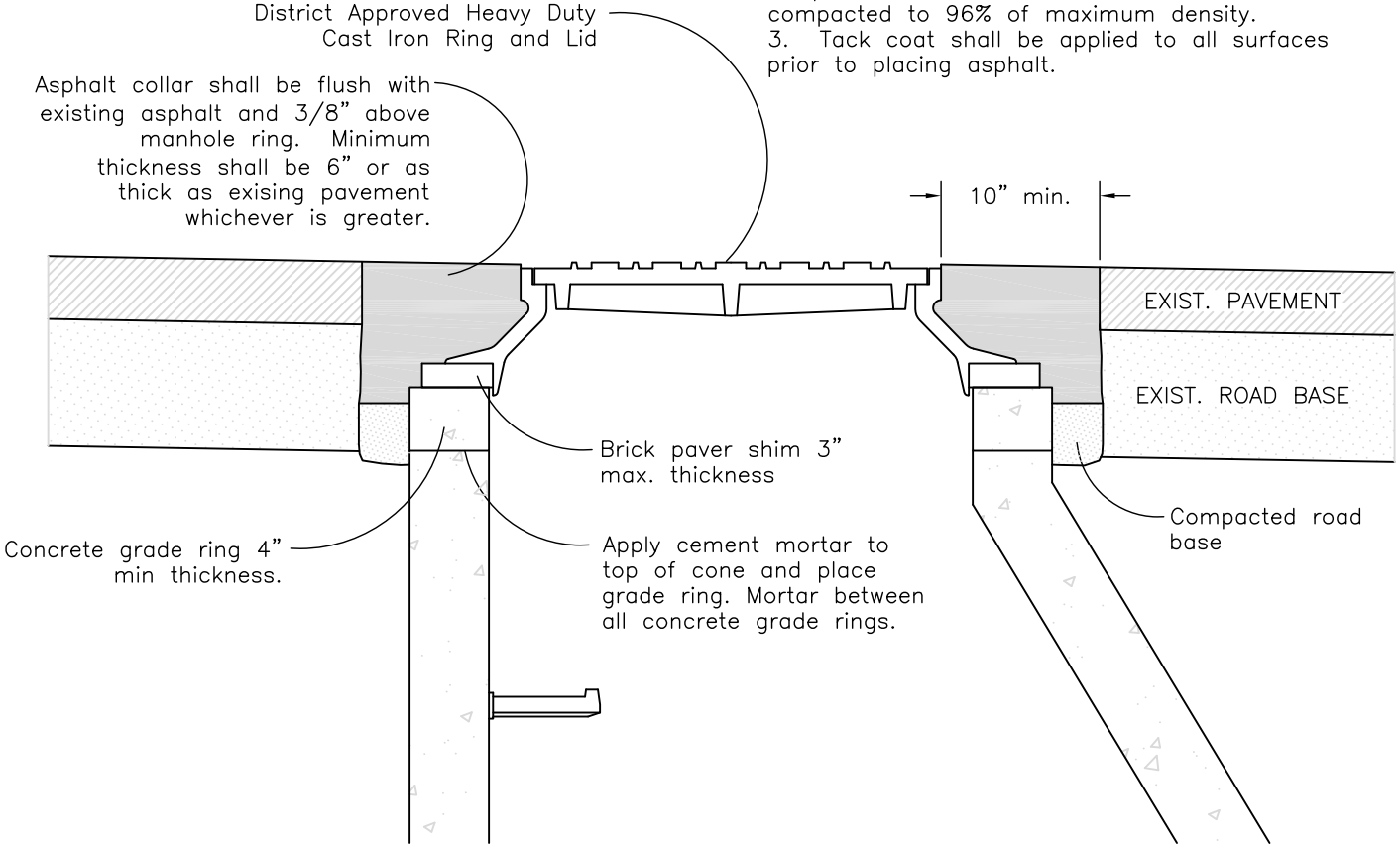
NOTES:
1. Ring and lid shall be inspected and replaced if broken or cracked with District approved heavy duty ring and lid.
2. Grade rings shall be minimum of 4" thick. Concrete shall be 6.5 bag mix with 28 day compressive strength of 4000 psi.
3. Cast iron ring shall be adjusted precisely to slope and cross slope of road. Brick pavers may be used as shims to a maximum thickness of 3". Shims shall be fully grouted. Metal spacer rings shall not be used.
4. Cast iron ring shall be 1/4" to 3/8" below the existing pavement surface. Cleats on lid shall not extend above the plane of the asphalt.

ASPHALT COLLAR
1. Asphalt collar shall be recycled asphalt mix prepared on site in portable asphalt batch plant.
2. Recycled asphalt mix shall be applied at a temperature not less than 200° F. and compacted to 96% of maximum density.
3. Tack coat shall be applied to all surfaces prior to placing asphalt.

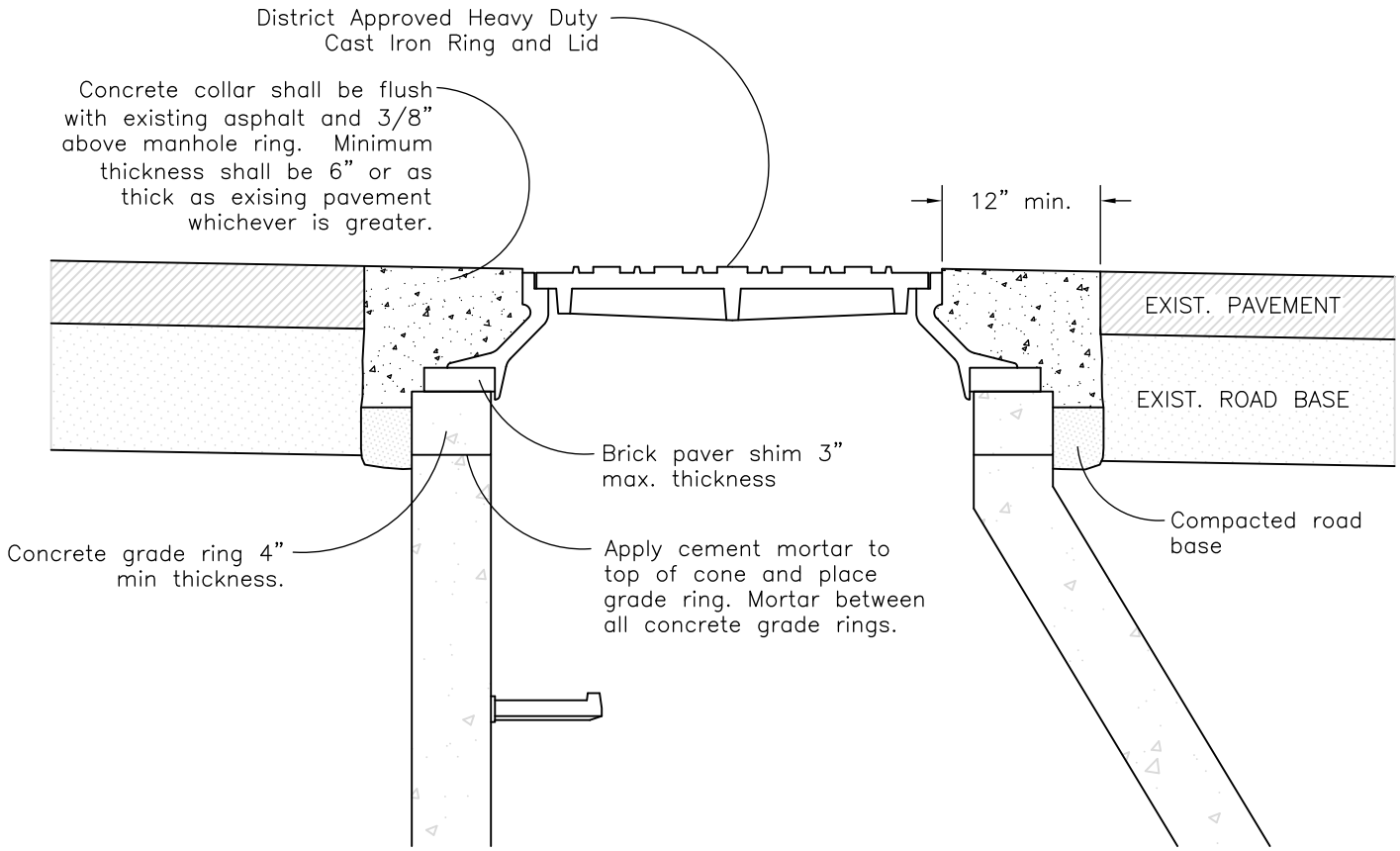


DETAIL - ASPHALT COLLAR

FOR RAISING MANHOLE COVER IN STREET
WITH FLEXIBLE PAVEMENT

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 7/20/98	DWG. NO.
	REVISIONS:	
DETAIL - ASPHALT COLLAR	SCALE: NO SCALE	D1

NOTES:
1. Ring and lid shall be inspected and replaced if broken or cracked with District approved heavy duty ring and lid.
2. Grade rings shall be minimum of 4" thick. Concrete shall be 6.5 bag mix with 28 day compressive strength of 4000 psi.
3. Cast iron ring shall be adjusted precisely to slope and cross slope of road. Brick pavers may be used as shims to a maximum thickness of 3". Shims shall be fully grouted. Metal spacer rings shall not be used.
4. Cast iron ring shall be 1/4" to 3/8" below the existing pavement surface. Cleats on lid shall not extend above the plane of the asphalt.
5. Concrete collar shall be 6.5 bag mix.

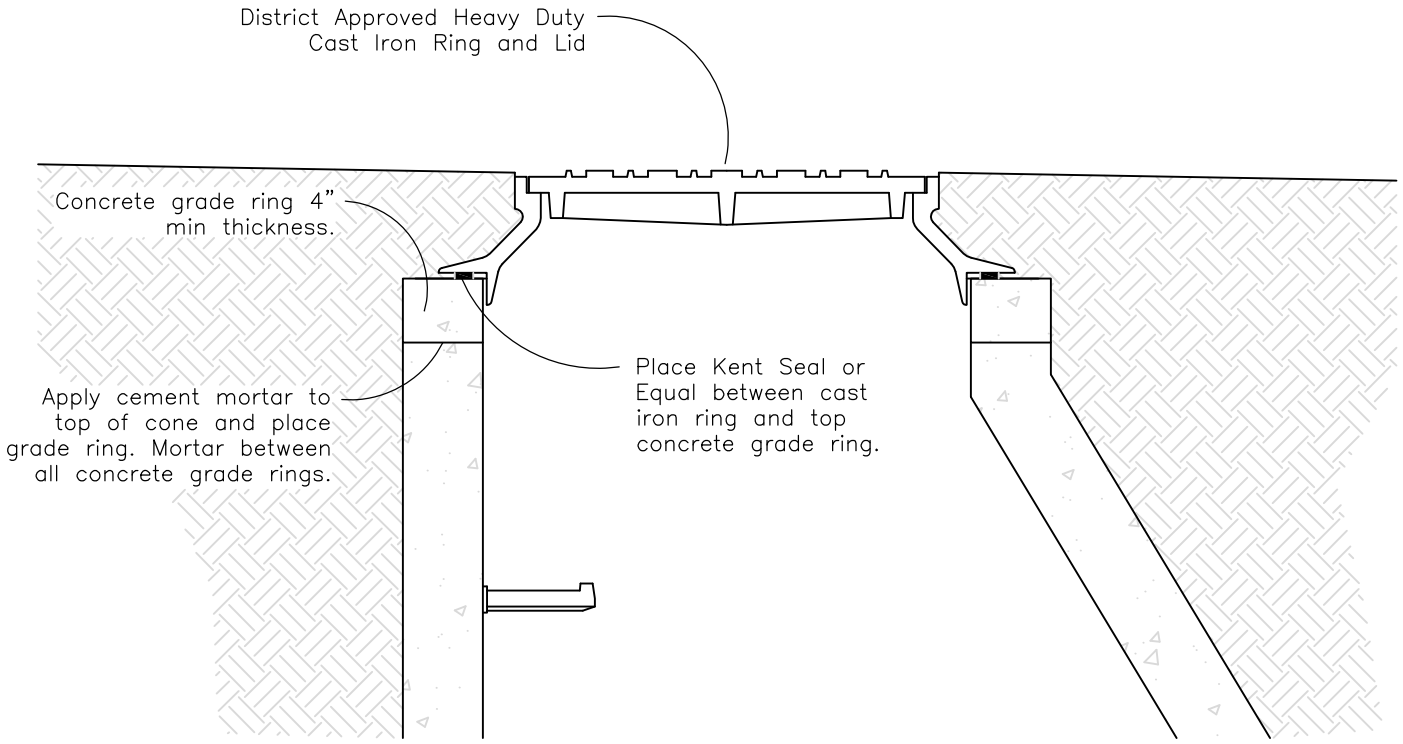


DETAIL - CONCRETE COLLAR

FOR RAISING MANHOLE COVER IN STREET WITH FLEXIBLE PAVEMENT
ONLY WHERE REQUIRED BY OWNER OF ROADWAY

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 3/4/99	DWG. NO.
	REVISIONS:	
DETAIL - CONCRETE COLLAR	SCALE: NO SCALE	D2

NOTES:
1. Ring and lid shall be inspected and replaced if broken or cracked with District approved heavy duty ring and lid.
2. Grade rings shall be minimum of 4" thick. Concrete shall be 6.5 bag mix with 28 day compressive strength of 4000 psi.
3. Cast iron ring shall be adjusted precisely to grade of landscaping. Cast iron riser rings may be used to make fine grade adjustments to a maximum thickness of 3".

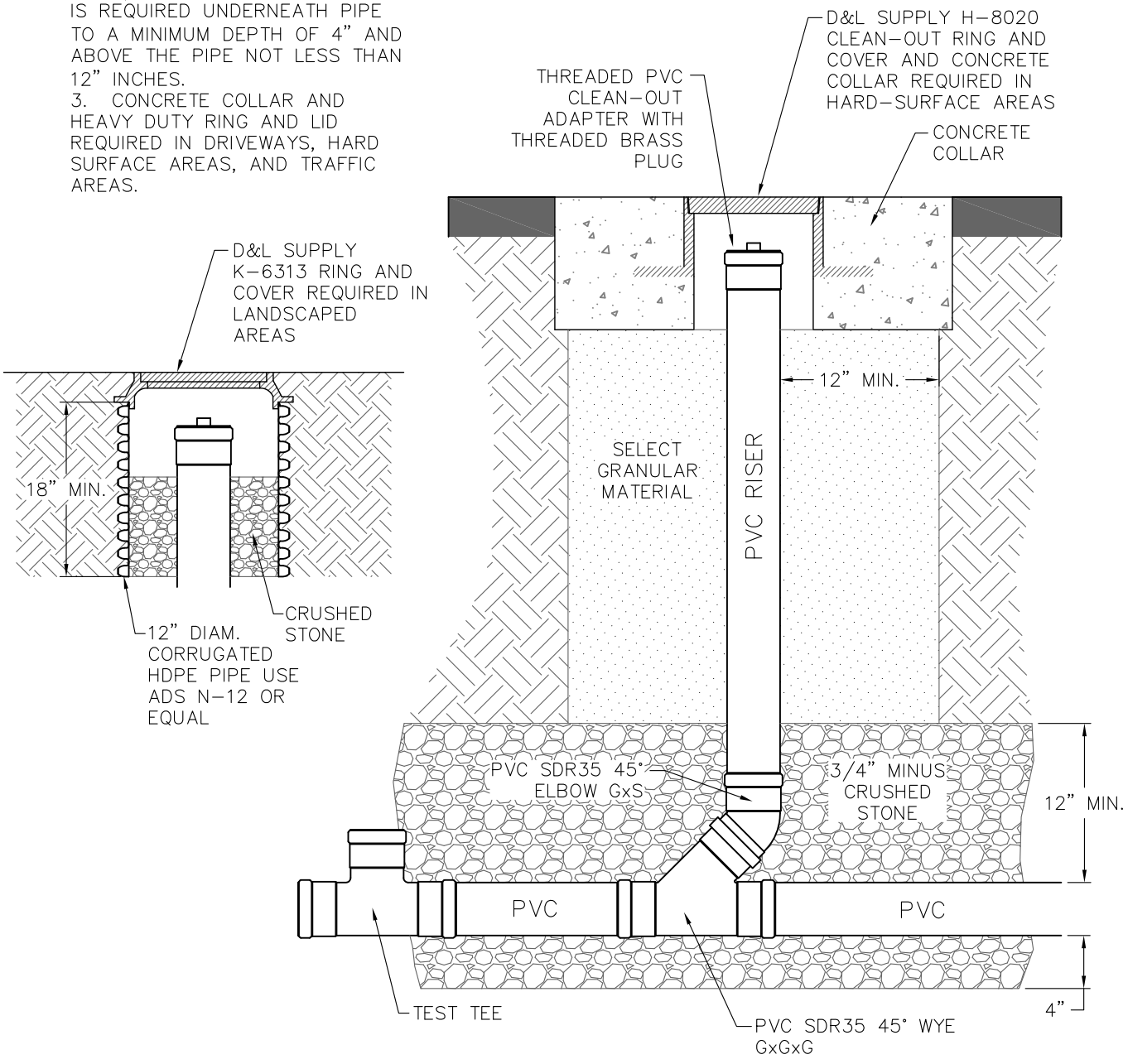


DETAIL - RAISED MANHOLE IN LANDSCAPING

FOR RAISING MANHOLE COVER IN UNPAVED AREAS

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 3/4/99	DWG. NO.
	REVISIONS:	
RAISED MH IN LANDSCAPING	SCALE: NO SCALE	D3

