shown in Standard Details.

1.18 Warranty

All materials, products, and workmanship shall be guaranteed for a period of 1-year from the written Date of Acceptance by the City and the date approved As-built drawings are submitted. 30-days prior to the date of acceptance a walk thru will be required and if any repair is required an additional time line will be addressed and after the completion, City will take over maintenance of infrastructure.

1.19 Erosion Control Plans:

All construction activity within the City must address stormwater pollution prevention, and comply with all applicable State requirements for the pre and post construction storm water management. These are generally known as the “NPDES”. The State requires the application for the above general permit to be submitted at least 7-days prior to the start of project. A Stormwater Pollution Prevention Plan (SWPPP) must be prepared prior to submittal and Best Management Practice (BMP) in place before construction begins. (See Stormwater Policy Section 5)

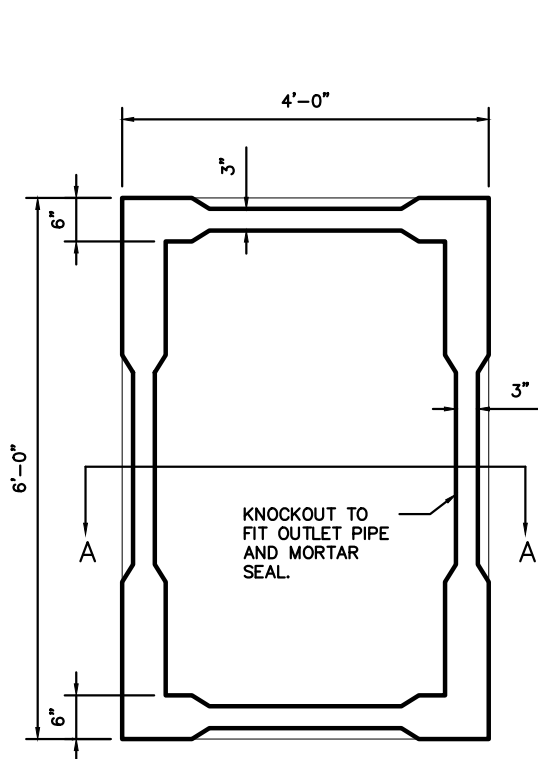
The City of Edinburg requires a signed copy of the certification statement in our files before construction begins. The SWPPP will be maintained by the developer/contractor and must be available for inspection at the job site at all times. In addition, the construction

drawings set shall include plan sheets showing the Erosion Control Plan and Erosion Control Details for the development. If required, a written narrative must also be submitted to the Director of Public Works or City Engineer for review and approval. The narrative report must contain a project description, existing site conditions, and the name of the professional preparing the report.

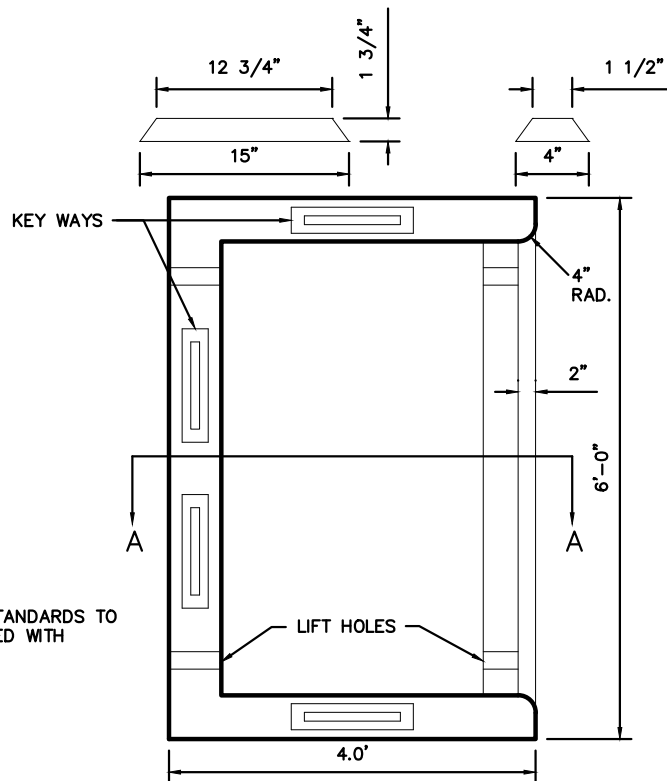
1.20 Standard Drainage Details

The following details show the adopted standards required by the City which are included at the end of this section:

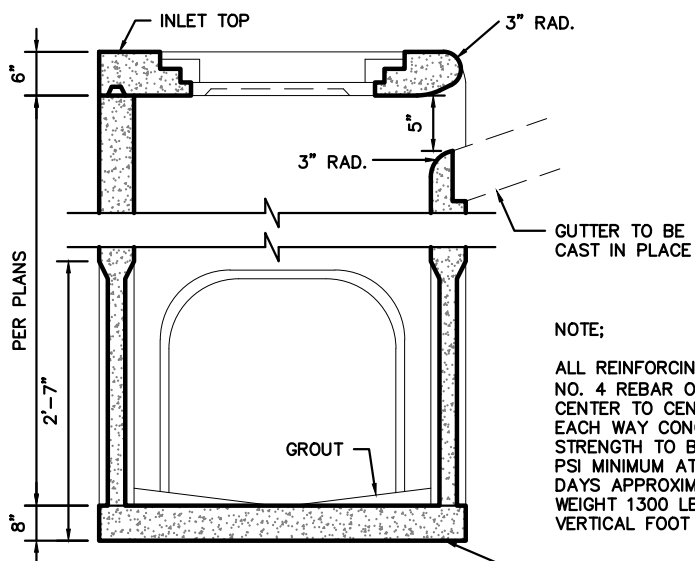
- D-1** Type "A" Inlet Details
- D-2** Type "A" Inlet with Extension Details
- D-3** Type "C-C" Inlet Details
- D-4** Pre-cast Concrete Manhole Details
- D-5** Concrete Pipe Support Collar Details
- D-6** Down Drain Structure Details
- D-7** Ditch Cross Section Detail
- D-8** Standard Pipe Bedding Details
- D-9** Utility Crossing at Existing Street Detail
- D-10** Manhole Cover Details
- D-11** Lot Layout Grading Details
- D-12** Concrete Sloped-End Treatment Detail
- D-13** Dowel Type Expansion Joint for Drainage Structures Detail
- D-14** Concrete Slope Protection Details
- D-15** Stone Riprap Details
- D-16** Concrete Sidewalk Drain Details



BOTTOM END SECTION



TOP VIEW PLAN

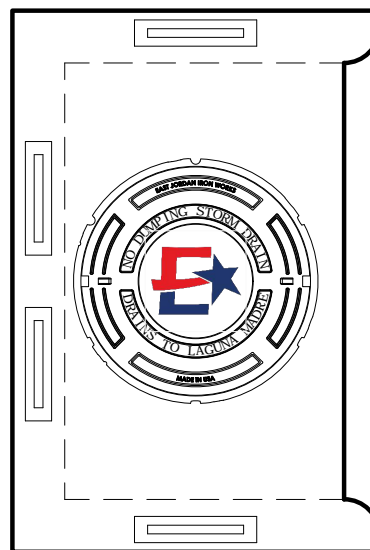


SECTION A-A

NOTE;
MATERIAL STANDARDS TO
BE SUBMITTED WITH
SUBMITTALS.

NOTE;
ALL REINFORCING TO BE
NO. 4 REBAR ON 12"
CENTER TO CENTER
EACH WAY CONCRETE
STRENGTH TO BE 4000
PSI MINIMUM AT 28
DAYS APPROXIMATE
WEIGHT 1300 LB. PER
VERTICAL FOOT

BOTTOM TO BE
CAST IN PLACE



TOP VIEW PRECAST LID

PRECAST TYPE "A" INLET

D-1

TYPE "A" INLET DETAILS

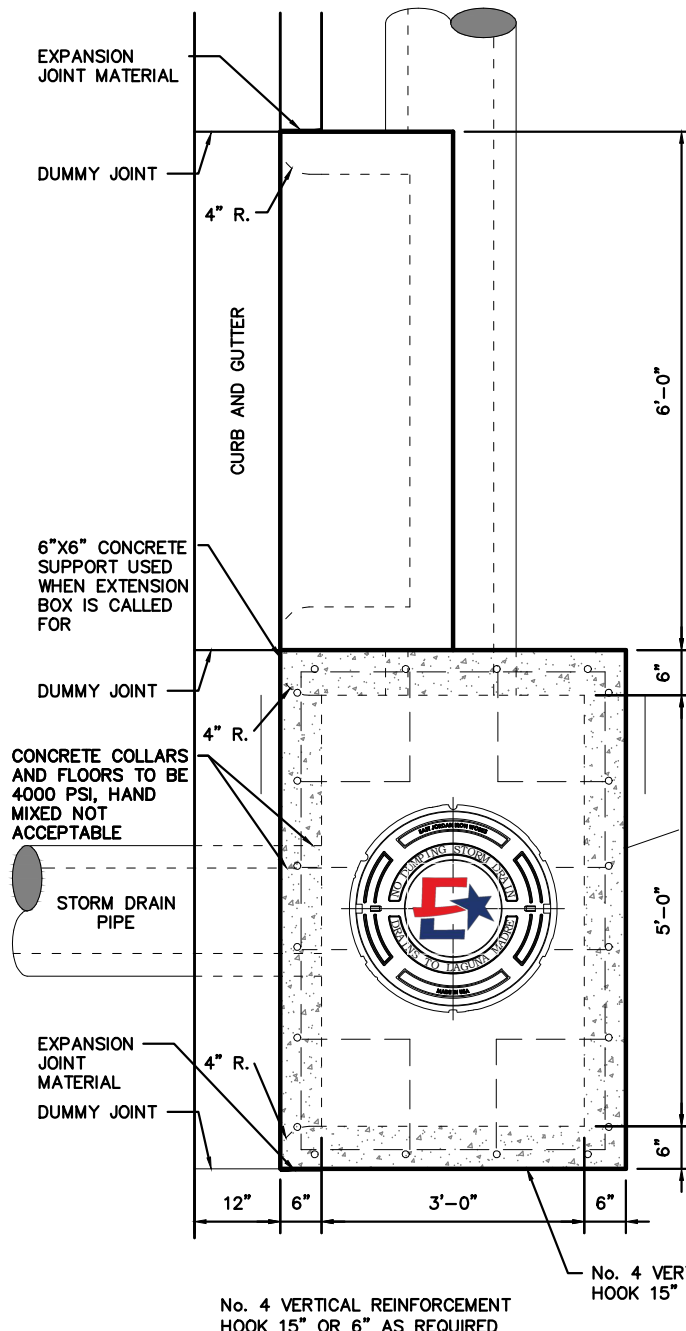
SCALE: N.T.S.

DATE: OCTOBER, 2021

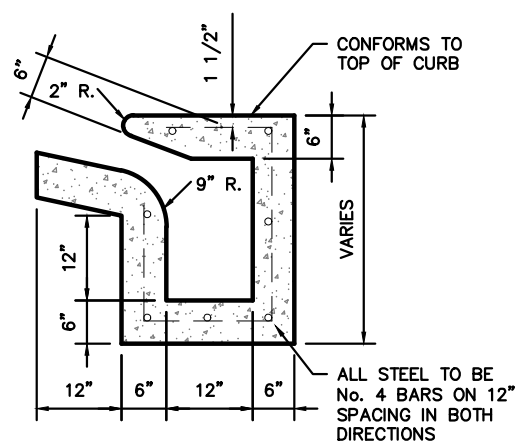
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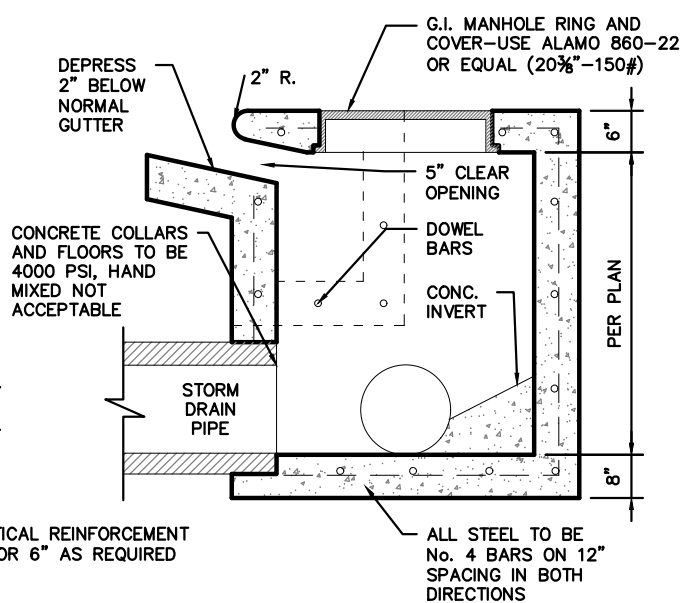




PLAN



INLET EXTENSION



SECTION

NOTE:

1. SLOPE BOTTOM OF INLET EXTENSION $\frac{1}{2}$ "/1'-0" TOWARD INLET EXTENSION TO INLET TO BE MADE IN INCREMENTS OF 3'-0" OR 6'-0" ONLY. TRANSITION NORMAL GUTTER TO INLET SLOPE APPROXIMATELY 3'-0".
2. ALL STEEL TO BE No. 4 VERTICAL REINFORCEMENT HOOK 15" OR 6" AS REQUIRED

D-2

**TYPE "A" INLET WITH EXTENSION
DETAILS**

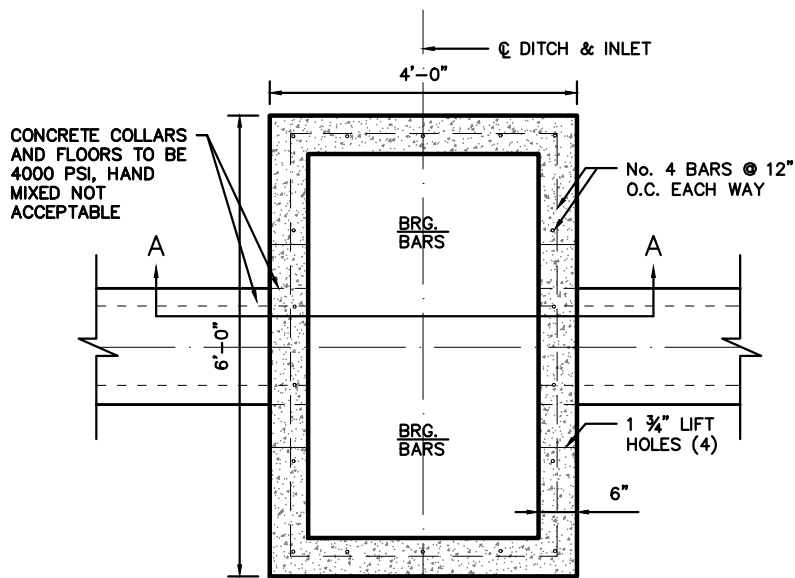
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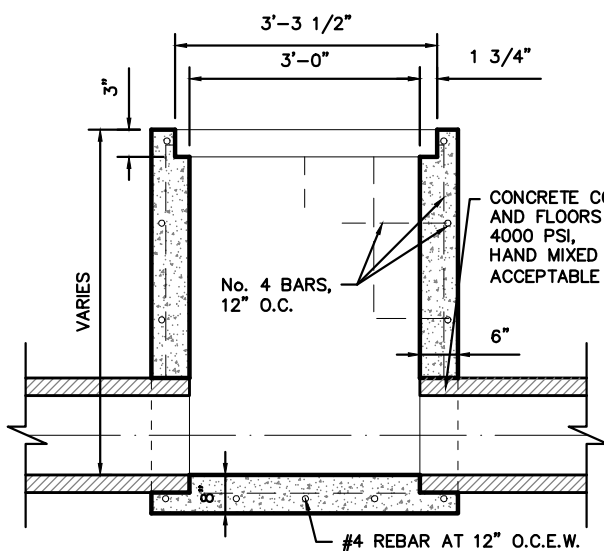
DATE: OCTOBER, 2021

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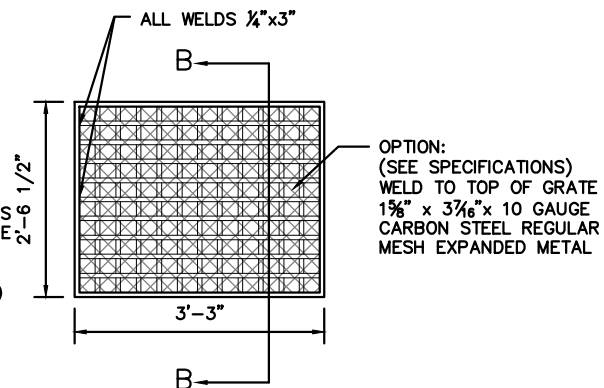




TOP VIEW OF INLET

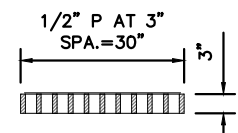


SECTION "A-A"



TOP VIEW OF GRATE

(BYCYCLE PROOF)



SECTION "B-B"

TYPE "C-C" GRATED INLET

(TWO GRATES PER INLET)

D-3

TYPE "C-C" INLET DETAILS

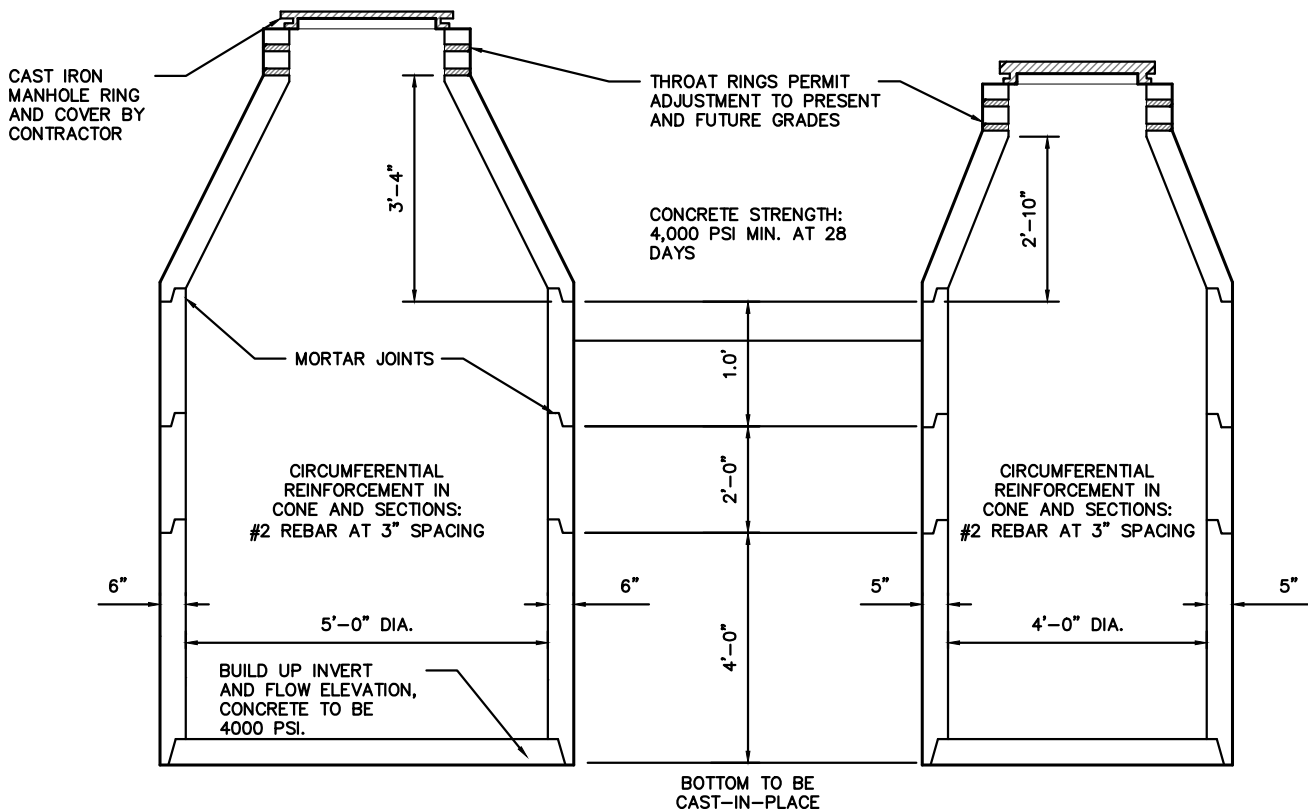
SCALE: N.T.S.

DATE: OCTOBER, 2021

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THE CITY OF
Edinburg



WEIGHTS OF 5'-0" DIA. MANHOLE

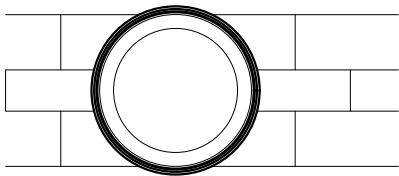
THROAT RING	90 LBS.
CONE SECTION	2800 LBS.
1'-0" SECTION	1329 LBS.
2'-0" SECTION	2658 LBS.
3'-0" SECTION	3987 LBS.
4'-0" SECTION	5316 LBS.

MANHOLES SECTIONS ARE CAST IN

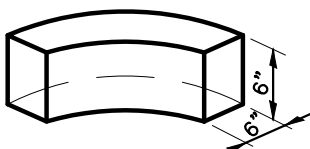
1'-0" LENGTHS
2'-0" LENGTHS
3'-0" LENGTHS
4'-0" LENGTHS

WEIGHTS OF 4'-0" DIA. MANHOLE

THROAT RING	90 LBS.
CONE SECTION	1750 LBS.
1'-0" SECTION	875 LBS.
2'-0" SECTION	1750 LBS.
3'-0" SECTION	2625 LBS.
4'-0" SECTION	3500 LBS.

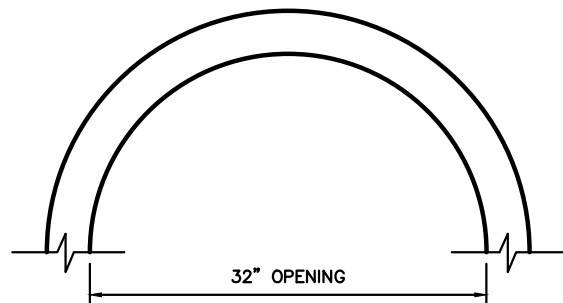


PRECAST CONCRETE SEGMENTS MAY BE USED ON LARGER DIAMETER PIPELINES IN LIEU OF BREAKING OUT LARGE HOLES IN PRECAST SECTIONS.



SEGMENTAL BLOCK

5'-0" DIA. - 15 BLOCKS FULL CIRCLE
4'-0" DIA. - 12 BLOCKS FULL CIRCLE



D-4

PRECAST CONCRETE MANHOLE DETAILS

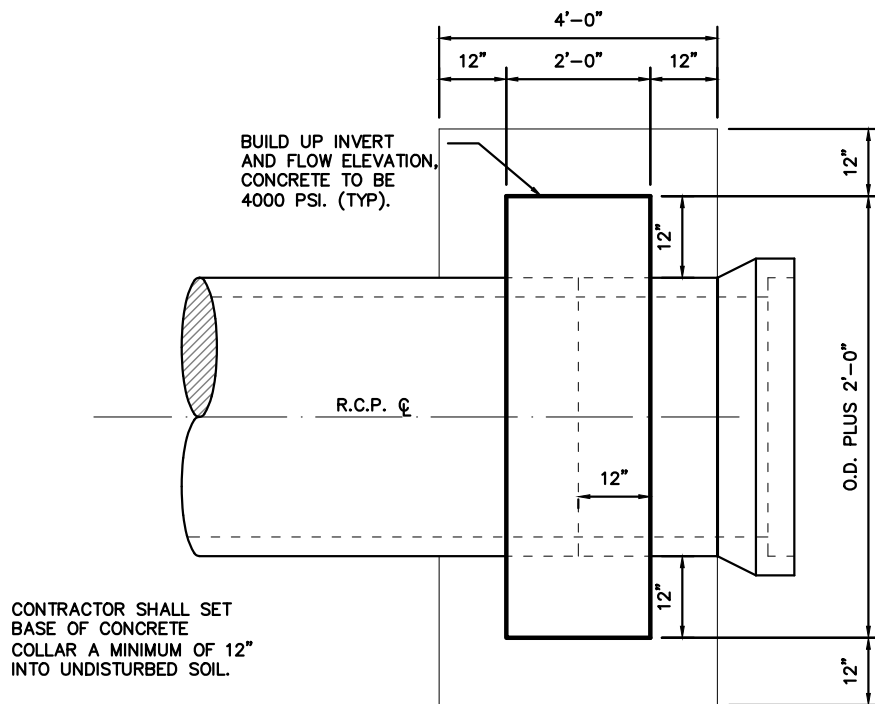
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DATE: OCTOBER, 2021

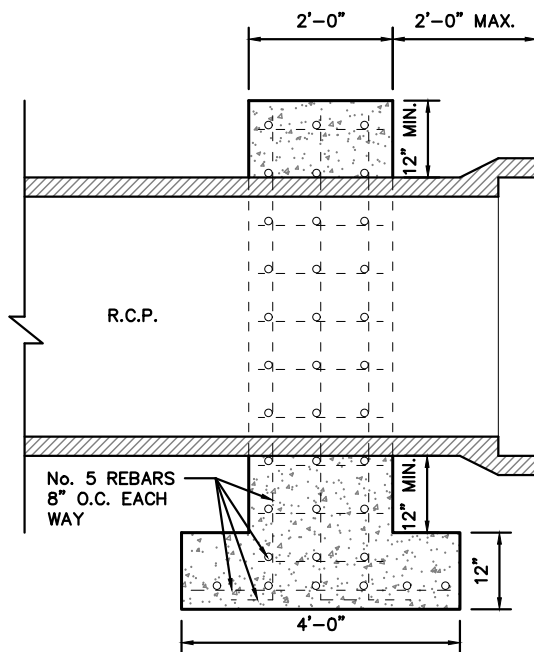
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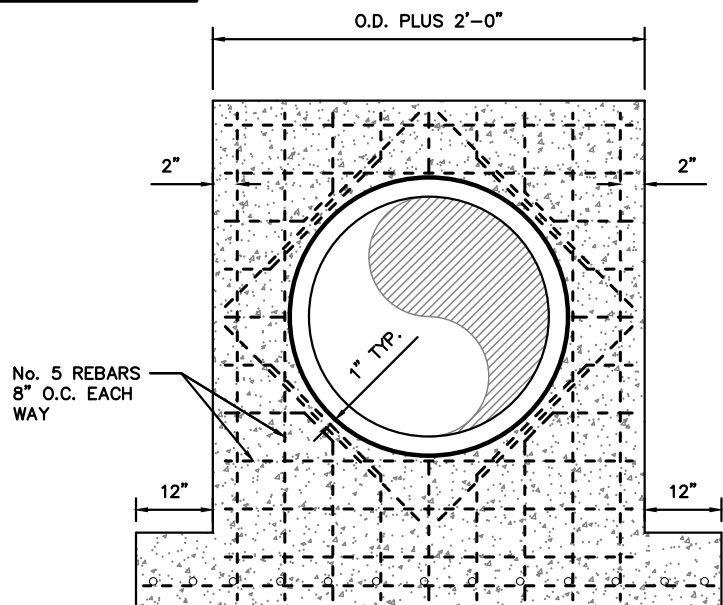
THE CITY OF
Edinburg



TOP VIEW



SIDE VIEW SECTION



FRONT VIEW SECTION

CONCRETE PIPE SUPPORT COLLAR

D-5

CONCRETE PIPE SUPPORT COLLAR DETAILS

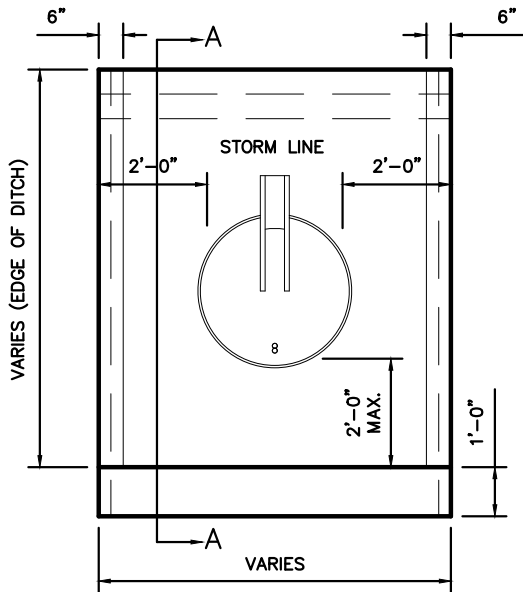
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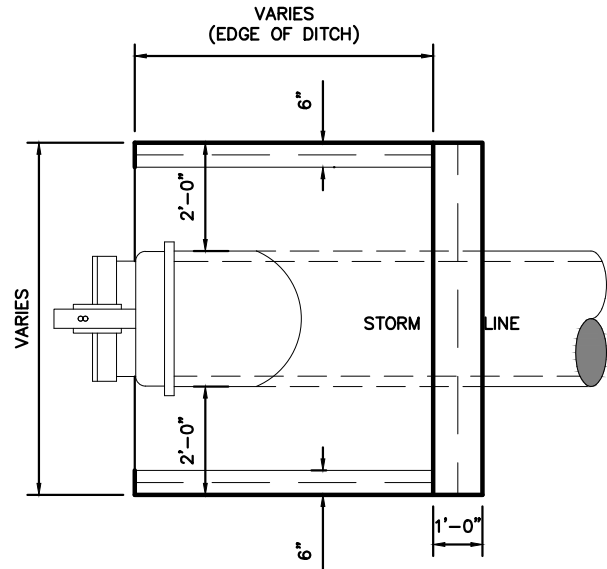
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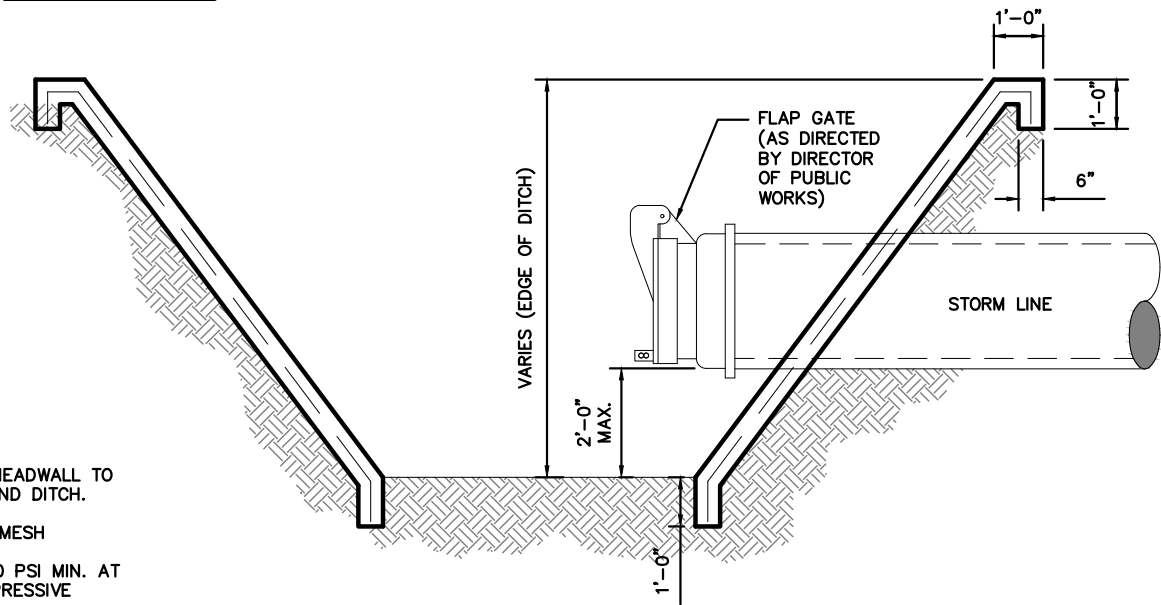
THE CITY OF
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FRONT VIEW



TOP VIEW



SECTION A-A

NOTE:

1. PROP. CONC. HEADWALL TO CONFIRM AROUND DITCH.
2. 6X6 #10 WIRE MESH
3. CONC. AT 4000 PSI MIN. AT 28 DAYS COMPRESSIVE STRENGTH.
4. MIN. 95% STD. COMPACTION NATURAL GROUND

DOWN DRAIN STRUCTURE

D-6

**DOWN DRAIN STRUCTURE
DETAILS**

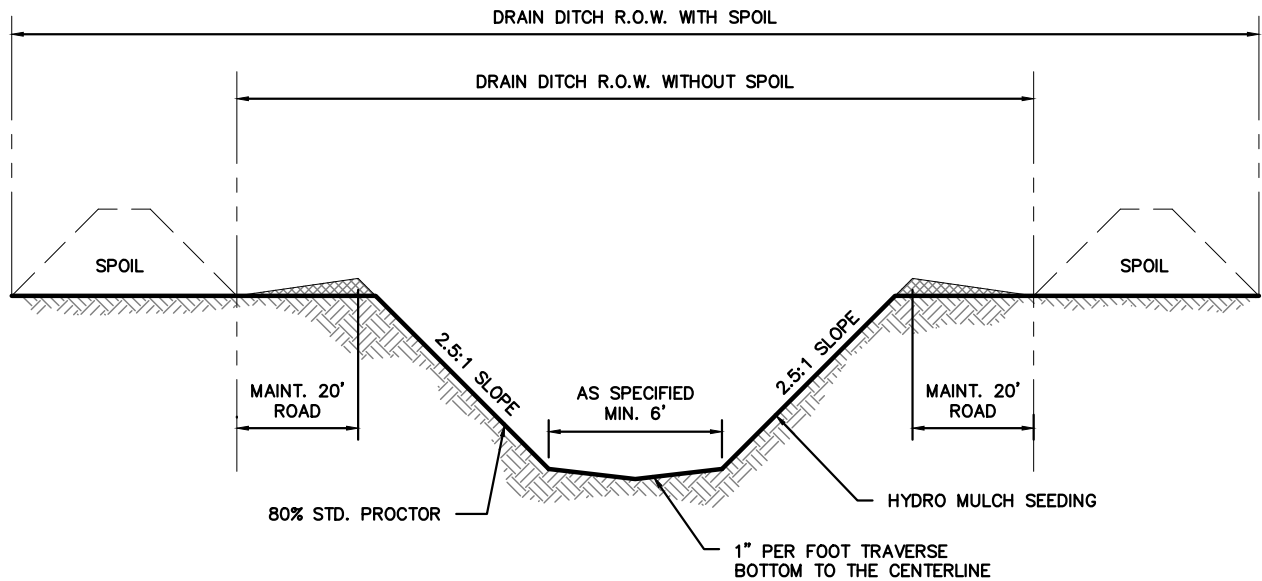
SCALE: N.T.S.

REVISED: MH

DATE: OCTOBER, 2021

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DITCH CROSS SECTION

NOTE:

ROW WIDTH TO BE DETERMINED
BY CITY ENGINEER BASED ON
ESTABLISHED X-SECTIONS.

D-7

DITCH CROSS SECTION DETAIL

SCALE: N.T.S.

DATE: OCTOBER, 2021

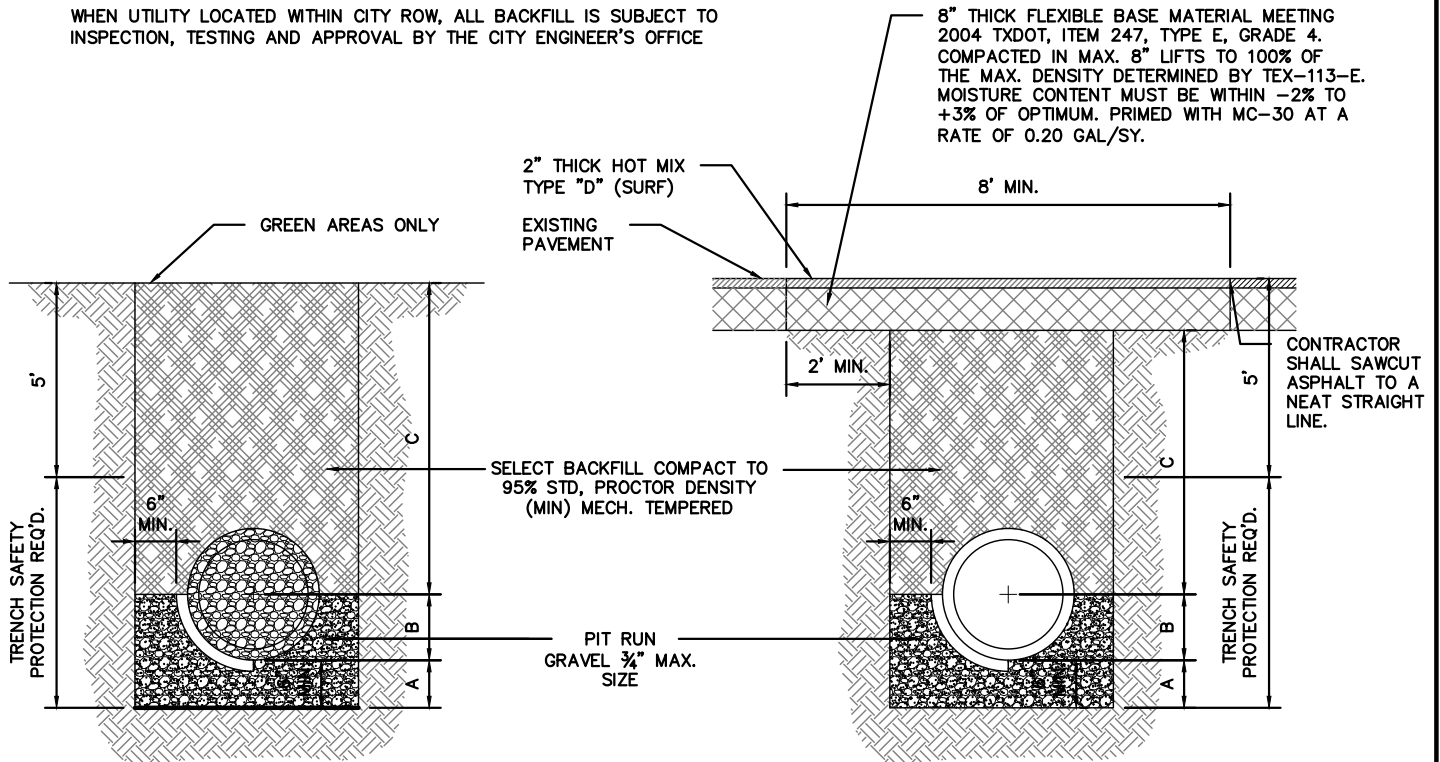
REVISED: MH

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NOTE;

WHEN UTILITY LOCATED WITHIN CITY ROW, ALL BACKFILL IS SUBJECT TO INSPECTION, TESTING AND APPROVAL BY THE CITY ENGINEER'S OFFICE



STANDARD PIPE BEDDING

STANDARD PIPE BEDDING

UNDER EXISTING PAVEMENT OR PROP. PAVEMENT

- A. GRAVEL (3/4" MAX. SIZE) BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS = 6")
- B. GRAVEL BACK FILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, MECH. TAMPED).
- C. FILL TRENCH W/SELECT BACKFILL ($PI < 20$), W/12" LIFTS COMPACT TO 95% STD. PROCTOR

FOUNDATION PREPARATION (WELLPOINTS, GRAVEL AND/OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

- A. GRAVEL (3/4" MAX. SIZE) BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS = 6")
- B. GRAVEL BACK FILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, MECH. TAMPED).
- C. FILL TRENCH W/SELECT BACKFILL ($PI < 20$), W/12" LIFTS COMPACT TO 95% STD. PROCTOR

FOUNDATION PREPARATION (WELLPOINTS, GRAVEL AND/OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

NOTE:

THIS IS THE MINIMUM STANDARD ANY DEVIATION WILL REQUIRE A GEOTECHNICAL ENGINEER DESIGN RECOMMENDATION FOR UTILITY TRENCH (SEE MATERIAL LIST).

D-8

STANDARD PIPE BEDDING DETAILS

SCALE: N.T.S.

REVISED: MH

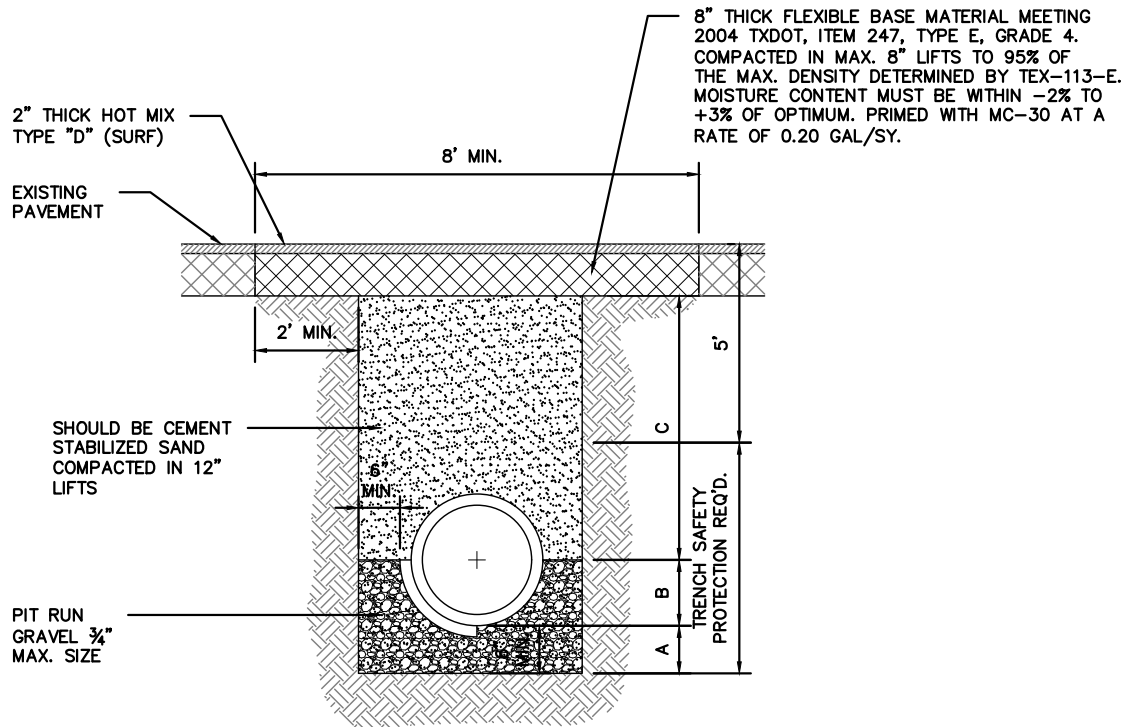
DATE: OCTOBER, 2021

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THE CITY OF
Edinburg

NOTE;

WHEN UTILITY LOCATED WITHIN CITY ROW, ALL BACKFILL IS SUBJECT TO INSPECTION, TESTING AND APPROVAL BY THE CITY ENGINEER'S OFFICE



STANDARD PIPE BEDDING (MAIN ONLY)

UNDER EXISTING PAVEMENT OR PROP. PAVEMENT

- A. GRAVEL ($\frac{3}{4}$ " MAX. SIZE) BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS = 6")
- B. GRAVEL BACK FILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, MECH. TAMPED)
- C. FILL TRENCH WITH SAND (12" LIFTS, MECH. TAMPED).

FOUNDATION PREPARATION (WELLPOINTS, GRAVEL AND/OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

(STORM SEWER)

D-9

UTILITY CROSSING AT EXISTING ACTIVE STREET DETAIL

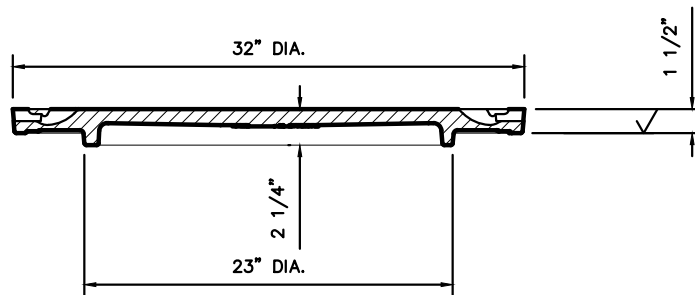
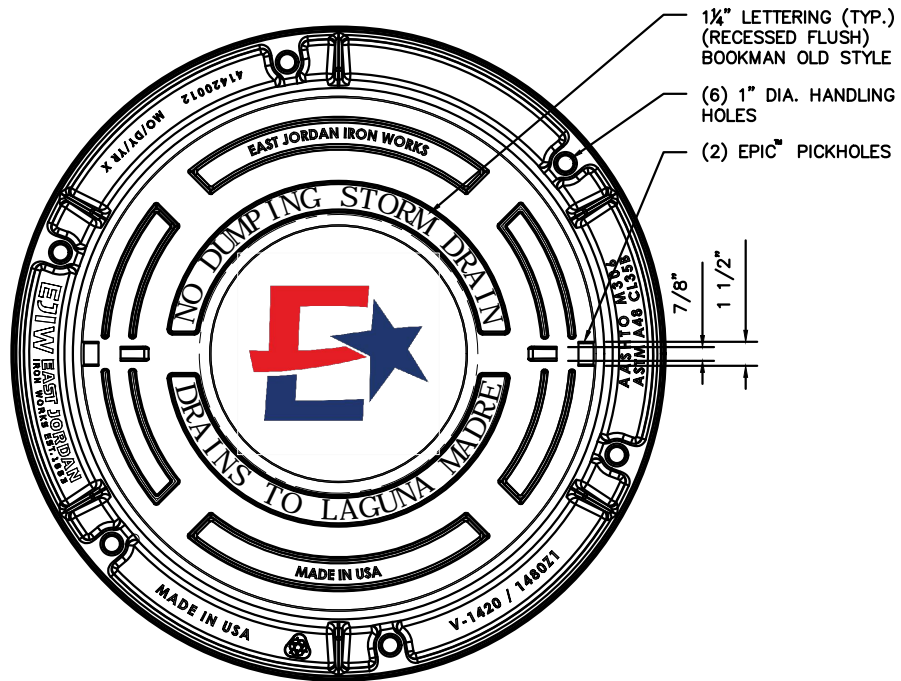
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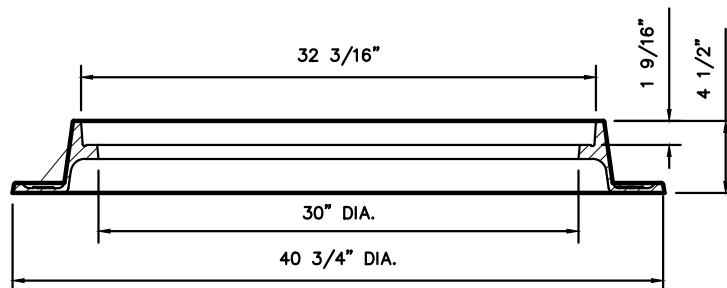
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COVER SECTION



FRAME SECTION

**CITY STANDARD ROADWAY MANHOLE
RING AND COVER CASTING DETAIL**

D-10

**MANHOLE COVER
DETAILS**

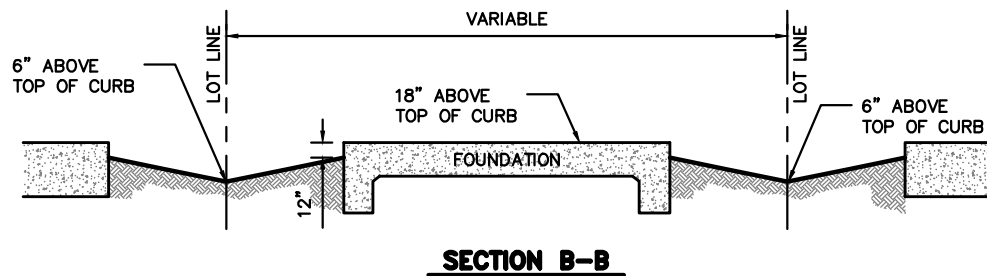
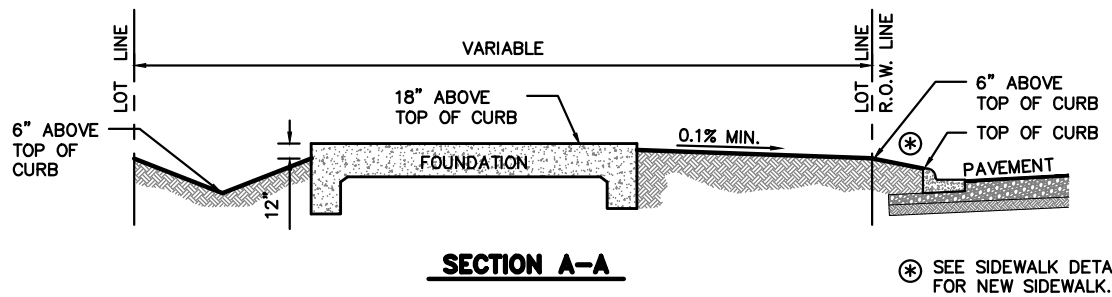
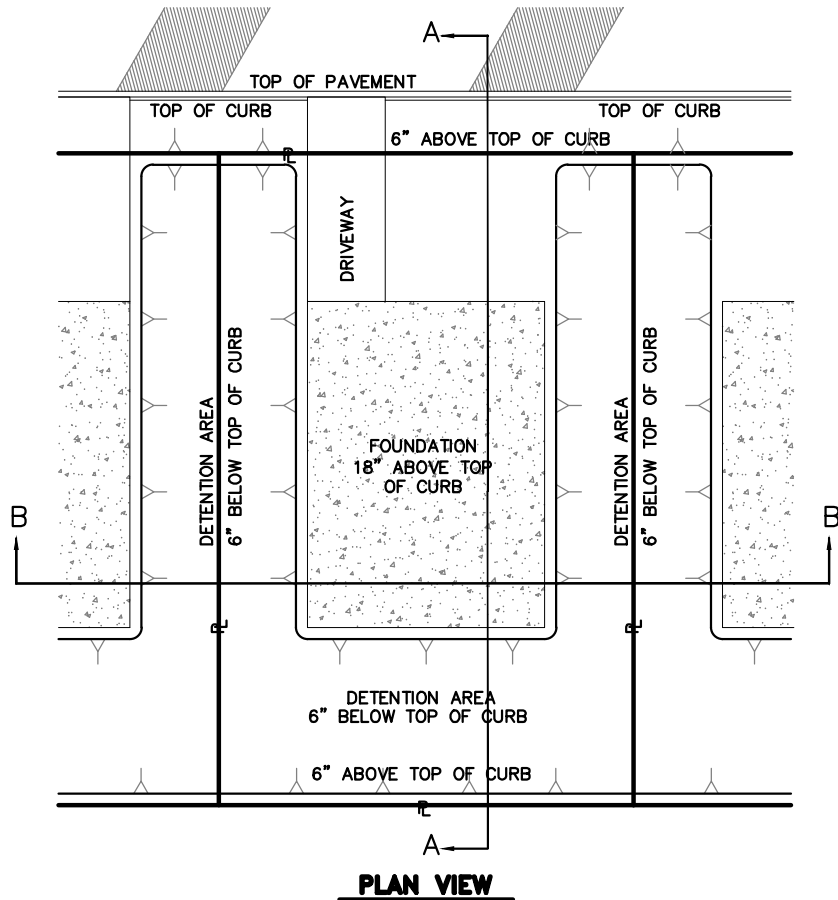
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TYPICAL LOT LAYOUT GRADING DETAILS

D-11

LOT LAYOUT GRADING DETAILS

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DATE: OCTOBER, 2021

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[illegible]

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 P.S.I. AT 28 DAYS.
2. ALL STEEL TO BE GRADE 60.
3. MINIMUM 95% STD. COMPACTION.

D-12

CONCRETE SLOPED-END TREATMENT DETAILS

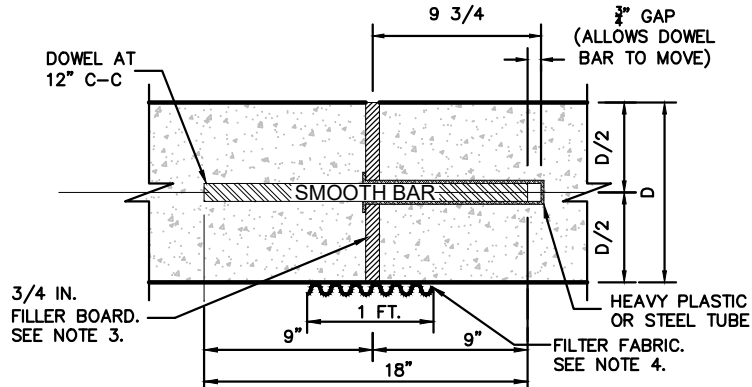
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DOWEL TYPE EXPANSION JOINT

NOTES:

1. CENTER DOWEL HORIZONTALLY ON JOINT.
2. EXPANSION JOINT BARS SHALL BE HELD PARALLEL TO THE FINISHED CONCRETE SURFACE.
3. CEDAR SHALL BE USED AS EXPANSION JOINT MATERIAL. BITUMINOUS FIBER BOARD MAY BE USED AGAINST EXISTING CONCRETE PAVEMENT.
4. FILTER FABRIC: NON-WOVEN GEOTEXTILE.

• FABRIC WEIGHT	OZ/SY	6 MIN.
• PERMITTIVITY	1/SEC	0.5 MIN.
• TENSILE STRENGTH	LBS	200 MIN.
• APPARENT OPENING SIZE	SIEVE NO.	80-120
• ELONGATION AT YIELD	7	20-100
• TRAPEZOIDAL TEAR	LBS	75 MIN.

