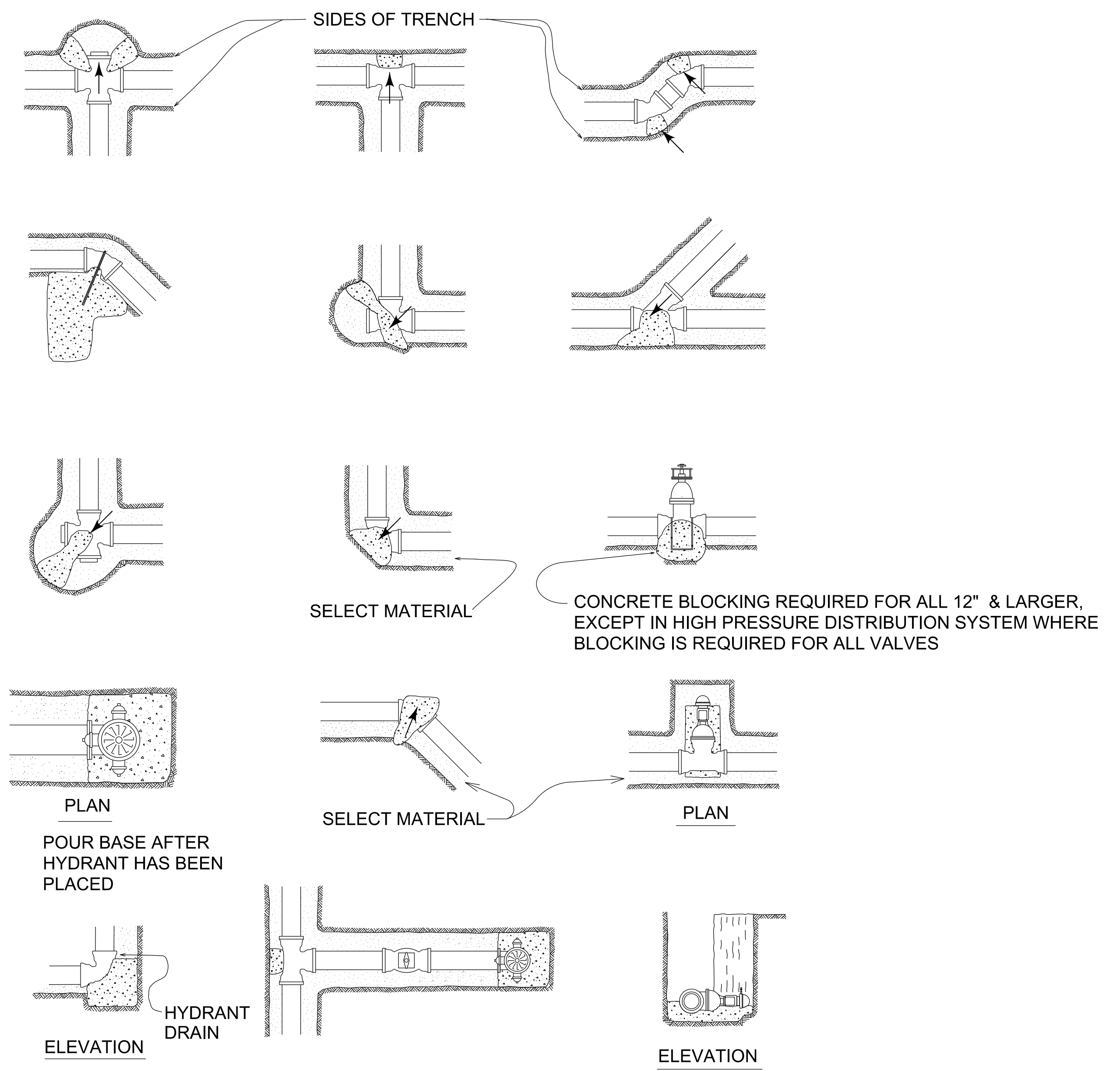
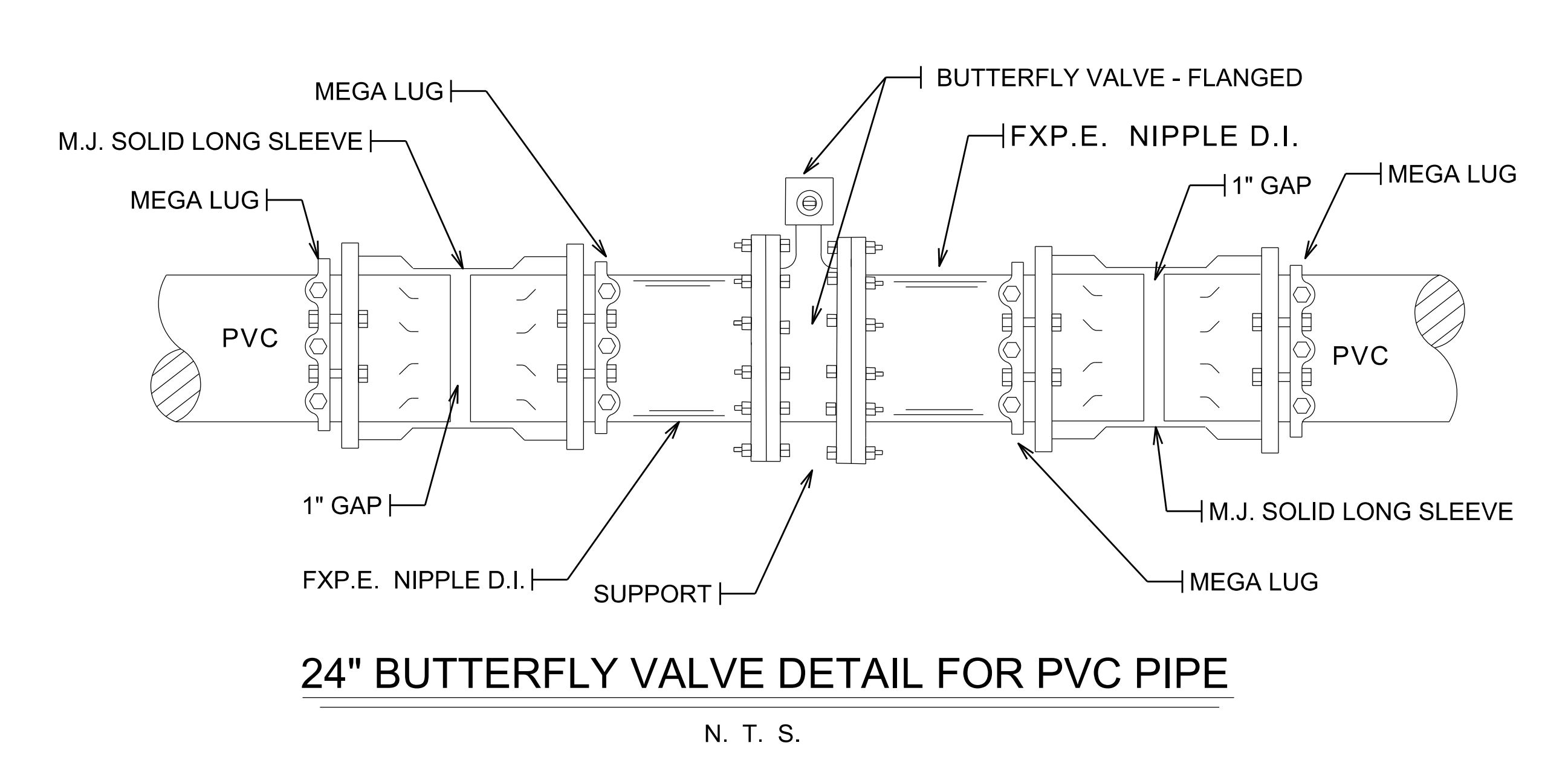
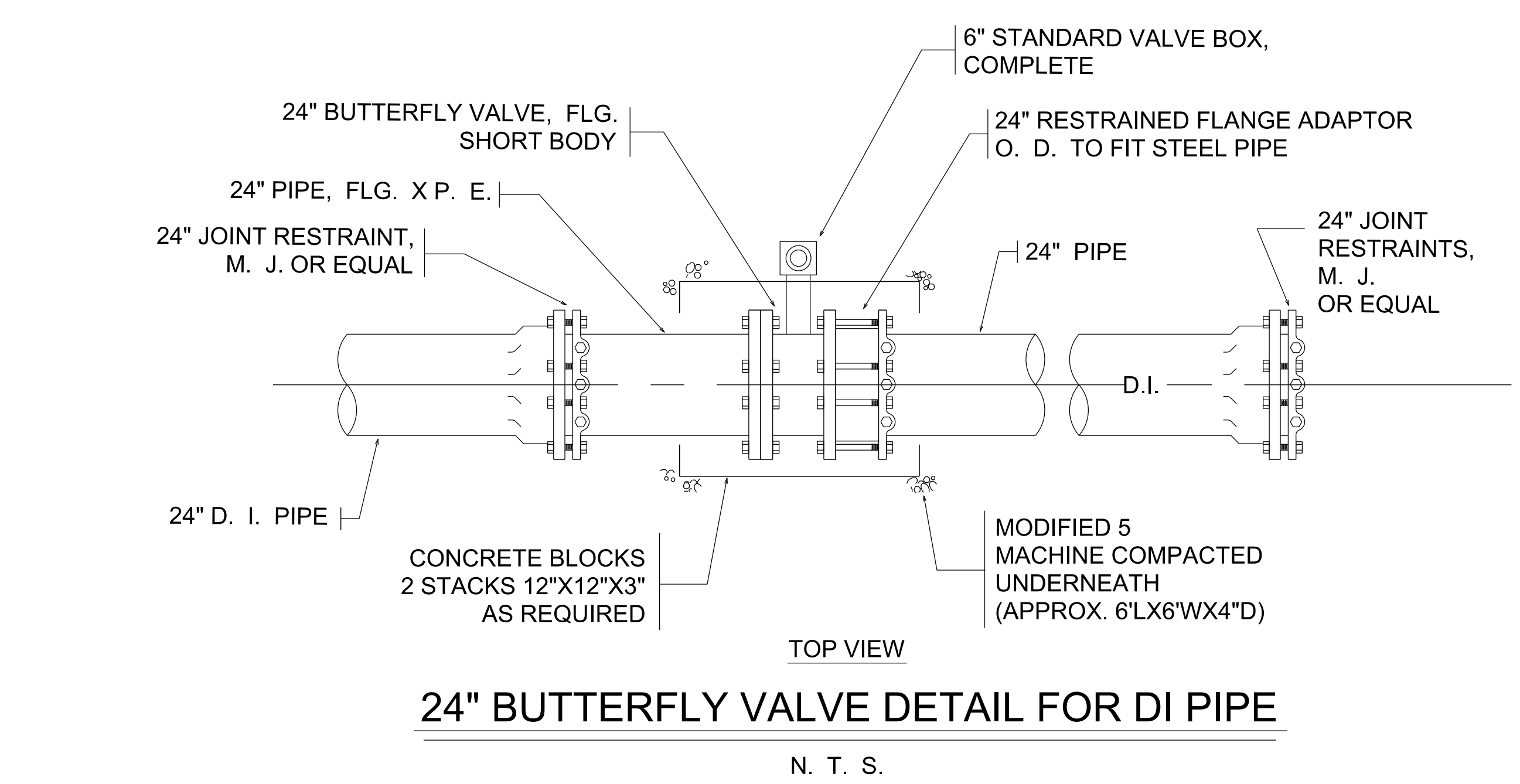