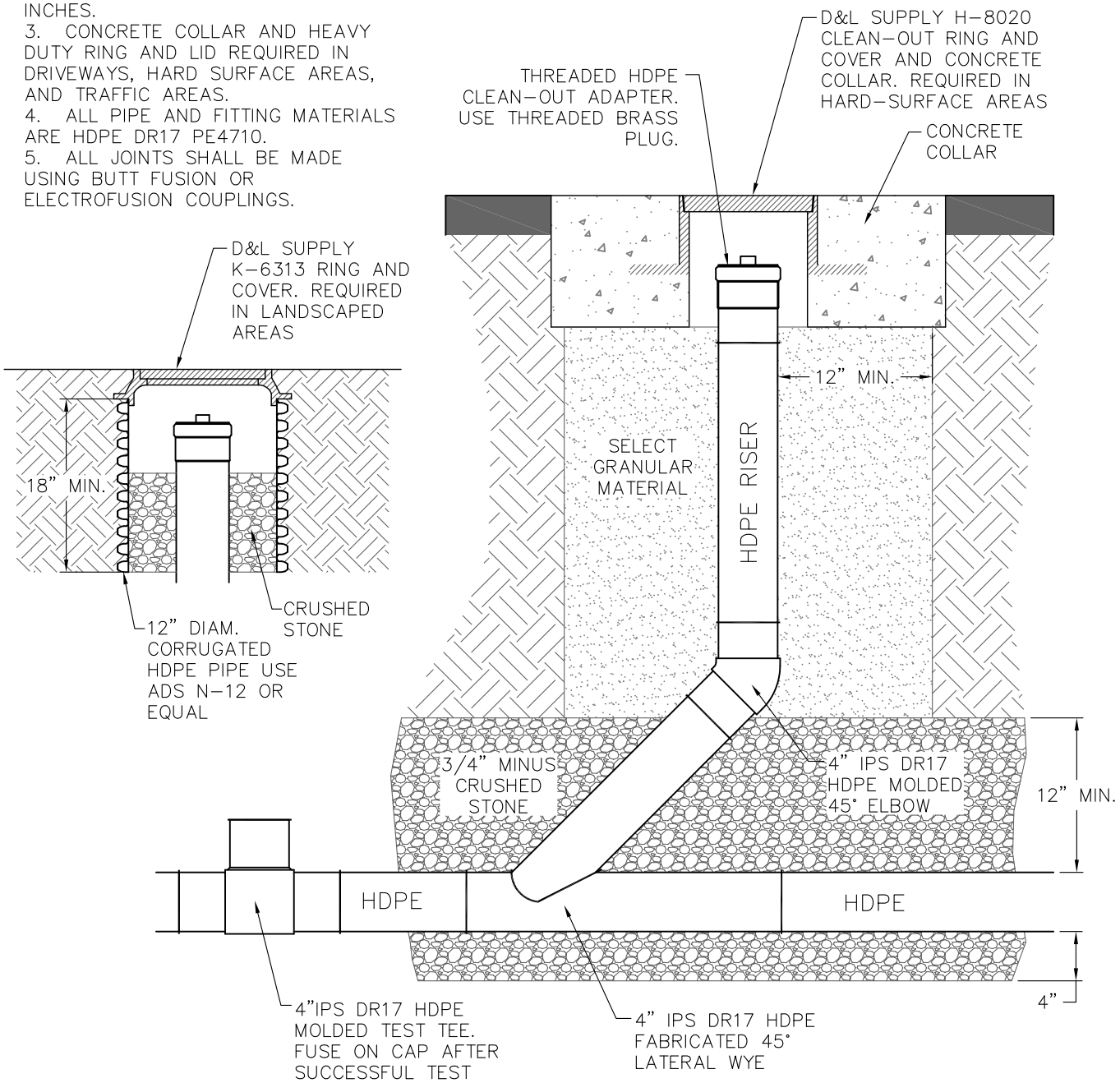
NOTES:
1. ONLY SELECT GRANULAR MATERIAL SHALL BE PLACED AROUND RISER PIPE TO A THICKNESS OF 12". NO PARTICLES LARGER THAN 1.5" IN DIAMETER SHALL BE ALLOWED.
2. 3/4" MINUS CRUSHED STONE IS REQUIRED UNDERNEATH PIPE TO A MINIMUM DEPTH OF 4" AND ABOVE THE PIPE NOT LESS THAN 12" INCHES.
3. CONCRETE COLLAR AND HEAVY DUTY RING AND LID REQUIRED IN DRIVEWAYS, HARD SURFACE AREAS, AND TRAFFIC AREAS.



DETAIL – PVC SDR35 CLEAN-OUT

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 2/3/2014	DWG. NO.
	REVISIONS:	
PVC SDR35 CLEAN-OUT	SCALE: NO SCALE	D4A

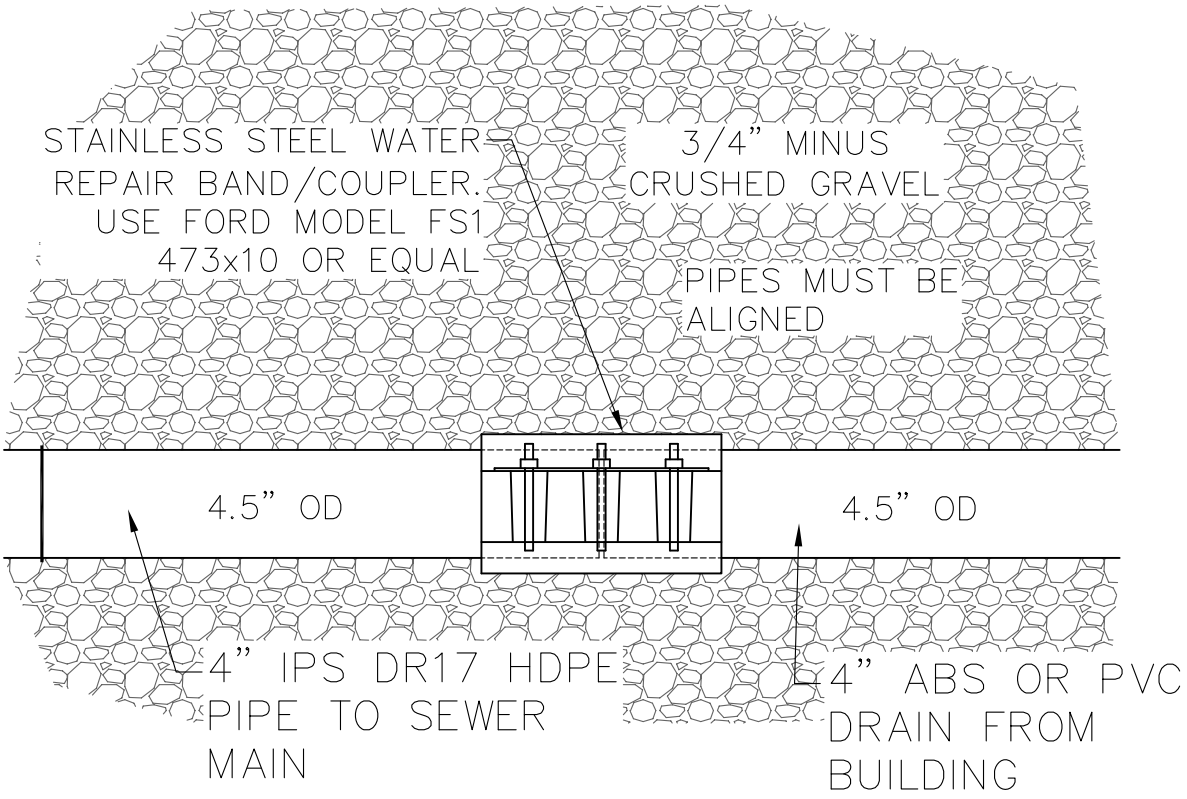
NOTES:
1. ONLY SELECT GRANULAR MATERIAL SHALL BE PLACED AROUND RISER PIPE TO A THICKNESS OF 12". NO PARTICLES LARGER THAN 1.5" IN DIAMETER SHALL BE ALLOWED.
2. 3/4" MINUS CRUSHED STONE IS REQUIRED UNDERNEATH PIPE TO A MINIMUM DEPTH OF 4" AND ABOVE THE PIPE NOT LESS THAN 12" INCHES.
3. CONCRETE COLLAR AND HEAVY DUTY RING AND LID REQUIRED IN DRIVEWAYS, HARD SURFACE AREAS, AND TRAFFIC AREAS.
4. ALL PIPE AND FITTING MATERIALS ARE HDPE DR17 PE4710.
5. ALL JOINTS SHALL BE MADE USING BUTT FUSION OR ELECTROFUSION COUPLINGS.



DETAIL – HDPE WATERSHED CLEAN-OUT

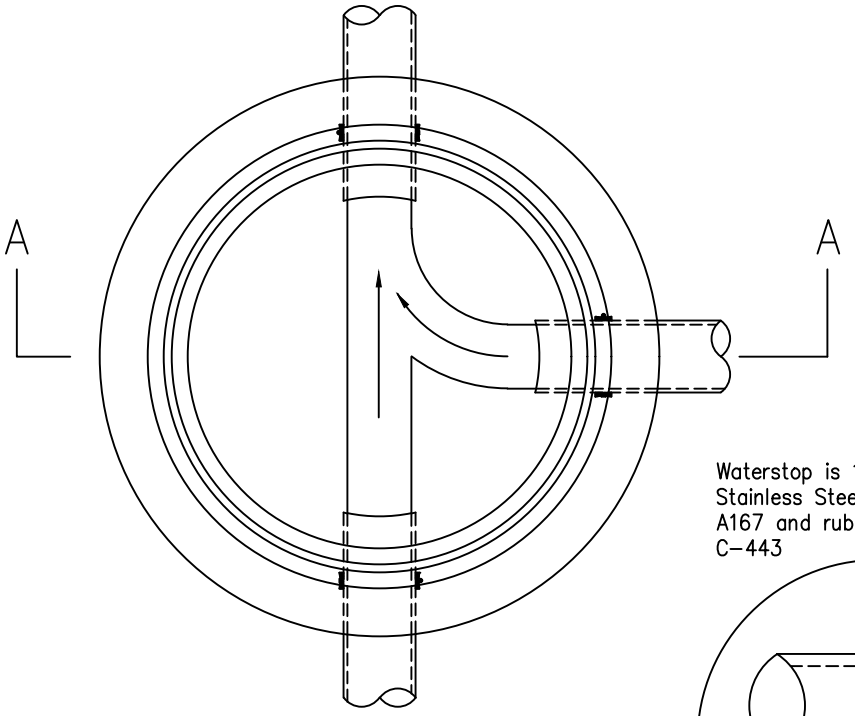
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/23/2014 REVISIONS:	DWG. NO.
HDPE WATERSHED CLEAN-OUT	SCALE: NO SCALE	D4B

NOTES:
1. CONNECTION MUST BE MADE WITHIN 5 FEET OF BUILDING FOUNDATION.
2. PIPES MUST BE CAREFULLY ALIGNED.



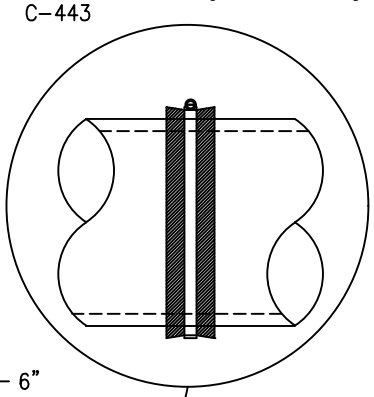
DETAIL – WATERSHED BUILDING SEWER CONNECTION

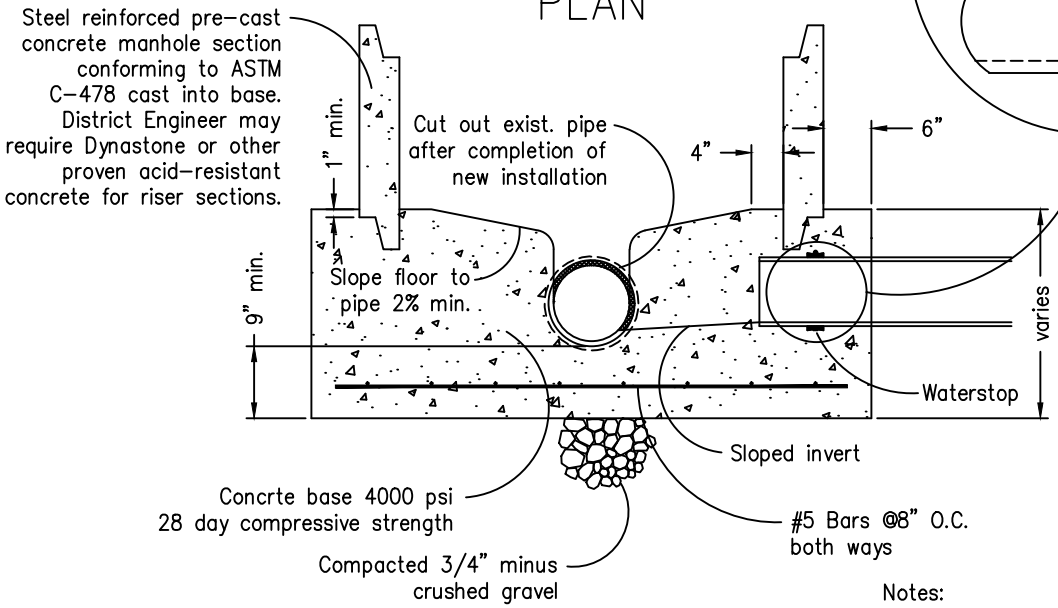
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/23/2014	DWG. NO.
	REVISIONS:	
WATERSHED BUILDING CONNECTION		D4C
	SCALE: NO SCALE	



PLAN

Waterstop is 1/2" 300 Series nonmagnetic Stainless Steel band conforming to ASTM A167 and rubber gasket meeting ASTM C-443