SMOOTH EXPANSION JOINT DOWELS

CONCRETE THICKNESS (D)	DOWEL DIA.
5" - 6"	3/4"
7" - 8"	1"
9" AND UP	1 1/4"

D-13

DOWEL TYPE EXPANSION JOINT FOR DRAINAGE STRUCTURES DETAIL

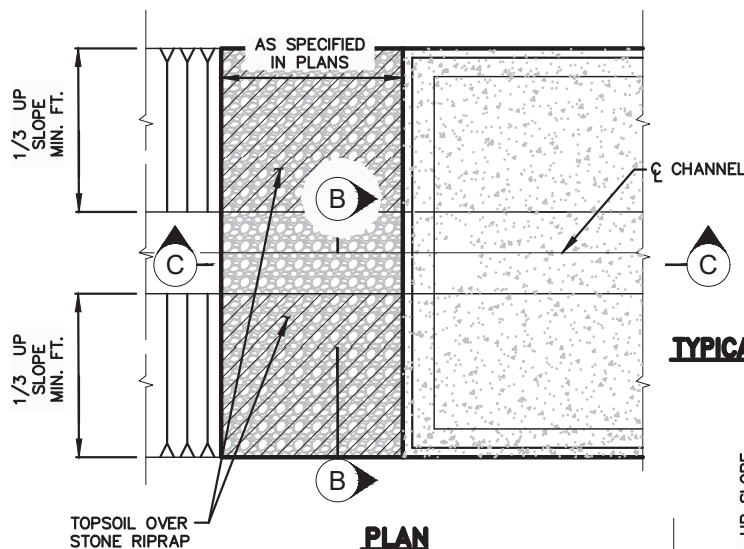
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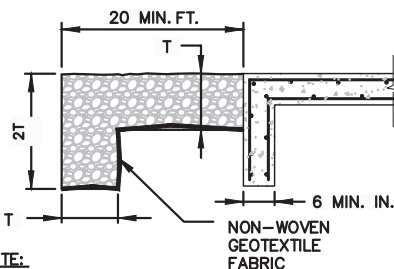
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PLAN

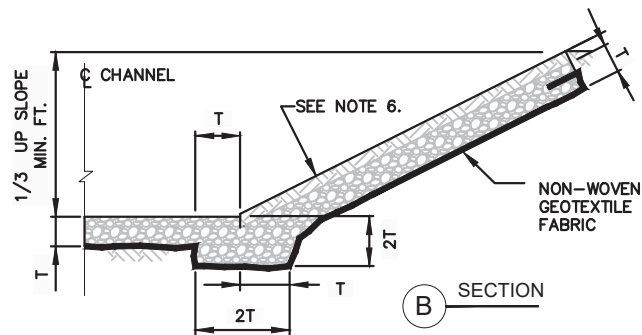


SECTION C

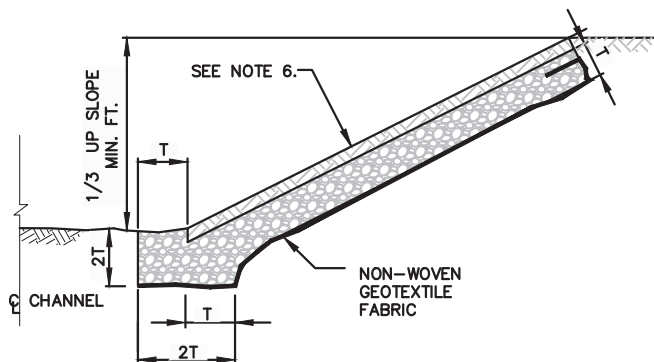
NOTE:
TOE-IN RIPRAP
ACROSS CHANNEL
BOTTOM & UP
SLOPE. DO NOT PLACE TOE
AGAINST CONCRETE.

NOTES

1. PROVIDE RIPRAP CONSISTING OF BROKEN CONCRETE OR NATURAL STONE. PROVIDE RIPRAP THAT IS DENSE, DURABLE AND HARD MATERIAL FREE FROM CRACKS, SEAMS AND OTHER DEFECTS WHICH WOULD INCREASE DETERIORATION FROM HANDLING AND NATURAL CAUSES.
2. RIPRAP CONSIST OF NATURAL STONE, SHALL HAVE A WEIGHT LOSS OF NOT MORE THAN EIGHTEEN (18) PERCENT AFTER (5) CYCLES OF MAGNESIUM SULFATE SOLUTION AS TESTED PER ASTM D 5240, TEST METHOD FOR TESTING ROCK SLABS TO EVALUATE SOUNDNESS OF RIPRAP BY USE OF SODIUM SULFATE OR MAGNESIUM SULFATE.
3. SHAPE AND DIMENSIONS.
 - .. PROVIDE RIPRAP IN CUBIC FORM, RATHER THAN ELONGATED (FLAT) SHAPES.
 - .. PROVIDE RIPRAP WITH A MINIMUM THICKNESS OF 6 INCHES.
 - .. NO MORE THAN 25 PERCENT SHALL HAVE A LENGTH GREATER THAN 2-1/2 TIMES THE WIDTH OR THICKNESS. NO LENGTH SHALL EXCEED 3 TIMES THE WIDTH OR THICKNESS.
4. DO NOT PROVIDE SPALLS, FRAGMENTS AND CHIPS EXCEEDING 5 PERCENT BY WEIGHT. THE DIMENSION AND SHAPE LIMITATIONS DO NOT APPLY TO THIS PORTION OF THE RIPRAP.
5. WHERE BROKEN CONCRETE IS USED, CUT EXPOSED METAL FLUSH WITH THE SURFACE PRIOR TO PLACING THE RIPRAP. RIPRAP THAT IS DESIGNED TO BE RE-USED FROM THE PROJECT SITE WILL BE VERIFIED FOR RE-USE BY THE ENGINEER.
6. FILL RIPRAP VOIDS AND BURY RIPRAP A MINIMUM OF 6 INCHES WITH TOPSOIL ON SIDE SLOPE AS DIRECTED BY THE ENGINEER.
7. PROVIDE RIPRAP CONFORMING TO THE FOLLOWING TABLES, WHEN TESTED USING METHOD A, AS OUTLINED IN ASTM D 5519, STANDARD TEST METHODS FOR PARTICLE SIZE ANALYSIS OF NATURAL AND MAN-MADE MATERIALS:



TYPICAL STONE RIPRAP AT CONCRETE CHANNEL LINING



TYPICAL STONE RIPRAP LINING DETAIL-SIDE SLOPE ONLY

TABLE 1

RIPRAP GRADATION NO. 1

PERCENT LIGHTER BY WEIGHT	STONE WEIGHT LBS.		VOLUME CUBIC FT (2)		CUBICAL SHAPE FT. (EACH SIDE)		SPHERICAL SHAPE FT. (DIA.)	
	LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT
100	180	265	1.20	1.77	1.06	1.21	1.31	1.50
50	80	110	0.53	0.73	0.81	0.90	1.01	1.12
15	40	60	0.27	0.40	0.64	0.74	0.80	0.91
NOTES:								
A. THE THEORETICAL CUBE AND SPHERE SIZE IS PRESENTED FOR GUIDANCE ONLY. NOTES 1 TO 5 SHALL CONTROL RIPRAP SHAPE AND DIMENSIONS.								
B. VOLUME IS BASED ON 150 PCF. UNIT WEIGHT.								
C. RIPRAP GRADATION NO. 1 IS TO BE USED WHERE AN 18 INCH THICK RIPRAP MAT IS NOTED ON THE PLANS.								

TABLE 2

RIPRAP GRADATION NO. 2

PERCENT LIGHTER BY WEIGHT	STONE WEIGHT LBS.		VOLUME CUBIC FT (2)		CUBICAL SHAPE FT. (EACH SIDE)		SPHERICAL SHAPE FT. (DIA.)	
	LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT	LOWER LIMIT	UPPER LIMIT
100	260	640	1.73	4.27	1.20	1.62	1.49	2.01
50	130	200	0.87	1.33	0.95	1.10	1.18	1.37
15	40	150	0.27	1.00	0.64	1.00	0.80	1.24
NOTES:								
A. THE THEORETICAL CUBE AND SPHERE SIZE IS PRESENTED FOR GUIDANCE ONLY. NOTES 1 TO 5 SHALL CONTROL RIPRAP SHAPE AND DIMENSIONS.								
B. VOLUME IS BASED ON 150 PCF. UNIT WEIGHT.								
C. RIPRAP GRADATION NO. 1 IS TO BE USED WHERE AN 18 INCH THICK RIPRAP MAT IS NOTED ON THE PLANS.								

D-15

**STONE RIPRAP
DETAILS**

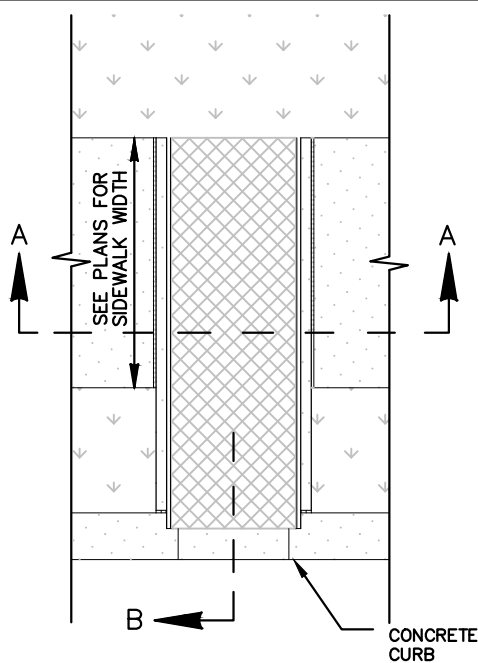


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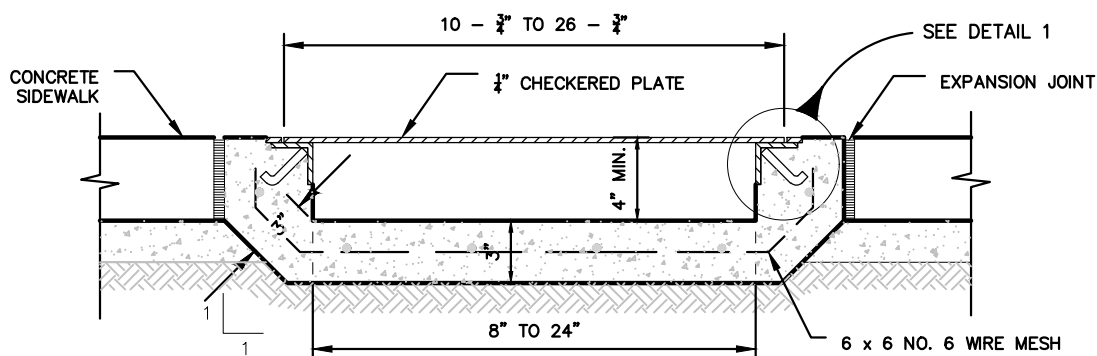
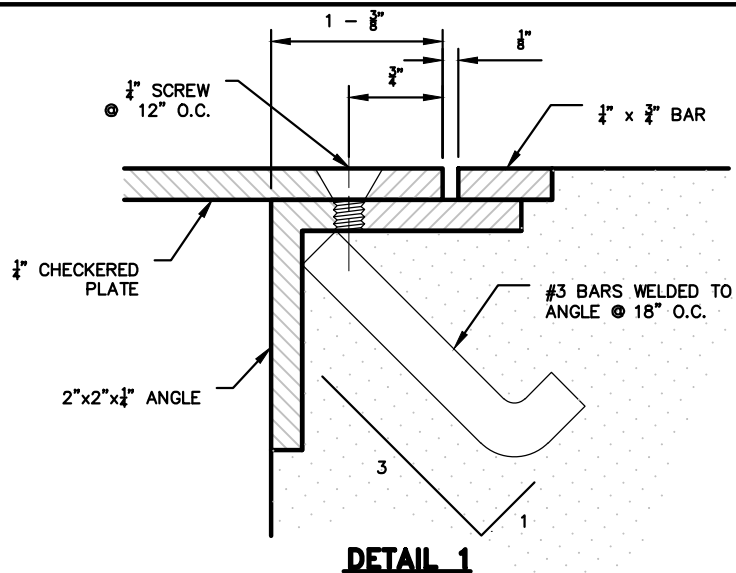
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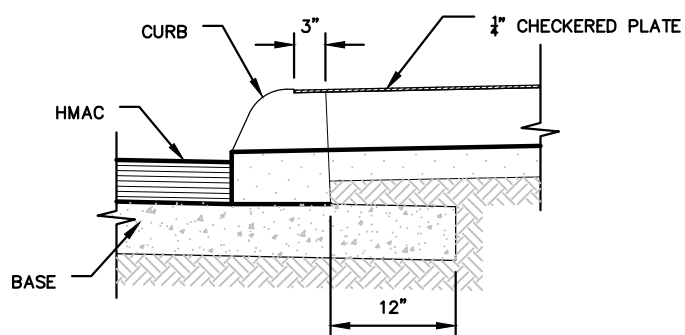
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CONCRETE SIDEWALK DRAIN DETAIL



SECTION A-A



SECTION B

D-16

CONCRETE SIDEWALK DRAIN DETAILS

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DATE: MAY, 2022

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SECTION 2 - STREETS AND ROADWAYS POLICY

- 2.01** Introduction
- 2.02** Applicability
- 2.03** Variance Request
- 2.04** Master Plan
- 2.05** General
 - A.** Right-of-Ways and Paving Widths
 - B.** Standards for Private Roads
 - C.** Traffic Safety
 - D.** Street Lighting Standards
 - E.** Street Naming Standards
 - F.** Medians
 - G.** Cul-de-Sacs
 - H.** Alleys
 - I.** Curb & Gutter
 - J.** Sidewalks
- 2.06** Street Geometrics
 - A.** Street Intersections
 - B.** Corner Clips and Curb Radius
 - C.** Horizontal Curve Requirements
 - D.** Grades
- 2.07** Materials
- 2.08** Testing Requirements
- 2.09** Access Management
- 2.10** Traffic Impact Analysis
- 2.11** Street Banners Standards
- 2.12** Standard Streets and Roadway Details
 - P-1** Minor Residential Street Section Detail (32-ft B-B / 50' ROW)
 - P-2** Minor Residential Street Section with Street Trees Detail (32-ft B-B / 60' (ROW)
 - P-3** Residential Collector / Multi-Family Street Section Detail
 - P-4** Collector Street Section Detail
 - P-5** Minor Arterial Street Section Detail
 - P-6** Principal Arterial Street Section Detail
 - P-7** Rural Paving Street Section Detail
 - P-8** Curb & Gutter Details
 - P-9** Valley Gutter Details
 - P-10** Concrete Sidewalk Details
 - P-11** Handicap Ramp Details
 - P-12** Paving Drive Pad Details
 - P-13** Pedestrian Facilities Ramps Types
 - P-14** Pedestrian Facilities Sidewalk at Driveway
 - P-15** Pedestrian Facilities Detectable Warnings
 - P-16** Pedestrian Facilities Crossing Layout
 - P-17** Median Detail

- P-18** Gated Entrance Detail
- P-19** Sidewalk Deviation at Fire Hydrant
- P-20** Sidewalk Rip-Rap
- P-21** ADA Sidewalk At Mailbox Detail
- P-22** Entrance Profile for Driveways without Curb and Gutter
- P-23** Typical Banner Detail
- P-24** Dowel Type Expansion Joint Detail

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SECTION 2

STREETS AND ROADWAYS POLICY

2.01 Introduction

The purpose of this section is to define the general requirements for the design of street and roadway improvements and to provide typical details of these improvements. The City Engineer should be consulted if variations from these standards are anticipated. In general, these sections are conditions on utility requirements adopted by the Code of Ordinances of the City of Edinburg specified in the **Unified Development Code**. In cases where limitations or physical barriers restrict compliance with the provisions of this section, adequate alternatives will be considered by the City Engineer.

2.02 Applicability

- A. The standards in this section shall be applicable in the event of the following:
 - 1. Application for subdivision plat approval
 - 2. Application for site plan approval
 - 3. Application for Master Plan developments where a subdivision plat is not required
 - 4. Application for building permits:
 - a. Greenfield developments – vacant previously undeveloped land
 - b. Brownfield developments – redevelopment of previously occupied land
 - A. Repurpose of existing buildings
 - B. Change of land use
 - C. Additional structures
 - D. Increase in size of existing structures
 - 5. Application for Right-of-Way permits

6. Application for Driveway Permit
7. Street right-of-way dedication is required by the owner of any tract of land within the corporate limits of the City of Edinburg or its extraterritorial jurisdiction as provided in these guidelines, at time plat recording.

2.03 Variance Request

A variance to the standards in this section may be requested where there are unique and/or restrictive conditions or circumstances to the site being developed. The variance shall not compromise the safety or welfare of the public and shall maintain the purpose and intent of these standards. The request must show specific hardship and where no other feasible alternative is attainable. Hardship cannot be a symptom of site layout or be created by design.

The variance shall be submitted for approval to the City Engineer in writing and include a site plan and a clear illustration of request and hardship.

2.04 Master Plan

All street and roadway designs must be sized and located according to the City's adopted Thoroughfare Plan and/or developed Area-wide Conceptual Circulation Plan. The City of Edinburg will periodically amend its Thoroughfare Plan and the **Project Engineer must be familiar with the most current adopted plan (Rio Grande Valley Metropolitan Planning Organization).**

2.05 General

A. Policy

1. All street designs must,
 - i. Coordinate, align, **and connect** with other streets in **adjacent** existing subdivisions, other existing or planned streets, or with other features of the City;
 - ii. Conform to the general plan for the extension of roads, streets, alleys, access easements and public highways which have been or may be laid out by the City;

- iii. Provide for the safe, efficient, and convenient movement of vehicular and pedestrian traffic;
 - iv. Distribute traffic which creates conditions favorable to health, safety, convenience, and prosperity within the City;
 - v. Provide alternate travel routes to reduce potential impacts on street congestion;
 - vi. Match the community character of the respective district(s); and
 - vii. Respect natural resources, topography, and drainage.
- 2. Vehicular travel lanes, sidewalks and trails, and parking should be separated.
 - 3. Residential subdivisions may not face a roadway classified greater than a Residential Collector.
 - 4. Parking along a roadway classified as greater than a Residential Collector shall not be allowed.
 - 5. Access to Subdivisions (Public/Private):
 - a. Less than 60 dwelling units: 1 access point minimum.
 - b. 60 – 120 dwelling units: 2 access points minimum.
 - c. More than 120 dwelling units: 2 access points, plus 1 access point per 60 units in excess of 120.
 - d. The number of access points may be reduced for multi-family developments if it is demonstrated to the City Engineer that the access provided is,
 - i. Adequate for the delivery of City services and emergency response; and
 - ii. Safe and efficient traffic circulation is provided.
 - e. The City Engineer may require an increased number of access points to promote connectivity of subdivisions and if, due to unusual characteristics of a site or

adjacent streets, such additional access is necessary to ensure safe and adequate sanitation, public school transportation, and emergency response.

6. Block Length.

- a. As determined by UDC.

7. Lots may only access internal lot streets on double frontage lots.

8. Corner lots may only access the street with lesser classification or lesser traffic.

B. Right-of-Ways and Paving Widths

1. Streets, alleys, and other rights-of-way within proposed developments shall be appropriately dedicated for the purposes they are intended to serve.

2. Developer shall dedicate right-of-way width sufficient to make the full right-of-way width conform to either the right-of-way standards or to the adopted thoroughfare plan, whichever provides for a wider pavement section.

3. The City Engineer shall make the final determination of whether to require the construction of the additional pavement section or require a deposit an amount equal to the cost of the improvements.

4. Improvements, whether constructed or funds deposited shall include the pavement of an amount necessary to make the full pavement width comply with either the right-of-way standards or adopted thoroughfare plan, whichever provides for a wider pavement section and include the following;

- a. Pavement shall conform to the standard specifications and in accordance with the appropriate street section detail, including curb and gutter and drainage.
- b. Any extension of existing pavement shall require a cutback of a minimum of two feet to assure adequate sub-base and pavement joint.

5. The City may pay, provided funds are available, for street right-of-way or paving in excess of that set out in the City's adopted Thoroughfare Plan, except where such

extra widths are in commercial developments, or where they are not required by the City.

6. Street Standards

- a. The following shall govern all street construction, except with regard to State Highways, which shall meet Texas Department of Transportation (TxDOT) specifications:

Street Standards		
Right-of-Way Width	Paving Width	Paving Section
50-ft. (w/15-ft. U.E.) Minor Residential (60-ft. with street trees)	32-ft. B-B (18" C&G)	*6-inch Subgrade 8-inch Flexible Base 2-inch HMAC
60-ft. Residential Collector	43-ft. B-B (18" C&G)	*6-inch Subgrade 8-inch Flexible Base 2-inch HMAC
80-ft. Collector	57-ft. B-B (24" C&G)	*8-inch Subgrade 10-inch Flexible Base 3-inch HMAC
100-ft. Minor Arterial	64-ft. B-B (24" C&G)	*10-inch Subgrade 12-inch Flexible Base 3-inch HMAC
120-ft. Principal Arterial	81-ft. B-B (24" C&G)	*10-inch Subgrade 12-inch Flexible Base 3-inch HMAC
<ul style="list-style-type: none"> Travel lanes are 12-ft. wide and parking lanes are 9-ft. wide. Continuous Left (CL) and Occasional Left (OL) lanes are 14-ft. wide. Multi-family subdivisions shall be required to comply with residential collector street standards (43-ft. B-B minimum). C&G means curb and gutter on each side of the street. 2% Treated Subgrade required unless determined by a City approved Professional Engineered Geo-Technical Report. 		

- b. Adjustments – The City shall require the street's design to minimize the disturbance of natural resources, including floodplains. Where additional right-of-way is needed to obtain vertical curve, grade, clear sight triangles, turn lanes, or medians, the required right-of-way shall be adjusted to the extent necessary in accordance with local needs as determined by the Planning and Engineering Department.

- c. Half-Streets Prohibited – No half-streets shall be permitted in new subdivision plats.
- d. Street Trees shall be required for streets that serve subdivisions with 16 lots or greater.

C. Standards for Private Roads

1. Private roads shall be constructed to the same standards as public streets.
2. The widths of the access easements for private roads shall be established at the same widths as would be required for public street right-of-way.
3. Permits and inspections that are required for construction of private roads shall be processed in the same manner as those for public streets.
4. Street lighting standards shall be the same as public streets.
5. Police, fire, sanitation, and other public vehicles shall be provided access. Access control devices shall meet regulations adopted by the City, including redundancy requirements. The description and specifications for the access control devices shall be submitted for approval with the final plat. The developer shall provide the City with all the equipment necessary to operate the access control devices, as determined by the City, at no cost to the City. **The HOA will maintain proper maintenance for the equipment.**
6. Gates shall be of breakaway construction to allow for emergency passage of first-responder vehicles without damage to the vehicles.
7. Gated entry shall comply with Gate Standards detail (see Gate Entrance Detail P-18).
8. Guard houses and gates must be set back a minimum of 70 feet from projected public right-of-way in accordance with City's thoroughfare plan and provide access that is at least 20 feet in width and 14 feet in height. Clearance for construction equipment on trailers may be higher.
9. More than a **70-foot** setback may be required where the road serves more than 160 units, or as determined by The City Engineer.

10. The access between the guard house and the public street shall be an easement of 60 feet in width and a pavement width of 36 to 40 feet or as determined by The City Engineer or designee.
11. The entry way shall provide pedestrian access separate from the vehicular access and meet ADA requirements.

D. Traffic Safety

1. The engineer or developer shall submit a Trip Generation Worksheet using the data provided in the ITE Trip Generation Manual Latest Edition.
2. The City Engineer or designee may require a traffic study to determine the impact of the proposed development on existing infrastructure, when 100 peak trips are exceeded or special features of the development may negatively affect the surrounding areas.
3. The traffic study must be performed by a licensed professional engineer qualified to perform such work.
4. Off-site improvements or modifications may be required to address identified demands of the proposed development which may include, but are not limited to, traffic signal installations, additional signage, pavement markings, access control structures, deceleration lanes, or modification of access **point** locations at developer's expense.
5. Developer shall provide a street sign layout in accordance with the Texas Manual for Uniform Traffic Control Devices (TMUTCD), latest edition, for approval by the City Engineer or designee and **escrow** sufficient funds to provide for the materials and installation of such street signs.
6. Traffic Calming measures may be required by the City Engineer or designee on Minor Residential and Residential Collector Streets that;
 - a. Serve 92 or more residential units (or are otherwise demonstrated to carry volumes of traffic in excess of 100 vehicles per hour during peak hours), and have a straight or relatively straight alignment for a distance of 500 feet or more; or

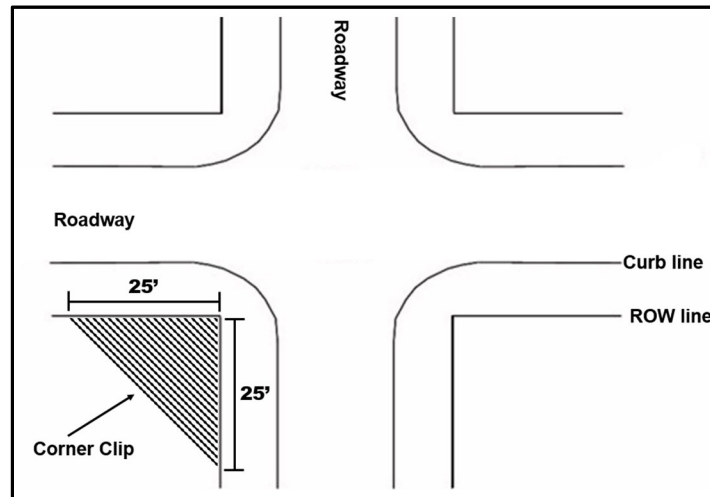
- b. Are configured or connected in such a way that they are likely to be attractive as a short cut to avoid congested intersections or difficult turn movements.
- c. Traffic calming options that may be required include;
 - i. Intersection throttling curbs.
 - ii. Approach Medians at Intersection
 - iii. Pavement width changes.
 - iv. Pedestrian Crossing Treatments
 - 1. Elevated Pedestrian Crossing
 - 2. Pedestrian Refuge Islands
 - v. Traffic Diverters in long straight sections.
 - 1. Chicanes
 - 2. Bulb-outs
 - 3. Curb extensions
 - vi. Interruption in parking lanes.
 - vii. Altering of the curve radii to preserve large trees.
 - viii. Traffic Circles

7. Sight Distance Requirements

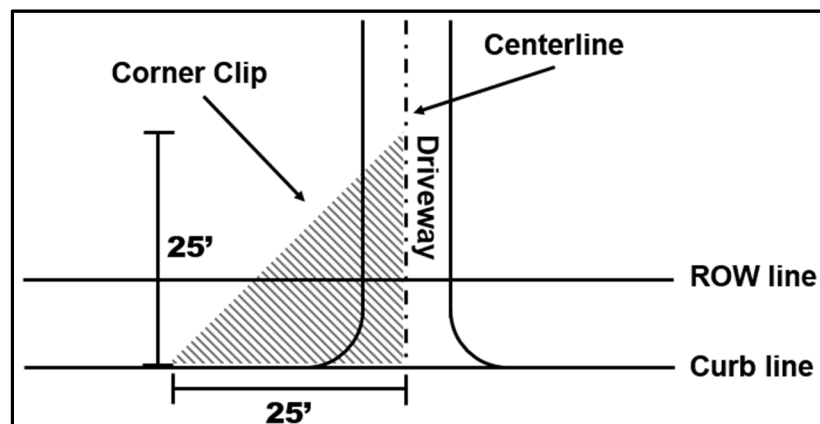
Intersections should be designed to provide the proper intersection sight distance free of obstructions.

- a. Shall include the triangular area formed by the right-of-way lines of intersecting streets and a line connecting points 25 feet on either side of such intersecting

rights-of-way, including triangles formed from centerlines of driveways, there shall be clear space and no obstruction to vision.



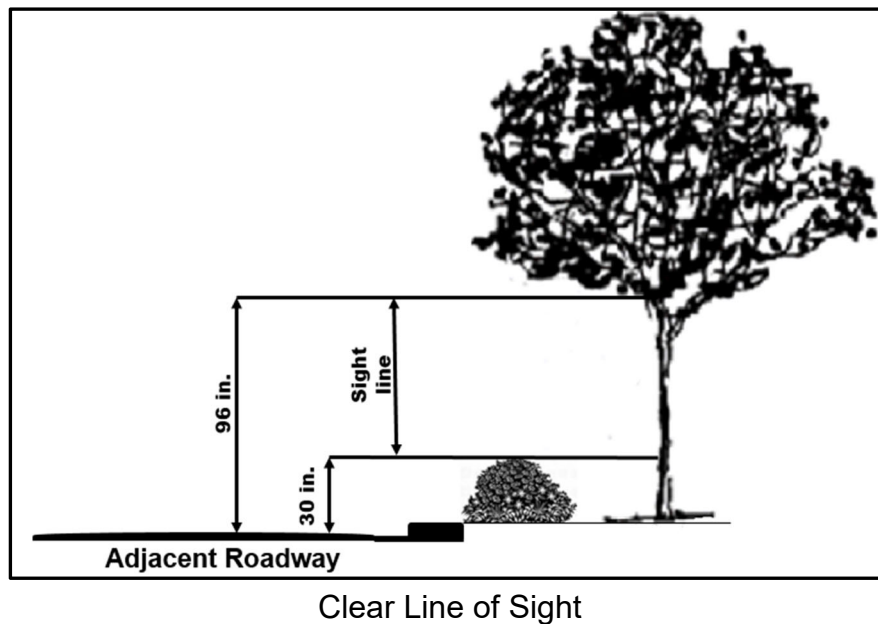
Roadway Corner Clip



Driveway Corner Clip

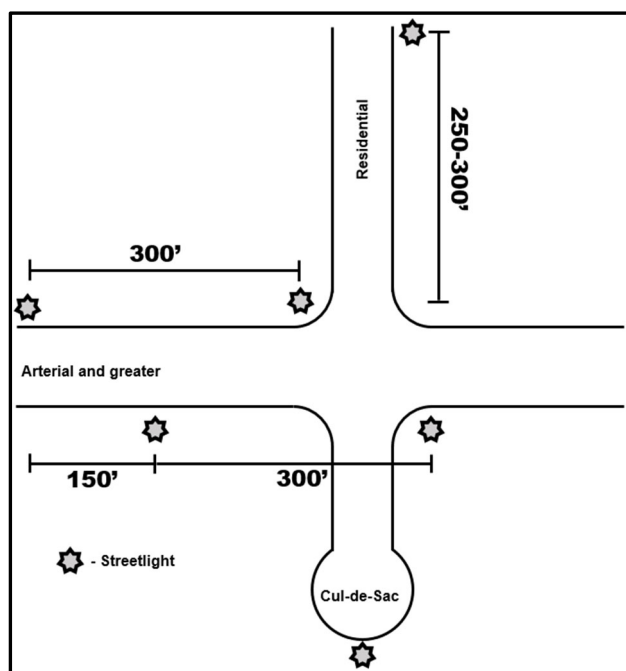
- b. No persons shall place or maintain any structures or fences, landscaping, or other objects within any sight distance triangle that obstructs or obscures site distance visibility by more than 25 percent of the area between the ground and eight feet, except for the following:
 - i. Landscaping, structures, or fences that protrude no more than 30 inches above the adjacent roadway surface may be permitted within the sight distance triangle.
 - ii. Trees may be planted and maintained within the sight distance triangle if all branches are trimmed to maintain a clear vision for a vertical height of 96

inches above the roadway surface and the location of the trees planted, based on the tree species' expected to mature height and size, does not obstruct sight visibility by more than 25 percent of the sight distance triangle.



E. Street Lighting Standards

1. Street lighting shall be High-pressure sodium and have a luminosity of 27,500 lumens and shall be installed between 250 and 300 feet on all residential roadways. Street lights shall be install at 300 feet on any roadway classified greater than a Collector and shall be installed on both sides of the arterial at 150 foot staggered spacing.



Street Light Spacing

2. The City Engineer or designee shall review street lighting plans for compliance with these standards.
3. The developer shall provide information demonstrating provisions have been made with the electric provider for the subdivision prior to recording of the subdivision plat.
4. Street lights shall be installed at all intersections, at cul-de-sacs, and at such other locations as deemed necessary by the City Engineer or designee within the proposed subdivision and along streets adjacent to the subdivision.
5. The Cost of streetlight improvements shall be incurred by the subdivider or developer.
6. Existing streetlights within the subdivision or along streets adjacent to the subdivision shall be upgraded to the appropriate luminary level reflective of the street's classification during the platting review and approval process and at the building permit issuance stage.

F. Street Naming Standards

1. Street names shall be selected by the City according to a set of conventions that facilitates way finding and efficient emergency response.

2. Names of new streets shall not duplicate or cause confusion with the names of existing streets, unless the new streets are in continuation of or in alignment with existing streets, in which case names of existing street shall be used.
3. Names of new streets shall not duplicate the names of subdivisions unless they are located exclusively within the subdivision after which they are named.

G. Medians

1. Medians that are part of a dedicated public right-of-way may not be utilized for any purpose other than by the City or a public utility.
2. A developer or other entity may beautify a median in public right-of-way with landscaping with the approval of the Administrator and/or Planning and Zoning Commission provided that:
 - a. It does not interfere with existing or proposed public utilities;
 - b. It conforms to the sight distance requirements of this section; and
 - c. The applicant has submitted documentation with regard to the entity that will have permanent responsibility for maintenance of and liability for such improvements.

H. Cul-de-sacs

1. May be used under the following conditions:
 - a. Natural resources, such as floodplains or open space, or irrigation district canals make standard blocks inefficient;
 - b. Cul-de-sac streets serve no more than 20 lots or are no more than 600 feet in length, whichever results in a shorter street segment; and
 - c. The pedestrian circulation system provides for direct, non-vehicular access between cul-de-sacs ends where:
 - i. Two lots or fewer are situated between them; and

- ii. The distance between them, measured along street centerlines, is more than 650 feet.
3. Cul-de-sacs shall have a minimum radius of 50-feet to the property line and 40-foot radius to the back of curb.
4. The cul-de-sac shall be designed where there shall be no head in parking.
5. Where the cul-de-sac has a raised median or traffic circle in the middle, there shall maintain an unobstructed 20-ft travel lane.

I. Alleys

1. May be used for primary or secondary vehicular access to lots and uses.
2. May not provide any access to property outside the boundaries in which the alleys are dedicated.
3. Shall be a minimum of 20 feet wide, with an 18 feet cartway for residential development.
4. Shall not be shared between commercial and residential use.
5. For Multifamily development, a minimum of 25 feet wide, with a 24 feet cartway.
6. A minimum structural section shall consist of 6" of Subgrade, 8" of Flexible Base, and 2" HMAC.
7. Shall intersect streets at right angles and shall be constructed as a standard approach with the necessary valley gutters and in accordance with sight distance requirements.
8. Intersections between alleys and streets shall include a minimum curb radius of 30 feet to the inside edge of the alley paving with any additional area platted as part of the alley.

9. Turnouts shall be paved to the property line with turnouts not less than 20 feet wide.
10. Must be the same length as the blocks that provide frontage to the lots that the alleys serve.
11. No dead-end alley shall be permitted.
12. No cul-de-sac alley shall be permitted.
13. Existing alleys shall be maintained as originally built.

J. Curb and Gutter

1. All streets shall be constructed with standard concrete curb and gutter, size determined by classification, as shown in the street standards and detailed in this section;
2. Where the City Engineer has determined that a rural section is adequate given the existing conditions of adjacent streets, the developer must provide for the escrow deposit of the curb and gutter in lieu of construction.
3. May be required to prevent erosion of the pavement section.

K. Sidewalks

1. A sidewalk plan shall be submitted with the preliminary plat, development plat, and minor plat application and with the building permit application for un-platted property.
2. A sidewalk permit shall be filed with and reviewed for approval by The City Engineer or designee in accordance with permit requirements in *Chapter 98* of the Code of Ordinances.
3. Sidewalks should be constructed concurrent with street construction with special provisions to protect their condition and integrity during the process of building

construction, unless the Planning and Zoning Commission allows otherwise under the following conditions:

- a. Sidewalk segments across individual lots will be constructed after buildings constructed on the individual lots, but before they are occupied; and
 - b. The timing and phasing of development will result in the completion of sidewalk on each street segment within 2 years of the date that building construction on the street segment is commenced.
4. Sidewalk requirements may be altered or waived if a sidewalk plan that provides equal or greater pedestrian circulation is submitted to and approved by the Planning and Zoning Commission under the following conditions:
 - a. In suburban estate developments to allow off-street trails in lieu of sidewalks, thereby meeting the needs of walker and cyclists; or
 - b. In order to implement the City's Parks and Recreation Master Plan.
5. Design Criteria The following design criteria shall be applicable to 5-foot and 6- foot concrete sidewalk designs and as shown in the standard details.
 - a. Sidewalk Width:
 - i. Along Minor Residential, Residential Collector: 5 feet
 - ii. Along Collector, Minor Arterial, Arterial, Principal Arterial, High-speed Principal Arterial and Freeway: 6-feet
 - iii. Where an obstacle exists the sidewalk may be reduced to 36 inches at the approval of the City Engineer or designee
 - b. Sidewalks must be provided in the area between the parkway and the edge of the right-of-way as shown in the in the standard details of this section.
 - c. Sidewalks may meander into the parkway to protect the root system of a mature tree, provided that no sidewalk may be located closer than three feet to the back of curb or edge of pavement if no curb is present.

- d. Sidewalks shall also be installed in any pedestrian easements as may be required by the Planning Department - Unified Development Code (UDC).
- e. Sidewalk alignment must match existing alignment in area or be set a minimum of 4- 5-foot from back of curb.
- f. Sidewalk shall slope from the backside toward the street with a maximum transverse slope of $\frac{1}{4}$ inch per foot (2%), 1-inch above the top of curb, and a maximum longitudinal slope of $\frac{1}{2}$ inch per foot (5%).
- g. Sidewalks and ramps shall be constructed of 4" thick concrete (3000 psi) reinforced with 6" x 6" No. 6 gage wire mesh, and No. 3 bars @ 12" on center each way (OCEW) or No. 4 @ 18" OCEW.
- h. Bar-lift Plastic Chairs or approved equal shall be used exclusively to secure steel at center of concrete thickness.
- i. Subgrade and 2" sand cushion shall be compacted to 90% standard proctor.
- j. Contraction joints shall be scored every 6 feet and expansion joints every 30 feet. (Does not match the Code of ordinances)
- k. Sidewalk shall have a non-slip broom finish transverse to the walkway. Exposed aggregate concrete shall not be permitted.
- l. Brick paver, tile, decorative or stamped concrete are not permitted within the right of way or within access easements for private streets except as follows:
 - i. Sidewalks leading to the entrance of the residence (permit required).
 - ii. Driveway leading to garage entrances of the residence (permit required).
- m. Any permitted stained/colored decorative or stamped concrete must have color additive included in the mixture process. Painted concrete shall not be permitted.
- n. All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3000 psi at 28-days.

- o. Membrane curing compound shall be applied at a minimum of 1 gallon per 180 square feet of area.
- p. Handicap Ramps shall be place at all intersection with roadways or where required by State or Federal Law.
- q. Flatwork is required to meet Texas Accessibility Standards (Texas Civil Statutes, Article 9102).
- r. No admixtures to the concrete mix (i.e. fibermesh, plasticizers, etc.) shall be allowed without approval from the City Engineer.

2.06 Street Geometrics

A. Street Intersections

- 1. Intersection of more than two streets at one point is prohibited.
- 2. Streets shall intersect one another at a 90-degree angle.
- 3. No intersection of streets at angles less than 75 degrees shall be approved.
- 4. Offset street intersections shall be separated by a minimum centerline to centerline offset dimension of 150 feet.
- 5. The centerline to centerline distance may be reduced to no less than 75 feet if the City Engineer or designee determines that the proposed offset will provide for comparable safety and efficiency of traffic movement, taking into consideration the existing, planned functional classification of the streets and left turn conflicts.
- 6. Variances by the City Engineer with regard to the angle of intersections may be granted giving due regard to terrain, sight distances, and safety. A minimum of 25 feet radius shall be required at all approved acute angle intersections.

7. Subdivision Entrance Way

- a. Subdivision entranceways that have a Minor Residential or Residential Collector street intersecting with an Arterial, or a street of higher classification, shall require the following:
 - i. A minimum of 80 feet (ROW) in width by 140 feet in length;
 - ii. Shall accommodate one entrance and two exit lanes;
 - iii. Gatehouses or architectural features that highlight the entrance are permitted in the median of a subdivision entranceway that meets these specifications.

B. Corner Clips and Curb Radius

1. The following corner clip and curb radii shall govern at all intersection of streets, with regard to State Highways, which shall meet Texas Department of Transportation (TxDOT) specifications:

(Corner Clip / Radius Dimensions)					
	Minor Residential (50' ROW)	Residential Collector (60' ROW)	Collector (80' ROW)	Minor Arterial (100' ROW)	Principal Arterial (120' ROW)
Minor Residential	(15'/20')	(20'/20')	(30'/25')	(40'/30')	(50'/35')
Residential Collector (60' ROW)	(20' / 20')	(20'/25')	(30'/30')	(40'/35')	(50'/40')
Collector (80' ROW)	(30' / 25')	(30'/30')	(30'/35')	(40'/40')	(50'/50')
Minor Arterial (100' ROW)	(40' / 30')	(40'/35')	(40'/40')	(40'/50')	(50'/50')
Principal Arterial (120' ROW)	(50' / 35')	(50'/40')	(50'/50')	(50'/50')	(50'/50')

C. Horizontal Curve Requirements

1. Minor Residential streets must have a minimum radius at the centerline of 250 feet.
2. Residential Collector streets must have a minimum radius at the centerline of 700 feet.
3. Collector streets must have a minimum radius at the centerline of 1200 feet.
4. Minor Arterial and Principal Arterial shall be designed in accordance with the American Association of State Highway and Transportation Officials (AASHTO) "A Policy on Geometric Design of Highways and Streets", latest edition.

D. Grades

1. Minor residential streets may have a maximum grade of 10 percent.
2. Residential Collector streets may have a maximum grade of 7 1/2 percent.
3. Collector streets may have a maximum grade of 5 percent; unless the natural topography is such as to require steeper grades in which case 7 1/2 percent may be used for a maximum length of 200 feet.
4. Minor Arterial and Principal Arterial streets shall have the maximum grades determined by the City Engineer based on the natural topography of the area served.
5. All streets must have a minimum grade of at 0.25% slope or as directed by the City Engineer or designee.
6. Centerline grade changes with an algebraic difference of more than 2 percent shall be connected with vertical curves of sufficient length to provide a minimum of 600 feet sight distance on major streets; 400 feet sight distance on minor streets and local residential streets. No vertical curve shall be less than 200-feet in length if the algebraic grade change difference is 2 percent or more. If the algebraic difference is less than 2 percent, the minimum length of vertical curve must be 100 feet.

7. Wherever a cross slope is necessary or desirable from one curb to the opposite curb, such cross slope or curb split shall not exceed 6-inches in 31-feet.

2.07 Materials

Approved material listing is as follows. All deviations must be approved in writing by the City Engineer or designee. All materials shall be new and in accordance with Standard Specifications.

- A. Dense Graded Hot-Mix Asphalt Pavement shall be in accordance with Section 2612, "Dense-Graded Hot-Mix Asphalt". No seal coating of new construction will be allowed.
- B. Prime Coat shall conform to Section 2610, "Prime Coat".
- C. Tack Coat shall conform to Section 2577, "Asphalts, Oils and Emulsions".
- D. Flexible Base shall conform to Section 2601, "Flexible Base".
- E. Concrete used for rigid pavements shall have a 28-day compressive strength of 4,000 PSI in accordance with Section 03300, "Cast-in-Place Concrete".

2.08 Testing Requirements

Construction Materials Testing shall be performed by the City of Edinburg and shall be required at different stages of construction as follows:

- A. Subgrade preparation: A minimum of one test per each 1000 square yards or thereof of street area for subgrade compaction and depth. Additional testing may be required at the discretion of the City Engineer or designee.
- B. Compacted Flexible Base: A minimum of one test per 1000 square yards or fraction thereof of street area from caliche compaction and depth. Additional testing may be required at the discretion of the City Engineer or designee.

C. HMAC: A minimum of one test per each 1500 square yards or fraction thereof of street area for thickness verification. Submittal of certified type grade from supplier shall be submitted for approval prior to delivery.

D. Concrete:

1. Curb and Gutter – one set of cylinders (set consisting of 3) to be broken at 7 and 28 days with one space for every 1500 LF of curb and gutter;
2. Concrete Pavement—one set of cylinders for every 1000 square yards, one for every 5000 square yards, slump and air for every 1000 square yards. A certified mix design from the supplier for every mix must be approved by the City Engineer or designee.

E. It is the responsibility of the Developer or his Contractor to request construction materials testing from the City a minimum of 24 hours in advance. Failure to follow appropriate testing frequency or procedures shall result in the removal of any improvements necessary verify compliance.

F. All testing shall be covered by the Construction Materials Testing Fee collected from the Developer. Additional funds may be required to cover actual costs which must be paid prior to final acceptance of any subdivision.

2.09 Access Management

Access management is the coordinated planning, regulation, and design of access points (roadway, alleys and driveways) between roadways and land development to promote the efficient and safe movement of people and goods by reducing conflicts on the roadway system and at its interface with other modes of travel.

A. Locations

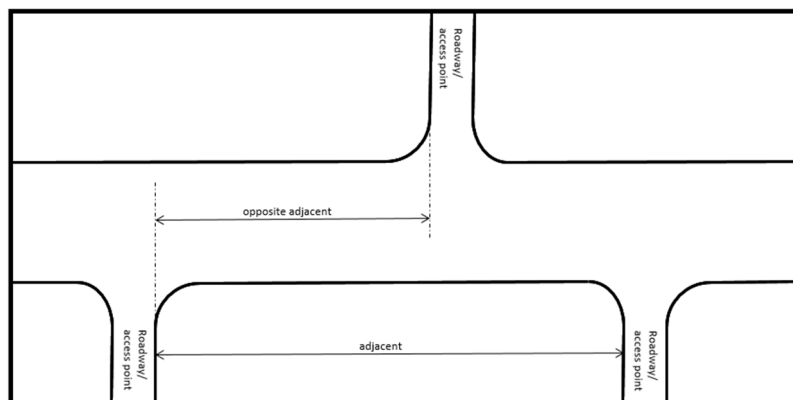
Until which time that the City of Edinburg Thoroughfare plan is established the location of access points shall be determined by TxDOT standards as shown below:

Minimum Access Point Spacing

Roadway Speed (MPH)	Adjacent Access point Spacing (ft)
30	200
35	250
40	305
45	360
50 or greater	425
<i>Note: To avoid left turn conflicts opposite adjacent access points shall be a minimum of 125 ft apart.</i>	

B. Measuring

Access point spacing shall be measured from inside edge to inside edge.



Measuring

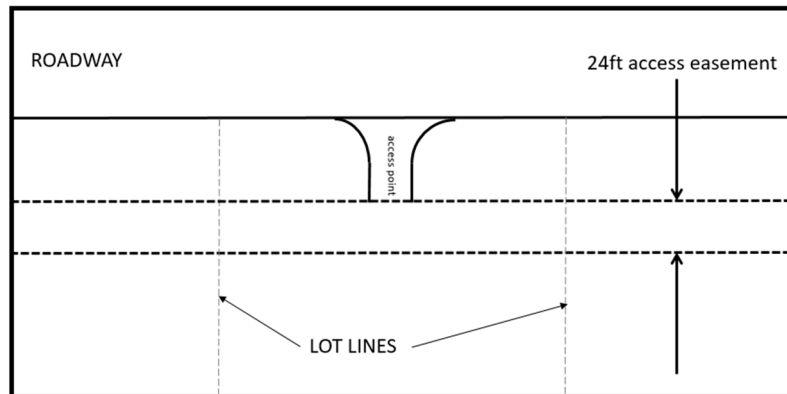
C. Corner Clearance

Corner clearances shall follow Table X: Minimum Access Point Spacing.

D. Common and Shared Access Easements

Where proper access point spacing cannot be met the City Engineer or designee shall require a shared access between developments. There shall be a plat note or recorded

as a separate instrument recording a 24 ft access easement between the effected properties.



Shared Access Easement

E. Queue Lengths and Storage

Developments shall provide adequate vehicle storage as to not hinder adjacent roadways.

1. Commercial development shall provide a forty-foot onsite throat length to first conflict point minimum. The required throat length may be greater if recommended by TIA or City Engineer.
2. Residential developments and single-family homes along arterial roadways shall provide proper area to allow for turnaround and head out egress to the roadway.
3. Commercial developments shall provide adequate on-site storage for any site specific maneuvers, loading and unloading as to not use adjacent roadways and hinder vehicular traffic.

4. On-Site Stacking:

Land Use	Minimum Required Queue Spacing (ft)
Restaurant with a drive-through window	11 vehicles
Coffee Shop with a drive-through window	15 vehicles
Snack Bar with a drive-through window	15 vehicles
Bank – per lane	5 vehicles
Gas Stations with parallel to the roadway	35 ft setback from pump island to ROW
Gas Stations with perpendicular to the roadway	50 ft setback from pump island to ROW
Gate Access	40 ft from ROW to key pad and 50 ft from key pad to the gate including a 20 ft turnaround
Elementary schools – 200-1,200 population	600 – 1,500 linear feet outside of the gates*
Middle schools – 200-1,200 population	700 – 1,500 linear feet outside of gates*
High school – 400-2,500 population	800 – 1,500 linear feet outside of gates*, **
Note: 1 vehicle = 20ft *SCDoT <i>Guidelines for School Design</i> . Final length will be interpolated by projected full build population. **High School Population greater than 2,500 should consider two separate loops.	

F. Marginal Access Roads

Where a proposed development has residential property fronting a collector road or greater a marginal access street shall be provided. The marginal access street will be parallel to and adjacent to the collector or greater road. The construction of the marginal access street will not relieve the developer of any responsibility or obligation for right-of-way dedication.

2.10 Traffic Impact Analysis

A Trip Generation Worksheet shall be required for any Green or Brown field development and repurpose of existing structures. Where there are 100 or more trips generated a Traffic Impact Analysis may be required. The engineer will meet with staff to determine the scope of the analysis. The analysis may require a review of driveways, internal circulation, adjacent road ways and traffic signals, all-way stop and traffic signal warrants, traffic calming mitigation measures and pedestrian studies.

2.11 Street Banner Standards

This policy outlines the guidelines for the use and coordination of banner installation. The banner location shall be utilized for the purpose of advertising a community event designed for the general public's interest. Banners are managed by the City of Edinburg Department of Public Works for any and all city streets. For banners requested on along state roads are approved by the Texas Department of Transportation. The Department of Public Works is solely responsible to submitting the Texas Department of Transportation permit request.

To request the Banner:

Request the banner location in writing on your organization letter head; include the date, time, location, date of advertising, and items to be advertised. Please include the exact wording, and must include its dimensions as noted below.

A. STREET BANNER REQUIREMENTS

1. Scheduling

- a. Installation of banner shall be on a first-come, first-served basis and any city events will take priority. All banner requests must be submitted in writing through this policy/application and must be approved by the Director of Public Works or designee. Department of Public Works staff will schedule the banner for the requested time and location, provided that there has not been a prior submission for the same date. If prior event has been scheduled for same location and time, staff will notify the new event of the prior approval, and will offer a new time and location no later than ten (10) working days of receipt of their request.

2. Restrictions

- a. Banners are allowed to be installed only at eight (8) locations as follows: four (4) locations on U.S. BUS. 281 (Closner Blvd.) and four (4) locations on S.H. 107 (University Dr.) upon availability.
- b. Banners are allowed to be hung for the promotion of civic, charitable, or religious events only.

- c. Banner shall be up for a maximum time of thirty (30) days. They shall be removed by the following business day, and can be installed starting at 9:00 a.m. on the day they are scheduled to be installed weather permitting.
- d. If there is a prior application for installing a banner, the Director of Public Works, in his sole discretion, may deny permission to install any other banner during the same time frame.

3. Banner Specifications

- a. See P-20 Exhibit
- b. Size
 - i. Overall Length: 24 Ft. (Minimum) to 40 Ft. (Maximum)
 - ii. Overall Height: 3½ Ft. (Minimum) to 4 Ft. (Maximum)

4. Banner Construction

- a. Mesh Material (mesh material will guarantee longer life of the banner due to less wind resistance and is required) is to be of a type that will withstand normal weather (wind and rain) conditions (NO EXECPTIONS).
- b. Banner (top, bottom and both sides) is to have a finished hem to prevent wind tears.
- c. A hemmed edge approximately two (2) inches wide is required at the top, bottom, and both sides of banner with metal eyelets installed on doubled material for the purpose of attaching the banner to the existing guide wires.
- d. Grommets (protective eyelets) must be placed along the top edges of the banner and one at each bottom end. Grommets located at the bottom ends will have heavier reinforcing or other pre-approved method (i.e. D rings with reinforced nylon straps). The minimum grommet size shall be ½-inch (inside measurement), and the grommets shall be placed every twenty four (24) inches.

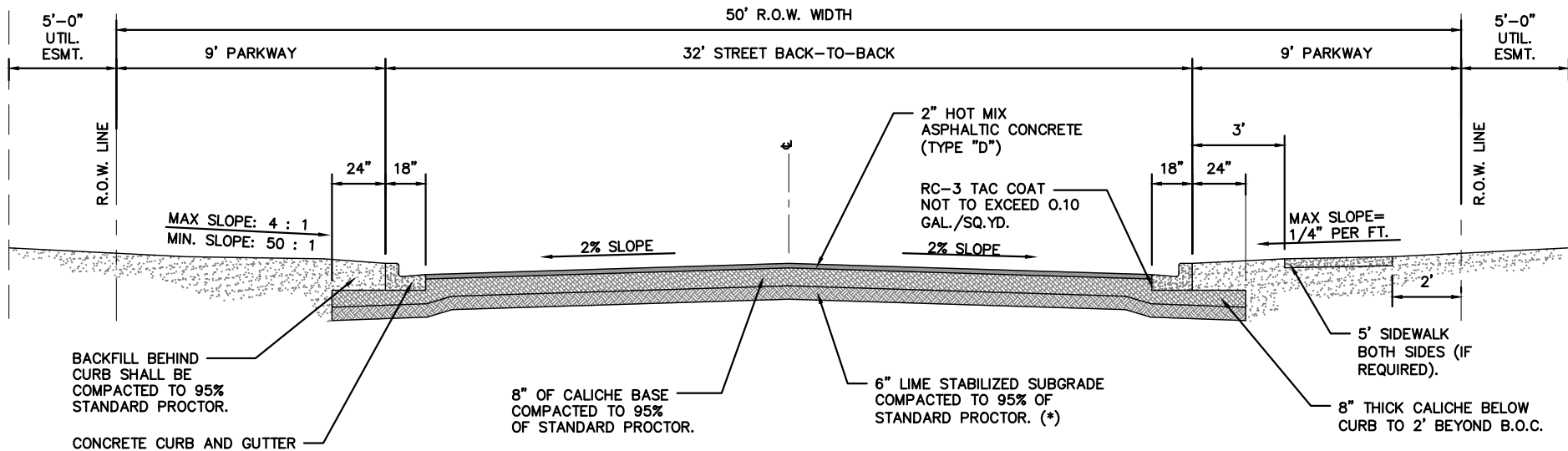
5. Installation of Banner

- a. Installation and removal of the banner shall be the sole responsibility of the Department of Public Works-Traffic Division.
- b. Banner must be provided to the Department of Public Works five (5) days prior to the scheduled date of installation.
- c. The use of the banner cables is subject to availability and condition of banner cables. If weather conditions pose a danger to the installation personnel or are a safety hazard, banner will not be installed until safe to do so.

