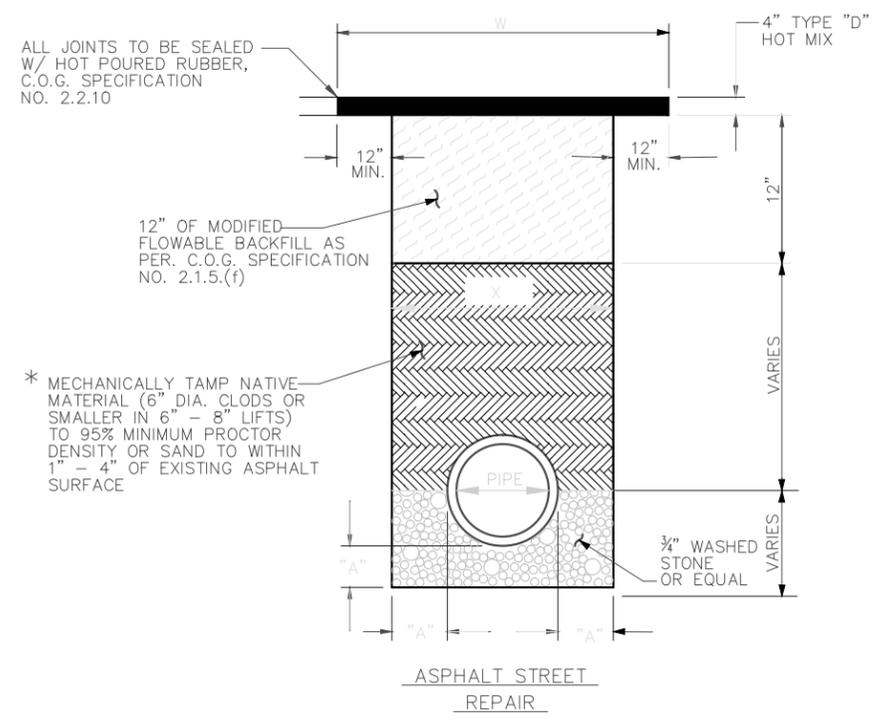
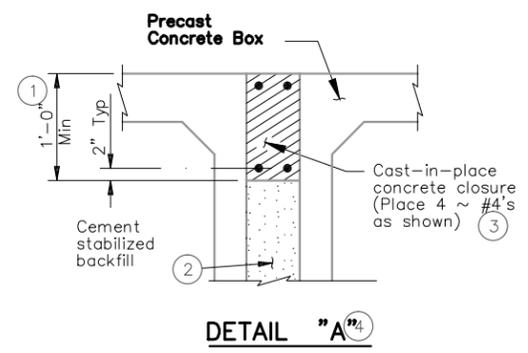
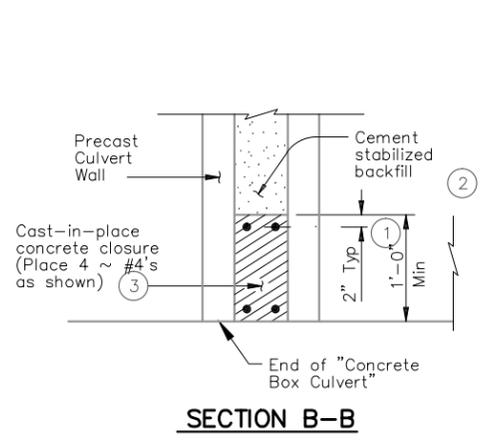
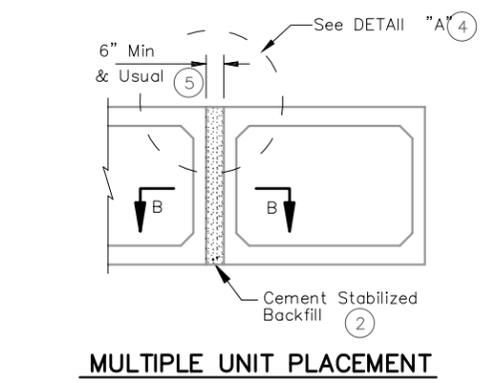


- * MECHANICALLY TAMPED NATIVE MATERIAL MAY BE USED TO THE BOTTOM OF CONCRETE PAVEMENT WHEN BOTH OF THE FOLLOWING CONDITIONS ARE MET:
1. THE OUTSIDE OF THE STORM DRAIN MUST BE A MINIMUM OF 2 FEET BELOW THE BOTTOM OF THE PAVEMENT.
 2. THE STREET IS BEING COMPLETELY REPLACED OR IT IS A NEW STREET.

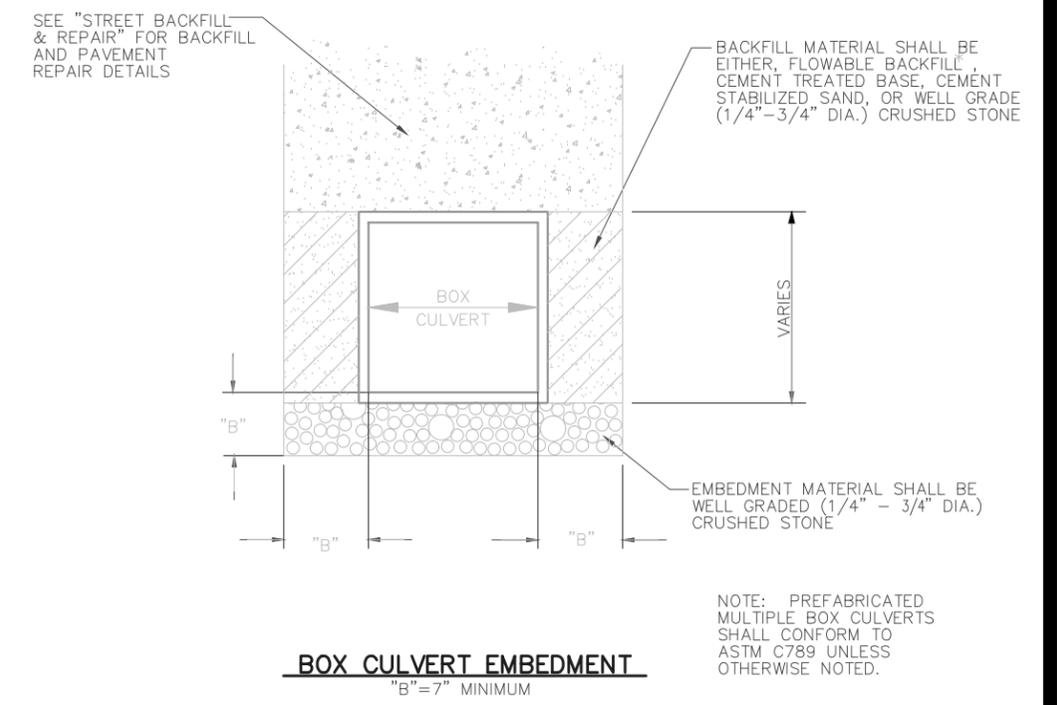


STREET BACKFILL & REPAIR
N.T.S.

NOTE: SAWCUT TO REPAIR ASPHALT OR CONCRETE PAVEMENT PRIOR TO OPENING THE DITCH IN ORDER TO ENSURE A NEAT STRAIGHT EDGE.



- 1 For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B-B detail when interior walls are cast full length.
- 2 Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.
- 3 Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
- 4 For multiple unit placement with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".
- 5 This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked. No payment will be made for any additional material in the gap between adjacent boxes.



* FLOWABLE BACKFILL IS ONLY REQUIRED FOR AREAS TO BE PAVED.

NORMAL SIZE OF PIPE IN INCHES	O.D. OF PIPE BELL IN INCHES CLASS III R.C.P.	MINIMUM TRENCH WALL CLEARANCE "A" IN INCHES	WIDTH OF TRENCH ("X")		WIDTH OF PVMT. REPLACEMENT * ("W") CONC. & ASPHALT **
			MAXIMUM ** IN INCHES	MINIMUM ** IN INCHES	
18	22.5	6	48	36	60
24	29.0	6	48	42	60
30	35.5	6	52	48	72
36	42.5	6	61	55	72
42	49.75	6	68	62	86
48	56.5	8	75	69	93
54	63.25	8	82	76	100
60	70.5	8	89	83	107
66	77.5	8	96	90	114
72	84.5	8	103	97	121
72+	VARIES	8	*	*	*

NOTE: * REFER TO THE PLANS FOR SPECIFIED WIDTH OF REPLACEMENT.
** RECOMMENDED WIDTHS - VARIES BASED ON DEPTH, AND SOIL MATERIAL.

TABLE OF DIMENSIONS FOR WIDTH OF TRENCH AND PAVEMENT REPLACEMENT

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STORM DRAIN STANDARD DETAILS