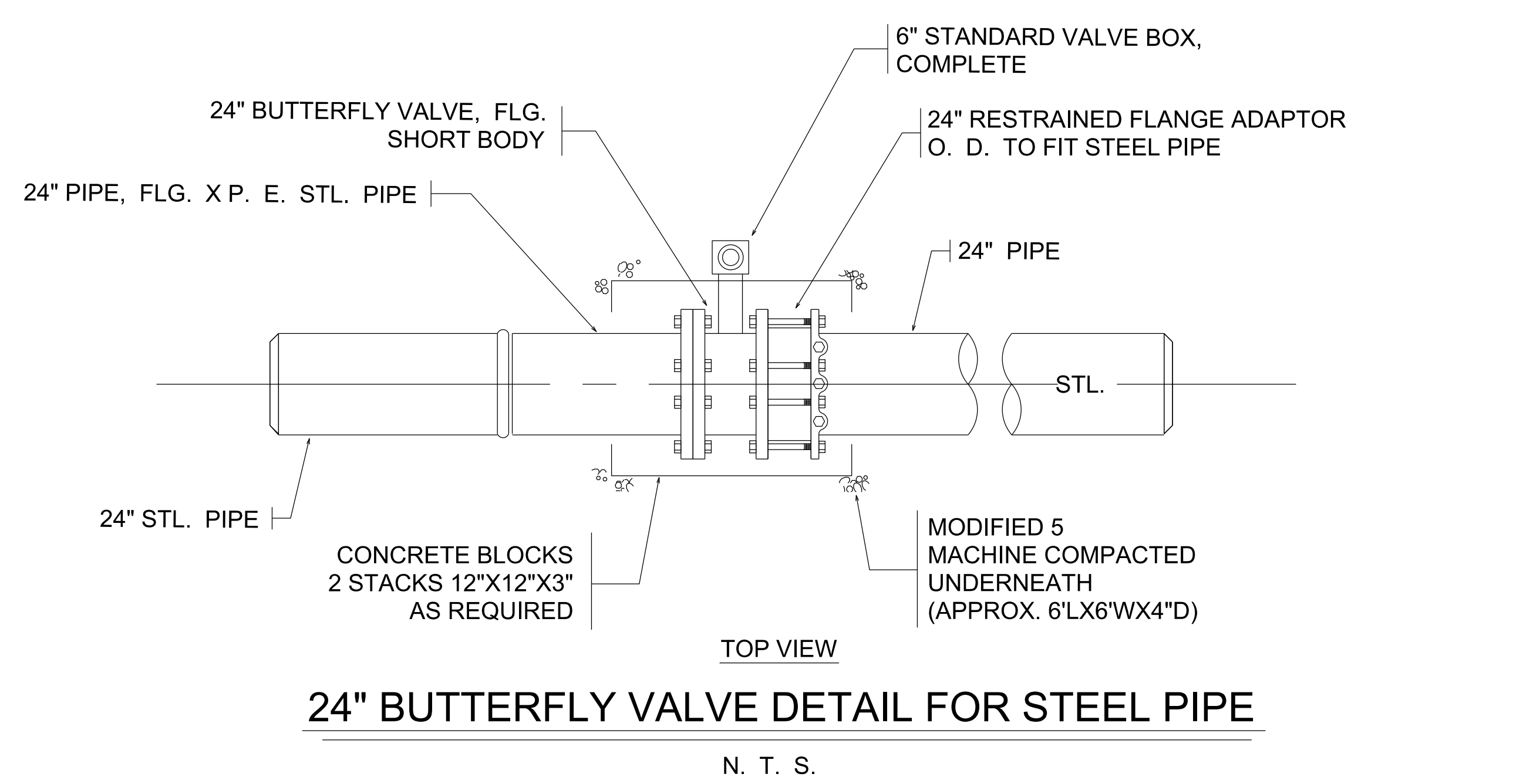
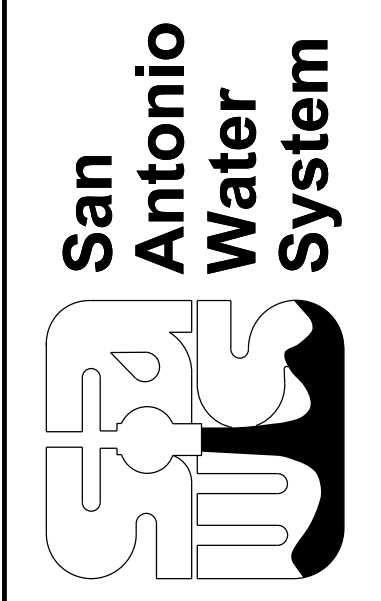


