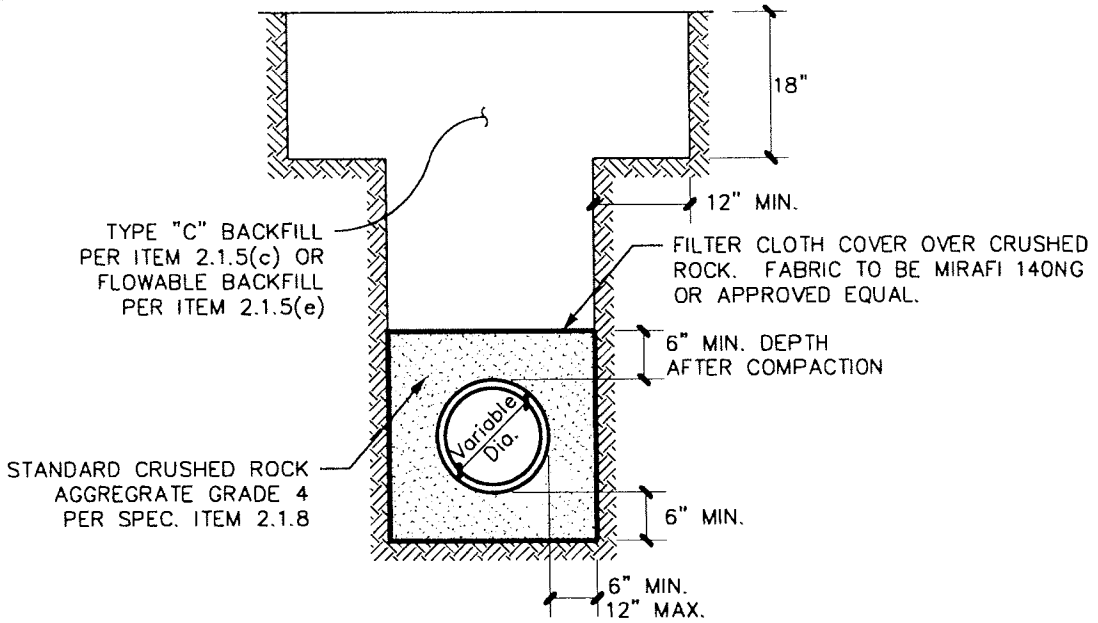
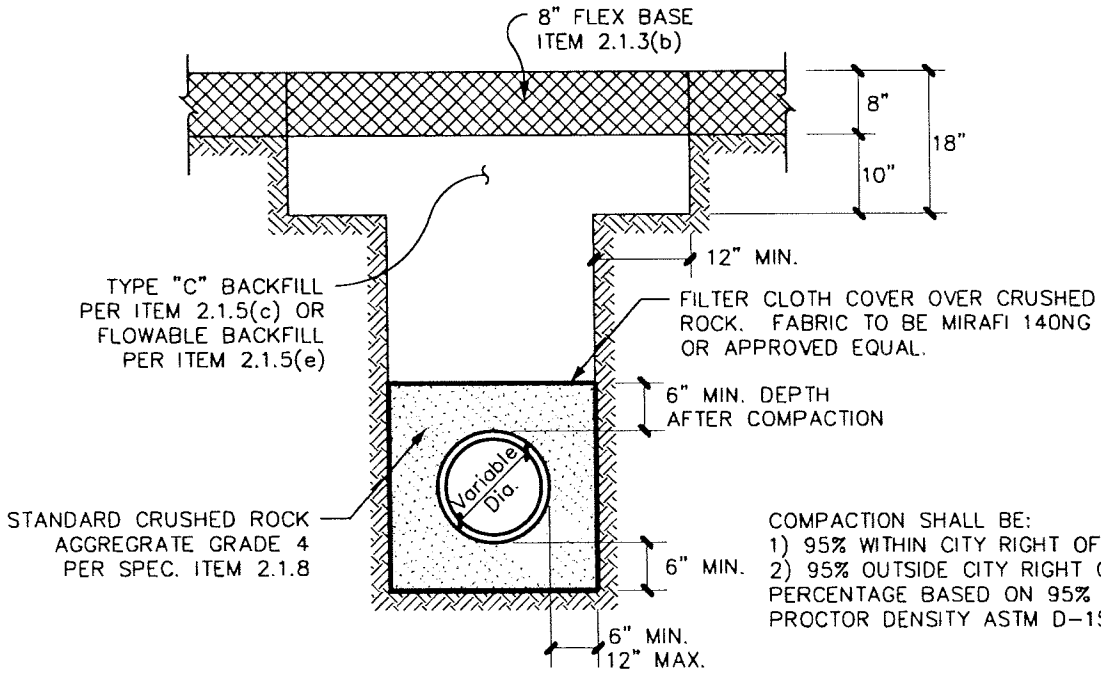


UNPAVED AND FUTURE PAVED AREAS



COMPACTION SHALL BE:
1) 95% WITHIN CITY RIGHT OF WAY
2) 95% OUTSIDE CITY RIGHT OF WAY
PERCENTAGE BASED ON 95% MODIFIED
PROCTOR DENSITY ASTM D-1557

EXISTING FLEXBASE SURFACE

NOTES:

1. AT THE END OF EACH WORK DAY ALL SPOILS SHALL BE REMOVED FROM THE CITY & TxDOT R.O.W. UNLESS PRIOR WRITTEN PERMISSION IS OBTAINED FROM THE OWNER TO STORE SPOILS IN DESIGNATED SPOIL STORAGE AREAS THAT DO NOT OBSTRUCT AUTOMOBILE OR PEDESTRIAN TRAFFIC.
2. ALL BACKFILL SHALL BE PER SPEC. ITEM 6.2 AND SHALL BE COMPACTED PER SPEC. ITEM 6.2.9 (b). ROCKS GREATER THAN 4" IN DIA. SHALL BE REMOVED FROM ANY NATIVE MATERIAL USED AS BACKFILL.
3. ALL PAVEMENT SHALL BE REMOVED ALONG NEAT SAW-CUT LINES PER SPEC. ITEM 8.8.
4. A MAXIMUM OF 300 FT. OF OPEN TRENCH WILL BE ALLOWED AT ANY TIME, UNLESS APPROVED BY THE CITY ENGINEER.
5. IN SANDY SOILS THE CRUSHED ROCK EMBEDMENT SHALL BE WRAPPED IN A FILTER FABRIC.
6. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND TEXAS LAWS CONCERNING EXCAVATION, TRENCHING, AND SHORING.

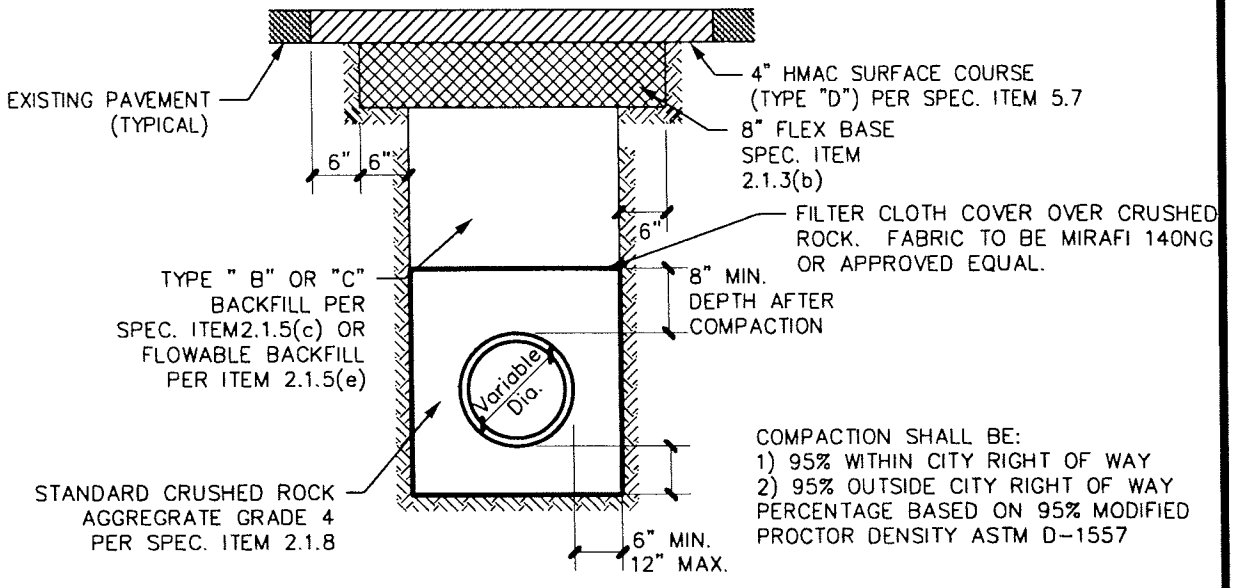
City of Colleyville Texas

DRAINAGE SYSTEM CONSTRUCTION DETAILS

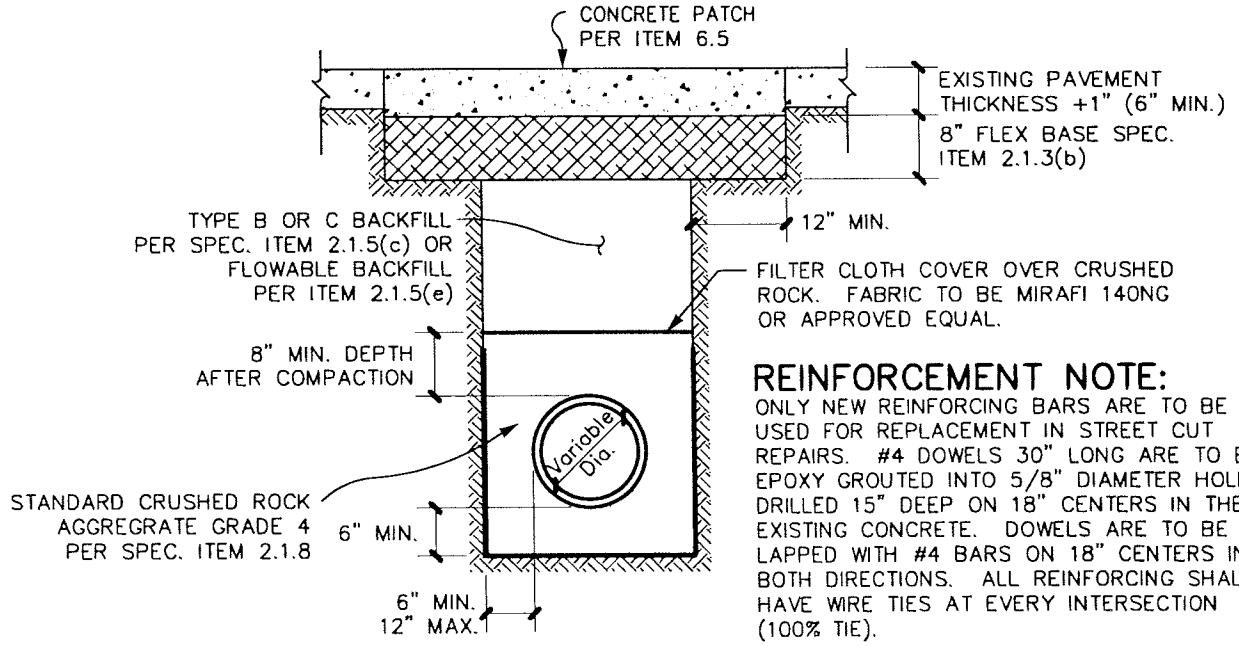
STORM SEWER EMBEDMENT & BACKFILL

REVISION DATE:
APRIL 14, 2000

SHEET: D-1A



EXISTING ASPHALT PAVEMENT



REINFORCEMENT NOTE:

ONLY NEW REINFORCING BARS ARE TO BE USED FOR REPLACEMENT IN STREET CUT REPAIRS. #4 DOWELS 30" LONG ARE TO BE EPOXY GROUTED INTO 5/8" DIAMETER HOLES DRILLED 15" DEEP ON 18" CENTERS IN THE EXISTING CONCRETE. DOWELS ARE TO BE LAPPED WITH #4 BARS ON 18" CENTERS IN BOTH DIRECTIONS. ALL REINFORCING SHALL HAVE WIRE TIES AT EVERY INTERSECTION (100% TIE).