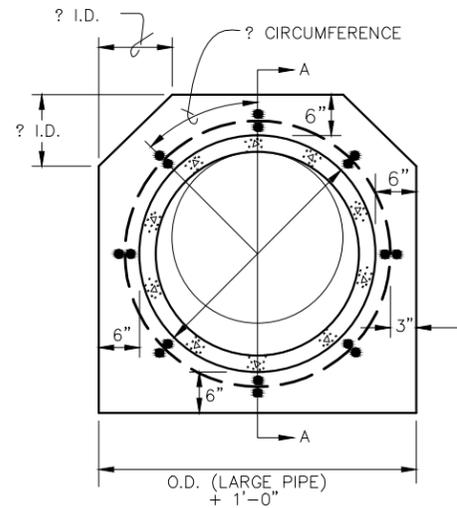
BACKFILL / EMBEDMENT



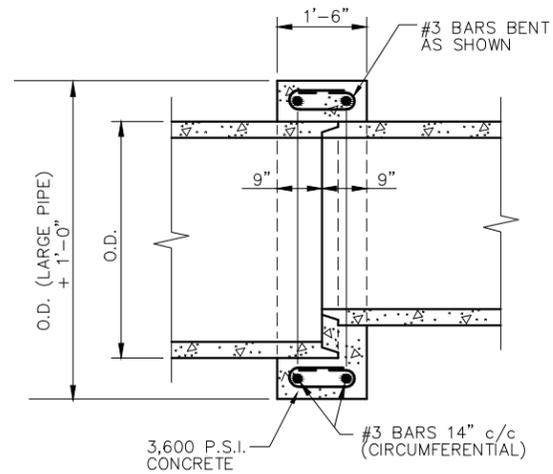
THE CITY OF THE COLONY TEXAS

ENGINEERING DEPARTMENT

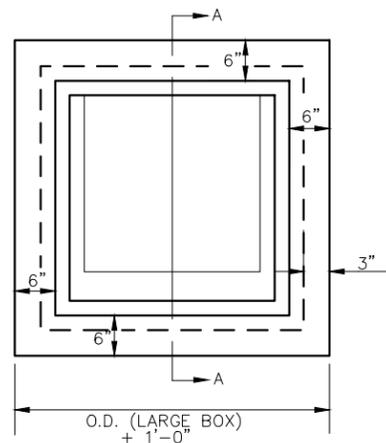
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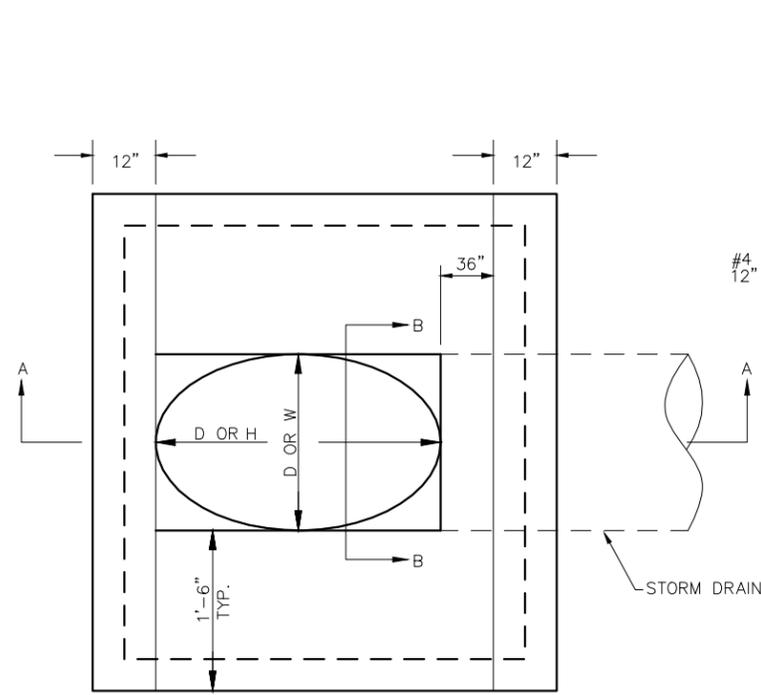
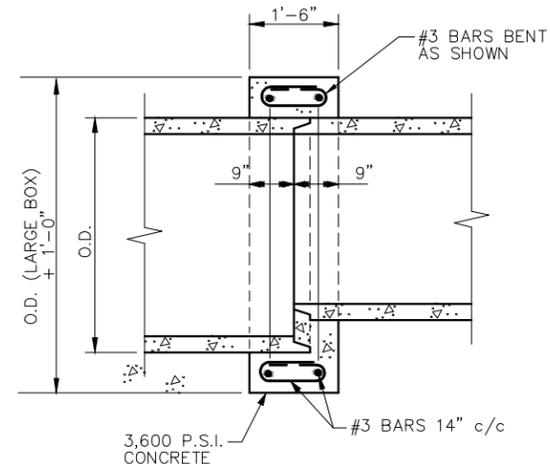
CONCRETE COLLAR DETAIL (PIPE)



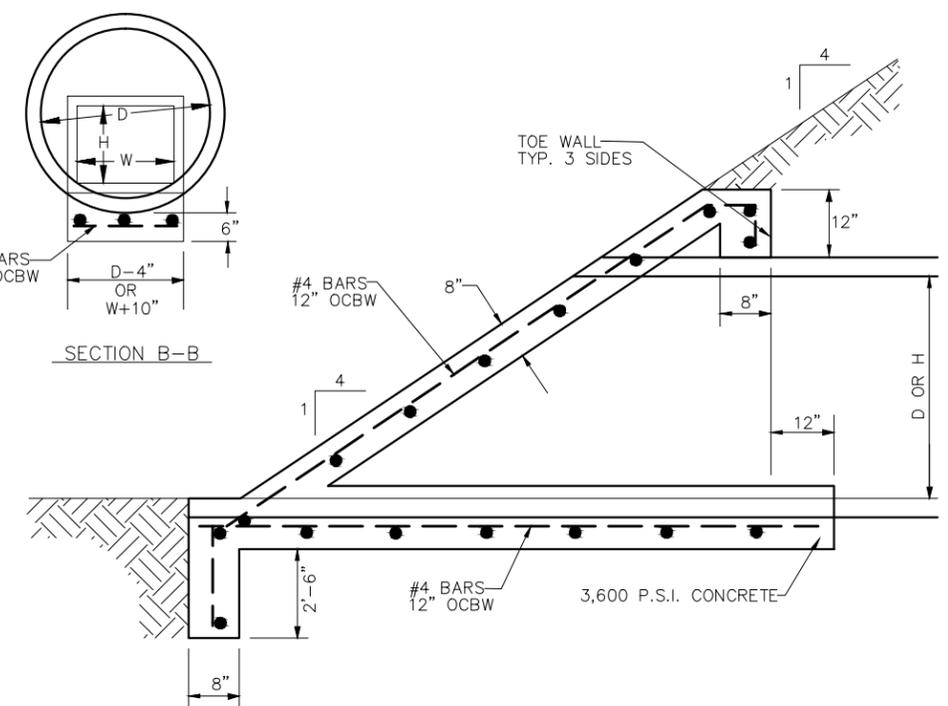
CONCRETE COLLAR
N.T.S.



CONCRETE COLLAR DETAIL (BOX)



PLAN



SLOPED HEADWALL
N.T.S.

STORM DRAIN GENERAL NOTES

GENERAL:

(A) All construction shall be in accordance with the standard specifications of the City of The Colony, which has also adopted the Fourth Edition of the "Standard Specifications for Public Works Construction - North Central Texas" herein referred to as "COG" specifications. Copies may be obtained from the North Central Texas Council of Governments, 616 Six Flags Drive, Suite 200, Arlington, Texas 76005-5888. (817) 640-3300.

CLOSED CONDUITS:

- (A) Closed conduits shall be installed per COG Item 508 specifications.
- (B) Only Reinforced Concrete Pipe (RCP) or Reinforced Concrete Box (RCB) is approved for use, unless approved otherwise by the City Engineer.
- (C) Class IV RCP shall be used where the pipe cover is greater than 1 foot and less than 3 feet. Class III RCP shall be used when the pipe cover is from 2 feet to 6 feet. The Class of all other RCP shall be determined by an Engineer per Loads and Supporting Strengths, American Concrete Pipe Association.
- (D) C-850 RCB shall be used where the cover is less than 3 feet. C-789 shall be used where the cover varies from 3 feet to 6 feet. The design of all other RCB shall be determined by an Engineer.
- (E) For pipes, embedment shall be per the Street Backfill & Repair detail on this sheet. For box culverts, embedment shall be per the Box Culvert Embedment detail on this sheet. Note that flowable backfill is only required below areas to be paved.
- (F) The contractor shall seal all joints on closed conduits with Omni-Flex joint seals, or equal; unless approved otherwise by the City Engineer.
- (G) The minimum size for laterals is 18 inches in diameter. The minimum size for mains is 24 inches in diameter.

CONCRETE FOR PRE-CAST PRODUCTS:

(A) All concrete to be used in pre-cast products for drainage structures shall come from plants certified by the National Pre-cast Concrete Association.

FITTINGS COLLARS AND CONNECTIONS:

- (A) The Contractor shall use only pre-fabricated fittings on new construction projects. Field connections shall be made only to existing pipe with City approval. The connection shall be a smooth connection and concrete wrapped on the outside and inside.
- (B) Concrete collars shall be constructed per the Concrete Collar Details on this sheet at all storm drain size and at grade changes or in curves where the joint is being pulled more than recommended by the manufacturer. Please also refer to the details on this sheet and COG Item 508.3.4.1 specifications.

INLETS:

- (A) All inlets shall be poured in place. Precast inlets, junction boxes, manholes, and eadwalls are not allowed.
- (B) Inlets shall not be used as junction boxes or placed on a main, unless otherwise approved by the City Engineer.
- (C) The minimum opening for a curb inlet shall be 5 feet. Curb inlets shall be constructed in 5 foot increments. All curb inlets with 15 feet wide or larger openings shall have a center support. All curb inlets greater than 5 feet deep shall be designed and sealed by an Engineer.
- (D) Bottoms, tops, and variable height curb to be separate pours (3 pours) for curb inlets.
- (E) Curb inlet bottoms shall be poured prior to any paving.
- (F) Curb inlets shall have 10 linear feet of variable height curb on both sides of the inlet opening.
- (G) Ring and cover on curb inlets to be located directly over the outlet pipe.
- (H) Openings for Type Y and Special Type Y inlets shall vary from 3 feet to 5 feet. All Type Y and Special Type Y inlets greater than 6 feet deep shall be designed and sealed by an Engineer.

CONCRETE:

- (A) Concrete shall be made with a minimum of 5 sacks of cement and have a minimum compressive strength of 3,600 PSI at 28 days.
- (B) All reinforcing steel shall be new, neat, billet-steel per ASTM designation A-615, Grade 60, and shall be detailed and placed for ACI Manuals SP-88 and 318, latest additions. All reinforcing steel shall have minimum 15 inch lap splices, unless noted otherwise on the plans.
- (C) The Contractor shall use a liquid membrane-forming curing compound per COG Item 303.2.13.1.1.
- (D) All exposed surfaces shall have 3/4-inch chamfer.

TESTING:

(A) All closed conduits shall be Television Inspected per City of The Colony specifications.

BACKFILL AND COMPACTION REQUIREMENTS

- (A) All ditchlines shall be mechanically tamped with the cost incidental to this bid item. Backfill other than select fill, may consist of on-site or off-site inorganic soils and should be placed in loose lifts 6-inch - 8-inch in thickness and shall be mechanically compacted to 95% of the maximum dry density as defined by ASTM D-698 (Standard Proctor) procedures under existing and proposed pavement, and to 90 percent standard proctor procedures elsewhere. The moisture content of the fill at the time of compaction shall be near optimum to four percentage points above the proctor optimum value. Densities shall be taken every one (1) lift at staggered one hundred (100) foot increments.
- (B) Densities will also be taken beneath and around each and every inlet, junction box and manhole installed during the project during backfill activities. Sample staggering will be as directed by the City's construction inspector for the project.

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STORM DRAIN STANDARD DETAILS