No.	Description	Drn.	Approved	Date



Date: 12/17/2011  
 Drawn by: TMJ  
 Designed by: TMJ  
 Checked by: JGR  
 Scale: AS NOTED ABOVE  
 Approved by: JGR  
 Map No:

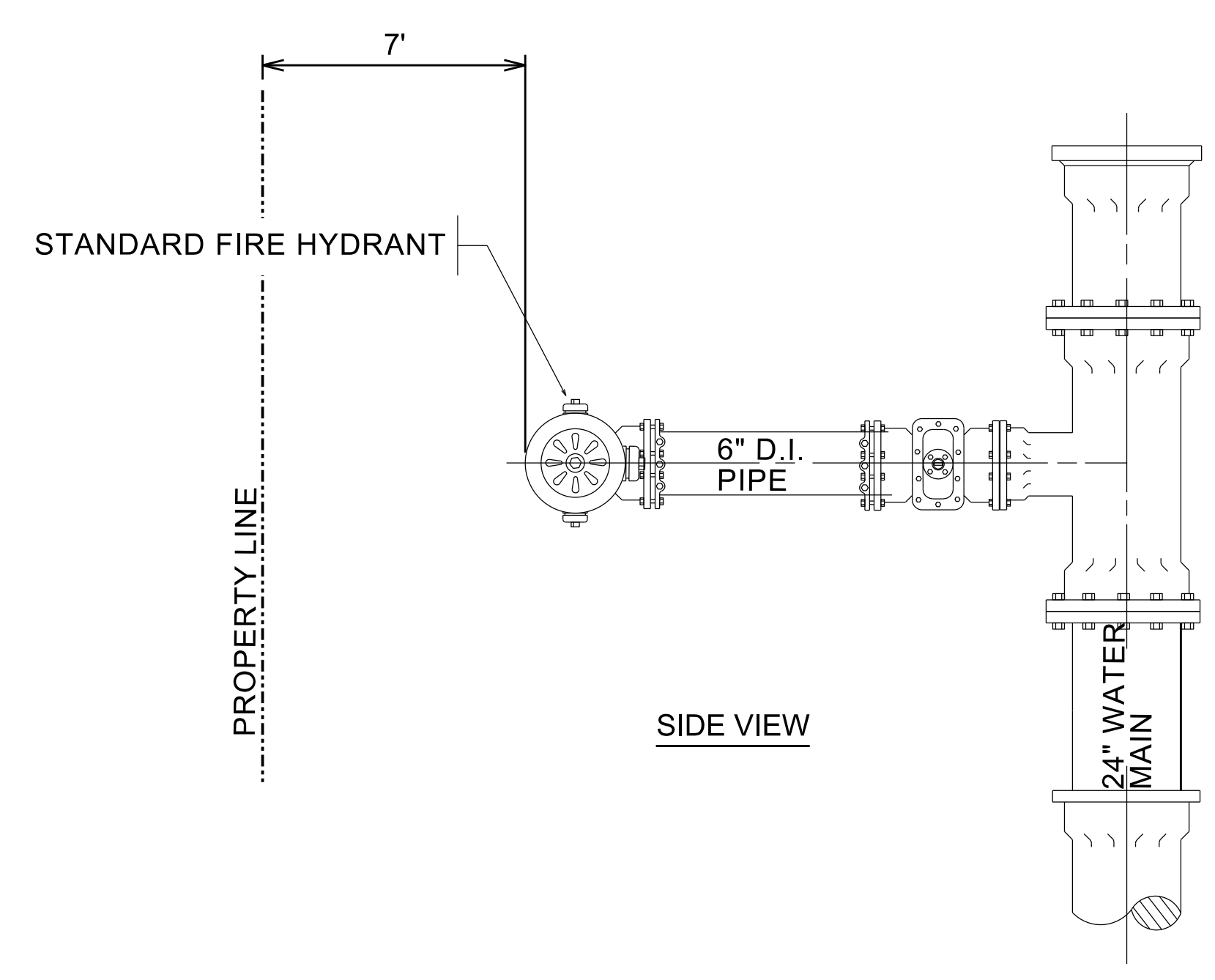


SAWS JOB NO. 10-7003  
 CROSS MOUNTAIN TRAIL  
 24" WATER TRANSMISSION MAIN  
 PROJECT

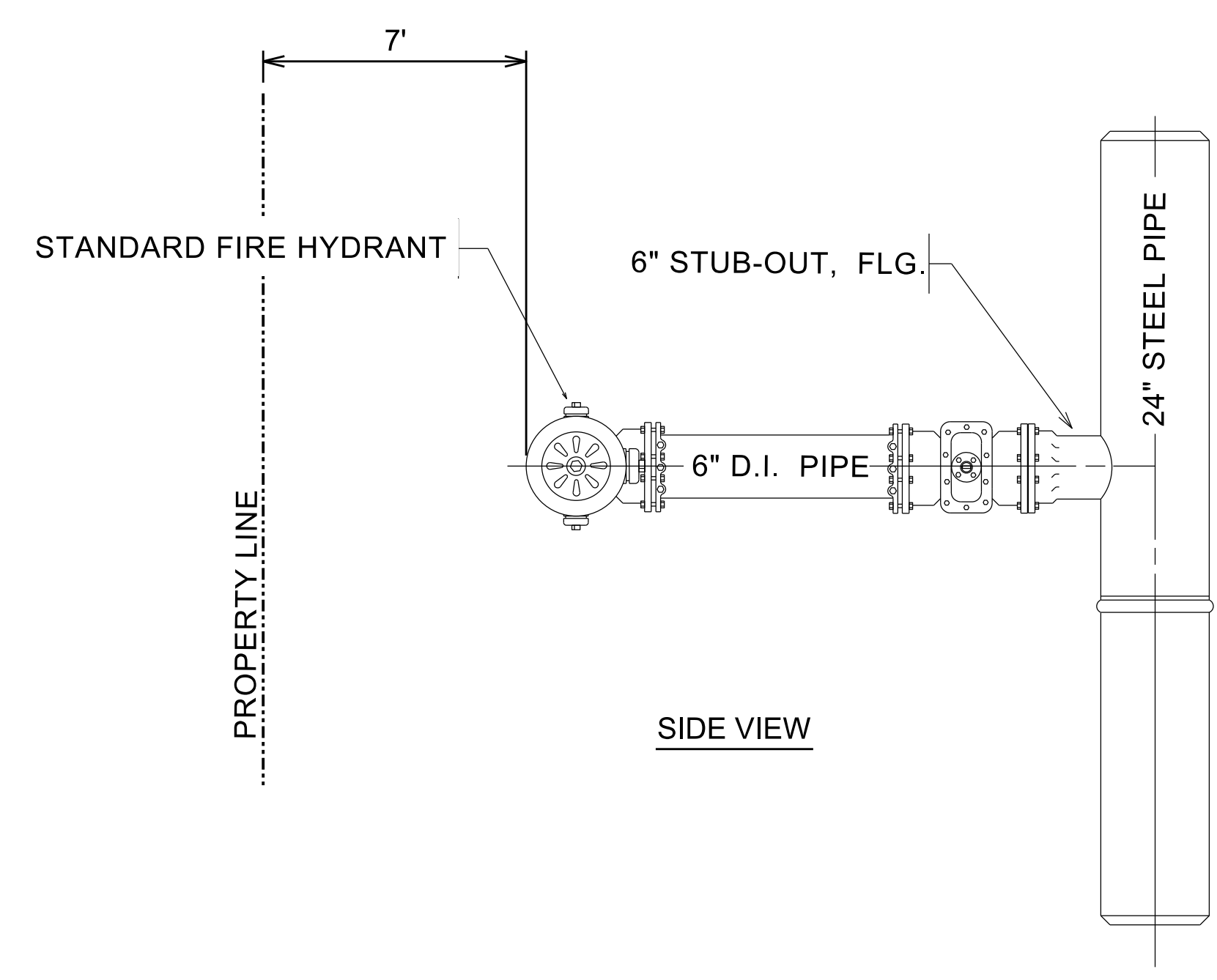
DETAIL SHEET



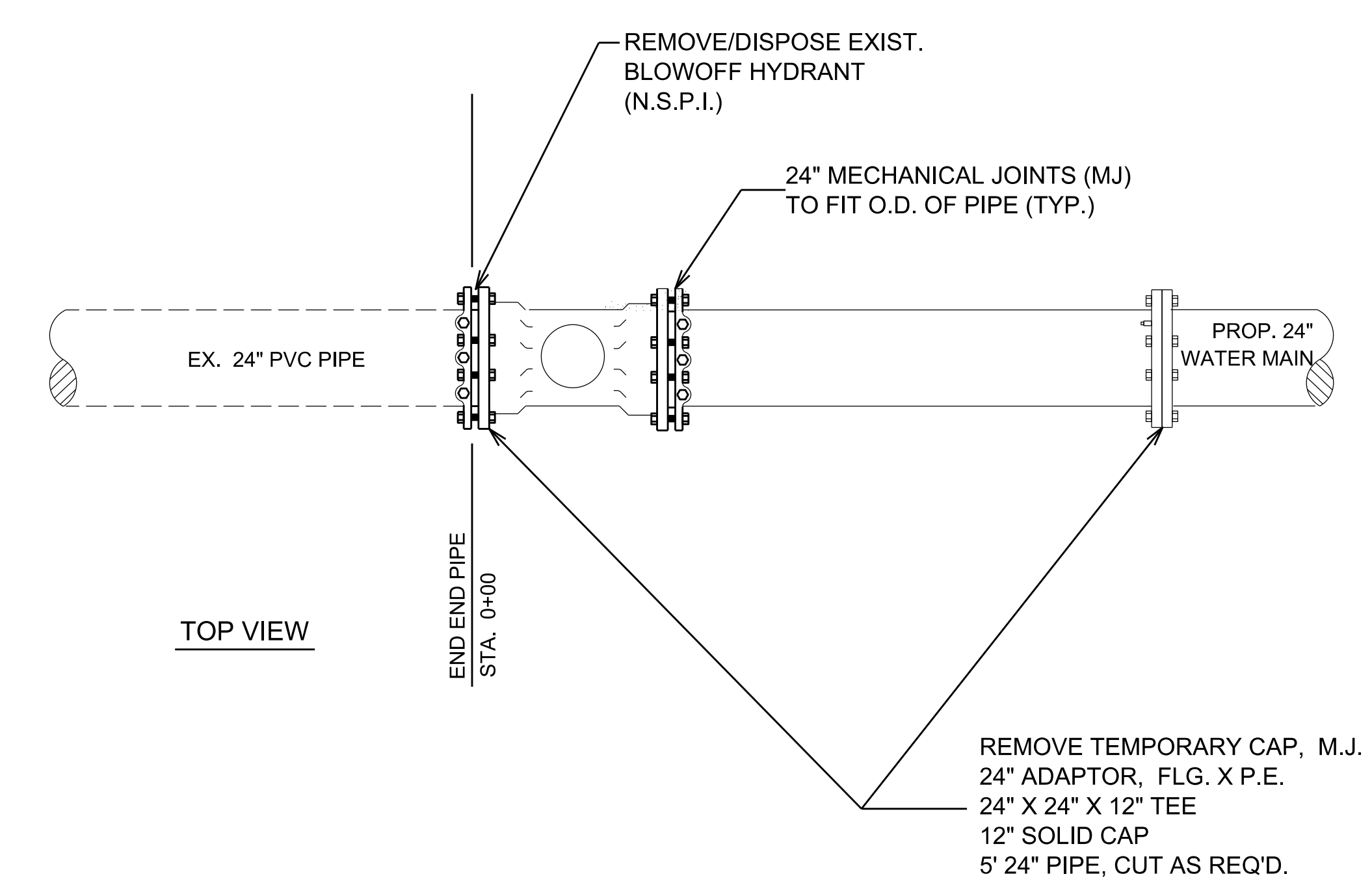
REVISIONS	No.	Description	Drn.	Approved	Date



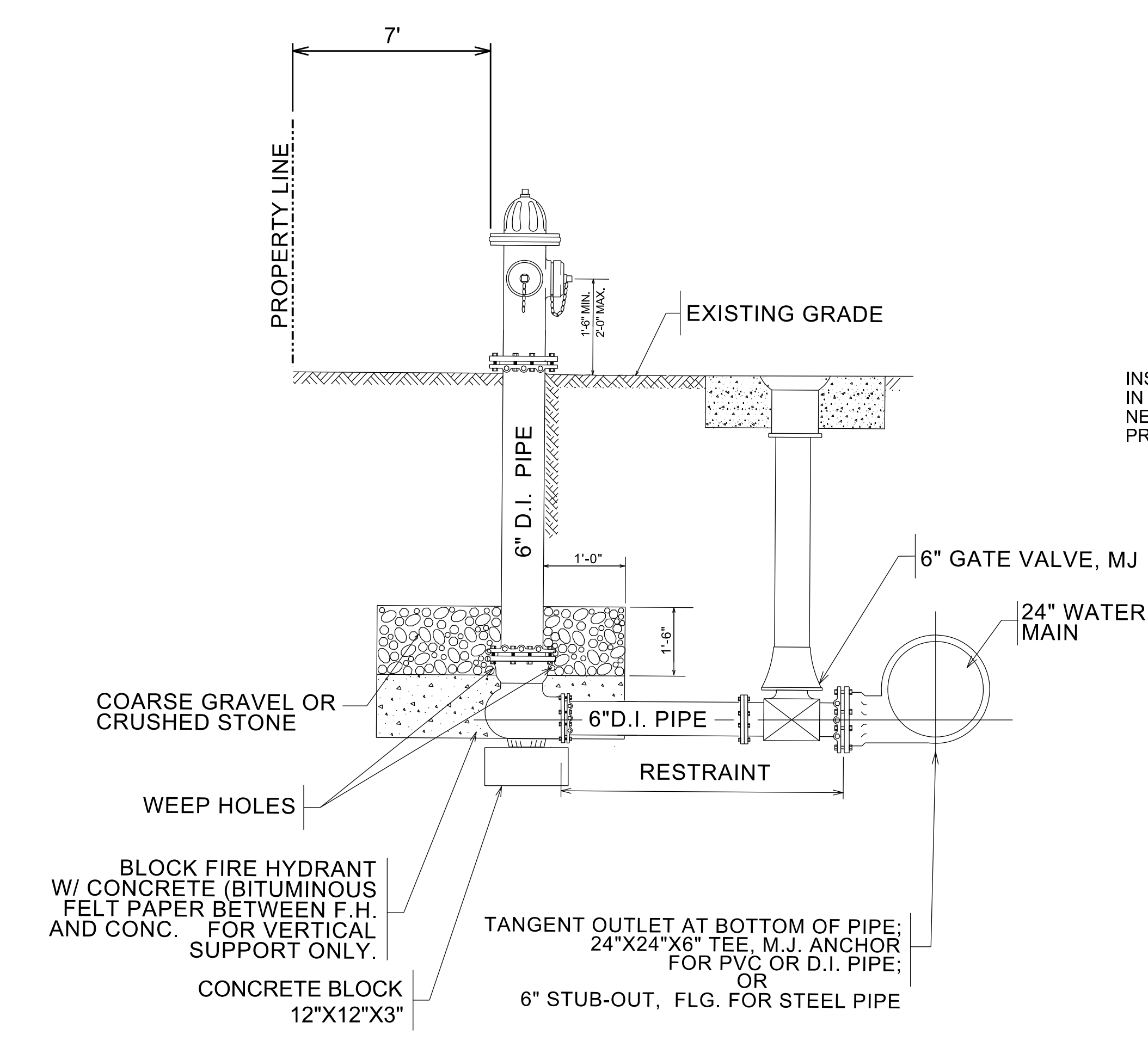
**FIRE HYDRANT DETAIL FOR PVC & D.I. PIPE**  
N. T. S.