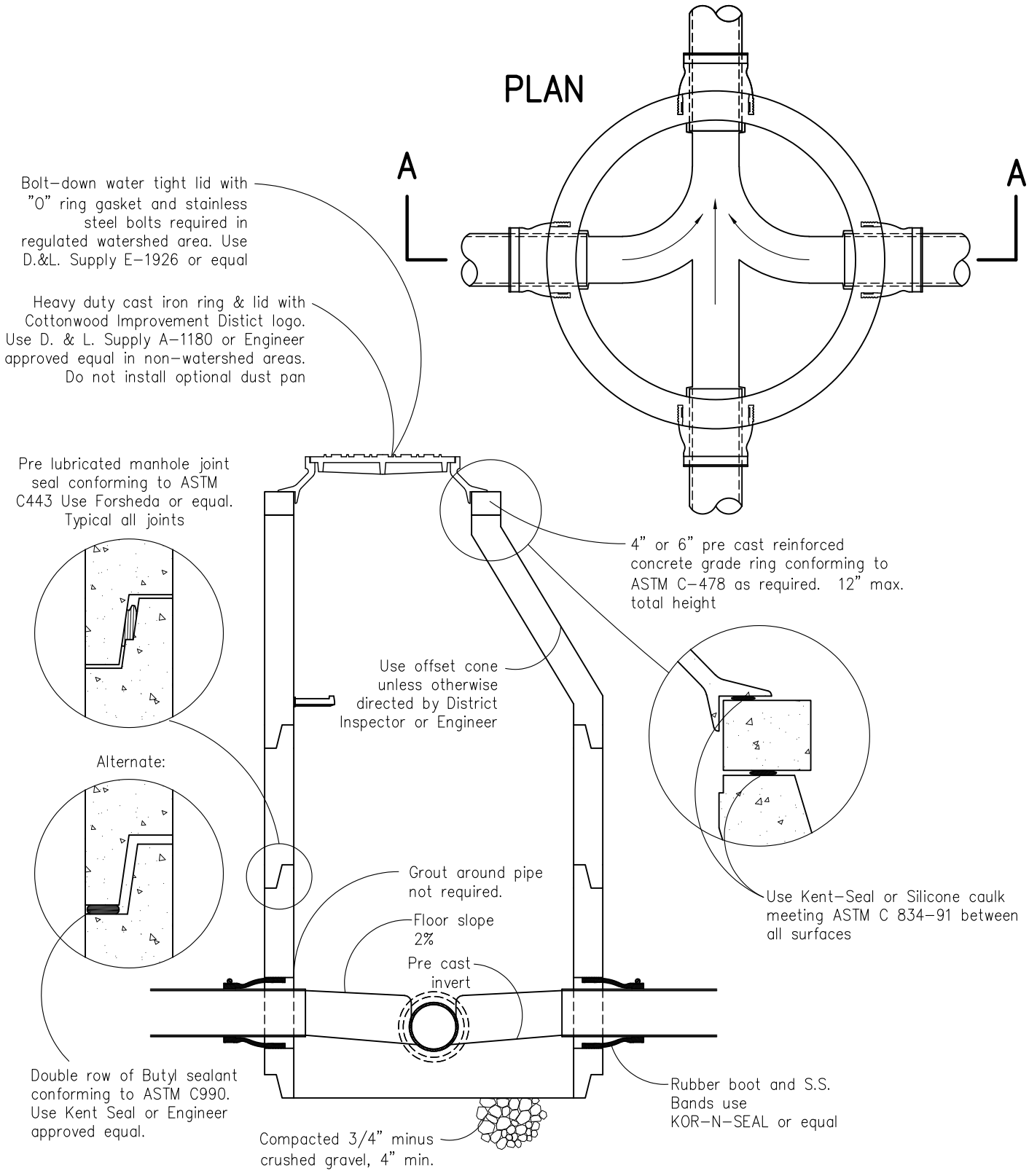
SECTION A-A

MANHOLE BASE
CAST-IN-PLACE

Notes:

1. This manhole base is to be used for a connection to an existing line or as an alternate to a pre-cast manhole base.
2. Inverts shall be smooth and "U" shaped.
3. Waterstops shall be A-LOK Wedge style for existing pipes and One-Piece spliced style for new pipe, or, Engineer approved equals.
4. The first pre cast manhole section shall be cast into the base. The remainder of the manhole construction shall conform to The Cottonwood Improvement District Standard Pre-cast Manhole Details.

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/2/99	DWG. NO.
	REVISIONS:	
	5/14/2007	
CAST-IN-PLACE MANHOLE BASE	5/1/2025	D5
	SCALE: 1/2"=1'	



SECTION A-A, PRE-CAST MANHOLE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/2/99	DWG. NO.
	REVISIONS:	
STANDARD PRE-CAST MANHOLE	2/1/2016 1/18/2024	D6A
	SCALE: 1/2"=1'	

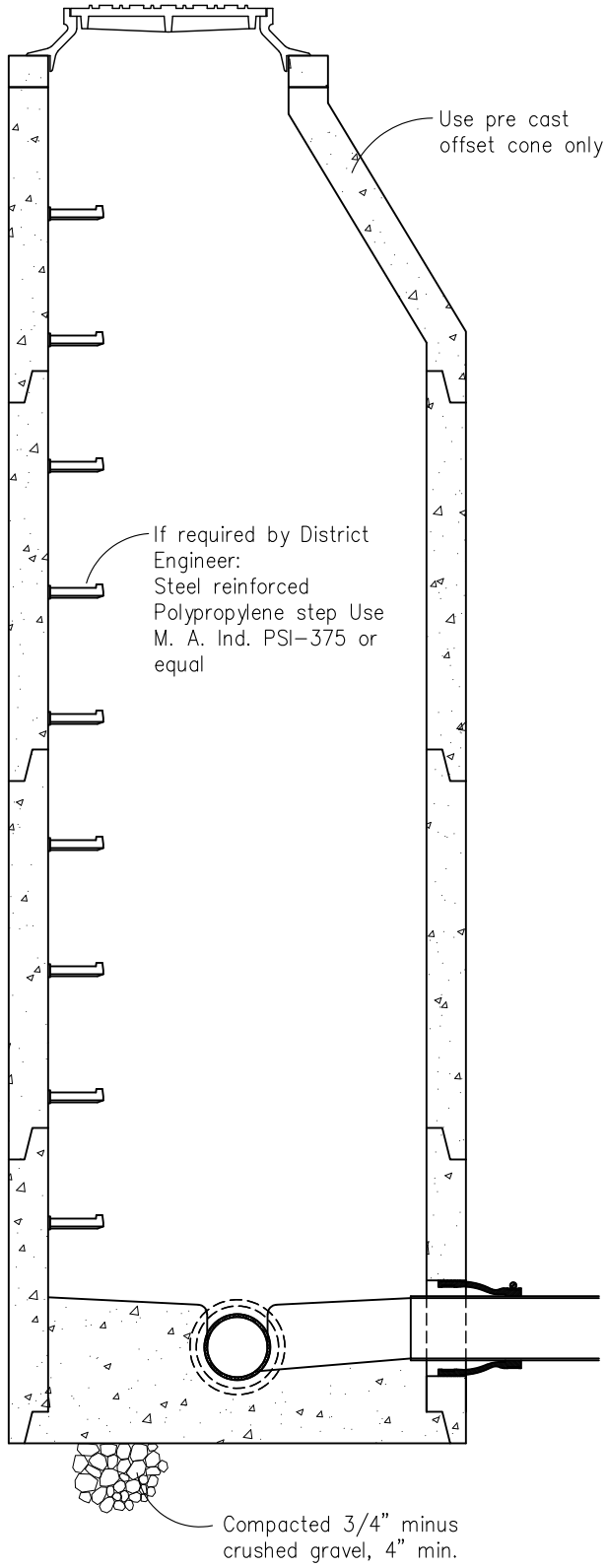
Standard Manhole Notes:

1. Manhole diam. shall be in accordance with the following table:

Largest Pipe Size	2 Pipes straight through to 45° bend	2 Pipes 45° to 90° bend	3 or 4 pipes
10" or less	4' diam	4' diam	4' diam
12"	4' daim	4' diam	5' daim
15"	4' daim	5' daim	5' diam
18"	4' diam	5' diam	5' diam
21"	5' diam	5' diam	5' diam
24"	5' diam	5' diam	5' diam
30"	5' diam	5' diam	6' diam
33"	5' diam	6' diam	Custom
36"	5' daim	6' daim	Custom
39"	6' daim	6' daim	Custom

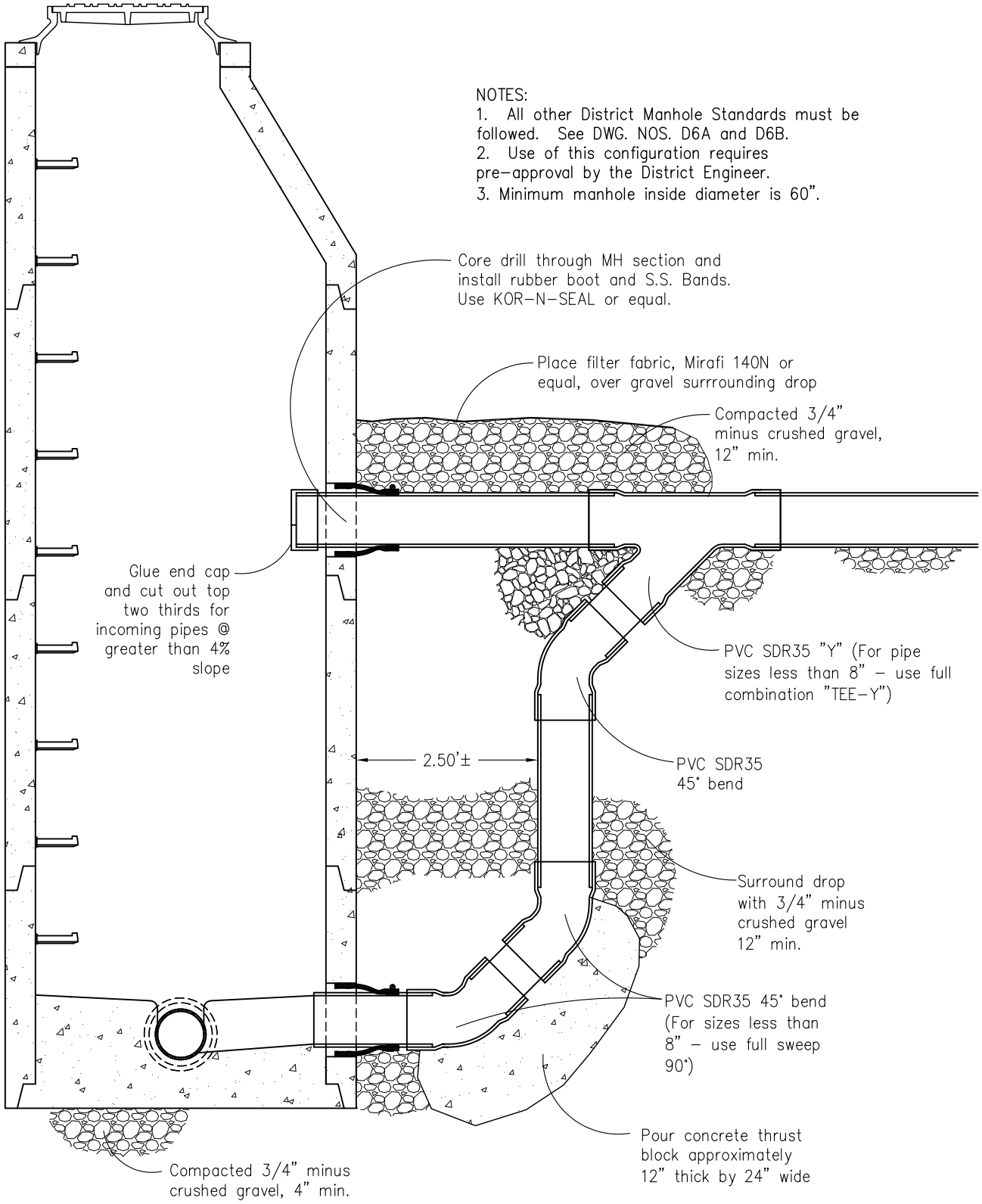
A larger size than those shown above, or a custom design may be required depending on pipe alignments and field conditions.

2. Invert covers shall be placed in all manholes or as indicated by District Inspector. Covers will only be removed in paved areas and only after pavement is installed and manhole cover is brought to grade.
3. All pipes entering or exiting manhole must be booted. Use KOR-N-SEAL or equal. Boot shall conform to ASTM C-443. Internal and external steel bands shall be 300 Series nonmagnetic stainless steel conforming to ASTM A167.
4. For installation of new pipe into existing manhole: core drill into manhole and install KOR-N-SEAL boot or equal.
5. Kent-Seal may be used as alternate to Forsheda Gasket under the following conditions: - ground water level is below the manhole base - not a regulated watershed area - and/or the alternate is approved by the District after an on-site inspection.
6. Vacuum test of manhole is required at completion of construction in watershed areas. Inspector may require a vacuum test of manhole in non-watershed areas at his discretion. (Typically in areas where water table is high)
7. No visible leaks into manhole will be allowed. All leaks must be repaired by method approved by District before final inspection
8. Pre-cast manhole base, sections and cone shall conform to ASTM C478, latest edition. District Engineer at his discretion may require base, sections and cone to be epoxy coated or made of acid resistant material.
9. Minimum drop through manhole is 0.05'. Typical drop through manhole is 0.2'.



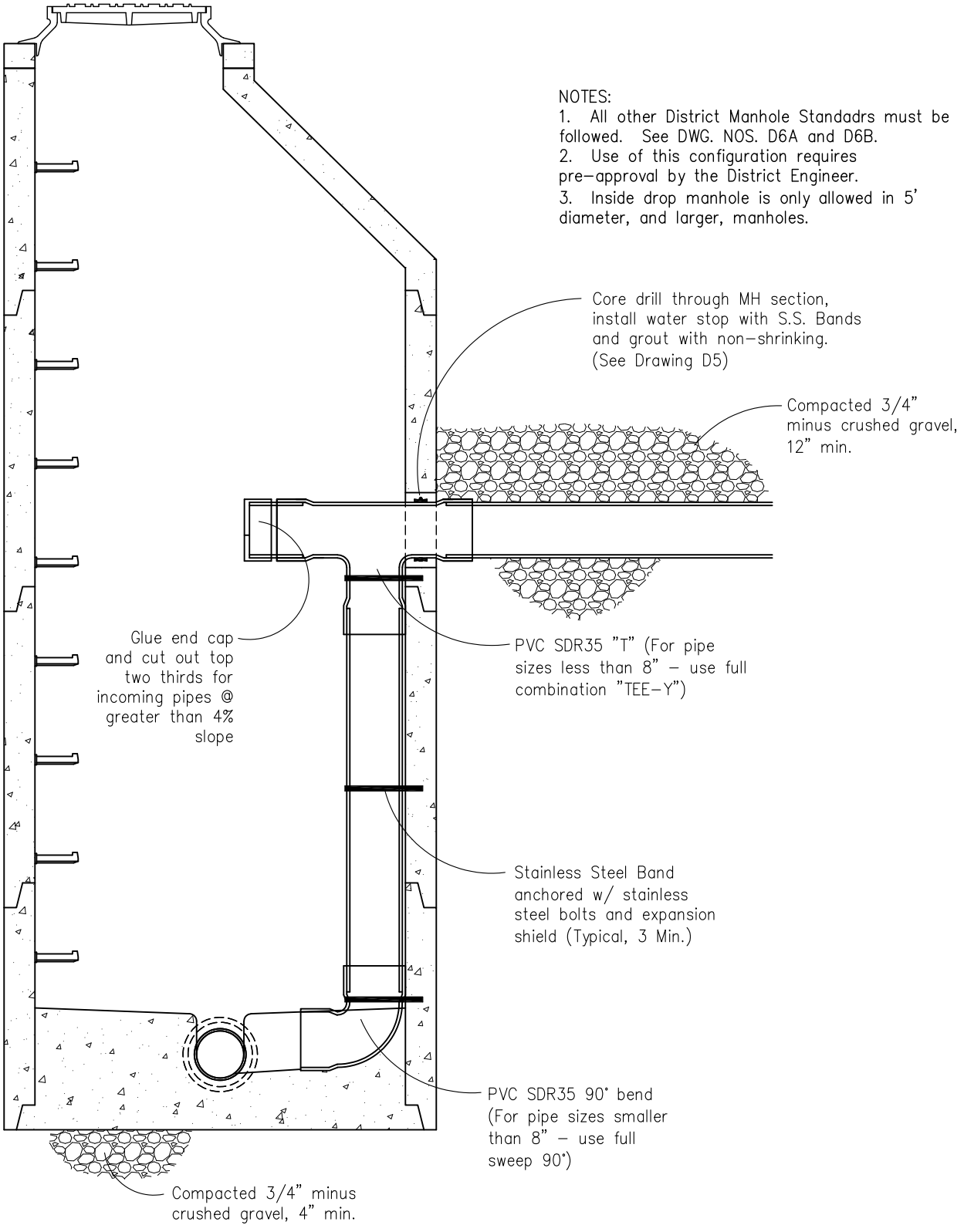
SECTION A-A, PRE-CAST MANHOLE CONTINUED

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/2/99	DWG. NO.
	REVISIONS:	
STANDARD PRE-CAST MANHOLE	2/1/2016 1/18/2024	D6B
	SCALE: 1/2"=1'	