EXISTING CONCRETE PAVEMENT

NOTES:

1. AT THE END OF EACH WORK DAY ALL SPOILS SHALL BE REMOVED FROM THE CITY & TxDOT R.O.W. UNLESS PRIOR WRITTEN PERMISSION IS OBTAINED FROM THE OWNER TO STORE SPOILS IN DESIGNATED SPOIL STORAGE AREAS THAT DO NOT OBSTRUCT AUTOMOBILE OR PEDESTRIAN TRAFFIC.
2. ALL BACKFILL SHALL BE PER SPEC. ITEM 6.2 AND SHALL BE COMPACTED PER SPEC. ITEM 6.2.9 (b). ROCKS GREATER THAN 4" IN DIA. SHALL BE REMOVED FROM ANY NATIVE MATERIAL USED AS BACKFILL.
3. ALL PAVEMENT SHALL BE REMOVED ALONG NEAT SAW-CUT LINES PER SPEC. ITEM 8.8.
4. A MAXIMUM OF 300 FT. OF OPEN TRENCH WILL BE ALLOWED AT ANY TIME, UNLESS APPROVED BY THE CITY ENGINEER.
5. IN SANDY SOILS THE CRUSHED ROCK EMBEDMENT SHALL BE WRAPPED IN A FILTER FABRIC.
6. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND TEXAS LAWS CONCERNING EXCAVATION, TRENCHING, AND SHORING.

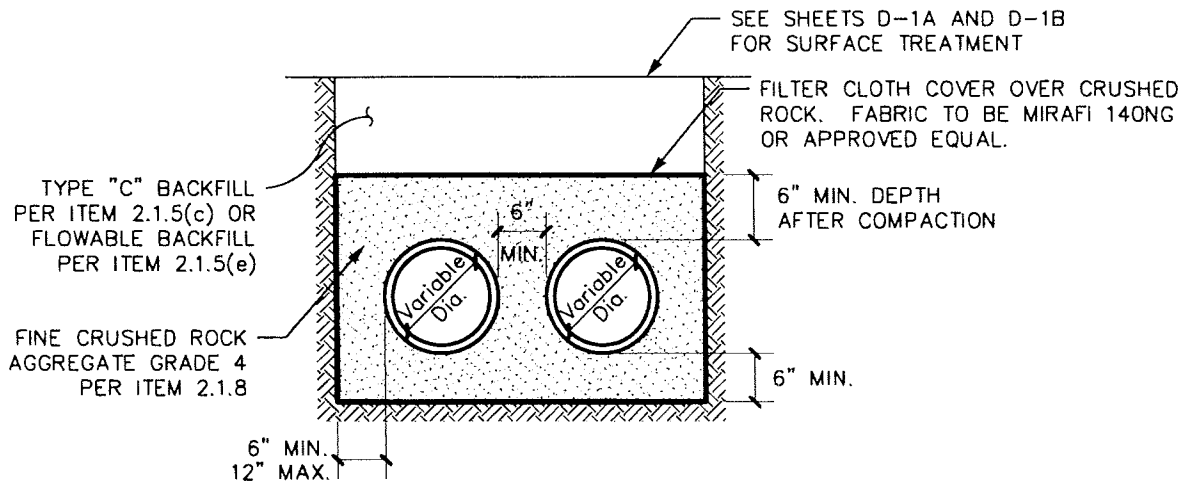
City of Colleyville Texas

DRAINAGE SYSTEM CONSTRUCTION DETAILS

STORM SEWER EMBEDMENT & BACKFILL

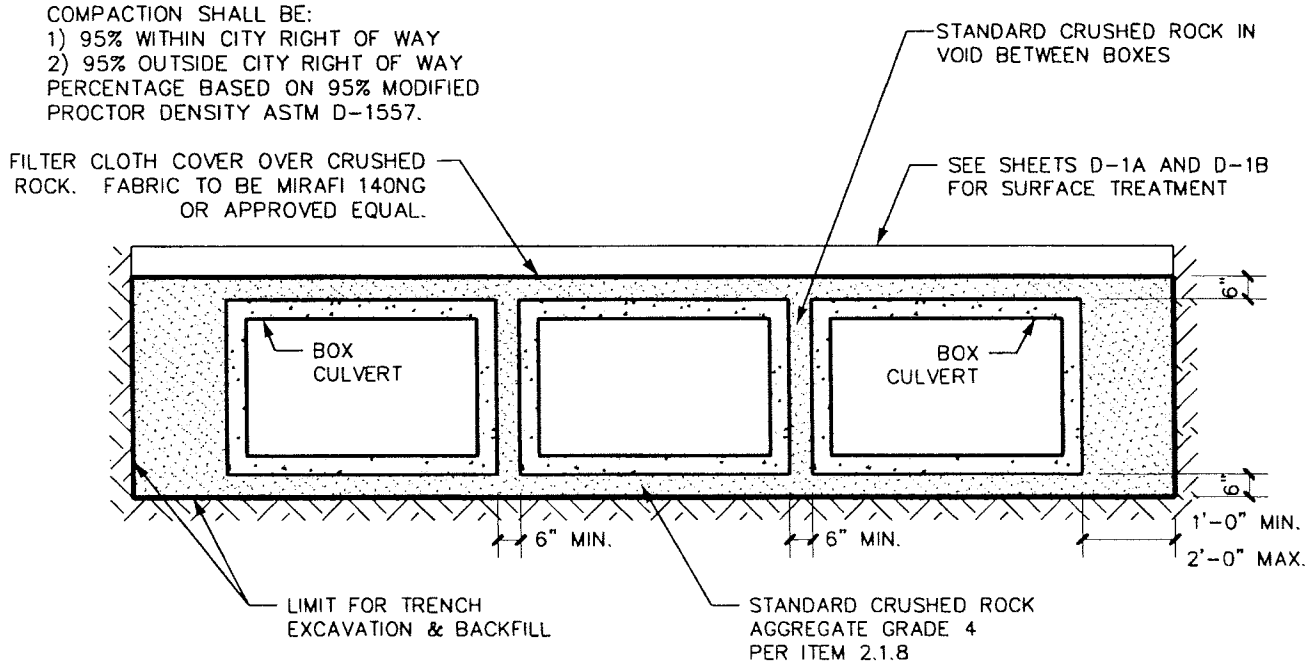
REVISION DATE: APRIL 14, 2000

SHEET: D-1B



MULTIPLE PIPE EMBEDMENT

COMPACTION SHALL BE:
1) 95% WITHIN CITY RIGHT OF WAY
2) 95% OUTSIDE CITY RIGHT OF WAY
PERCENTAGE BASED ON 95% MODIFIED PROCTOR DENSITY ASTM D-1557.

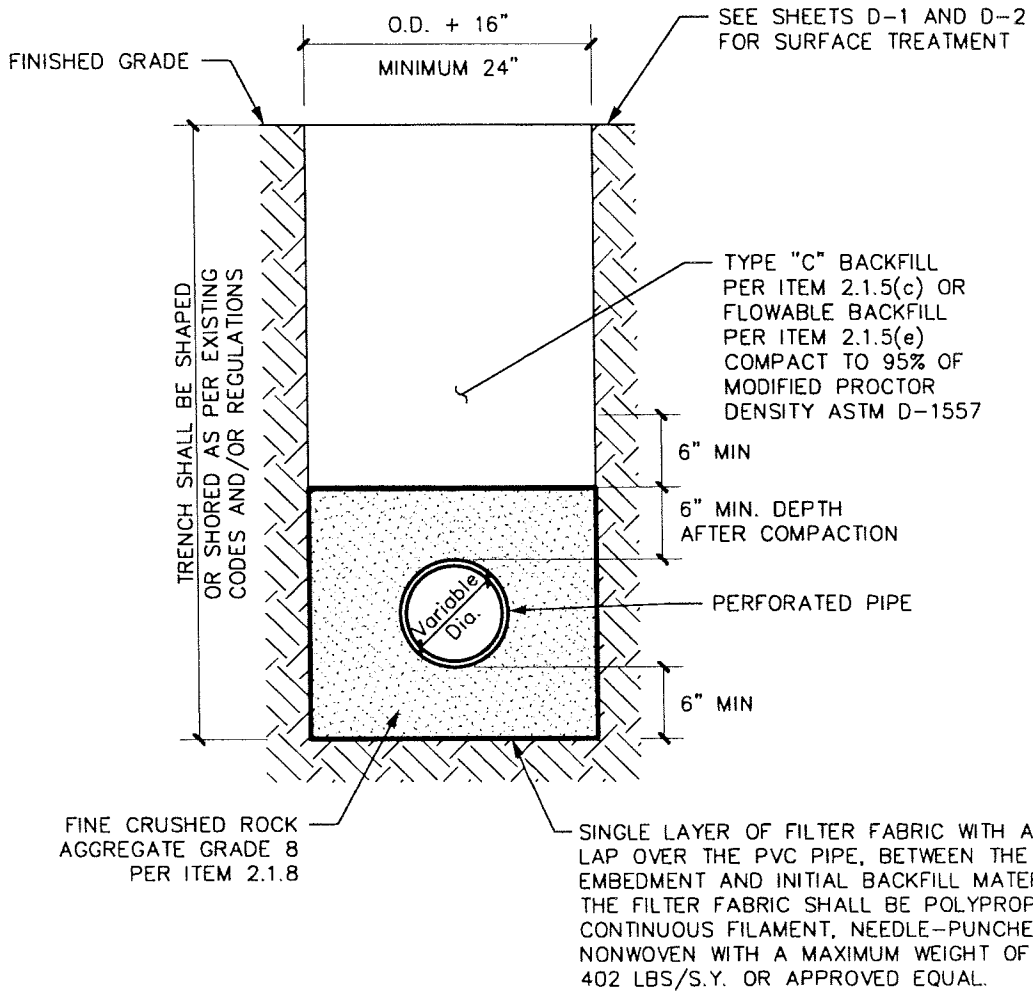


MULTIPLE BOX EMBEDMENT

NOTES:

1. AT THE END OF EACH WORK DAY ALL SPOILS SHALL BE REMOVED FROM THE CITY & TxDOT R.O.W. UNLESS PRIOR WRITTEN PERMISSION IS OBTAINED FROM THE OWNER TO STORE SPOILS IN DESIGNATED SPOIL STORAGE AREAS THAT DO NOT OBSTRUCT AUTOMOBILE OR PEDESTRIAN TRAFFIC.
2. ALL BACKFILL SHALL BE PER SPEC. ITEM 6.2 AND SHALL BE COMPACTED PER SPEC. ITEM 6.2.9 (b). ROCKS GREATER THAN 4" IN DIA. SHALL BE REMOVED FROM ANY NATIVE MATERIAL USED AS BACKFILL.
3. ALL PAVEMENT SHALL BE REMOVED ALONG NEAT SAW-CUT LINES PER SPEC. ITEM 8.8.
4. A MAX. OF 300 FT. OF OPEN TRENCH WILL BE ALLOWED AT ANY TIME, UNLESS APPROVED BY THE CITY ENGINEER.
5. IN SANDY SOILS THE CRUSHED ROCK EMBEDMENT SHALL BE WRAPPED IN A FILTER FABRIC.
6. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND TEXAS LAWS CONCERNING EXCAVATION, TRENCHING, AND SHORING.