**FIRE HYDRANT DETAIL FOR STEEL PIPE**  
N. T. S.

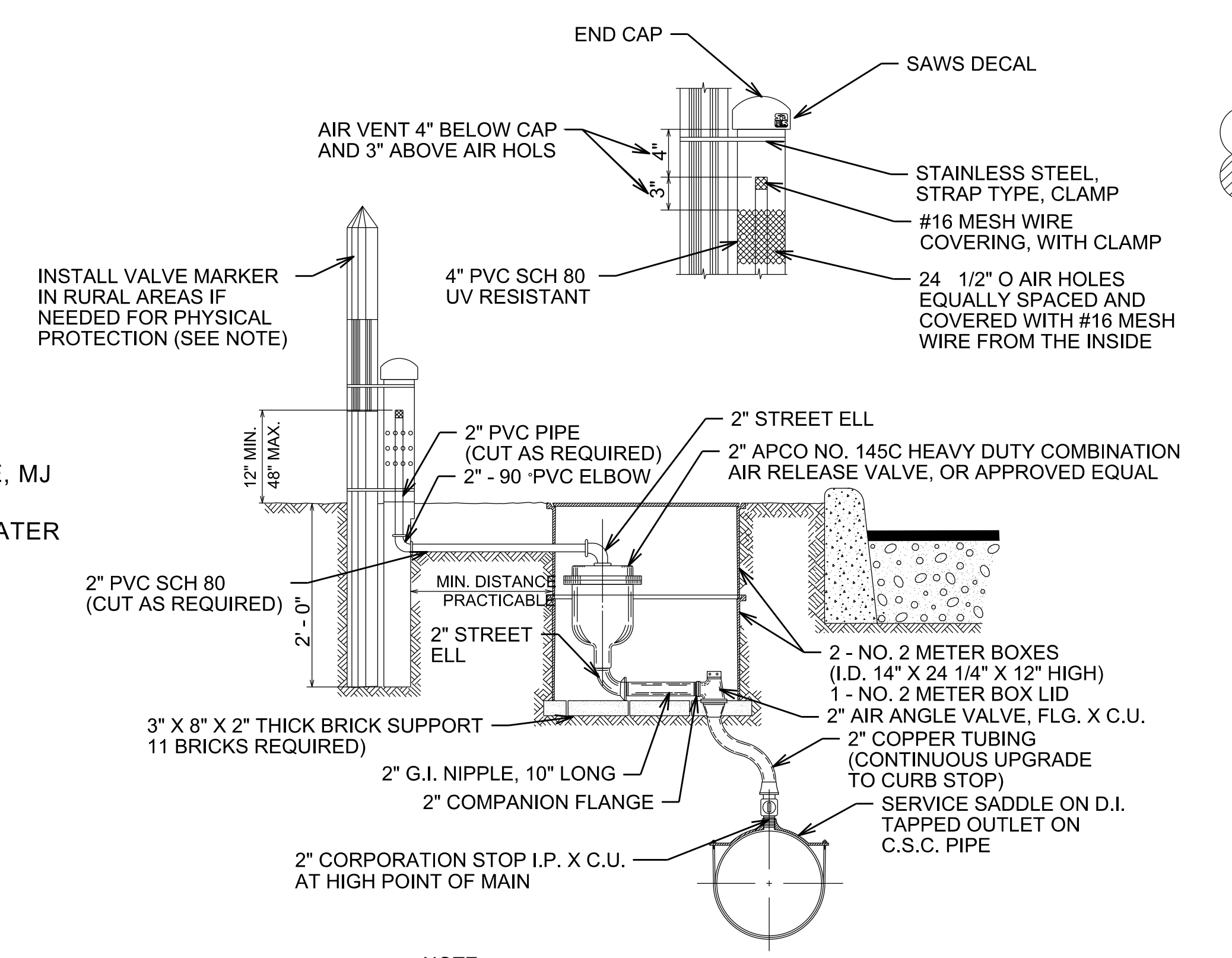


**24" TIE-IN DETAIL @ STA. 0+00**  
N. T. S.

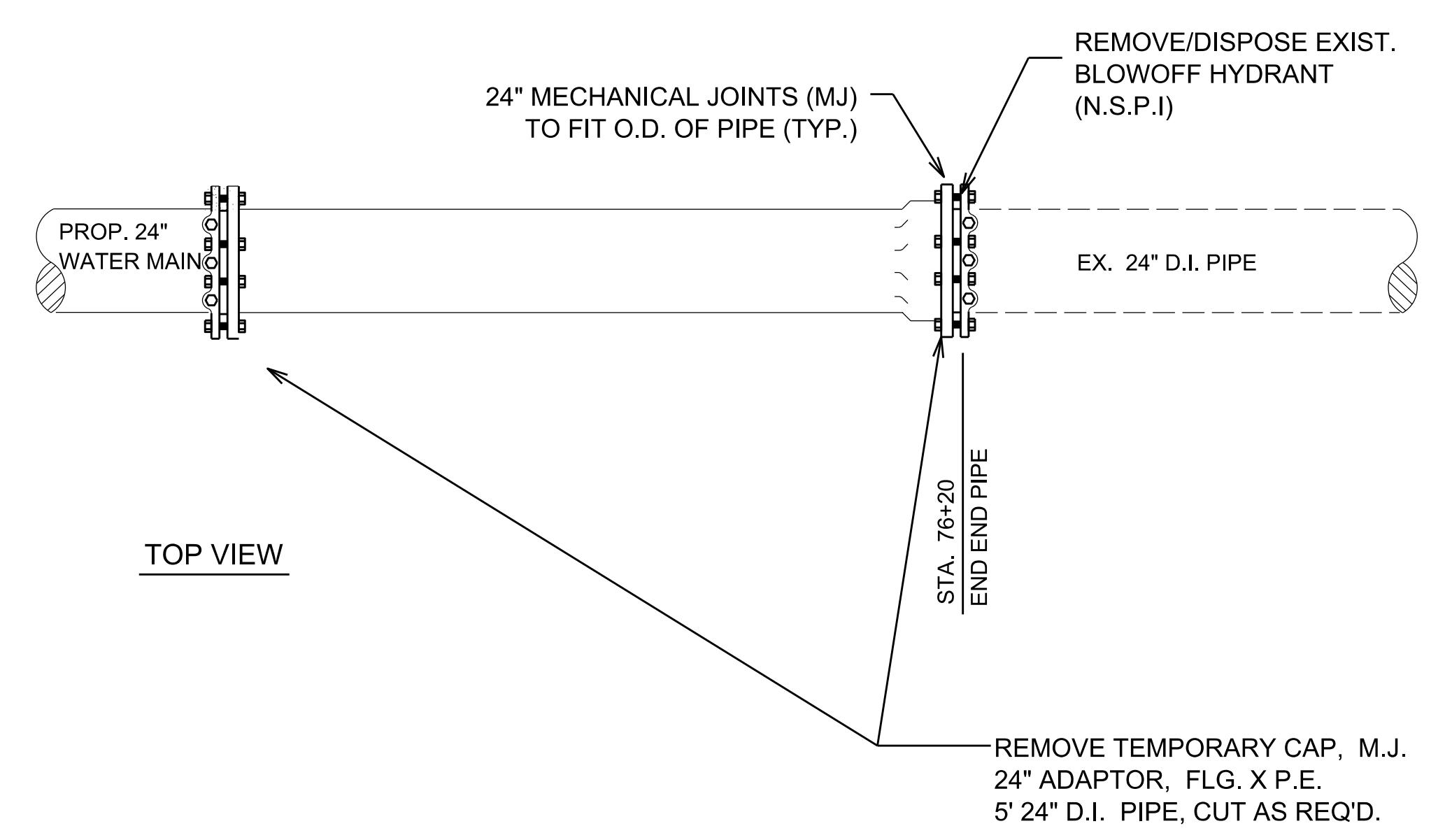


**STANDARD FIRE HYDRANT DETAIL**  
N. T. S.

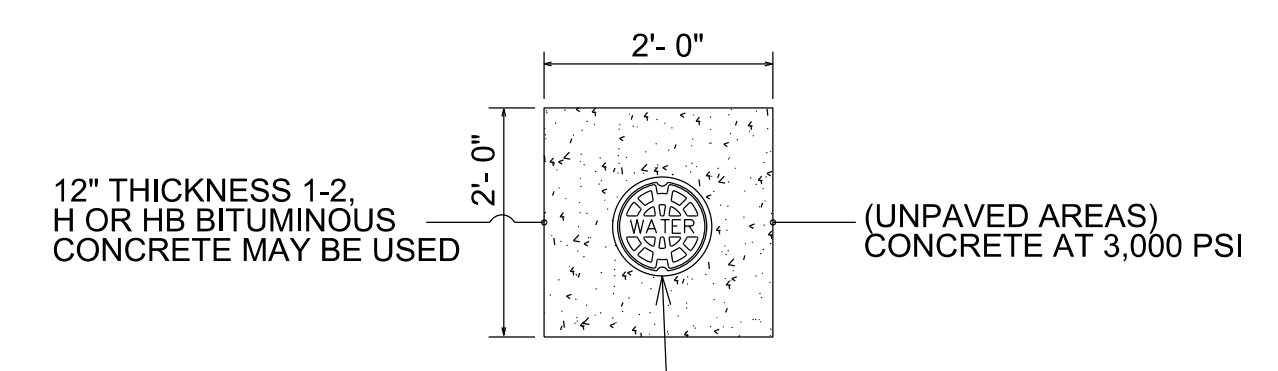
NOTE:  
1) THIS DETAIL ILLUSTRATION SHALL BE SUITABLE FOR PVC, DUCTILE IRON (D.I.) OR STEEL PIPE.