2.12 Standard Streets and Roadway Details

The following details show the adopted standards required by the City which are included at the end of this section:

- P-1** Minor Residential Street Section Detail (32-ft B-B / 50' ROW)
- P-2** Minor Residential Street Section with Street Trees Detail (32-ft B-B / 60' (ROW)
- P-3** Residential Collector / Multi-Family Street Section Detail
- P-4** Collector Street Section Detail
- P-5** Minor Arterial Street Section Detail
- P-6** Principal Arterial Street Section Detail
- P-7** Rural Paving Street Section Detail
- P-8** Curb & Gutter Details
- P-9** Valley Gutter Details
- P-10** Concrete Sidewalk Details
- P-11** Handicap Ramp Details
- P-12** Paving Drive Pad Details
- P-13** Pedestrian Facilities Ramps Types
- P-14** Pedestrian Facilities Sidewalk at Driveway
- P-15** Pedestrian Facilities Detectable Warnings
- P-16** Pedestrian Facilities Crossing Layout
- P-17** Median Detail
- P-18** Gated Entrance Detail
- P-19** Sidewalk Deviation at Fire Hydrant
- P-20** Sidewalk Rip-Rap
- P-21** ADA Sidewalk At Mailbox Detail
- P-22** Entrance Profile for Driveways without Curb and Gutter
- P-23** Typical Banner Detail
- P-24** Dowel Type Expansion Joint Detail



FLEXIBLE BASE (TYPE E GRADE 4) SHALL CONFORM TO THE FOLLOWING REQUIREMENTS , PRIOR TO THE ADDITION OF LIME:

Retained on Sg. Sieve	Percent Required
2"	0
1/2"	20 - 60
No. 4	40 - 75
No. 40	70 - 90
Max. Pl:	15
Max. Wet Ball Pl:	15
Wet Ball Mill Max Amount	50

(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTES:

1. IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER
2. FOR STREETS SERVING A SUBDIVISION WITH NO STREET TREES (LESS THAN 16 LOTS).

P-1

MINOR RESIDENTIAL STREET SECTION (32' BB - 50' ROW) - DETAIL

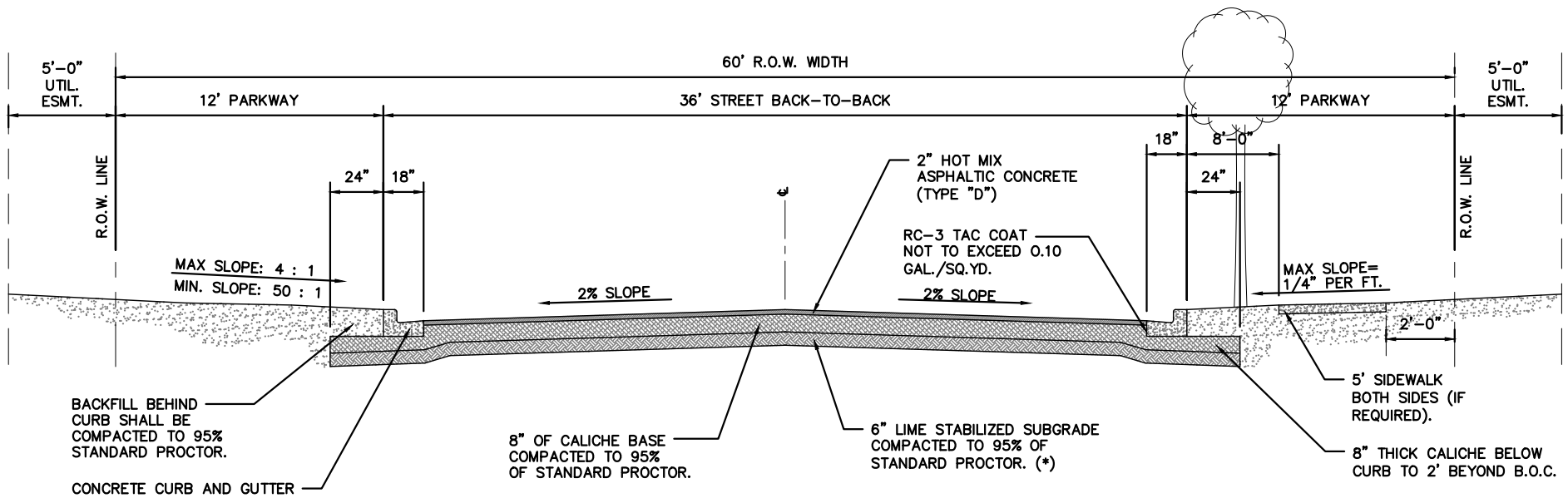
SCALE: N.T.S.

REVISED: MH

DATE: OCTOBER, 2021

DRAWN BY: RMM





FLEXIBLE BASE (TYPE E GRADE 4) SHALL CONFORM TO THE FOLLOWING REQUIREMENTS , PRIOR TO THE ADDITION OF LIME:

Retained on Sg. Sieve	Percent Required
2"	0
1 1/2"	20 - 60
No. 4	40 - 75
No. 40	70 - 90
Max. Pl:	15
Max. Wet Ball Pl:	15
Wet Ball Mill Max Amount	50

(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTES:

1. IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER
2. FOR STREETS SERVING A SUBDIVISION WITH NO STREET TREES (LESS THAN 16 LOTS).

P-2

MINOR RESIDENTIAL STREET SECTION W/ STREET TREE (36' BB-60' ROW) – DETAIL

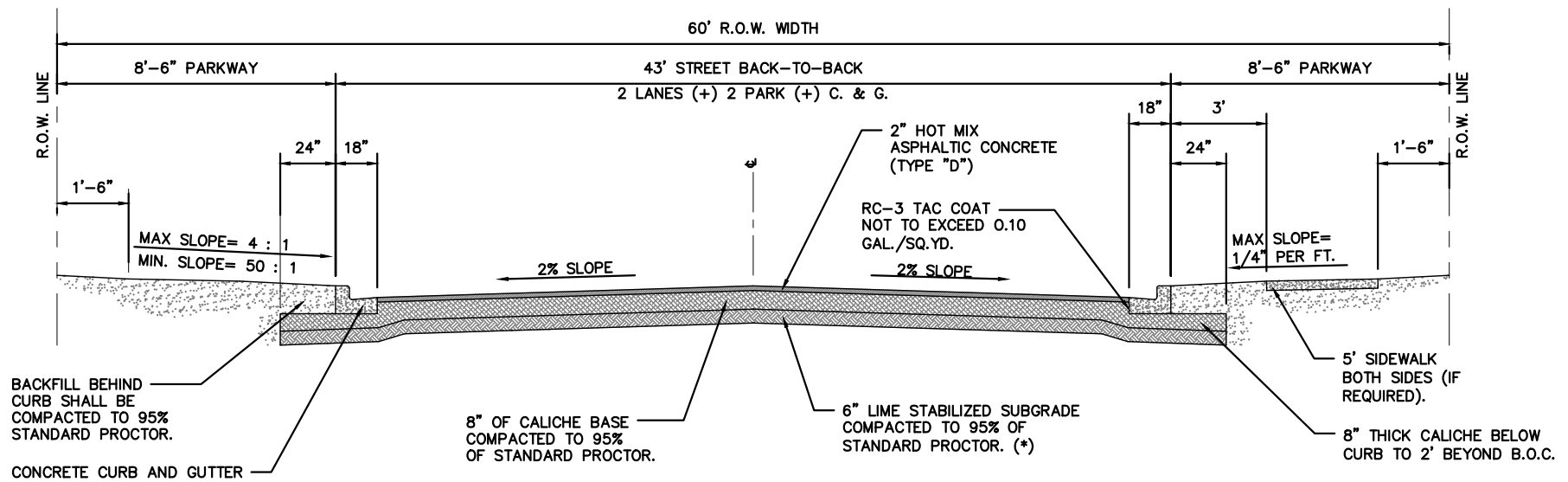
SCALE: N.T.S.

DATE: OCTOBER, 2021

REVISED: MH

DRAWN BY: RMM





FLEXIBLE BASE (TYPE E GRADE 4) SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, PRIOR TO THE ADDITION OF LIME:

Retained on Sg. Sieve	Percent Required
2"	0
1/2"	20 - 60
No. 4	40 - 75
No. 40	70 - 90
Max. Pl.	15
Max. Wet Ball Pl.	15
Wet Ball Mill Max Amount	50

(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTES:

1. IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER
2. FOR STREETS SERVING A SUBDIVISION WITH NO STREET TREES (LESS THAN 16 LOTS).

P-3

RESIDENTIAL COLLECTOR AND MULTI-FAMILY STREET SECTION DETAIL

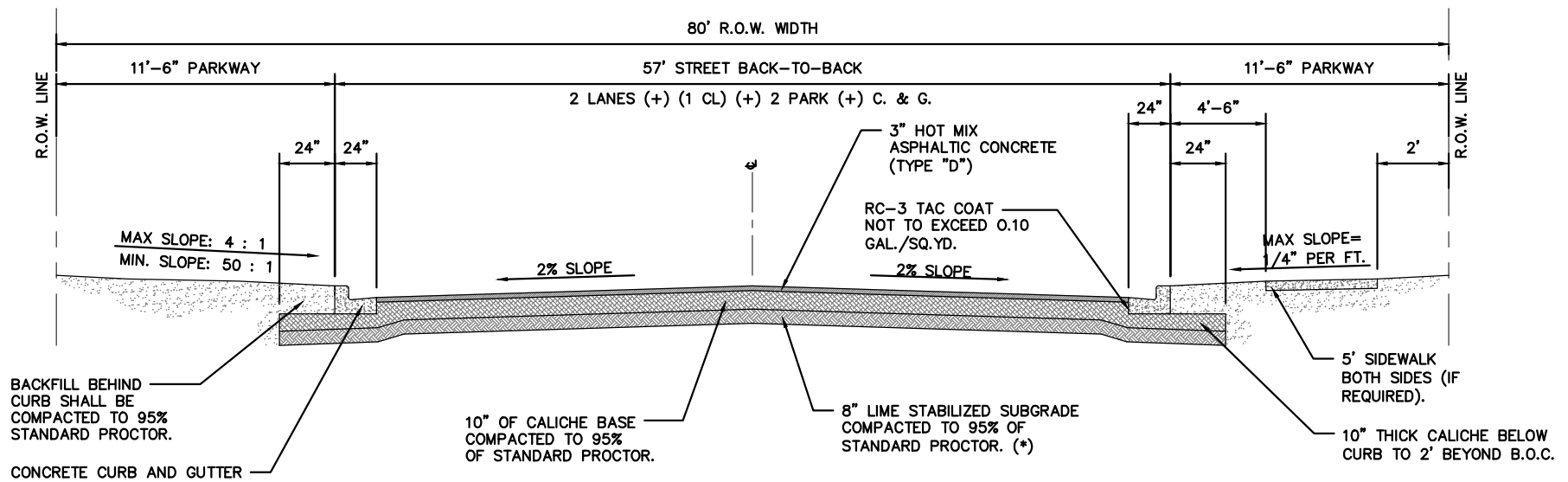
SCALE: N.T.S.

DATE: OCTOBER, 2021

REVISED: MH

DRAWN BY: RMM





FLEXIBLE BASE (TYPE E GRADE 4) SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, PRIOR TO THE ADDITION OF LIME:

Retained on Sg. Sieve	Percent Required
2"	0
1/2"	20 - 60
No. 4	40 - 75
No. 40	70 - 90
Max. Pl:	15
Max. Wet Ball Pl:	15
Wet Ball Mill Max Amount	50

(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTE:

1. IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER

P-4

COLLECTOR STREET SECTION DETAIL

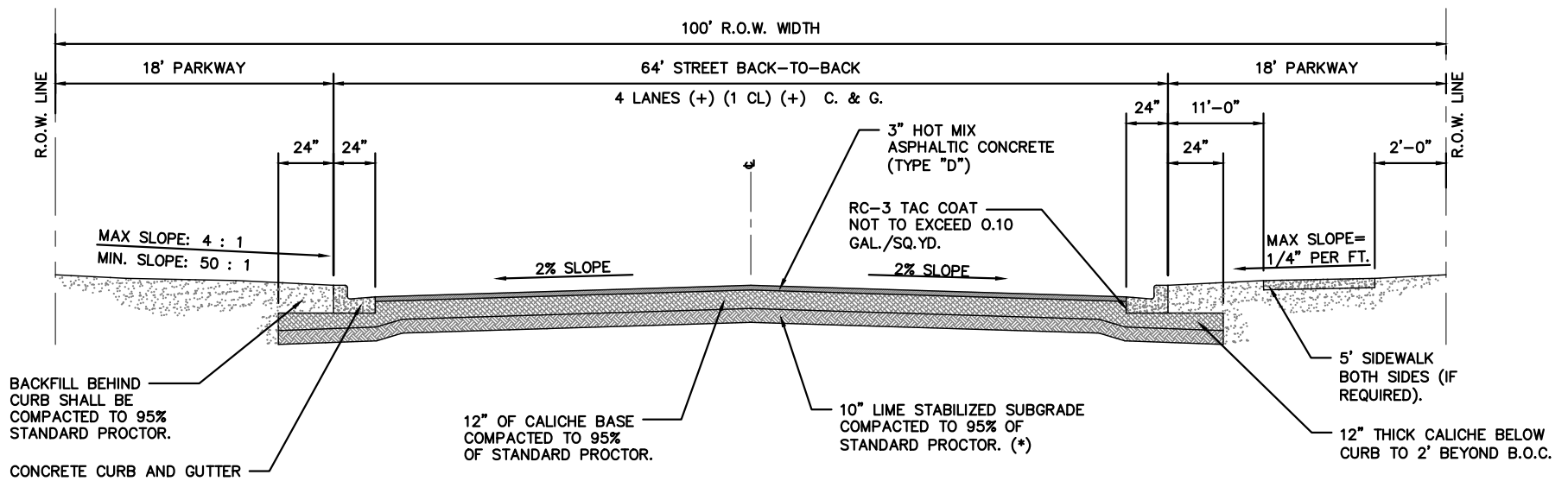
SCALE: N.T.S.

DATE: OCTOBER, 2021

REVISED: MH

DRAWN BY: RMM





FLEXIBLE BASE (TYPE E GRADE 4) SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, PRIOR TO THE ADDITION OF LIME:

Retained on Sg. Sieve	Percent Required
2"	0
1/2"	20 - 60
No. 4	40 - 75
No. 40	70 - 90
Max. Pl:	15
Max. Wet Ball Pl:	15
Wet Ball Mill Max Amount	50

(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTE:

1. IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER

P-5

MINOR ARTERIAL STREET SECTION DETAIL

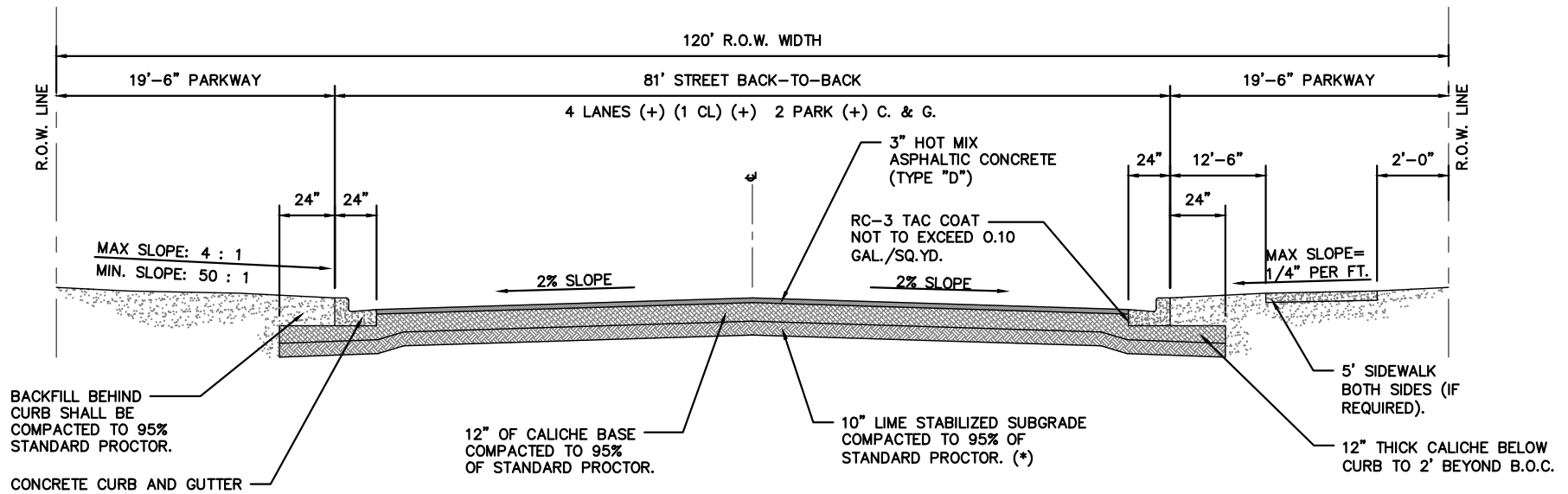
SCALE: N.T.S.

DATE: OCTOBER, 2021

REVISED: MH

DRAWN BY: RMM





FLEXIBLE BASE (TYPE E GRADE 4) SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, PRIOR TO THE ADDITION OF LIME:

Retained on Sg. Sieve	Percent Required
2"	0
1/2"	20 - 60
No. 4	40 - 75
No. 40	70 - 90
Max. Pl:	15
Max. Wet Ball Pl:	15
Wet Ball Mill Max Amount	50

(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTE:

1. IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER

P-6

PRINCIPAL ARTERIAL STREET SECTION DETAIL

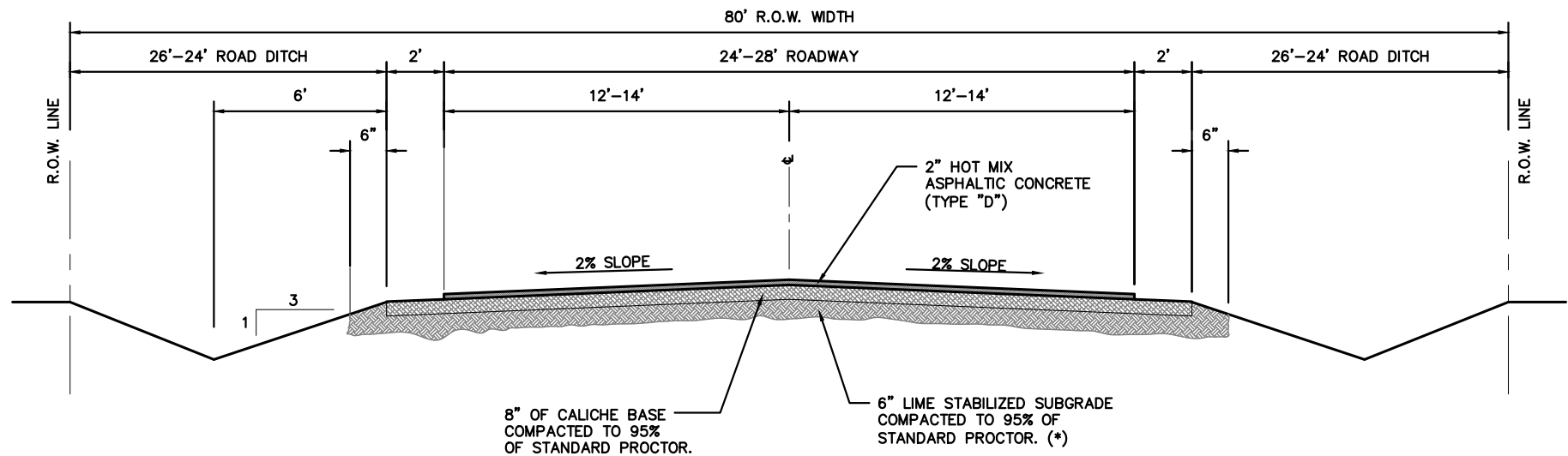
SCALE: N.T.S.

DATE: OCTOBER, 2021

REVISED: MH

DRAWN BY: RMM





(*) 2% LIME TREATMENT WILL BE REQUIRED UNLESS DETERMINED BY GEOTECHNICAL REPORT AT PROJECT DEVELOPMENT STAGE.

NOTE:

IF AN ALTERNATIVE PAVEMENT SECTION IS REQUESTED, A PAVEMENT DESIGN ANALYSIS WILL BE REQUIRED FOR APPROVAL BY THE CITY ENGINEER

P-7

RURAL ARTERIAL
STREET SECTION DETAIL

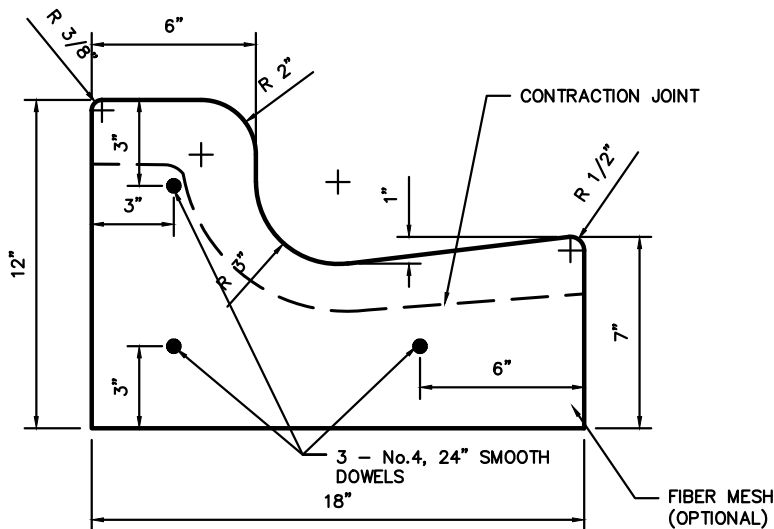
SCALE: N.T.S.

REVISED: MH

DATE: OCTOBER, 2021

DRAWN BY: RMM



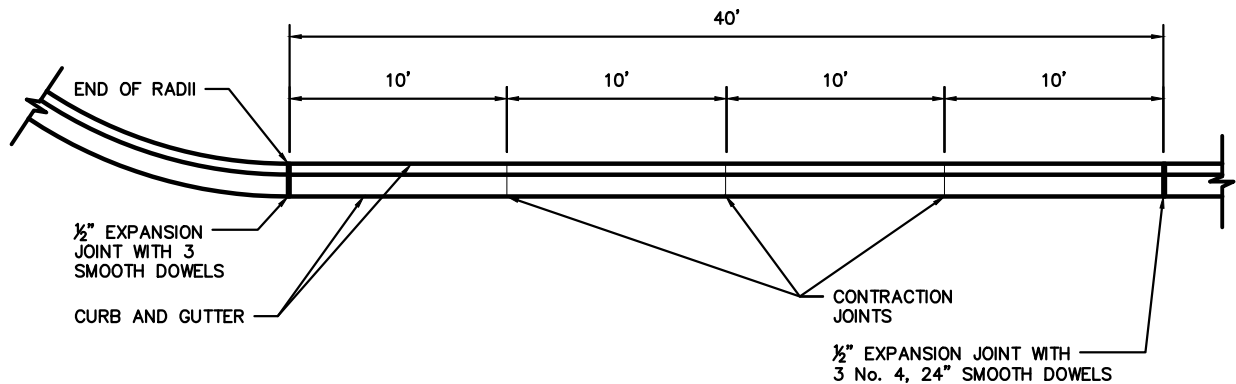


GENERAL NOTES:

1. CONCRETE SHALL BE 3000 PSI COMPRESSIVE STRENGTH AT 28 DAY
2. ALL CONCRETE WORK SHALL BE TREATED WITH MEMBRANE CURING COMPOUND TYPE 2 WHITE PIGMENTED ACCORDANCE WITH TEXAS DEPARTMENT OF TRANSPORTATION DEPARTMENTAL MATERIALS SPECIFICATIONS ITEM 4650. CONSIDERED INCIDENTAL TO CONCRETE WORK.
3. $\frac{1}{2}$ " EXPANSION JOINTS REQUIRED AT 40' C.C. AND AT THE BEGINNING AND END OF ALL RADII. CONTRACTION JOINTS SHALL NOT EXCEED 10' C.C.
4. EXPANSION JOINTS SHALL HAVE $\frac{1}{2}$ " EXPANSION JOINT MATERIAL AND 3 No. 4 24" SMOOTH DOWEL BARS COATED TO PREVENT BOND.

CURB AND GUTTER DETAIL

NOT TO SCALE



TYPICAL JOINTS

NOT TO SCALE

P-8

CURB AND GUTTER DETAILS

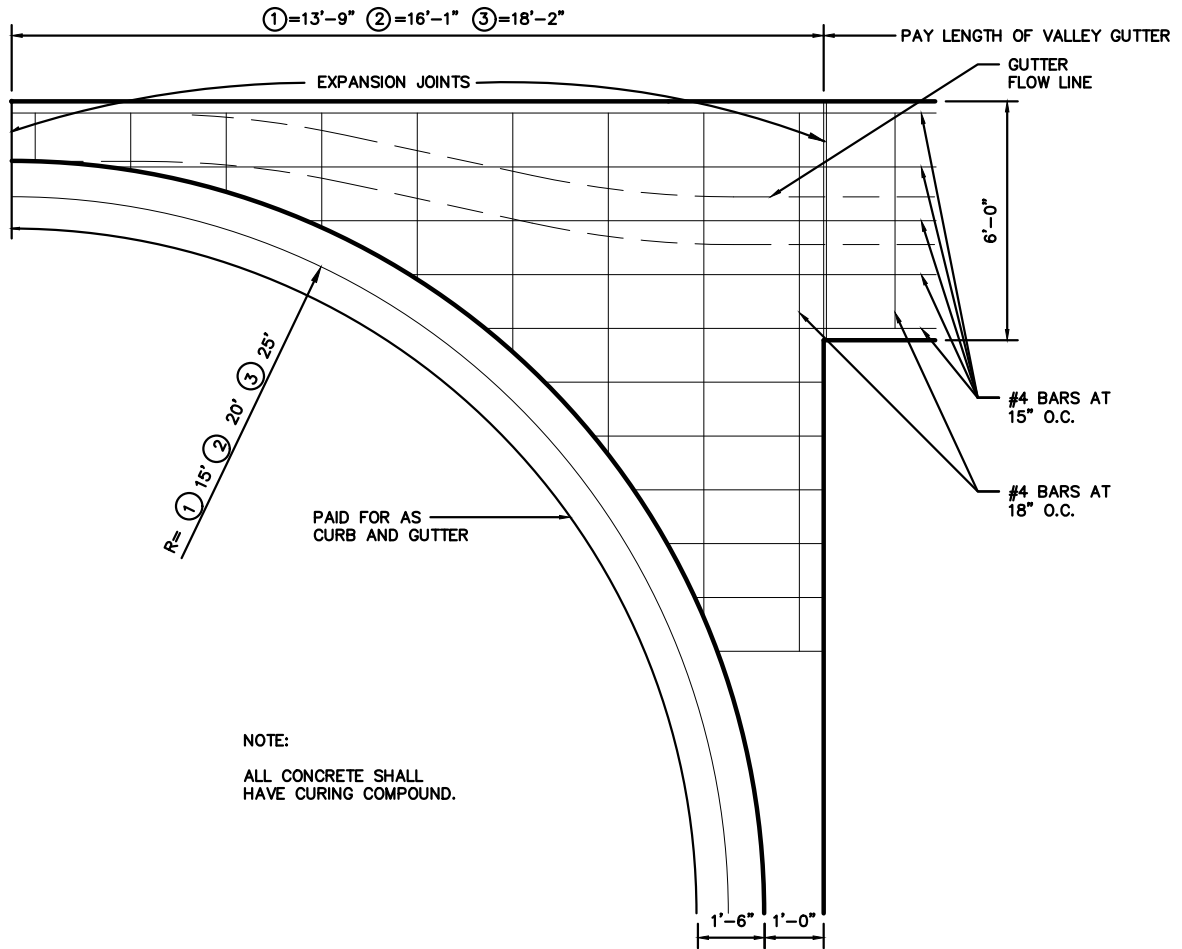
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DATE: OCTOBER, 2021

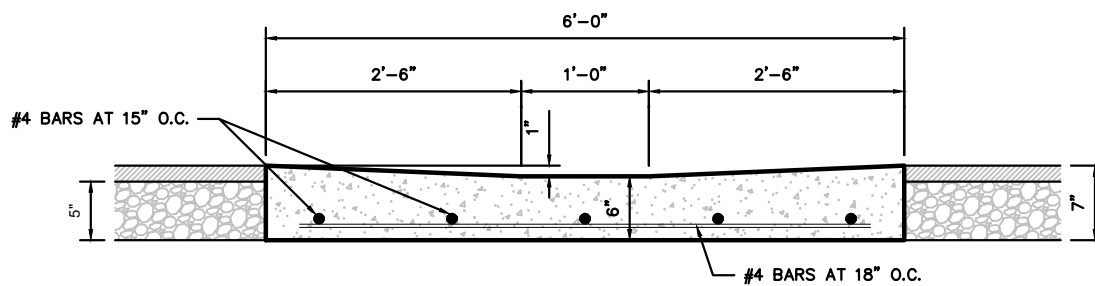
REVISED: MH

DRAWN BY: RMM





VALLEY GUTTER DETAIL



TYPICAL VALLEY GUTTER SECTION

P-9

VALLEY GUTTER DETAILS

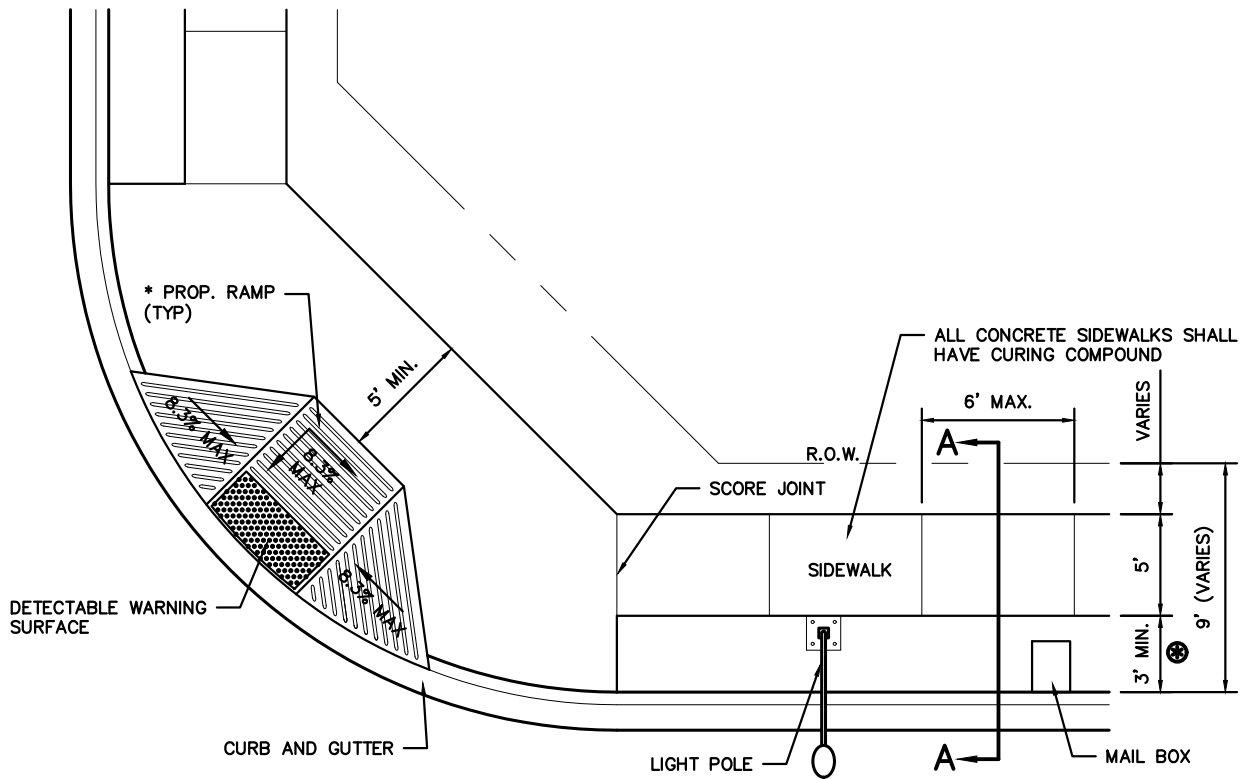
SCALE: N.T.S.

DATE: MAY, 2022

REVISED: MH

DRAWN BY: RMM



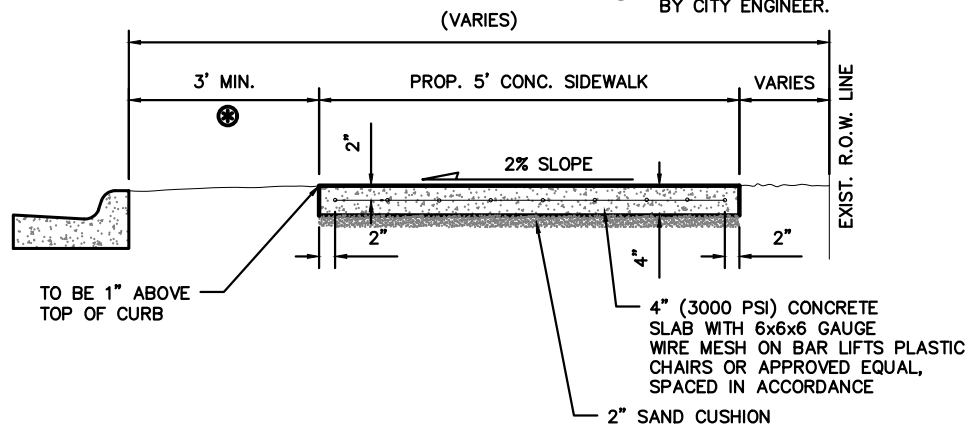


* NUMBER RAMPS AND RAMP TYPES MAY VARY WHERE PROPOSED.

PLAN VIEW

NOTES:

1. SCORE JOINTS $\frac{1}{4}$ " THICKNESS OF SIDEWALK
 2. EXPANSION JOINT EVERY 30'
 3. JOINT IN CENTER OF SIDEWALK IF OVER 15' WIDE.
- ⊗ ANY OTHER DEVIATION SHOULD BE APPROVED BY CITY ENGINEER.



SECTION A-A

TYPICAL CONCRETE SIDEWALK DETAIL

P-10

CONCRETE SIDEWALK DETAILS

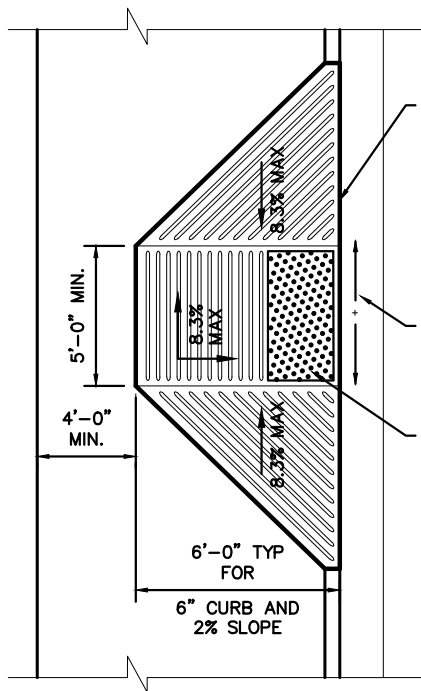
SCALE: N.T.S.

REVISED: MH

DATE: OCTOBER, 2021

DRAWN BY: RMM



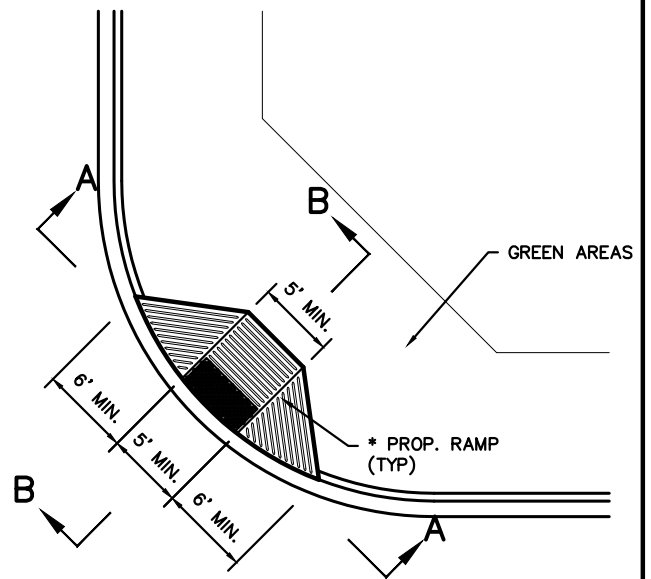


DETECTABLE WARNING
ACCORDANCE WITH
ADA STANDARDS

SLOPE GUTTER
FROM CURB
RAMP

DETECTABLE WARNING
SURFACE

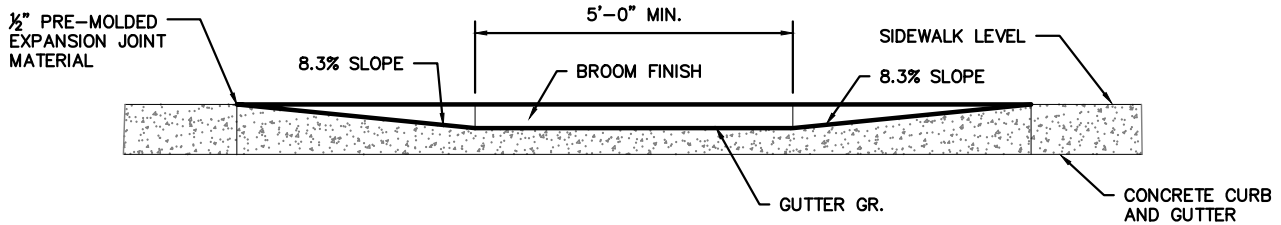
PLAN VIEW



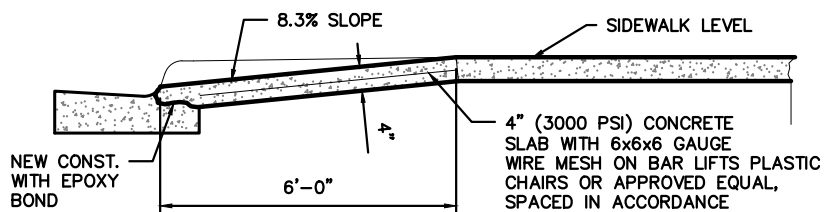
PLAN VIEW

NOTE:

1. NUMBER RAMPS AND RAMP TYPES MAY VARY WHERE PROPOSED.
2. CONCRETE SIDEWALK SHALL HAVE CURING COMPOUND.



SECTION A-A



SECTION B-B

P-11

HANDICAP RAMP DETAILS

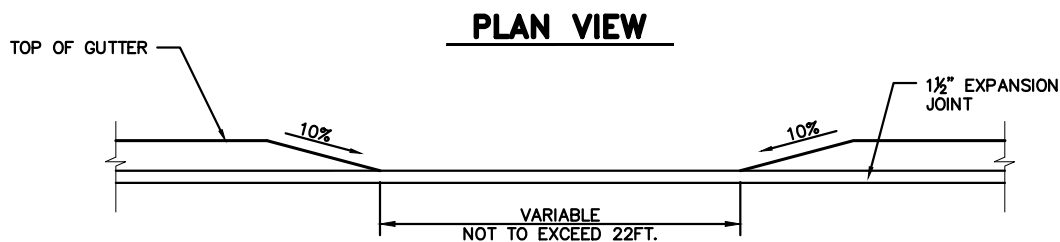


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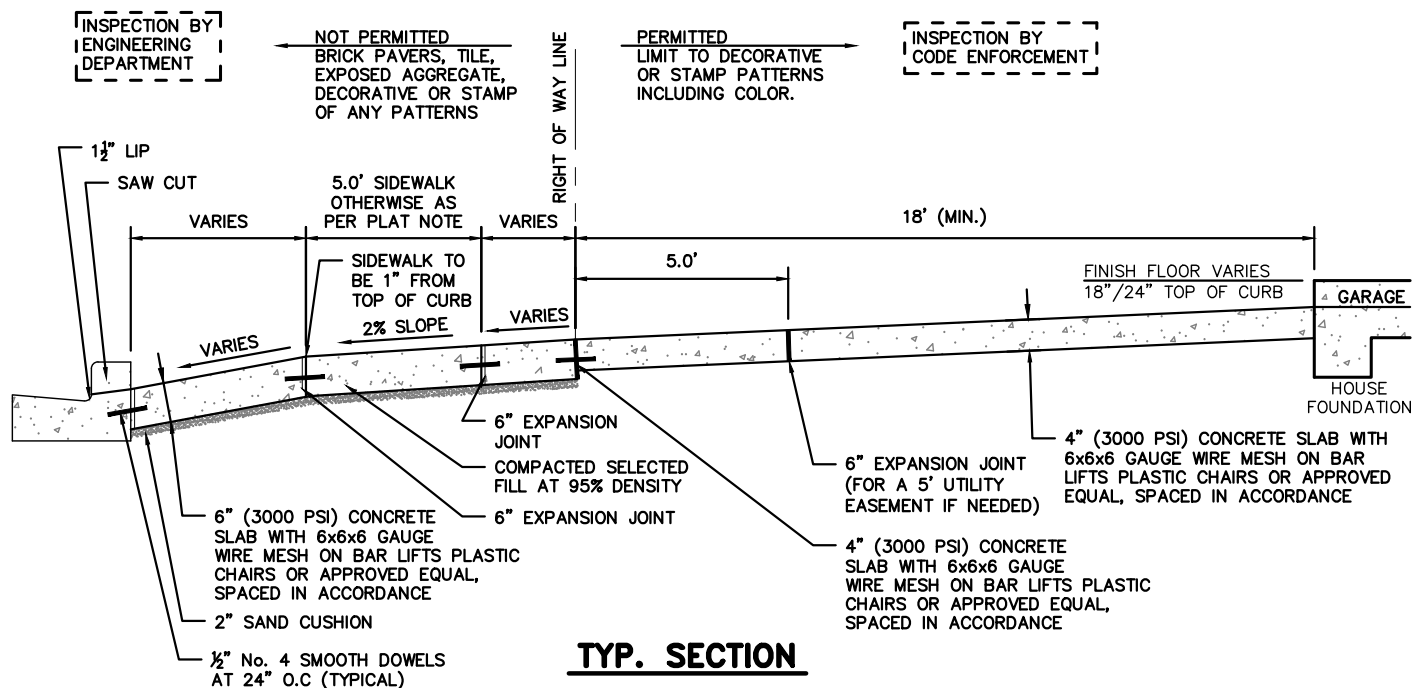
REVISED: MH

DATE: OCTOBER, 2021

DRAWN BY: RMM



NOTE:
CONCRETE SIDEWALK SHALL
HAVE CURING COMPOUND.



TYP. SECTION

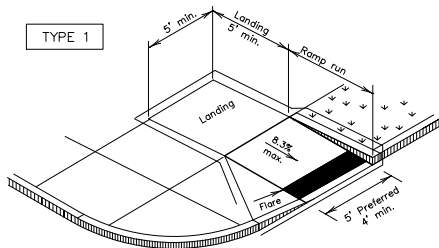
P-12

PAVING DRIVEPAD DETAILS

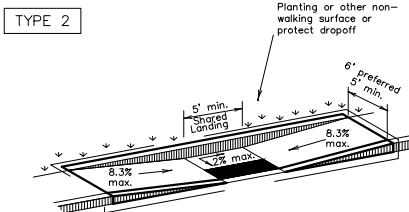
REVISÉ: MH

DRAWN BY: RMM

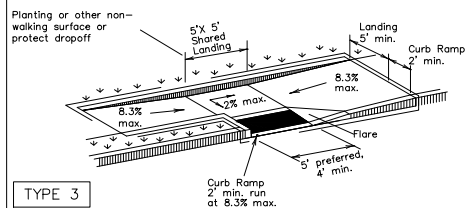




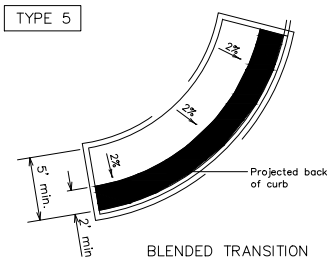
PERPENDICULAR CURB RAMP



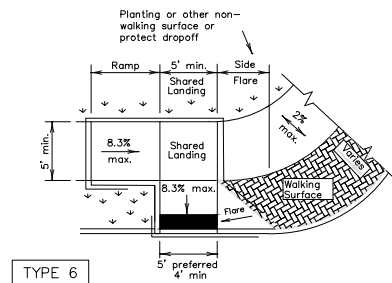
PARALLEL CURB RAMP
(Use only where water will not pond in the landing.)



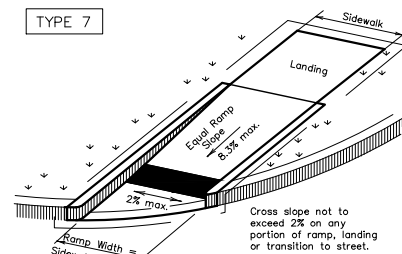
TYPE 3



BLENDED TRANSITION

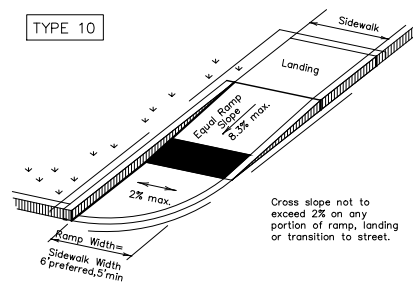


COMBINATION CURB RAMP

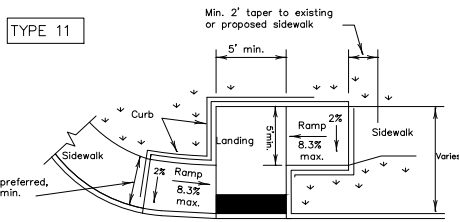


TYPE 7

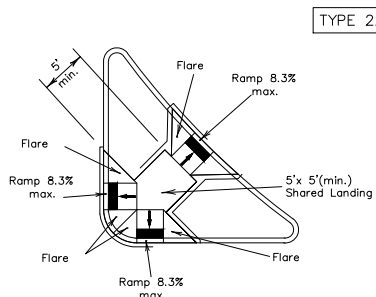
(Sidewalk set back from curb)



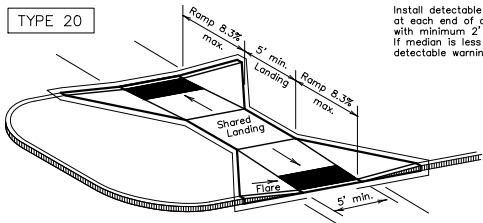
(Sidewalk adjacent to curb)



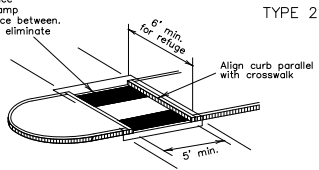
OFFSET PARALLEL CURB RAMP



COMBINATION ISLAND RAMP



CURB RAMP AT MEDIAN ISLANDS



TYPE 21

NOTES / LEGEND:
See General Notes on sheet 2 of 4 for more information.
v v Denotes planting or non-walking surface not part of pedestrian circulation path.
— Ramp Limits of Payment
■ Detectable Warning Surface

P-13

PEDESTRIAN FACILITIES RAMPS TYPES

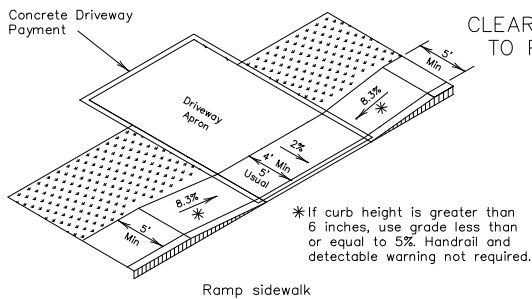
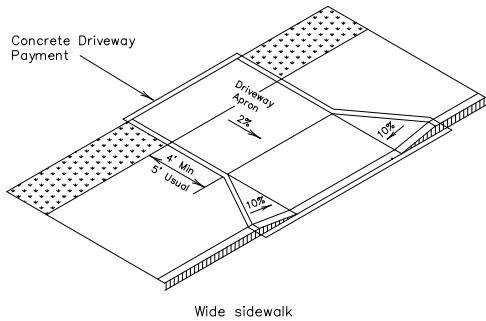
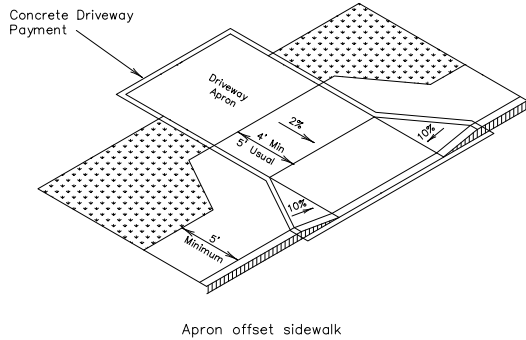
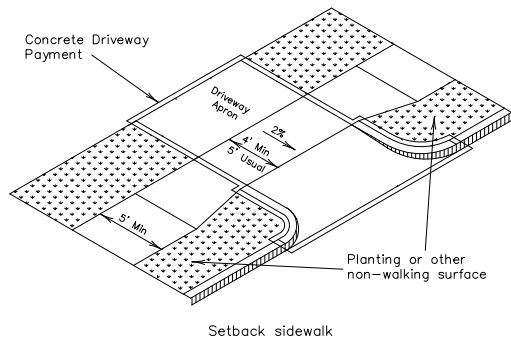
SCALE: N.T.S.

REVISED: MH

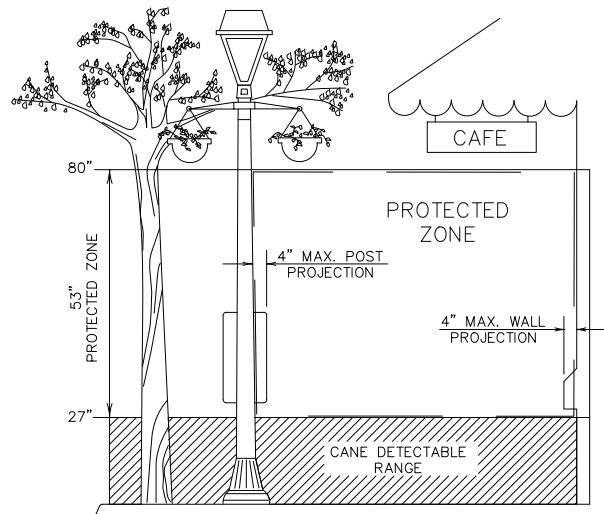
DATE: OCTOBER, 2021

DRAWN BY: RMM



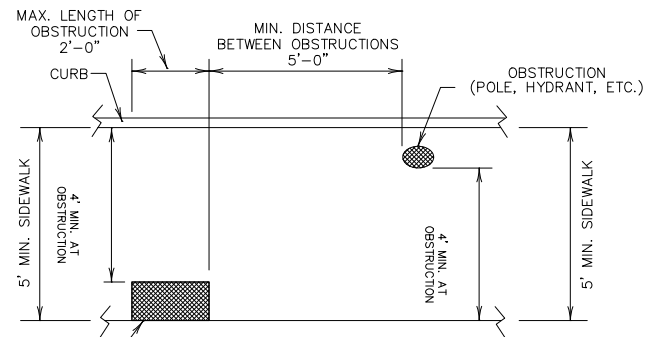


SIDEWALK TREATMENT AT DRIVEWAYS



PROTECTED ZONE

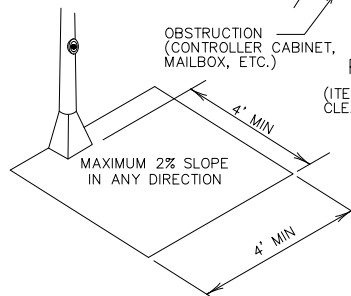
In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27" and 80" above the surface.



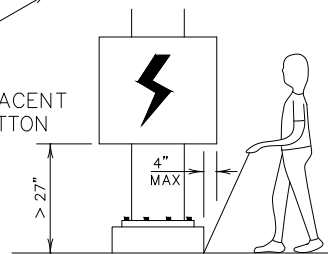
PLAN VIEW

PLACEMENT OF STREET FIXTURES

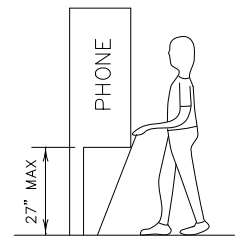
(ITEMS NOT INTENDED FOR PUBLIC USE, MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.