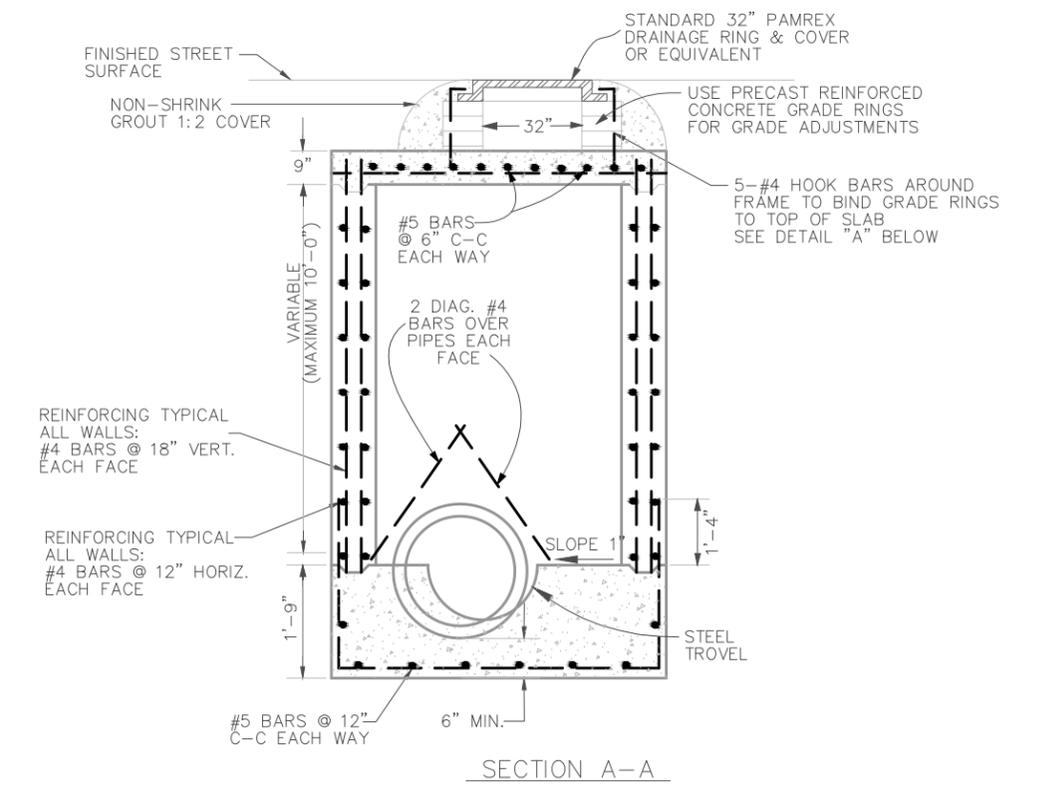
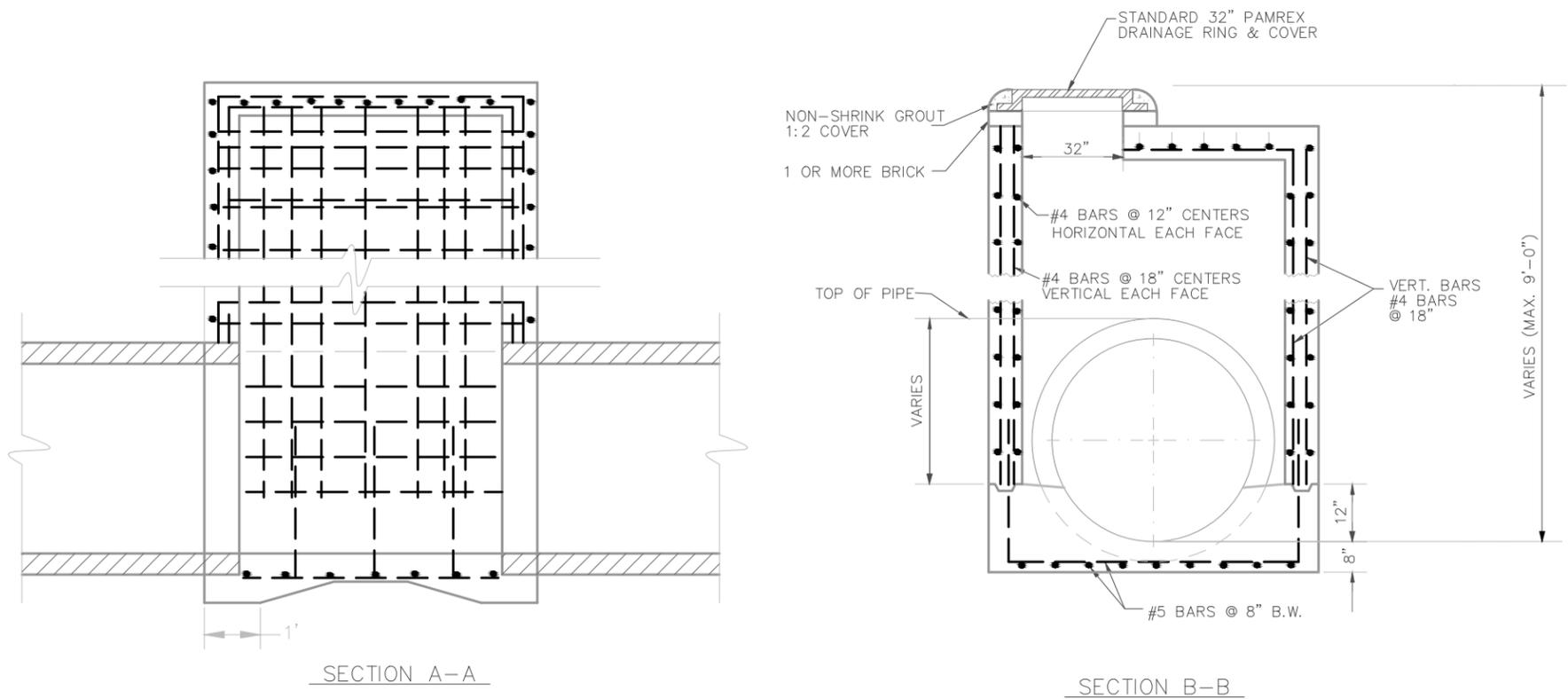
HEADWALLS, PIPE COLLARS & GENERAL NOTES



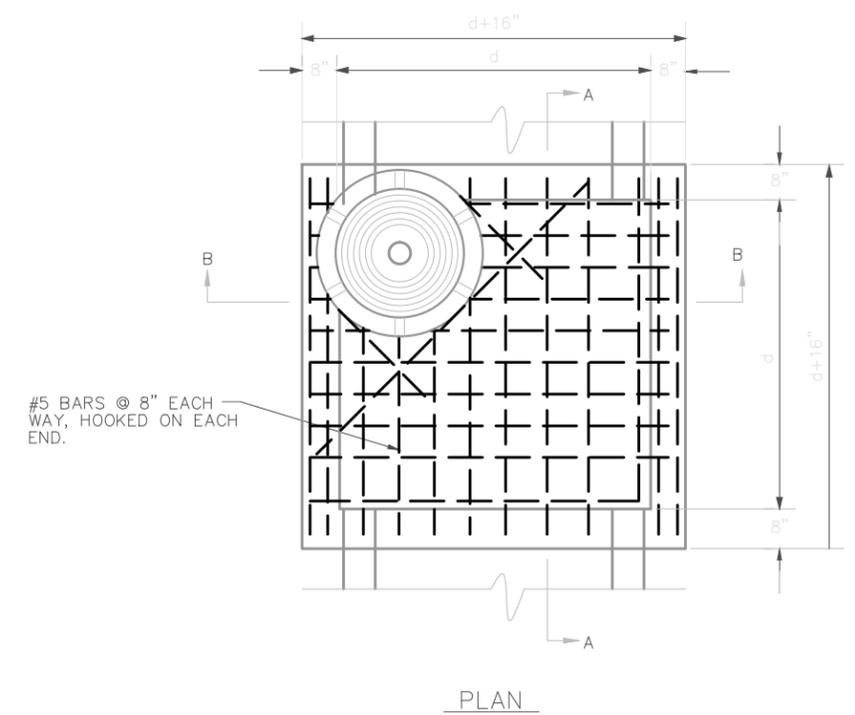
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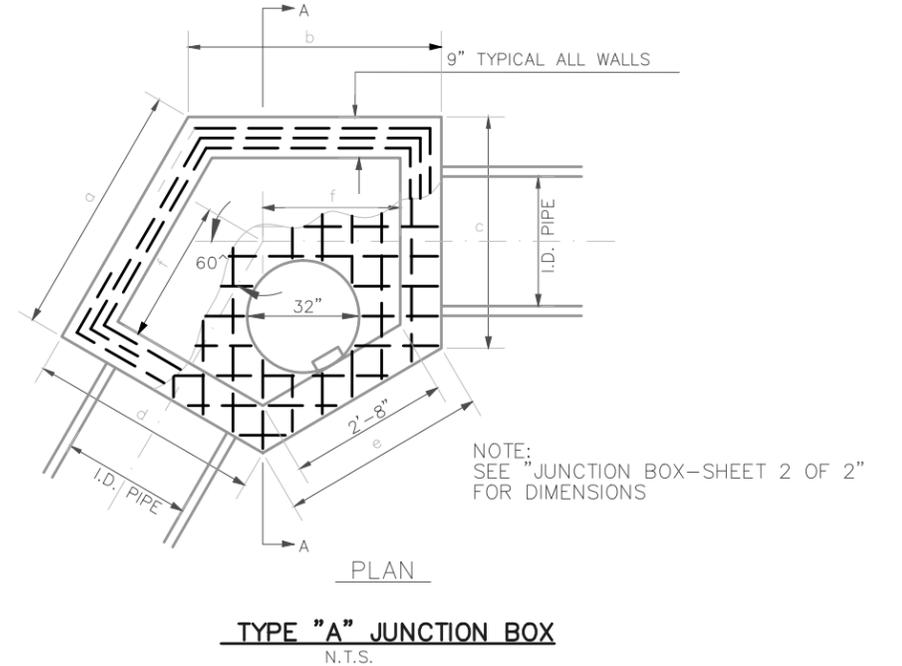
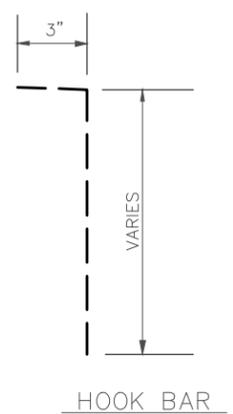
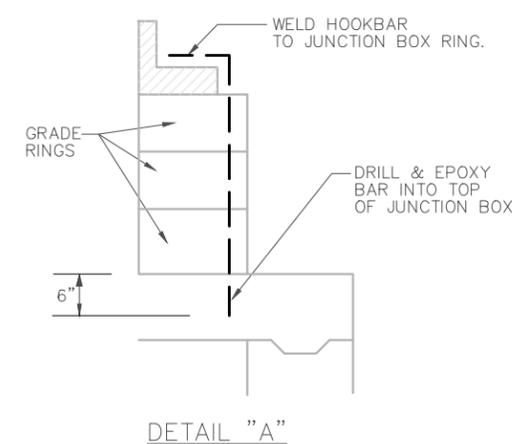
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	M.S.		JULY 7 2009	N.T.S.	D-2	



NO.	PIPE SIZES	d
1	24" - 45"	4'
2	48" - 54"	5'
3	60"	6'



TYPE "B" JUNCTION BOX
N.T.S.
NOTE: JUNCTION BOX FOR PIPE > 60" DIAMETER REQUIRE A SPECIAL DESIGN



TYPE "A" JUNCTION BOX
N.T.S.

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STORM DRAIN STANDARD DETAILS

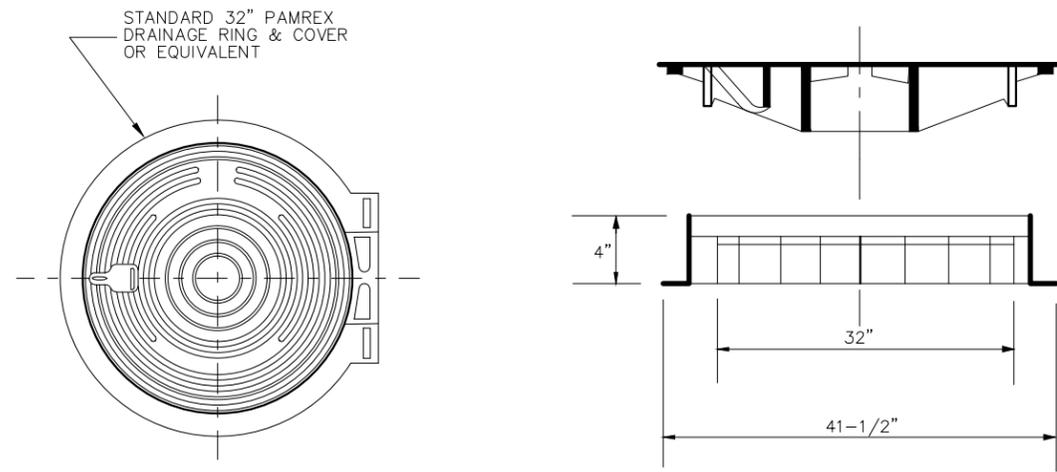
JUNCTION BOX
(SHEET 1 OF 2)

THE CITY OF THE COLONY
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DESIGN	DRAWN	CHECK	REV. DATE	SCALE	FILE	NO.
	M.S.		JULY 7 2009	N.T.S.	D-3	