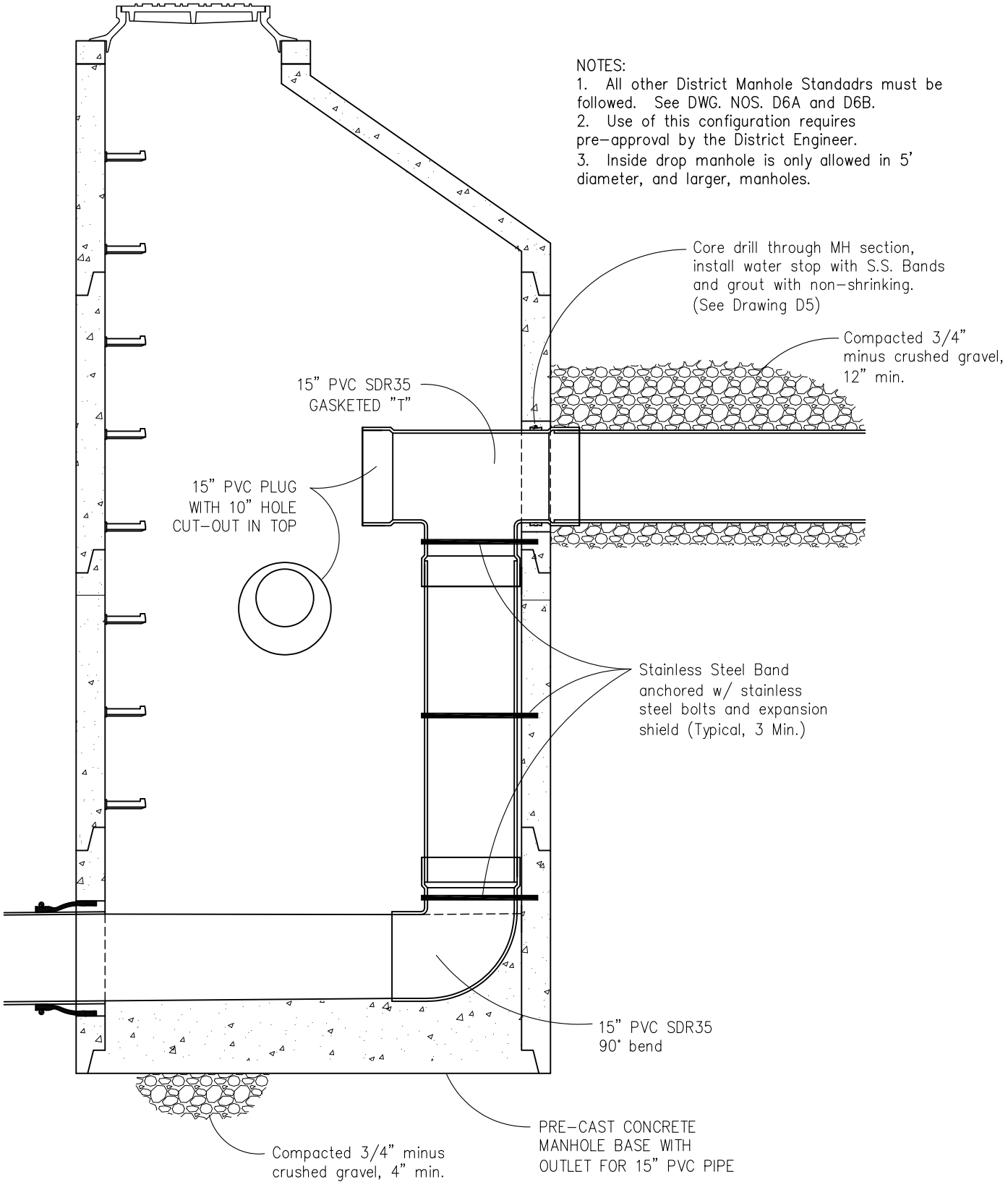
SECTION – DROP MANHOLE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/16/00	DWG. NO.
	REVISIONS:	
OUTSIDE DROP MANHOLE	2/1/2016 1/18/2024	D6C
	SCALE: 1/2"=1'	



SECTION - DROP MANHOLE

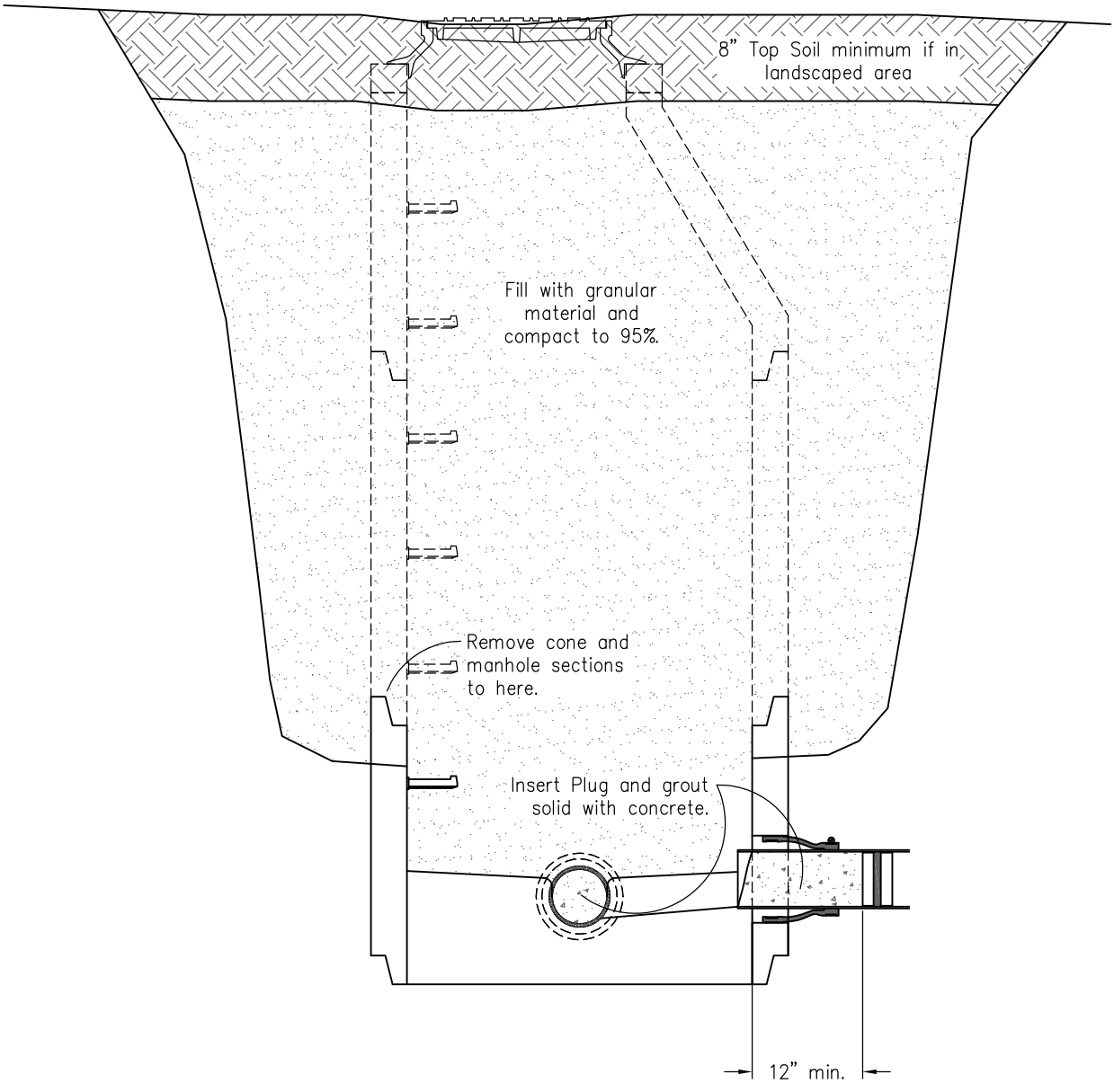
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/16/00	DWG. NO.
	REVISIONS:	
INSIDE DROP MANHOLE	2/1/2016 1/18/2024	D6D
	SCALE: 1/2"=1'	



SECTION – DROP MANHOLE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/16/00	DWG. NO.
	REVISIONS:	
6' INSIDE DROP MANHOLE - 15" PIPE	2/1/2016 1/18/2024	D6E
	SCALE: 1/2"=1'	

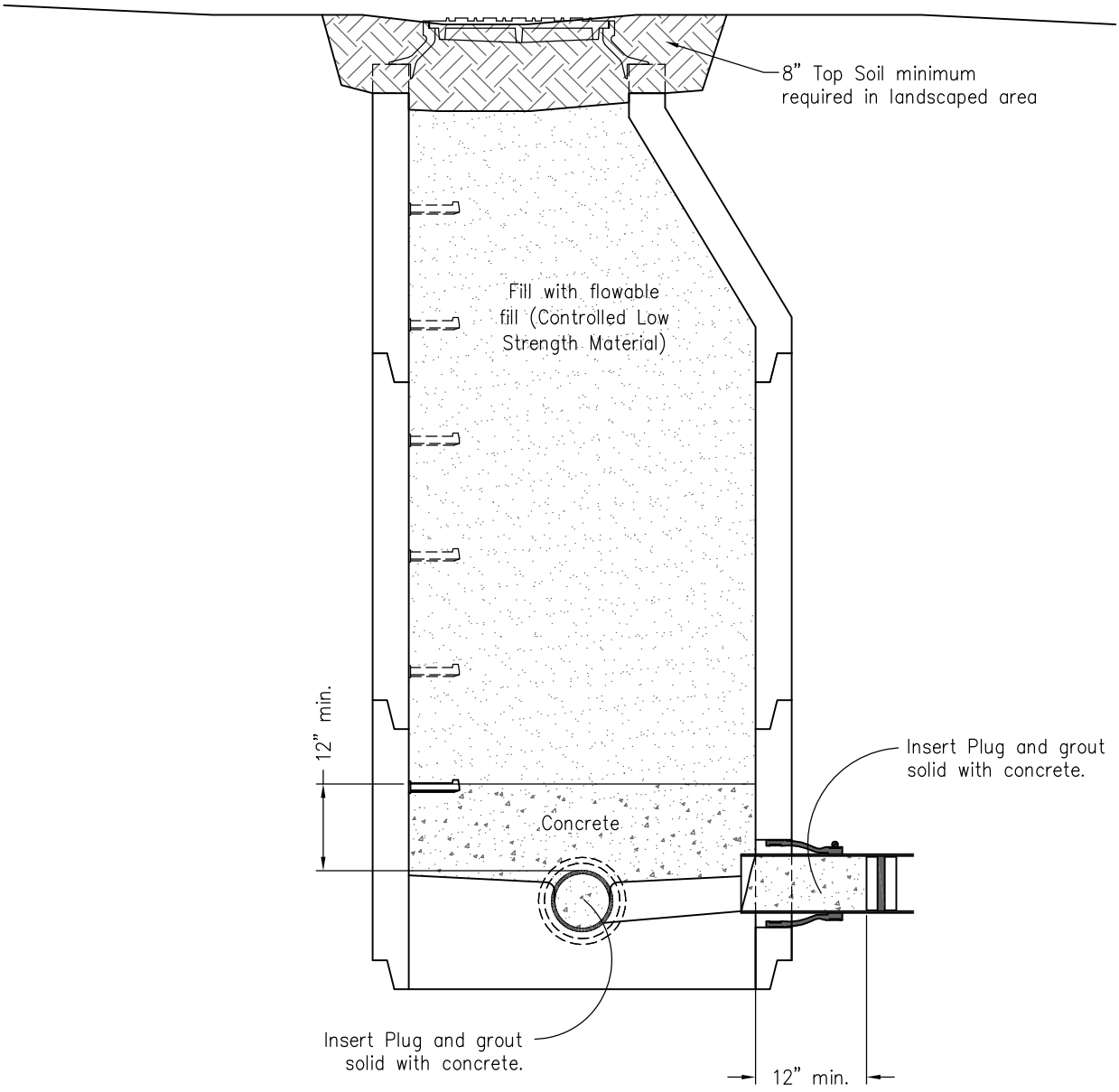
NOTES:
1. Remove and recycle ring and lid.
2. Excavate and remove cone and all sections down to base. Properly dispose of items removed.
3. Plug with Brandt Plug or other approved device and grout with concrete all entering and exiting pipes.
4. Backfill excavation with granular material and compact to 95%. If under roadway, compact to requirements of roadway owner. If in landscaped area, restore landscaping to original condition.



ABANDON SEWER MANHOLE

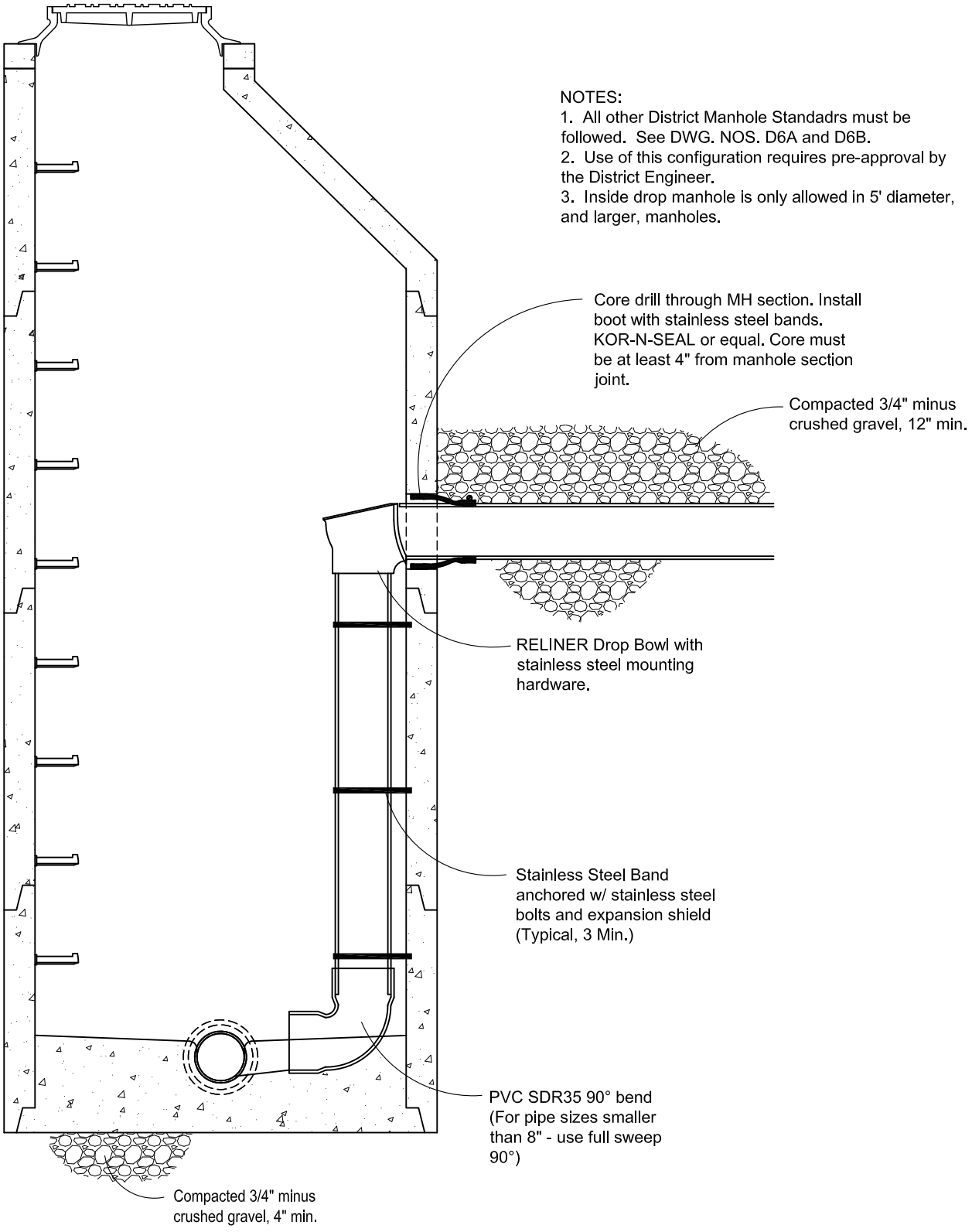
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/22/2005	DWG. NO.
	REVISIONS:	
ABANDON SEWER MANHOLE	SCALE: 1/2"=1'	D6F

NOTES:
1. Remove and recycle ring and lid. Remove and dispose of any grade rings or bick and mortar risers.
2. Plug with Brandt Plug or other approved device and grout with concrete all entering and exiting pipes.
3. Backfill inside manhole with granular material and compact to 95%. If under roadway, compact to requirements of roadway owner. If in landscaped area, restore landscaping to original condition.