City of Colleyville Texas	DRAINAGE SYSTEM CONSTRUCTION DETAILS STORM SEWER EMBEDMENT & BACKFILL	REVISION DATE: APRIL 14, 2000 SHEET: D-1C

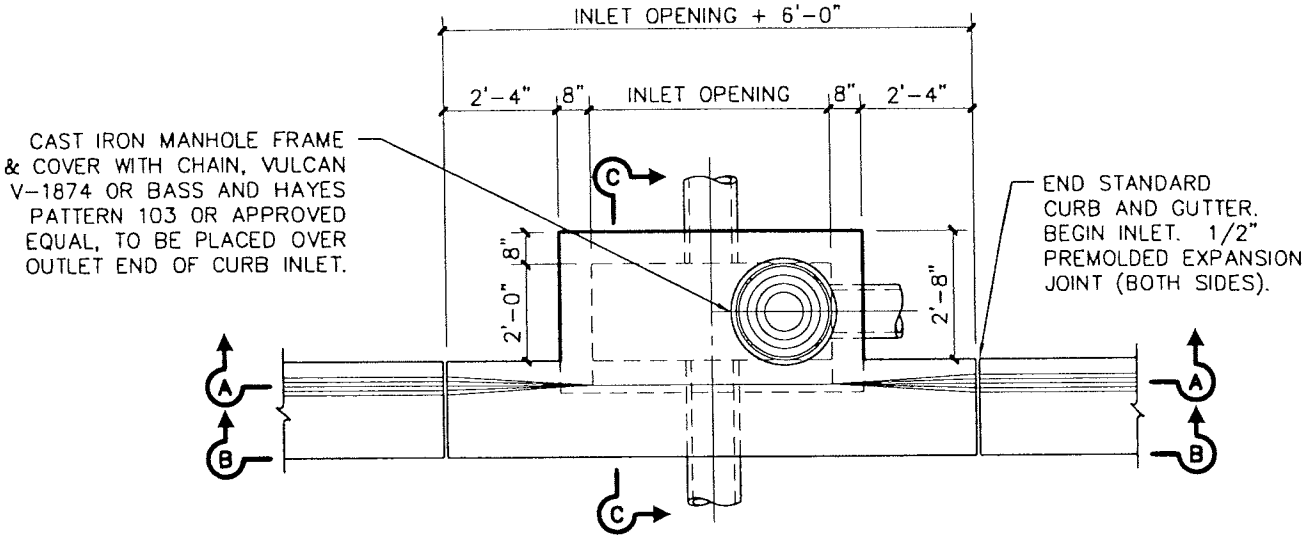


NOTES:

1. WHERE THE CONTRACTOR ENCOUNTERS UNDERGROUND WATER, A SUBSURFACE DRAINAGE SYSTEM SHALL BE INSTALLED, WITH THE DISCHARGE OF SAID SYSTEM BEING CARRIED TO THE NEAREST STORM DRAIN SYSTEM OR NATURAL WATER SHED SYSTEM.
2. THE SUBSURFACE DRAINAGE SYSTEM SHALL BE CONSTRUCTED WITH A MINIMUM SIZE OF SIX (6) INCH DIAMETER TYPE PS-46 PVC PIPE, OR APPROVED EQUAL. THE PIPE SHALL MEET ALL CURRENT ASTM F758 REQUIREMENTS, AND SHALL HAVE GASKET TYPE JOINTS. THE PERFORATED AND CONDUCTING PIPES SHALL BE WHITE IN COLOR.
3. IN SANDY SOILS THE CRUSHED ROCK EMBEDMENT SHALL BE WRAPPED IN A FILTER FABRIC.
4. CLEANOUTS SHALL BE INSTALLED AT THE END OF EACH PIPING SYSTEM.
5. FRENCH DRAINS SHALL BE SHOWN ON ALL RECORD DRAWINGS.
6. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND TEXAS LAWS CONCERNING EXCAVATION, TRENCHING, AND SHORING.

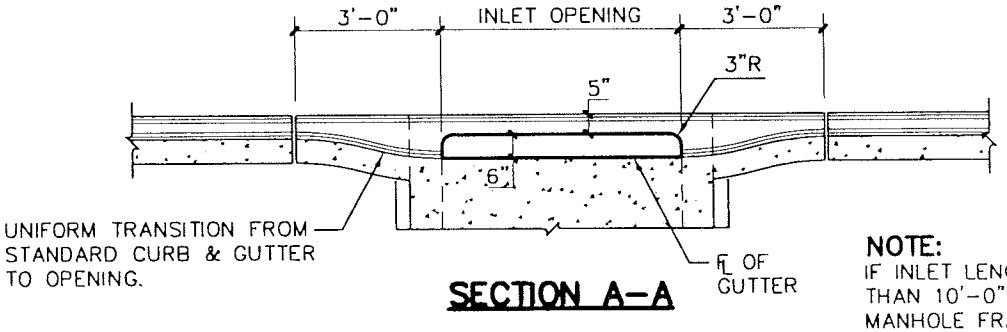
GENERAL NOTES:

1. IN GENERAL, INLET REINFORCING STEEL SHALL BE #4 BARS ON 12" CENTERS BOTH WAYS FOR GUTTER, BOTTOM SLAB ENDS, FRONT AND BACK WALLS, AND #4 BARS ON 6" CENTERS BOTH WAYS FOR TOP SLAB. AN ADDITIONAL #6 BAR SHALL BE PLACED IN THE FRONT EDGE OF THE TOP SLAB IN THE INLETS AND ADDITIONAL REINFORCING STEEL SHALL BE PLACED AROUND MANHOLES AS SHOWN.
2. ALL REINFORCING STEEL SHALL BE GRADE 60.
3. ALL CONCRETE SHALL BE CLASS "A". ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
4. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" TO THE CENTERS OF THE BARS.
5. WHEN AN INLET IS PLACED IN AN EXISTING STREET, 10 FEET OF CURB UPSTREAM AND DOWNSTREAM FROM THE INLET SHALL BE REMOVED AND REPOURED INTEGRALLY WITH THE INLET.
6. ALL BACK FILLING SHALL BE IN ACCORDANCE WITH ITEM 6.2.9 TO 95% MODIFIED PROCTOR DENSITY ASTM D-1557.
7. CENTER BEAM IS REQUIRED FOR ALL INLET OPENINGS GREATER THAN 10'-0".
8. TWO MANHOLE FRAMES AND COVERS ARE REQUIRED WHEN INLET OPENING IS GREATER THAN 10'-0".
9. ALL INLET FLOORS ARE TO HAVE A 2% SLOPE TOWARDS THE OUTLET PIPE.
10. MINIMUM INLET OPENING SIZE IS 8'-0".
11. MAXIMUM INLET OPENING SIZE IS 20'-0".
12. OUTLET PIPE TO BE PLACED AT LOWEST END OF FLOOR INLET. MANHOLE COVER TO BE PLACED ABOVE OUTLET END OF INLET.
13. MANHOLE FRAME AND COVER SHALL BE CAST IRON, VULCAN V-1874 OR BASS AND HAYES PATTERN 103 OR APPROVED EQUAL.
14. MANHOLE COVERS SHALL HAVE CHAINS ATTACHED TO PREVENT COVERS FROM BEING WASHED AWAY DURING FLOOD CONDITIONS.



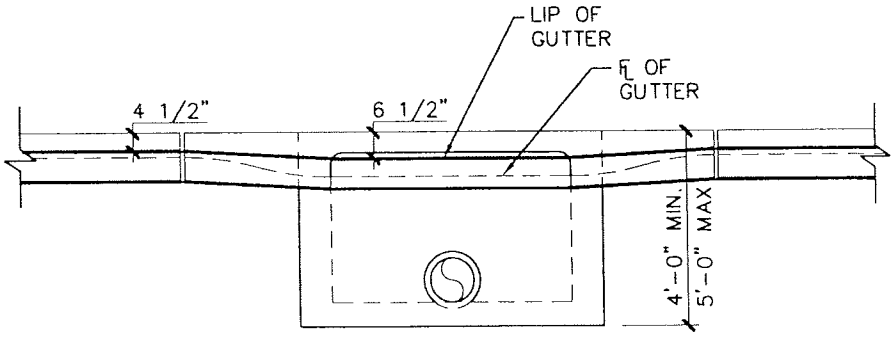
SEE SHEET D-5 FOR SECTION C-C

PLAN VIEW



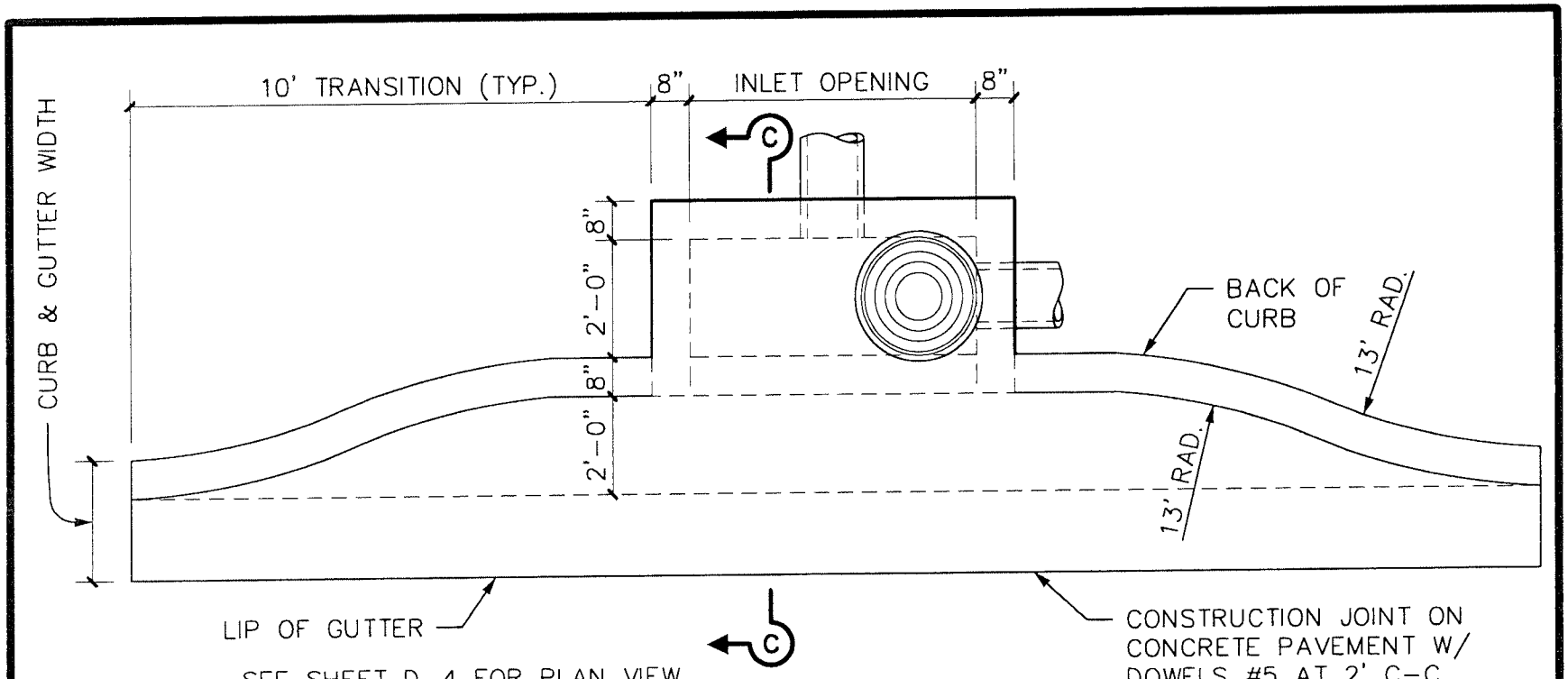
SECTION A-A

NOTE:
IF INLET LENGTH IS GREATER THAN 10'-0", PLACE TWO (2) MANHOLE FRAMES AND COVERS ON TOP OF INLET BOX.