CORNER



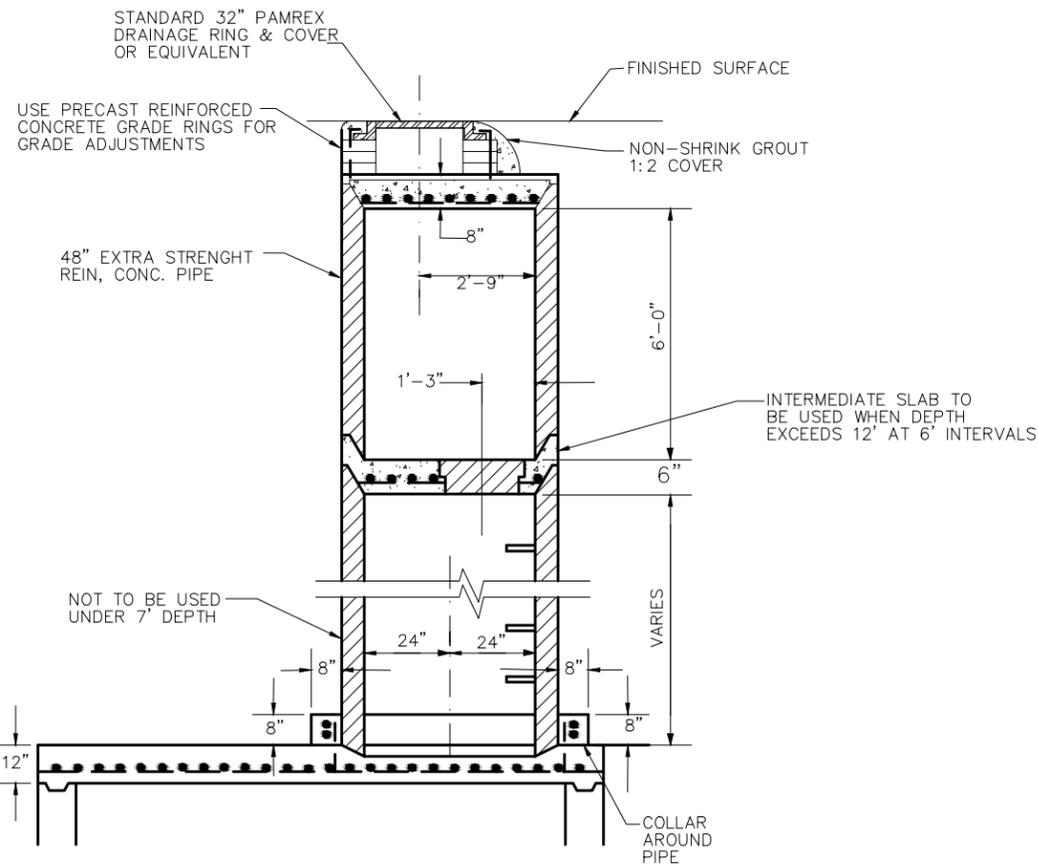
INLET RING & COVER NOTES:

1. THE STD. INLET COVER SHALL BE PAMREX 32" RING AND COVER NO. CDPA60EHDR A OR EQUAL
2. APPROXIMATE WEIGHT OF RING=73 lbs. AND COVER=122 lbs.

STANDARD 32" PAMREX DRAINAGE RING & COVER
N.T.S.

GENERAL NOTES:

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- (B) All manholes shall be poured in place. Precast junction boxes or manholes are not allowed.
- (C) Concrete shall be made with a minimum of 5 sacks of cement and have a minimum compressive strength of 3,600 PSI at 28 days.
- (D) All reinforcing steel shall be new, neat, billet-steel per ASTM designation A-615, Grade 60, and shall be detailed and placed per ACI Manuals SP-88 and 318, latest additions. All reinforcing steel shall have minimum 15 inch lap splices, unless noted otherwise on the plans.
- (E) The Contractor shall use a liquid membrane-forming curing compound per COG item 303.2.13.1.1 specifications.
- (F) Light broom finish required on all exposed manhole tops.
- (G) Manhole steps, frame and cover shall be installed as per the details on this sheet.
- (H) Staked manhole extension shall be installed, where specified on the plans and as per the details on this sheet.
- (I) Manholes shall be constructed per details on this sheet and COG Item 502.1.4 specifications.
- (J) Stormwater manholes shall be installed every 500 linear feet of pipe installed for pipe sizes less than 36" diameter. For pipe sizes over 36" diameter, a manhole shall be installed for every 1000 linear feet of pipe installed.



STACKED JUNCTION BOX EXTENSION
N.T.S.

NO.	PIPE SIZES	a	b	c	d	e	f
1	18"-24"	4'-5 1/2"	4'-5 1/2"	4'-2"	4'-2"	3'-6 1/2"	2'-5"
2	27"-33"	4'-11 5/8"	4'-11 5/8"	5'-1"	5'-1"	3'-6 3/8"	2'-8"
3	36"-42"	5'-5 5/8"	5'-5 5/8"	5'-11 1/4"	5'-11 1/4"	3'-6 3/8"	2'-11"
4	48"-54"	6'-1 3/4"	6'-1 3/4"	7'-1 1/4"	7'-1 1/4"	3'-6 1/2"	3'-3"
5	60"-66"	6'-9 7/8"	6'-9 7/8"	8'-3 1/4"	8'-3 1/4"	3'-6 1/2"	3'-7"
6	72"-78"	7'-6"	7'-6"	9'-5 1/4"	9'-5 1/4"	3'-6 1/2"	3'-11"
7	84"-96"	8'-6 1/8"	8'-6 1/8"	11'-2 1/4"	11'-2 1/4"	3'-6 1/2"	4'-5 1/2"

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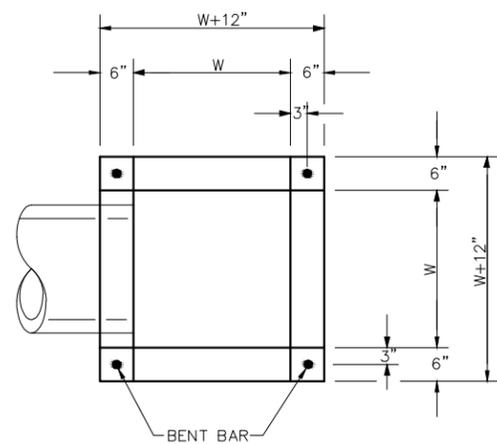
STORM DRAIN STANDARD DETAILS

JUNCTION BOX
(SHEET 2 OF 2)

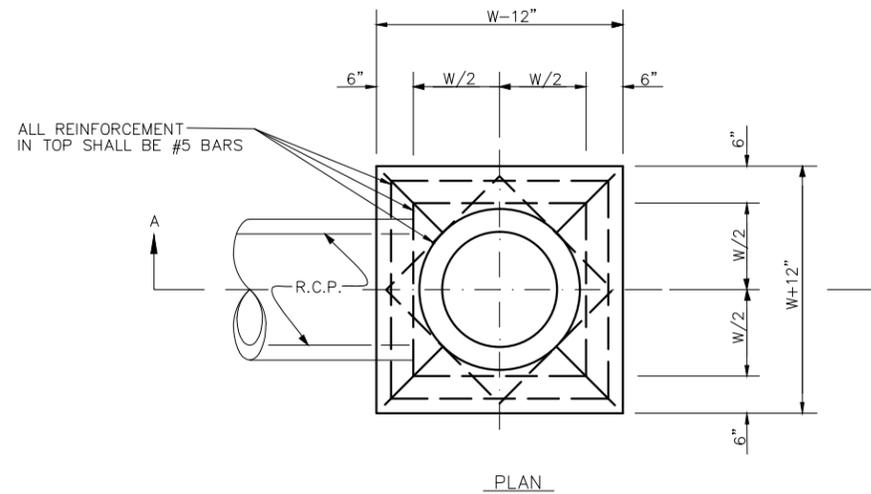


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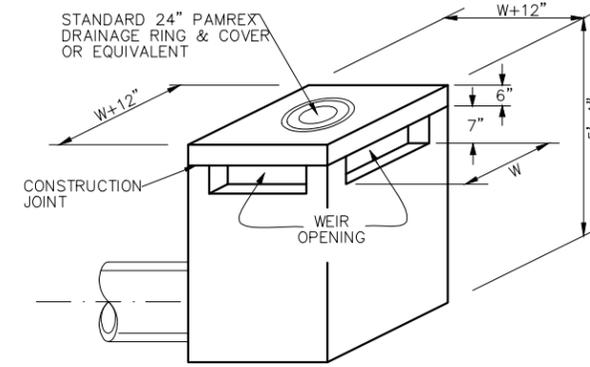
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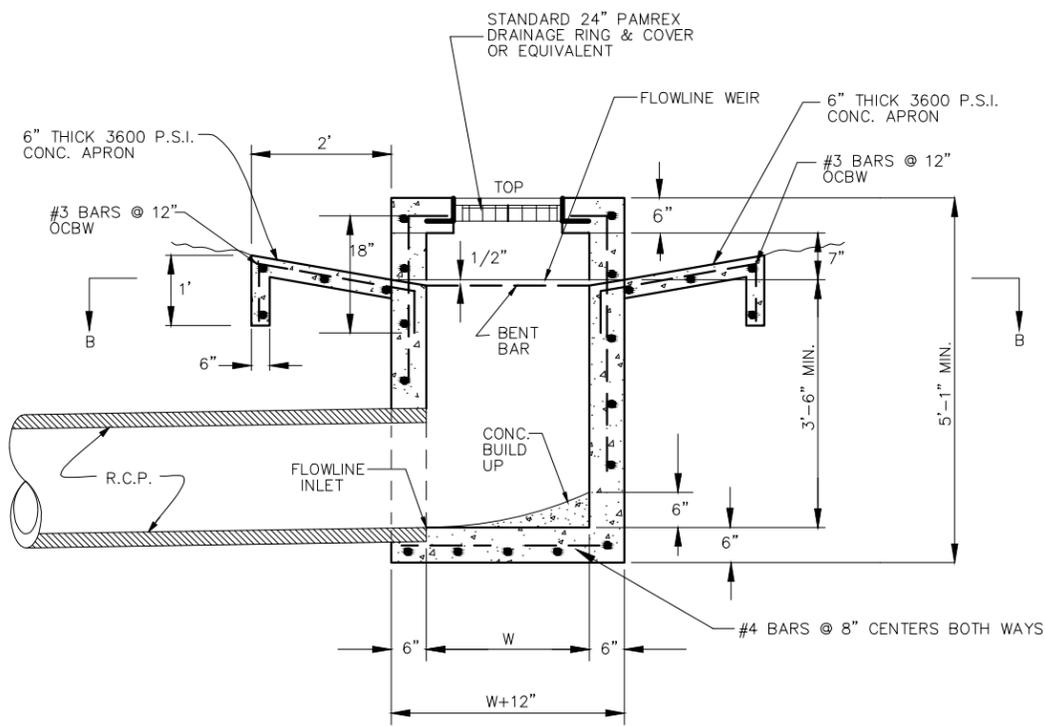
SECTION B-B



PLAN



ISOMETRIC DETAIL



SECTION A-A

TYPE Y AND SPECIAL TYPE Y INLET NOTES:

1. SPECIAL TYPE Y INLET HAS WEIR OPENINGS REQUIRED ON TWO SIDES.
2. TYPE Y INLET HAS WEIR OPENINGS REQUIRED ON FOUR SIDES.
3. THE MINIMUM OPENINGS FOR TYPE Y AND SPECIAL TYPE Y INLETS IS W=3 FEET.
4. ALL REINFORCING SHALL BE WITH #4 BARS @ 12 INCH CENTERS, EXCEPT IN TOP.

TYPE Y & SPECIAL TYPE Y INLET

N.T.S.