ABANDON SEWER MANHOLE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 5/23/2007	DWG. NO.
	REVISIONS: 2/1/2016	
ABANDON SEWER MANHOLE - ALT	SCALE: 1/2"=1'	D6G



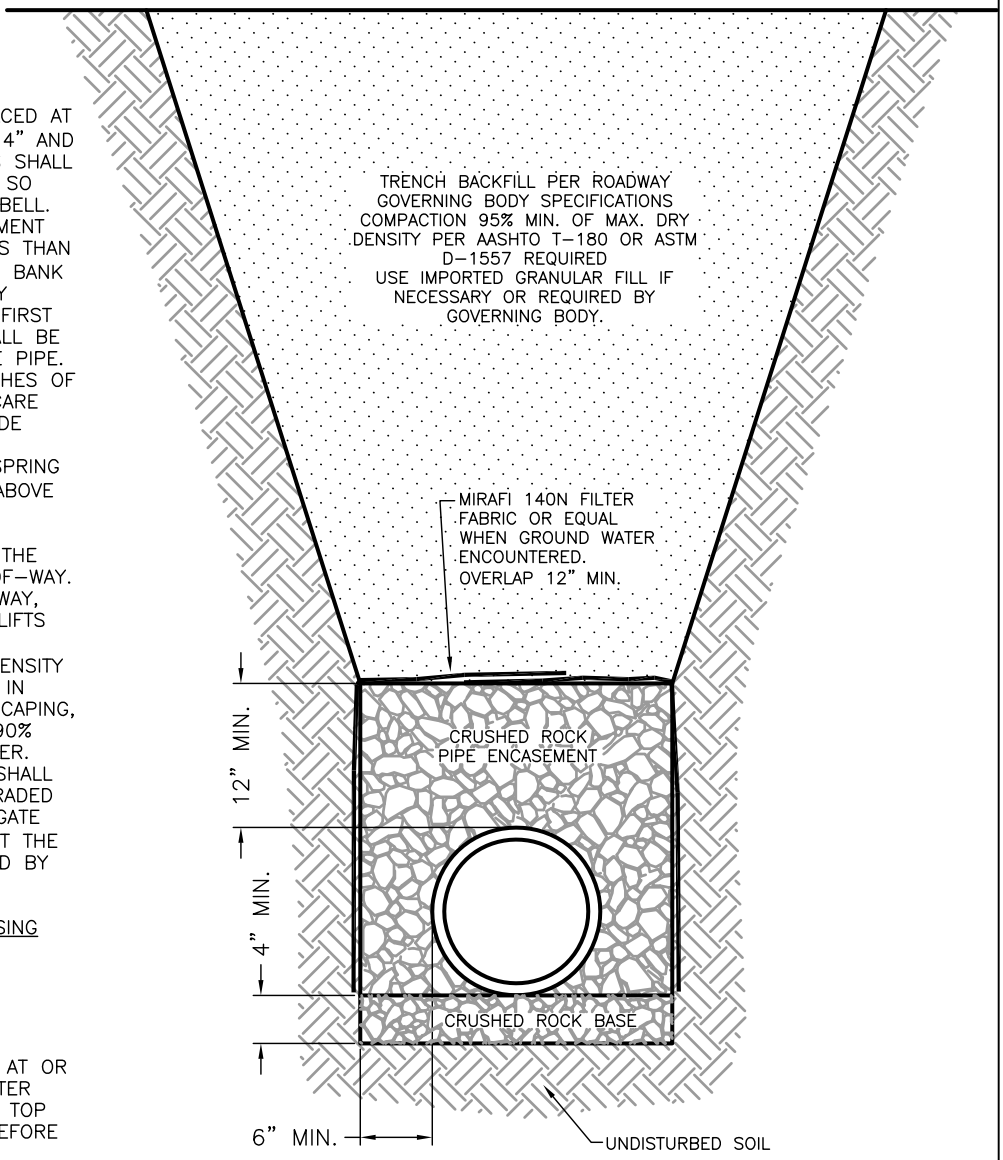
SECTION - DROP MANHOLE

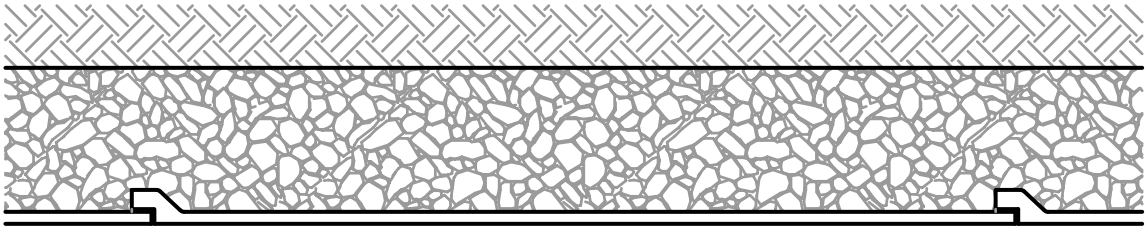
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 11/23/2023	DWG. NO.
	REVISIONS:	
	2/1/2016	
INSIDE DROP MANHOLE	1/18/2024	D6H
	SCALE: 1/2"=1'	

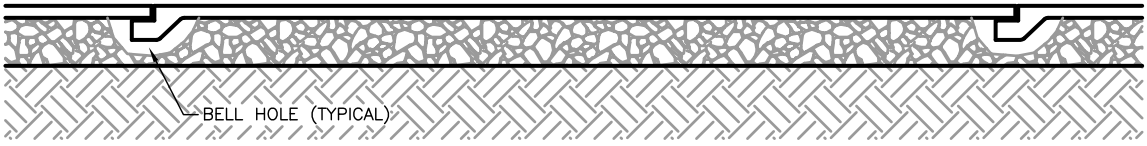
NOTES:
1. CRUSHED ROCK BASE SHALL BE PLACED AT GRADE TO A DEPTH OF NOT LESS THAN 4" AND MECHANICALLY COMPACTED. BELL HOLES SHALL BE EXCAVATED IN THE COMPACTED BASE SO THAT THE PIPE IS NOT RESTING ON ITS BELL.
2. TOTAL CRUSHED ROCK PIPE ENCASEMENT SHALL BE PLACED TO A DEPTH NOT LESS THAN 12" ABOVE THE TOP OF THE PIPE, FROM BANK TO BANK OF TRENCH, AND MECHANICALLY COMPACTED USING A VIBRATING PLATE. FIRST LIFT OF CRUSHED ROCK ENCASMENT SHALL BE PLACED UP TO THE SPRING LINE OF THE PIPE. CONTRACTOR SHALL SLICE UNDER HAUNCHES OF PIPE COMPLETELY FILLING ANY VOIDS. CARE SHALL BE TAKEN TO KEEP PIPE ON GRADE WHILE SLICING. SECOND LIFT OF THE ENCASEMENT SHALL EXTEND FROM THE SPRING LINE OF THE PIPE UP TO A POINT 12" ABOVE THE TOP OF THE PIPE.
3. BACK FILL MATERIAL ABOVE PIPE ENCASEMENT SHALL BE AS DICTATED BY THE GOVERNING BODY OF THE ROAD RIGHT-OF-WAY. IF PIPELINE IS NOT IN ROAD RIGHT-OF-WAY, BACK FILL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING 8" IN THICKNESS AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER AASHTO T-180 OR ASTM D-1557. IN AREAS WHERE PIPELINE IS UNDER LANDSCAPING, THE COMPACTION MAY BE LOWERED TO 90% WITH APPROVAL OF THE DISTRICT ENGINEER.
4. BEDDING AND PIPE ZONE MATERIAL SHALL BE CLEAN, FREE-DRAINING AND WELL-GRADED CRUSHED ROCK WITH A MAXIMUM AGGREGATE SIZE OF 1". CRUSHED ROCK MUST MEET THE SPECIFICATIONS BELOW AND BE APPROVED BY THE DISTRICT INSPECTOR:

SIEVE	PERCENT PASSING
3/4	90-100
3/8	20-55
#4	0-10
#8	0-5

5. IN AREAS WHERE GROUND WATER IS AT OR ABOVE THE PIPE ZONE, MIRAFI 140N FILTER FABRIC OR EQUAL SHALL BE PLACED ON TOP OF THE CRUSHED STONE ENCASEMENT BEFORE BACK FILLING TRENCH.

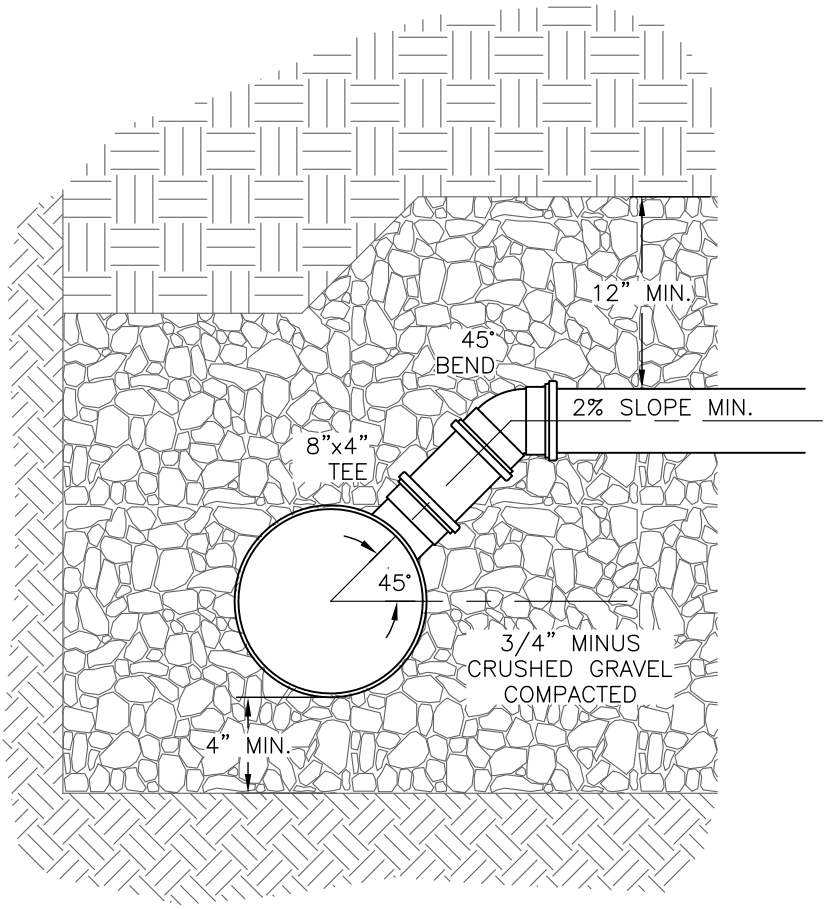






COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/2/99	DWG. NO.
	REVISIONS:	
TYPICAL TRENCH SECTION	SCALE: NO SCALE	D7

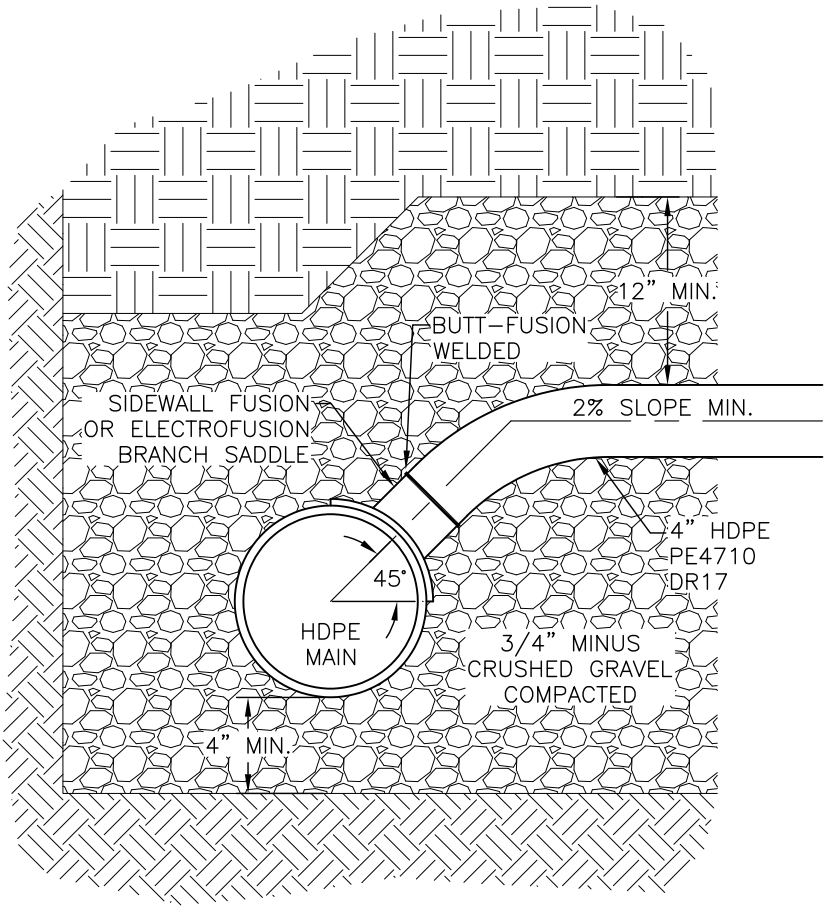
NOTES:
1. "INSERTA–TEE" MAY BE USED FOR CONNECTION OF NEW SERVICE LINE TO EXISTING MAIN EXCEPT IN CASE WHERE A 6" SERVICE LINE IS TO BE CONNECTED TO AN 8" MAIN. A FACTIRY TEE MUST BE USED IN ALL OTHER CASES.
2. IF SPECIAL CIRCUMSTANCES SUGGEST DEVIATING FROM THIS DETAIL, THE DISTRICT INSPECTOR OR ENGINEER MUST APPROVE CHANGES.
3. SLICE UNDER HAUNCHES OF PIPE TO FILL VOIDS. MECHANICALLY COMPACT GRAVEL.



SECTION

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 2/17/2000	DWG. NO.
	REVISIONS:	
SERVICE LINE CONNCETION	SCALE: NO SCALE	D8

NOTES:
1. IF SPECIAL CIRCUMSTANCES SUGGEST DEVIATING FROM THIS DETAIL, THE DISTRICT INSPECTOR OR ENGINEER MUST APPROVE CHANGES.
2. SLICE UNDER HAUNCHES OF PIPE TO FILL VOIDS. MECHANICALLY COMPACT GRAVEL.