Protruding objects of a height > 27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

P-14

PEDESTRIAN FACILITIES SIDEWALK AT DRIVEWAY

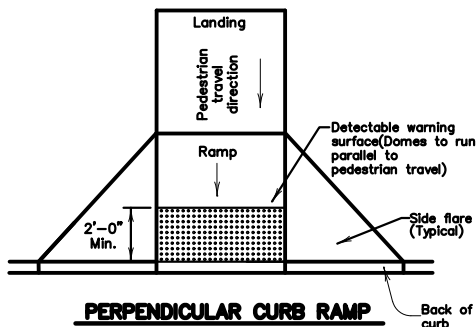
SCALE: N.T.S.

REVISED: MH

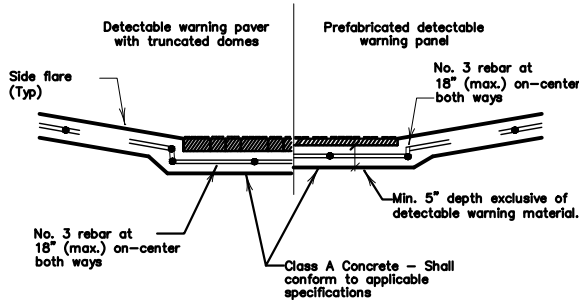
DATE: OCTOBER, 2021

DRAWN BY: RMM

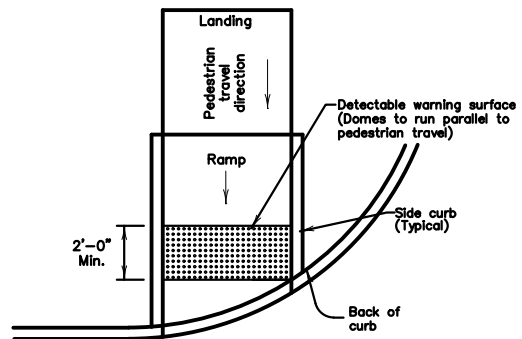
THE CITY OF
Edinburg



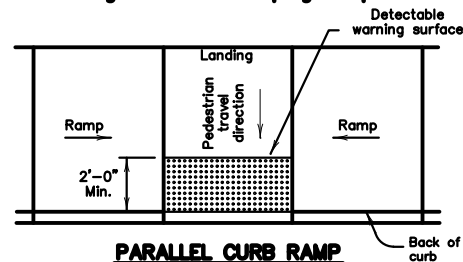
PERPENDICULAR CURB RAMP
Typical placement of detectable warning surface on sloping ramp run.



SECTION: CURB RAMP AT DETECTABLE WARNING



DIRECTIONAL CURB RAMP
Typical placement of detectable warning surface on sloping ramp run.



PARALLEL CURB RAMP
Typical placement of detectable warning surface on landing at street edge.

General Notes

Curb Ramps

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Lesser slopes that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5' x 5' passing areas at intervals not to exceed 200' are required.
4. Landings shall be 5' x 5' minimum with a maximum 2% slope in any direction.
5. Maneuvering space at the bottom of curb ramps shall be a minimum of 4' x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
6. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC 68.102.
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5' x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Handrails are not required on curb ramps. Provide curb ramps wherever an accessible route crosses (penetrates) a curb.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Provide a smooth transition where the curb ramps connect to the street.
16. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
17. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

Detectable Warning Material

18. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 705 of the TAS. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
19. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
20. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
21. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
22. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb. Align the rows of domes to be perpendicular to the grade break between the ramp run and the street. Detectable warning surfaces may be curved along the corner radius.

Detectable Warning Pavers

24. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
25. Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.

Sidewalks

26. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within one or more reach ranges specified in TAS 308.
27. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
28. Street grades and cross slopes shall be as shown elsewhere in the plans.
29. Changes in level greater than 1/4 inch are not permitted.
30. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than 5% must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with TAS 505.
31. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
32. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
33. Sidewalk details are shown elsewhere in the plans.

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PEDESTRIAN FACILITIES DETECTABLE WARNINGS

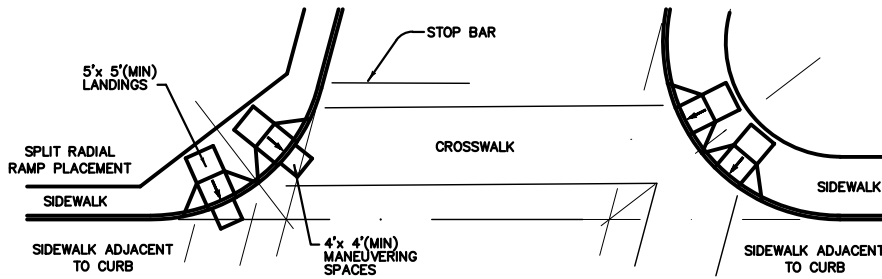
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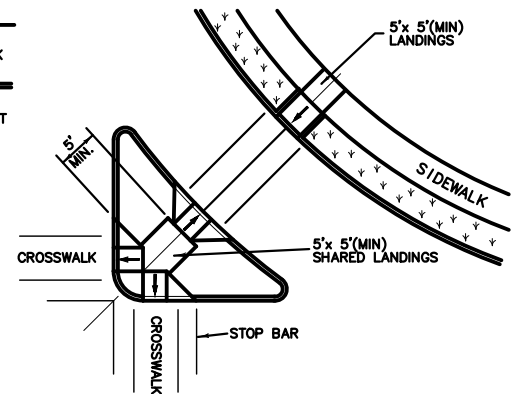
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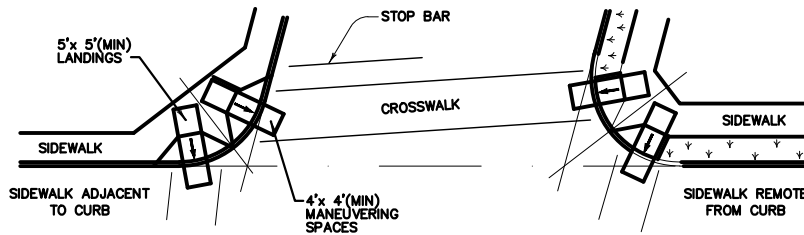
THE CITY OF
Edinburg



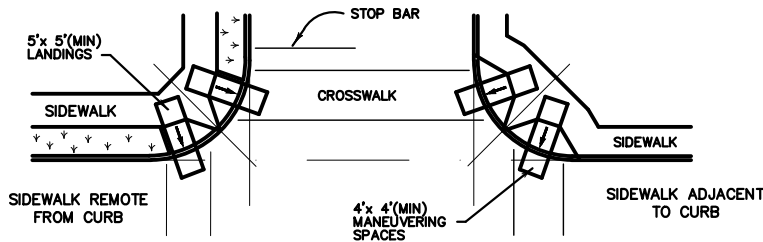
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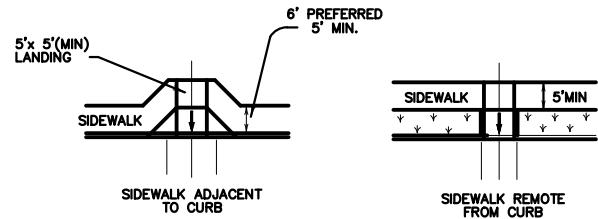
**AT INTERSECTION
W/FREE RIGHT TURN & ISLAND**



SKewed INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



**MID-BLOCK PLACEMENT
PERPENDICULAR RAMPs**

TYPICAL CROSSING LAYOUTS

P-16

**PEDESTRIAN FACILITIES
CROSS LAYOUT**

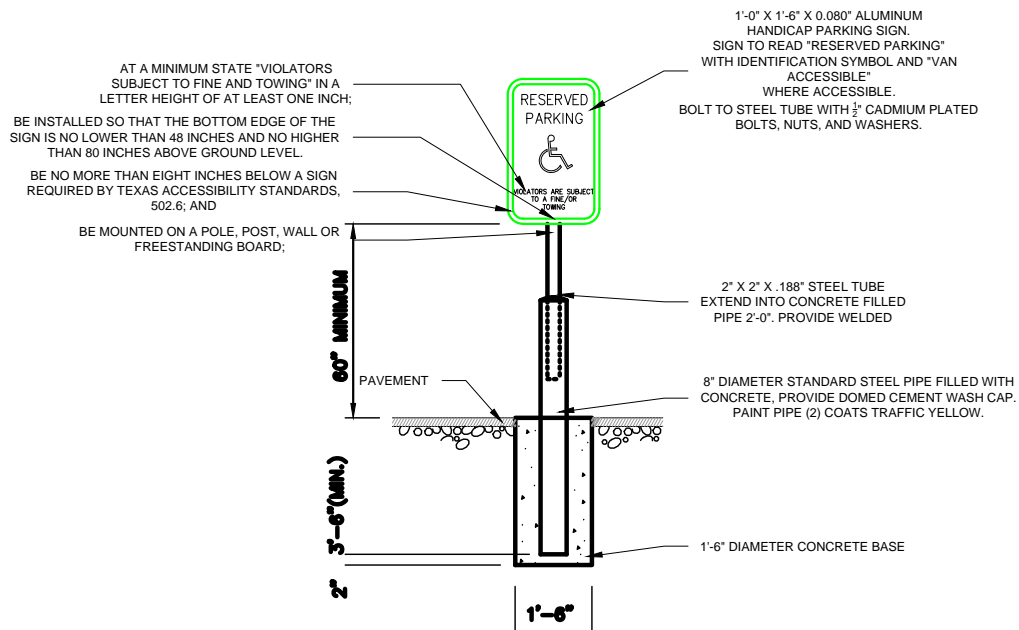
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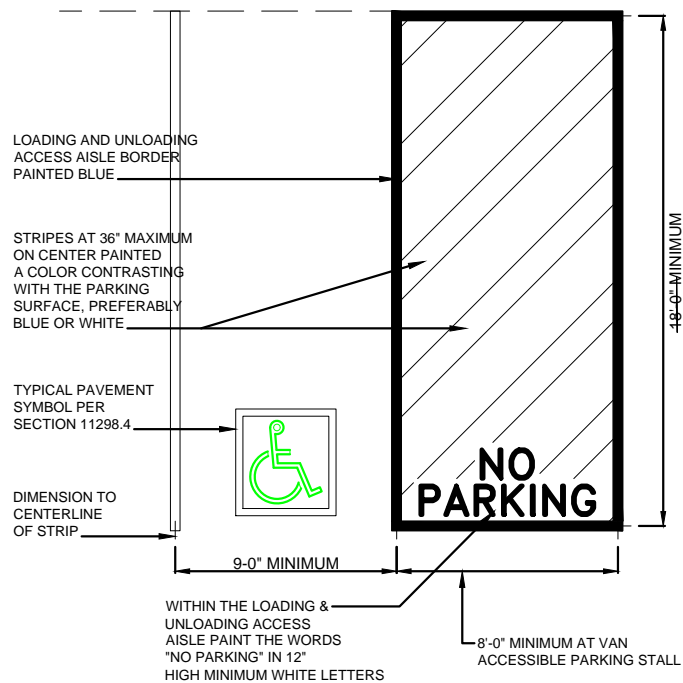
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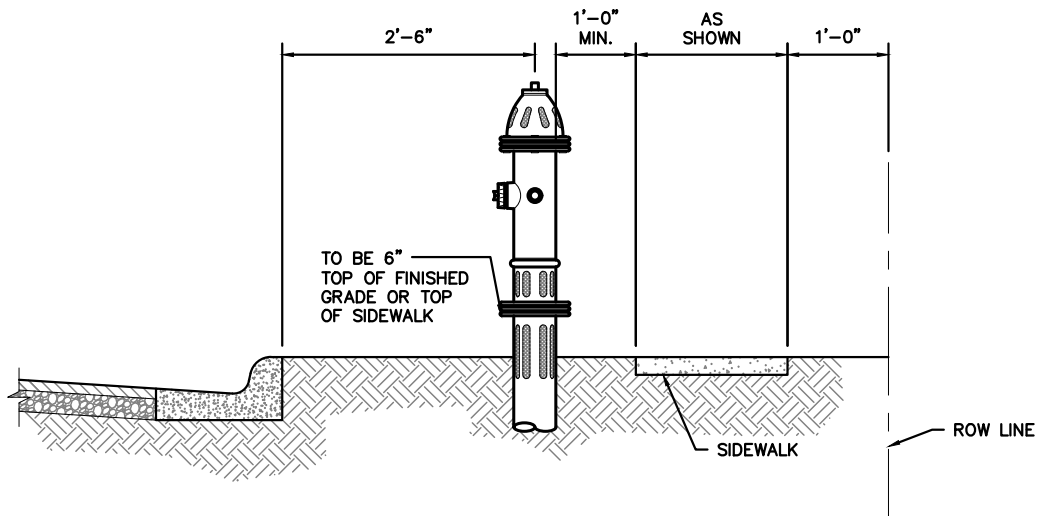
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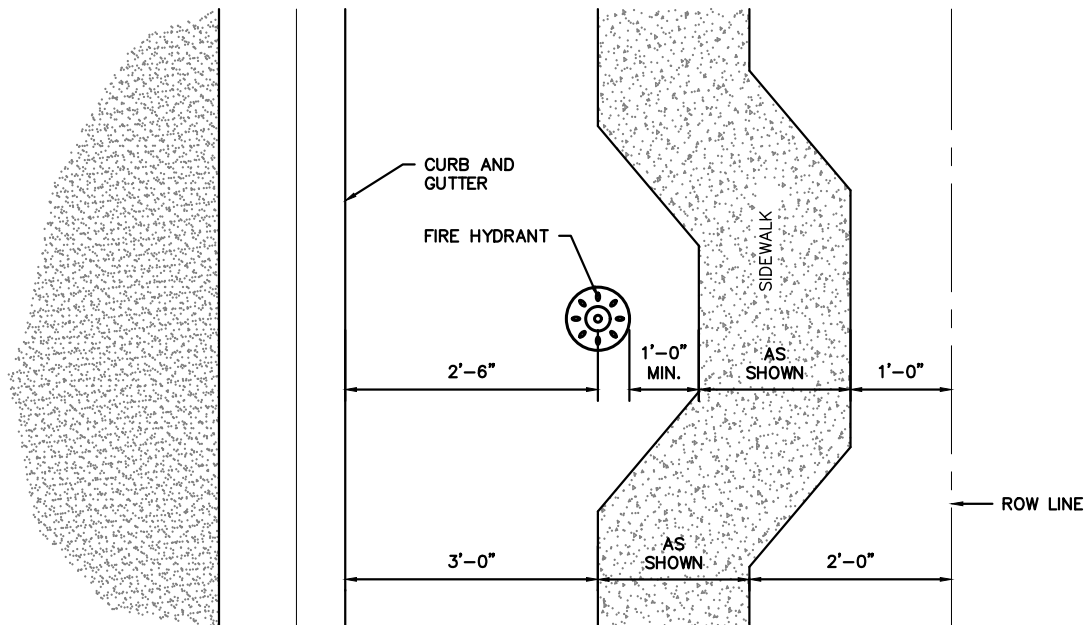


HANDICAP SIGN & SUPPORT





FIRE HYDRANT LOCATION – PROFILE



FIRE HYDRANT LOCATION – PLAN

P-19

**SIDEWALK DEVIATION AT
FIRE HYDRANT**

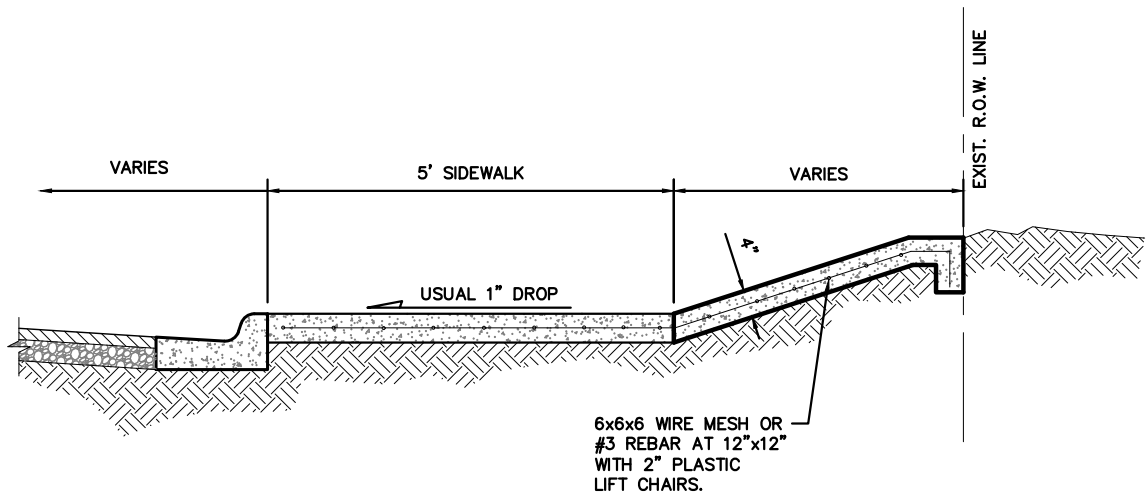
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DATE: OCTOBER, 2021

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SIDEWALK RIP-RAP

P-20

**SIDEWALK
RIP-RAP**

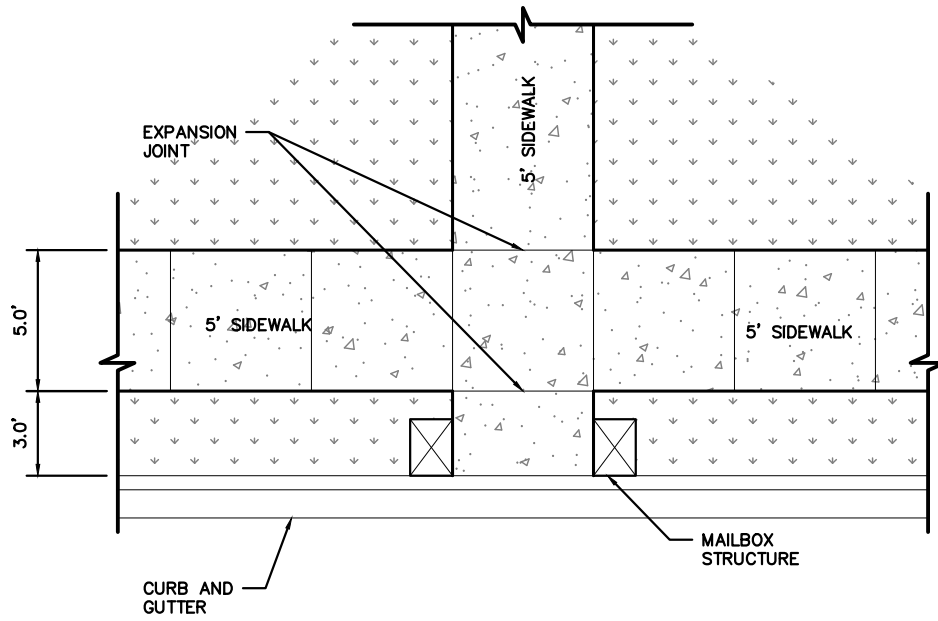


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REVISED: MH

DATE: OCTOBER, 2021

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SIDEWALK PLAN

NOTE:

1. ANY CHANGE TO SIDEWALK PLAN SHOULD BE APPROVED BY THE CITY ENGINEER.

P-21

ADA SIDEWALK AT MAILBOX DETAILS

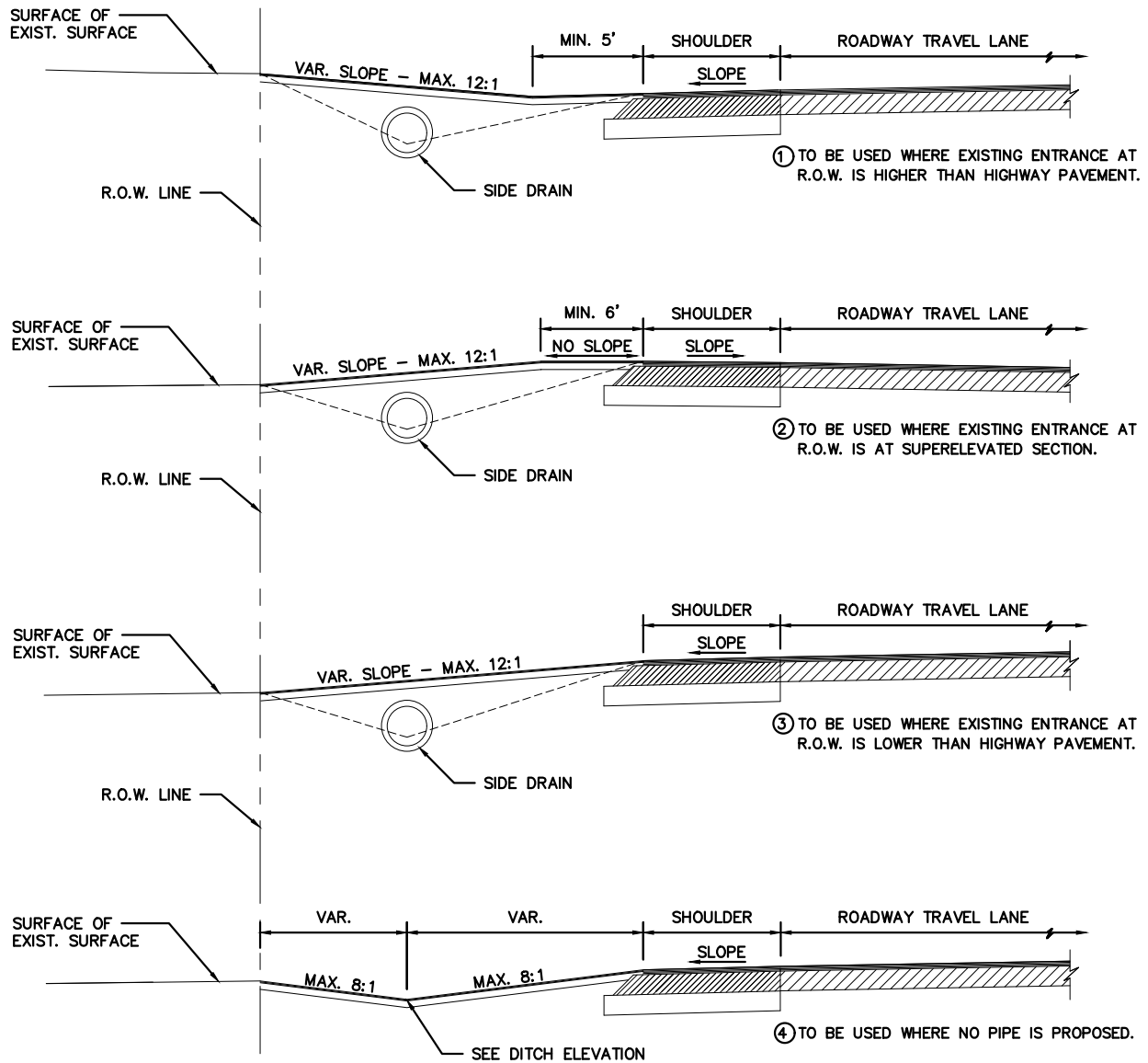
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DATE: OCTOBER, 2021

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TYPICAL ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G

P-22

ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G

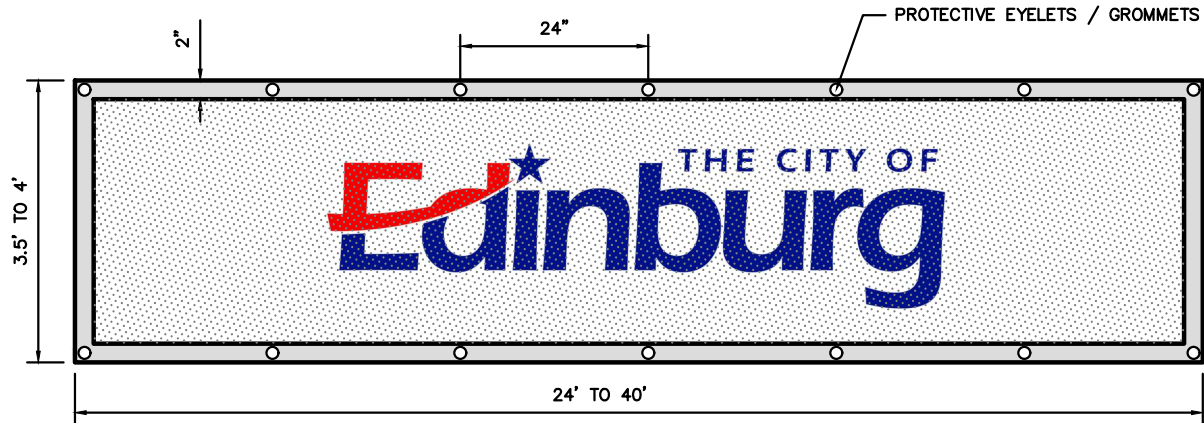
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DATE: OCTOBER, 2021

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TYPICAL BANNER

NOTES:

1. MESH MATERIAL (MESH MATERIAL WILL GUARANTEE LONGER LIFE OF THE BANNER DUE TO LESS WIND RESISTANCE AND IS REQUIRED) IS TO BE OF A TYPE THAT WILL WITHSTAND NORMAL WEATHER (WIND AND RAIN) CONDITIONS (NO EXCEPTIONS).
2. BANNER (TOP, BOTTOM AND BOTH SIDES) IS TO HAVE A FINISHED HEM TO PREVENT WIND TEARS.
3. A HAMMED EDGE APPROXIMATELY TOW (2) INCHES WIDE IS REQUIRED AT THE TOP, BOTTOM, AND BOTH SIDES OF BANNER WITH METAL EYELETS INSTALLED ON DOUBLED MATERIAL FOR THE PURPOSE OF ATTACHING THE BANNER TO THE EXISTING GUIDE WIRES.
4. GROMMETS (PROTECTIVE EYELETS) MUST BE PLACED ALONG THE TOP EDGES OF THE BANNER AND ONE AT EACH BOTTOM END. GROMMETS LOCATED AT THE BOTTOM ENDS WILL HAVE HEAVIER REINFORCING OR OTHER PRE-APPROVED METHOD (I.E. D RINGS WITH REINFORCED NY7LON STRAPS). THE MINIMUM GROMMET SIZE SHALL BE 1/2-INCH (INSIDE MEASUREMENT), AND THE GROMMETS SHALL BE PLACED EVERY TWENTY FOUR (24) INCHES.

P-23

TYPICAL BANNER DETAIL

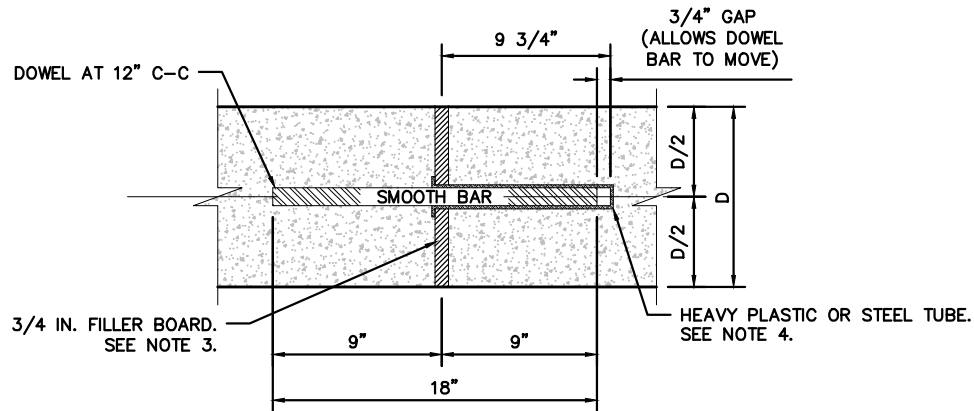
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DATE: OCTOBER, 2021

DRAWN BY: RMM





DOWEL TYPE EXPANSION JOINT

NOTES:

1. CENTER DOWEL HORIZONTALLY ON JOINT.
2. EXPANSION JOINT BARS SHALL BE HELD PARALLEL TO THE FINISHED CONCRETE SURFACE.
3. CEDAR SHALL BE USED AS EXPANSION JOINT MATERIAL. BITUMINOUS FIBER BOARD MAY BE USED AGAINST EXISTING CONCRETE PAVEMENT.
4. HEAVY PLASTIC TUBE IS ONLY REQUIRED ON TRANSVERSE JOINTS.

SMOOTH EXPANSION JOINT DOWELS

CONCRETE THICKNESS (D)	DOWEL DIA.
5" - 6"	#4 (1/2")
7" - 8"	#5 (5/8")
9" AND UP	#6 (3/4")

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DOWEL TYPE EXPANSION JOINT DETAIL

SCALE: N.T.S.

DATE: MAY, 2022

REVISED: MH

DRAWN BY: RMM



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SECTION 3 - WATER AND SEWER POLICY

- 3.01** General
- 3.02** Master Plan
- 3.03** Water Improvements
 - A.** General Policies
 - B.** Design Standards
 - C.** Materials
 - D.** Water Line Crossing within the City and ETJ
 - E.** Road Crossings
 - F.** Railroad Crossings
 - G.** Protection Requirements at Waterline–Sanitary Sewer Crossings (Non-Pressure Rated)
 - H.** Protection Requirements at Waterline–Sanitary Sewer Crossings (Pressure Rated)
 - I.** Additional Requirements
 - J.** Oil and Gas Pipeline Crossings
 - K.** Directional Bore Construction
 - L.** Circulation and Flushing for Water Quality
 - M.** Interconnections
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 - O.** Required Submittals
 - P.** Water Meters
- 3.04** Sanitary Sewer Improvements
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 - C.** Materials
- 3.05** Connection to Wastewater Collection and Treatment Systems
 - A.** Connection Required
 - B.** On-Site Sewage Facilities
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- 3.06** Approved Materials Listing See Exhibit “A”
- 3.07** Sample Reimbursement Contract See Exhibit “B”
- 3.08** Standard Water and Sewer Details
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 - W-1A** Single Water Service Connection Details Alternative
 - W-2** Double Water Service Connection Details

- W-2A** Double Water Service Connection Details Alternative
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Sanitary Sewer Collection System:

- S-1** Residential Sanitary Sewer Service Details
- S-2** Multifamily and Commercial Sanitary Sewer Service Details
- S-3(A)** Monolithic Fiberglass Manhole Details
- S-3(B)** Monolithic Fiberglass Manhole Details
- S-4** Shallow Service Connection Detail
- S-5** Deep Service Connection Detail
- S-6** Double Deep Service Connection Detail
- S-7** Sewer Standard Pipe Bedding Details
- S-8** Utility Crossing at Existing Street Detail
- S-9** Utility Line Bore Detail
- S-10** Drain Ditch Crossing Section
- S-11** Sewage Air Release Valve Detail
- S-12** Manhole Cover Details
- S-13** Force Main Discharge Manhole Detail

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SECTION 3

WATER AND SEWER POLICY

3.01 Introduction

The purpose of this section is to define the general requirements for the design of water and sanitary sewer improvements and to provide typical details of these improvements. City Engineer and the Director of Utilities Department or designee should be consulted if variations from these standards are anticipated. In general these sections are conditions on utility requirements adopted by the Code of Ordinances of the City of Edinburg specified in the Unified Development Code. In cases where limitations or physical barriers restrict compliance with the provisions of this section shall adequate alternatives be considered by the City Engineer or the Director of Utilities or designee.

3.02 Master Plan

All water and sewer designs must be sized and located according to the City's adopted Water and Wastewater Master Plan. The City of Edinburg will periodically amend its Water and Wastewater Master Plan and it is the responsibility of the Project Engineer to be familiar with the most current adopted plan. In all cases, the designs must meet or exceed the current Texas Commission on Environmental Quality (TCEQ) Standards. All city owned water and sewer lines installed on easements must be exclusive to the City.

3.03 Water Improvements

All water mains that are made a part of or extended from the distribution system of the City of Edinburg shall be in conformance to these requirements.

A. General Policies

1. All developments within the City and its Certificate of Convenience and Necessity (CCN) shall be properly connected to the approved water distribution system.
2. The water distribution system shall be designed by a Professional Engineer licensed to practice in the State of Texas.
3. All water distribution systems shall be designed to provide service to and through subject property and maximize coverage to the City-approved service area.

4. Pipe sizes shall be required to serve the anticipated development but not less than:
 - a. Single Family Residential
 - i. Distribution and/or future extension 8-inch
 - ii. Internal Service 8-inch
 - b. Commercial, Retail, Multi-family 8-inch
 - c. Industrial 8-inch
 - d. Pipe sizes shall be measured in inches and even numbered only (excluding 10-inch size), odd numbered sizes shall not be allowed.

Developments bordering planned extensions of major transmission lines shown on the Water Master Plan shall install the shown pipe size at the cost of the development subject to the City's standard reimbursement policy specified in the Unified Development Code, Article 7 – Section 7.506 – Responsibility for Payment of On-Site and Off-Site Installation Costs. The developer is responsible up to and including pipe sizes of 12-inches, unless deemed necessary by the Director of Utilities to improve efficiency. For larger pipe sizes, the City shall participate based on the availability of funds for the difference in cost of material only, subject to approval by the Director of Utilities and City Council.

5. The City may require a larger diameter pipe based on various factors including service area, demand, fire flow requirements and historical data.
6. Reimbursement for over-sizing shall not apply if such over-sizing was necessary to meet minimum fire-flow requirements.
7. All potable waterlines and lines with fire hydrants shall require a two source connection (looped system).
8. There shall be no connection made to any water main owned by or under the control of the City of Edinburg or any water main attached to the Edinburg distribution system by any person or persons, except authorized agents of the City of Edinburg. Authorized agents shall be limited to Contractors under contract by the City of

Edinburg or private Developer Contractor authorized in writing by the City to perform work.

9. Fire Hydrant spacing shall be every 300 feet in commercial, industrial and multi-family areas, every 600 feet in residential areas, and so that every building in the City Limits (and ETJ developments) will be within 300 feet of a standard City fire hydrant. All distances will be measured along Public R.O.W. or emergency access ways. As it relates to public safety and the continual unobstructed flow of traffic, fire hydrants shall be located on both sides of all principle arterials or greater.
10. Blue Reflective Markers shall be affixed on the centerline pavement to indicate the location of a fire hydrant.
11. On cul-de-sac streets less than 400 feet in depth, the hydrant should be located at the entrance of the cul-de-sac. Hydrants shall be installed as specified in the Standard Details of this section. Fire Marshal has authority on minimum quantity of hydrants and hydrant locations. Additional installations may be required at the discretion of the Director of Utilities.
12. Permanent and temporary flush valves shall be required in accordance with the Standard Details on dead-end mains at locations where a fire hydrant is not installed and where sampling is required.
13. Valves shall be spaced at approximately a 600 foot grid or as directed by the Director of Utilities to minimize water outage during maintenance or emergency repairs. Valves shall also be located on any stub-outs for future main extension.
14. All lots must be serviced with dual water service stub-outs and located at lot lines. These service locations shall be marked on the curb and gutter with a "W" mark not less than 4-inches in size or in manner approved by the City. Water service shall be opposite of sewer service locations.
15. Upon termination of a one-year warranty period, maintenance of all water mains and water services up to and including the water meter device (Code of Ordinances, Chapter 50) located within City right-of-way or public easements shall become the property of the City of Edinburg.

16. All water services, beyond the water meter, shall be private and must be maintained by properties being serviced.

17. Waterline Testing - Prior to acceptance or connection to City distribution system, all testing must be successfully completed. The Engineering Field Inspector must observe all testing including setup, operation, and field results. The Contractor is responsible for all materials, equipment and labor to perform the following:

- a. Water mains and appurtenances shall be tested for leakage in accordance with AWWA Standard C-900 (150 p.s.i. for two hours). All air shall be removed from the water main before the start of the test.

Leakage is defined as the quantity of water that must be supplied to the water main in maintaining the specified leakage test pressure. This quantity of water must be pumped with a pump of adequate head and capacity from a storage tank of such configuration that quantities of water pumped from the storage tank can be accurately calculated.

The entire length of pipe line shall be tested as one length unless otherwise specified by the City.

- b. Before being placed in service, the entire line, including service connections, shall be chlorinated. Chlorine may be applied by hypochlorite and water mixture only. The chlorinating agent shall be applied at the beginning of each pipe section.

Water shall be fed slowly into a new line to produce a dosage as indicated:

<u>Dosage</u>	<u>Residence Time for Sterilization</u>
50 ppm	24 Hours
200 ppm	8 Hours
500 ppm	30 Minutes

After dosage has been tested by color indicator or photo cell and residence time is complete the line must be flushed before testing for bacteria by the City. Water for testing, flushing, etc., will be at the Contractor's expense and arrangements must be made with the City for the purchase of water. All water for testing flushing, etc. must be metered. The City will sample and perform the bacteriological tests and associated costs to be paid by the Contractor per sample including all retests required by the City.

B. Design Standards

All water mains must be designed in accordance with Subchapter D: Rules and Regulations for Public Water Systems by the Texas Commission on Environmental Quality (TCEQ), current edition.

C. Materials

Approved material listing is provided on Exhibit “A”. All deviations must be approved in writing by the Director of Utilities and upon approval by the City’s Technical Specification Review Committee. All pipe, fittings, and materials shall be new, **domestic** and in accordance with Standard Specifications.

1. P.V.C. or Polyvinyl Chloride pipe larger than 2-inches shall meet the requirements of AWWA C900-16, PVC Pressure Pipe
 - a. Class 235 DR 18
2. Copper tubing and polyethylene piping (polyethylene must be encased) for cold water services shall meet or exceed any and all AWWA & ASTM Standards to include ASTM D2737, ASTM D2239, C901, C906, and NSF standard 61 and 14 on sizes SIDR-9, SIDR-7, & SIDR 11.5 IPS.
3. Tapping sleeve and valve:
 - a. Tapping sleeve to meet AWWA specifications with a minimum working pressure of 150 P.S.I.
 - b. Tapping valve shall meet AWWA specifications with a minimum working pressure of 150 P.S.I.
4. All fittings shall be Ductile Iron meeting specifications of A.N.S.I./AWWA C110.
5. All bends / deflections shall utilize the Mega-lug, Mega-flange, joint restraint fittings.
6. All water services from water main to angle stop(s) shall be one continuous length of copper tubing with no splices.
7. No galvanized pipe or fitting will be allowed with the exception of 2-inch riser on blow-offs (detail to be provided by Professional Engineer).

8. All valves will be fitted with a fully adjustable valve box and extension stern that is adjustable (trench adaptor) in trench depth from 3-feet to 13-feet depth.
9. All pipe, fittings and materials are to be inspected and approved by the City prior to installation. Any deviation from these standards must be requested in writing by licensed Professional Engineer responsible for the design of the development and explaining hardship for such deviation. City Engineer and/or Utilities Director must respond in writing prior to usage.

D. Water Line Crossing within the City and CCN

1. Public and private utility crossings other than sanitary sewer: Where a water line crosses another utility (phone, cable, low pressure gas, etc.), a minimum of 18- inches of clearance must be maintained between the outside wall of the water line and the outside wall of the utility.
2. Stream or ditch crossings.
 - a. Elevated Crossings:
 - i. Water lines shall be steel encased with thickness as shown in details and shall extend a minimum of 15-feet beyond the last bend or the right-of-way line, whichever is greater.
 - ii. Elevated crossings are preferred to underground crossing.
 - iii. Supporting water lines on existing or proposed bridges meeting the following criteria may be used, when approved in advance by the City Engineer:
 - A. Have adequate structural capacity.
 - B. Have sufficient clearance above bent cap elevated for installation under the bridge.
 - C. Design elevated crossing with the elevation of the bottom of the water line above the low chord of the nearest adjacent bridge or a minimum 1½-foot above the 100-Year Floodplain Elevation, whichever is greater.

- D. Extend pipe from right-of-way to right-of-way crossings.
- E. Provide air release valves at the highest point of the waterline.
- F. Provide sufficient span length to accommodate the section of future widening of the stream or ditch, if available.
- G. Support the line on columns spaced to accommodate structural capacity of the pipeline considering deflection and loading.
- H. Base column support design on soil capacity, spacing, loading, and structural requirements.
- I. Provide pedestrian pipe guards on elevated crossings, when applicable.

b. Underground Crossing:

- i. Provide a minimum 5-foot clearance above top of pipe to the ultimate flow line of the ditch.
- ii. Provide sufficient length to exceed the ultimate future development of the ditch.
- iii. Water lines shall be steel or restrained joint pipe and shall extend a minimum of 15-feet beyond the last bend or to the right-of-way line, whichever is greater.

E. Road Crossings

- 1. All roadway crossings shall be bored with steel casing (thickness as shown on details).
- 2. Extend carrier pipe from proposed or existing right-of-way to right-of-way, whichever is greater.
- 3. Use PVC (DR 18) pipe within steel casing under existing and future roadway from a point 5-feet outside of the service road or outside of pavement toward the right-of-way, to a similar point on the other side of the highway across the right-of-way. For

highway or roadway crossings with open-ditch drainage sections, extend casing from right-of way to right-of-way.

4. Where additional right-of-way has been acquired for future widening, the casing shall extend to within 10-feet of the future right-of-way line.
5. Coordinate and obtain all necessary roadway crossing permits from appropriate entities.
6. PVC casing may be allowed on a case basis by the City Engineer.

F. Railroad Crossings

1. For railroad crossings, the water line shall be PVC (DR-18) pipe within a steel casing which extends from right-of-way to right-of-way. Any deviation must be approved by the appropriate railroad company and The City of Edinburg.
2. Where there is a non-railroad right-of-way, extend casing a minimum of 15-feet from either side of the centerline of the Right of Way or as required by the appropriate entity.
3. Coordinate and obtain permit with appropriate entity.

G. Protection Requirements at Waterline – Sanitary Sewer Crossings (Non-Pressure Rated) as per current TCEQ standard.

H. Protection Requirements at Waterline – Sanitary Sewer Crossings (Pressure Rated) as per current TCEQ standard.

I. Additional Requirements

1. Use electrically isolated flange joints for transitions between two dissimilar metallic pipes. Electrically isolate water lines from casing pipe and supports.
2. The carrier pipeline shall extend a minimum of 1 foot beyond the end of the casing to allow flanged joints to be constructed.
3. For welded steel bends, extend steel pipe a minimum of 5 feet beyond the bend.

J. Oil and Gas Pipeline Crossing

1. Coordinate with applicable agency.

K. Directional Bore Construction

Use the following general criteria for establishing bore sections:

1. Improved streets – Use bore construction to cross a street regardless of surface. Bore length shall be computed as roadway width at proposed bore location plus 5 feet to either side of roadway.
2. Driveways – Use bore construction to cross active driveways. Compute bore length as driveways width plus 1 foot to either side. Where proposed lines are in close vicinity and parallel to culvert pipes along roadside ditch streets, the length of bore shall be the same as the length of existing culvert.
3. Trees – Use auger construction to cross within 4 feet of trees 6 inches and larger in diameter. Use a minimum of 8-foot auger length centered about the tree.

L. Circulation and Flushing for Water Quality

The layout of the water distribution system shall provide maximum circulation of water to prevent future problems of odor, taste, or color due to stagnant water.

1. All designs must provide a source of fresh water at each end or at multiple points of a subdivision to create circulation. Valves and fire hydrants must be placed to allow flushing of lines.
2. Dead end mains must be avoided. When necessary, isolate dead end lines with an in-line valve, and equip with a blow-off, fire hydrant or flushing valve at the end.
3. Stubs must be provided for future extensions. Stubs shall include a valve with no service connections on stubs. A full pipe joint between the valve and plug shall be required.

M. Interconnections

1. For interconnections between utility districts outside the City, written approval must be given by TCEQ.
2. For interconnections between the City and Utility District a written agreement between the districts must be approved by the City and recorded in the County records.

N. New Water Lines Constructed near Sanitary Sewers and Force Mains per current TCEQ standards.

O. Required Submittals

See Section 4 of the Engineering Standards.

P. Water Meters

All meter sizes shall require prior approval by the City of Edinburg. Final meter size determination will be made by the City and shall be based on consumption standards. All meters are to be “smart meters”.

Note: All 4” (inch) and above meters shall be placed in a concrete meter vault and be approved by the City. Meters accepted will be Siemens or Sensus or an approved equal.

3.04 Sanitary Sewer Improvements

All sanitary sewer mains that are made a part of or extended from the collection system of the City of Edinburg shall be in conformance to these requirements.

A. General Policies

1. All developments within the City and its CCN shall be properly connected to the approved sanitary sewer collection system.
2. The Sanitary Sewer Collection System shall be designed by a Professional Engineer licensed to practice in the State of Texas.

3. All sanitary sewer collection systems shall be designed to provide service to and through subject property and maximize coverage to the City approved service area.
4. Pipe sizes shall be required to serve the anticipated development but not less than:
 - a. Single Family 8-inch
 - b. Commercial, Retail, Multi-Family 8-inch
 - c. Industrial 12-inch
 - d. Educational Facility 12-inch
5. The city is hereby authorized, pursuant to V.T.C.A., Water Code § 17.934, to provide a sanitary sewer system to property owners within the corporate limits of the city and within the extraterritorial jurisdiction thereof. The city also is authorized to require all property owners having said sewer service adjacent or abutting their property to connect to the sewer system. All required connections shall be completed within 365 days after the city sewer service is available. Also, all existing on-site wastewater systems shall be eliminated, in accordance to state law, upon connection to the city sewer system. The city is also authorized to charge the property owner for the sewer service even if the property owner fails to connect said service within the 365-day period.
6. Developments bordering planned extensions of major collection lines shown on the Wastewater Master Plan shall install the shown pipe size at the cost of the development subject to the City's standard reimbursement policy specified in the Unified Development Code, Article 7- Section 7.506 – Responsibility for payment of On-Site and Off-Site Installation Costs. The Developer is responsible up to and including pipe sizes of 12-inches, unless deemed necessary by the Director of Utilities to improve efficiency. For larger pipe sizes, the City may participate based on the availability of funds for the difference in cost of material only, subject to approval by the Director of Utilities and City Council.
7. The City may require a larger diameter pipe based on various factors including service area, demand, projected service and historical data.
8. There shall be no connection made to any sanitary sewer main owned by or under the control of the City of Edinburg, or any sanitary sewer main attached to the Edinburg collection system by any person or persons, except authorized agents of the City of

Edinburg. Authorized agents shall be limited to Contractors under contract by the City of Edinburg or private Developer Contractor authorized in writing by the City to perform work.

9. All lots must be serviced with single service stub-outs, including a clean-out located within the property easement. These service locations shall be marked on the curb and the gutter with an "S" not less than 4-inches in size or in a manner approved by the City. Sewer services shall be opposite of water service locations. Also, a magnetic tape must be installed from the point of the stub out extending 12-inches above finished grade of the lot. The tape shall read "SEWER" at intervals on the entire length of the tape.
10. Upon termination of a one-year warranty period, maintenance of all sewer mains located within City right-of-way or public easements shall become the property of the City of Edinburg.
11. Wastewater Lateral Maintenance – The customer shall be responsible for keeping the lateral free of all obstruction from his/her premises to the main wastewater collection line within a public right-of-way or easement. The customer shall be responsible for removing any obstruction (stoppages) that occur within the wastewater lateral up to the property easement or property line. The City will be responsible for keeping all main wastewater collection lines within a public right-of-way or easement free of obstruction subject to other provisions within this Chapter.
12. Manhole spacing shall be in accordance with the Design Criteria for Sewage Systems by the Texas Commission on Environmental Quality (TCEQ) TAC 217 current edition. As allowed by this rule, the City of Edinburg Utilities, shall require manholes spacing at a maximum of 400-feet.
13. All sewer mains and appurtenances shall be tested for exfiltration/infiltration in accordance with Design Criteria for Sewage Systems by the Texas Commission on Environmental Quality (TCEQ) TAC 217, current edition.
14. Sanitary Sewer Testing – Prior to acceptance or connection to City collection system, all testing must be successfully completed. The Engineering Field Inspector must observe all testing including setup, operation, and field results. The Contractor is responsible for all materials, equipment and labor to perform the following:

- a. Infiltration/Exfiltration Limitations: All testing is to comply with the current TCEQ standards. Copies of all test results shall be made available to the Engineering Department. The air test shall conform to the procedure described in ASTM C 828 or other appropriate procedures.
 - b. Deflection Test: All testing is to comply with the current TCEQ standards.
 - c. Video Camera Inspection: The City of Edinburg may perform a video inspection prior to final acceptance of the work. Any defects including, but not limited to, sagging, leakage, infiltration, joint separation, service connection defects or loss of roundness shall require repair in a manner prescribed by the Project Engineer and acceptable to the Director of Utilities.
15. Connection to main sanitary sewer line after the installation of fiberglass manhole requires proper equipment to open existing main line in service. The City's Engineering Inspector must be present during the connection to active sewer lines.
16. Contractor may not enter any manholes without a self-contained breathing apparatus (SCBA), safety harness and tripod. All field personnel must be properly trained in their use.
17. Contractor must provide approved support, shoring, benching and/or shielding with accordance with current OSHA regulations. Failure to provide a safe work environment will result in immediate issuance of a stop work order until hazards are corrected.

B. Design Standards

All sanitary sewer mains must be designed in accordance with Design Criteria for Sewage Systems by the Texas Commission on Environmental Quality (TCEQ) TAC 217, current edition, in regards to design, pipe selection, bedding, protection, capacities, fencing, and access.

C. Materials

Approved material listing is provided on Exhibit "A". Any deviations must be approved in writing by the Director of Utilities. Requests for variations to pre-approved standard materials lists are subject to review by the City's Technical Specification Review

Committee. All pipe, fittings and materials shall be new and in accordance with Standard Specifications:

1. P.V.C. or Polyvinyl Chloride:

a. Gravity Uses:

a. All Depths, SDR26 meeting requirements of ASTM specification D-3034;

b. Sewer Services – SCH40

b. Force mains – DR 21 (Class 200)

c. Rubber gaskets to meet ASTM D-1869, D-361 or C-443.

d. Manhole rings and covers shall have 32" (inch) opening and include the City of Edinburg seal and designated sanitary sewer.

e. Manholes shall be fiberglass – ½" thickness (full length)

2. Pumps for Lift Station shall be equivalent or equal to:

a. Self-priming – refer to Exhibit "A"

b. Submersible – refer to Exhibit "A"

3.05 Connection to Wastewater Collection and Disposal Systems

A. Connection Required

Other than exceptions specified in the Unified Development Code – Division 8.400, Utilities, all subdivisions within the corporate limits and CCN, shall install all sewer lines to City Specifications and connect to the City of Edinburg Sewer Collection and Disposal System.

B. On-Site Sewerage Facilities (OSSF)

1. Only where specific exceptions are noted, OSSF systems shall be permitted in compliance with the requirements of the “Design Criteria for On-Site Sewage Facilities” by the Texas Department of Health and shall require the approval by the Hidalgo County Health Department.
2. Where OSSFs are proposed, the following conditions shall apply:
 - a. Lots greater than net ½ acre (21,780 square feet): OSSF’s may be installed if a sanitary sewer collection system is not available within 400 ft.
3. Single family or multi-family residential dwellings with anticipated wastewater generations of no greater than 5,000 gallons per day must comply with 30 TAC Chapter 285.
4. Proposals for sewerage facility for the disposal of wastewater in the amount of 5,000 gallons per day or greater must comply with 30 TAC Chapter 217.
5. Setback Requirements for OSSF
 - a. Dwelling or property line: 10-ft. minimum
 - b. Water supply, including potable water lines, wells, and cisterns: 150-ft. minimum
 - c. Watercourse: 50-ft. minimum. All systems within the water supply watershed shall meet the standards of the UDC, Section 4.211, Riparian Buffers

C. Organized Sewage Facilities

1. Any proposed organized wastewater collection and treatment systems other than the City of Edinburg must be approved by the Director of Utilities and be permitted by the Texas Commission of Environmental Quality (TCEQ) in accordance with 30 TAC Chapter 305 and 217.
2. Any proposed disposal of wastewater by connecting to an existing permitted facility other than the City of Edinburg must provide a written agreement with the retail public utility. The agreement must demonstrate that:

- a. The retail public utility has or will have the ability to treat the total flow anticipated from the ultimate development and occupancy of the proposed subdivision for a minimum of 30 years.
- b. The subdivider has paid the cost of all fees associated with connection to the wastewater collection and treatment system so that service is available to each lot upon completion of construction of the wastewater facilities described on the final plat. Engineering plans for the proposed wastewater collection system must comply with 30 TAC Chapter 217.

D. Prohibited Systems

1. Pit privies and portable toilets are prohibited. Onsite sewerage facilities that do not meet wastewater treatment standards as developed by TECQ as set out in 30 TAC Chapter 285 are prohibited.