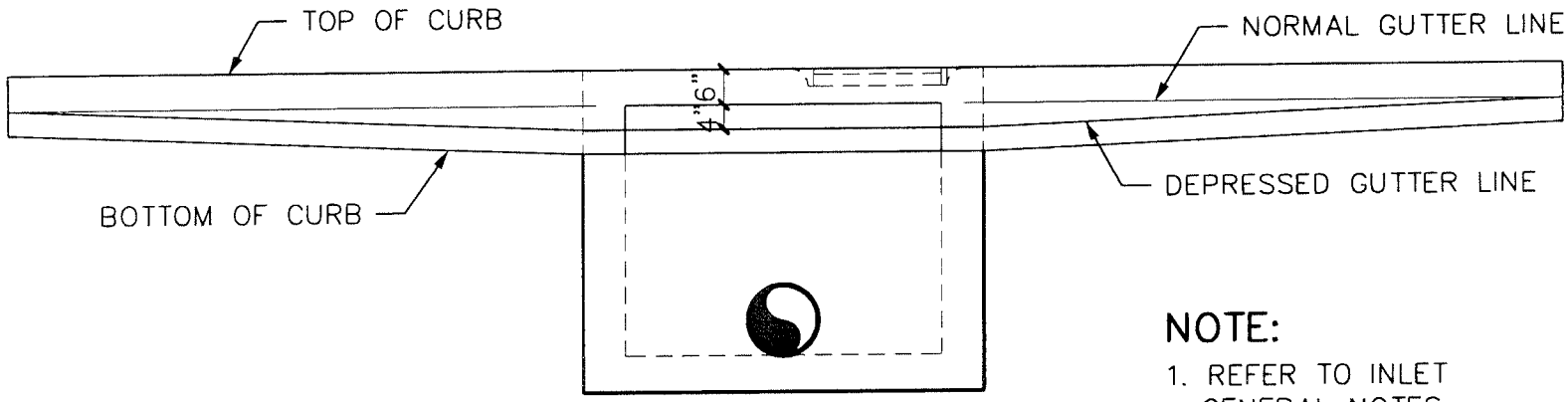


SECTION B-B

City of Colleyville Texas	DRAINAGE SYSTEM CONSTRUCTION DETAILS STORM SEWER CURB INLET	REVISION DATE: APRIL 14, 2000 SHEET: D-4



SECTION C-C



ELEVATION

NOTE:

1. REFER TO INLET GENERAL NOTES

City of Colleyville, Texas

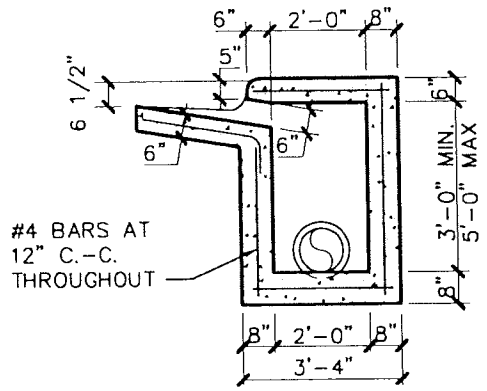
DRAINAGE SYSTEM CONSTRUCTION DETAILS

STORM SEWER RECESSED CURB INLET

REVISION DATE: APRIL 14, 2000

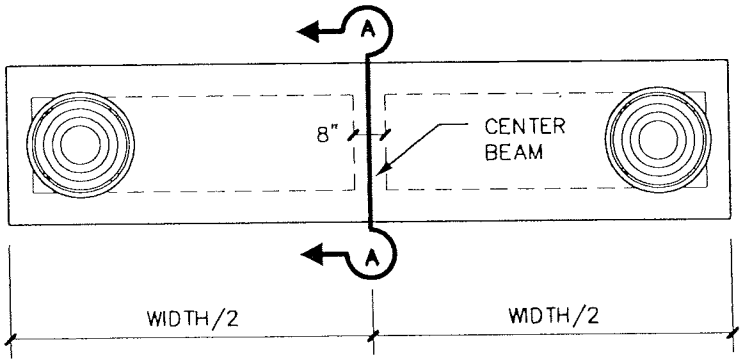
SHEET: D-5

05/30/00 3:12 D-5

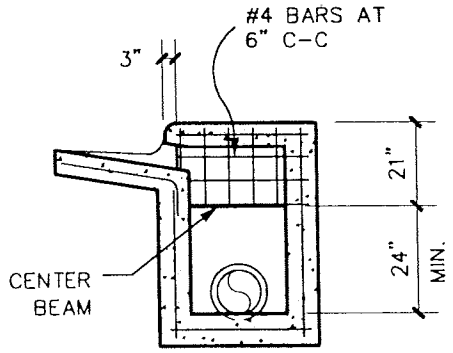


SECTION C-C

NOTE
SEE SHEET D-3 FOR GENERAL INLET INFORMATION



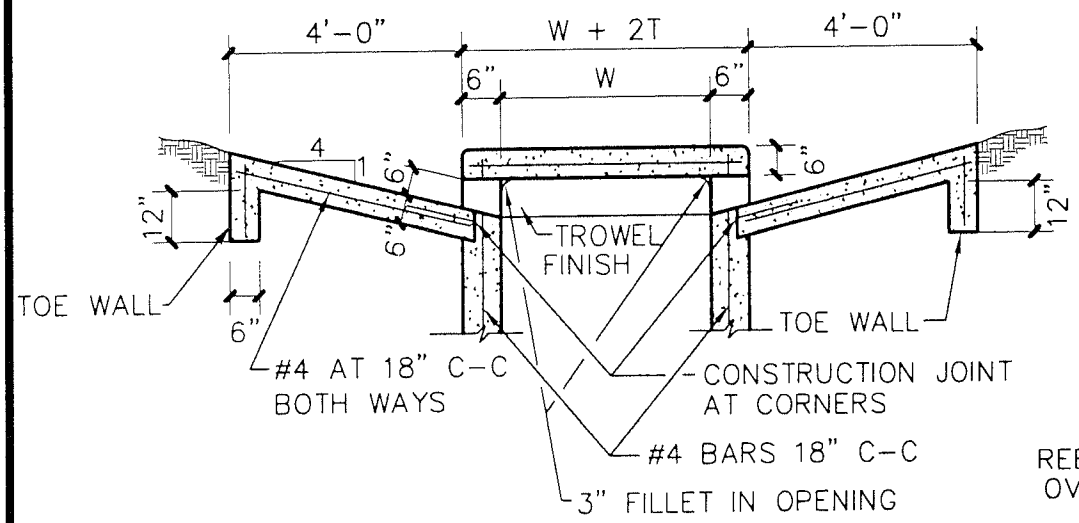
PLAN VIEW



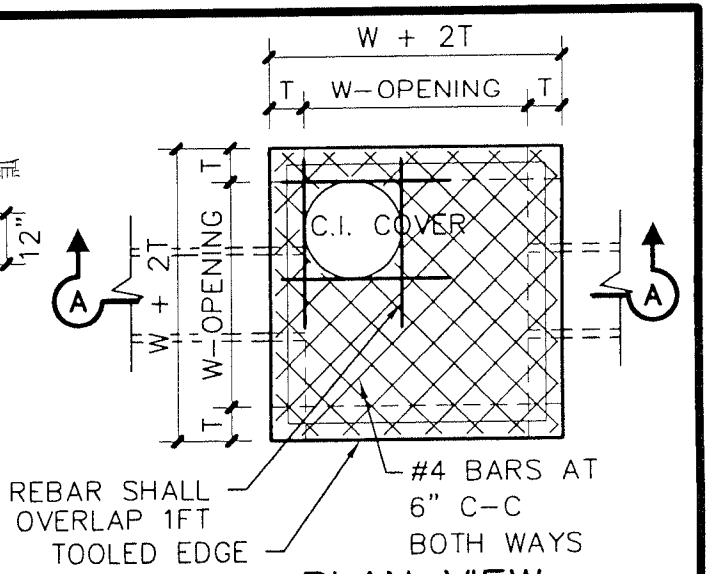
SECTION A-A

CENTER BEAM DETAIL

City of Colleyville Texas	DRAINAGE SYSTEM CONSTRUCTION DETAILS STORM SEWER CURB INLET	REVISION DATE: APRIL 14, 2000 SHEET: D-6



SECTION A-A



PLAN VIEW

NOTES:

1. MATERIAL AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATIONS FOR STANDARD CONCRETE MANHOLES.
2. LAYERS OF REINFORCED STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACES SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. EXCAVATION FOR DROP INLET TO BE INCLUDED IN THE PRICE BID FOR DROP INLET.
4. FOR DETAILS OF REINFORCING TO LOWER PORTIONS OF INLET SEE APPROPRIATE SQUARE STORM DRAIN MANHOLE DETAILS.
5. DEPTH OF DROP INLET FROM FINISHED GRADE TO FLOW LINE OF INLET IS VARIABLE. APPROXIMATE DEPTH WILL BE SHOWN ON PLANS AT LOCATION OF INLET.
6. ALL STANDARD DROP INLETS SHALL HAVE ONE OPENING ON EACH SIDE UNLESS SHOWN ON PLANS.
7. DECK MAY BE REINFORCED SAME AS STANDARD SQUARE STORM DRAIN MANHOLE.
8. CAST IRON FRAME AND COVER WITH CHAIN. VULCAN V-1874 OR BASS AND HAYES PATTERN NO. 103, OR APPROVED EQUAL.
9. TOE WALLS TO BE 18" IN DEPTH AND 6" IND WIDTH WITH REINFORCING BARS.

INLET SIZE	T	W
2' SQUARE	7"	2'-0"
4' SQUARE	7"	4'-0"
5' SQUARE	8"	5'-0"
6' SQUARE	9"	6'-0"
7' SQUARE	9"	7'-0"
8' SQUARE	9"	8'-0"

FOR LOWER PORTION OF 2' SQUARE DROP INLET USE REINF. STEEL DETAILS OF 4' SQUARE MANHOLE AND ELIMINATE INLET RING AND COVER.