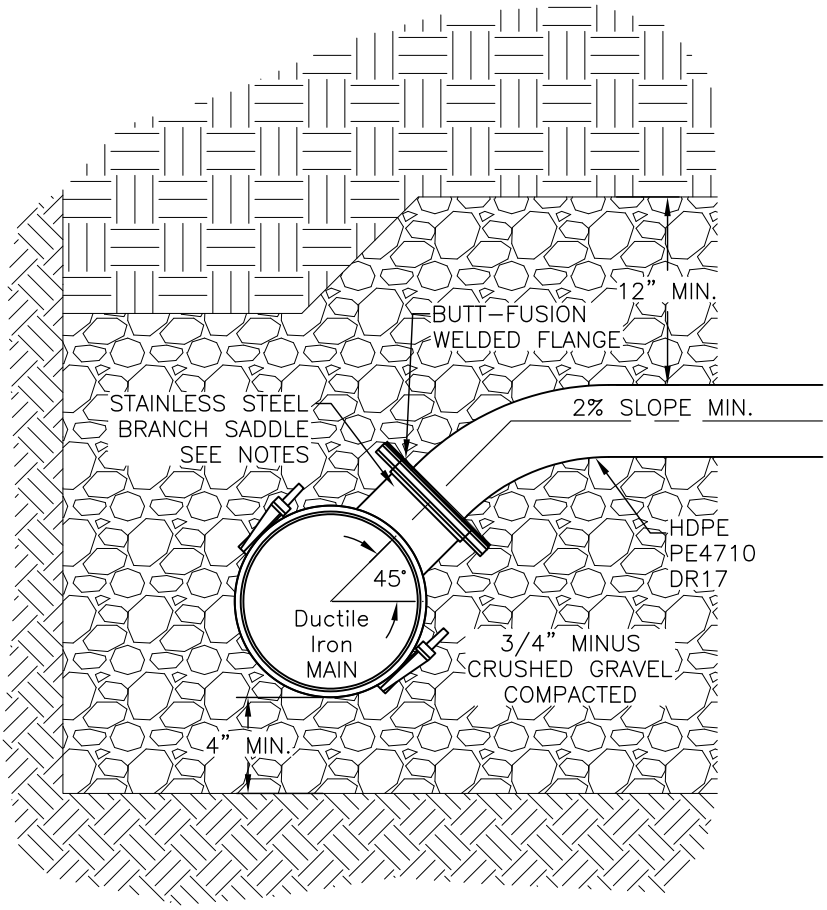


SECTION

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 5/7/2014	DWG. NO.
	REVISIONS:	
WATERSHED SERVICE LINE CONNECTION - HDPE		D8A
	SCALE: NO SCALE	

NOTES:

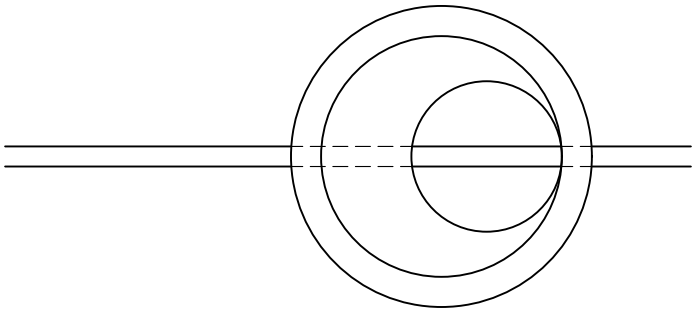
1. USE ROMAC SST TAPPING SLEEVE OR ENGINEER APPROVED EQUAL FOR 4" OR 6" SERVICE CONNECTIONS.
2. USE ROMAC STYLE 305 STAINLESS STEEL SERVICE SADDLE OR ENGINEER APPROVED EQUAL FOR 1–1/4" TO 3" DIAMETER PRESSURIZED SERVICE CONNECTION.
3. THE DISTRICT ENGINEER OR INSPECTOR MUST APPROVE ANY DEVIATIONS FROM THIS DETAIL.
4. SLICE UNDER HAUNCHES OF PIPE TO FILL VOIDS.



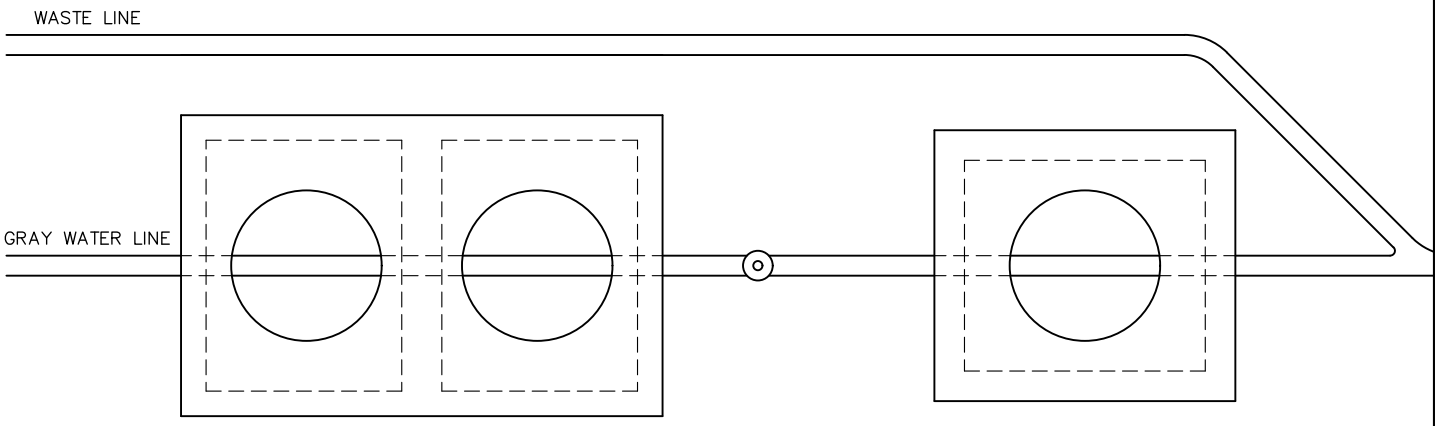
SECTION

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 5/16/2023	DWG. NO.
	REVISIONS:	
WATERSHED SERVICE LINE CONNECTION - DI		D8B
	SCALE: NO SCALE	

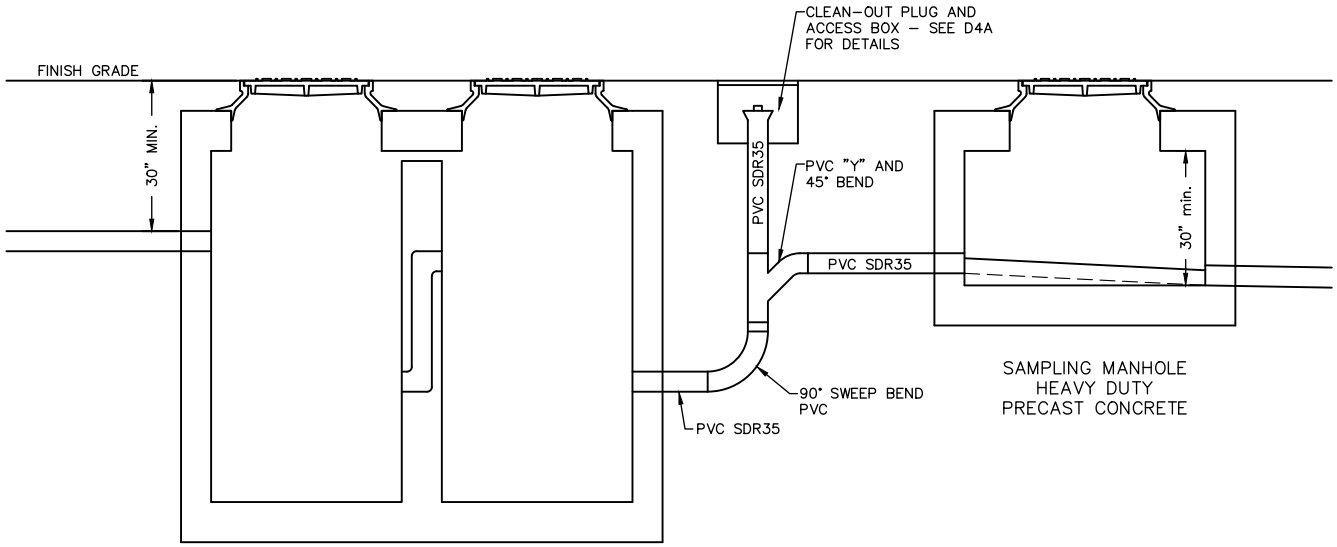
NOTES:
1. GREASE TRAP AND SAMPLING MANHOLE MUST BE TRAFFIC RATED WITH HEAVY DUTY CAST–IRON RING & COVER.
2. CAPACITY AND SIZE OF GREASE TRAP MUST BE PRE–APPROVED BY DISTRICT ENGINEER. CAPACITY SHALL BE LARGE ENOUGH TO LIMIT MAINTENANCE AND CLEANING TO ONCE PER MONTH. MINIMUM SIZE IS 1000 GAL.
4. ALL BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH DISTRICT STANDARDS AND SPECIFICATIONS.
5. SAMPLING MANHOLE MAY BE 4' DIAMETER CIRCULAR MANHOLE OR 3.5'x3.5' MIN. INSIDE DIMENSIONS SQUARE BOX.
6. WASTE LINE AND GRAY WATER LINE CONVERGE DOWNSTREAM OF SAMPLING MANHOLE.



ALTERNATE 4' DIAM.
HD CONCRETE
SAMPLING MANHOLE



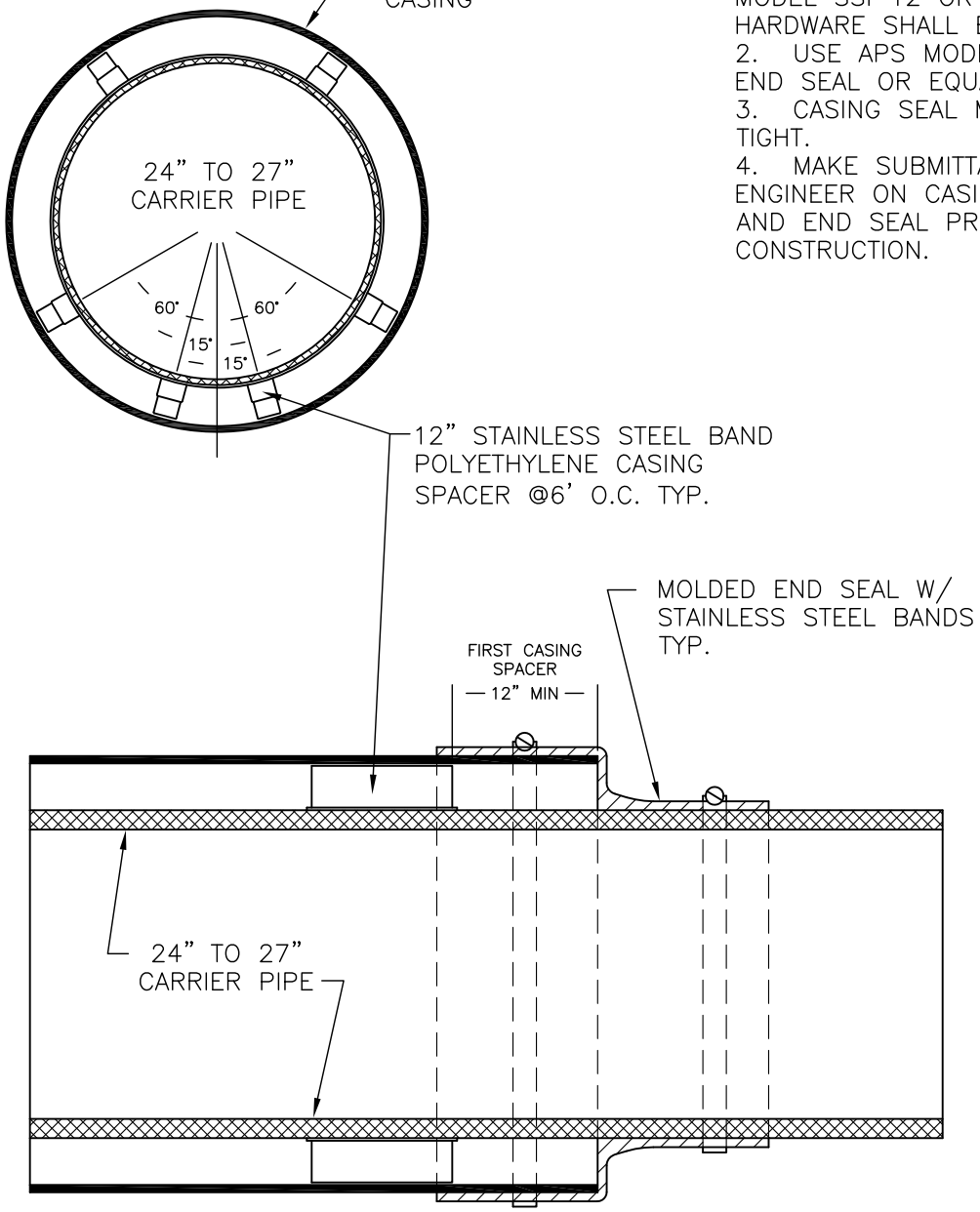
PLAN



SECTION

GREASE INTERCEPTOR AND SAMPLING MANHOLE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 9/23/1999	DWG. NO.
	REVISIONS:	
	1/27/2006 Min. Trap Size	
GREASE TRAP & SAMPLING MH	8/24/2020 C.O. PVC	D10
	SCALE: 1/3"-1'	

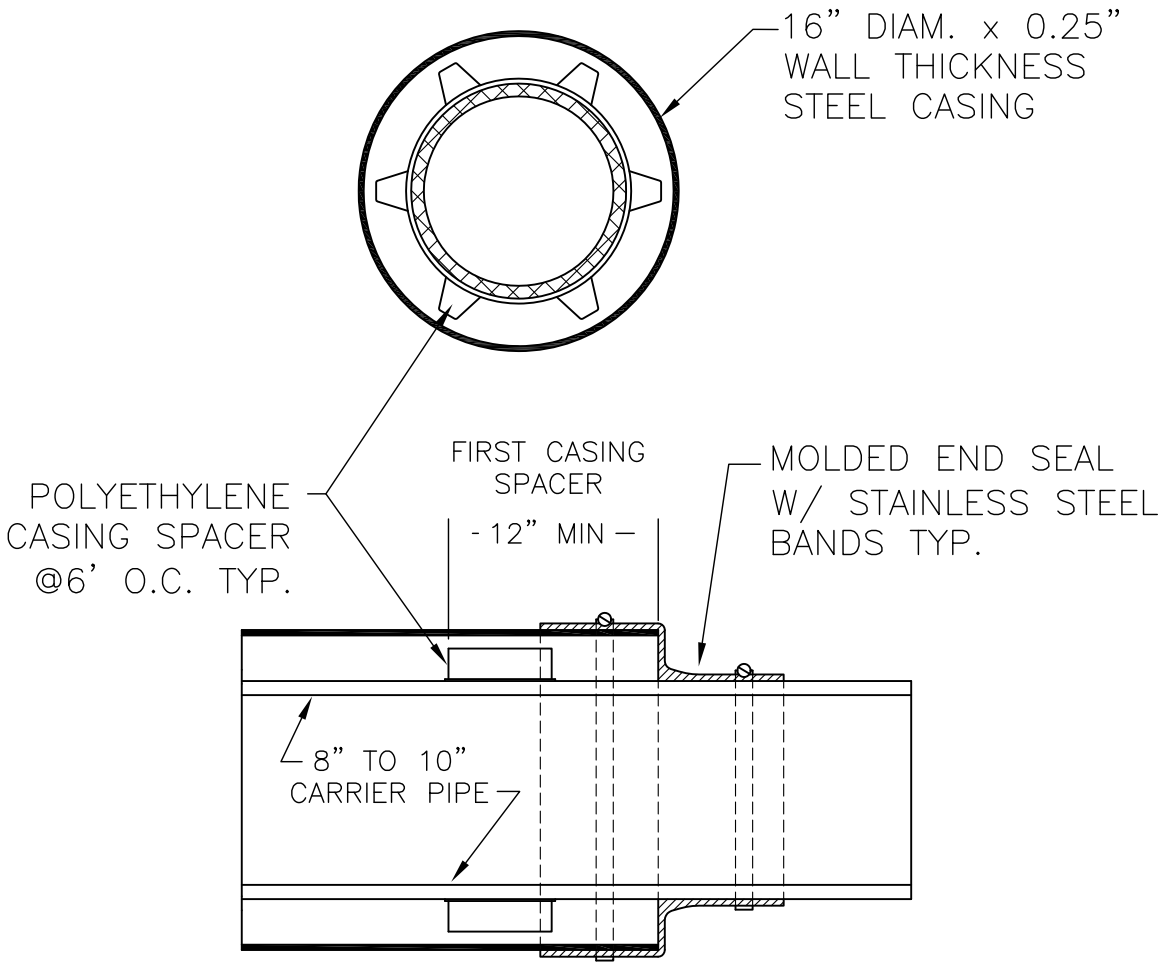


NOTES:
1. USE 304 STAINLESS STEEL BANDED POLYETHYLENE SPACERS APS MODEL SSI 12 OR EQUAL. ALL HARDWARE SHALL BE 304 STAINLESS.
2. USE APS MODEL AM MOLDED END SEAL OR EQUAL.
3. CASING SEAL MUST BE WATER TIGHT.
4. MAKE SUBMITTAL TO DISTRICT ENGINEER ON CASING PIPE, SPACERS AND END SEAL PRIOR TO CONSTRUCTION.