3.06 Approved Materials Listing – See Exhibit “A”

3.07 Sample Reimbursement Contract – See Exhibit “B”

3.08 Standard Water and Sewer Details

The following details show the adopted standards required by the City which are included at the end of this section:

Water Distribution System:

- W-1** Single Water Service Connection Details
- W-1A** Single Water Service Connection Details Alternative
- W-2** Double Water Service Connection Details
- W-2A** Double Water Service Connection Details Alternative
- W-3** Meter Service Detail
- W-4** Water Standard Pipe Bedding Details
- W-5** Thrust Blocks Details
- W-6** Water Line Adjustment Detail
- W-7** Fire Hydrant Installation Detail
- W-8** Valve and Valve Box Detail
- W-9** Typical Air Release Valve Installation Details
- W-10** Flush Valve Detail

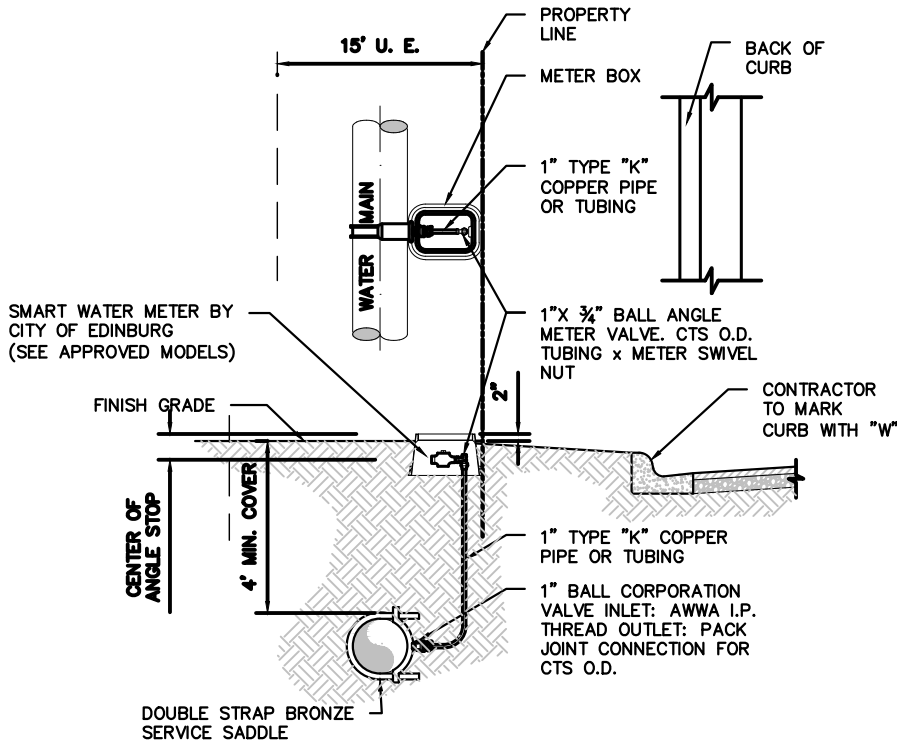
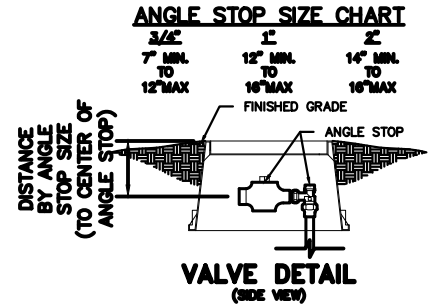
- W-11** Commercial Cast Iron Meter Cove Detail
- W-12** Residential Oval Plastic Meter Cover Detail
- W-13** Water Tapping Sleeve and Valve Installation on Larger Pipe
- W-14** Same Size Water Tapping Sleeve and Valve Installation
- W-15** Method for filling New Water Line Prior to Chlorination and Testing
- W-16** Meter Vault Detail
- W-17** Blow Off/ Temporary Flush Out

Sanitary Sewer Collection System:

- S-1** Residential Sanitary Sewer Service Details
- S-2** Multifamily and Commercial Sanitary Sewer Service Details
- S-3(A)** Monolithic Fiberglass Manhole Details
- S-3(B)** Monolithic Fiberglass Manhole Details
- S-4** Shallow Service Connection Detail
- S-5** Deep Service Connection Detail
- S-6** Double Deep Service Connection Detail
- S-7** Sewer Standard Pipe Bedding Details
- S-8** Utility Crossing at Existing Street Detail
- S-9** Utility Line Bore Detail
- S-10** Drain Ditch Crossing Section
- S-11** Sewage Air Release Valve Detail
- S-12** Manhole Cover Details
- S-13** Force Main Discharge Manhole Detail

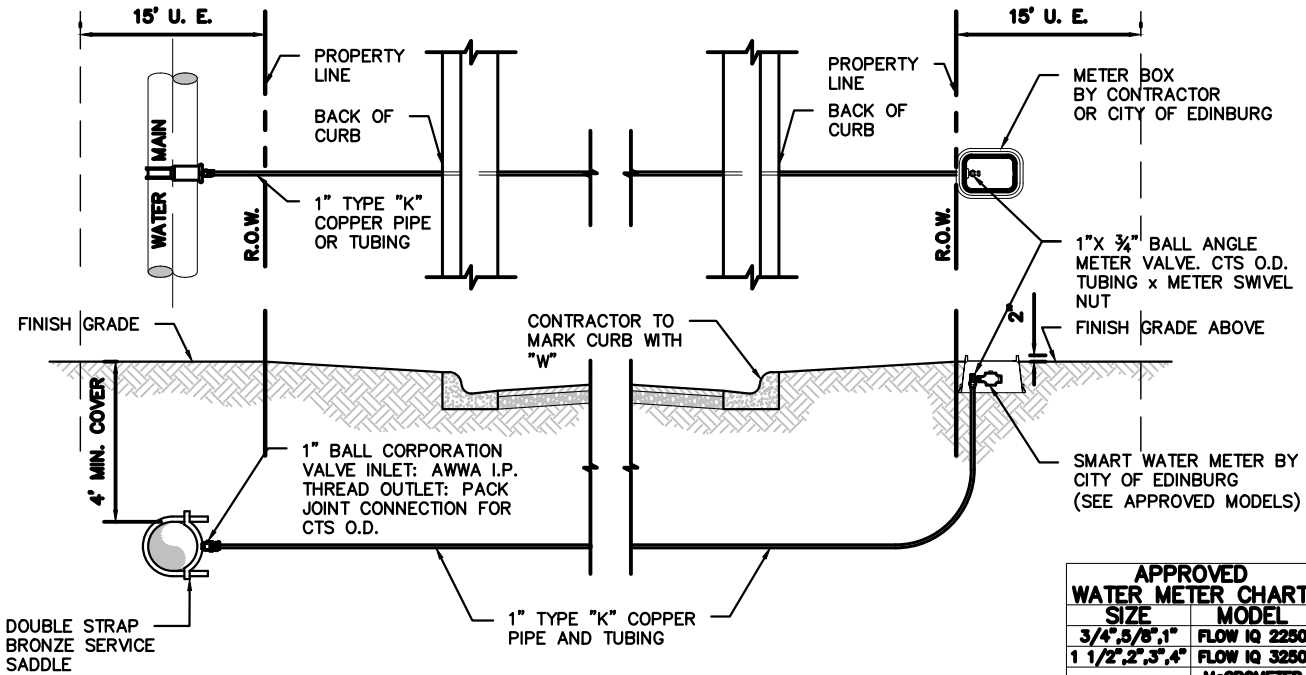
NOTES:

- FOR MORE THAN FOUR-PLEX OR FOUR COMMERCIAL BUILDING USE 4" GATE VALVE WITH BOX. SEE BELOW OPTIONS:
 - 4" TYPE "K" COPPER ENCASED IN 8" PVC.
 - 4" C900 DR18 WITH 4"x2" BRASS CAP AND 2" TEE, ALL WELDED BY A REGISTER WELDER.
- 4' MIN. COVER FOR WATER MAINS 5' MIN. FOR ALL ARTERIAL OR GREATER CLASSIFICATIONS
- COMMERCIAL INSTALLATIONS TO BE 2" SINGLE SERVICE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
- METER BOX TO BE 12" BACK OF PROPERTY LINE.
- ALL NUTS AND BOLTS MUST BE GREASED WITH FOOD GRADE GREASE.



TYPICAL SINGLE WATER SERVICE CONNECTION

(NEAR SIDE)



TYPICAL SINGLE WATER SERVICE CONNECTION

(FAR SIDE)

APPROVED WATER METER CHART	
SIZE	MODEL
3/4", 5/8", 1"	FLOW IQ 2250
1 1/2", 2", 3", 4"	FLOW IQ 3250
6" AND UP	McCROMETER ULTRA-MAG

W-1

**SINGLE WATER SERVICE CONNECTION
DETAILS**

SCALE: N.T.S.

REVISED: R.H.

DATE: MAY, 2022

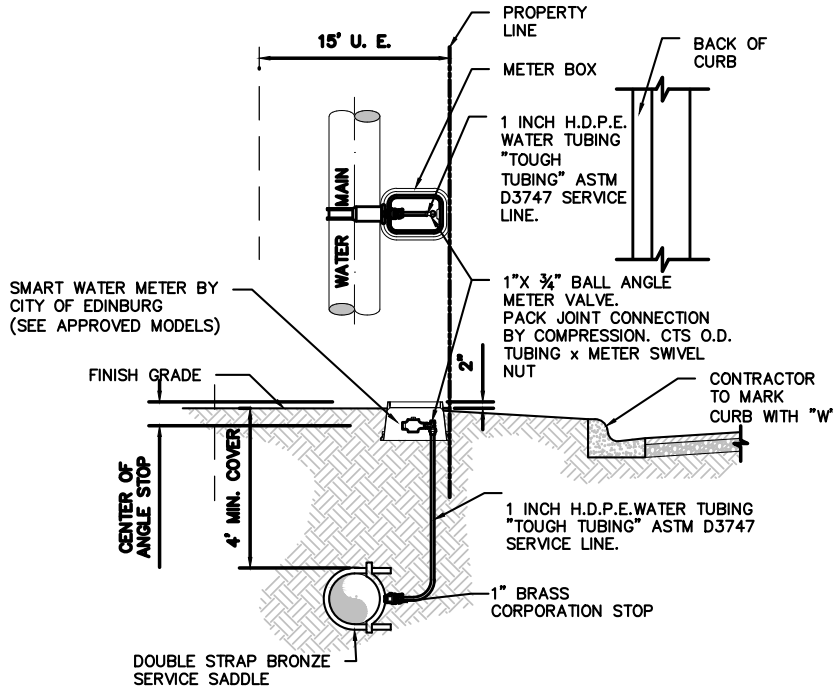
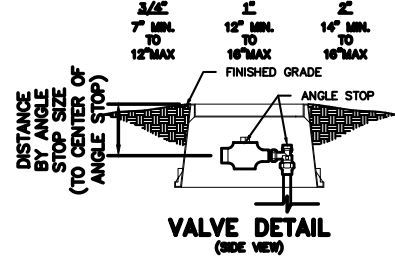
DRAWN BY: G.R.

THE CITY OF
Edinburg

NOTES:

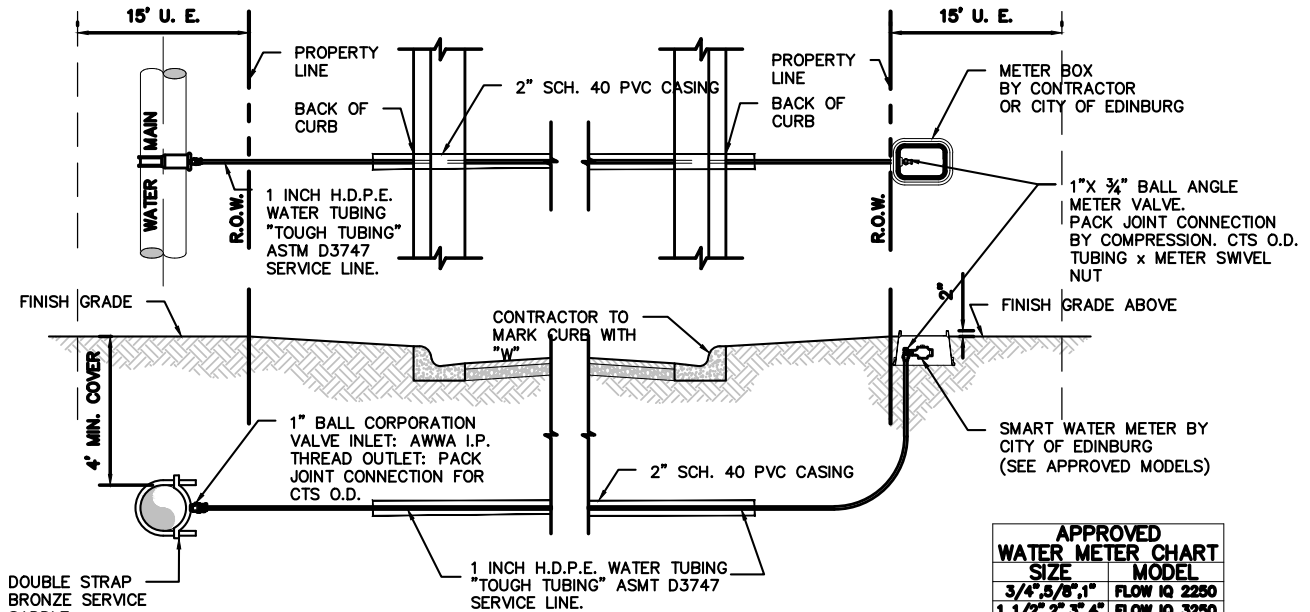
- FOR MORE THAN FOUR-PLEX OR FOUR COMMERCIAL BUILDING USE 4" GATE VALVE WITH BOX. SEE BELOW OPTIONS:
 - 4" TYPE "K" COPPER ENCASED IN 8" PVC.
 - 4" C900 DR18 WITH 4"x2" BRASS CAP AND 2" TEE, ALL WELDED BY A REGISTER WELDER.
- 4' MIN. COVER FOR WATER MAINS 5' MIN. FOR ALL ARTERIAL OR GREATER CLASSIFICATIONS
- COMMERCIAL INSTALLATIONS TO BE 2" SINGLE SERVICE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
- METER BOX TO BE 12" BACK OF PROPERTY LINE.
- ALL NUTS AND BOLTS MUST BE GREASED WITH FOOD GRADE GREASE.

ANGLE STOP SIZE CHART



TYPICAL SINGLE WATER SERVICE CONNECTION

(NEAR SIDE)



TYPICAL SINGLE WATER SERVICE CONNECTION

(FAR SIDE)

APPROVED WATER METER CHART	
SIZE	MODEL
3/4", 5/8", 1"	FLOW IQ 2250
1 1/2", 2", 3", 4"	FLOW IQ 3250
6" AND UP	McCROMETER ULTRA-MAG

W-1A

**SINGLE WATER SERVICE CONNECTION
DETAILS ALTERNATIVE**

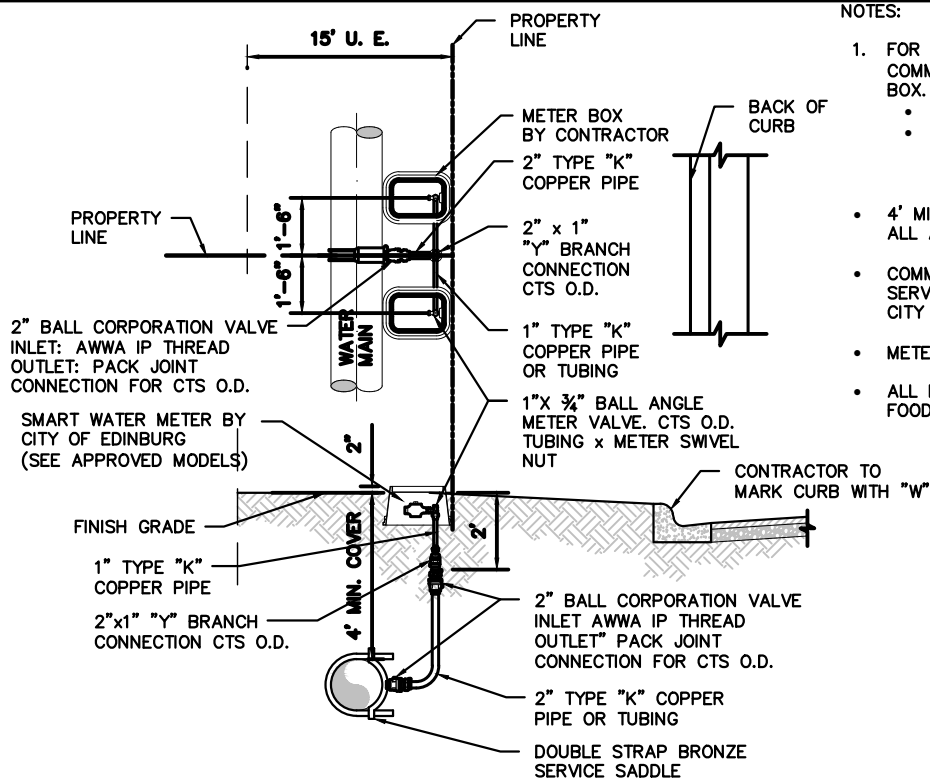
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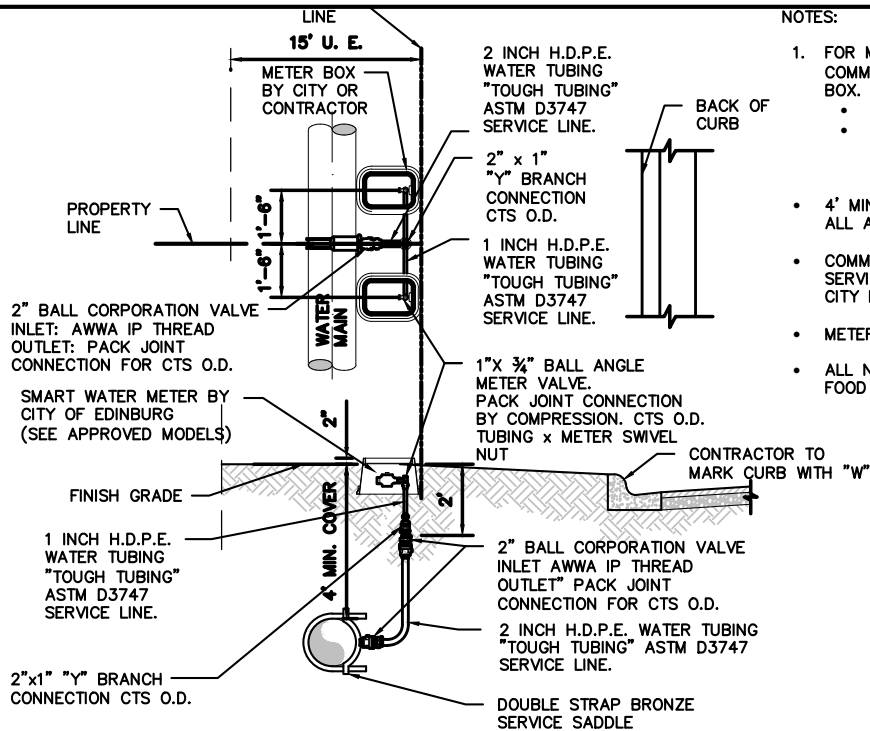
REVISED: R.H.

DATE: MAY, 2022

DRAWN BY: G.R.

**THE CITY OF
Edinburg**

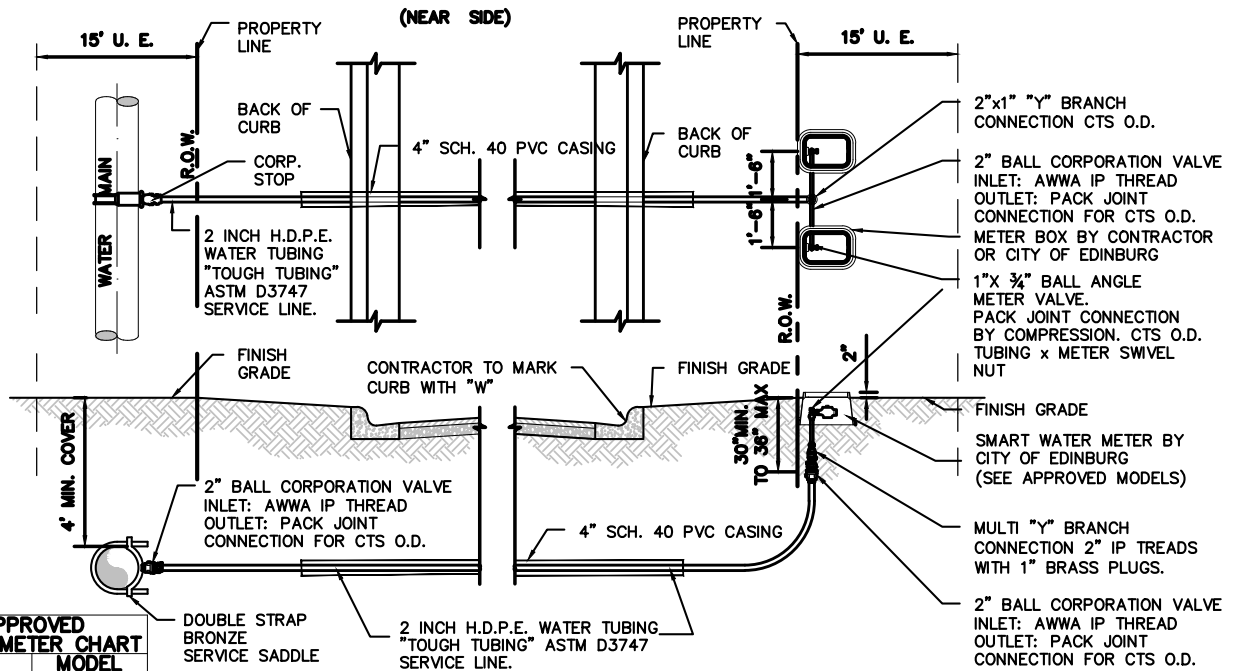




NOTES:

- FOR MORE THAN FOUR-PLEX OR FOUR COMMERCIAL BUILDING USE 4" GATE VALVE WITH BOX. SEE BELOW OPTIONS:
 - 4" TYPE "K" COPPER ENCASED IN 8" PVC.
 - 4" C900 DR18 WITH 4"x2" BRASS CAP AND 2" TEE, ALL WELDED BY A REGISTER WELDER.
- 4" MIN. COVER FOR WATER MAINS 5' MIN. FOR ALL ARTERIAL OR GREATER CLASSIFICATIONS
- COMMERCIAL INSTALLATIONS TO BE 2" SINGLE SERVICE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
- METER BOX TO BE 12" BACK OF PROPERTY LINE.
- ALL NUTS AND BOLTS MUST BE GREASED WITH FOOD GRADE GREASE.

TYPICAL DOUBLE WATER SERVICE CONNECTION



APPROVED WATER METER CHART	
SIZE	MODEL
3/4", 5/8", 1"	FLOW IQ 2250
1 1/2", 2", 3", 4"	FLOW IQ 3250
6" AND UP	MO-CROMETER ULTRA-MAG

TYPICAL DOUBLE WATER SERVICE CONNECTION

(FAR SIDE)

W-2A

DOUBLE WATER SERVICE CONNECTION DETAILS ALTERNATIVE

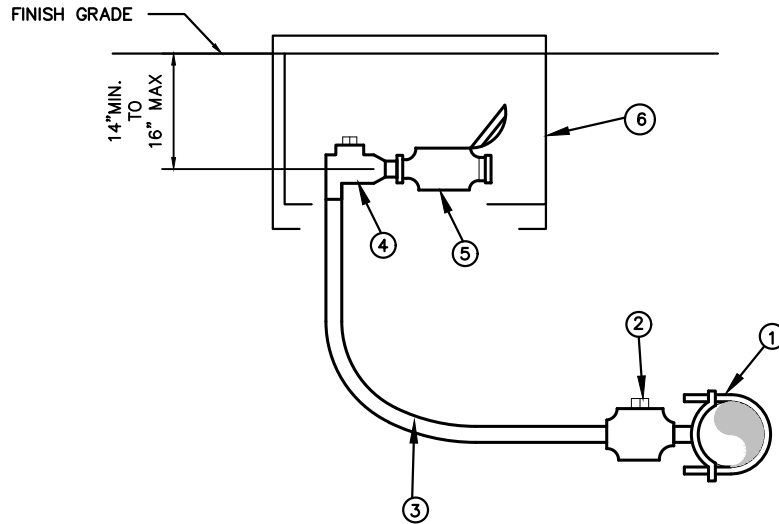
SCALE: N.T.S.

REVISED: R.H.

DATE: MAY, 2022

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2" METER SERVICE

1. X" x 2" DOUBLE STRAP BRASS SADDLE
2. 2" BALL CORP. MIPX C.T.S.
3. 2" COPPER TUBING TYPE "L"
4. 2" BRASS ANGLE STOP
5. WATER METER NY CITY OF EDINBURG
6. LARGE C.I. METER BOX WILL BE PROVIDED BY CITY OF EDINBURG.
7. METER BOX TO BE 12" BACK OF PROPERTY LINE.
8. ALL NUTS AND BOLTS MUST BE GREASED WITH FOOD GRADE GREASE.

* ALL WATER METERS 4" AND ABOVE SHALL BE PLACED IN A CONCRETE METER VAULT APPROVED BY THE CITY OF EDINBURG.

W-3

METER SERVICE DETAIL

SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.



WHEN UTILITY LOCATED WITHIN CITY ROW, ALL BACK FILL IS SUBJECT
TO INSPECTION AND APPROVAL BY THE CITY ENGINEER'S OFFICE



BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

ALL EXISTING/ACTIVE STREET CROSSING SHALL REQUIRE SAND
BACKFILL OF ENTIRE TRENCH. (SEE DETAIL S-6)

STANDARD PIPE BEDDING (MAIN ONLY)

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

W-4

WATER STANDARD PIPE BEDDING DETAILS

DRAWN BY: G.R./RMM



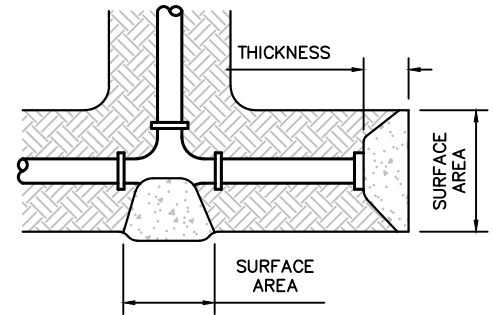
THRUST BLOCK SIZE			
HORIZONTAL BENDS			
DIAMETER OF PIPE IN INCHES	SURFACE AREA SQ. FT.	THICKNESS IN INCHES	WEIGHT AT VERTICAL BENDS—LBS.
22-1/2° BENDS			
6 OR LESS	2	8	1,700
8	3	12	3,000
10	3.5	12	4,500
12	4	14	6,600
14	5	18	9,000
16	6	18	11,800
45° BEND			
6 OR LESS	4	12	3,200
8	5	14	5,800
10	6	18	9,000
12	7	18	13,000
14	8	24	17,000
16	11.5	24	23,200
90° BEND			
6 OR LESS	6	12	6,000
8	8	15	10,700
10	10	18	16,700
12	12	18	24,000
14	18	24	32,600
16	21	24	42,700
TEES & DEAD ENDS			
6 OR LESS	3	12	---
8	4	15	---
10	6	18	---
12	8.5	18	---
14	11.5	24	---
16	15	24	---

NOTE:

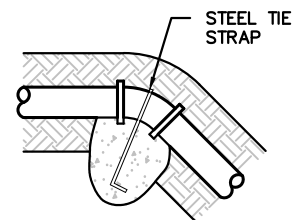
ALL VALUES SHOWN ARE MIN. FOR A HYDROSTATIC PRESSURE OF 150 PSI AND A SOIL RESISTANCE OF 2,000 LBS PER SQ. FT. WITH PIPELINE HAVING A MIN. OF 3 FT. OF COVER WITH CURB AND GUTTER AND A 5 FT. MIN. WITHOUT CURB AND GUTTER

THRUST BLOCKS DETAILS

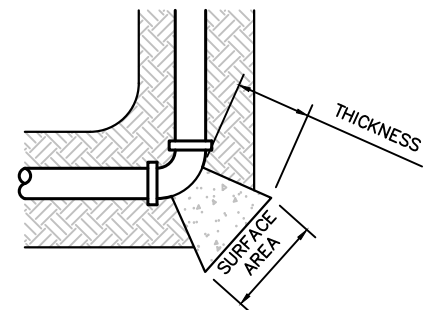
NOTE: SEE THRUST BLOCK SIZE CHART FOR PROPER THICKNESS AND SURFACE AREAS



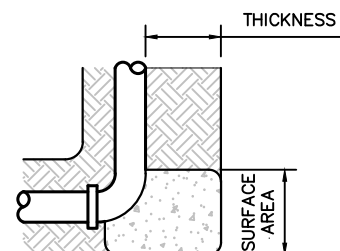
TEES & DEAD ENDS



VERTICAL BENDS



HORIZONTAL BENDS



HYDRANT BURYS

W-5

THRUST BLOCKS DETAILS

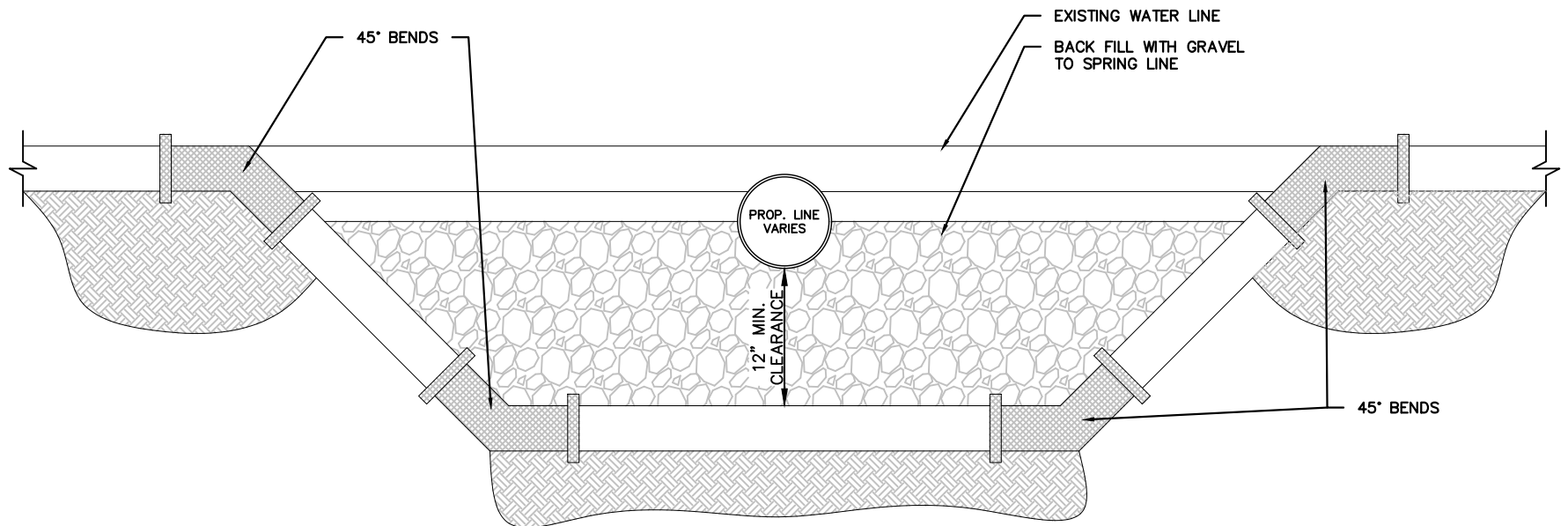
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.

THE CITY OF
Edinburg



NOTE:
ALL BENDS AND JOINTS MUST BE SUPPORTED BY
A CONCRETE THRUST BLOCK. APPROVED EQUAL, OR
AS DIRECTED BY ENGINEER.

WATER AND SANITARY SEWER CROSSINGS MUST
MEET TCEQ STANDARDS.

W-6

WATER LINE ADJUSTMENT DETAIL

SCALE: N.T.S.

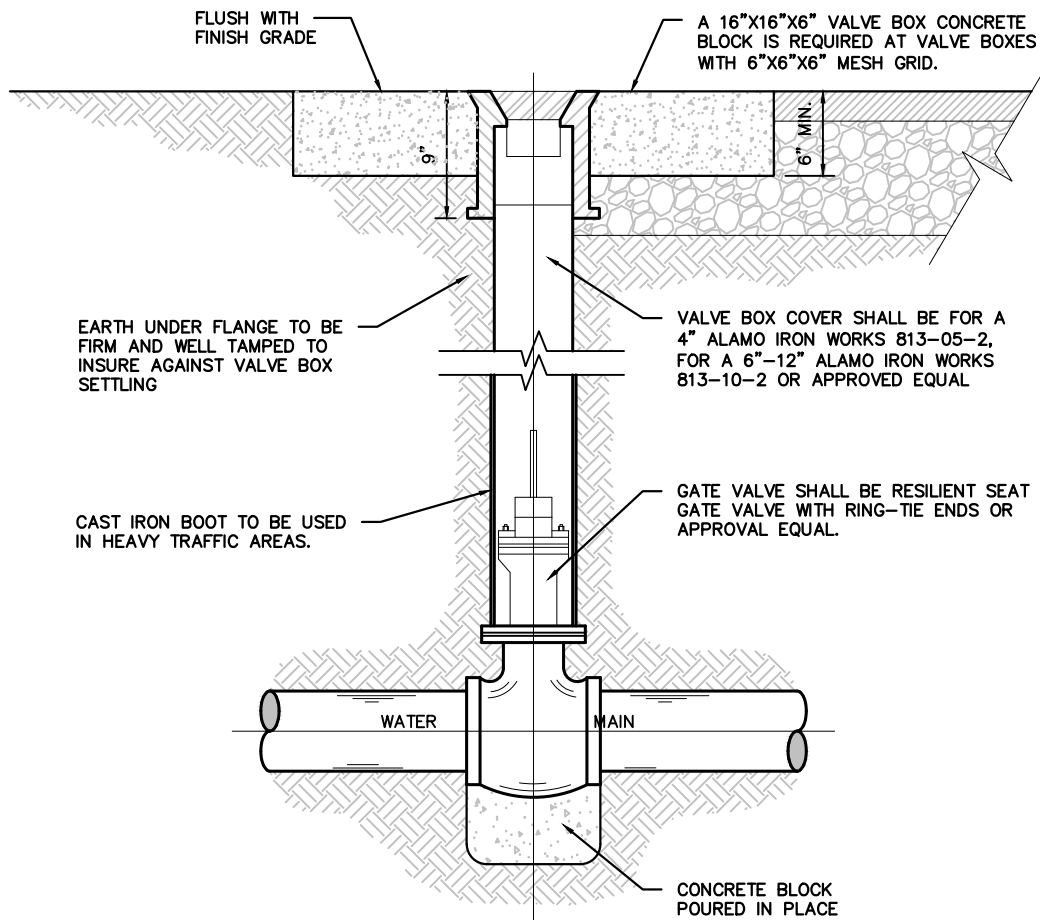
DATE: OCTOBER 2021

REVISED: R.H.

DRAWN BY: G.R.







TYPICAL VALVE AND VALVE BOX INSTALLATION ON MAIN LINE

MUELLER (A-2360 SERIES) OR AMERICAN FLOW CONTROL (AFC-2500) ONLY

NOTE: ALL FITTINGS TO BE GREASED
AND WRAPPED IN PLASTIC.

W-8

VALVE AND VALVE BOX DETAILS

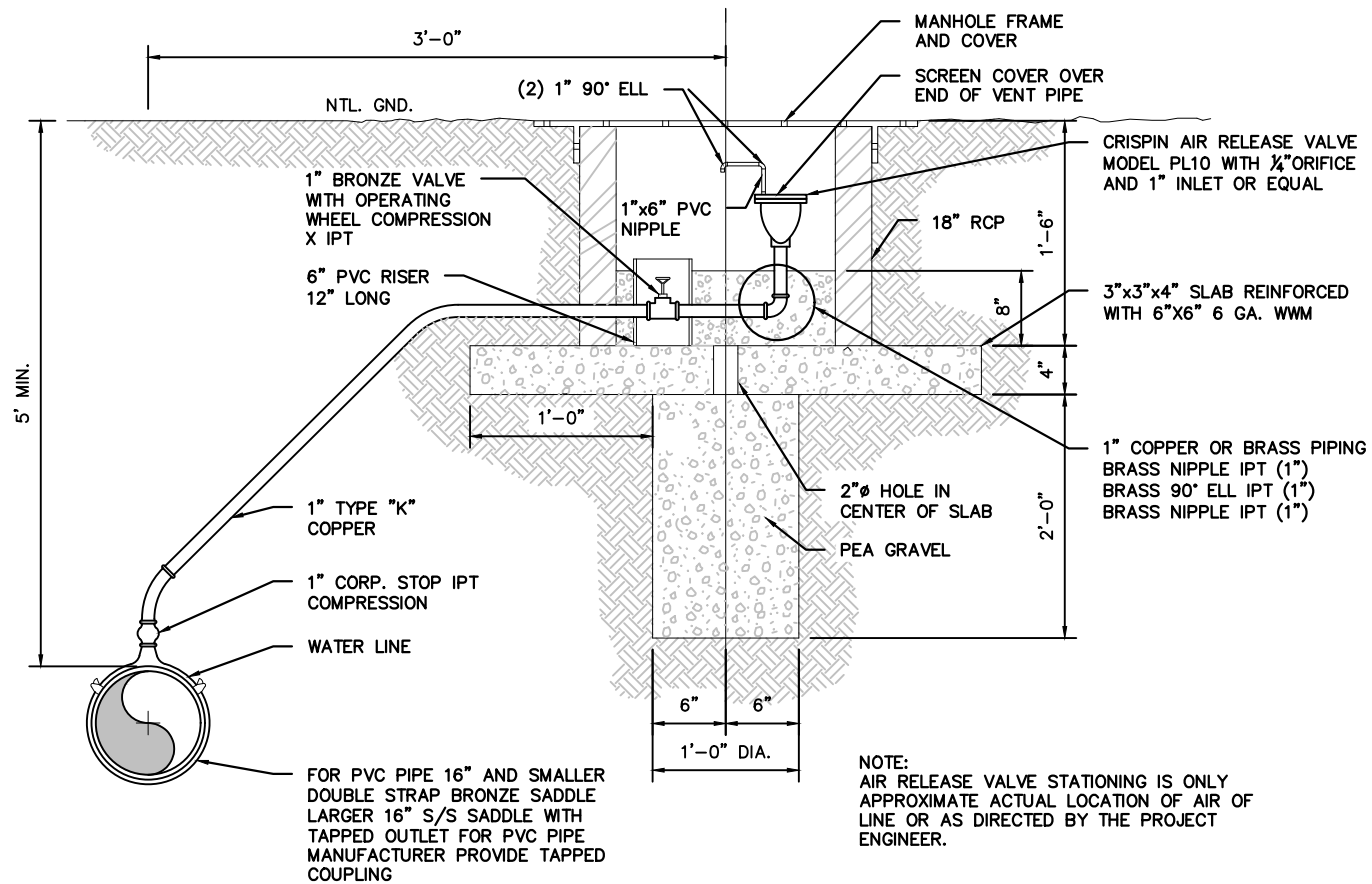
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REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





TYPICAL AIR RELEASE VALVE INSTALLATION DETAIL

W-9

TYPICAL AIR RELEASE VALVE
INSTALLATION DETAIL

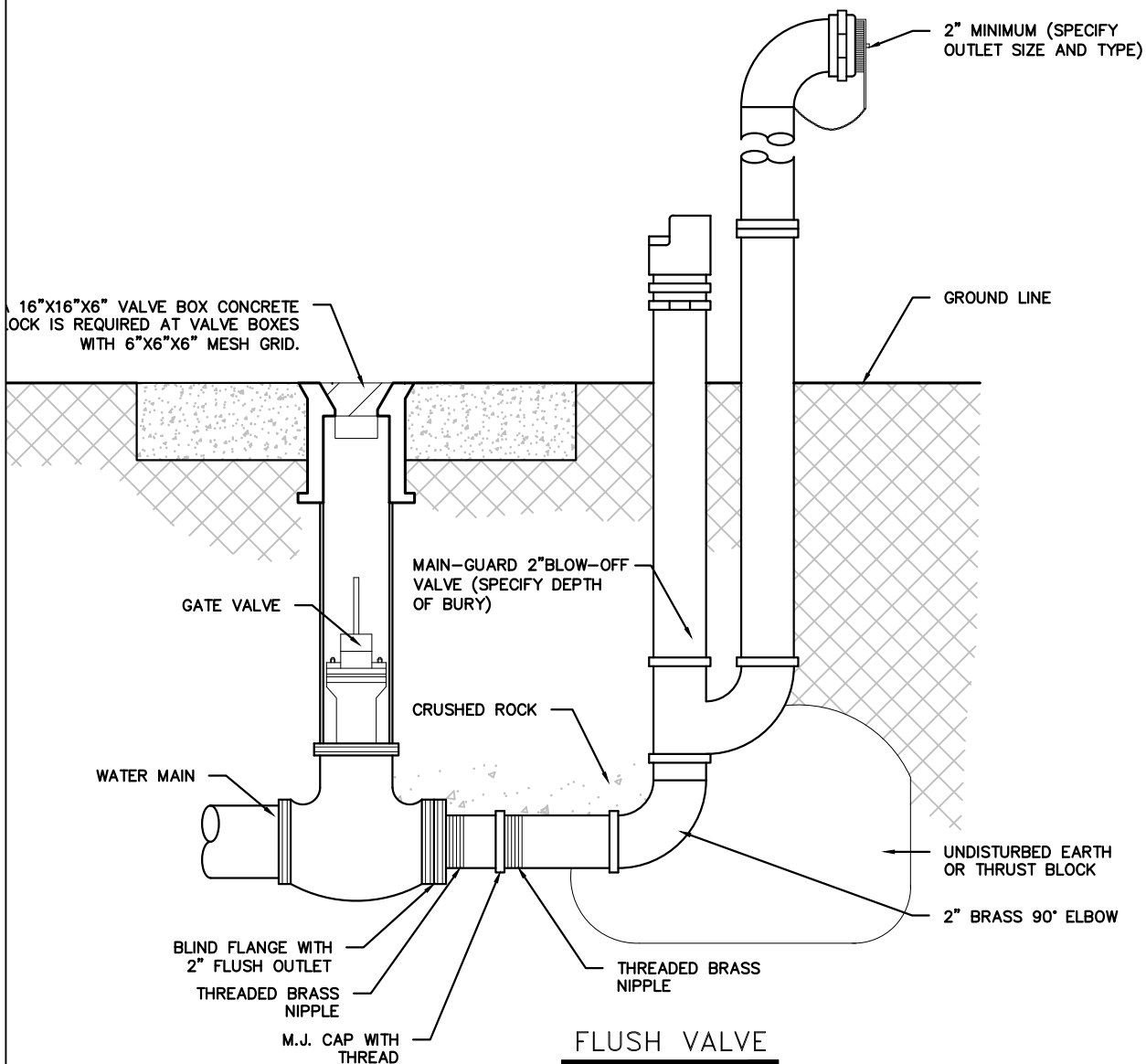
SCALE: N.T.S.

DATE: OCTOBER 2021

REVISED: R.H.

DRAWN BY: G.R.





POST HYDRANT SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 5' MIN. DEPTH OF BURY. THESE FLUSH VALVES WILL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD AND SHALL OPEN TO THE LEFT. ALL WORKING PARTS SHALL BE BRONZE TO BRONZE DESIGN AND BE SERVICEABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND DIGGING, THE OUTLET SHALL ALSO BE BRONZE AND BE 1 1/2" NST. FLUSH VALVES SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO. ST. LOUIS, MO. OR APPROVED EQUAL.

W-10

FLUSH VALVE DETAIL

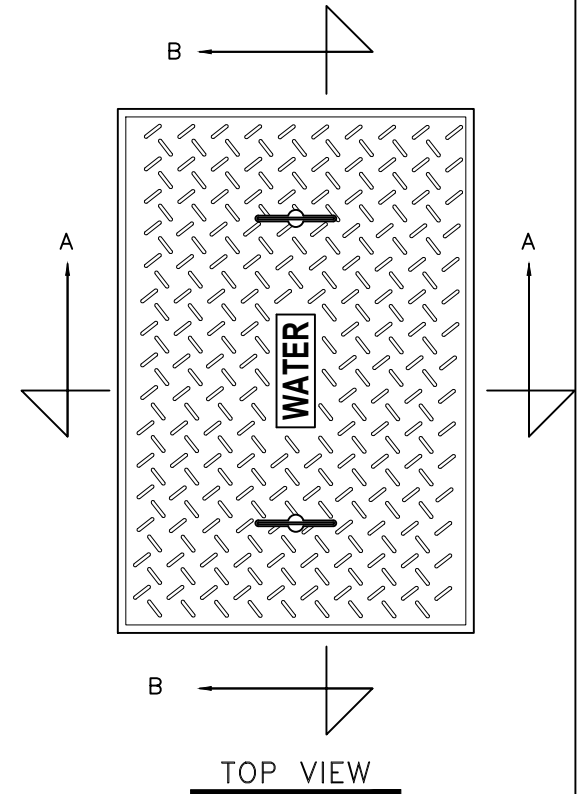
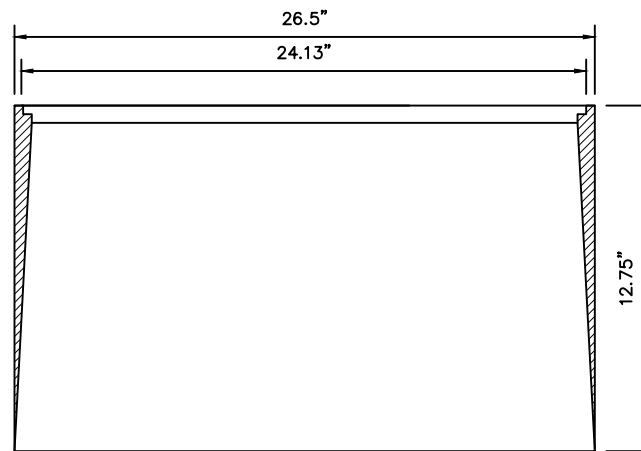
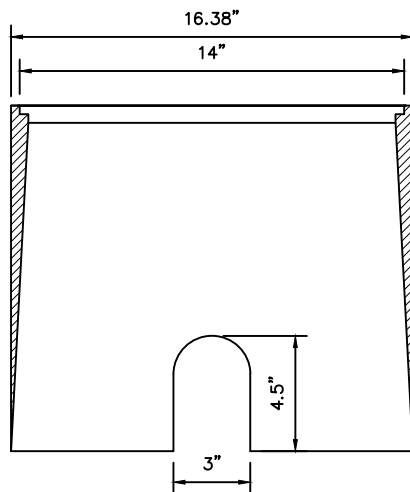
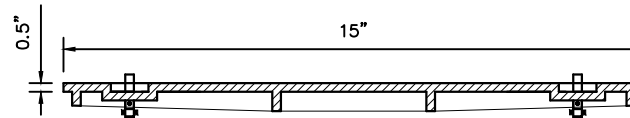
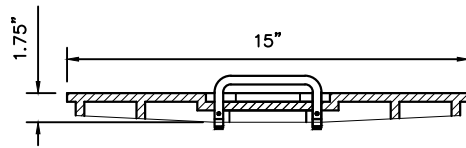
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





SECTION A-A

SECTION B-B

CAST IRON METER

NOTES:

A. MATERIAL — CAST IRON
PER ASTM A48 CLASS 30B

B. LIFT HANDLE — $\frac{3}{8}$ " DIA.
STEEL STANDARD.

C. DIMENSIONS IN INCHES.

W-11

COMMERCIAL CAST IRON
METER COVER DETAIL

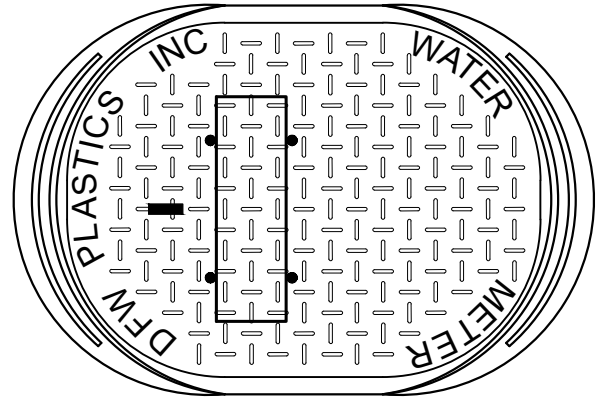
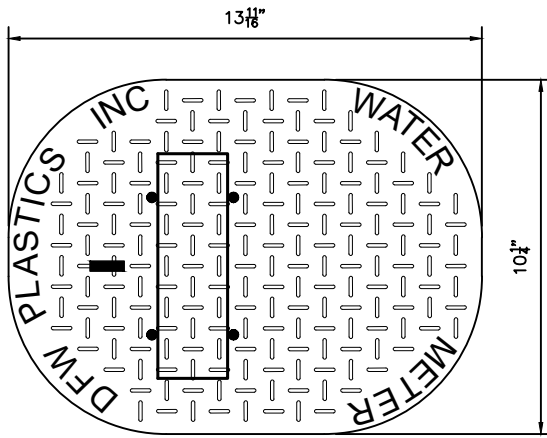


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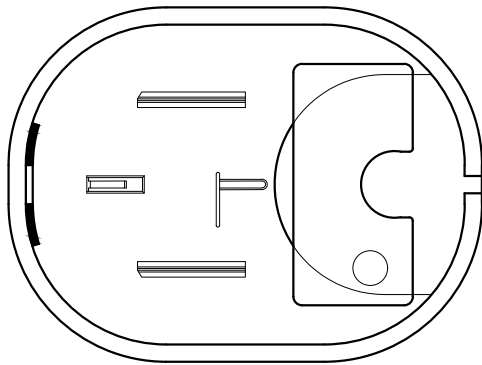
REVISED: R.H.

DATE: OCTOBER 2021

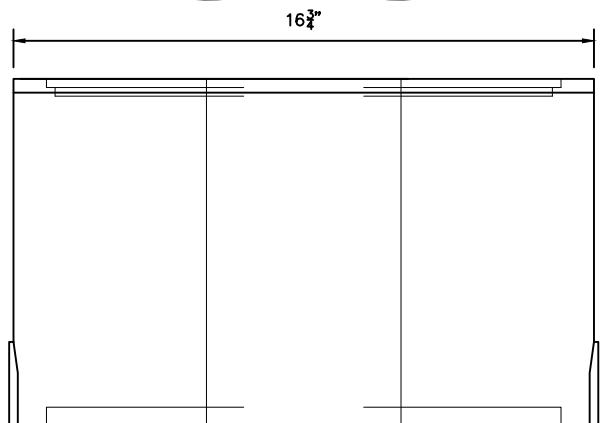
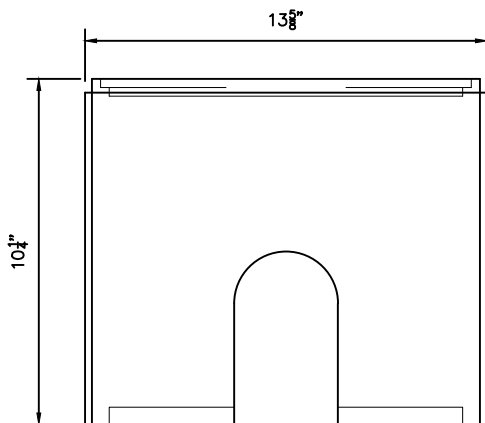
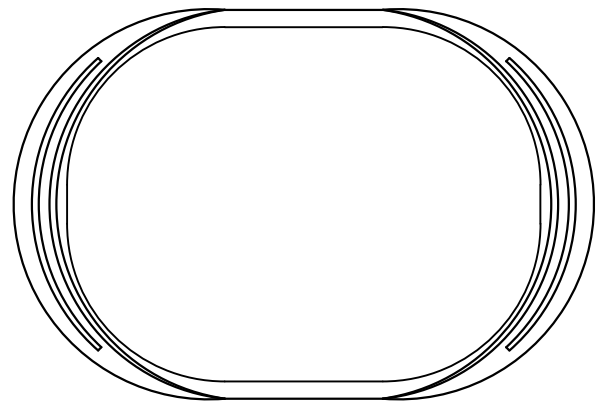
DRAWN BY: G.R.



DFW1017-10-1A



DFW1017-1A-LID



DFW1017-10-BODY

NOTES:

1. DIM'S +/- 1/8" U.N.O.
2. SNAP LOCK POCKET WILL RECEIVE

W-12

RESIDENTIAL OVAL PLASTIC
METER COVER – DETAILS

SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.



CONSTRUCTION NOTES:

1. ALL CONCRETE TO HAVE A MINIMUM OF 28 DAYS COMPRESSIVE STRENGTH OF 3,000 P.S.I.

CONSTRUCTION NOTES:

A. WATER MAIN (SEE PLANS AND SPECIFICATIONS).

B. TAPPING SLEEVE (SIZE AS REQUIRED).

C. CONCRETE SUPPORT UNDER TAPPING SLEEVE AND BEHIND.

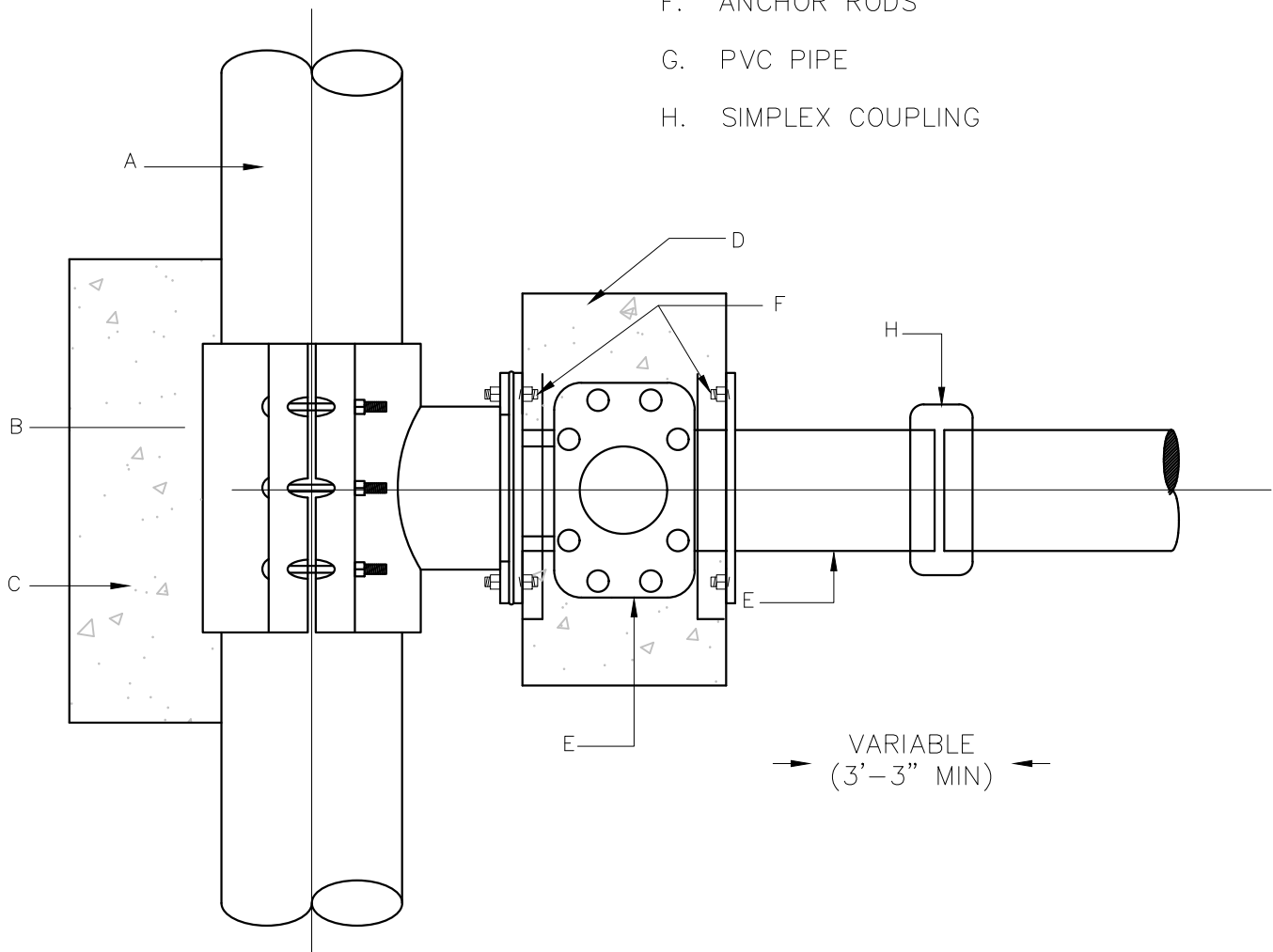
D. THRUST BLOCK AS PER SPECIFICATIONS.