**STANDARD 2" AIR RELEASE VALVE**  
N. T. S.

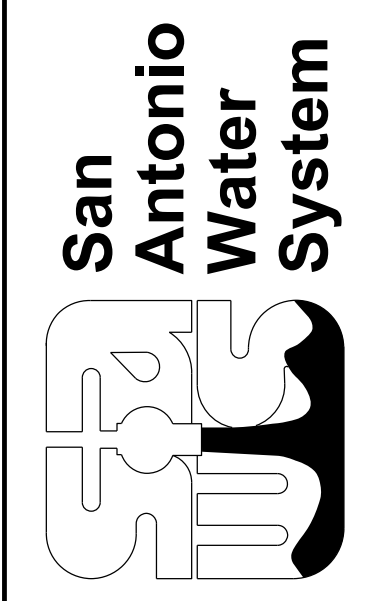


**24" TIE-IN DETAIL @ STA. 76+21**  
N. T. S.

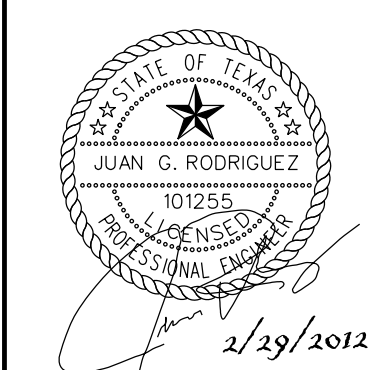


**TYPICAL VALVE COLLAR**  
N. T. S.

Date: 12/17/2011  
Drawn by: TMJ  
Designed by: TMJ  
Checked by: JGR  
Scale: AS NOTED ABOVE  
Approved by: JGR  
Map No:

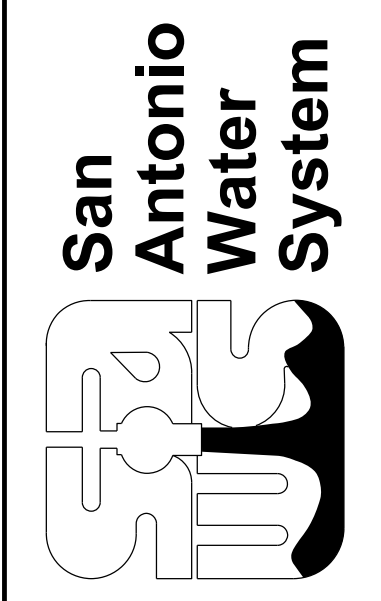


SAWS JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
24" WATER TRANSMISSION MAIN  
PROJECT

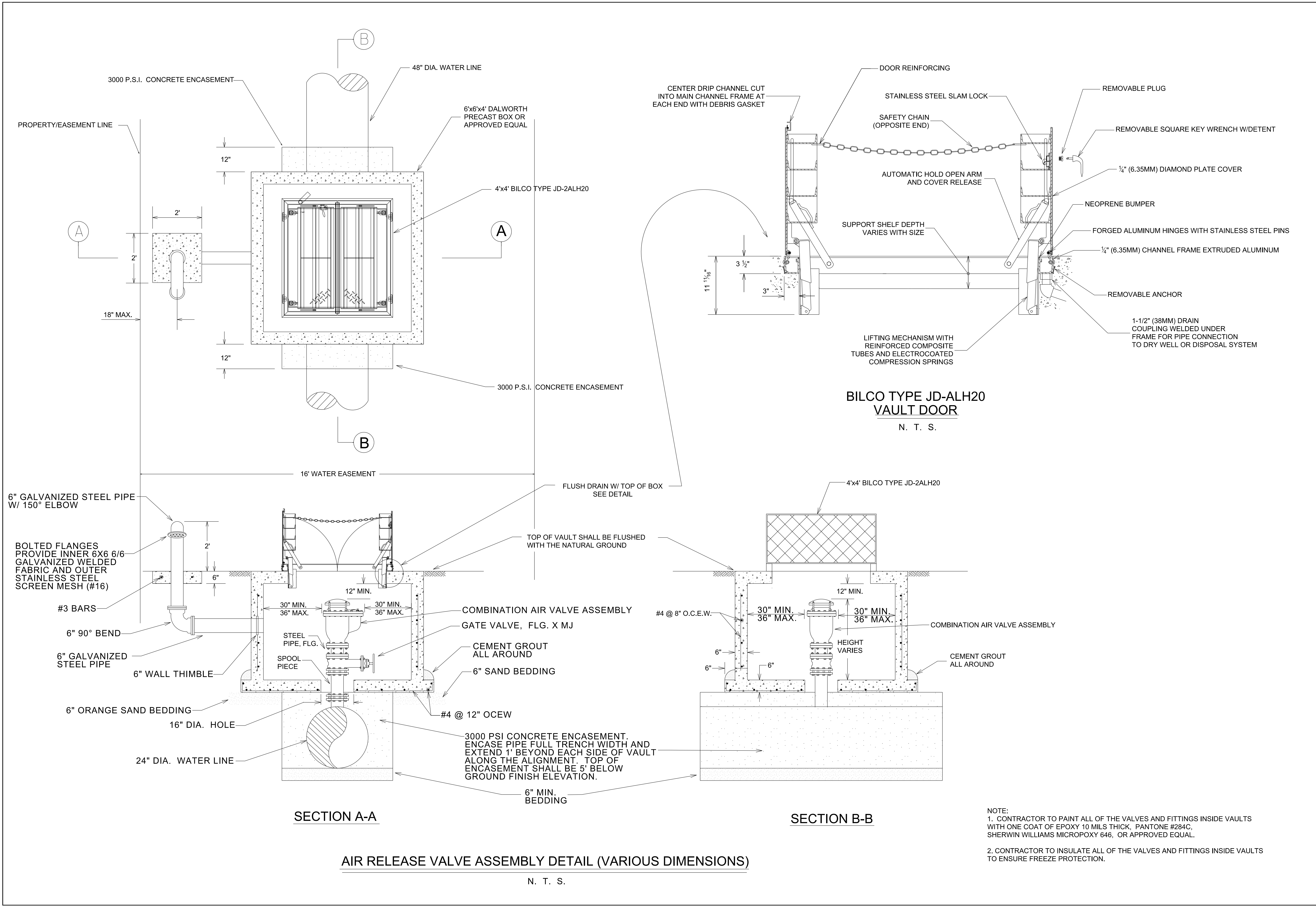


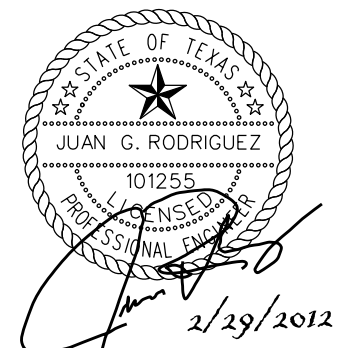
REVISIONS	
No.	Description

Date: 12/16/2011  
 Drawn by: TMJ  
 Designed by: TMJ  
 Checked by: JGR  
 Scale: AS NOTED ABOVE  
 Approved by: JGR  
 Map No:



SAWS JOB NO. 10-7003  
 CROSS MOUNTAIN TRAIL  
 24" WATER TRANSMISSION MAIN  
 PROJECT

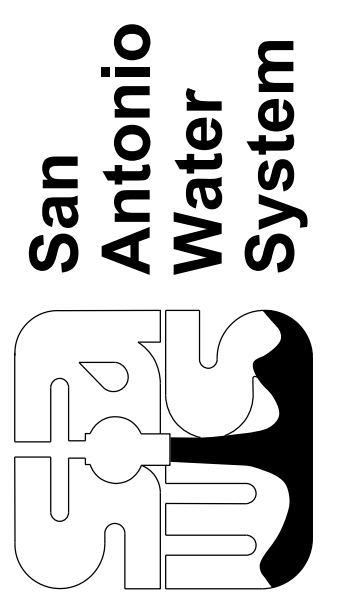




REVISIONS	Date	Dr.	Approved
No.			
Description			

INFORMATION
No.
Description

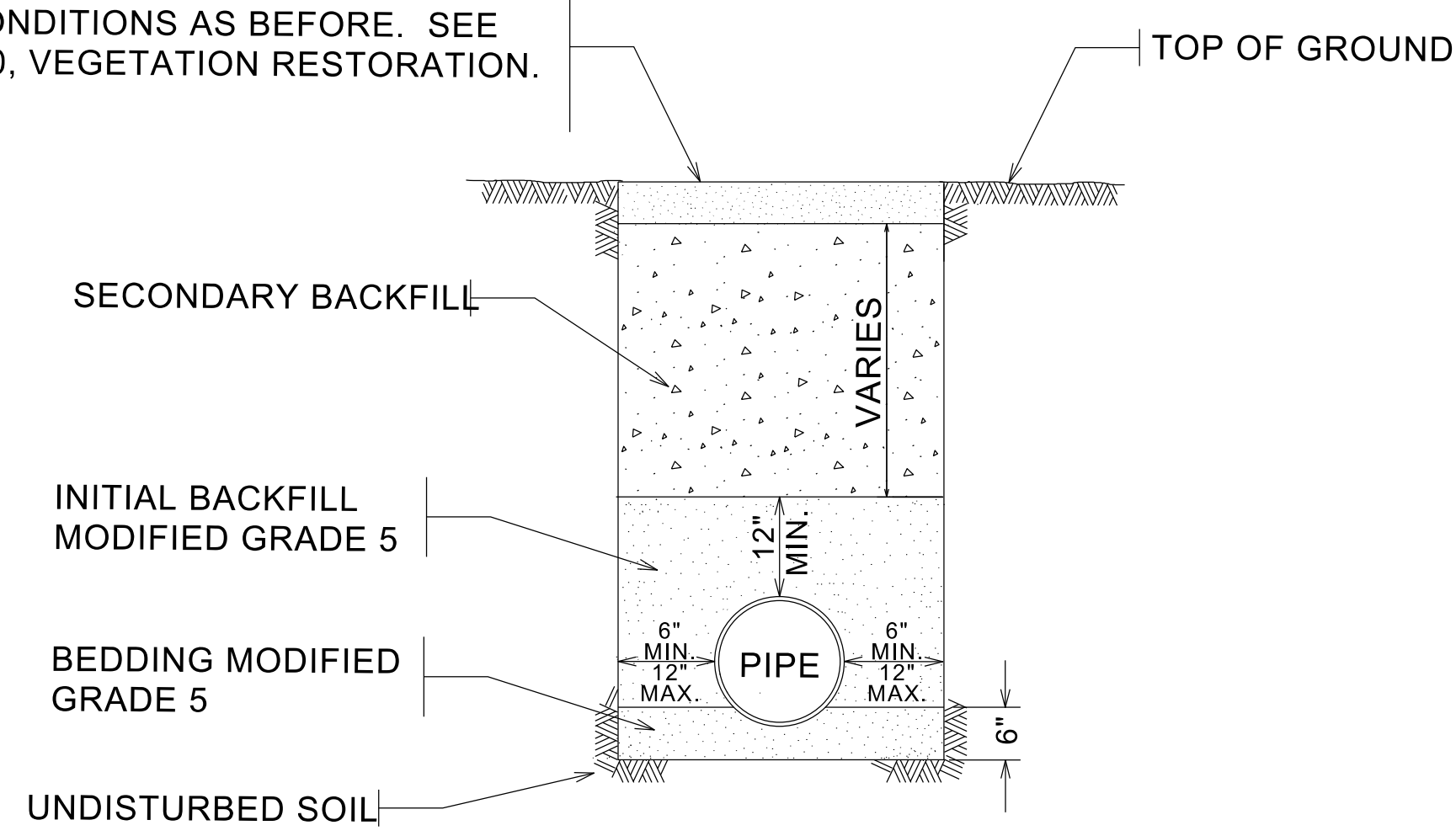
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Drawn by: TMJ
Designed by: TMJ
Checked by: JGR
Scale: AS NOTED ABOVE
Approved by: JGR
Map No:



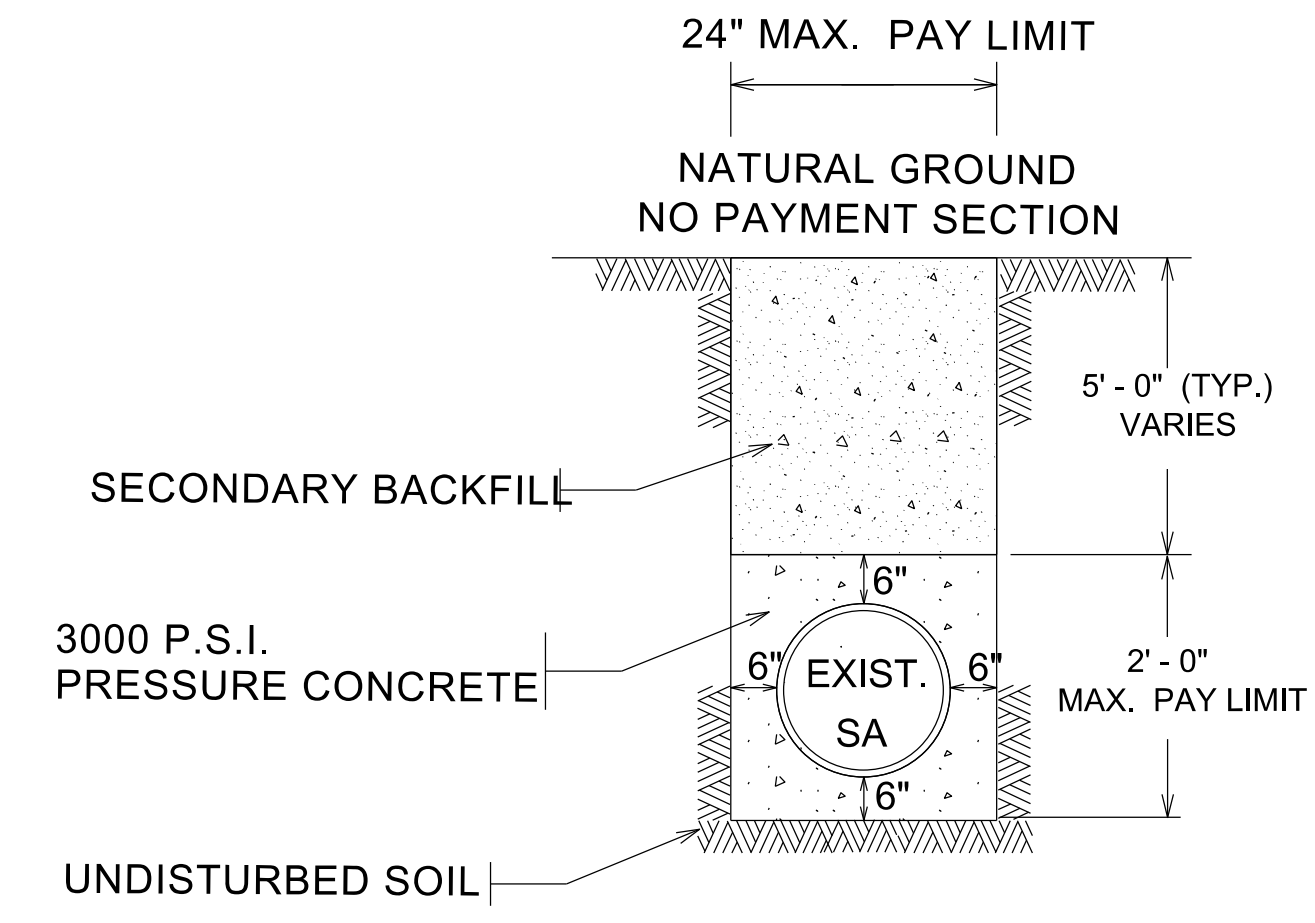
JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
WATER TRANSMISSION MAIN  
PROJECT

MISCELLANEOUS DETAILS

4" TOP SOIL AND REVEGETATE IN EQUAL OR BETTER CONDITIONS AS BEFORE. SEE SECTION 02360, VEGETATION RESTORATION.

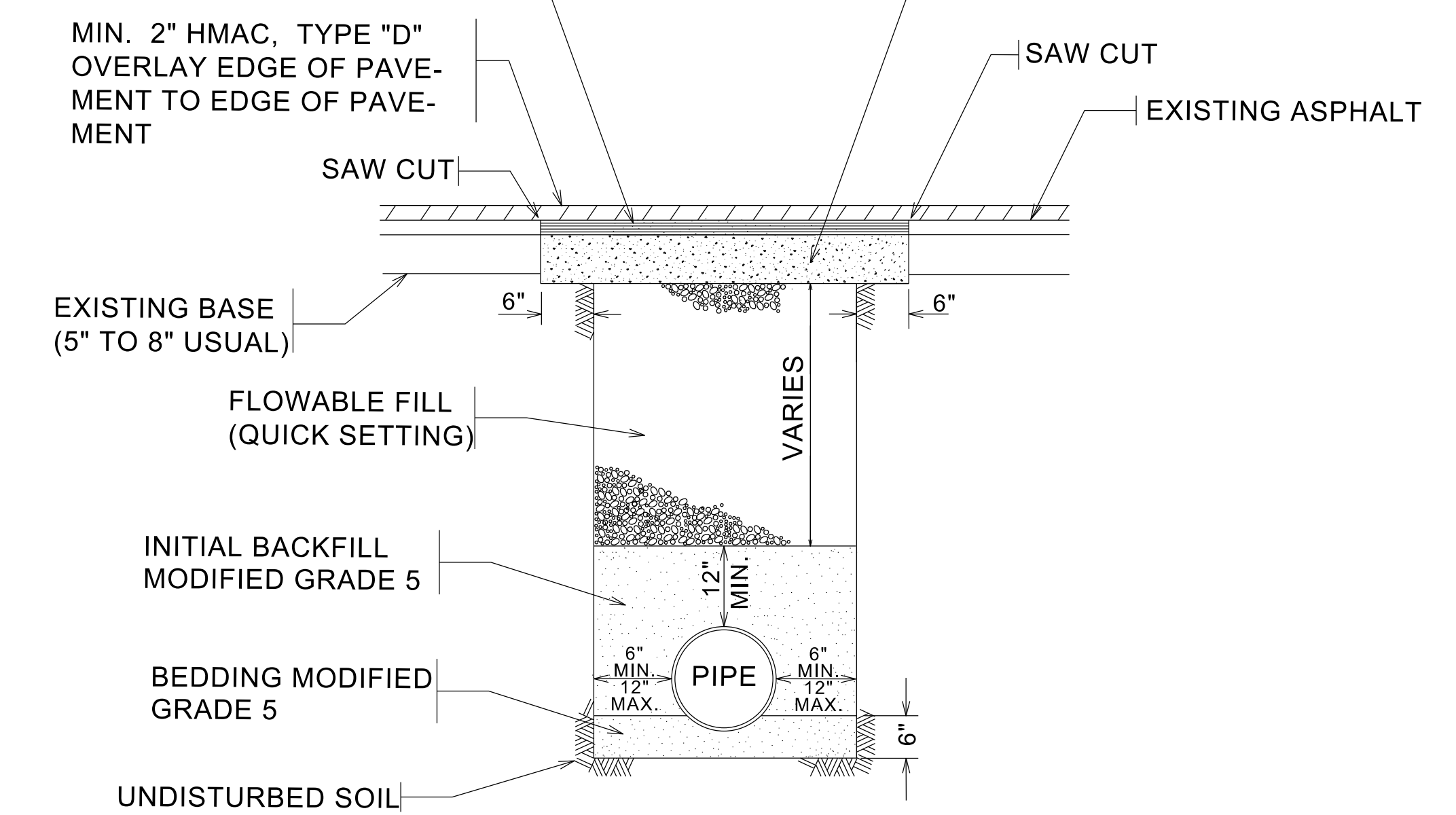


**TRENCH UNDER NATURAL GROUND**  
N. T. S.



**TYPICAL CONCRETE ENCASEMENT DETAIL (IF APPLICABLE)**  
N. T. S.

MIN. 2" HMAC, TYPE "D" AT 98% STD. PROCTOR DENSITY (ABOVE TRENCH AND BASE REPAIRS)