NOTE: MINIMUM DIMENSION FOR "W" = 36 INCHES

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STORM DRAIN STANDARD DETAILS

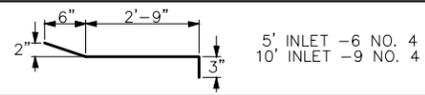
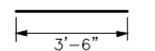
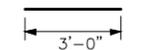
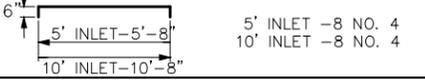
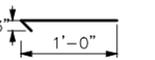
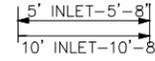
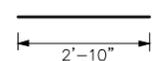
INLETS
(SHEET 1 OF 3)



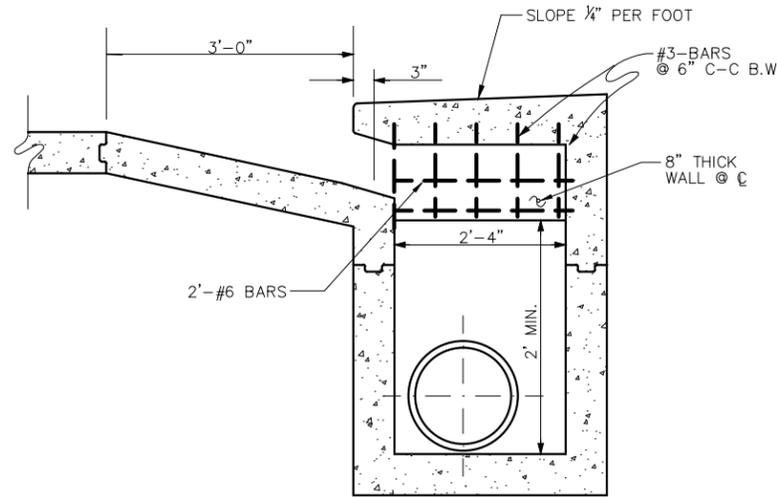
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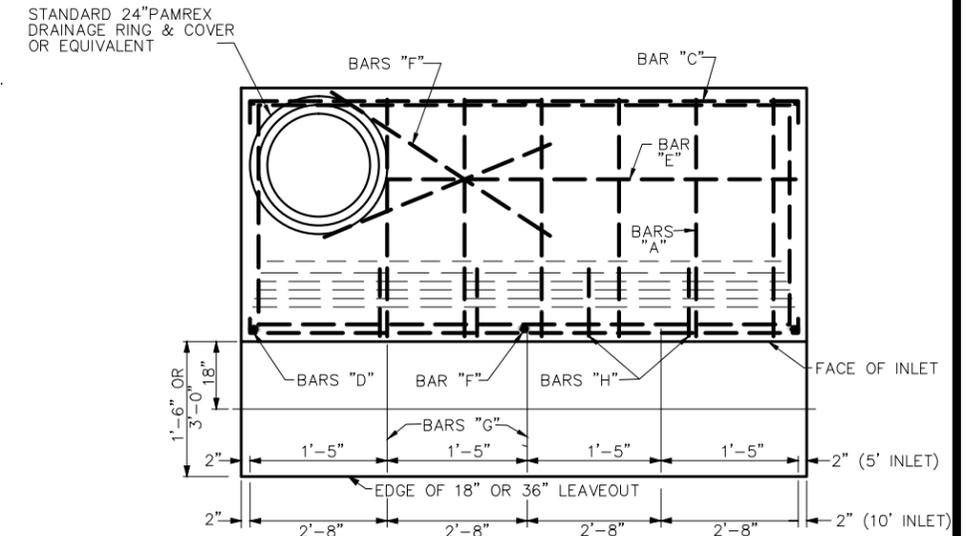
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	M.S.		JULY 7 2009	N.T.S.	D-5	

BAR	DESCRIPTION	BAR	DESCRIPTION
A	 5' INLET - 6 NO. 4 10' INLET - 9 NO. 4	F	 5' INLET - 3 NO. 4 10' INLET - 4 NO. 4
B	 5' INLET - 5 NO. 4 10' INLET - 13 NO. 4	G	 5' INLET - 5 NO. 3 10' INLET - 7 NO. 3
C	 5' INLET - 8 NO. 4 10' INLET - 8 NO. 4	H	 5' INLET - 6 NO. 4 10' INLET - 9 NO. 4
D	 5' INLET - 5 NO. 4 10' INLET - 7 NO. 4	I	 5' INLET - 1 NO. 3 10' INLET - 1 NO. 3
E	 5' INLET - 3 NO. 4 10' INLET - 8 NO. 4	J	 5' INLET - 6 NO. 4 10' INLET - 11 NO. 4

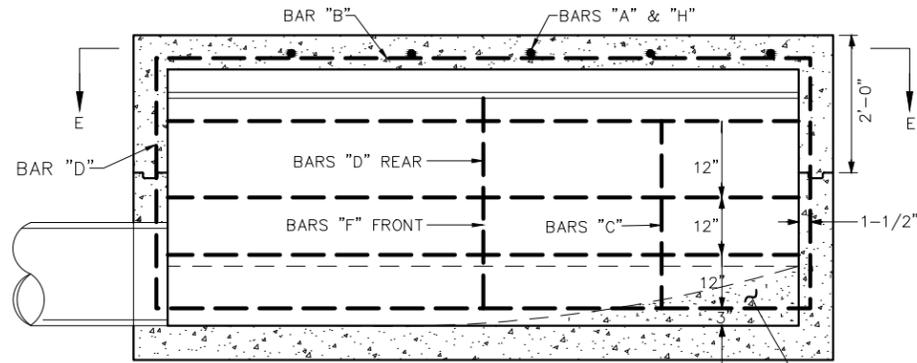
REINFORCING STEEL SCHEDULE
N.T.S.



SECTION F-F

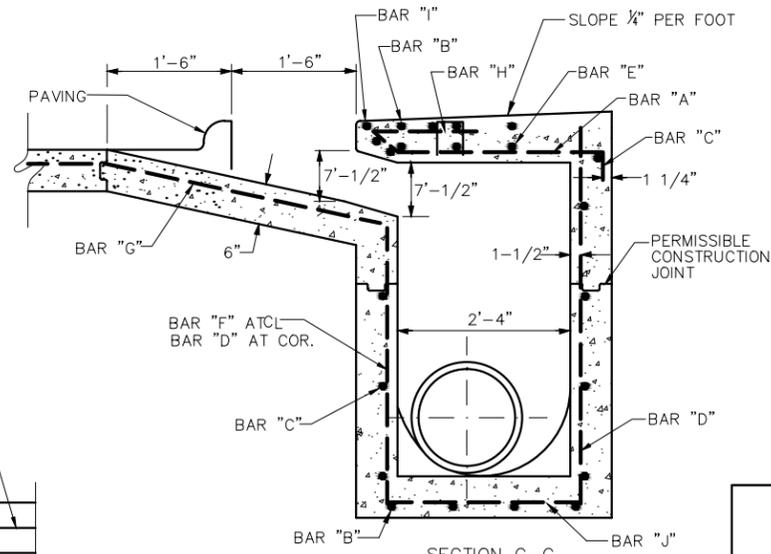


SECTION E-E

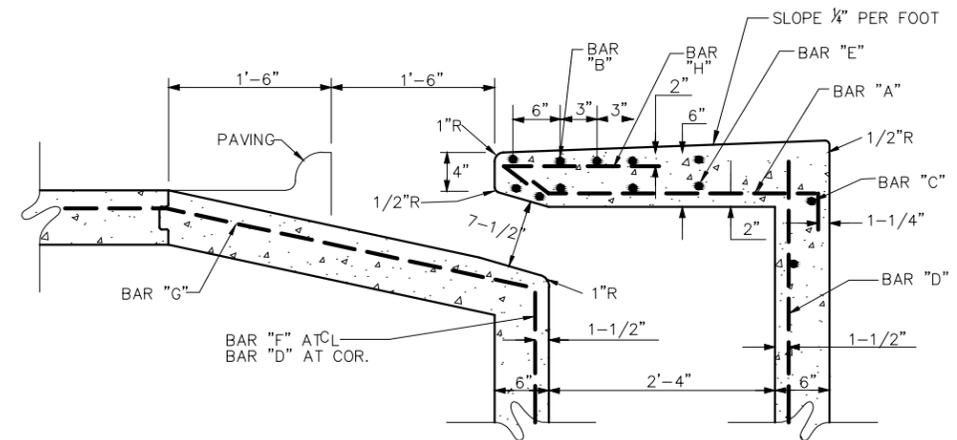


SECTION B-B

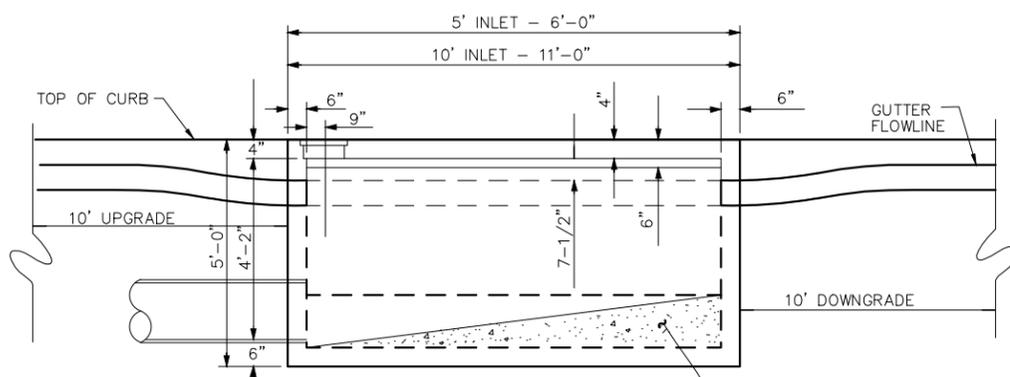
CONCRETE BUILDUP



SECTION C-C



SECTION D-D



SECTION A-A

CONCRETE BUILDUP- WRAP TO SUIT CONDITIONS 1/2" MORTAR FINISH TROWLED TO A SMOOTH HARD SURFACE.

CURB INLETS
N.T.S.

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STORM DRAIN STANDARD DETAILS