E. FLANGED AND HUB ENDS "O" RING SEALS WITH 2" SQUARE WRENCH NUT GATE VALVE.

F. ANCHOR RODS

G. PVC PIPE

H. SIMPLEX COUPLING



W-13

WATER TAPPING SLEEVE AND VALVE
INSTALLATION ON LARGER PIPE

SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.

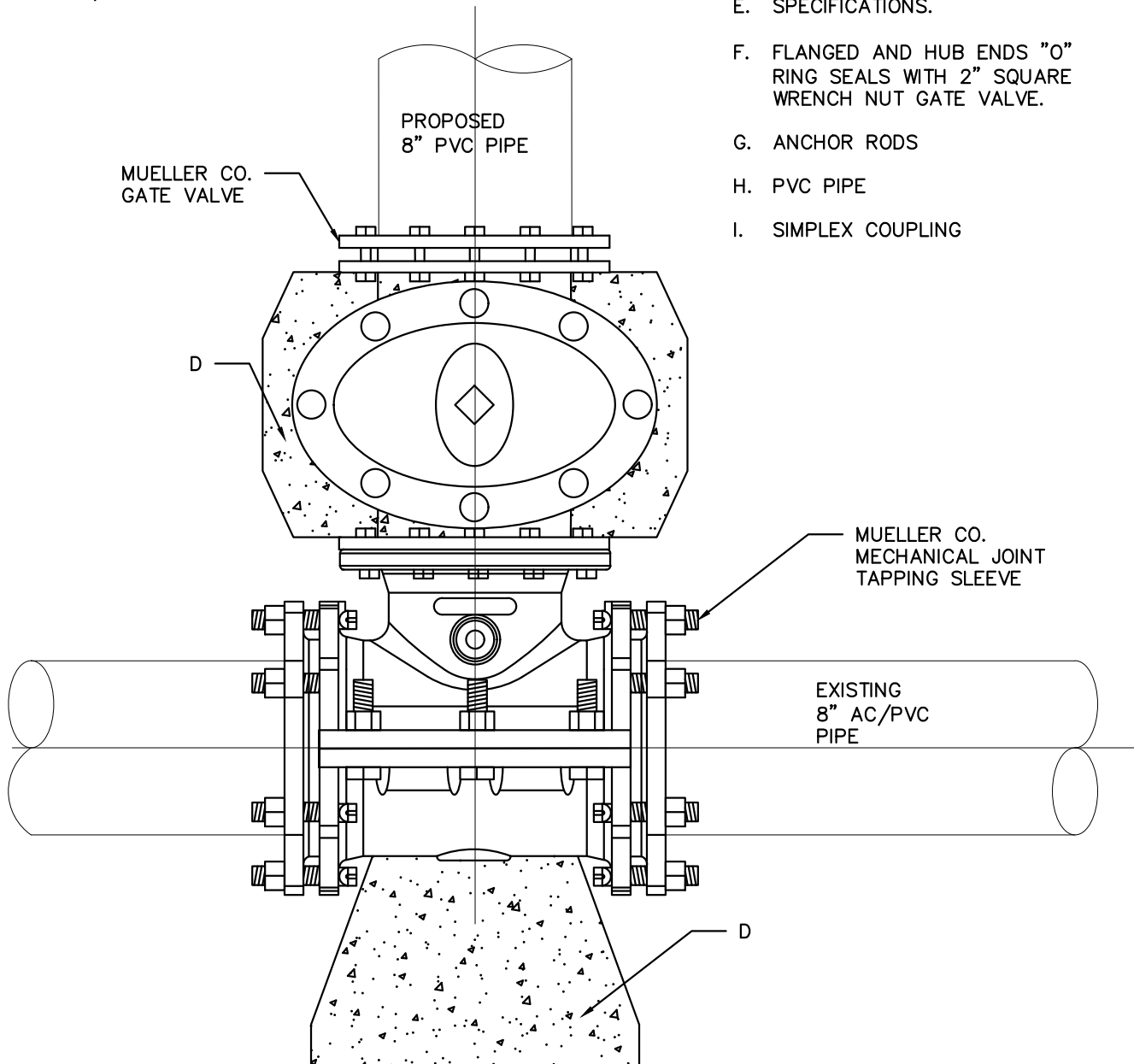
THE CITY OF
Edinburg

CONSTRUCTION NOTES

CONSTRUCTION NOTES

1. ALL CONCRETE TO HAVE A MINIMUM OF 28 DAYS COMPRESSIVE STRENGTH OF 3,000 PSI

- A. WATER MAIN (SEE PLANS AND SPECIFICATIONS).
- B. TAPPING SLEEVE (SIZE AS REQUIRED).
- C. CONCRETE SUPPORT UNDER TAPPING SLEEVE AND BEHIND.
- D. THRUST BLOCK AS PER
- E. SPECIFICATIONS.
- F. FLANGED AND HUB ENDS "O" RING SEALS WITH 2" SQUARE WRENCH NUT GATE VALVE.
- G. ANCHOR RODS
- H. PVC PIPE
- I. SIMPLEX COUPLING



W-14

SAME SIZE WATER TAPPING SLEEVE
AND VALVE INSTALLATION

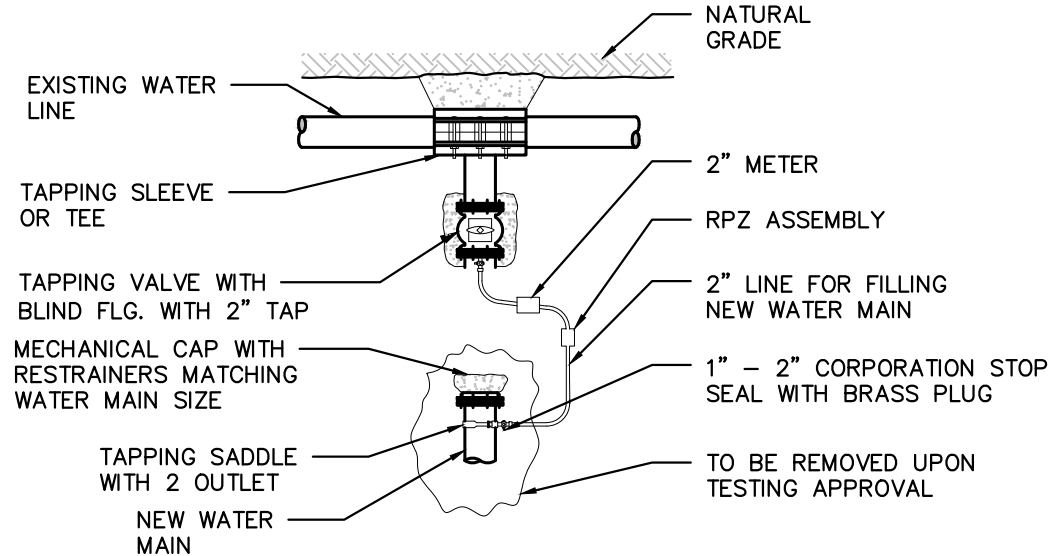
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.

THE CITY OF
Edinburg



METHOD FOR FILLING NEW WATER LINES PRIOR TO CHLORINATION AND TESTING

NOTES:

1. THIS METHOD SHALL ALSO BE USED AT A NEW CONNECTION TO AN EXISTING DEAD END LINE.
2. AFTER THE NEW LINE HAS BEEN DISINFECTED AND PRESSURIZED, THE VALVE AT THE CONNECTION TO THE EXISTING LINE SHALL BE OPENED (BY CITY OF EDINBURG) TO FLUSH OUT THE SUPER CHLORINE.
3. 2" METERED TAP SHALL BE PAID BY DEVELOPER, CONTRACTOR OR CUSTOMER.

W-15

METHOD FOR FILLING NEW WATER LINES PRIOR TO CHLORINATION AND TESTING

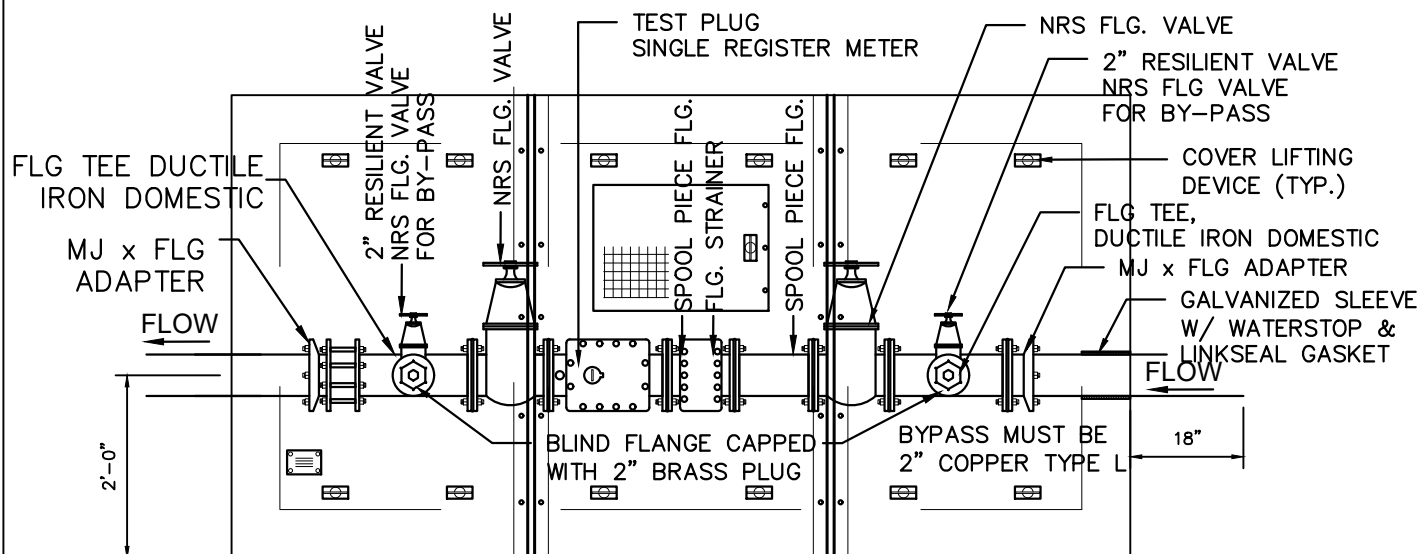
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DATE: MAY, 2022

REVISED: R.H.

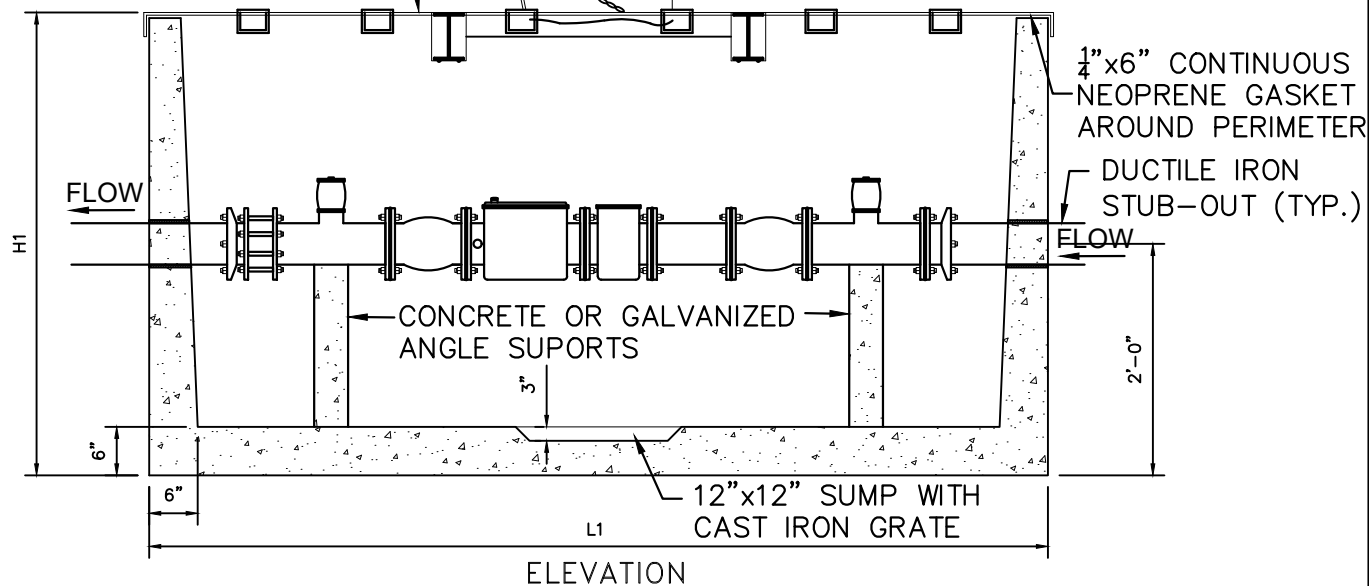
DRAWN BY: G.R./RMM





RAISED PLATE SECTIONAL STEEL COVER WITH 24"x24" HINGED MANWAY HOT DIPPED GALVANIZED AFTER FABR. PER CITY OF EDINBURG SPECIFICATIONS.

MODEL	SIZE	BY PASS	L1	W1	H1	WEIGHT LBS
DMCCOH3	3"	2"	11'-6"	6'-0"	4'-3"	14,500
DMCCOH4	4"	2"	11'-6"	6'-0"	4'-3"	15,000
DMCCOH6	6"	4"	13'-6"	6'-0"	4'-3"	15,500



SPECIFICATIONS:

CONCRETE: Class 1 concrete with design strength of 4500 PSI at 28 days. Unit of monolithic construction at floor and first stage of wall with sectional riser to required depth.

REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

STEEL COVER: All steel fabrication shall be in accordance to AWA D1.1. Steel shall be ASTM A36 carbon steel, and hot dipped galvanized after fabrication in accordance to ASTM A 123. Standard cover is rated for 50 PSF.

ENGINEERING DATA: The meter assembly shall be factory assembled in vault & hydrostatically tested prior to delivery. Field excavation & preparation shall be complete prior to delivery. Pipe, valves and fittings of the assembly shall be approved by one or more of the following associations: American Water Works Association, Underwriters Laboratories, Uniform Plumbing Code, American Society of Sanitary Engineering.

W-16

METER VAULT DETAILS

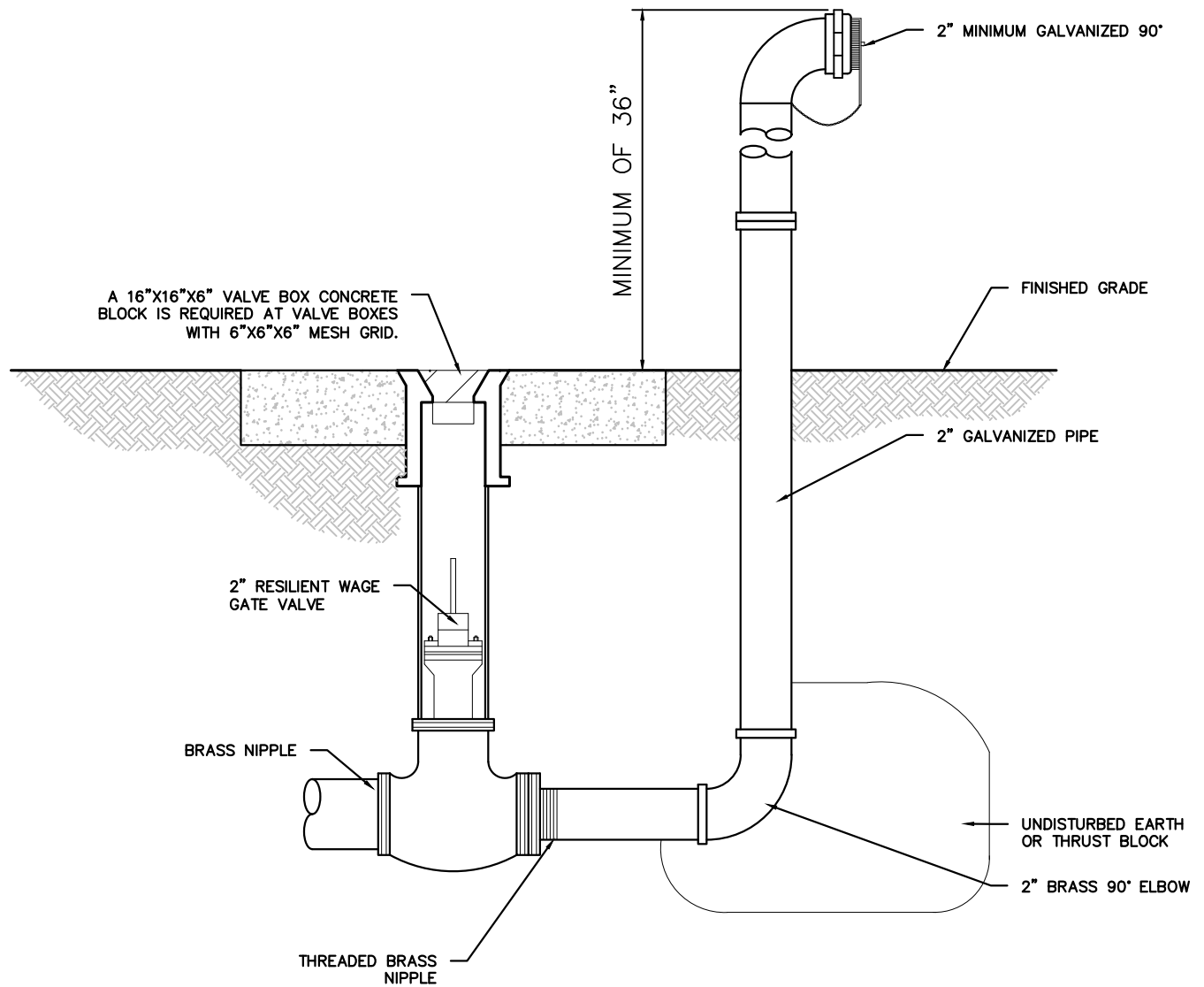


SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.



BLOW OFF/TEMPORARY FLUSH OUT

CONSTRUCTION NOTES:

1. ALL MATERIALS TO BE DOMESTIC.

W-17

BLOW OFF/ TEMPORARY FLUSH OUT

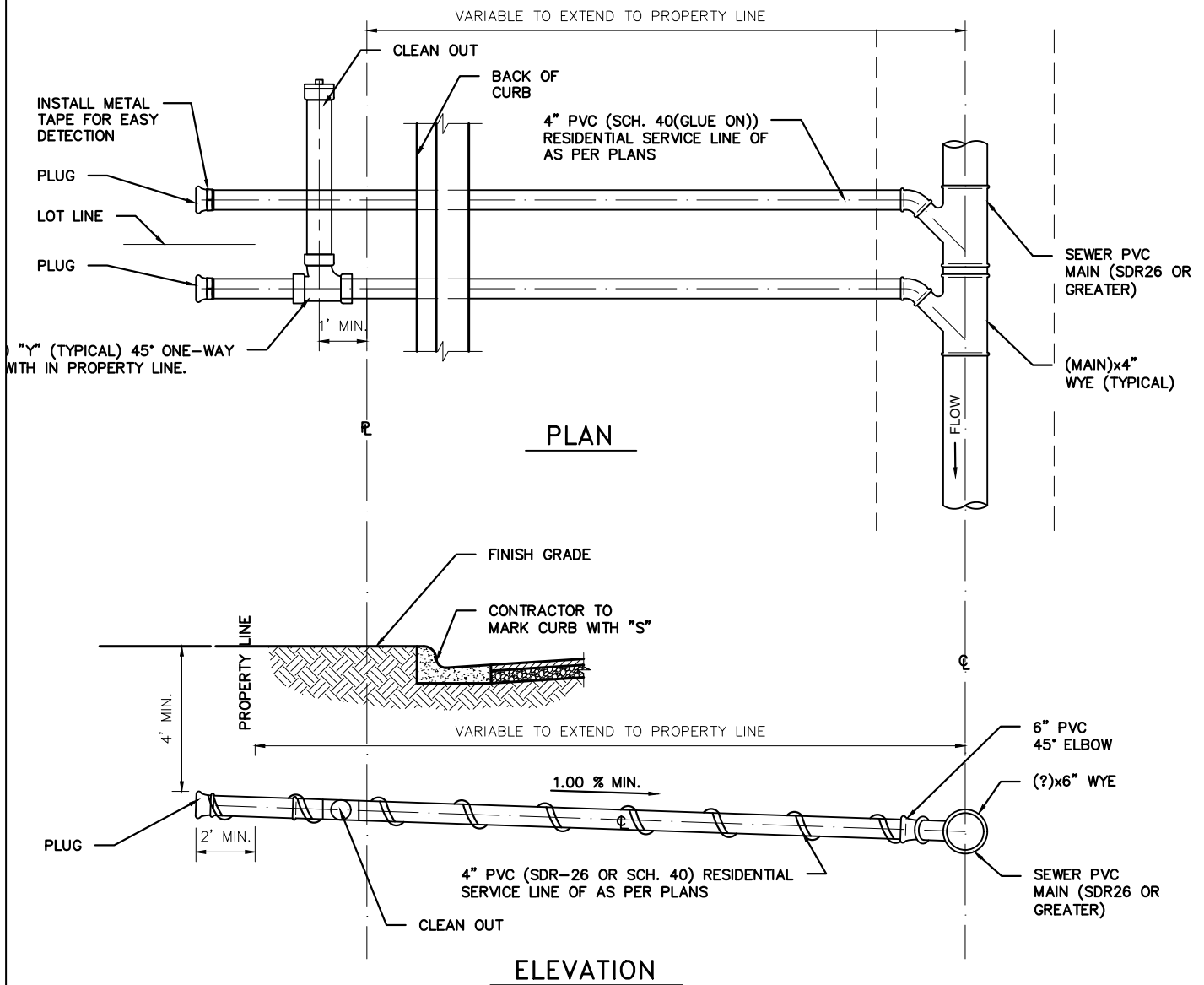
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.

THE CITY OF
Edinburg



TYPICAL RESIDENTIAL SEWER SERVICE LINE INSTALLATION

(RESIDENTIAL AND DUPLEX ONLY)

NOTE: SEE DETAIL S-5 FOR BACKFILL REQUIREMENTS.

S-1

RESIDENTIAL SANITARY SEWER SERVICE DETAILS

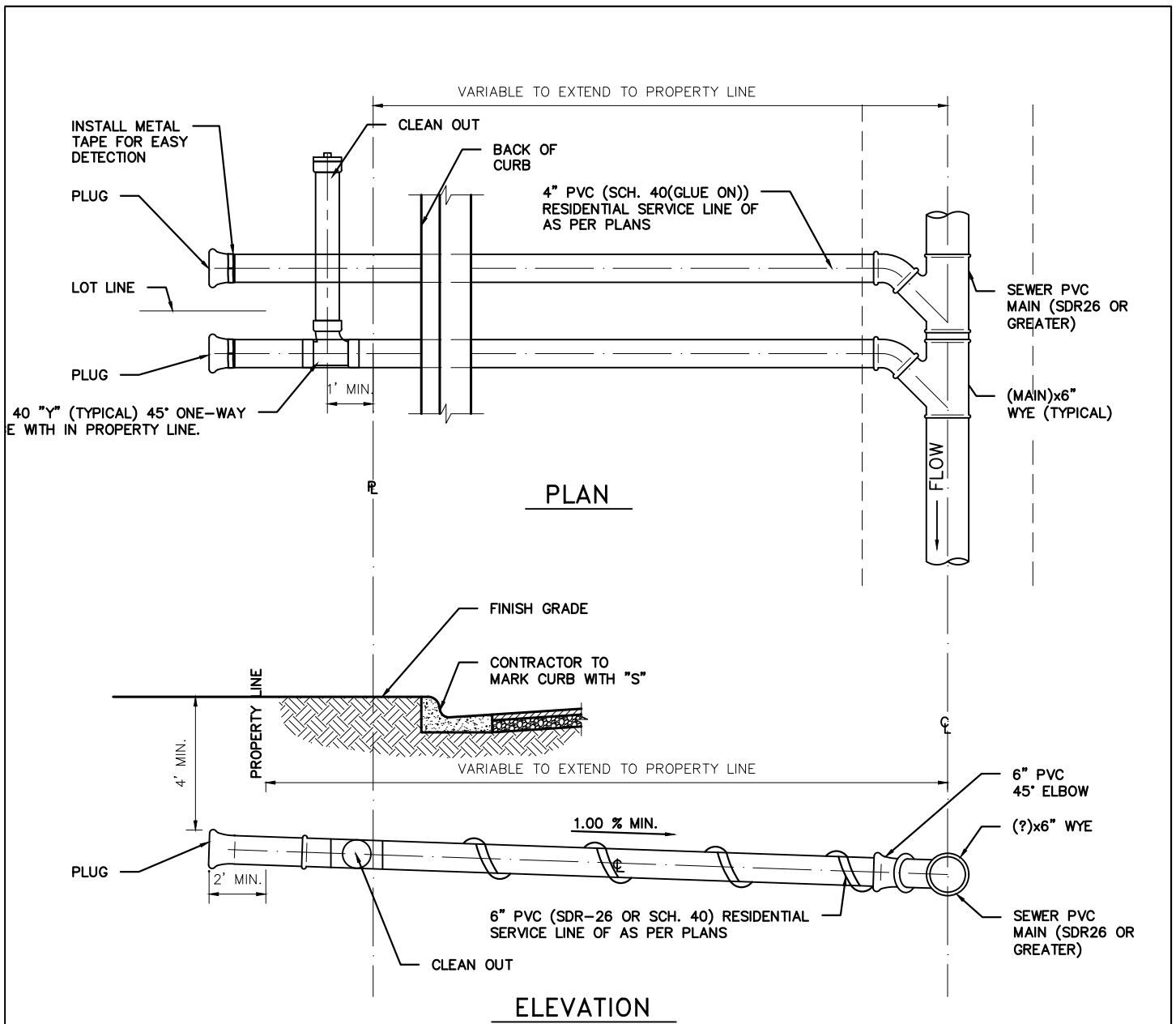
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





TYPICAL MULTIFAMILY AND COMMERCIAL SEWER SERVICE LINE INSTALLATION
(MULTIFAMILY UP TO TRIPLEX)

NOTE: SEE DETAIL S-5 FOR BACKFILL REQUIREMENTS.

S-2

MULTIFAMILY AND COMMERCIAL
SANITARY SEWER SERVICE DETAILS

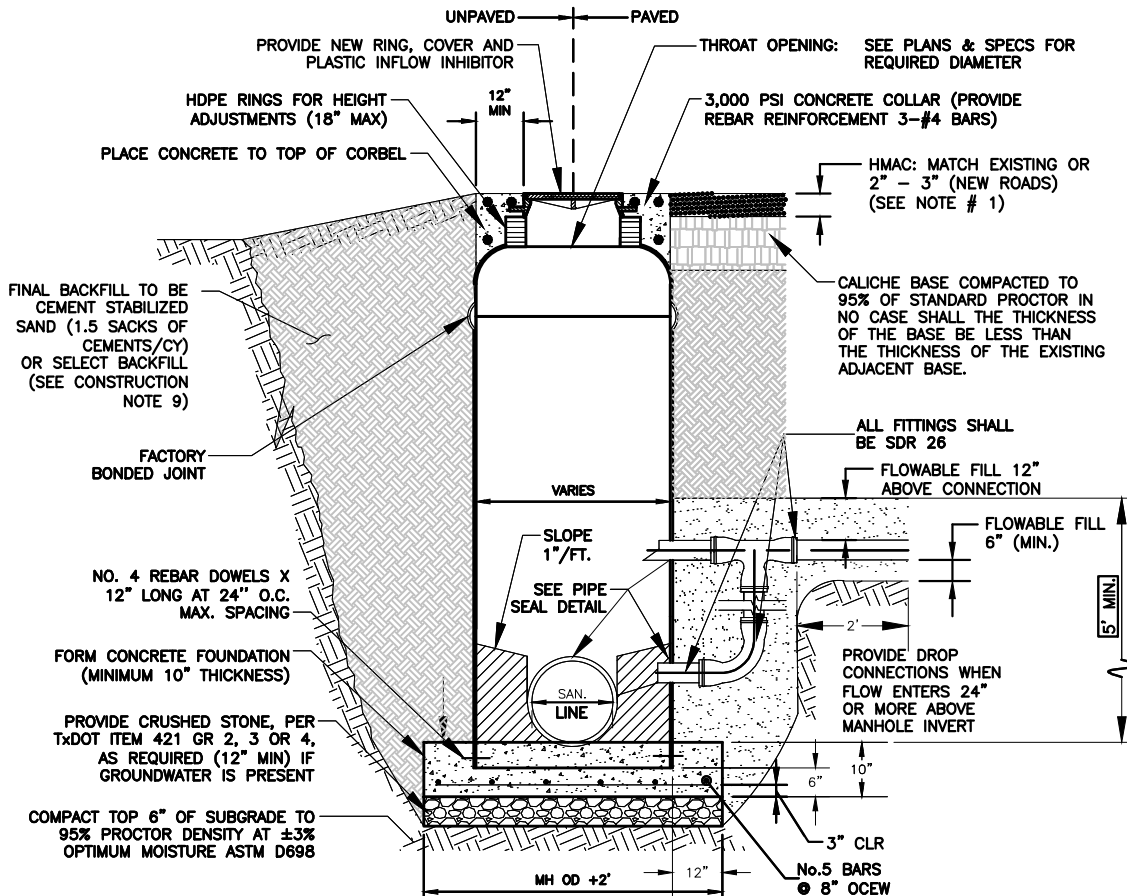
SCALE: N.T.S.

DATE: OCTOBER 2021

REVISED: R.H.

DRAWN BY: G.R.





MONOLITHIC FIBERGLASS MANHOLE

NOT TO SCALE

GENERAL WASTEWATER CONSTRUCTION NOTES:

- HMAC: 2"- MINOR RESIDENTIAL, RESIDENTIAL AND MULTI-FAMILY COLLECTOR, COLLECTOR, MINOR AND PRINCIPAL ARTERIAL STREETS. HMAC: 3"-RURAL ARTERIAL STREETS. IN NO CASE SHALL THE THICKNESS OF THE HMAC BE LESS THAN THE THICKNESS OF THE EXISTING ADJACENT HMAC.
- THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND EXAMINE LOCAL CONDITIONS TO BE ENCOUNTERED, IMPROVEMENTS TO BE PROTECTED, AND PERMITS AND FEES TO BE REQUIRED, ALONG WITH OTHER RESEARCH THAT IS NECESSARY TO ENSURE THAT THE CONTRACTOR THOROUGHLY UNDERSTANDS THE PROJECT AND IS FULLY AWARE OF ALL THE CONDITIONS AND CONSTRAINTS THAT MAY BE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION.
- THE CONTRACTOR SHALL ADHERE TO ALL TCEQ REGULATIONS PER 30 TAC CHAPTER 217 AND TRENCH SAFETY FOR EXCAVATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL TRAFFIC CONTROL AND MUST ADHERE TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- ALL FIBERGLASS MANHOLES SHALL BE MONOLITHIC WITH 0.50" MINIMUM WALL THICKNESS. FIBERGLASS BOTTOM SHALL BE DESIGNED TO WITHSTAND HYDROSTATIC HEAD PRESSURE UNDER ALL CONDITIONS.
- ALL MANHOLE WALL PENETRATIONS SHALL BE CORED AND SEALED WITH APPROVED TPSMHA WATER STOP GASKET ASSEMBLY.
- THE CONTRACTOR SHALL PROVIDE PROTECTIVE COATING ON ALL EXPOSED CONCRETE SURFACES, INCLUDING CORBEL AREA, MANHOLE WALLS AND MANHOLE BENCH.
- FOR FIBERGLASS MANHOLES WITH WATERTIGHT BOTTOM, ADHERE TO ALL MANUFACTURER REQUIREMENTS. FIBERGLASS BOTTOM AND BENCH MUST ALSO BE FACTORY INSTALLED.
- CEMENT STABILIZED SAND AND SELECT BACKFILL TO BE COMPACTED IN 12 INCH LIFTS TO 95% STD. PROCTOR.
- ALL DROP CONNECTIONS TO MANHOLE SHALL USE TPSMHA WATER STOP GASKET ASSEMBLY.
- CONCRETE COLLARS WITHIN PAVED AREAS SHALL BE SQUARE.

S-3(A)

MONOLITHIC FIBERGLASS MANHOLE DETAILS

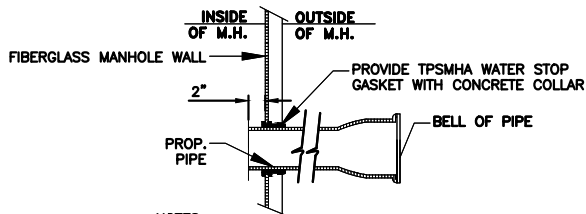
THE CITY OF
Edinburg

SCALE: N.T.S.

REVISED: R.H.

DATE: JULY, 2022

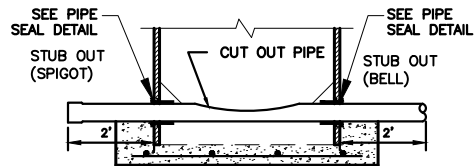
DRAWN BY: G.R.



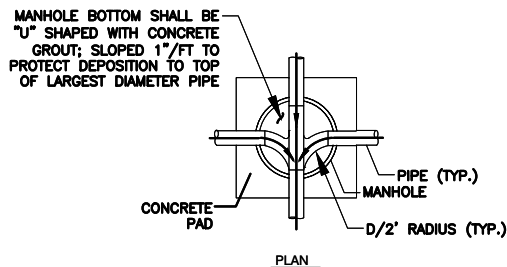
NOTES:
1. INSTALL SEAL IN ACCORDANCE WITH MFGS. SPECS.

PIPE SEAL DETAIL

NOT TO SCALE



SECT. VIEW A-A



WASTEWATER MANHOLE (BOTTOM)

NOT TO SCALE

MANHOLE REQUIREMENTS	
PIPE DIAMETER	MANHOLE DIAMETER
≤18"	4'
18" < TO ≤36"	5'
36" < TO ≤42"	6'

APPROVED COATINGS TABLE	
MANUFACTURER	MODEL NAME
JEFFCOAT	JEFFCOAT 326
RAVEN LINING SYSTEM	RAVEN 405
SHERWIN WILLIAMS	DURAPLATE 5800
CARBOLINE	PHENOLINE 309

NOTE:
COAT ALL CONCRETE SURFACES INCLUDING BUT NOT LIMITED TO BENCH, WALLS AND CONCRETE COLLARS AROUND PIPE CONNECTIONS.

S-3(B)

MONOLITHIC FIBERGLASS MANHOLE DETAILS

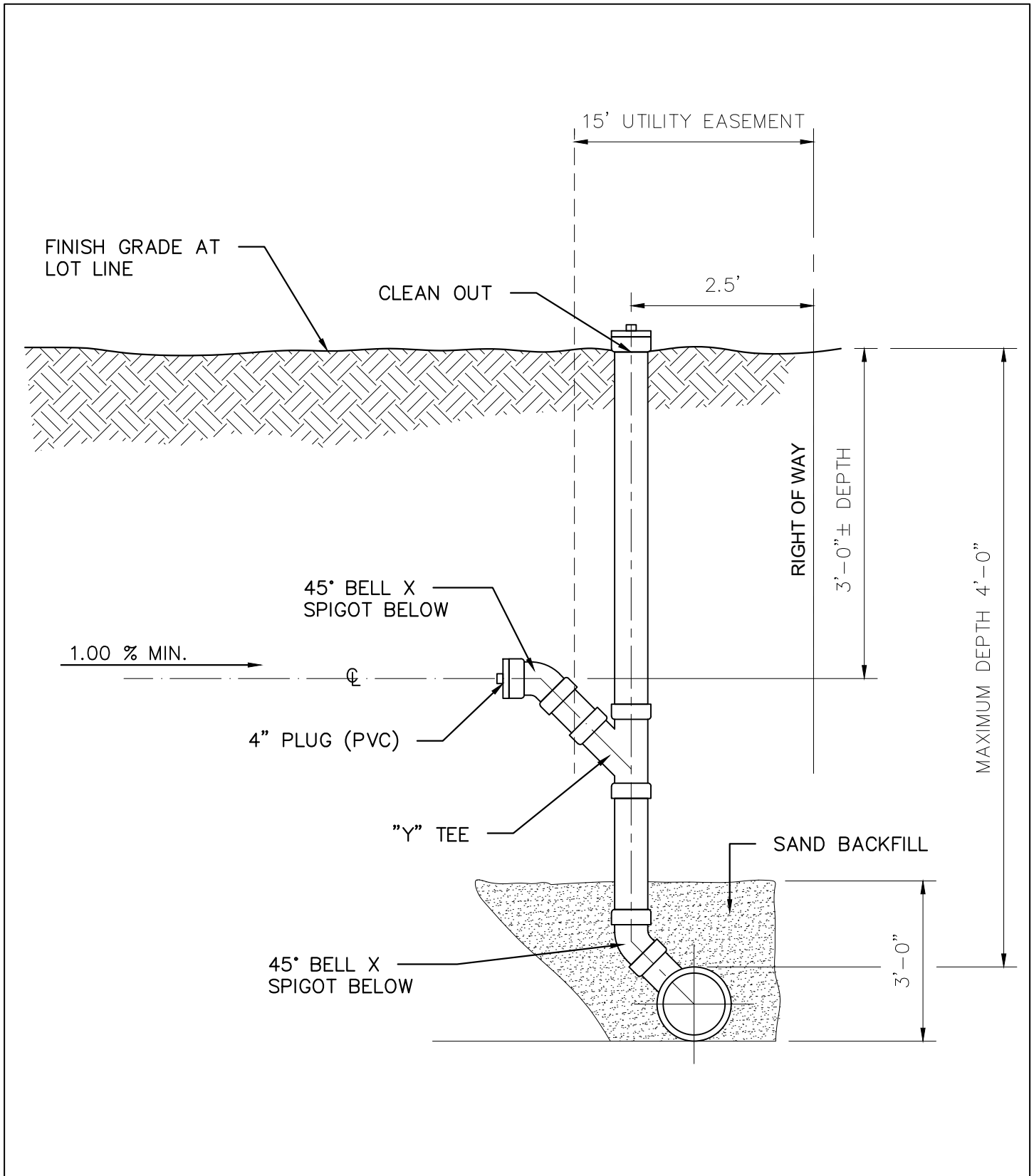
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





S-4

SHALLOW SERVICE CONNECTION DETAIL

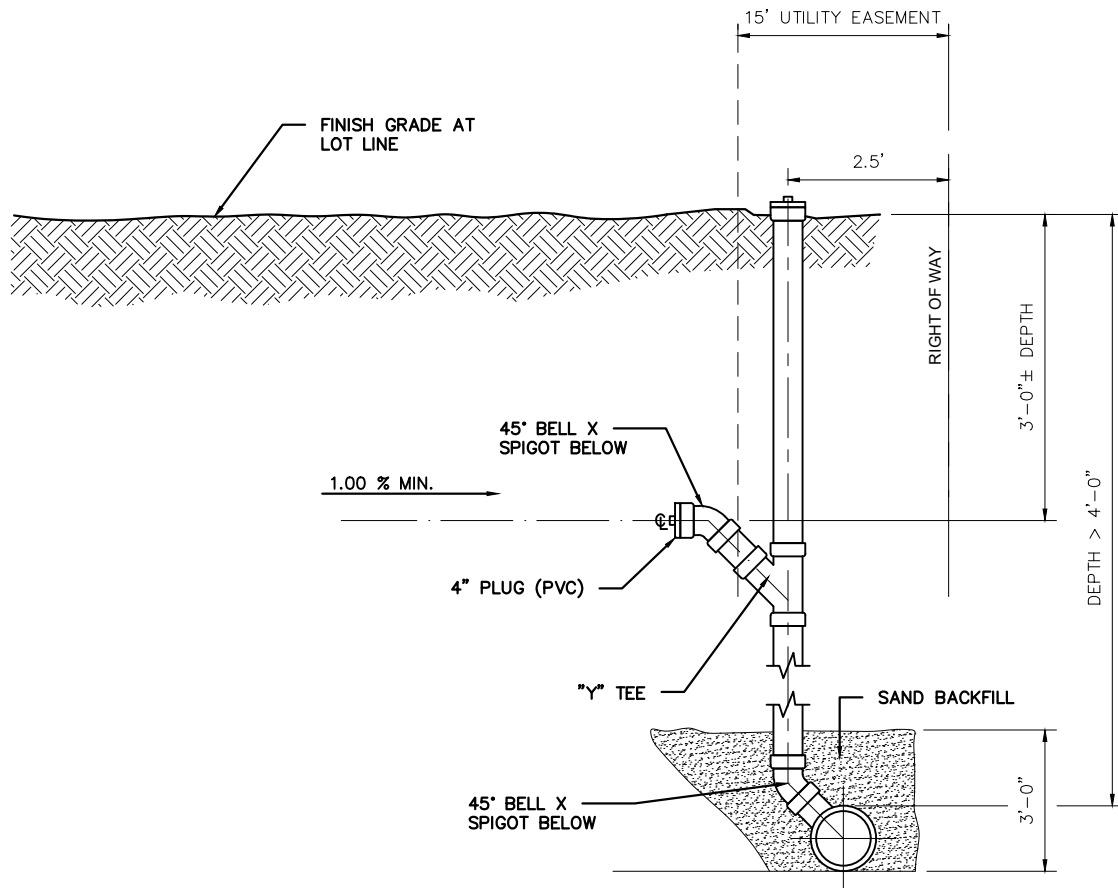
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





TYPICAL DEEP SERVICE CONNECTION

S-5

DEEP SERVICE CONNECTION
DETAIL

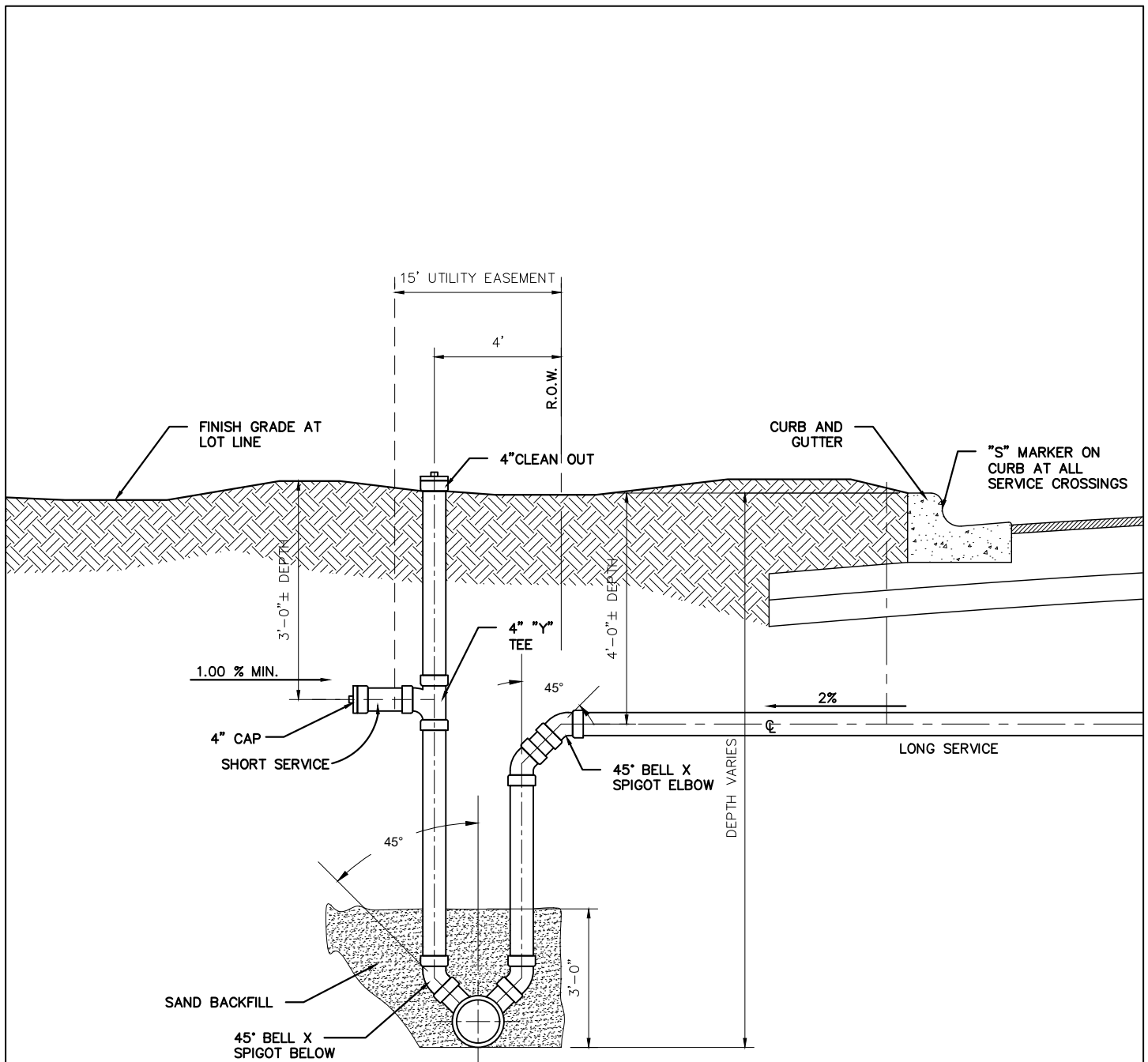
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





TYPICAL DOUBLE DEEP SERVICE CONNECTION

S-6

DOUBLE DEEP SERVICE
CONNECTION DETAIL

SCALE: N.T.S.

REVISED: R.H.

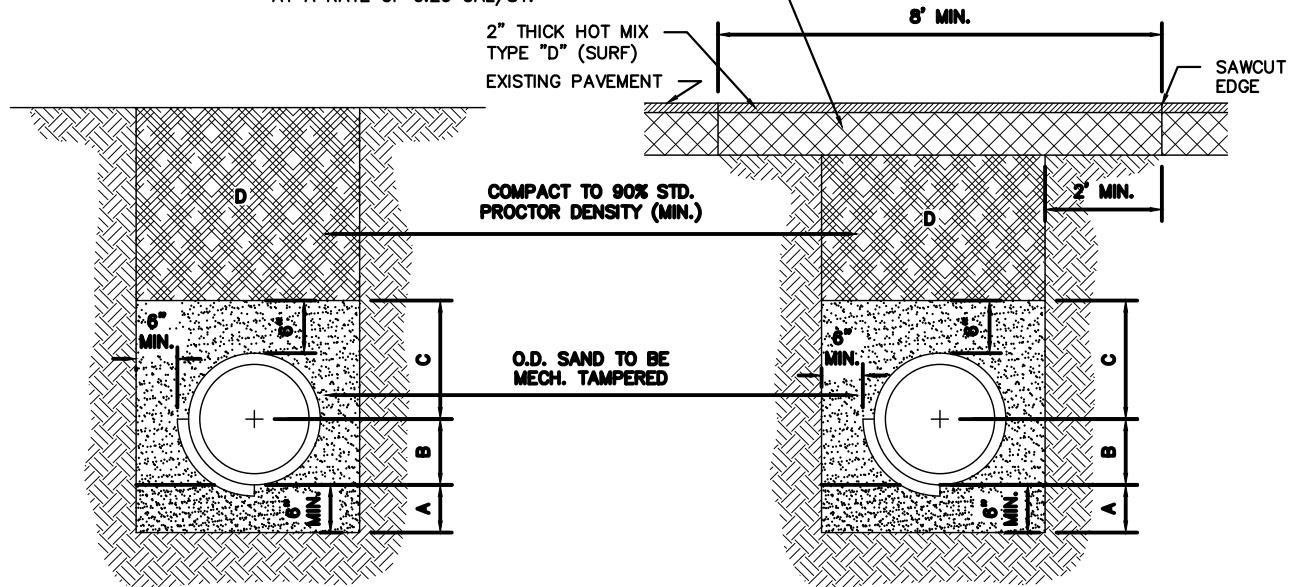
DATE: OCTOBER 2021

DRAWN BY: G.R.



NOTE: WHEN UTILITY LOCATED WITHIN CITY R.O.W., ALL BACKFILL IS SUBJECT TO INSPECTION AND APPROVAL BY THE CITY ENGINEER'S OFFICE

8" THICK FLEXIBLE BASE MATERIAL MEETING 2004 TxDOT, ITEM 247, TYPE "E", GRADE 4. COMPACTED IN MAX. 8" LIFTS TO 100% OF THE MAX. DENSITY DETERMINED BY TEX-113-E. MOISTURE CONTENT MUST BE WITHIN -2% TO +3% OF OPTIMUM. PRIMED WITH MC-30 AT A RATE OF 0.20 GAL/SY.



STANDARD PIPE BEDDING (MAIN & SERVICE LATERALS)

APPLICABLE BENEATH FUTURE/UNPAVED STREETS

- A. SAND BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS = 6")
- B. SAND BACK FILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, MECH. TAMPED).
- C. SAND BACK FILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE. (6" LIFTS, MECH. TAMPED).
- D. FILL TRENCH W/SELECT BACKFILL, W/12" LIFTS COMPACT TO 90% STD. PROCTOR.

FOUNDATION PREPARATION (WELL POINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

STANDARD PIPE BEDDING (MAIN ONLY)

(PARALLEL WITHIN EXIST. STREET)

- A. SAND BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS = 6")
- B. SAND BACK FILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, MECH. TAMPED).
- C. SAND BACK FILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE. (6" LIFTS, MECH. TAMPED).
- D. FILL TRENCH W/SELECT BACKFILL, W/12" LIFTS COMPACT TO 95% STD. PROCTOR.

FOUNDATION PREPARATION (WELL POINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

NOTE: ALL EXISTING/ACTIVE STREET CROSSINGS SHALL REQUIRE SAND BACKFILL OF ENTIRE TRENCH. (SEE DETAIL S-6)

S-7

SANITARY SEWER STANDARD PIPE BEDDING DETAILS

SCALE: N.T.S.

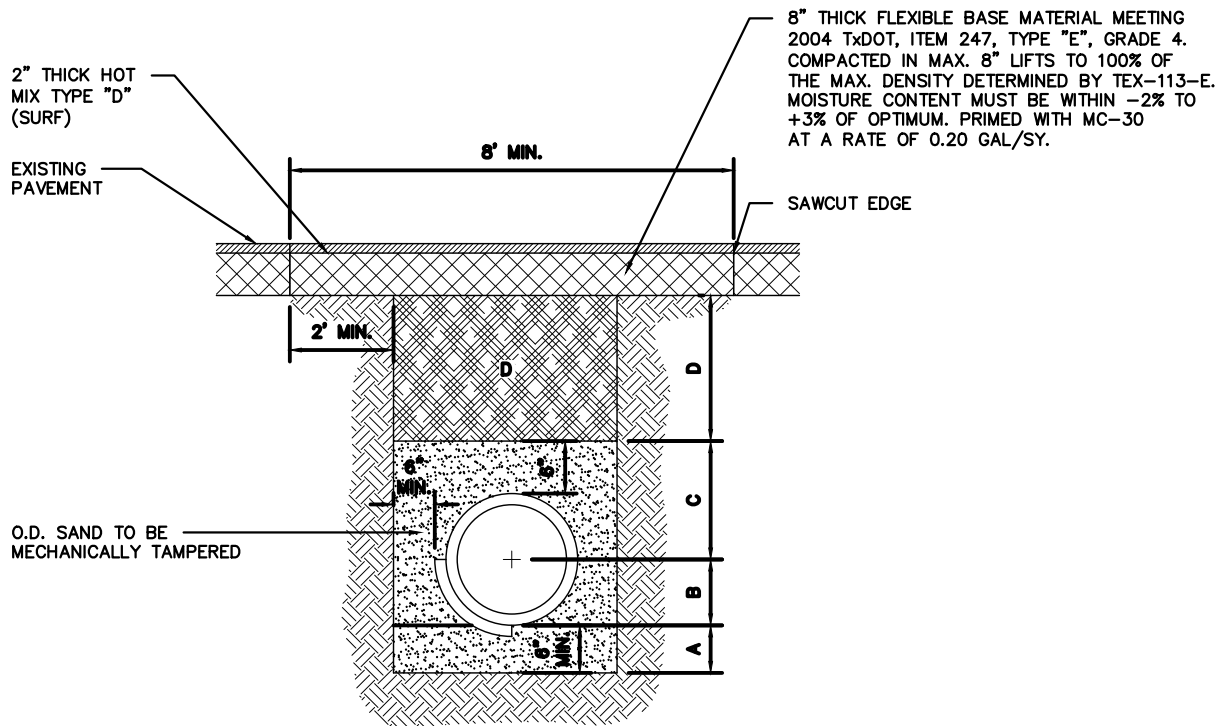
DATE: OCTOBER 2021

REVISED: R.H.

DRAWN BY: G.R.