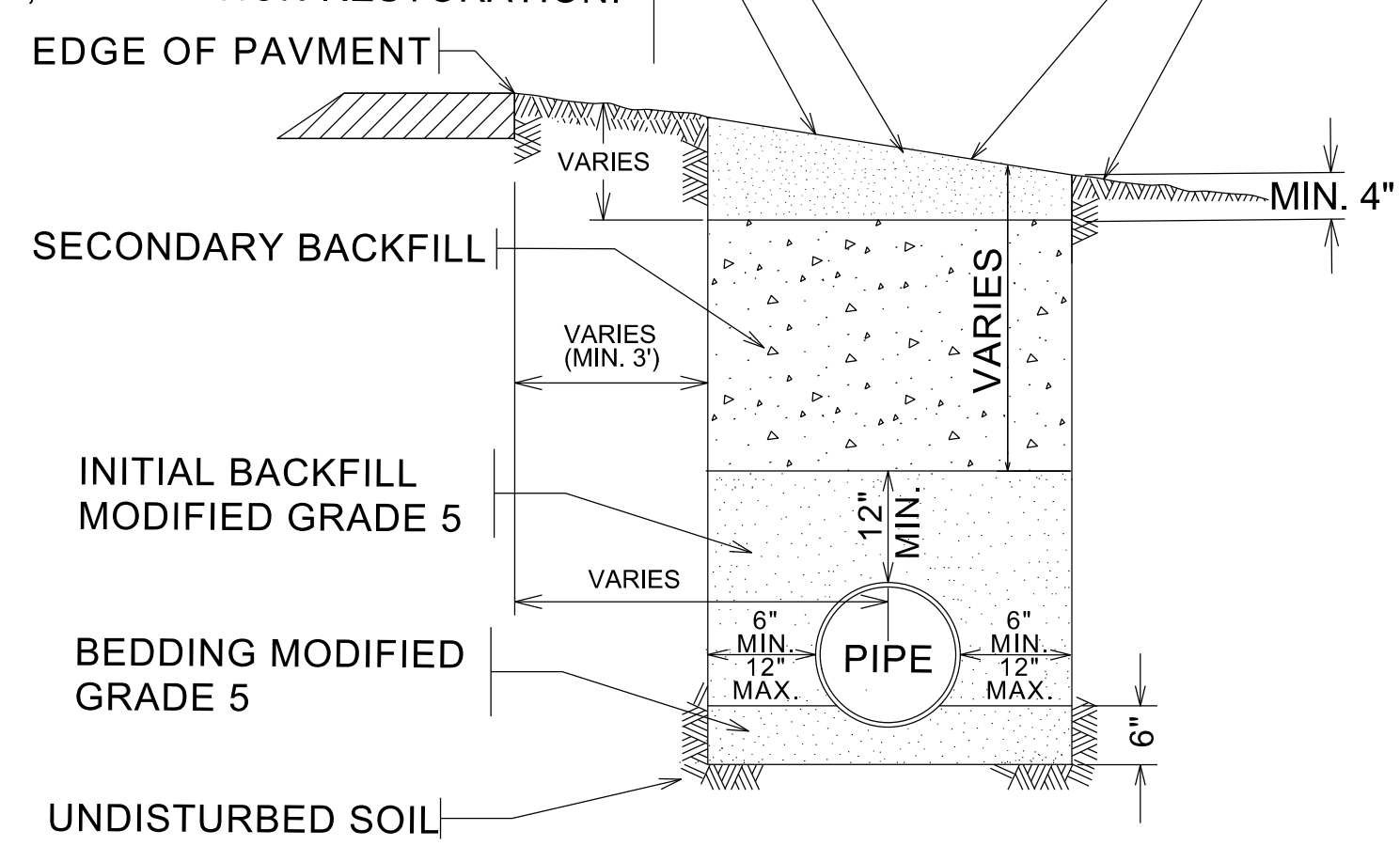
**TRENCH UNDER PAVEMENT (IF APPLICABLE)**  
N. T. S.

NOTE:

10" THICKNESS OF ASPHALT TREATED BASE, BENCHED 6 INCHES EACH SIDE OF TRENCH, WILL BE USED FOR THE FINAL LIFT OF THE TRENCH REPAIR AND FOR BASE FAILURE REPAIR. THE ASPHALT TREATED BASE, PLACED IN TWO LIFTS, WILL BE BROUGHT UP TO WITHIN 2 INCHES OF THE EXISTING PAVEMENT SURFACE.

FOR LONGITUDINAL SLOPES GREATER THAN 5%, GROUND STABILIZATION SHALL BE REQUIRED AS PER BEXAR COUNTY REQUIREMENTS

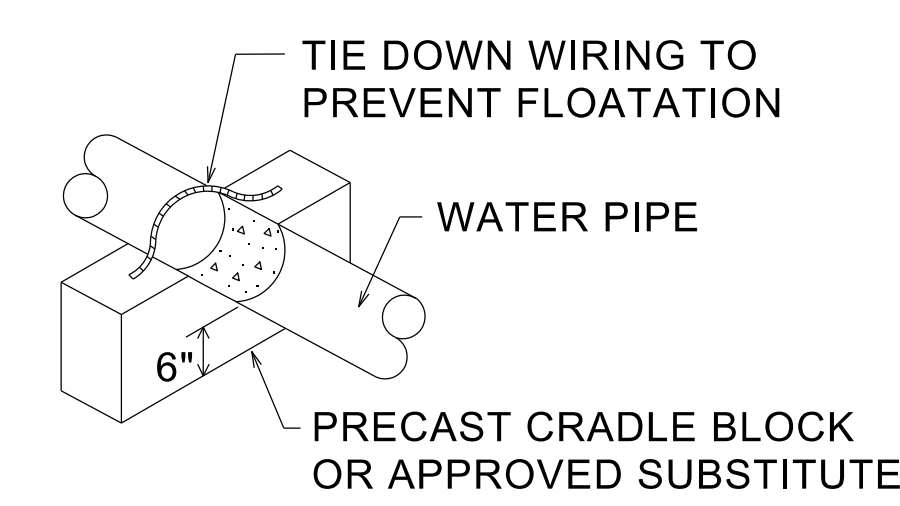
TOP SOIL AND REVEGETATE IN EQUAL OR BETTER CONDITIONS AS BEFORE. SEE SECTION 02360, VEGETATION RESTORATION.



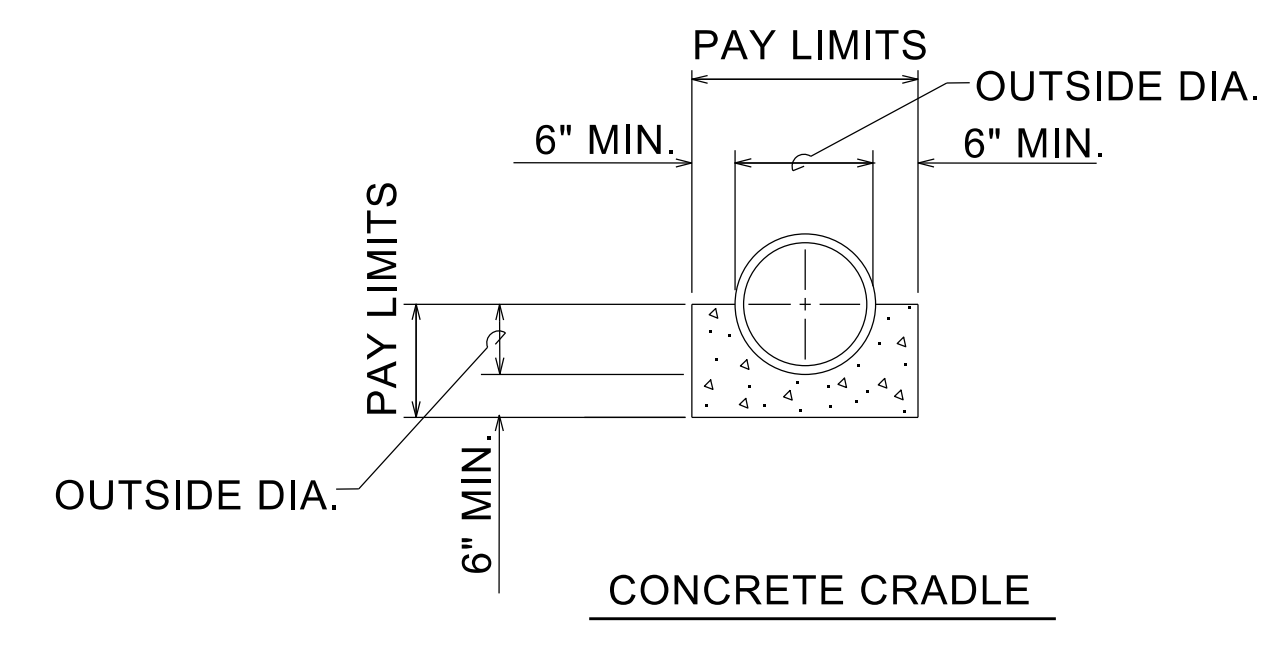
**TRENCH UNDER NATURAL GROUND ALONG SLOPED DITCH**  
N. T. S.

**NO SEPARATE PAY ITEM**

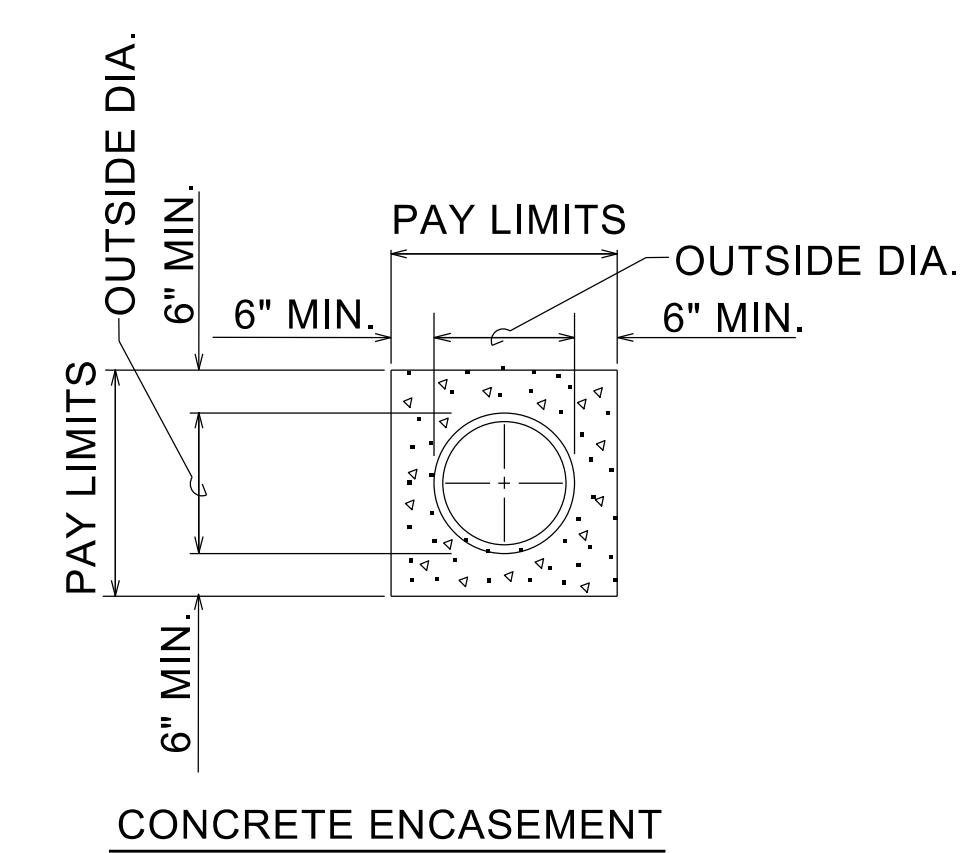
WHERE A SEWER CROSSES OVER A WATERLINE ALL PORTIONS OF THE SEWER WITHIN NINE FEET OF THE WATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 P.S.I. USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW CONVEYANCE MAY BE ENCASED IN A JOINT OF 150 P.S.I. CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THE NEW CONVEYANCE, THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT 5 FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALD WITH CEMENT GROUT OR MANUFACTURED SEAL.