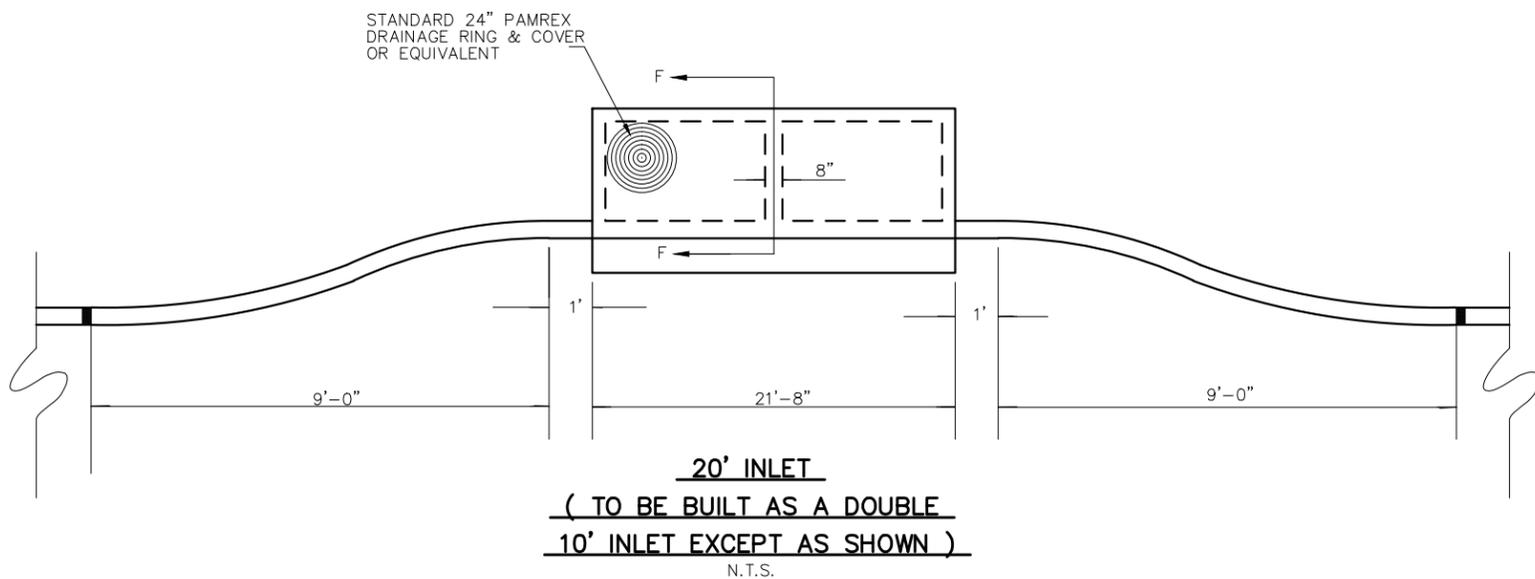
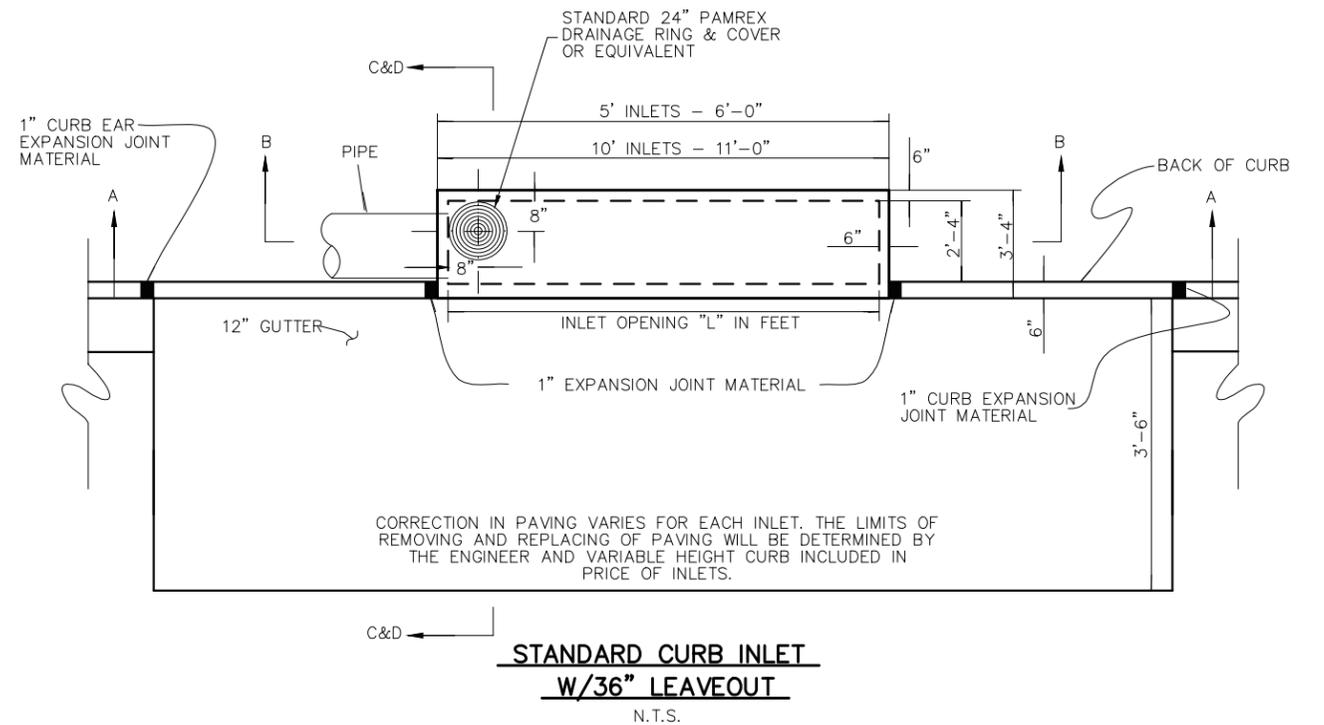
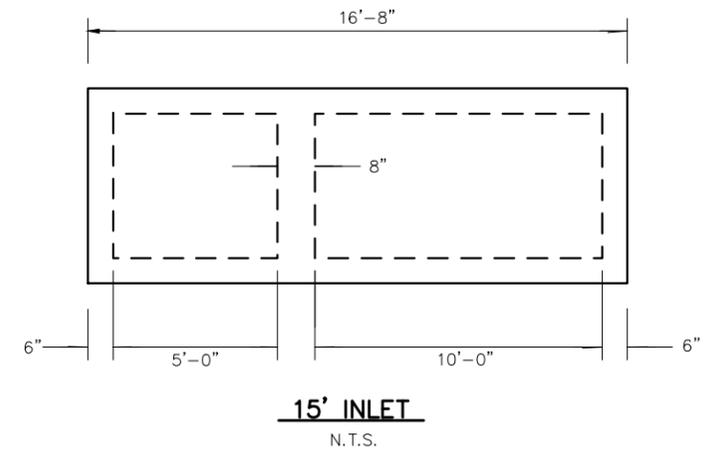
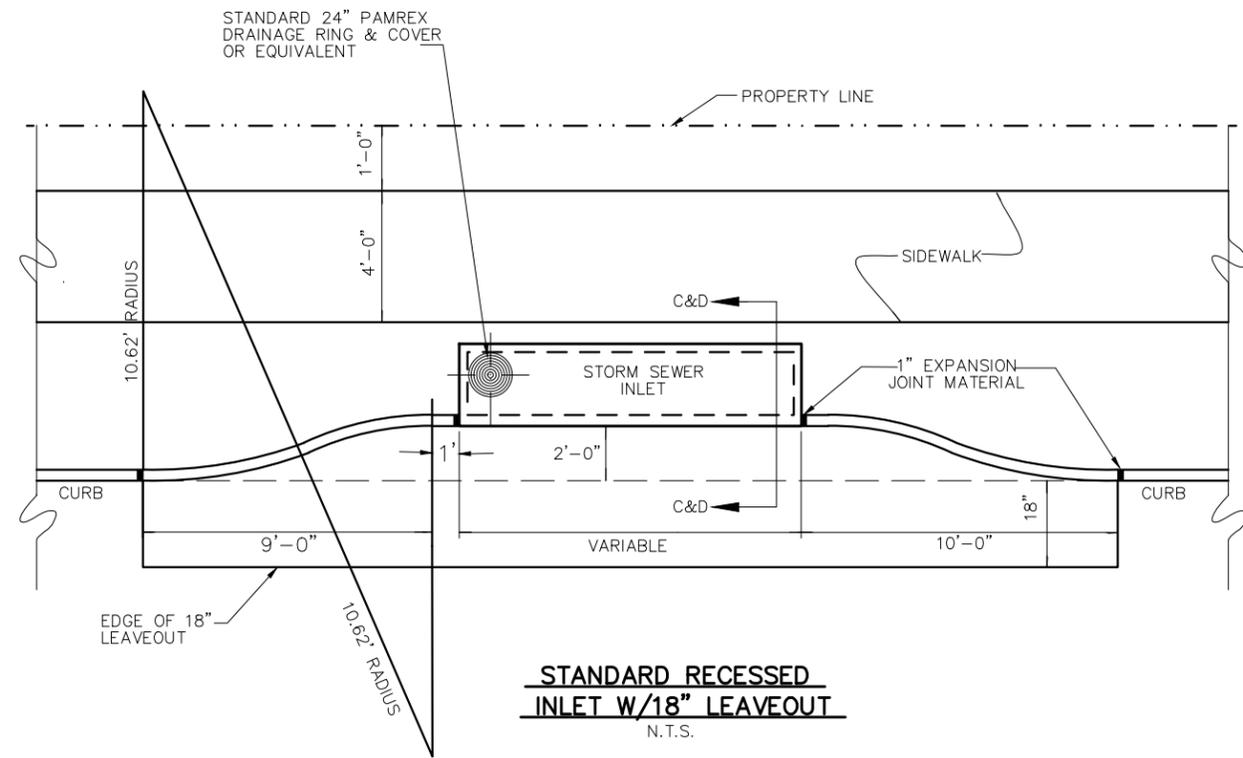
INLETS
(SHEET 2 OF 3)



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STORM DRAIN STANDARD DETAILS

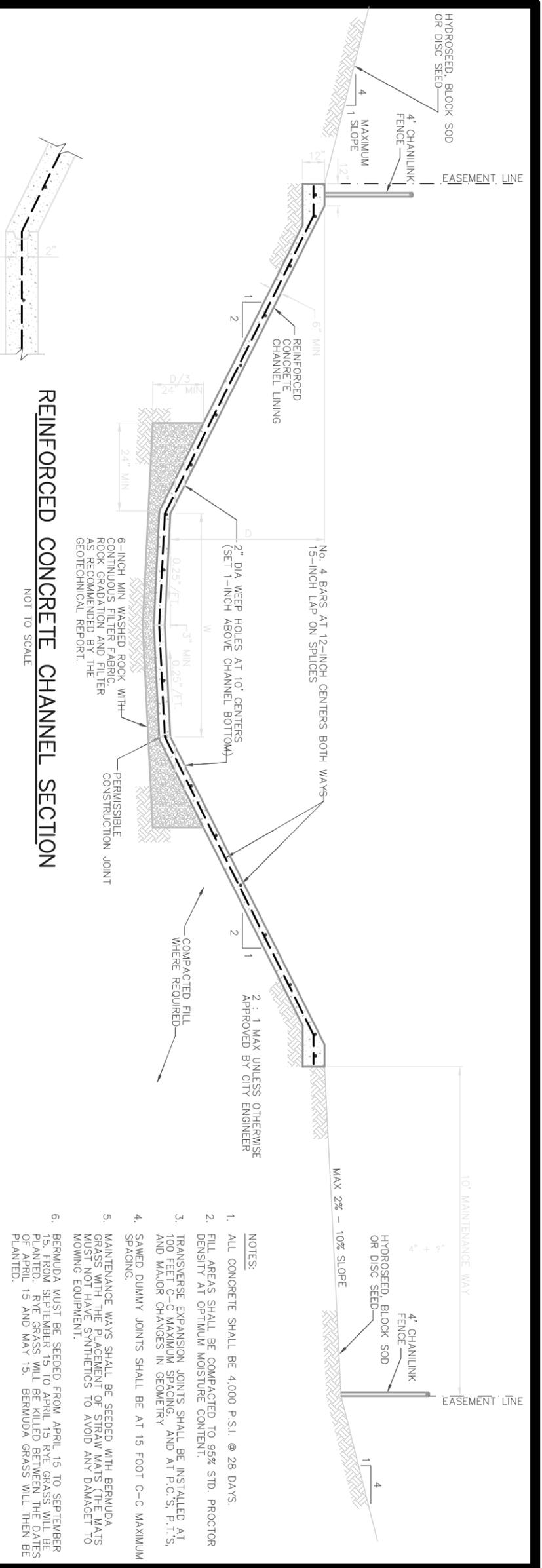
INLETS
(SHEET 3 OF 3)



THE CITY OF THE COLONY
TEXAS

ENGINEERING DEPARTMENT

DESIGN	DRAWN	CHECK	REV. DATE	SCALE	FILE	NO.
	M.S.		JULY 7 2009	N.T.S.	D-7	

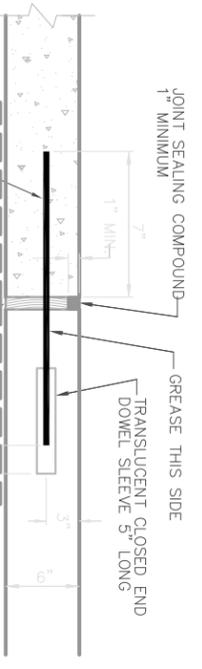
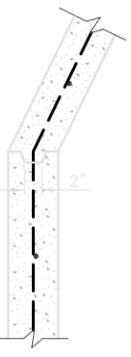