city of Colleyville Texas

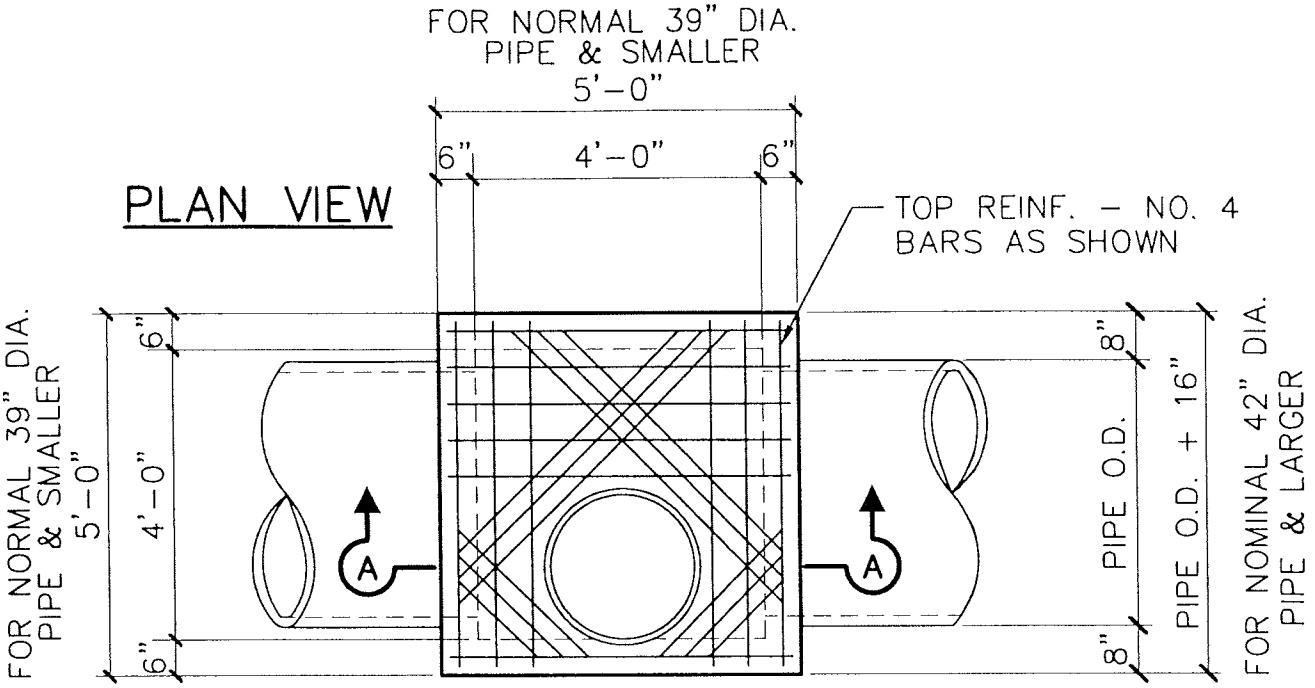
DRAINAGE SYSTEM CONSTRUCTION DETAILS

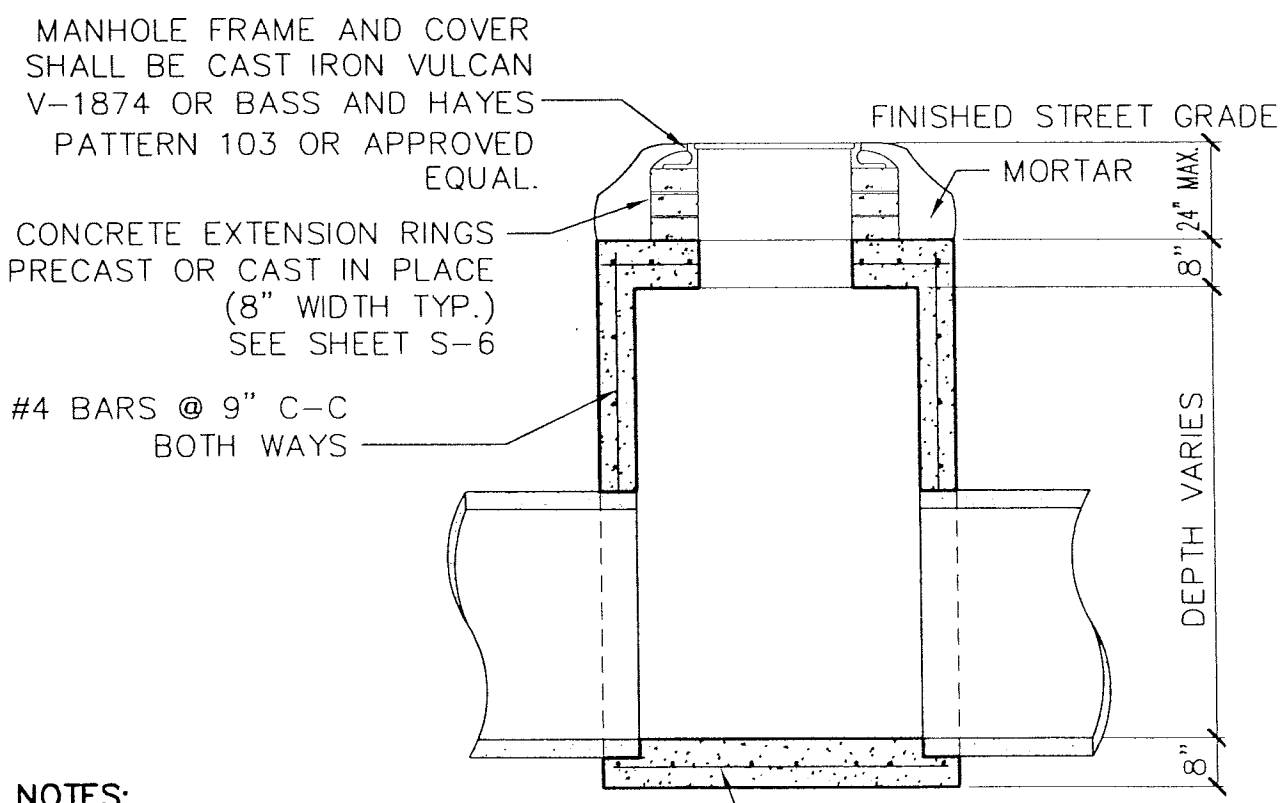
STORM SEWER DROP INLET

REVISION DATE: APRIL 14, 2000

SHEET: D-7

04/14/00 2:27



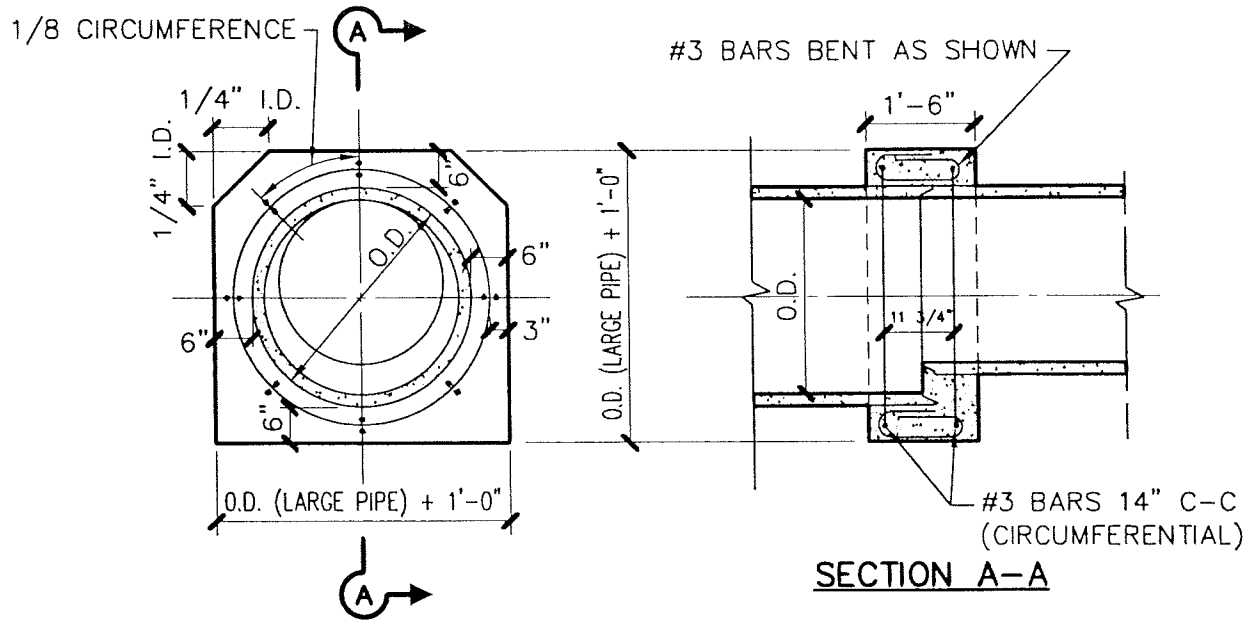


NOTES:

1. LARGER JUNCTION BOXES SHALL BE DESIGNED BY THE ENGINEER AND SUBMITTED TO THE CITY ENGINEER FOR REVIEW.

SECTION A-A

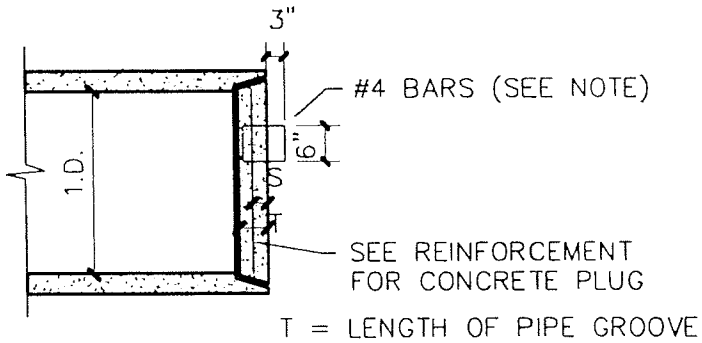
City of Colleyville Texas	DRAINAGE SYSTEM CONSTRUCTION DETAILS STORM SEWER MANHOLE	REVISION DATE: APRIL 14, 2000 SHEET: D-8



SECTION A-A

REINFORCED CONCRETE COLLAR

NOTE:
COLLARS MAY ONLY BE USED TO REDUCE THE DIAMETER ONE PIPE SIZE.
A JUNCTION BOX IS REQUIRED FOR REDUCING MORE THAN ONE PIPE SIZE.



T = LENGTH OF PIPE GROOVE

REINFORCED CONCRETE PIPE PLUG

PIPE SIZE	REINF. BAR	DISTANCE C-C BOTH WAYS	S
18"-33"	# 2	12"	1/2 T
36"-54"	# 3	12"	1/3 T
60"	# 4	12"	1/4 T

NOTE:
STEEL HANDLE FOR REINFORCED CONCRETE PIPE PLUG SHALL BE LOCATED 1/4 I.D. ABOVE CENTER POINT OF PLUG. TWO (2) STEEL HANDLES WILL BE REQUIRED ON PLUGS OF 36" DIA. PIPES OR LARGER AND SHALL BE PLACED 1/4 I.D. APART AND 1/4 I.D ABOVE CENTER OF PLUG.

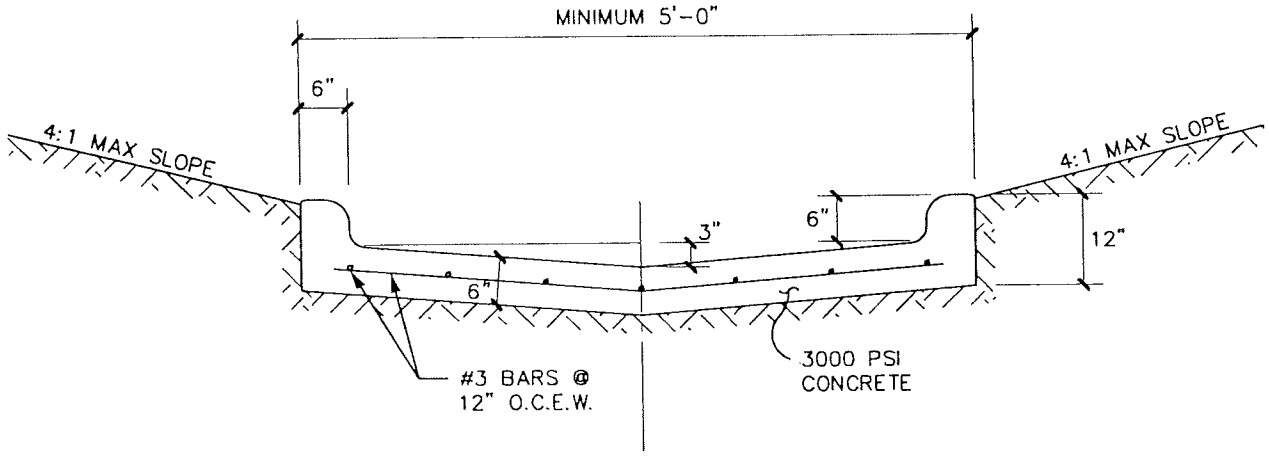
City of Colleyville Texas

DRAINAGE SYSTEM CONSTRUCTION DETAILS

STORM SEWER REINFORCED CONCRETE COLLAR

REVISION DATE: APRIL 14, 2000

SHEET: D-9



NOTES:

1. IF FLUME IS 7' OR WIDER, USE PIPE BOLLARDS 7' x 6" DIA., AND FILL WITH CONCRETE PLACE AT BOTH START AND END OF FLUME BURY TO 4' DEPTH
2. SIDE SLOPES TO BE HYDROMULCHED.

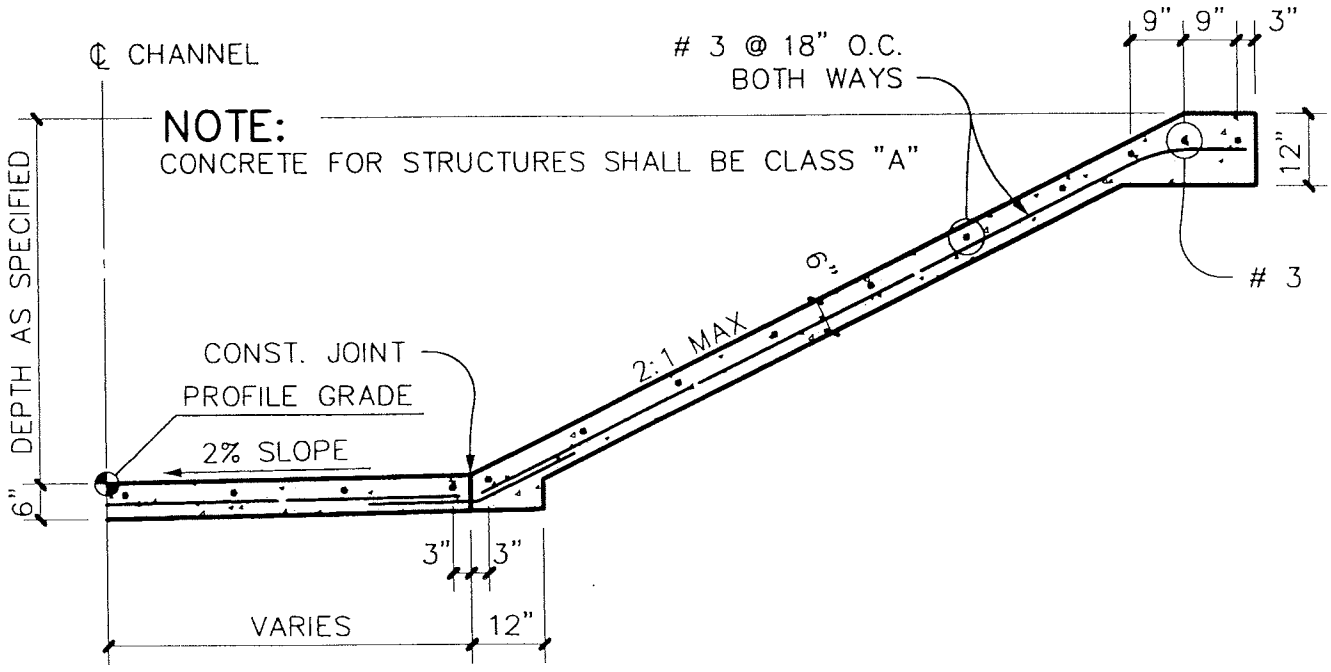
City of Colleyville Texas

DRAINAGE SYSTEM CONSTRUCTION DETAILS

STORM SEWER CURBED FLUME AND PILOT CHANNELS

REVISION DATE: APRIL 14, 2000

SHEET: D-10



NOTE:

RIPRAP TO BE FORMED ON UNDISTURBED SOIL CUT TO GRADE. IF TO BE PLACED ON FILL, ALL FILL SHALL BE PLACED ON BENCHES CUT IN UNDISTURBED SOIL AND FILLED IN 8" LOOSE LIFTS, EACH COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE FILL SO COMPACTED SHALL THEN BE CUT TO GRADE. WEEP HOLES SHALL BE LOCATED BASED ON STRUCTURAL DESIGN AND HYDROLOGIC FLOW CHARACTERISTICS OF THE CHANNEL.