NOTE: WHEN UTILITY LOCATED WITHIN CITY R.O.W., ALL BACKFILL IS
SUBJECT TO INSPECTION AND APPROVAL BY THE CITY ENGINEER'S OFFICE



STANDARD PIPE BEDDING (MAIN & SERVICE LATERALS)

UNDER EXISTING/ACTIVE STREET CROSSINGS.

- SAND BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS = 6")
- SAND BACK FILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, MECH. TAMPED).
- SAND BACK FILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE. (6" LIFTS, MECH. TAMPED).
- FILL TRENCH W/SELECT BACKFILL, W/12" LIFTS COMPACT TO 95% STD. PROCTOR.

FOUNDATION PREPARATION (WELL POINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACK FILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL BE SAND, APPROVED SITE SOIL OR OTHER APPROVED SUBSTITUTE.

S-8

UTILITY CROSSING AT EXISTING /
ACTIVE STREET DETAIL
(WATER / SANITARY SEWER)

SCALE: N.T.S.

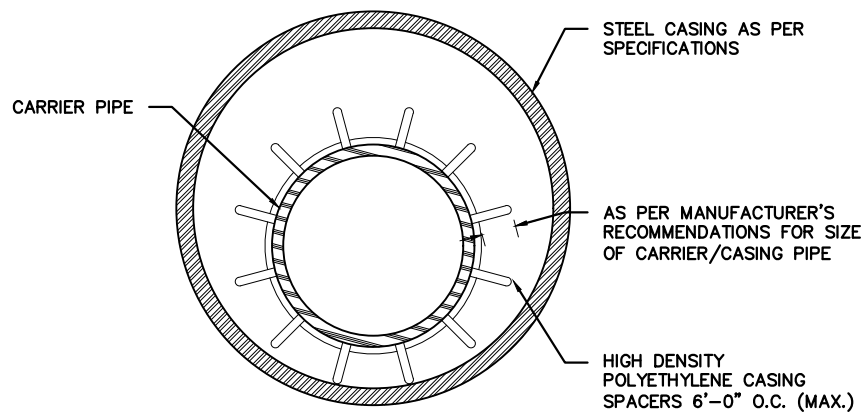
REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.

THE CITY OF
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BORING INSTALLATION		
CARRIER PIPE SIZE	PIPE CASING SIZE	MIN. WALL THICKNESS
6"	14"	0.187"
8"	16"	0.187"
10"	18"	0.250"
12"	20"	0.250"
14", 15"	24"	0.344"
16"	24"	0.344"
18"	30"	0.375"
24"	36"	0.375"
36"	48"	0.625"



GENERAL NOTES:

1. ALL STEEL CASING SHALL BE WELDED.
2. STEEL CASING SHALL BE CLOSED AT EACH END USING BRICK OR BLOCK AND MORTAR GROUTED.
3. CASING SPACERS SHALL BE USED TO INSTALL THE CARRIER PIPE INSIDE THE ENCASEMENT PIPE. CASING SPACERS SHALL FASTEN TIGHTLY ONTO THE CARRIER PIPE SO THAT WHEN THE CARRIER PIPE IS BEING INSTALLED THE SPACERS WILL NOT MOVE ALONG THE PIPELINE. CASING SPACERS SHALL BE DOUBLED ON EACH END OF THE ENCASEMENT.
4. PROJECTION - TYPE CASING SPACERS SHALL BE CONSTRUCTED OF PREFORMED SECTIONS OF HIGH DENSITY POLYETHYLENE. THE FLEXIBLE SECTIONS SHALL BE JOINED TOGETHER AROUND THE PIPE TO PROVIDE A MINIMUM OF 16 PLASTIC PROJECTIONS PER SPACER SECTION.
5. INSTALLATION AND SIZE OF SPACERS SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.

S-9

UTILITY LINE BORE
DETAIL

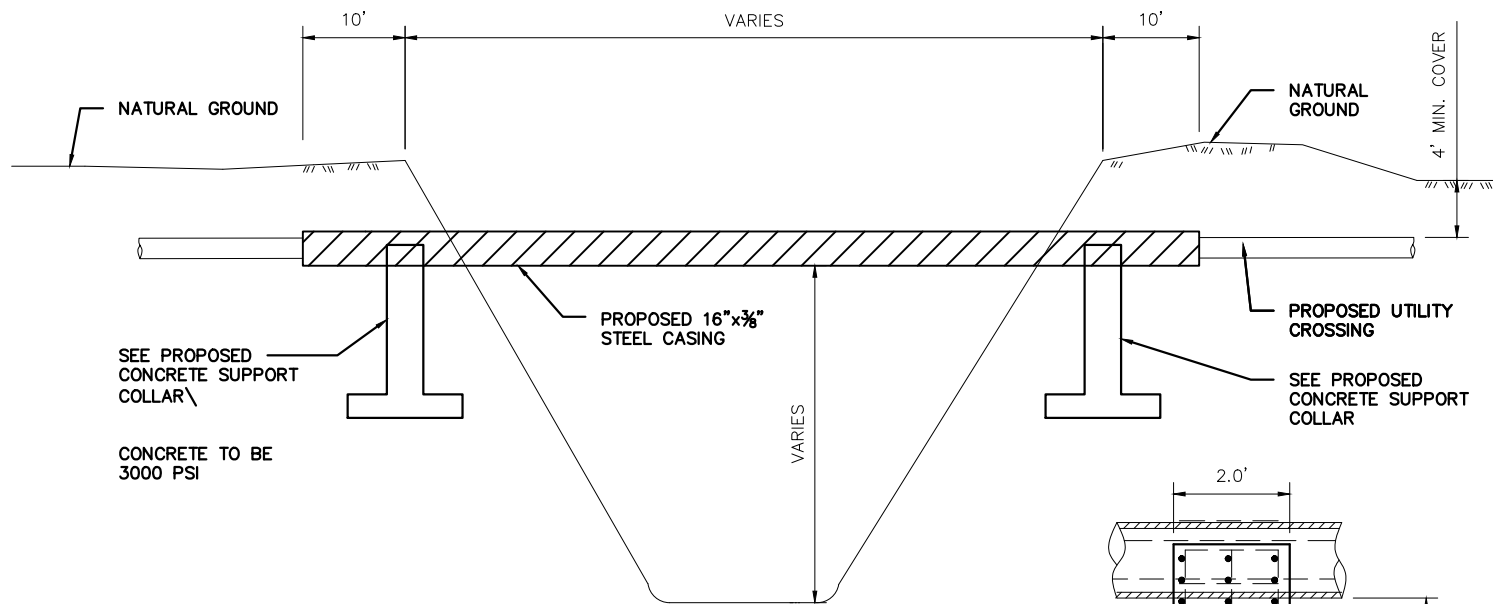


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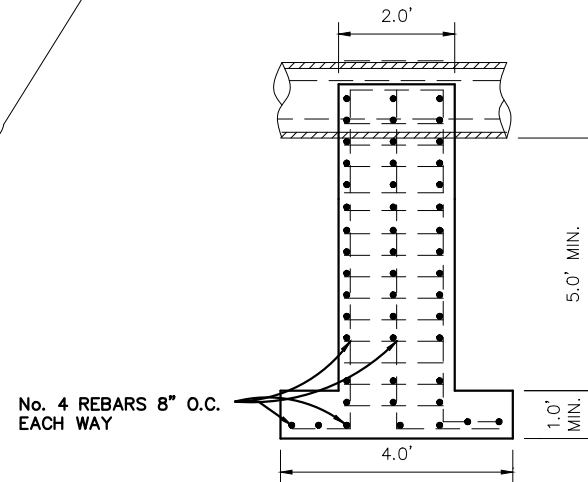
REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.



DRAIN DITCH CROSSING SECTION
N.T.S.



DETAIL

S-10

SECTION DETAILS
DRAIN DITCH CROSSING

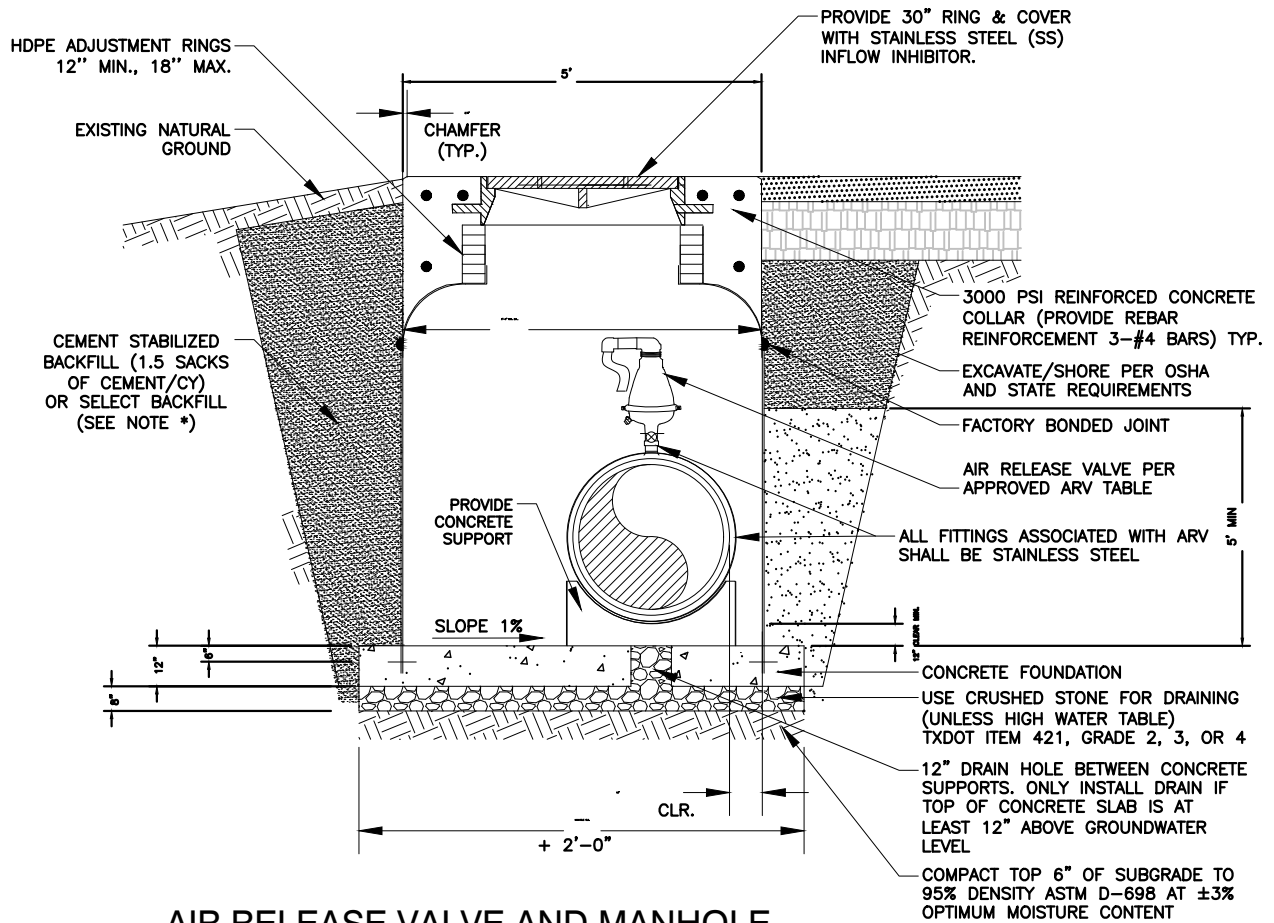
SCALE: N.T.S.

DATE: OCTOBER 2021

REVISED: R.H.

DRAWN BY: G.R.





AIR RELEASE VALVE AND MANHOLE

NOT TO SCALE

APPROVED ARVs		
MANUFACTURER	MODEL NAME	MATERIAL
A.R.I.	D-025 OR D-025 SHORT	316 SS
H-TEC	MODEL 986 (SS) AND 988	
VENT OMAT	MODEL RGXII (ST. STEEL)	
VALMATIC	VM 48AS OR VM 49AS	

* CEMENT STABILIZED SAND AND SELECT BACKFILL TO BE COMPACTED IN 12 INCH LIFTS TO 95% STD. PROCTOR.

S-11

SEWAGE AIR RELEASE VALVE DETAILS

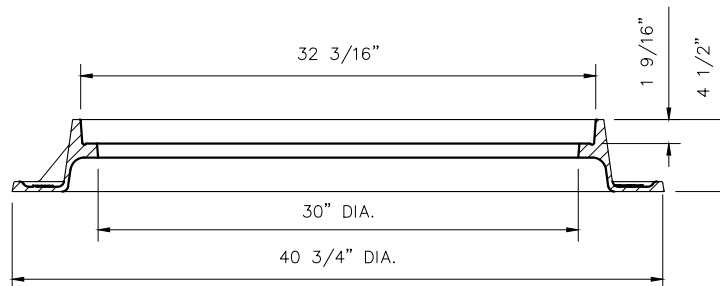
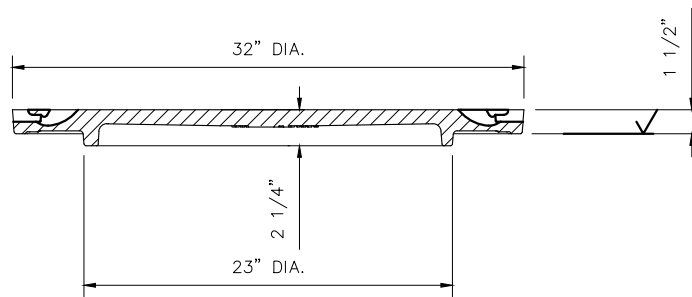
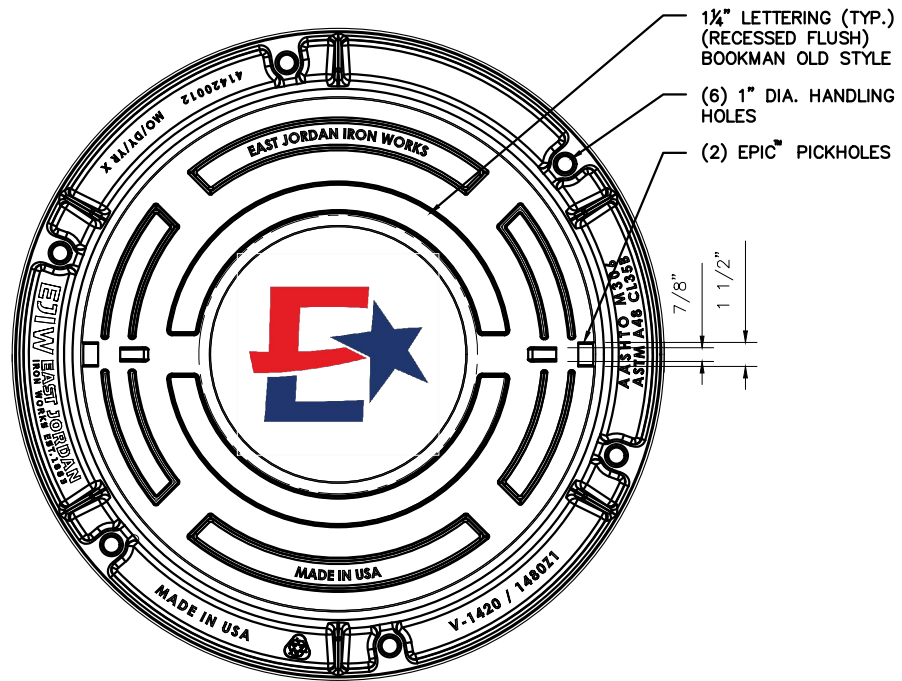
SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.





**CITY STANDARD ROADWAY MANHOLE
RING AND COVER CASTING DETAIL**

S-12

MANHOLE COVER
DETAILS

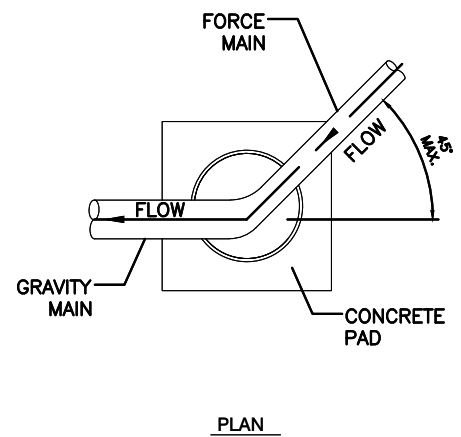
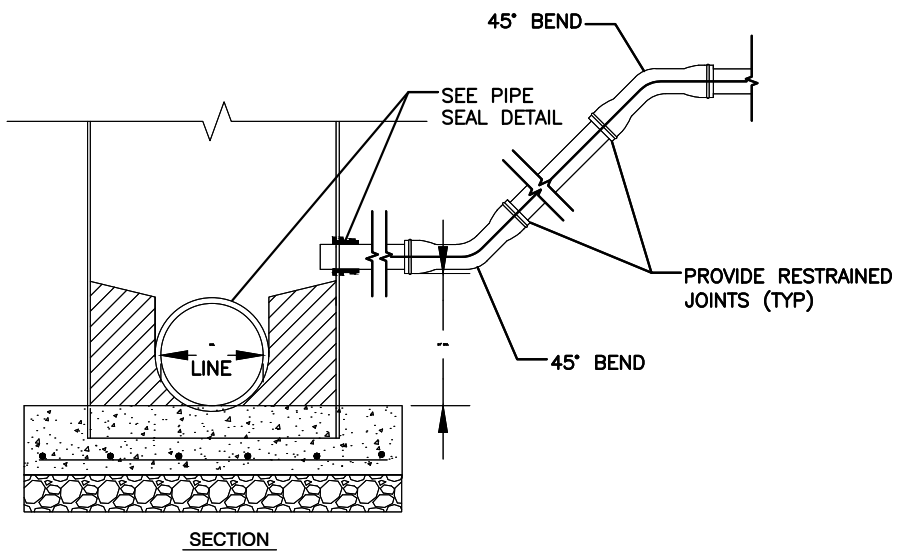
SCALE: N.T.S.

DATE: OCTOBER 2021

REVISED: R.H.

DRAWN BY: G.R.





NOTES:

1. ALL BENDS SHALL BE DUCTILE IRON WITH RESTRAINED JOINTS.
2. INFLUENT FORCE MAIN MUST BE NO MORE THAN 45° FROM PARALLEL WITH DOWNSTREAM FLOW DIRECTION.

S-13

FORCE MAIN DISCHARGE
MANHOLE DETAIL

SCALE: N.T.S.

REVISED: R.H.

DATE: OCTOBER 2021

DRAWN BY: G.R.



Exhibit “A”

TABLE OF CONTENTS

1. Valves
2. Fire Hydrants and Flush-out Valve Assembly
3. Tap saddles and tap sleeves
4. Meter Boxes and Lids
5. Corporation and Curb Stops
6. Straight Coupling X MID
7. Brass Fittings
8. Copper Tubing, Pipe and Fittings
9. Valve Boxes
10. Fittings
11. Restraints
12. Repair Couplings
13. Adapters
14. Resilient Wedge Gate Valve Specifications
15. Fire Hydrant Specifications
16. Water Meters
17. Pre-Cast Meter Vaults
18. Pumps for Lift Station
 - A. Self-Priming
 - B. Submersible
19. Sewer Couplings

1. Valves

A. Brass Gate Valves

- i. Sizes – 2”-3”
- ii. Style – FIP x FIP
- iii. Manufacturers Name Product Number
 - a. Hammond IB-645 (MUST BE NO LEAD COMPLIANT)

Comments: These products must have brass-operating wheels.

B. Resilient Wedge Gate Valves

- i. Sizes – 2”-20”
- ii. Styles – MJ, Flg, Flg x MJ
- iii. Manufacturers name Product Number
 - a. American Flow Control AFC 2500
 - b. Mueller A-2362

Comments: These products must be trimmed in 304 stainless steel.

C. Butterfly Valves

- i. Sizes – 16”-36”
- ii. Styles – MJ, Flg., MJ x Flg.
- iii. Manufacturers Name Product Number
 - a. Mueller B-3211

Comments: This product must be epoxy coated inside and out and must have EPDM seat.

2. Fire Hydrants and Flush-out Valve Assembly

A. Fire Hydrants

- i. Sizes- 3', 3'6", 4', 4'6", 5', 5'6", 6'
- ii. Styles- MJ, Flg, Flg x MJ
- iii. Manufacturers Name Product Bury Size / MJ Number
 - a. Mueller Super Centurion, 250
 - 3'0" A423
 - 4'0" A423
 - 5'0" A423

- b. American Flow Control 5 ¼" B-84-B
 - 3'0"
 - 4'0"
 - 5'0"
- c. Kennedy Guardian K81D
 - 3'0"
 - 4'0"
 - 5'0"

Comments: **All fire hydrants must be painted red from the factory and be trimmed in 304 stainless steel.**

B. Flush valve assembly

- i. Size- 2"
- ii. Manufactures Name Product Bury Size Model Number
 - a. The Kupferle Foundry Company Main Guard 3' #77

Comments: This product is to be used at the end of all dead end mains. Any other variations of flush out valve assembly must be submitted and approved by the City of Edinburg prior to installation.

C. Fire hydrant repair kits

- i. Manufacturers Name Product
 - a. Mueller 1968 – Present
 - b. American Darling B-82-B, B-84-B
 - c. Kennedy 1968 – Present

Comments: Flanges shall be cast iron, and bolts shall be stainless steel.

3. Tap Saddles and Tap Sleeves

A. Brass Tap Saddles for C-900 PVC

- i. Sizes – 2"-12"
- ii. Outlet size – 1"
- iii. Style - O.D. controlled / Single Strap
- iv. Manufacturers Name Product Number

- a. Mueller H-13000 BR 1B Series
- b. Ford S90-XXX

Comments: This product must be brass with no exceptions and must be lead free.

B. Brass Tap Saddles for C-900 PVC

- i. Sizes – 4”- 12”
- ii. Outlet size – 2”
- iii. Style – double band or O.D. controlled
- iv. Manufacturers Name D.B Product Number O.D.C Product Number
 - a. Mueller H-13000 BR2B Series
 - b. Ford 202-BSD-XXX-Tap

Comments: This product must be brass with no exceptions and must be lead free.

C. Mechanical Tapping Sleeve

- i. Size – Size on Size 4”-24”
- ii. Type – Mechanical Joint Tapping Sleeve
- iii. Manufacturers Name Product Number
 - a. Mueller – H-615

D. Tap Sleeves Size on reducing size

- i. Sizes – 4”-24”
- ii. Outlet sizes – 4”-12”
- iii. Type – Fusion bonded Epoxy
- iv. Manufacturers Name Product Number
 - a. Smith Blair 622
 - b. Ford – FTS/FTSC

Comments: This product must be trimmed in 304 stainless steel. Epoxy Coated Tapping Sleeve with Flexi Blue Epoxy Coated Flange.

4. Meter Boxes, Lids, and Gaskets

A. Meter Box Residential

- i. Style – Rectangular
- ii. Type – Plastic body with plastic lid with lock lid.

- iii. Manufacturers Name Product Number
 - a. Mid States DFW 1200

B. Large Rectangle Meter Box

- i. Sizes – 15" x 27"
- ii. Style – Rectangular double wall iron or plastic box with cast iron lid /with open HASP.
- iii. Manufacturers Name Product Number
 - a. Jumbo 1200 Square

C. Meter Box Lids

- i. Style – Rectangular
- ii. Type – Plastic
- iii. Manufacturers Name Product Number
 - a. DFW Plastics 1200

D. Meter Gaskets and Plugs

- i. Meter gaskets must conform to ASTM D2000 and be NSF 61 compliant.
- ii. Manufacturer's Name Product Number
 - a. Ford

5. Corporation and Curb Stops

A. Brass Corporation Stop

- i. Sizes – 3/4"-1"
- ii. Style – MIP x Flair / Compression
- iii. Manufacturers Name Product Number
 - a. Mueller – E-25029 X Comp NL B – 250025 X Flair NL
 - b. Ford – F-1100-3 NL, F-700-34 NL
 - c. A-Y McDonald – 4704 X Flair NL 4704 – 33 X Comp NL

B. Brass Corporation Stop

- i. Size – 2"
- ii. Styles – MIP x MIP , MIP x FIP
- iii. Manufacturers Name MIP x MIP Product Number FIP x FIP Product Number
 - a. Mueller B - P-25028 X Comp NL B 25025 X Flair NL
 - b. Ford FB500 – 7, FB700-7-NL, FB 1102-7NL, FB1100-7-NL
 - c. A-Y McDonald – 470NL 4704-33 NL

Comments: MIP x compression is an option on this product, and all products must be no lead compliance.

C. Brass Corporation Stop

- i. Size – 1”
- ii. Style – MIP x Flare
- iii. Manufactures Name Product Number
 - a. Mueller H – 15025 NL OK
 - b. Ford F – 700 4 NL

Comments: MIP x Compression is an option on this product, and all products must be no lead compliance.

D. Brass Angle Stops

- i. Size – $\frac{3}{4}$ ”, 1”, 1” x $\frac{3}{4}$ ”, 1 $\frac{1}{2}$ ”, 2”
- ii. Style – 90 degree angle Flare x FIP
- iii. Manufactures Name Product Number
 - a. Mueller B - B24255 NL
 - b. Ford BA43-232W-NL, BA43-342W-NL, BA43-444W-NL, FV43-777W-NL
 - c. A-Y McDonald 4602 – 33 NL

Comments: Compression x swivel is an option in this product, and all products must be no lead compliance.

E. Bronze Meter Flange

- i. Size 1 $\frac{1}{2}$ ”, 2”
- ii. Manufacture’s Name Product Number
 - a. Ford
 - b. McDonald

F. Multi-Service “Y”

- i. Size – 1” x $\frac{3}{4}$ ”, 2” x 1”
- ii. Style – FIP x FIP
- iii. Manufacture’s Name Product Number
 - a. Ford Y11-474-NL
 - b. Ford Y44-243-NL

6. Straight Coupling X MIP

A. Coupling

- i. Size – 1", $\frac{3}{4}$ "
- ii. Styles – MIP x COMPRESSION
- iii. Manufacturers Name Product Number
 - a. Mueller H - 15425 NL – 15428 NL
 - b. Ford C-38-23-2-5-NL, C38-44-2-625-NL

Comments: Flare is an option on this product, and all products must be no lead compliance.

B. Straight Coupling

- i. Size – 2"
- ii. Style – MIP x Compression
- iii. Manufacturers Name Product Number
 - a. Mueller P - 15428 NL 15425 NL
 - b. Ford C 84 -77

Comments: To be used only when 2" services are not soldered, and all products must be no lead compliance.

7. Brass Fittings

A. Brass Reducer Bushings

- i. Sizes – 1"x $\frac{3}{4}$ ", 2" x 1", 2" x 1 $\frac{1}{2}$ ", 1 $\frac{1}{2}$ " x 1", 1 $\frac{1}{2}$ " x $\frac{3}{4}$ ", 2" x $\frac{3}{4}$ "
- ii. Style – FIP x FIP
- iii. Manufacturers Name Product Number
 - a. Ford – C – 18-47

Comments: All Products must be no lead compliance.

B. Brass Meter Couplings

- i. Sizes – $\frac{3}{4}$ ", 1"
- ii. Style – MIP x Swivel Ford – C – 18-47
- iii. Manufacturers Name Product Number
 - a. Mueller H 10891 –12 NL
 - b. Ford C 38- 23-2.5 NL-C38-13-2.188 NL

Comments: All Products must be no lead compliance.

C. Brass Nipples

- i. Sizes – $\frac{3}{4}$ "- 2"
- ii. Style – MIP x MIP
- iii. Lengths – 1" –5"

Comments: All brass nipples must be copper.

- i. Style – FIP x FIP

D. Pack Joint Compression Coupling

- i. Sizes – $\frac{3}{4}$ ", 1", 1" x $\frac{3}{4}$ "
- ii. Manufacturers Name Product Number
 - a. Ford
 - b. Mueller
 - c. McDonald

E. Brass Service Plugs

- iii. Size – 1"
- iv. Manufacture's Name Product Number
 - a. Ford CSP-4-I-NL

F. Expansion Connections

- i. Size – $\frac{3}{4}$ "
- ii. Manufacture's Name Product Number
 - a. Ford EC-23-NL

G. Male Adapter by Compression

- i. Size – $\frac{3}{4}$ ", 1", 2"
- ii. Style – MIP x PJ
- iii. Manufacture's Name Product Number
 - i. Ford C-84-xx-NL
 - ii. McDonald
 - iii. Mueller

8. Copper Tubing, Pipe and Fittings

A. Copper Tubing

- i. Sizes – $\frac{3}{4}$ ", 1"
- ii. Type – "K" soft

Comments: Soft copper shall be Type "K" (100 ft). Hard copper shall be Type "L" (20 ft).

B. Rigid Copper Pipe "Type "L" Hard Copper"

- i. Size – 2", 3"
- ii. Type – "L" hard

C. Copper Fittings

- i. Size – 2", 3"
- ii. Type – Copper

Comments: To be used with 2" rigid Hard copper pipe Type "L".

9. Valve Boxes

A. Size – 19"- 22" (Small)

B. Type – Adjustable

C. Manufacturers Name Product Number

- i. Tyler/Union 6850 must be domestic and heavy duty standard drop lid.
- ii. Star VB-0002 must be domestic and heavy duty standard drop lid.
- iii. East Jordan Iron 85506015 must be domestic and heavy duty standard drop lid.

10. Fittings

A. Sizes – 4"- 36"

B. Style – MJxMJ, MJxFLG, FLGxFLG

C. Type – Ductile iron AWWA C-153 and AWWA C-110 – ASTM A536 250 PSI W.W.P.

D. Manufacturers Name

- i. Tyler/Union
- ii. Star Pipe

Comments: All products must be domestic, and all imports will not be accepted. P401 coating must be added when working on Wastewater and Lift Station Projects. P401 must

be factory applied. Field application of P401 will not be allowed. Asphalt coating and cement lining to comply with ANSI/AWWA C104/A21.4. Fusion bonded epoxy coating to comply with ANSI/AWWA C166/A21.16.

11. Restraints (Mega Lugs and PVC Flanges)

A. Mega Lugs

- i. Sizes – 3” – 36”
- ii. Style – Ductile iron
- iii. Manufacturer’s Name Product Number
 - a. PVC Grip 3500
 - b. PVC Star Grip 4000
 - c. Ford UFR – 1500
 - d. EBAA Iron, Inc. 2000PV Series
 - e. Tyler Union TurfGrip 2000 Series

Comments: When using all thread rod as a means of restraint stainless steel must be used. All products must be domestic, and all imports will not be accepted.

B. PVC Flanges

- i. Sizes – 3”-8”
- ii. Style – Schedule 80 PVC

Comments: Bolt set shall be stainless steel 304.

12. Repair Couplings

A. Barrel Couplings

- i. Sizes – 4” – 36”
- ii. Style – Cast compression x compression
- iii. Manufacturers Name Product Name
 - a. Romac MACRO
 - b. Smith Blair Quantum 442, 461

Comments: These products are only to be used when PVC repair couplings are not applicable, 2 bolt coupling to be an exception to the product.

B. PVC

C. Repair Clamps

- iv. Sizes – 2"-16"
- v. Manufacturer's Name Product Name
 - a. Smith Blair 226
 - b. Romac Style CL 1
 - c. Ford Style F1

Comments: These products shall be full circle, ductile iron coated lids with low alloy bolts, heavy hex nuts, up to 300 psi, meet NSF/ANSI 61, NSF/ANSI 372, and meet AWWA C230 and AWWA C213. The band shall be Type 304 stainless steel per ASTM A240. The lugs shall be cast using ductile iron 80-55-06 per ASTM A536 with fusion bonded epoxy finish. The gasket shall be nitrile (Buna-N) per ASTM D2000 and certified to NSF/ANSI 61-G and 372. The bridge plate shall be type 304 stainless steel quarter-hard per ASTM A240. The bolts and nuts shall be HSLA steel per AWWA C111/A21.11.

13. Adapters

- A. Sizes – 4"- 36"
- B. Style - Flange x MJ, MJ x MJ
- C. Manufacturers Name
 - i. Mueller
 - ii. Smith Blair
 - iii. Ford

Comments: Must have 304 stainless trim and be Epoxy/nylon coated. There are some exceptions in some these products due to the variations of the way these certain products are manufactured.

14. Resilient Wedge Gate Valve Specification

The resilient seat gate valves 2-12" shall fully comply with the latest revision of AWWA C509 or C515, and shall also be UL listed and FM approved. The valves shall be tested and certified to ANSI/NSF 61. Valves shall include the following specific design criteria:

- A. The valve shall have a 250 psig working pressure.
- B. Each valve shall be factory seat tested to 250 psig and shell tested to 500 psig.

- C. The valve type shall be non-rising stem (NRS) or outside screw and yoke (OS&Y) as specified.
- D. The valve shall have an arrow cast on the operating nut or hand wheel showing opening direction.
- E. All valves shall be open left.
- F. The NRS valves shall be provided with a 2" square operating nut and OS&Y valves shall be provided with a hand wheel. The bolt that attaches the operating nut to the stem shall be recessed into the operating nut so as not to interfere with valve wrench operation.
- G. The valves shall have bolts and nuts for the stuffing box and bonnet and operating nut with one of the following compositions:
 - i. Type 304 stainless steel
 - ii. Type 316 stainless steel
- H. The valve stem shall be made of bronze ASTM B-132 alloy C67600 bar stock material. The stem material shall provide a minimum 70,000 psi tensile strength with 15% elongation and yield strength of 30,000 psi.
- I. The stem shall have at least one "anti-friction" thrust washer above and below the stem collar.
- J. The NRS valves shall have a stuffing box that is o-ring sealed. Two o-rings shall be placed above and one o-ring below the stem thrust collar. The thrust collar shall be factory lubricated. The thrust collar and its lubrication shall be isolated by the o-rings from the waterway and from outside contamination providing permanent lubrication.
- K. The valve body, bonnet, stuffing box, and disc shall be composed of ASTM A- 126 Class B grey iron or ASTM A395 or A536 ductile iron.
- L. The valves shall have an end configuration of MJ or FLG with restraining capabilities.
- M. The valve disc and guide lugs must be fully (100%) encapsulated in SBR ASTM D2000 or EPDM rubber material. The peel strength shall not be less than 75 ppi. Guide caps of an Acetal bearing material shall be placed over solid guide lugs, guides placed over bare metal are not acceptable.
- N. The valves shall have all internal and external ferrous surfaces coated with fusion bonded epoxy coating of 10 mils nominal thickness and coating shall conform to AWWA C550.
- O. The tapping valves shall have an inlet flange conforming to ANSI B16.1 Class 125. The valve inlet flange shall have a machined raised face complying with MSS SP-60. The seat opening of the tapping valves shall be at least .30" larger than the nominal pipe size.
- P. The valves shall be warranted by the manufacturer against defects in materials or workmanship for a period of 10 years from the date of purchase.
- Q. The manufacturing facility for the valves must have current ISO certification.

- R. The NRS valves shall be MUELLER A2360 series or AFC 2500 series
- S. The OS&Y valves shall be MUELLER R2360 series or AFC 2500 series
- T. The NRS tapping valves shall be MUELLER T2360 series or AFC 2500 series

Note: The City reserves the right to accept only those materials, which are in full compliance with these specifications and deemed most advantageous to its interests. Failure to comply with any of these above requirements is sufficient cause for rejection of proposed valves.

15. Fire Hydrant Specifications

Fire hydrants shall meet or exceed AWWA C502, latest revision. Rated working pressure shall be 250 p.s.i., and hydrants shall include the following specific design criteria:

- A. The main valve shall be of the compression type.
- B. The hydrant must have a traffic breakaway feature.
- C. Traffic feature must be designed for easy 360-degree rotation of nozzle section during field installation.
- D. The hydrant must open left and be marked on the hydrants bonnet to indicate the specified opening direction.
- E. The main valve opening shall not be less than 5 ¼" and be designed so that removal of all working parts can be accomplished without excavating.
- F. The bronze seat shall be threaded into mating threads of bronze.
- G. The draining system of the hydrant shall be bronze and positively activated by the main operating rod.
- H. The lower half of the main operating rod shall constructed of 304 stainless steel as a minimum.
- I. Hydrant drains shall close completely after no more than three turns of the operating nut.
- J. There shall be a minimum of 2 internal ports and minimum 2 drain port outlets to the exterior of the hydrant.
- K. Drain shutoff shall be direct compression closure.
- L. The hydrant shall be 2 ½" NST threads on hose nozzles and 4 ½" NST threads on pumper nozzle.
- M. The hydrants operating nut shall be 1 ¼" pentagon shape.
- N. The interior of the shoe including the upper and lower valve plates shall have a protective coating that meets AWWA C-550 standards.
- O. All stem nuts shall be constructed of brass or 304 stainless steel as a minimum.
- P. All internal and external dressings such as pins, springs, lock washers, nuts and bolts etc. must be minimum of 304 stainless steel.

- Q. Hydrants shall be painted red by the manufacturer.
- R. Hydrant shoe inlet size shall be 6" and connection type shall be push on or MJ and must have restraining capabilities.
- S. Hydrants shall be warranted by the manufacturer against defects in material or workmanship for a period of 10 years from the date of manufacture.
- T. Hydrants shall be Mueller Super Centurion 250, or AFC B-84-B U, or approved equal. Friction loss shall not exceed 3.0 p.s.i.g. at 1000 gpm through 4 ½" pumper nozzle.
- U. The fire hydrant extensions must be compatible with the fire hydrant.

Note: The City reserves the right to accept only those materials, which are in full compliance with these specifications and deemed most advantageous to its interests. Failure to comply with any of these above requirements is sufficient cause for rejection of proposed hydrants.

16. Water Meters Specifications

A. C-700 STANDARD COLD WATER METERS (Only for replacement of existing water meters)

Specifications are for ¾" x ⅝" through 1", 1½" 2" Standard Water Meters. Herein are minimum requirements which are intended to govern, in general, the size and types of materials desired. The City of Edinburg reserves the right to evaluate minor exceptions to these specifications.

i. Scope

- b. All meters furnished shall be magnetic drive, sealed registers, nutating disc positive displacement piston type designed for water works services. It is the intent of the City to minimize the repair of any meters furnished under these specifications.

ii. Applicable Specifications

- a. Except as otherwise modified or supplemented herein, AWWA Standard C-700 (or the latest revision thereof) shall govern the materials, design, manufacture and testing of all meters furnished under these specifications.

iii. Material Requirements

- a. The main case for all sizes shall be of no-lead high copper alloy ANSI/NSF 61 certified. All meters shall have cast on them, in raised characters, the size and direction of flow through the meters.

- b. The measuring chamber shall be unitized construction (i.e. complete with measuring element, calibration devised and registered in one assembly). The measuring chamber shall be capable of operating within its accuracy limits without recalibration when transferred from one main case to another. The measuring element shall be mounted horizontal stationary shaft with bearings and essentially weightless in water.
- c. The measuring chamber or center section shall be self-contained units easily removed from main case.
- d. Main case connections: Shall be no-lead high copper alloy, straight.

iv. Register

- a. Register shall be affixed to the upper part of the meter case in such a way as to insure that it will be tamper resistant. Meter case must have stainless steel tamper resistant torx head screw.
- b. Registers shall be a "Sealed Register" type. Shall read in gallons and have a large test or sweep hand, and shall be equipped with low flow indicators.
- c. Register shall be magnetically driven; low torque, high resolution low flow leak detection straight reading type; hermetically sealed against fogging, moisture, dirt, and corrosion; and mechanically unconnected from the measuring components.
- d. The register lens shall be of a high strength heat tested glass to minimize breakage.
- e. The register box and lid shall be made of bronze with locking hasp as standard equipment.
- f. In the event that special tools are required to maintain maintenance on a meter, the bidder shall furnish a sufficient supply at no cost.

v. Performance and Test Requirements

- a. The manufacturer shall submit a letter of certification that new meters will test accurate as designated by AWWA Standard C-700 or latest revision.

vi. Guarantee

- a. The new meters furnished under this contract shall meet the required new meter accuracy standards as established by AWWA Standards C-700, latest revision, for a period of one year from date of receipt.
- b. Each bidder shall state the type and model of meter quoted, as listed in his catalogue, and literature shall be furnished to the City of Edinburg at the time bid is submitted.
- c. Meter quoted shall have been operational in a municipal distribution system for a minimum of five (5) years.
- d. Meters that fail due to deterioration of metal parts used in the manufacture will result in a \$25.00 back charge to the supplier to cover costs of the City of Edinburg removing and reinstalling the meter.

B. Specifications Cold Water Turbo Meters

Specifications are for 1"1/2 thru 6" Turbo Water Meters. Herein are minimum requirements which are intended to govern, in general, the size and types of materials desired. The City of Edinburg reserves the right to evaluate minor exceptions to these specifications.

i. Scope

- a. All meters furnished shall be magnetic drive, sealed registers, turbine type designed for water works services. It is the intent of the City to minimize the repair of any meters furnished under these specifications.

ii. Applicable Specifications

- a. Except as otherwise modified or supplemented herein, AWWA Standard C-701 (or the latest revision thereof) shall govern the materials, design, manufacture and testing of all meters furnished under these specifications.

iii. Material Requirements

- a. The main case shall be of bronze material and lead free. Meters shall have cast on them, in raised characters, and the size and direction of flow through the meters.

- b. The measuring chamber shall be unitized construction (i.e. complete with measuring element, calibration devised and registered in one assembly). The measuring chamber shall be capable of operating within its accuracy limits without recalibration when transferred from one main case to another. The measuring element shall be mounted horizontal stationary shaft with bearings and essentially weightless in water.
- c. The measuring chamber or center section shall be self contained units easily removed from main case.
- d. All external bolts, nuts and washers shall be of a non-corrosive water works bronze or stainless steel and be easily removed from the main case.
- e. Main case connections: Flanges on the 1 1/2" thru 2" meters shall be oval. Meters shall be furnished with two (2) bronze companion flanges. And on the 3" thru 4" size meters shall be round faced. Also, each respective meter should come with inside iron pipe thread, bronze bolts, and nuts and gaskets.

iv. Register

- a. Register shall be affixed to the upper part of the meter case in such a way as to insure that it will be tamper resistant. Meter case must have stainless steel tamper resistant torx head screw.
- b. Registers shall be a "Sealed Register" type. Shall read in gallons and have a large test or sweep hand, and shall be equipped with low flow indicators.
- c. Register shall be magnetically driven; straight reading type; hermetically sealed against fogging, moisture, dirt, and corrosion; and mechanically unconnected from the measuring components.
- d. The register lens shall be of a high strength heat tested glass to minimize breakage.
- e. The register box and lid shall be made of bronze with locking hasp as standard equipment.
- f. In the event that special tools are required to maintain maintenance on a meter, the bidder shall furnish a sufficient supply at no cost.

v. Performance and Test Requirements

- a. The manufacturer shall submit a letter of certification that new meters will test accurate as designated by AWWA Standard C-701 or latest revision.

vi. Guarantee

- a. The new meters furnished under this contract shall meet the required new meter accuracy standards as established by AWWA Standards C-701, latest revision, for a period of one year from date of receipt.
- b. Each bidder shall state the type and model of meter quoted, as listed in his catalogue, and literature shall be furnished to the City of Edinburg at the time bid is submitted.
- c. Meter quoted shall have been operational in a municipal distribution system for a minimum of five (5) years.
- d. Meters that fail due to deterioration of metal parts used in the manufacture will result in a \$25.00 back charge to the supplier to cover costs of the City of Edinburg removing and reinstalling the meter.

C. COMPOUND WATER METER SPECIFICATIONS

i. Classification

These specifications cover a contract for Cold Water Meters, 2" thru 6: Compound Water Meters. Included herein are minimum requirements which are intended to govern, in general, the size and types of Materials desired. The City of Edinburg reserves the right to evaluate minor exceptions to these specifications

Note: All new developments shall install smart water meters. Please refer to City's Standard Details W-1 and W-2 for approved smart water meters. Standard water meters will only be allowed to replace existing broken, damaged, and non-working water meters.

ii. Conformance To Standards

The meters shall meet or exceed all requirements of ANSI/AWWA Standard C701 and C702 for Class II compound and turbine meter assemblies. Each meter assembly shall be performance tested to ensure compliance.

iii. Maincases

The meter maincase shall be of epoxy coated ductile or bronze material. All meters shall have cast on them, in raised characters, the size and direction of flow through the meter.

iv. Performance

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum headloss through the meter / strainer assembly shall not exceed those listed in following table per meter size.

v. Measuring Chamber

The measuring chamber shall be unitized construction (i.e. complete with measuring element, calibration devised and registered in one assembly). The measuring chamber shall be capable of operating within its accuracy limits without recalibration when transferred from one main case to another. The measuring element shall be mounted horizontal stationary shaft with bearings and essentially weightless in water.

vi. Register

- a. The Register shall be affixed to the upper part of the meter case in such way as to insure that it will be tamper resistant. Meter case must have stainless steel tamper resistant torex head screw.
- b. Register shall be a single billing "Sealed Register" type; shall read in gallons and have a large test or sweep hand.
- c. Register shall be magnetically driven; straight reading type; hermetically sealed against fogging, moisture, dirt, and corrosion; and mechanically unconnected from the measuring components.
- d. The register lens shall be of a high strength heat tested glass to minimize breakage.

vii. Maximum Operating Pressure

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 200 pounds per square inch (psig).

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viii. Strainers

The meter strainer shall be integral and cast as part of the meter's maincase. The strainer's screen shall have a minimum net open area of at least two (2) times the pipe opening and be a V-shaped configuration for the purpose of maintaining a full unobstructed flow pattern. The strainer body shall be a coated ductile iron fusion-bonded epoxy identical to that of the meter's maincase. All fasteners shall be stainless steel capable of maintaining the following static pressure rating.

ix. Connections

Flanges for the 2" size meter assemblies shall be of the 2-bolt oval flange configuration. The 3", 4", 6", 8" and 10" size meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

x. Certifications And Markings

All sizes of meter shall display the sizes and in addition to the manufactures serial numbers.

xi. Guarantee And Maintenance

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange. In the event that special tools are required to perform maintenance on a meter, the bidder shall furnish a sufficient supply at no cost to the City.

17. Pre- Cast Concrete Meter Vault

A. Concrete

Class 2 concrete with design strength of 4500 PSI at 28 days. Unit shall be of monolithic construction at floor and first stage of wall with sectional riser to required depth. Reinforcement: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

B. Steel Cover

All steel fabrication shall be with accordance to AWA D1.1. Steel shall be ASTM A36 carbon steel, and hot dipped galvanized after fabrication in accordance to ASTM A123. Standard cover shall be rated at 50 PSF.

Park USA is an approved Vendor for the City of Edinburg on all 4" and above Pre-Cast meter vaults.

Size	Bypass	L1	W1	H1	Weight (lbs)
4"	2"	11'-6"	6'-0"	4'-3"	15,000
6"	2"	13'-6"	6'-0"	4'-3"	15,550

18. Pumps for Lift Stations

- A. Self-Priming
- B. Submersible
 - i. Flygt

Note: All products/materials must be domestic made. Other utility related domestic products/materials not listed may be considered.

19. Sewer Couplings

- A. Sizes – 4", 6", 8"
- B. Style – PVC x PVC, PVC x Clay, PVC x PVC Shear Guard, PVC x Clay Shear Guard
- C. Manufacturer's Name Product Number
 - i. Fernco 1001, 1002 Series
 - ii. Indiana Shear Guard 102-ON 4, 6, 9PK

Comments: Sewer couplings shall be flexible, leak proof, root proof, and resistant to chemicals. Stainless steel clamps must be erosion resistant and rust proof.

Exhibit “B”

CITY OF EDINBURG SUBDIVISION IMPROVEMENTS REIMBURSEMENT CONTRACT
SAMPLE TEMPLATE. Prepared by: (Engineering Firm)

**AGREEMENT FOR THE CONSTRUCTION OF PROJECT AND REIMBURSEMENT OF
ADVANCES BETWEEN
CITY OF EDINBURG
AND
(DEVELOPER NAME)**

STATE OF TEXAS §
COUNTY OF HIDALGO §

This Agreement for the Construction of Project and Reimbursement of Advances (the “Agreement”) is made and entered into on _____, 20____, by and between the City of Edinburg, a Municipal Corporation, (hereinafter called the City) and **(Developer Name)** (hereinafter called Developer).

This Agreement is being executed by the City and Developer to set forth the terms and conditions under which Developer may be reimbursed by the City for the construction of certain Project costs, and the terms under which the City will maintain such Project.

SECTION I
CONSTRUCTION OF PROJECT

A. The Developer shall ensure construction of a project known as a **(Project/Subdivision Name and Description)**(hereinafter called “**PROJECT**”), under the terms and specifications and other documents prepared by **(Engineering Firm Name)** dated **(Date)** all of which are either attached hereto or referred to herein and are hereby incorporated by reference for all purposes.

B. All physical facilities constructed as a part of the Project have been designed by a qualified engineer selected by the Developer. Such design shall be subject to the approval of all governmental agencies with jurisdiction, including, without limitation, the Texas Department of Health, the Texas Commission on Environmental Quality (the “Commission”), the City, and Hidalgo County, as applicable.

C. The Project shall be constructed in a good and workmanlike manner and all material used in such construction are fit for their intended purpose.

D. Upon completion of construction of Project, the Developer shall provide the City with final record drawings of the Project.

E. Upon completion of construction of Project, the Developer shall provide the City with applicable acceptance letters and a certificate of completion from the City’s engineers certifying that the construction of such Project has been completed in accordance with the plans and specifications approved by the City.

SECTION II

COSTS OF PROJECT

A. Developer shall pay for the entire cost of the Project, currently estimated to a total of **(Total Cost Amount)**, which Project shall become the property of the City.

B. The Developer shall promptly pay the costs of the Project as the same become due, including, without limitation, all costs of design, engineering, materials, labor, construction, and inspection arising in connection with the Project; all payments arising under any contracts entered into for the construction of the Project; all costs incurred in connection with obtaining governmental approvals, certificates, permits, easements, rights-of-way, or sites required as a part of the construction of the Project, including, without limitation, any on-site or off-site mitigation costs; and all out-of-pocket expenses incurred in connection with the construction of the Project. The City shall not be liable to any contractor, engineer, attorney, materialman, or other party employed or contracted with in connection with the construction of the Project, but shall only be obligated to reimburse the Developer in the manner and to the extent provided in this Agreement.

C. Upon installation, completion, and operation of the Project, and after approval of the Project by City, City agrees to reimburse to the Developer for a 10-year period any pro rata share of the cost of the Project paid to the City related to use of the Project in connection with approval of a subdivision plat or application of City permits, services or issuance of a certificate of compliance for property. The amount reimbursed to Developer is limited to the amounts shown in the schedule attached as Exhibit A. The City may retain an administrative fee as shown in Exhibit A.

D. For the avoidance of doubt, the City's requirement to reimburse Developer a pro rata share of the cost of the Project shall terminate 10 years after the effective date of this Agreement.

SECTION III

COMMENCE WORK

A. Developer shall ensure work on the Project commences on the commencement date. The commencement date shall be the date the Developer or his representatives issue its notice to proceed to its contractor. Said notice will be issued within ten (10) days of the date of this Agreement. Developer shall complete the project within ninety (90) days of the commencement date.

SECTION IV

INDEMNITY

A. The Developer shall indemnify and hold the City harmless from and against all losses, costs, damages, expenses, and liabilities ("Losses") of whatsoever nature, including, but not limited to, attorneys' fees, costs of litigation, court costs, amounts paid in settlement and amounts paid to discharge judgments relating to any claim, lawsuit, cause of action or other legal action or proceeding brought against the City or to which the City may be a party, even if groundless, false or fraudulent, directly or indirectly resulting from, arising out of, or relating to the construction of the Project, within two (2) years of the completion of the Project.

B. In the event of any action brought against the City in which indemnification by the Developer is applicable, the City shall promptly give written notice to the Developer and the Developer shall assume the investigation and defense of such action, including the employment of counsel and the payment of all expenses. The City shall have the right, at its expense, to employ separate counsel and to participate in the investigation and defense of any such action. In the event of any settlement entered into or of any final judgment for a plaintiff in any such action, the Developer shall indemnify and hold the City harmless from and against any losses incurred by reason of such settlement or judgment. The expiration of the term of this Agreement shall not relieve the Developer from any liability hereunder arising prior to the expiration of this Agreement.

SECTION V **CONVEYANCE**

A. The Developer shall convey the Project to the City by general warranty deed or other appropriate instrument of conveyance, with full warranties, free and clear of any liens, claims, encumbrance, options, charges, assessments, restrictions, laminations or reservations, including liens for ad valorem taxes for past and current years, and payments due to construction contractors, laborers, or materialmen. The Developer shall provide reasonable proof of title and proof of no liens, claims, or encumbrances. Each conveyance shall include all easements within which the Project are located, unless such easements have been dedicated to the public, and all easements necessary to own, operate and maintain the Project. Each conveyance shall additionally include fee simple title to any and all plant sites, together with necessary rights of way where such site or sites are not directly accessible by a dedicated public street, and all licenses, franchises and permits for the Project. The Developer shall also assign, in writing, all of its contractors' and materialmen's warranties relating to the Project. All documents or instruments of conveyance, transfer, or assignment hereunder shall be in a form and content acceptable to the City.

B. Conveyance of the Project to the City shall not relieve the Developer of liability for satisfaction of any unpaid claim for materials or labor or, for a period of two (2) years after conveyance of the Project to the City, the correction of any existing engineering or construction defects then existing in the Project. The City shall be under no obligation to contest or challenge any claim for labor or materials; provided, however, that in the event the Developer fails to promptly correct any such defect or satisfy any such claim, the City may elect to do so and, in such event, shall have full rights of subrogation. Subject to any applicable statutes of limitation, the Developer shall pay the City for the City's costs in correcting any defect or satisfying any claim including, but not limited to, construction costs, engineering fees, attorneys' fees, building or construction permits, filing fees or court costs

C. All representations, warranties and agreements of the City and the Developer hereunder shall survive the conveyance of the Project to the District or City.