REINFORCED CONCRETE CHANNEL SECTION

NOT TO SCALE

CONSTRUCTION JOINT

NOT TO SCALE

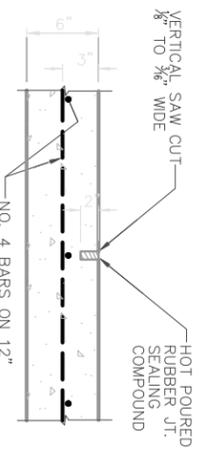


TRANSVERSE EXPANSION JOINT

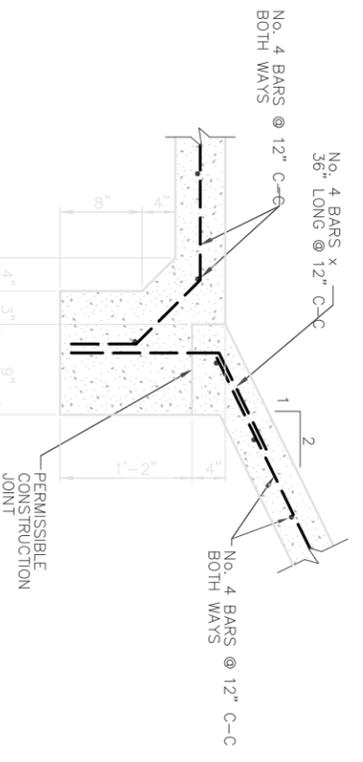
NOT TO SCALE

SAWED DUMMY JOINT

NOT TO SCALE



- NOTES:**
1. ALL CONCRETE SHALL BE 4,000 P.S.I. @ 28 DAYS.
 2. FILL AREAS SHALL BE COMPACTED TO 95% STD. PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT.
 3. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT 100 FEET C-C MAXIMUM SPACING, AND AT P.C.'S, P.T.'S, AND MAJOR CHANGES IN GEOMETRY.
 4. SAWED DUMMY JOINTS SHALL BE AT 15 FOOT C-C MAXIMUM SPACING.
 5. MAINTENANCE WAYS SHALL BE SEEDED WITH BERMUDA GRASS WITH THE PLACEMENT OF STRAW MATS (THE MATS MUST NOT HAVE SYNTHETICS TO AVOID ANY DAMAGE TO MOWING EQUIPMENT).
 6. BERMUDA MUST BE SEEDED FROM APRIL 15 TO SEPTEMBER 15. FROM SEPTEMBER 15 TO APRIL 15 RYE GRASS WILL BE PLANTED. RYE GRASS WILL BE KILLED BETWEEN THE DATES OF APRIL 15 AND MAY 15. BERMUDA GRASS WILL THEN BE PLANTED.



ALTERNATE CONSTRUCTION JOINT

NOT TO SCALE

PAVEMENT MARKING STANDARD DETAILS

TURN LANE AND TRANSVERSE MARKINGS

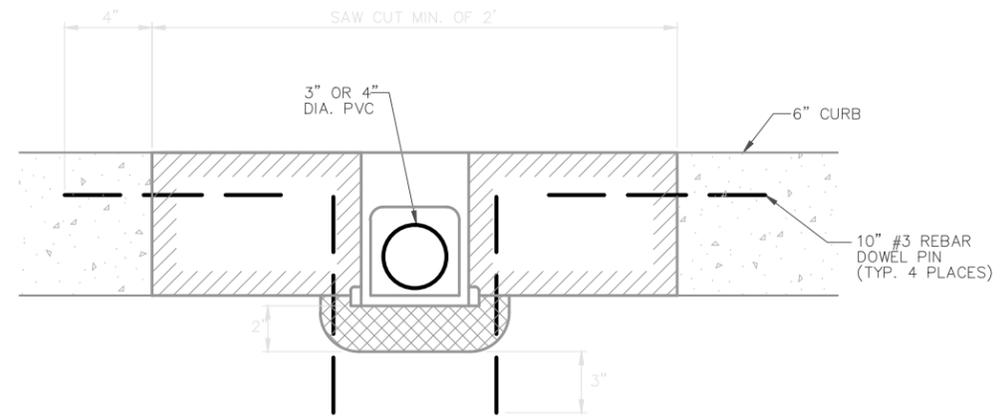
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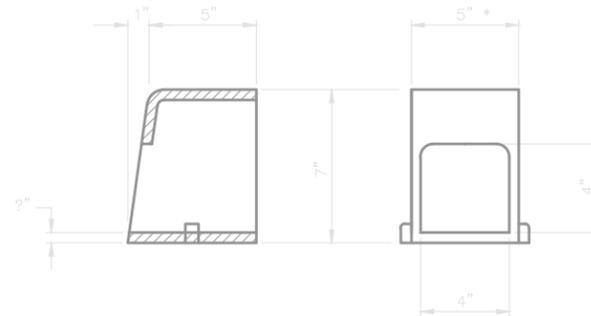
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	M.S.		July 7 2009	N.T.S.	D-8	

ENGINEERING DEPARTMENT

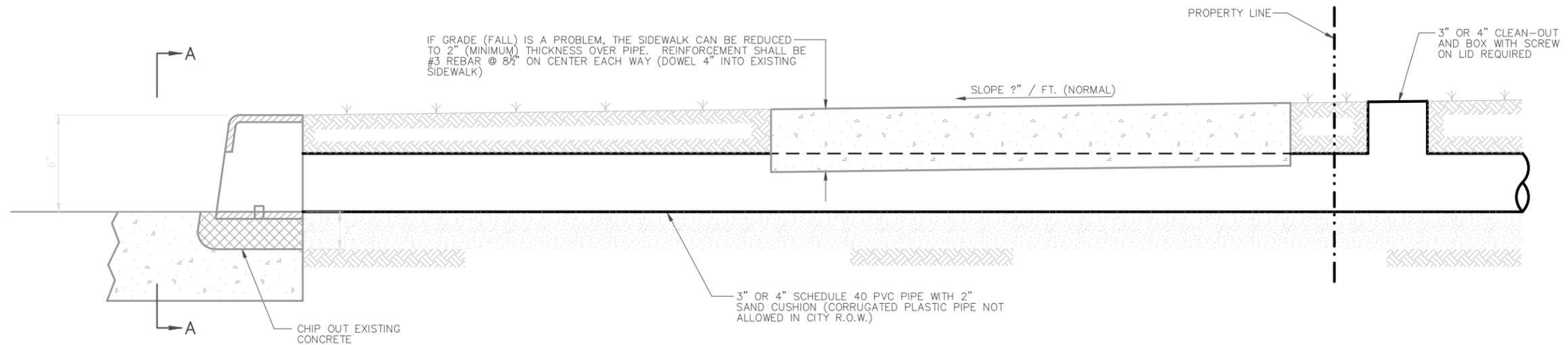
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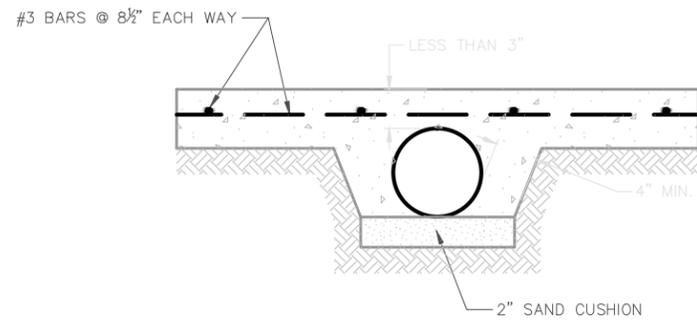
SECTION A-A
NOT TO SCALE



R-3262 NEENAH STORM WATER CURB OPENINGS (OR APPROVED EQUAL)
* WIDTH CAN VARY WHEN MORE THAN ONE PIPE IS BROUGHT THROUGH THE CURB



STORM WATER THROUGH CURB DETAIL



CONCRETE ENCASED DETAIL
(REQUIRED WHEN LESS THAN 3" CONCRETE OVER PIPE)
NOT TO SCALE

NOTES:

1. REMOVE AND REPLACE ONE 5 FOOT SECTION OF SIDEWALK.
2. IF PIPE COMING FROM PRIVATE PROPERTY IS LARGER THAN 4" IN DIAMETER, A "MANIFOLD" WILL BE USED SO THAT ONLY 3-INCH OR 4-INCH PIPES WILL BE BROUGHT TO AND THROUGH THE SIDEWALK CURB.
3. IF THICKNESS OF SIDEWALK IS LESS THAN 3-INCHES OVER THE PIPE (I.E. WHEN SIDEWALK IS ADJACENT TO CURB), THEN USE CONCRETE ENCASED PIPE (SEE DETAIL).
4. THERE SHALL BE A DUMMY JOINT IN THE SIDEWALK AT CENTERLINE OF DRAIN PIPE.

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STORM DRAIN STANDARD DETAILS

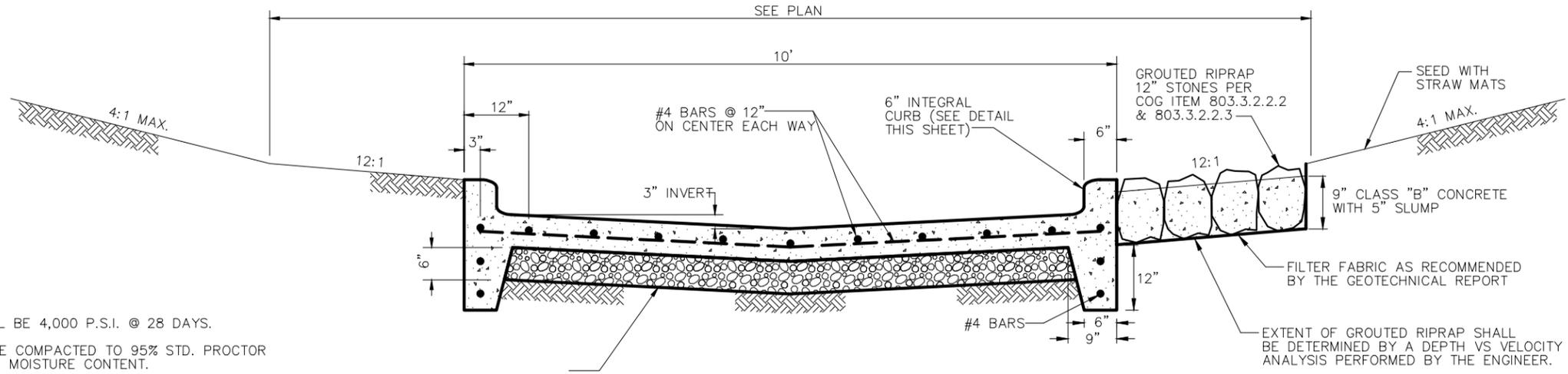
BACKFILL / EMBEDMENT



THE CITY OF THE COLONY
TEXAS

ENGINEERING DEPARTMENT

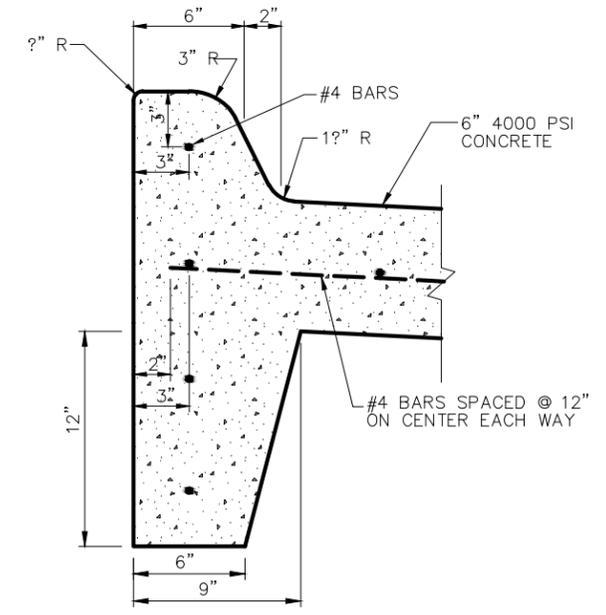
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	M.S.		JULY 7 2009	N.T.S.	D-9	



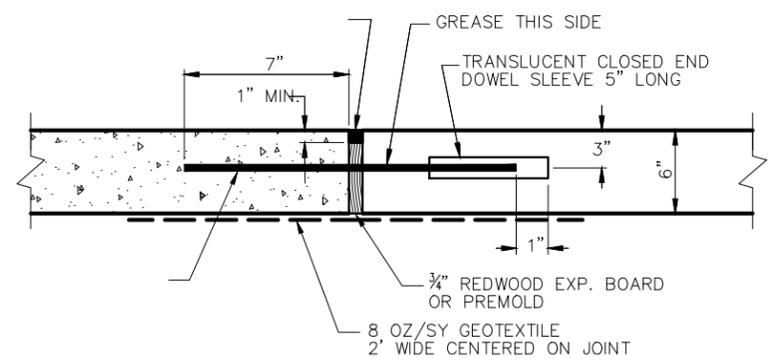
CONCRETE PILOT CHANNEL DETAIL
NOT TO SCALE

NOTES:

1. ALL CONCRETE SHALL BE 4,000 P.S.I. @ 28 DAYS.
2. FILL AREAS SHALL BE COMPACTED TO 95% STD. PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT.
3. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT 100 FEET C-C MAXIMUM SPACING. AND AT P.C.'S, P.T.'S, AND MAJOR CHANGES IN GEOMETRY
4. SAWED DUMMY JOINTS SHALL BE AT 15 FOOT C-C MAXIMUM SPACING.
5. UNPAVED CHANNEL SIDES AND BOTTOM SHALL BE SEEDED WITH BERMUDA GRASS WITH THE PLACEMENT OF STRAW MATS (THE MATS MUST NOT HAVE SYNTHETICS TO AVOID ANY DAMAGET TO MOWING EQUIPMENT.
6. BERMUDA MUST BE SEEDED FROM APRIL 15 TO SEPTEMBER 15. FROM SEPTEMBER 15 TO APRIL 15 RYE GRASS WILL BE PLANTED. RYE GRASS WILL BE KILLED BETWEEN THE DATES OF APRIL 15 AND MAY 15. BERMUDA GRASS WILL THEN BE PLANTED.