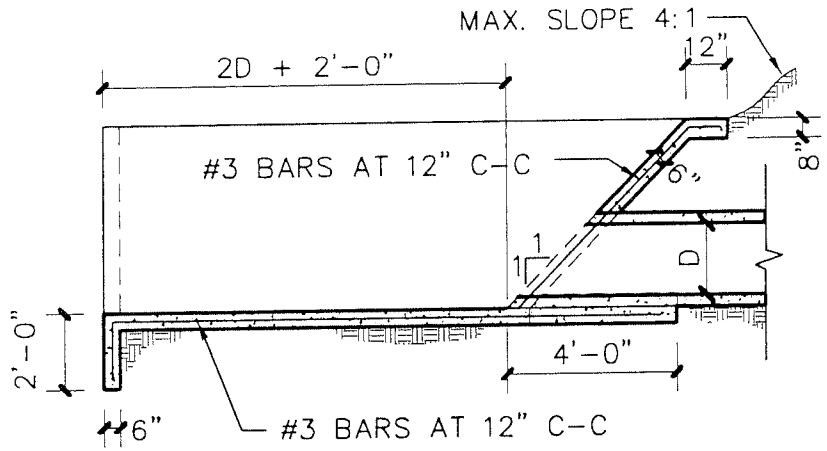
City of Colleyville Texas

DRAINAGE SYSTEM CONSTRUCTION DETAILS

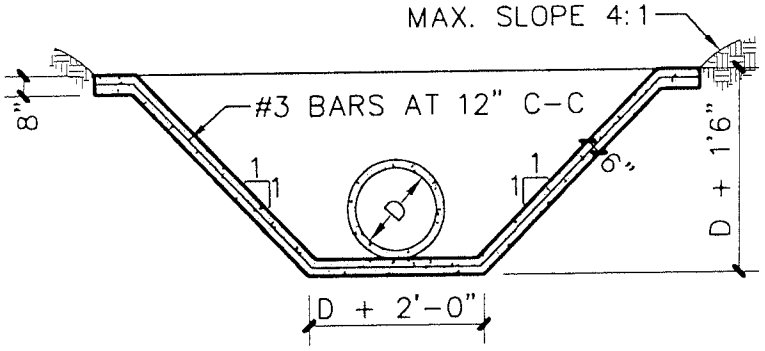
STORM SEWER CONCRETE RIPRAP

REVISION DATE: APRIL 14, 2000

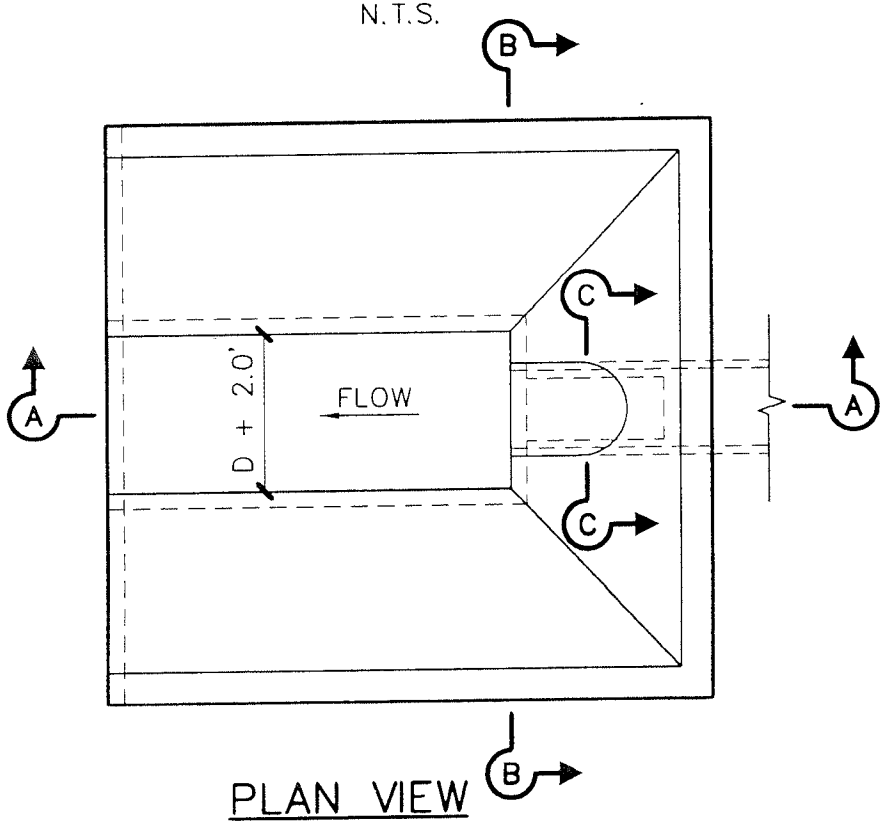
SHEET: D-11



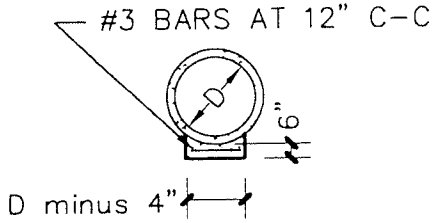
SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



PLAN VIEW
N.T.S.



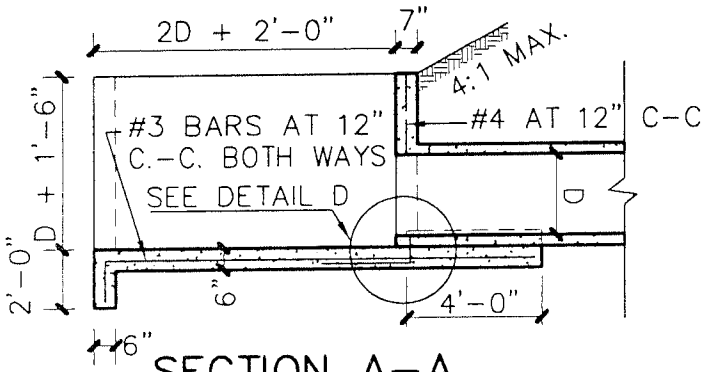
SECTION C-C
N.T.S.

DRAINAGE SYSTEM CONSTRUCTION DETAILS

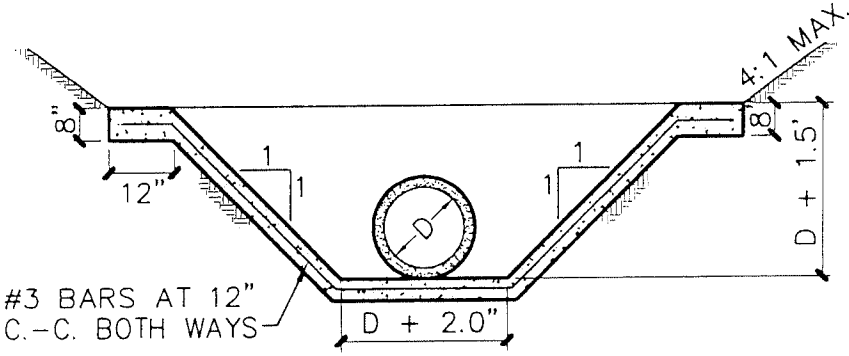
STORM SEWER SLOPING HEADWALL

REVISION DATE: APRIL 14, 2000

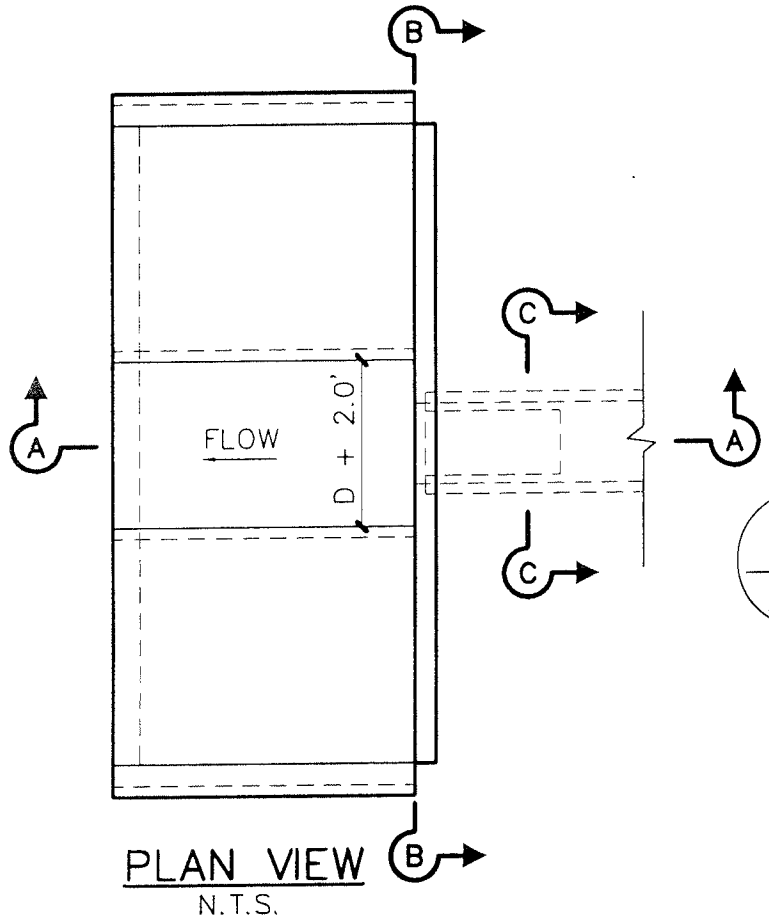
SHEET: D-12



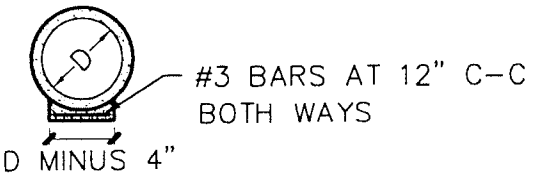
SECTION A-A
N.T.S.



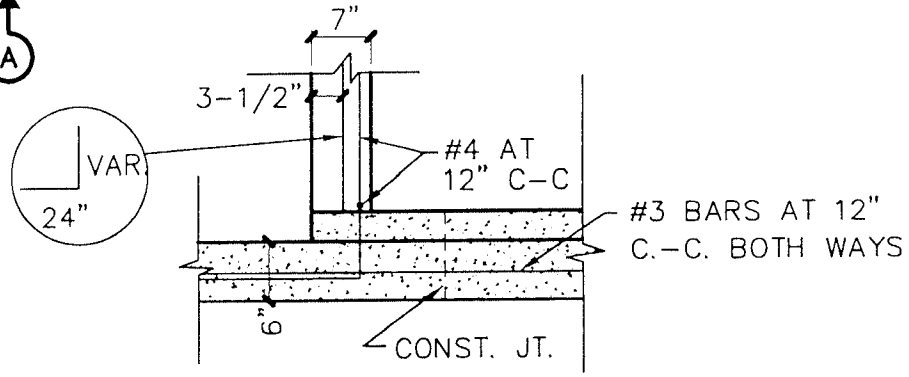
SECTION B-B
N.T.S.