SECTION VI **ALTERNATE DISPUTE RESOLUTION/NEUTRAL PARTY**

A. If any dispute, controversy, or claim between or among the Parties arises under this Agreement or is related in any way to this Agreement or the relationship of the Parties hereunder (a "Dispute"), the Parties shall first attempt in good faith to settle and resolve such Dispute by meeting at a

mutually agreeable time and place to discuss the Dispute within seven (7) days following the original written notice of any Dispute by the party making such a claim. The Parties shall seek to resolve the Dispute in writing within fourteen (14) days following the original written notice of any Dispute by the party making such a claim.

B. If a mutual resolution and settlement are not obtained at the meeting, the Parties shall participate in good faith in formal mediation, within thirty (30) days following the original written notice of any Dispute, with a mutually agreeable mediator at a mutually agreeable time and place. No settlement reached under this provision shall be binding on the Parties until reduced to a writing signed by a representative of Developer and the City. Unless the parties expressly agree otherwise, each party shall bear its own costs and legal and expert fees incurred in the mediation, and evenly share the costs of the mediator. If after proceeding in good faith the parties, with the assistance of a neutral mediator, do not resolve the dispute within forty-five (45) days following the original written notice of any Dispute, the parties may proceed in accordance with the Section below.

SECTION VII

CONTROLLING LAW, MANDATORY VENUE, AND FEES AND EXPENSES

A. After exhausting the procedures set forth above, either party may initiate litigation to resolve the dispute. The Law of the State of Texas shall control the Dispute. Venue is mandatory in in State courts located in Hidalgo County, Texas.

B. In the event of any litigation between the parties, the parties shall bear their own costs, including attorney fees and expenses.

SECTION VIII

INSURANCE

A. Developer shall ensure that its contractor has adequate liability insurance for the duration of the construction project in accordance with the provisions of the Section 33.44 of the Code of Ordinances of the City of Edinburg, regarding bond and insurance to ensure completion of work. Developer agrees that the contractor shall maintain all necessary liability insurance and worker's compensation insurance as required under Texas Law and the Code of Ordinances of the City of Edinburg.

LIMITATION OF LIABILITY

A. Developer agrees to limit the City's liability arising from City's acts, errors, or omissions such that the total liability of City shall not exceed the total costs of Project paid by the Developer. Developer agrees that City will not be liable for any indirect, incidental, special, or consequential punitive or multiple damages, including without limitation any damages resulting from loss of use, loss of business, loss of revenue, loss of profits, or loss of data, arising in connection with this Agreement, even if City has been advised of the possibility of such damages. The foregoing limitation of liability shall apply to the maximum extent allowed by law for limitation of City's liability, regardless of the cause of action under which such damages are sought.

SECTION IX

AGREEMENT CONSTRUCTION

A. The headings of the Sections contained in this Agreement are for reference purposes only, and shall not affect the meaning or interpretation of this Agreement. The parties have been advised by counsel in connection with this Agreement. This Agreement shall be construed and interpreted in accordance with the plain meaning of its language, and not for or against either party, and as a whole, giving effect to all of the terms, conditions, and provisions of this Agreement. Nothing contained in this Agreement shall be deemed to confer any right or benefit on any person who is not a party to this Agreement.

SECTION X **SEVERABILITY**

A. If any term or provision of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions of this Agreement shall remain in full force and effect and shall in no way be affected, impaired or invalidated.

SECTION XI **NOTICE**

A. Any notice to be given herein shall be in writing and shall be given by depositing same with the United States Postal Service, postage prepaid, via first class mail and certified, with return receipt requested. Notice required to be given herein shall be addressed as follows:

(a) Notices to the City:

City Manager
CITY OF EDINBURG
P.O. Box 1079
Edinburg, Texas 78540-1079

(b) Notices to Developer:

Owner/President
Name of Corporation
Address
City, Texas Zip

SECTION XII **NOTICE CHANGES**

A. Developer further agrees to give written notice to City of any and all changes of mailing address of Developer. In the event of assignment of this Reimbursement Contract, Assignee shall give written notice to City of Assignee's mailing address, and all subsequent changes thereof. In the event that reimbursement is made to City for the Project and City is unable to give notice of such reimbursement to Developer or Developer's Assignee, due to the failure of Developer or Assignee to provide City with written notice of current mailing address as required herein above, City will publish a Notice of Reimbursement to the Developer or Assignee, at the address as provided to City, on one (1) occasion, in a newspaper of general circulation within the City of Edinburg.

B. If, written thirty (30) days of publication of said Notice of Reimbursement, the party named therein fails to give notice to City of that party's current mailing address, all funds then held by City for reimbursement of the Project shall become property of the City, without recourse by any party otherwise entitled to such funds by virtue of this Reimbursement Contract.

SECTION XIII **NON-APPROPRIATIONS**

A. Notwithstanding anything in the Agreement to the contrary, any and all payments which the City is required to make under this Agreement shall be subject to annual appropriation or other availability of funds, as certified by the Director of Finance.

B. If the City cannot appropriate sufficient funding, then either party has the right to terminate the Agreement by providing ten (10) days' written notice to the other party.

SECTION XVII **SUCCESSORS AND ASSIGNS**

City and Developer agree that this Reimbursement Contract is fully assignable. Such assignment shall become effective upon receipt of the notice to City of such assignment as set forth herein.

SECTION XX **NO WAIVERS OR ACCORD AND SATISFACTION**

A. This Agreement may be amended only by written instrument signed by all parties.

B. No failure or delay of the City, in any one or more instances (i) in exercising any power, right, or remedy under this Agreement or (ii) in insisting upon the strict performance by Consultant of its covenants, obligations, or agreements under this Agreement, shall operate as a waiver, discharge, or invalidation thereof, nor shall any single or partial exercise of any such right, power, or remedy or insistence on strict performance, or any abandonment or discontinuance of steps to enforce such a right, power, or remedy or to enforce strict performance, preclude any other or future exercise thereof or insistence thereupon or the exercise of any other right, power, or remedy. The covenants, obligations, and agreements of Consultant and the rights and remedies of the City upon a default shall continue and remain in full force and effect with respect to any subsequent breach, act, or omission.

C. Without limiting the generality of the above, the receipt by City of any Services with knowledge of a breach by Developer of any covenant, obligation, or agreement under this Agreement shall not be deemed or construed to be a waiver of such breach. No acceptance of Project or payment to Developer shall be deemed to be other than on account of the earliest installment of the amounts due under this Agreement, nor shall any endorsement or statement on any check, or any letter accompanying any check, wire transfer or other payment, be deemed an accord and satisfaction. City may accept services or make payment without prejudice to its rights under this Agreement or pursue any remedy provided in this Agreement or provided otherwise by law or equity.

WITNESS OUR HANDS in duplicate originals this _____ day _____ of, 20__.

CITY OF EDINBURG

DEVELOPER

By: _____
(Name)
City Manager

By: _____
(Name)
(Title)

ATTEST:

By: _____
(Name)
City Secretary

APPROVED AS TO FORM:

By: _____
(Name)
City Attorney

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SECTION 4 – CONSTRUCTION PLANS SUBMITTAL POLICY

4.01 General Plans Submittals

4.02 Streets and Roadway Plans Submittals

4.03 Water Distribution System Plans Submittals

4.04 Sanitary Sewer Collection System Plans Submittals

4.05 Stormwater Pollution Prevention Plans Submittals

4.06 Construction Phase Submittals

SECTION 4

CONSTRUCTION PLANS SUBMITTAL POLICY

4.01 General Plans Submittals

The purpose of this section is to define the general requirements for the submittal of plans for preliminary approval for all construction improvements. In accordance with Section 7.410 of the Unified Development Code, where plans and specifications have been approved by the City and a conflict arises, the City's Engineering Standards shall prevail, unless otherwise approved in writing by the City Engineer.

A. Preliminary Approval Phase

1. Cover Sheet:
 - a. Name of Proposed Development
 - b. City Council Members
 - c. Planning and Zoning Members
 - d. City Engineer
 - e. Stamp of Staff Approval
 - f. Vicinity Map
 - g. Consulting Engineer information
2. Topography Sheet:
 - a. Survey boundaries of proposed development
 - b. Legal Description
 - c. Seal and Signature by a Registered Professional Land Surveyor
 - d. Contours at 1-foot intervals
 - e. Show all existing infrastructures such as water, sewer, drainage, irrigation, Gas lines, etc.

B. Final Approval Phase / Final Construction Plans

1. Final Cover Sheet (Finalized version of the Preliminary Phase)
2. Final Topography Sheet (Finalized version of the Preliminary Phase)
3. Final Drainage Plans (As noted in Drainage Section)

4. Final Streets and Roadway Plans (As noted in the following Sections)
5. Final Water Distribution Plans (As noted in the following Sections)
6. Final Sanitary Sewer Collection Plans (As noted in the following Sections)
7. Final Stormwater Pollution Prevention Plan (SW3P) (As noted in the following Sections)
8. Final Traffic Control Plan (TCP) (As noted in the following Sections)

4.02 Streets and Roadway Plans Submittals

The purpose of this section is to define the specific requirements for the submittal of plans for preliminary approval and construction of streets and roadway improvements.

A. Preliminary Approval Phase

1. A reproduction of that portion of the City's Thoroughfare Plan showing the relationship of the area to be improved and the proposed improvements to the City's street system.
2. Subdivision Street Layout Sheet:
 - a. Proper right-of-way dedication interior and additional to existing streets
 - b. Street geometry
 - c. Street sign layout in accordance with TMUTCD
 - d. Runoff flow direction
 - e. High points (elevations top of curb)
 - f. Curb radius at intersections as required
 - g. Existing and proposed 1-foot contours intervals to 150-feet outside subdivision boundaries
 - h. Drainage system
 - i. Sidewalk Plan with applicable handicap ramps. Residential sidewalks within the subdivision shall be installed at building permit stage.

3. Street Lighting Layout Sheet

- a. Location of lights in accordance with Street Lighting Standards
- b. Details (As required for preliminary approval)

B. Final Approval Phase / Final Construction Plans

1. Detailed final versions of all the required submittals in the Preliminary Approval Phase including any “red-lined” drawings prepared by City Staff.

4.03 Water Distribution System Plans Submittals

The purpose of this section is to define the specific requirements for the submittal of plans for preliminary approval and construction of water distribution system improvements.

A. Preliminary Approval Phase

1. A reproduction of that portion of the City’s Water Master Plan showing the relationship of the area to be improved and the proposed improvements.
2. Water Distribution System Layout Sheet:
 - a. Existing Water Distribution System (City or other)
 - b. Proposed Water Distribution System sized accordingly DR-18
 - c. Proposed Water Valves at 600-foot spacing intervals (On-Site)
 - d. Proposed Water Valves at 1000-foot spacing intervals (Off-Site)
 - e. Proposed interior water distribution system within 15-ft easement. Additional easement widths may be required as deemed necessary by the Director of Utilities.
 - f. Proposed Water Master Plan (distribution system).
 - g. Show proposed fire hydrant locations spaced at 300-ft for commercial and 500-ft for residential.
 - h. Tapping to City’s water distribution system with gate valve included.
 - i. Existing and proposed 1-foot contours intervals to 150-feet outside subdivision boundaries.
 - j. Tapping to City’s water distribution system with gate valve included.

B. Final Approval Phase / Final Construction Plans

1. Detailed final versions of all the required submittals in the Preliminary Approval Phase including any “red-lined” drawings prepared by City Staff.
2. Water Distribution System Layout Sheet
 - a. Proper identification of water mains size, type, linear footage and location
 - b. Final location of valves, fire hydrants, water services
 - c. Elevations of all fire hydrant bottom flange and valves top of cover
 - d. Provide all proposed water mains to be bored crossing any existing streets
 - e. Conflict with other utilities
3. Standard Water Distribution Details Sheet

4.04 Sanitary Sewer Collection System Plans Submittals

The purpose of this section is to define the specific requirements for the submittal of plans for preliminary approval and construction of water and sanitary sewer collection system improvements.

A. Preliminary Approval Phase

1. A reproduction of that portion of the City’s Wastewater Master Plan (collection system) showing the relationship of the area to be improved and the proposed improvements.
2. Sewer Collection System Layout Sheet:
 - a. Existing Sewer Collection System (City or other)
 - b. Proposed Sewer Collection System sized accordingly SDR-26
 - c. Proposed Fiberglass Manholes at 400-foot maximum spacing intervals (On-Site).
 - d. Proposed interior sewer collection system within 15-ft easement.
 - e. Proposed Wastewater Master Plan (collection system).
 - f. Existing and proposed 1-foot contours intervals to 150-feet outside subdivision boundaries.

B. Final Approval Phase / Final Construction Plans

1. Detailed final versions of all the required submittals in the Preliminary Approval Phase including any “red-lined” drawings prepared by City Staff.
2. Sanitary Sewer Collection System Layout Sheet
 - a. Plan and profile of proposed sewer construction
 - b. Proper identification of sewer mains size, type, linear footage and location
 - c. Proper slope for proposed sewer pipe
 - d. Elevations of all top of manhole covers
 - e. Provide all proposed sewer mains to be bored crossing any existing streets
 - f. Conflict with other utilities with proposed conflict design
 - g. A table indicating the number of sewer service connections and quantity in gallons per day of wastewater that will be added to the City Collection/Treatment System.
 - h. Service locations
3. Profile Sheets:
 - a. Plan and profile of proposed sanitary sewer
 - b. Pipe length, size, class, and slope
 - c. Identification of manholes
 - d. Flow lines at structures, 50-foot intervals along storm sewer length
 - e. Finished grade/natural ground
 - f. Identification of Utility crossings / Conflicts
 - g. Hydraulic Grade Line
 - h. Top of curb elevations
 - i. Manhole rim / flowline elevations
 - j. Trench protection limits
4. Standard Sanitary Sewer Details Sheet
5. Traffic Control Plan

4.05 Stormwater Pollution Prevention Plans Submittals

The purpose of this section is to define the specific requirements for the submittal of plans for preliminary approval and construction of Stormwater Pollution Prevention Plans (SW3P).

A. Preliminary Approval Phase

1. Proposed Site Layout
 - a. Silt Fencing Location
 - b. Construction Access Locations

B. Final Approval Phase / Final Construction Plans

1. Detailed final versions of all the required submittals in the Preliminary Approval Phase including:
 - a. Final Silt Fencing Location
 - b. Detailed Drainage Inlet Protection
 - c. Final Construction Access Locations
 - d. Standard SW3P Details Sheet

4.06 Construction Phase Requirements

- A. Plans Copies - Six (6) complete sets of plans, profiles, and specifications for all proposed improvements must be submitted showing location, size, depths, dimensions, and construction details.
- B. Cost Estimates – A detailed cost estimate for all improvements including drainage, streets, water and sanitary sewer must be submitted prior to the scheduled Pre-Construction Conference (PCC) or issuance of a Notice to Proceed (NTP).
- C. Pre-Construction Conference (PCC) – Shall be scheduled at a time and location designated by the City. The Project Engineer whose seal is affixed to the plans and the Contractor must be present. Failure of either party to be present may result in postponement.

- D. Notice to Proceed (NTP) – A NTP from the Engineering Department shall be issued by the City at the time of the PCC advising the Engineer that construction of improvements may commence. No work may commence without a NTP.
- E. Approved Plans – After PCC, City Staff, Project Engineer, and Contractor will sign the plans, which shall be exclusively used during construction. Contractor must have one of the signed plans onsite at all times not a copy. If Contractor is found not to have the signed set of the plans on site, a Stop Work Order may be issued by the City and may not commence until the City has verified the accuracy of the work.
- F. Stormwater Permits shall be posted at the construction site (See Stormwater Policy Section 5).
- G. Cut Sheets – Project Engineer must provide the City cut sheets at minimum 50' intervals and set utility installation staking prior to construction.
- H. Changes to Plans – Any deviations from the approved plans or change orders must be submitted to the City Engineer for approval.
- I. As-Built Plans – Three sets of digital (CD, AutoCad .dwg format) and paper copies (24 x 36) of the certified “As-Built” plans at the completion of all improvements must be submitted prior to acceptance. The sets will be reviewed by the Engineering Department for approval.
- J. Certificate of Completion – A certification signed by the Project Engineer attesting to the completion of all improvements in accordance with the approved construction plans must be submitted prior to acceptance.
- K. Guarantee of Work Performed – For a period of one year upon final completion of all work, the City shall require a guarantee of performance of all improvements in the following manner:
 - i. A performance bond executed by a surety company holding a license to do business in the state, and acceptable to the City, in an amount equal to the cost of the improvements for a period of one year or,
 - ii. A trust agreement whereby the developer has placed on deposit in a bank or trust company, in the name of the City and approved by the City, in a trust account a sum of money equal to the estimated cost of all site improvements.

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SECTION 5 – STORMWATER POLICY

5.01 Stormwater Management Standards and Permitting

5.02 Storm Water Discharges for Construction Activities

- A.** Requirements for obtaining stormwater general permit coverage for construction projects that will disturb 5 or more acres, whether on their own or as part of a larger common plan of development.
- B.** Requirements for small construction sites – Those that disturb from 1 to less than 5 acres.
- C.** Requirements for small construction sites – Those that disturb less than 1 acre.

5.03 Erosion Control Measures

5.04 Standard Stormwater Management Details

- STW-1** Erosion Control Details
- STW-2** Temporary Sediment Control Fence Details
- STW-3** Temporary Erosion Control Logs – 1
- STW-4** Temporary Erosion Control Logs – 2
- STW-5** Temporary Erosion Control Construction Access/Exit
- STW-6** Post Construction Sediment Control Fence
- STW-7** Temporary Rock Filter Dam
- STW-8** Concrete Truck Washout Area

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SECTION 5 STORMWATER POLICY

5.01 Stormwater Management Standards and Permitting

In addition to the provisions of drainage that is intended to move stormwater safely through the City and avoid flooding damage or safety risks, there is a need to clean stormwater to maintain the health of the ditches in the community by reducing or eliminating pollutants before they reach their destination. Avoidance, Minimization, and Mitigation can be applied as part of a stormwater management plan. Without proper stormwater management, all development will increase stormwater runoff volume and pollutant loading; thus, all developments shall be in conformance with Texas Commission on Environmental Quality (TCEQ) stormwater permitting requirements.

5.02 Storm Water Discharges for Construction Activities

- A. Requirements for obtaining stormwater general permit coverage for construction projects that will disturb 5 or more acres, whether on their own or as part of a larger common plan of development.

When you disturb 5 acres or more of land or are part of a larger common plan of development that will disturb 5 or more acres of land, you must follow these steps before discharging storm water to any surface water in the state of Texas:

- i. Review your facility's compliance history ranking:
- ii. If your facility is new or has a ranking of "high" or "average," continue to Step 2.
- iii. If it is "poor," then your facility is not eligible for coverage under a general permit. You must apply for an individual permit instead.
- iv. Read the general permit (TXR150000) to make sure it applies to your situation.
- v. Prepare and implement a Storm Water Pollution Prevention Plan. For more details, see Part III of General Permit TXR150000.

- vi. Submit an original completed Notice of Intent (NOI) form with an original signature and fee as noted on the NOI.
- vii. Before starting construction, post a copy of the Site Notice at the construction site. Leave the notice posted until construction is completed.
- viii. Site Notice for Primary Operators of Large Construction Activities
- ix. Site Notice for Secondary Operators of Large Construction Activities

B. Requirements for small construction sites--those that disturb from 1 to less than 5 acres

A construction general permit (TXR150000) is for construction activities disturbing at least 1 but less than 5 acres or is part of a common plan of development disturbing at least 1 but less than 5 acres.

You will need to follow these steps to discharge storm water from a small construction site to any surface water in the state:

- i. Review your facility's compliance history ranking:
 - a. If your facility either does not have a compliance history ranking or has a ranking of "high" or "average," continue with Item 2.
 - b. If it is "poor," then your facility is not eligible for coverage under a general permit but it may be eligible under an individual industrial wastewater permit.
- ii. Read the general permit (TXR150000) to make sure it applies to your situation.
- iii. Adhere to the requirements of the general permit (TXR150000).
- iv. Prepare and implement a Storm Water Pollution Prevention Plan. For more details, please refer to Part III of the general permit (TXR150000).
- v. Sign and post a construction site notice.

- vi. At least 2 days before beginning construction, provide a copy of the site notice to the operator of any Municipal Separate Storm Water Sewer System (MS4) into which storm water will be discharged.
 - a. MS4s include streets, channels, gutters, ditches or anything else that is publicly owned, designed or used to collect or transport storm water.
- vii. As long as you meet the conditions of this general permit, you are authorized to discharge storm water.
- viii. No notice of intent (NOI), notice of termination (NOT), or fee is required under this option—as long as the requirements of this general permit are followed.

C. Requirements for small construction sites--those that disturb less than 1 acre

If your construction project disturbs less than 1 acre and is not part of a larger common plan of development, coverage under General Permit (TXR150000) is not required.

If your project is part of a larger plan, the total number of acres disturbed under that larger plan must be considered when determining how this general permit (TXR150000) applies to you.

A construction activity is part of a larger common plan of development if it is completed in one or more of the following ways:

- i. in separate stages
- ii. in separate phases
- iii. in combination with other construction activities

It is identified by the documentation that identifies the scope of the project including such things as the following:

- i. plats
- ii. blueprints
- iii. marketing plans
- iv. contracts
- v. building permits
- vi. public notice or hearing

vii. zoning requests

It can include one operator or many operators.

Example: A subdivision is being built. You are grading 0.75 acres, another company is clearing 4 different acres, and a contractor is excavating another 0.5 acres. In this case, the total area that would be disturbed is 5.25 acres, so each operator would fall under the requirements associated with disturbing 5 or more acres.

5.03 Erosion Control Measures

A. There are two types of water erosion control measures; those that prevent initial movement (cover factor, non-structural measures) and those that reduce sediment from moving water (practice factor, structural measures). Erosion control measures must be properly deigned, installed and maintained if they are to accomplish their intended purpose and effectiveness.

i. Non-structural Erosion Control Measures:

- a. Non-structural erosion control measures provide the best means of managing sediment from disturbed lands by preventing soil movement. Dissipating the kinetic energy of rainfall is by placing cover (e.g., straw, burlap, mulch, etc.) over disturbed areas to prevent initial sediment transport.
- b. One or more effective practices are the use of vegetation. Vegetation measures can provide temporary cover to help control erosion during construction and permanent cover to stabilize a site after construction is completed. The measures include the use of sod, planting of temporary cover crops and establishing permanent cover crops.
- c. Two or more different types of seeds must be used and usually with a hydro mulch when establishing a permanent dry land grass cover. It is important to establish vegetative cover as soon as possible in order to reduce erosion. An approved native seed mix design shall be used to reestablished vegetative cover

in the City right-of- way. Hydro mulching is essential in establishing good stands of grass on moderate to steep slopes, and on other areas where it is difficult to establish vegetation.

ii. Structural Erosion Control Measures:

- a. Once erosion commences due to water, structural measures have to be utilized to reduce sediment transport from disturbed lands.

B. Performance Objectives:

ii. The primary performance objectives of an erosion control plan include:

- a. Conduct all land disturbance activities in a manner that effectively reduces accelerated soil erosion and reduces sediment transport and offsite deposition.
- b. Design and construct all temporary or permanent facilities for the conveyance of water around, through, or from the disturbed area to limit the flow of the water non-erosive velocities.
- c. Remove sediment caused by accelerated soil erosion from surface runoff water before it leaves the site.
- d. Stabilized the areas of land disturbance with permanent vegetative cover or stormwater quality control measures.

Timing of implementation is one of the most critical factors involved in the control of erosion from developing and redeveloping sites.

5.04 Standard Stormwater Management Details

STW-1 Erosion Control Details

STW-2 Temporary Sediment Control Fence Details

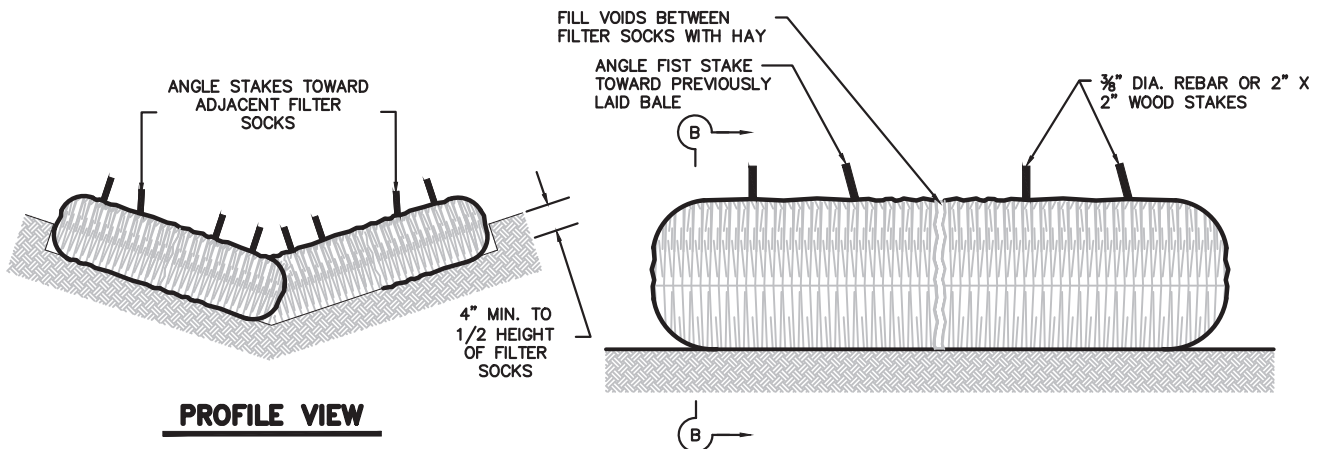
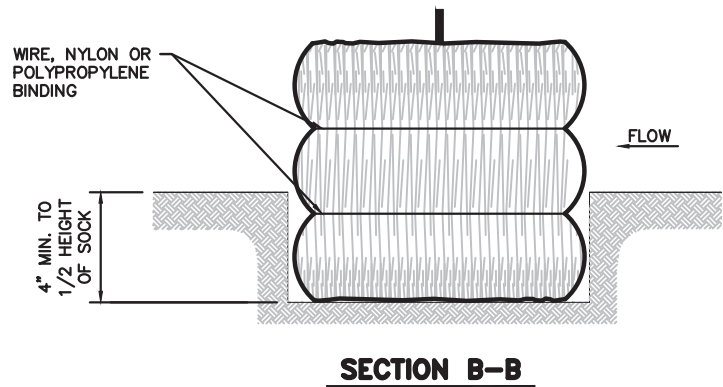
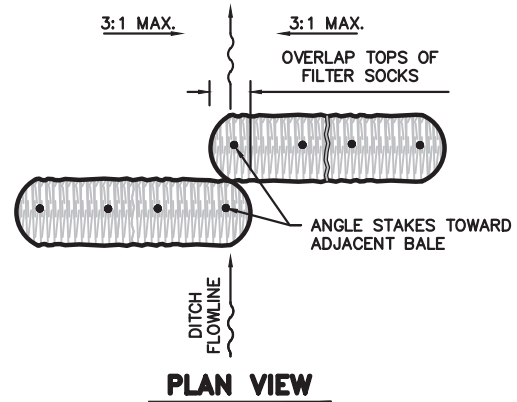
STW-3 Temporary Erosion Control Logs – 1

STW-4 Temporary Erosion Control Logs – 2

- STW-5** Temporary Erosion Control Construction Access/Exit
- STW-6** Post Construction Sediment Control Fence
- STW-7** Temporary Rock Filter Dam
- STW-8** Concrete Truck Washout Area

NOTES:

1. FILTER SOCKS SHALL BE A MINIMUM OF 8" DIAMETER.
2. FILTER SHALL BE BOUND BY EITHER WIRE NYLO OR POLYPROPYLENE STRING. THE FILTER SOCKS SHALL BE COMPOSED ENTIRELY OF VEGETABLE MATTER.
3. FILTER SOCKS SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4" AND WHERE POSSIBLE 1/2 THE HEIGHT OF THE HAY SOCK.
4. FILTER SOCKS SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT SOCKS. THE SOCKS SHALL BE PLACED WITH BINDINGS PARALLEL TO THE GROUND.
5. FILTER SOCKS SHALL BE SECURELY ANCHORED IN PLACE WITH 3/8" DIA. REBAR OR 2" X 2" WOOD STAKES, DRIVEN THROUGH THE FILTER SOCKS. THE FIRST STAKE SHALL BE ANGLED TOWARDS THE PREVIOUSLY LAID SOCK TO FORCE THE HAY SOCKS TOGETHER.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTION ONLY AND MAY BE MODIFIED BY THE ENGINEER.
7. NO HAY BALES ARE ALLOWED.



STW-1

**EROSION CONTROL
DETAILS**

SCALE: N.T.S.

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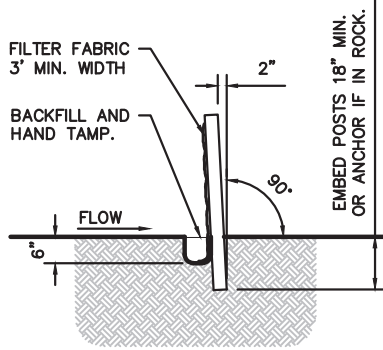
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GENERAL NOTES

1. THE GUIDELINES SHOW HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



SECTION A-A

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAX. FLOW THROUGH RATE OF 100 GPM/FT. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

CONNECT THE ENDS OF SUCCESSIVE REINFORCEMENT SHEETS OF ROLLS A MIN. OF 6 TIMES WITH HOG RINGS

4' MIN. STEEL WOOD POSTS SPACED AT 6' TO 8'.
SOFTWOOD POSTS SHALL BE 3" MIN. DIA. OR NOMINAL 2"x4". HARDWOOD POSTS SHALL HAVE A MIN. CROSS SECTION OF 1.5"x1.5".

FASTEN FABRIC TO TOP STAND OF WELDED WIRE MESH (W.W.M.) BY HOG RINGS OR CORD AT A MAX. SPACING OF 15".

ATTACH THE W.W.M. AND FABRIC ON END POSTS USING 4 EVENLY SPACED STAPLES FOR WOODEN POST (OR 4 T-CLIPS OR SEWN VERTICAL POCKETS FOR STEEL POSTS) (TYPICAL)

GALVANIZED W.W.M. (12.5 GA. MIN.)
MAX OPENING SIZE SHALL BE 2"x4"

WOVEN FILTER FABRIC

PLAN SHEET LEGEND

SEDIMENT CONTROL FENCE — SCF —

TEMPORARY SEDIMENT CONTROL FENCE — DETAILS

SCALE: N.T.S.

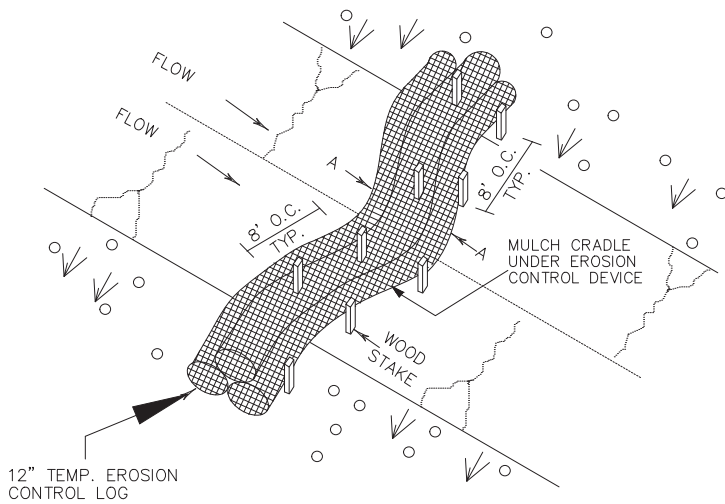
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STW-2

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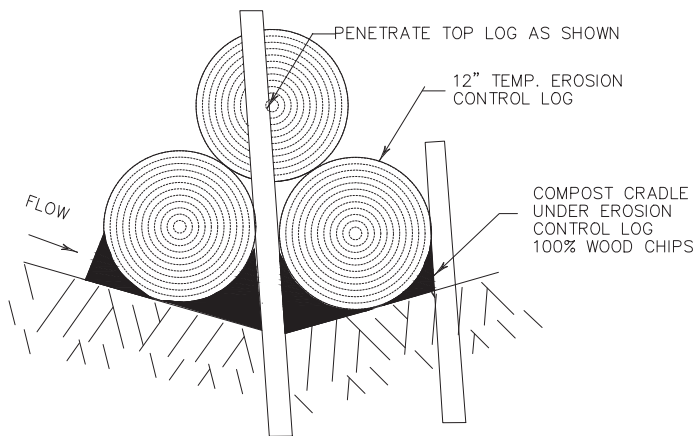


DITCH LINE SEDIMENT TRAP

DL-ST

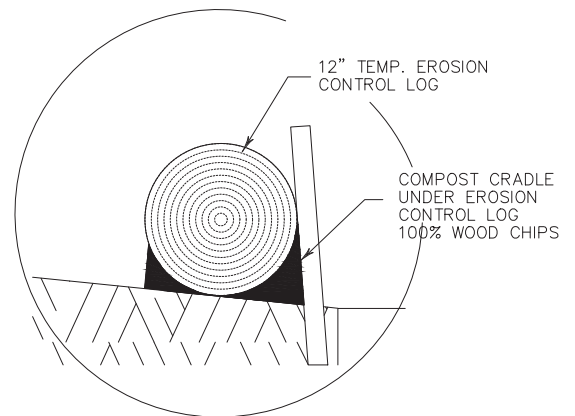
PLANS SHEET LEGEND

DL-ST
DITCH LINE SEDIMENT TRAP



DITCH LINE SEDIMENT TRAP A-A

DL-ST



COMPOST CRADLE

DL-ST

STW-3

**TEMPORARY EROSION CONTROL
LOGS - 1**

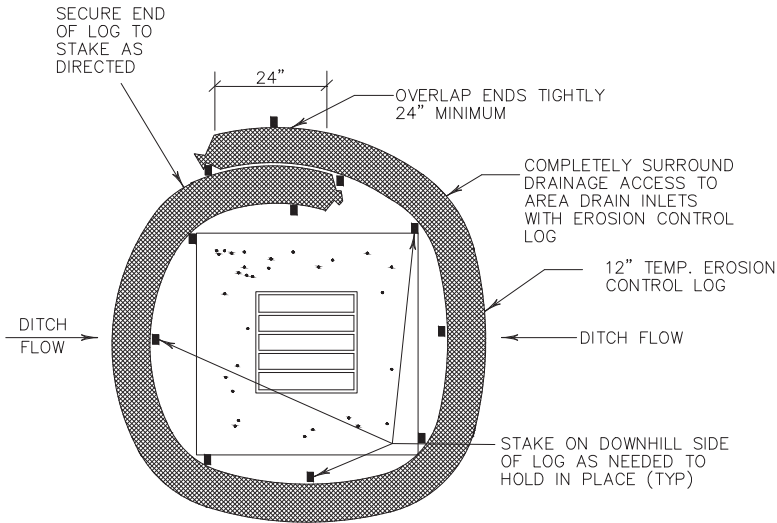
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DROP INLET SEDIMENT TRAP

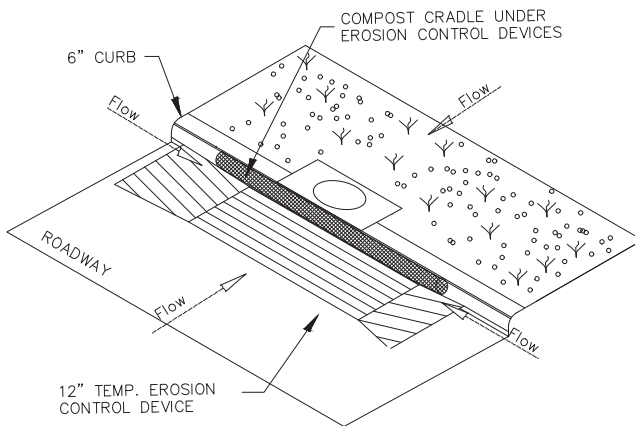
DI-ST

NTS

PLANS SHEET LEGEND

DI-ST
DROP INLET SEDIMENT TRAP

CI-ST
CURB INLET SEDIMENT TRAP



CURB INLET SEDIMENT TRAP

CI-ST

NTS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Traps: the drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:

1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1', whichever is less. Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

GENERAL NOTES

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG.
5. COMPOST CRADLE MATERIAL IS INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.

STW-4

TEMPORARY EROSION CONTROL LOGS - 2

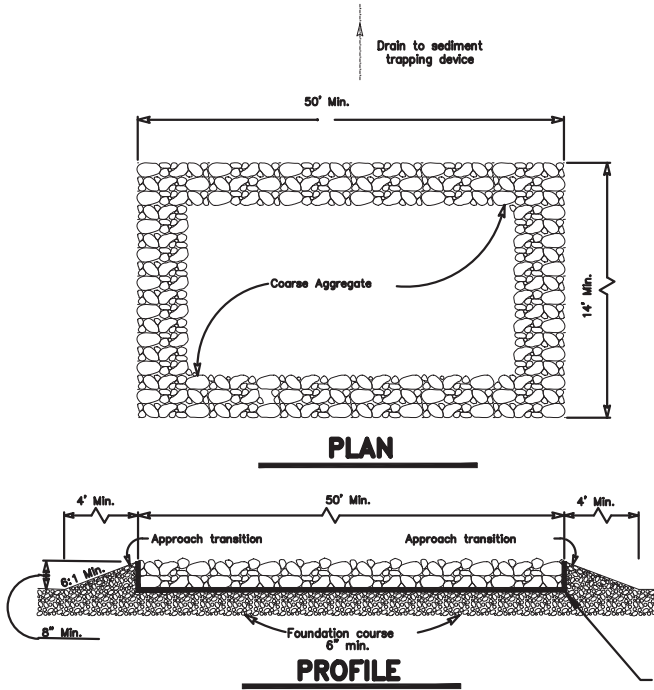
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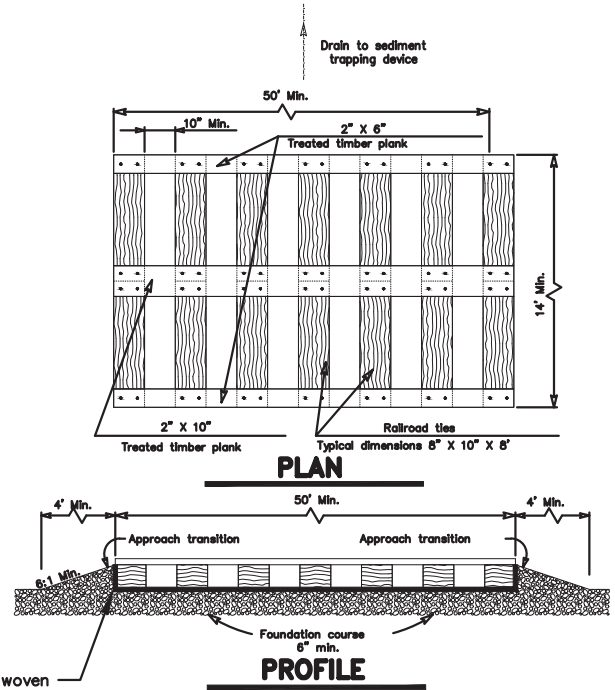
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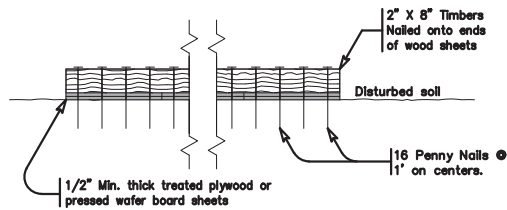
CONSTRUCTION EXIT (TYPE 1)



CONSTRUCTION EXIT (TYPE 2)

GENERAL NOTES

1. THE LENGTH OF TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



SECTION A-A

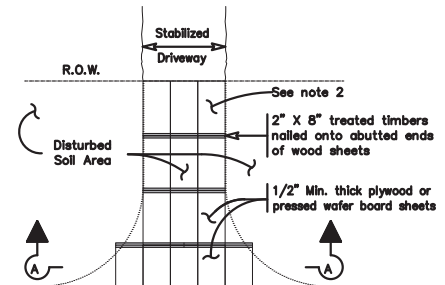
CONSTRUCTION EXIT (TYPE 3)

GENERAL NOTES

1. THE LENGTH OF TYPE 3 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE TYPE 3 CONSTRUCTION ACCESS/EXIT MAY BE CONSTRUCTED FROM OPEN GRADED CRUSHED STONE WITH A SIZE OF 2" TO 4" SPREAD AND A MIN. OF 4" THICK TO THE LIMITS SHOWN ON THE PLANS.
3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN. AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

GENERAL NOTES

1. THE LENGTH OF TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50.
2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1/2" x 6" MIN. LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE ENGINEER.
3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN. AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
6. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
7. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



PLAN

FILTER FABRIC: NON-WOVEN GEOTEXTILE FABRIC		
FABRIC WEIGHT	OZ/SY	6 MIN.
PERMITIVITY	1/SEC	0.5 MIN.
TENSILE STRENGTH	LBS	200 MIN.
APPARENT OPENING SIZE	SIEVE NO.	80-120
ELONGATION AT YIELD	%	20-100
TRAPEZOIDAL TEAR	LBS	75 MIN.

STW-5

TEMPORARY EROSION CONTROL CONSTRUCTION ACCESS/EXIT

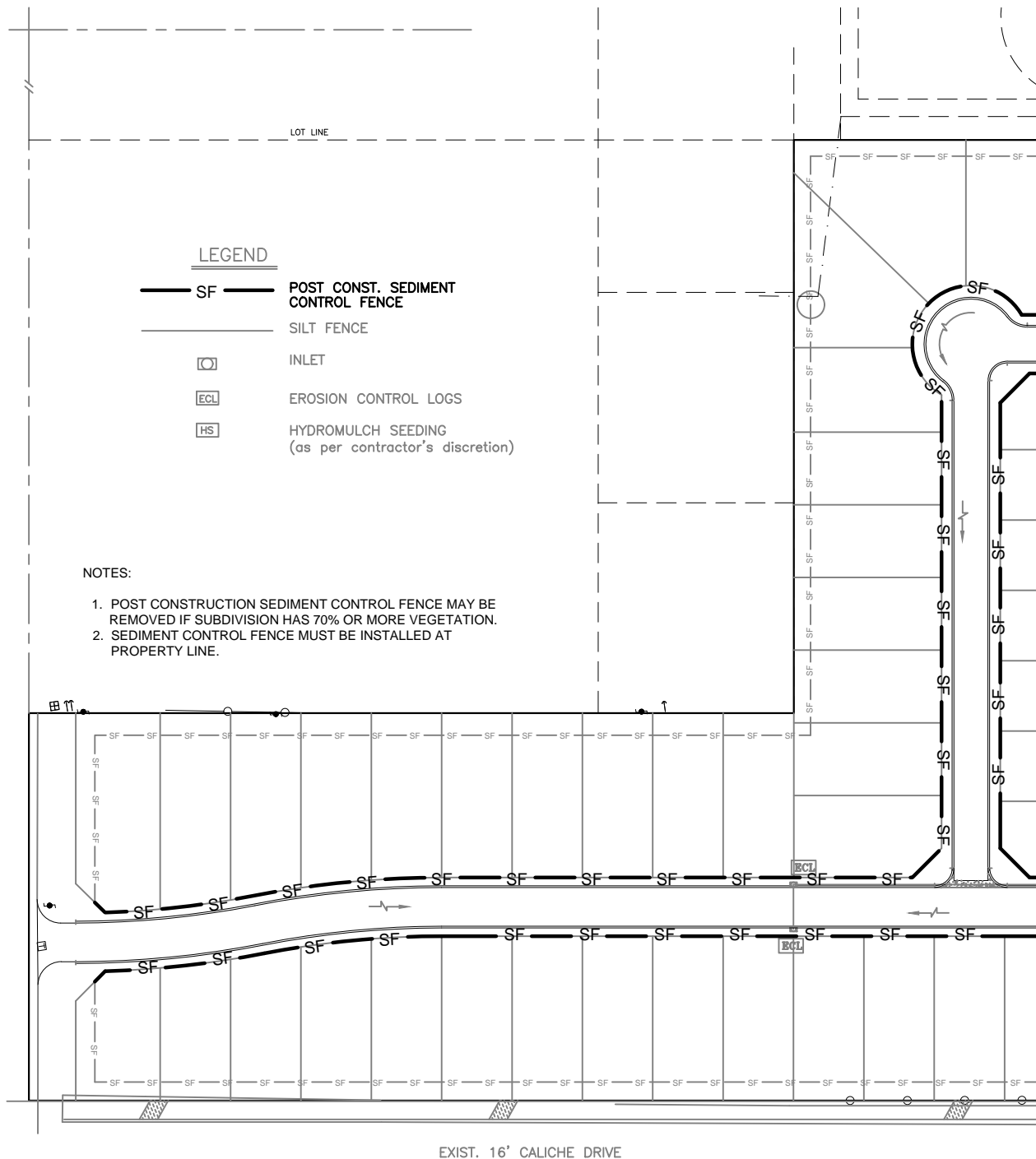
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STW-6

**POST CONSTRUCTION
SEDIMENT CONTROL FENCE**

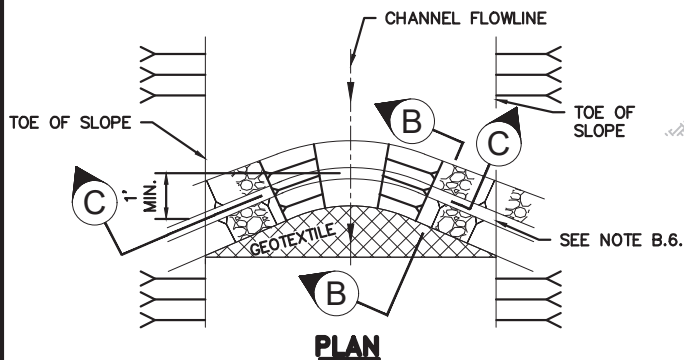
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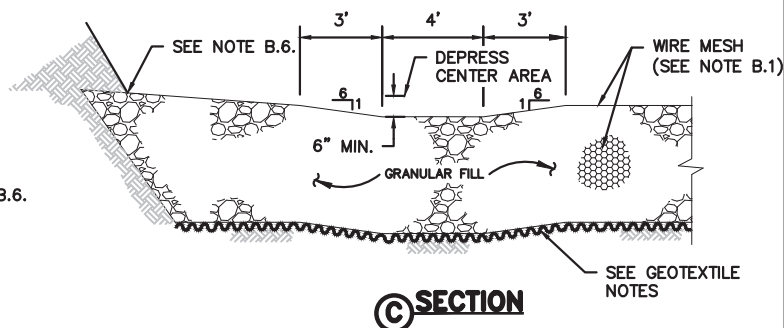
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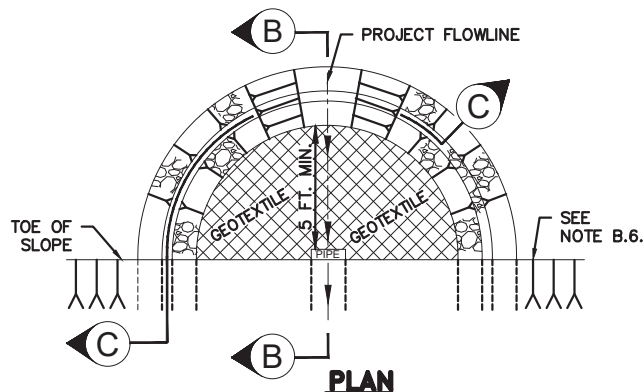




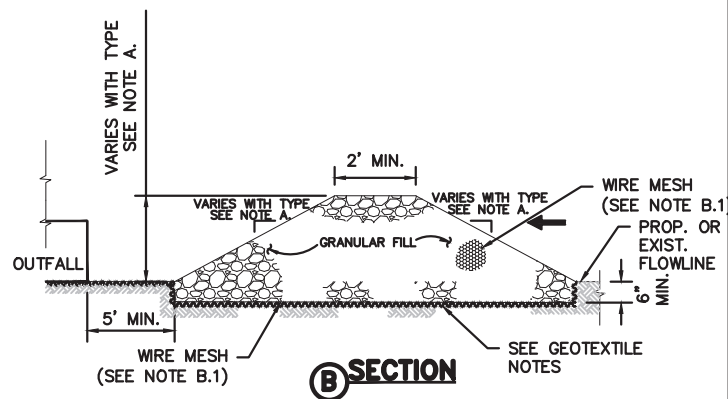
PLAN
IN-CHANNEL FILTER DAM



SECTION



PLAN



SECTION

NOTE:
ONLY APPLIES FOR DETENTION BASIN OUTFALL PIPE PROTECTION.

FILTER DAM AT DETENTION BASIN OUTFALL PIPE

FILTER DAM



SYMBOL

NOTES:

A. TYPES OF FILTER DAMS

1. TYPE 1 (NON-REINFORCED)

- HEIGHT - 18-24 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
- TOP WIDTH - 2 FEET (MAXIMUM).
- SLOPES - 2:1 (MAXIMUM).

2. TYPE 2 (REINFORCED)

- HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
- TOP WIDTH - 2 FEET (MAXIMUM).
- SLOPES - 2:1 (MAXIMUM).

3. TYPE 3 (REINFORCED)

- HEIGHT - 36-48 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
- TOP WIDTH - 2 FEET (MAXIMUM).
- SLOPES - 3:1 (MAXIMUM).

4. TYPE 4 (GABION)

- HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
- TOP WIDTH - 2 FEET (MINIMUM).

5. TYPE 5 (AS SHOWN ON PLANS)

B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.

- TYPE 2 AND TYPE 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCHES DIAMETER HEXAGONAL OPENINGS.

- PLACE GRANULAR FILL ON THE WIRE MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER. REFER TO GRANULAR FILL IN SPECIFICATION FOR RIPRAP AND GRANULAR FILL.

- 3-5 INCHES FOR ROCK FILTER DAM TYPES 1, 2 AND 4.

- 4-8 INCHES FOR ROCK FILTER DAM TYPE 3.

- FOLD WIRE MESH AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURE TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.

- IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.

- EMBED ONE FOOT MINIMUM INTO SLOPE AND RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA AT SLOPE.

C. FILTER FABRIC: NON-WOVEN GEOTEXTILE

FABRIC WEIGHT	OZ/SY	6 MIN.
PERMITTIVITY	1/SEC	0.5 MIN.
TENSILE STRENGTH	LBS	200 MIN.
APPROXIMATE OPENING SIZE	SIEVE NO.	80-120
ELONGATION AT YIELD	%	20-100
TRAPEZOIDAL TEAR	LBS	75 MIN.

D. GRANULAR FILL

- PROVIDE GRANULAR FILL CONSISTING OF CONCRETE OR STONE. PROVIDE GRANULAR FILL THAT IS DENSE, DURABLE AND HARD MATERIAL.

- PROVIDE GRANULAR FILL WITH THE FOLLOWING DIMENSIONS:

- PROVIDE 3 INCH TO 5 INCH GRANULAR FILL WITH NO MATERIAL DIAMETER LESS THAN 3 INCHES AND NO MATERIAL DIAMETER GREATER THAN 5 INCHES.

- PROVIDE 4 INCH TO 8 INCH GRANULAR FILL WITH NO MATERIAL DIAMETER LESS THAN 4 INCHES AND NO MATERIAL DIAMETER GREATER THAN 8 INCHES.

- PROVIDE RIPRAP GRADATION NO. 1 AND GRADATION NO. 2 AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STW-7

TEMPORARY ROCK FILTER DAM

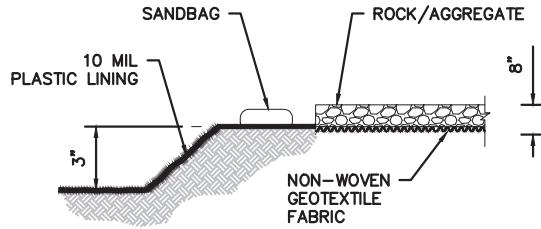
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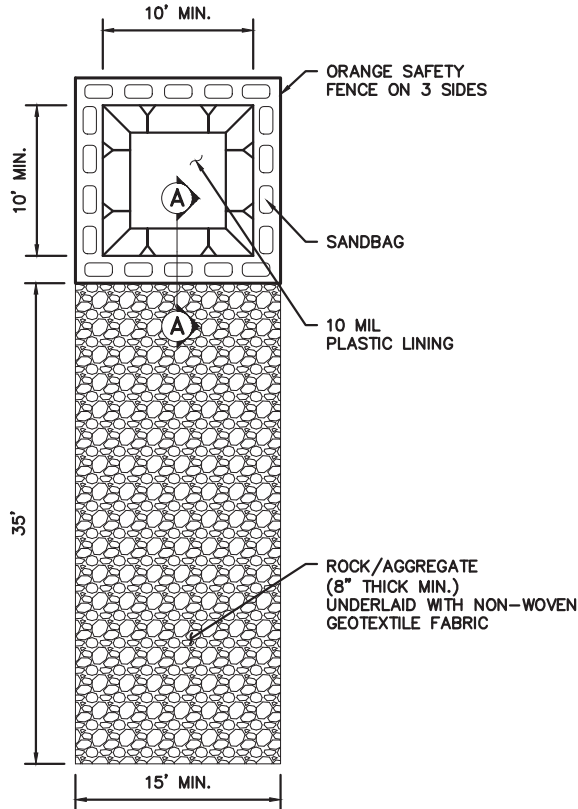


SECTION A-A

**CONCRETE TRUCK
WASHOUT AREA**



SYMBOL



PLAN

NOTES:

1. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASHOUT THEIR TRUCKS IN THE PIT AND NOWHERE ELSE.
2. UPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASHOUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
3. CONCRETE WASHOUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
4. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.
5. FILTER FABRIC: NON-WOVEN GEOTEXTILE FABRIC

FABRIC WEIGHT	OZ/SY	6 MIN.
PERMITIVITY	1/SEC	0.5 MIN.
TENSILE STRENGTH	LBS	200 MIN.
APPARENT OPENING SIZE	SIEVE NO.	80-120
ELONGATION AT YIELD	%	20-100
TRAPEZOIDAL TEAR	LBS	75 MIN.

STW-8

**CONCRETE
TRUCK WASHOUT AREA**

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