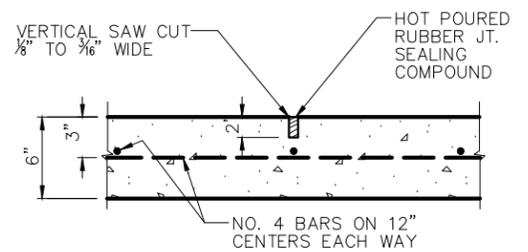


6" INTEGRAL CONCRETE CURB
NOT TO SCALE



NOTE:
SLEEVES FOR DOWELS SHALL HAVE AN INSIDE DIAMETER OF 1/16-INCH GREATER THAN THE DIAMETER OF THE DOWELS AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO USE.

TRANSVERSE EXPANSION JOINT
NOT TO SCALE



SAWED DUMMY JOINT
NOT TO SCALE

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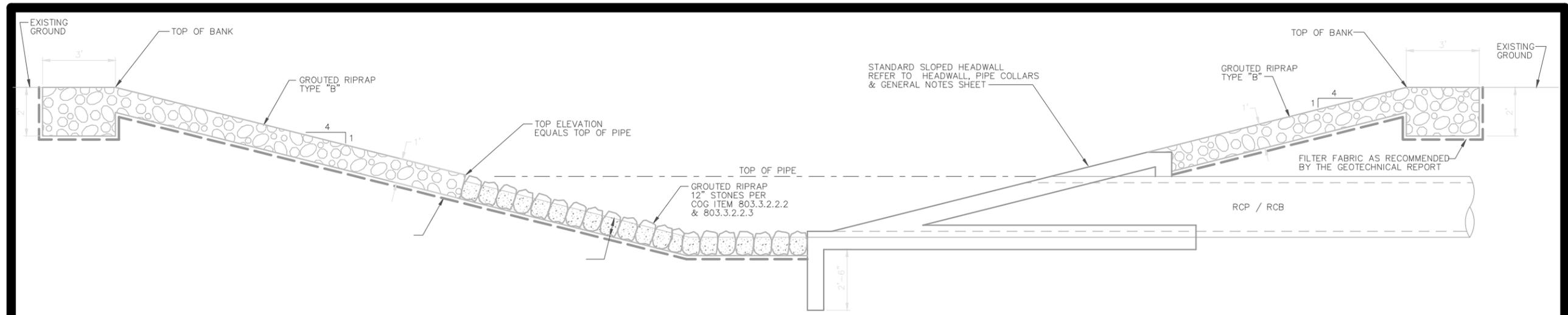
STORM DRAIN STANDARD DETAILS

TYPICAL PILOT CHANNEL

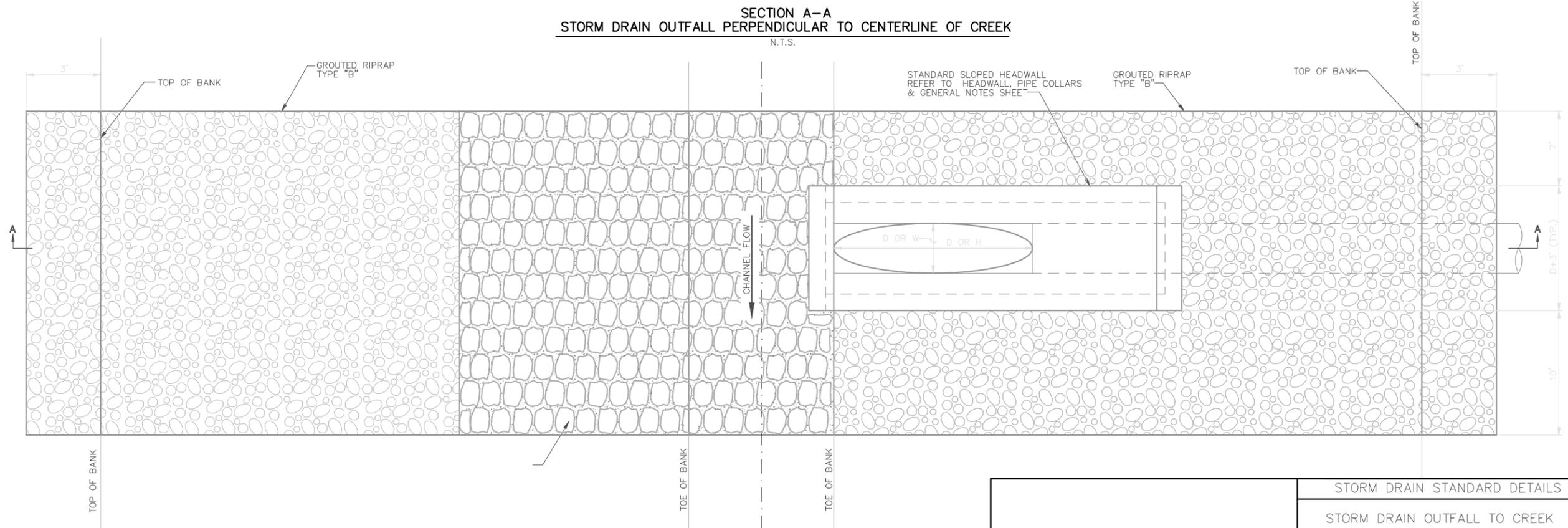


THE CITY OF THE COLONY
TEXAS
ENGINEERING DEPARTMENT

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	M.S.		JULY 7 2009	N.T.S.	D-10	



SECTION A-A
STORM DRAIN OUTFALL PERPENDICULAR TO CENTERLINE OF CREEK
 N.T.S.



STORM DRAIN OUTFALL PLAN VIEW
 N.T.S.

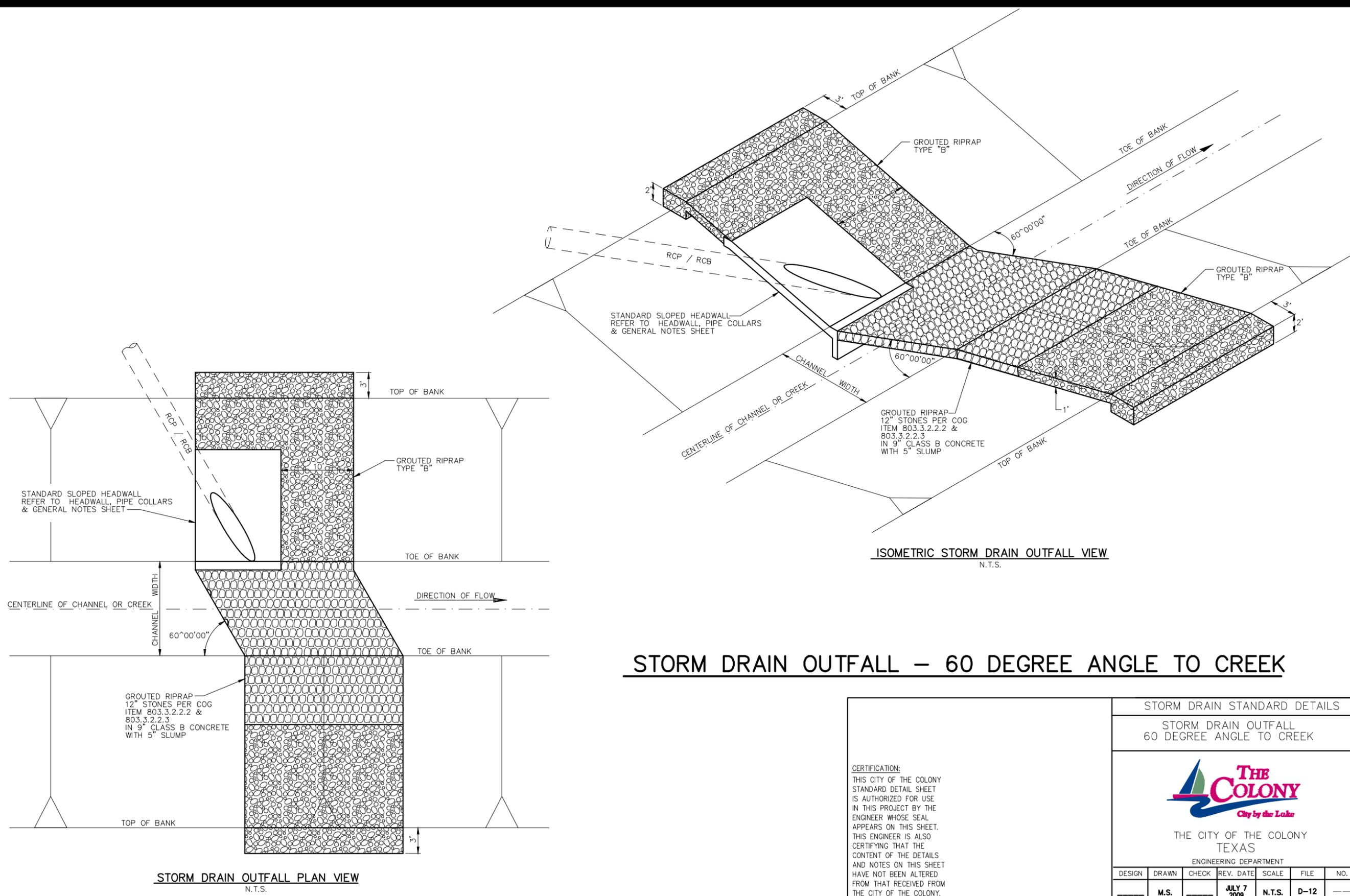
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STORM DRAIN STANDARD DETAILS
 STORM DRAIN OUTFALL TO CREEK



THE CITY OF THE COLONY
 TEXAS
 ENGINEERING DEPARTMENT

DESIGN	DRAWN	CHECK	REV. DATE	SCALE	FILE	NO.
	M.S.		JULY 7 2009	N.T.S.	D-11	



STORM DRAIN OUTFALL – 60 DEGREE ANGLE TO CREEK

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STORM DRAIN STANDARD DETAILS						
STORM DRAIN OUTFALL 60 DEGREE ANGLE TO CREEK						
 THE CITY OF THE COLONY TEXAS ENGINEERING DEPARTMENT						
DESIGN	DRAWN	CHECK	REV. DATE	SCALE	FILE	NO.
	M.S.		JULY 7 2009	N.T.S.	D-12	