PLAN VIEW
N.T.S.



SECTION C-C
N.T.S.



DETAIL D
N.T.S.

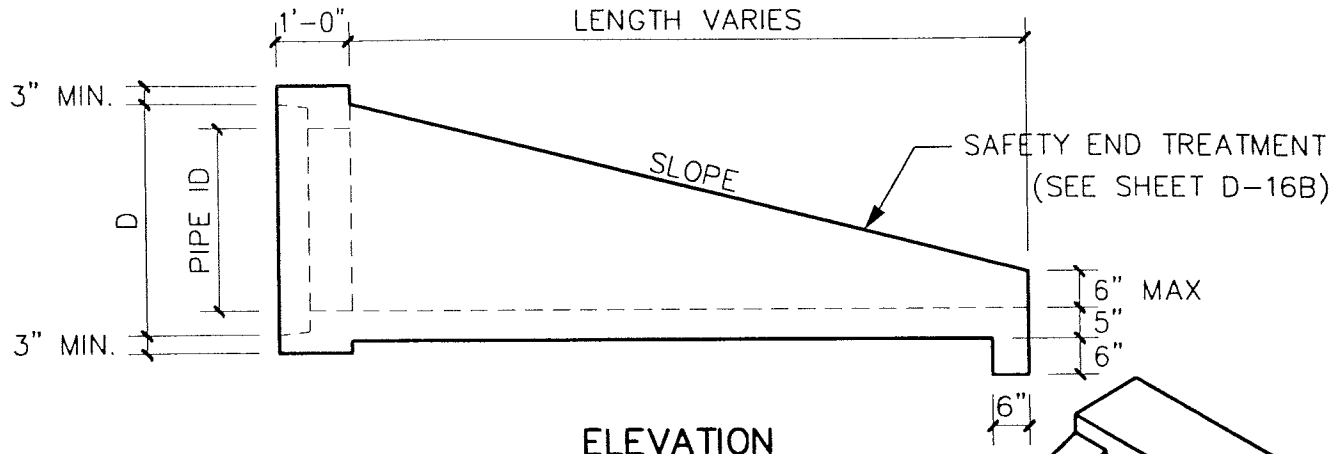
DRAINAGE SYSTEM CONSTRUCTION DETAILS

STORM SEWER VERTICAL HEADWALL

REVISION DATE: APRIL 14, 2000

SHEET: D-13

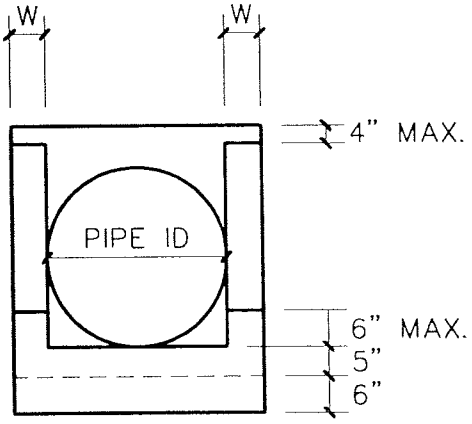
04/14/00 2:47 D-13



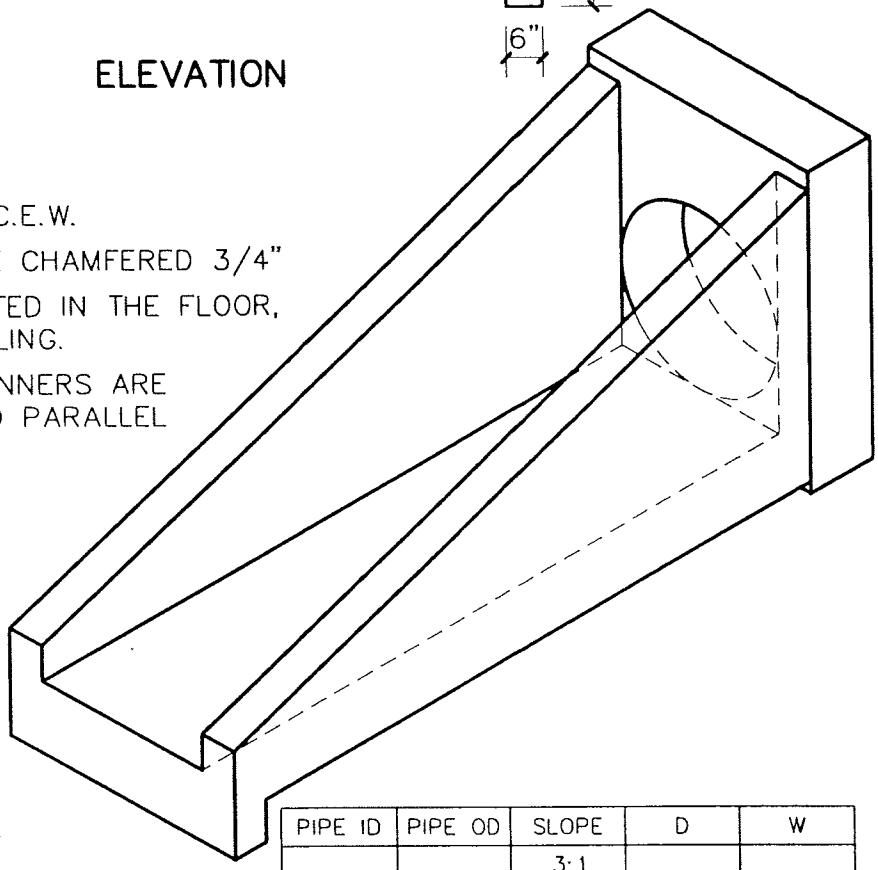
ELEVATION

NOTES:

1. 4500 PSI CONCRETE
2. #4 GRADE 60 REBAR 9" O.C.E.W.
3. ALL EXPOSED CORNERS ARE CHAMFERED 3/4"
4. SWIFT LIFT ANCHORS, LOCATED IN THE FLOOR, SHALL BE USED FOR HANDLING.
5. GALVANIZED STEEL PIPE RUNNERS ARE AVAILABLE FOR CROSS AND PARALLEL DRAINAGE APPLICATIONS.



FRONT ELEVATION



PIPE ID	PIPE OD	SLOPE	D	W
18"	23"	3:1	24"	5"
		4:1		
		6:1		
24"	30"	3:1	31"	5"
		4:1		
		6:1		

PIPE ID	PIPE OD	SLOPE	D	W
30"	37"	3:1	38"	6"
		4:1		
		6:1		
36"	44"	3:1	45-1/2"	6"
		4:1		
		6:1		
42"	51"	3:1	52-3/4"	8"
		4:1		
		6:1		
48"	58"	3:1	60"	8"
		4:1		
54"	65"	3:1	67"	8"

City of Colleyville Texas

DRAINAGE SYSTEM CONSTRUCTION DETAILS

STORM SEWER CULVERT

REVISION DATE: APRIL 14, 2000

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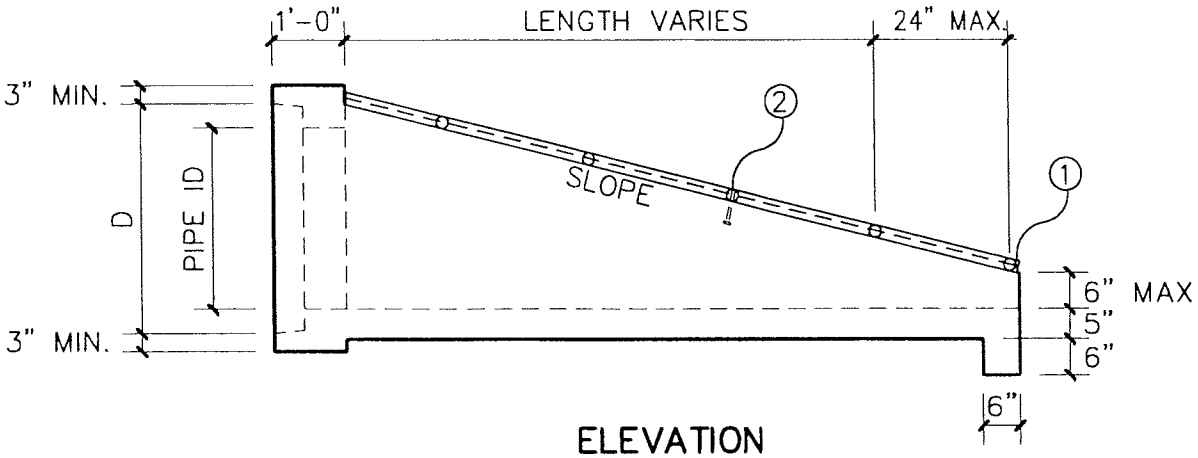
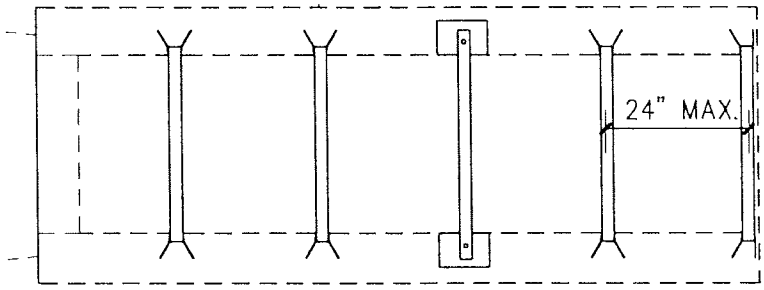


ELEVATION

① TOP OF SAFETY PIPE RUNNER (TYP)

② THIRD PIPE RUNNER SHALL ALWAYS HAVE BOLTED CONNECTION FOR CLEAN OUT ACCESS



PLAN

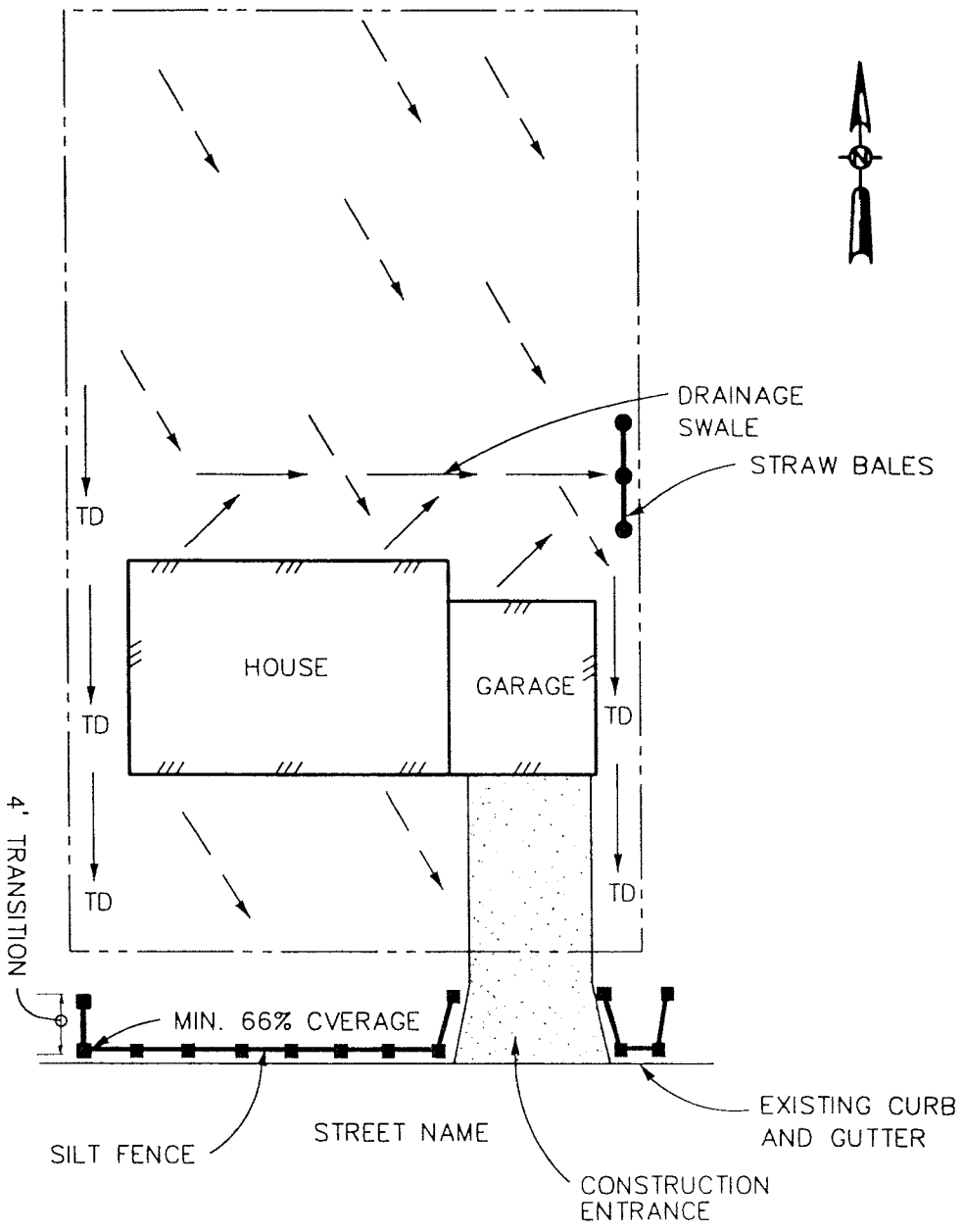
NOTES:

1. SAFETY END PIPE SHALL BE 2" DIAMETER.
2. PIPE AND BOLTS SHALL BE GALVANIZED STEEL.

An Erosion Control Plan shall at a minimum contain the following items:

1. A site plan drawn to the scale of the property where earthwork is proposesd showing the property boundary, any street right-of-way and any drainage easment.
2. The exisiting drainage flow by using arrows to indicate the direction of slope.
3. The location of any existing or proposed building footprint, if applicable.
4. The location and type of erosion control method proposed.
5. The location where access is gained to the property.

There shall be at least one construction access point, a minimum of 10' and a maximum of 20' wide, comprised of a 4" gravel base extending 10' from the curb (or property line).



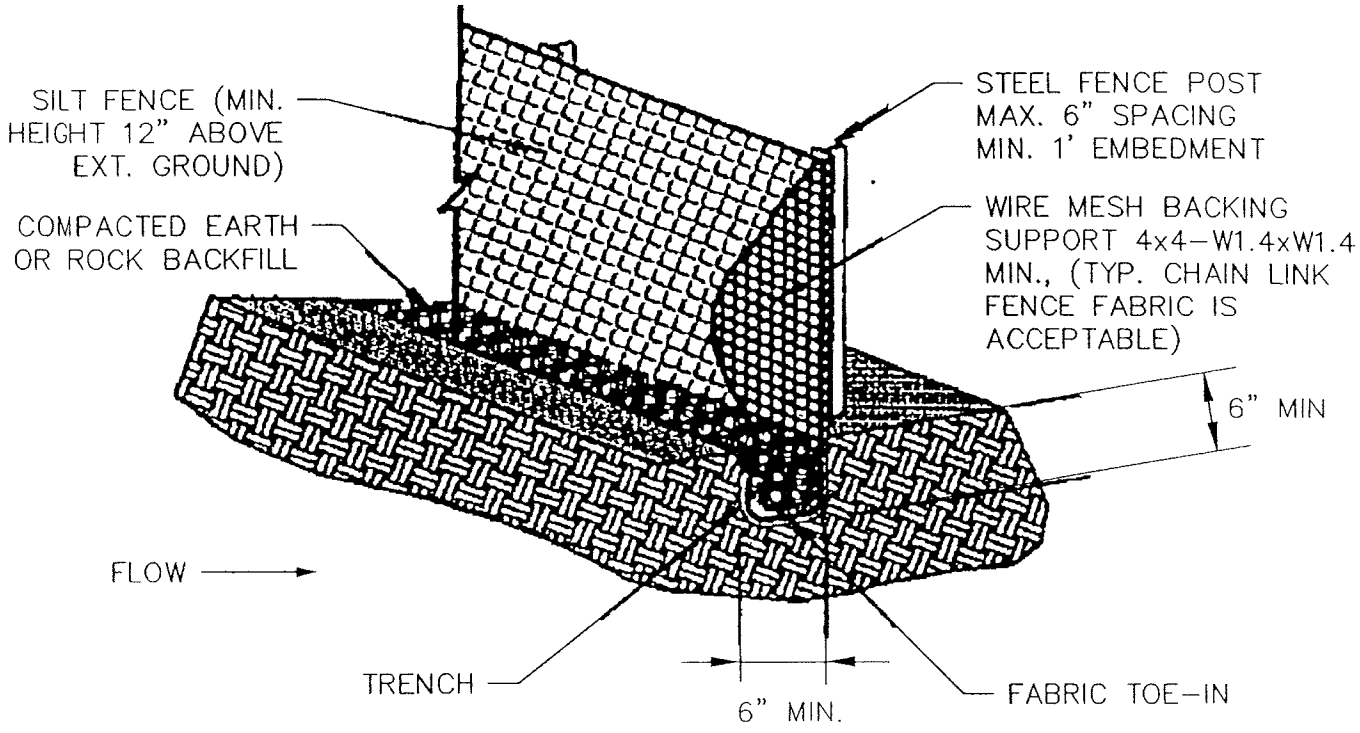
City of Colleyville Texas

EROSION CONTROL PLAN

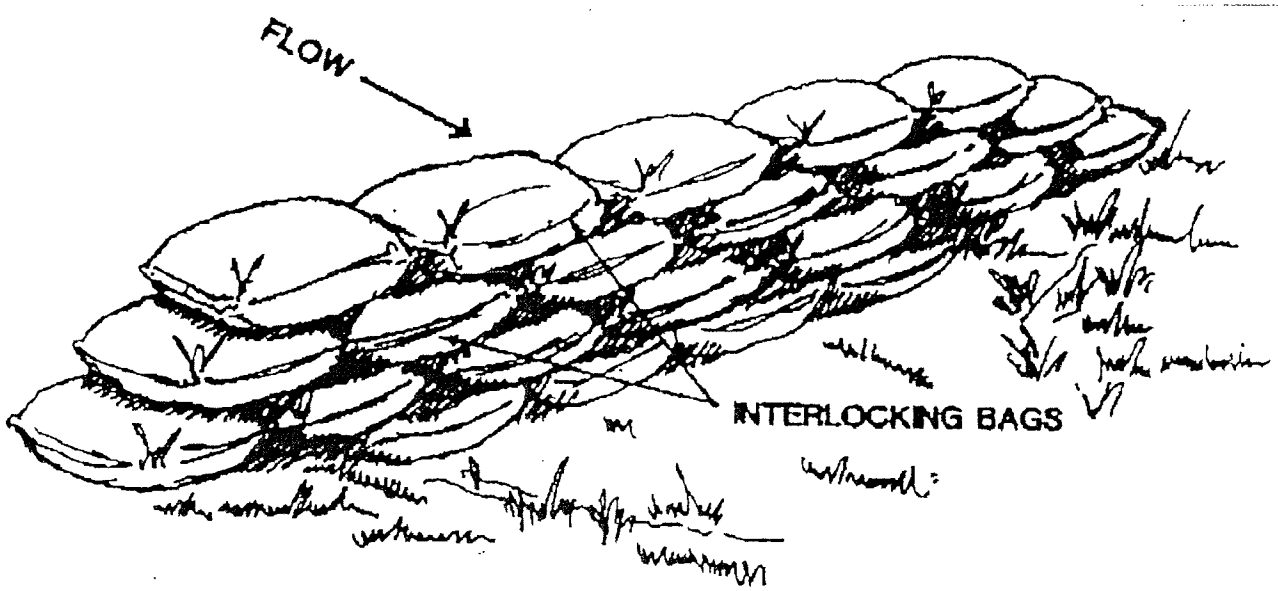
REVISION DATE: APRIL 14, 2000

SHEET: D-15A

At a minimum, an Erosion Control Barrier must: have the base buried to protect against washout, be installed to a minimum of 12" above the ground, be placed behind any curb, extend along 66% of the street frontage (additional barriers may be required by the City), a 4' transition is required at each end of the barrier, the construction access point must not be blocked, in the absence of any curb, the City Inspector shall determine the proper location for the barrier.



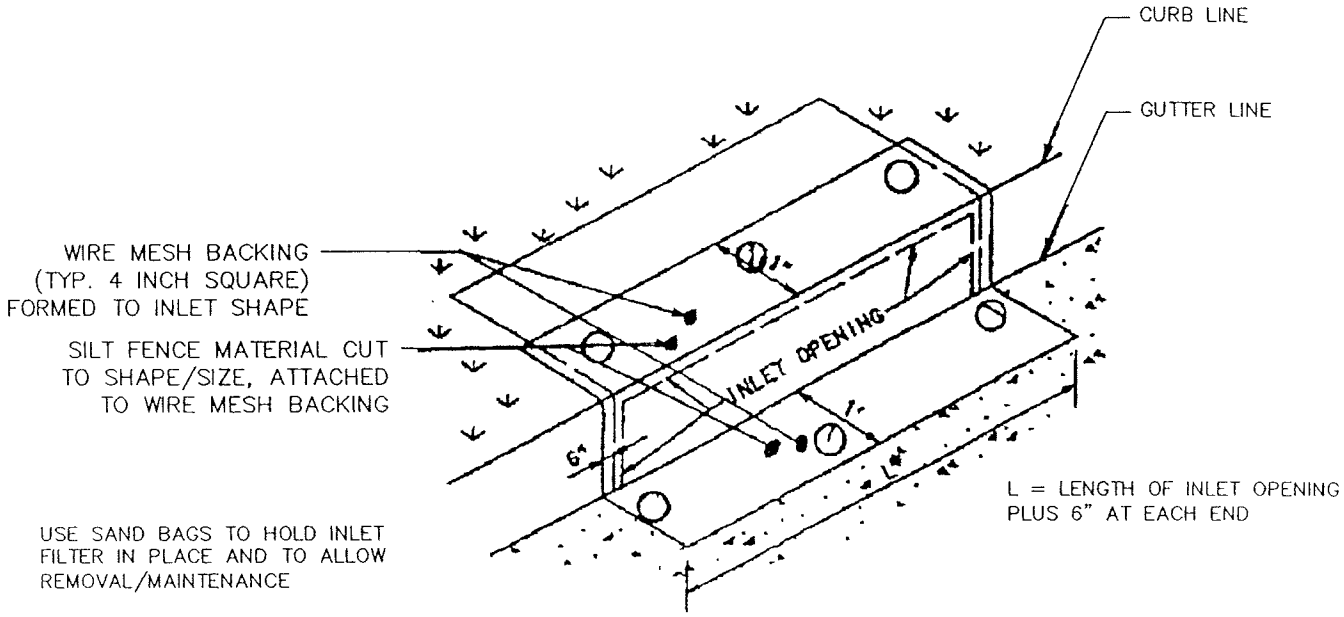
TYPICAL SILT SCREENING FENCE



TYPICAL SAND BAG SCREENING

City of Colleyville Texas	SILT FENCE AND SAND BAG SCREEN EROSION CONTROL BARRIERS	REVISION DATE: APRIL 14, 2000 SHEET: D–15B

At a minimum, an Erosion Control Barrier must: have the base buried to protect against washout, be installed to a minimum of 12" above the ground, be placed behind any curb, extend along 66% of the street frontage (additional barriers may be required by the City), a 4' transition is required at each end of the barrier, the construction access point must not be blocked, in the absence of any curb, the City Inspector shall determine the proper location for the barrier.



TYPICAL CURB INLET SCREENING

City of Colleyville Texas	CURB INLET SCREEN EROSION CONTROL BARRIER	REVISION DATE: APRIL 14, 2000 SHEET: D-15C