DETAIL 36" DIAM. STEEL CASING AND 27" DIAM. CARRIER PIPE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 4/3/2007	DWG. NO.
	REVISIONS:	
36" STEEL CASING, 27" CARRIER		D11A
	SCALE: 3/4"=1'	

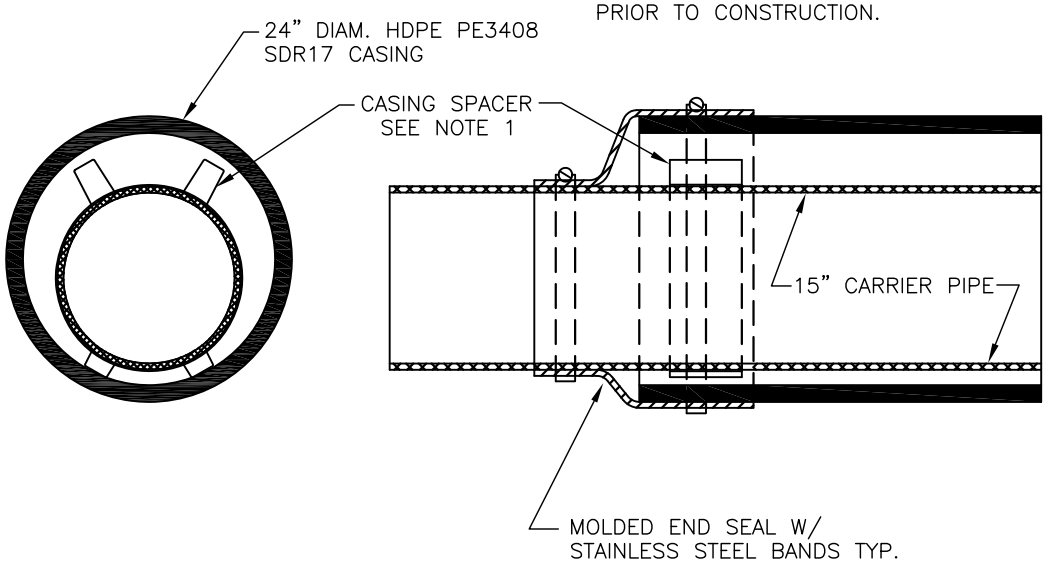
NOTES:
1. USE POLYETHYLENE CASING SPACERS APS MODEL CI OR EQUAL. ALL HARDWARE SHALL BE 304 STAINLESS.
2. USE APS MODEL AM MOLDED END SEAL OR EQUAL.
3. CASING SEAL MUST BE WATER TIGHT.
4. MAKE SUBMITTAL TO DISTRICT ENGINEER ON CASING PIPE, SPACERS AND END SEAL PRIOR TO CONSTRUCTION.



DETAIL– 16" DIAM. STEEL CASING AND 8" TO 12" DIAM. CARRIER PIPE

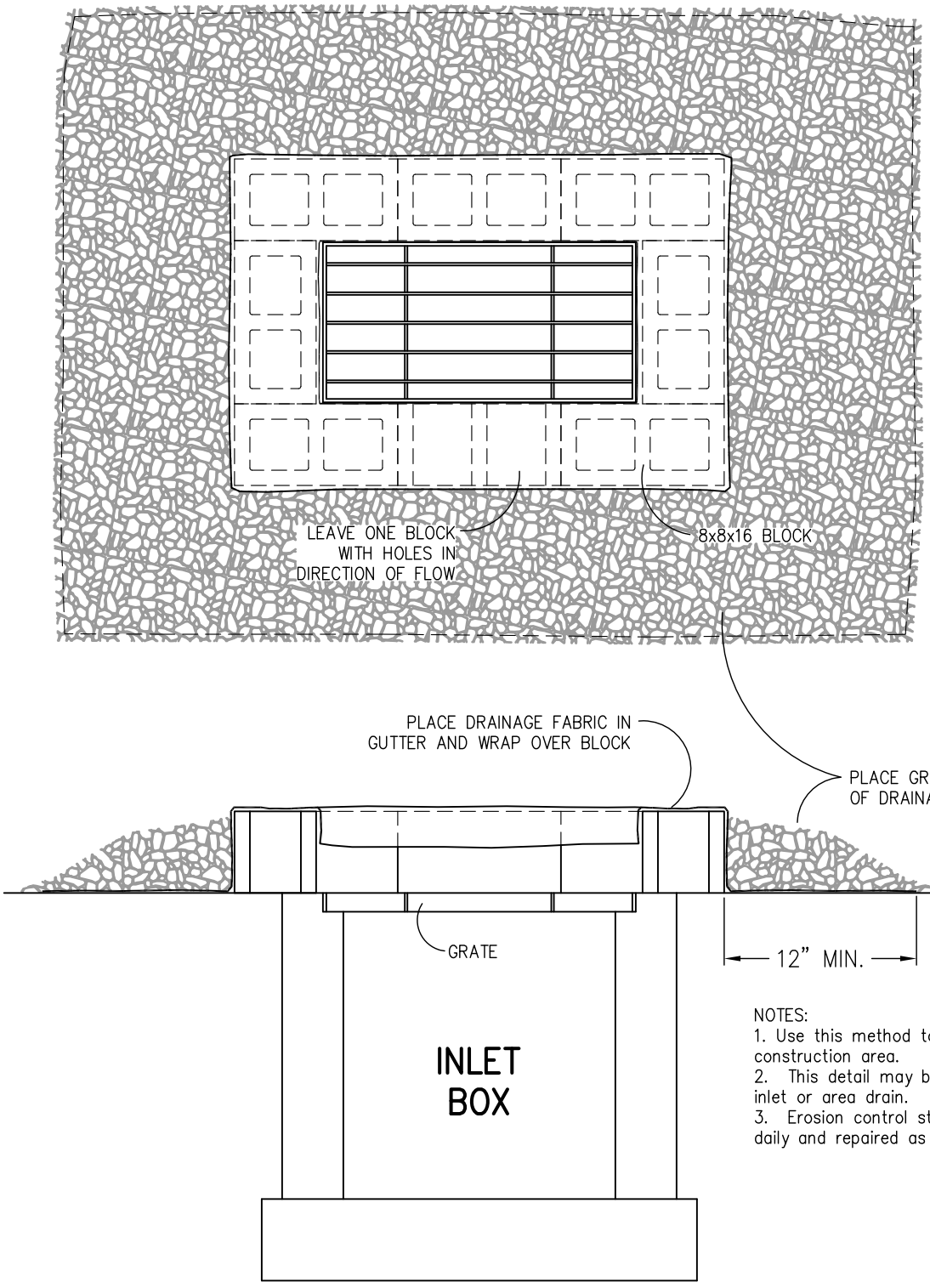
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/4/2007	DWG. NO.
	REVISIONS:	
16" STEEL CASING, 8" - 10" CARRIER	SCALE: 1"=1'	D11B

NOTES:
1. USE 304 STAINLESS STEEL BANDED POLYETHYLENE SPACERS APS MODEL SSI 12 OR EQUAL. USE NON–CENTERED, RESTRAINED CONFIGURATION. ALL HARDWARE SHALL BE 304 STAINLESS. USE THREE PER LENGTH OF PIPE.
2. USE APS MODEL AM MOLDED END SEAL OR EQUAL. CASING SEAL MUST BE WATER TIGHT.
3. MAKE SUBMITTAL TO DISTRICT ENGINEER ON CASING PIPE, SPACERS AND END SEAL PRIOR TO CONSTRUCTION.



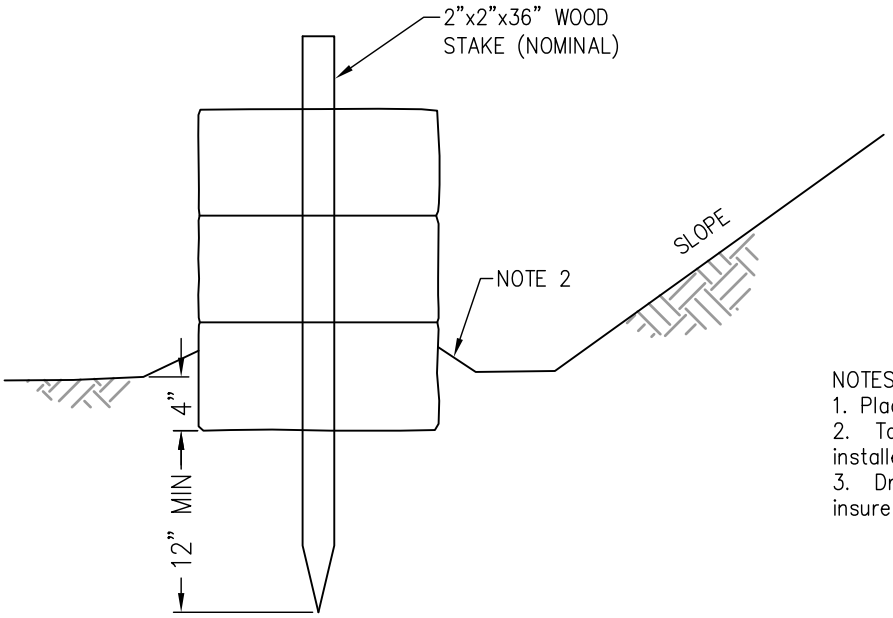
DETAIL – 24" DIAM. HDPE CASING AND 15" DIAM. PVC SDR35 CARRIER PIPE

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 9/24/20127	DWG. NO.
	REVISIONS:	
24" HDPE CASING, 15" CARRIER	SCALE: 3/4"=1'	D11C



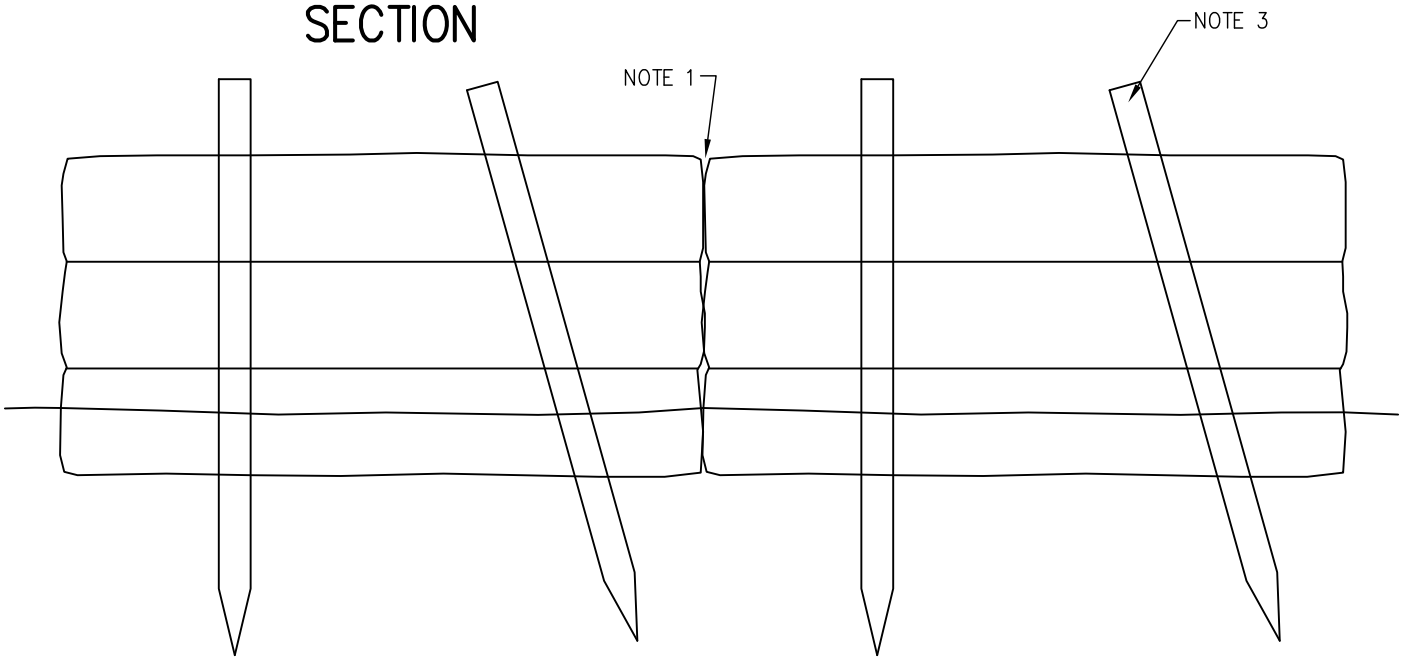
NOTES:
1. Use this method to protect all inlets in construction area.
2. This detail may be adapted to protect a curb inlet or area drain.
3. Erosion control structures shall be inspected daily and repaired as necessary.

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/22/2005	DWG. NO.
	REVISIONS:	
EROSION CONTROL - INLET	SCALE: 3/4"=1'	D12A

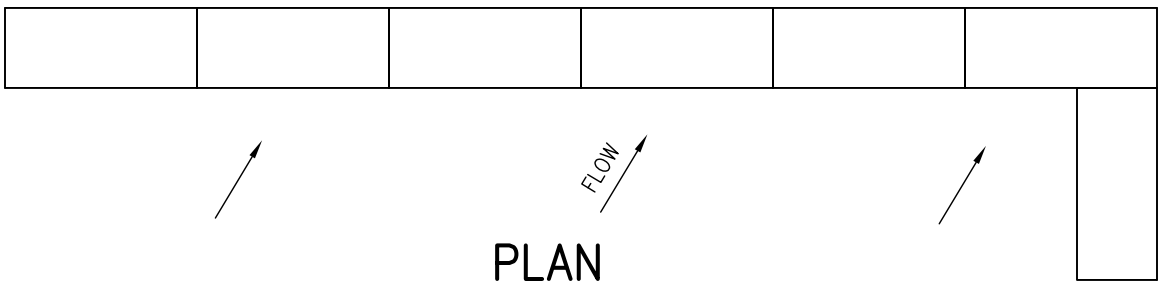


NOTES:
1. Place staw bales tightly together.
2. Tamp embedment spoils against sides of installed bales..
3. Drive angled stake before vertical stake to insure tight abutment between bales.

SECTION

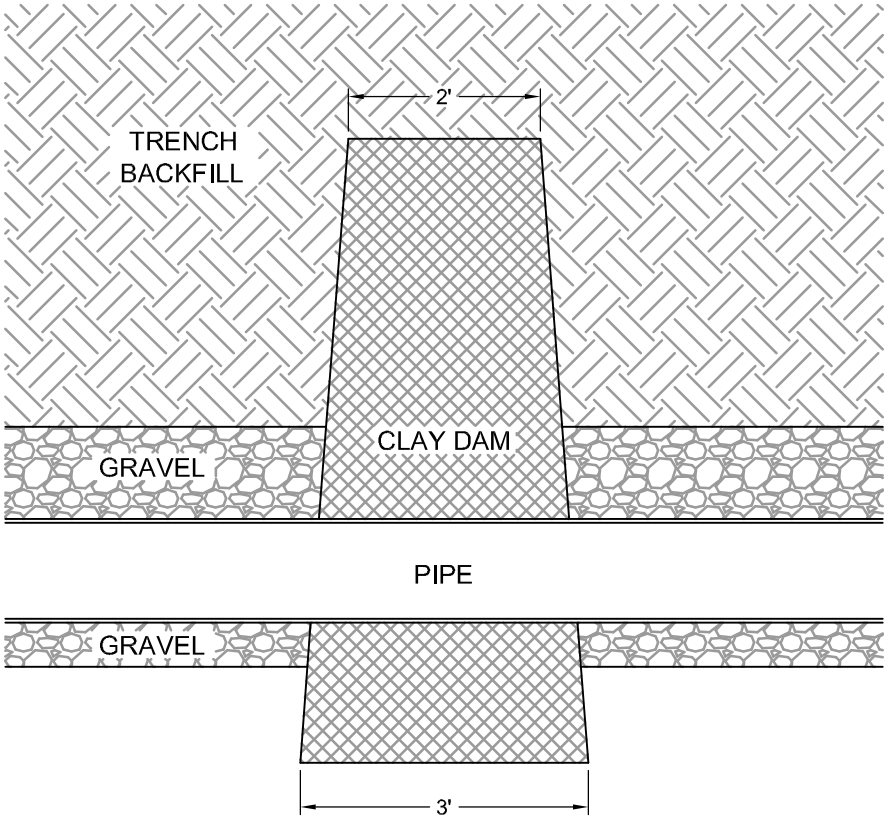


PROFILE

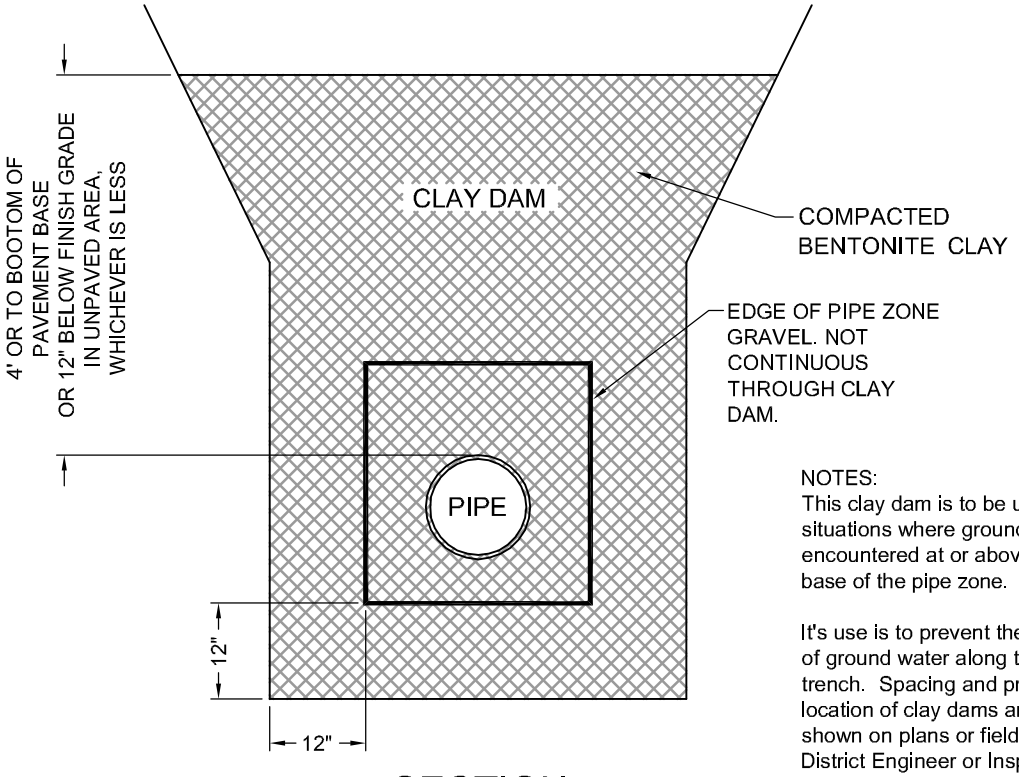


PLAN

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 6/22/2005 REVISIONS:	DWG. NO.
EROSION CONTROL - STRAW BALES	SCALE: NO SCALE	D12B



PROFILE



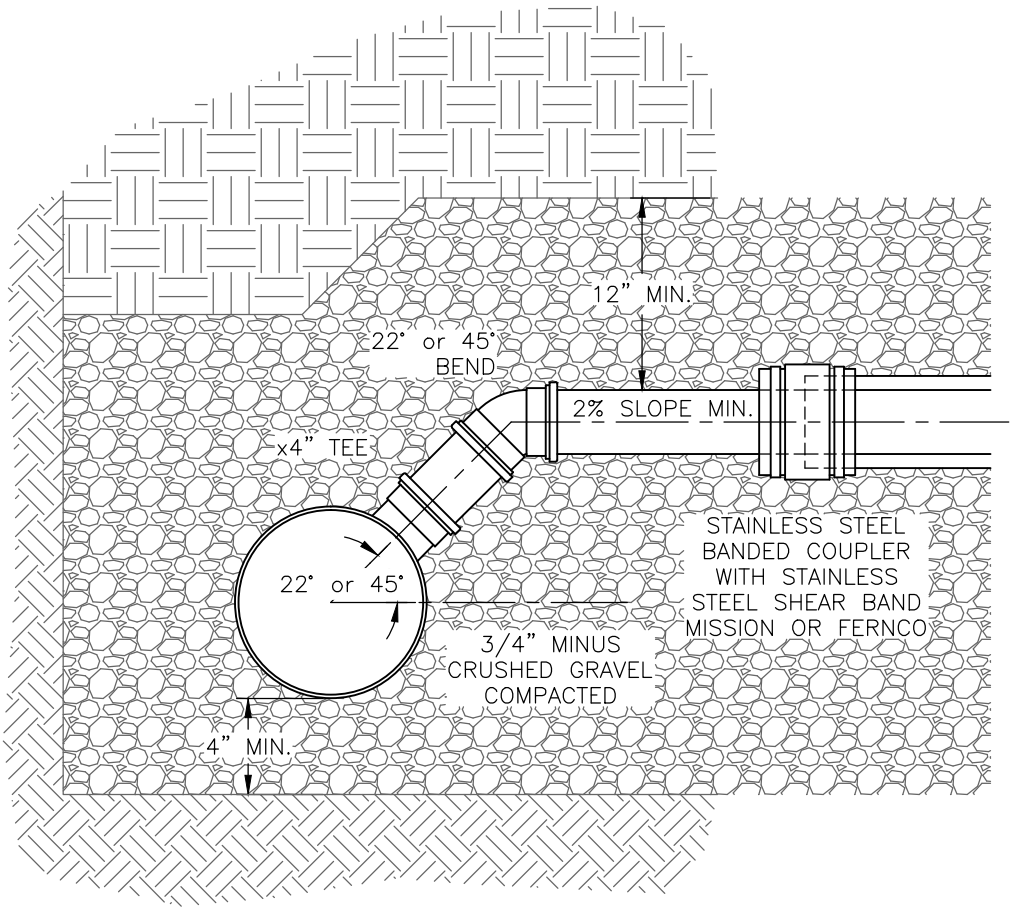
SECTION

NOTES:
This clay dam is to be used in situations where ground water is encountered at or above the gravel base of the pipe zone.

It's use is to prevent the migration of ground water along the sewer trench. Spacing and precise location of clay dams are to be shown on plans or field-specified by District Engineer or Inspector.

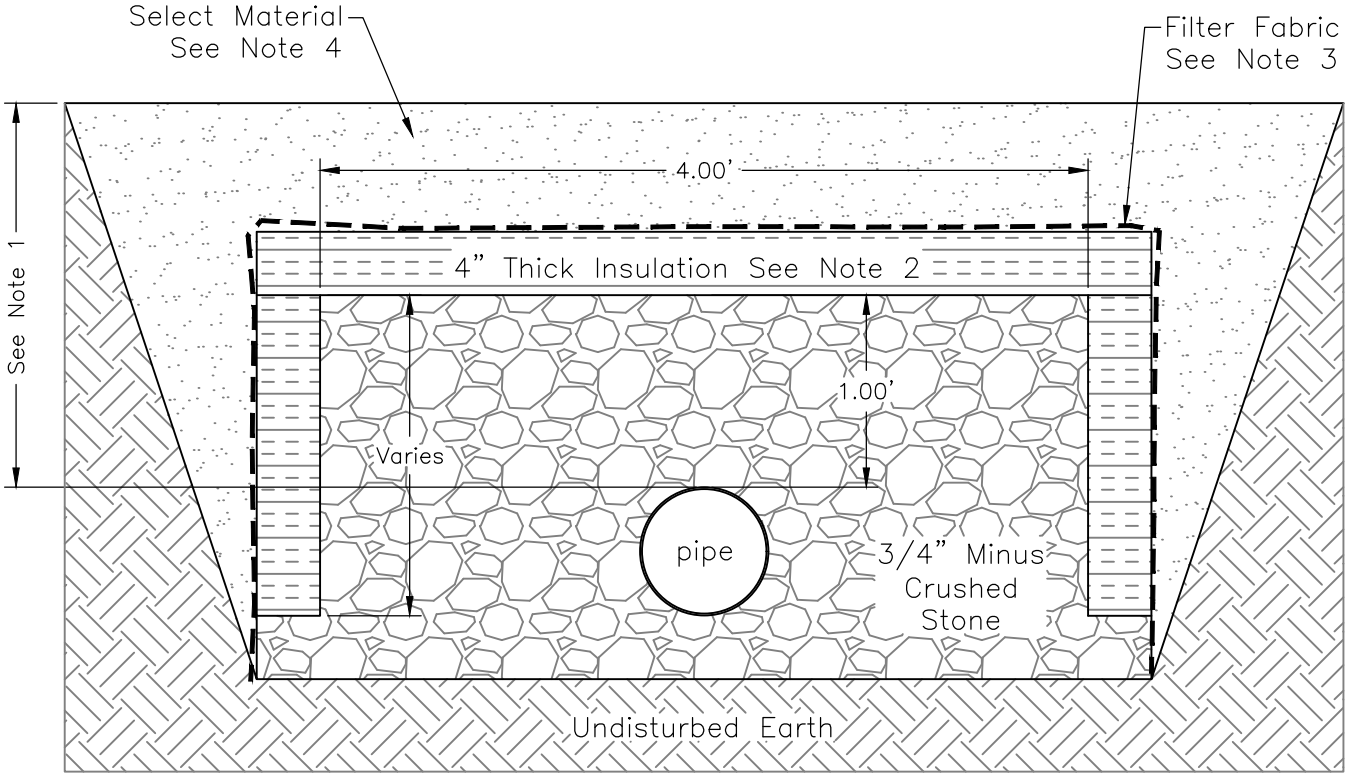
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 1/30/2007	DWG. NO.
	REVISIONS:	
DETAIL - CLAY DAM	SCALE: nts	D13

NOTES:
1. IF SPECIAL CIRCUMSTANCES SUGGEST DEVIATING FROM THIS DETAIL, THE DISTRICT INSPECTOR OR ENGINEER MUST APPROVE CHANGES.
2. SLICE UNDER HAUNCHES OF PIPE TO FILL VOIDS. MECHANICALLY COMPACT GRAVEL.



SECTION

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 2/4/2013	DWG. NO.
	REVISIONS:	
SERVICE LINE RE-CONNCETION	SCALE: 1"=1'	D14



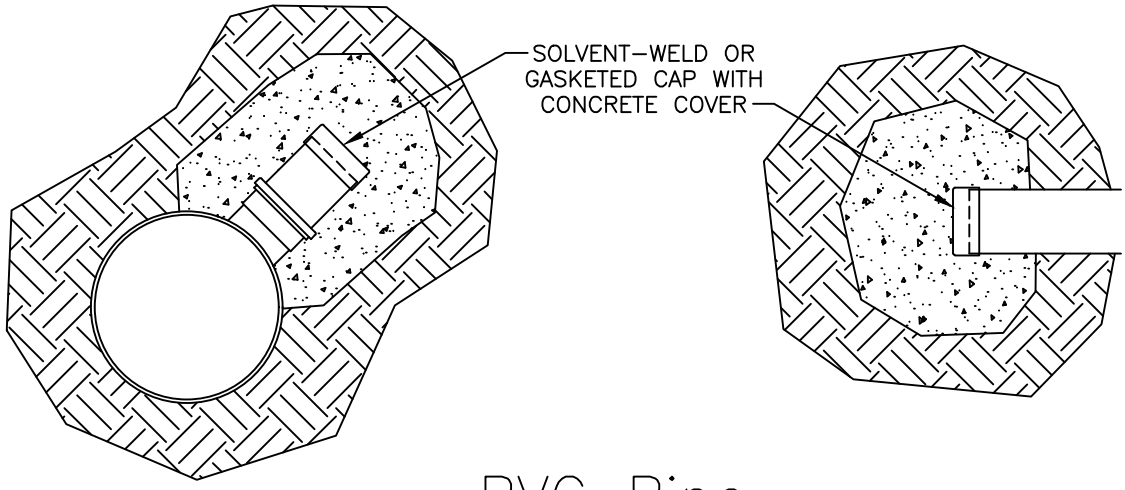
Notes:

1. Minimum cover from top of pipe to finish grade:
   - Valley Areas 2.0'
   - Canyon Areas 3.0'
2. Insulation – Use DOW STYROFOAM HIGHLOAD 100 psi Insulation or equal.
3. Filter Fabric – Use Mirafi 140N or equal.
4. Select Material – 1" minus, well graded, OR untreated base course and pavement.

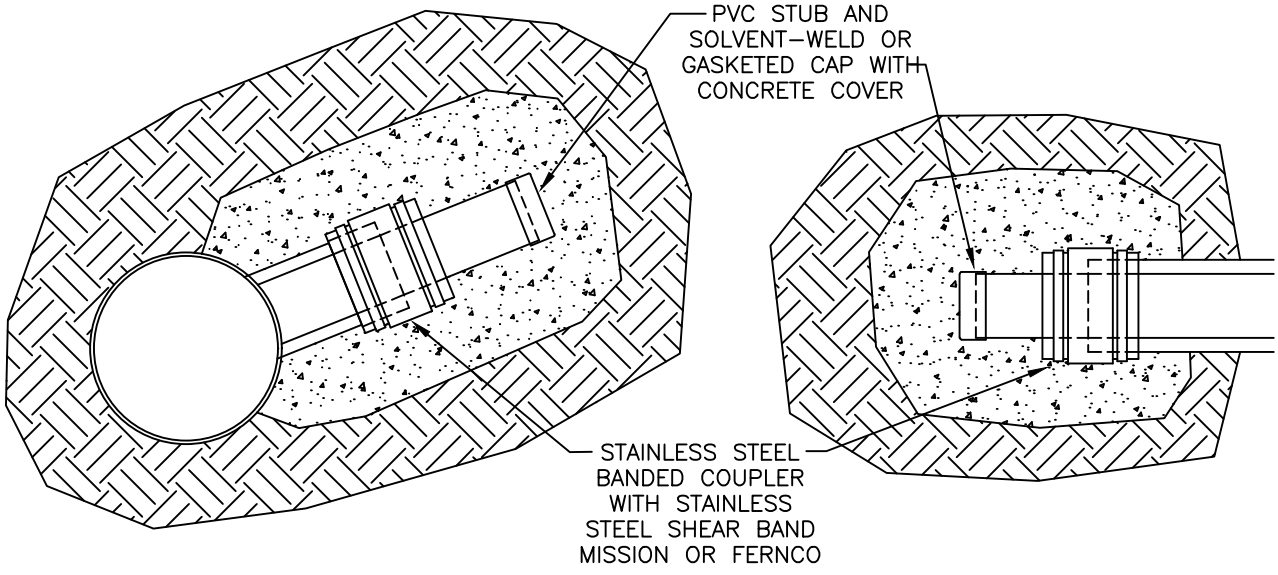
COTTONWOOD IMPROVEMENT DISTRICT	DATE: 5/7/2020	DWG. NO.
	REVISIONS:	
FROST PROTECTION	SCALE: 1"=1'	D15

NOTES:
1. This detail is to abandon a sewer service line when it will no longer be used. Cap–off must occur at property line or just upstream of District main line. Cap–off location is at the discretion of the District Engineer or District Inspector.
2. Make straight, clean, and perpendicular cut to existing pipe.
3. Surround cap with concrete.
4. For HDPE pipe: Fusion weld HDPE Cap to existing pipe. Concrete cap not required.

AT DISTRICT MAIN AT PROPERTY LINE



PVC Pipe



Clay, Concrete, Ductile Iron, or Transite Pipe

COTTONWOOD IMPROVEMENT DISTRICT	DATE: 2/15/2022	DWG. NO.
	REVISIONS:	
SERVICE LINE CAP-OFF	SCALE: 1"=1'	D16