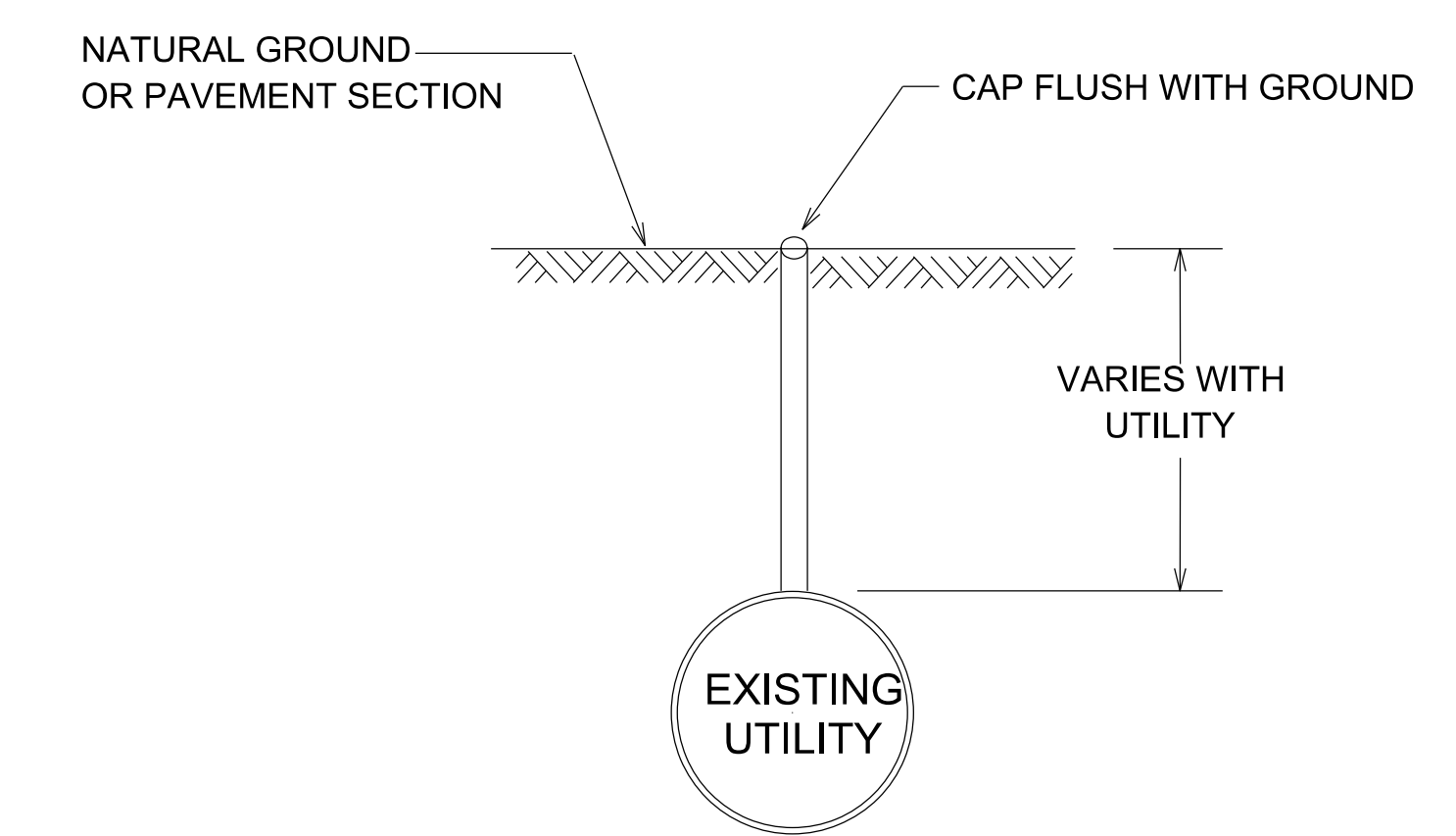
**SUPPORT FOR FOR ENCASEMENT OR CRADLE**



**TYPICAL CONCRETE ENCASEMENT DETAILS**  
N. T. S.

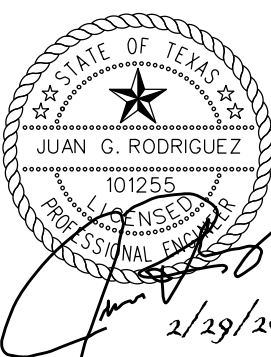


**CONCRETE ENCASEMENT**



- NOTE:
- CONTRACTOR SHALL INSERT 4" PVC TO TOP OF EXISTING UTILITY.
  - CONTRACTOR SHALL NOTIFY ENGINEER UPON COMPLETION OF ALL SPECIAL UTILITY LOCATES WHERE DESIGNATED ON PLANS. ENGINEER SHALL VERIFY UTILITY ELEVATION.
  - SUBSURFACE UTILITY INVESTIGATION USING VACUUM EXCAVATION IS REQUIRED.

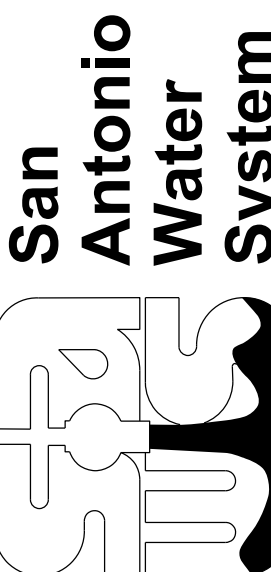
**SPECIAL MARKED UTILITY LOCATES**  
N. T. S.



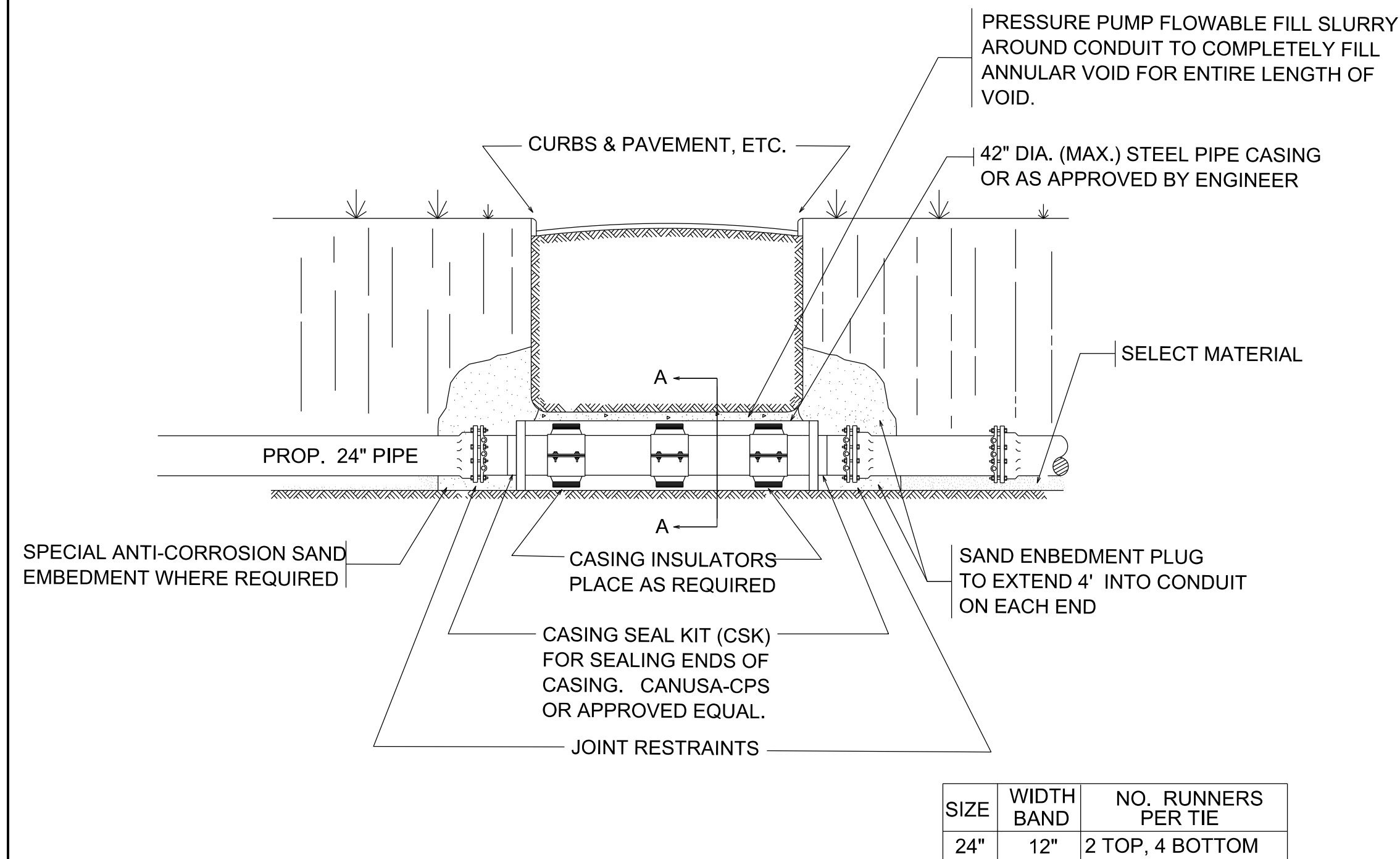
REVISIONS	Date	Dr.	Approved
No.			
Description			

INFORMATION

Date: 5-20-2011
Drawn by: TMJ
Designed by: TMJ
Checked by: JGR
Scale: AS NOTED ABOVE
Approved by: JGR
Map No:

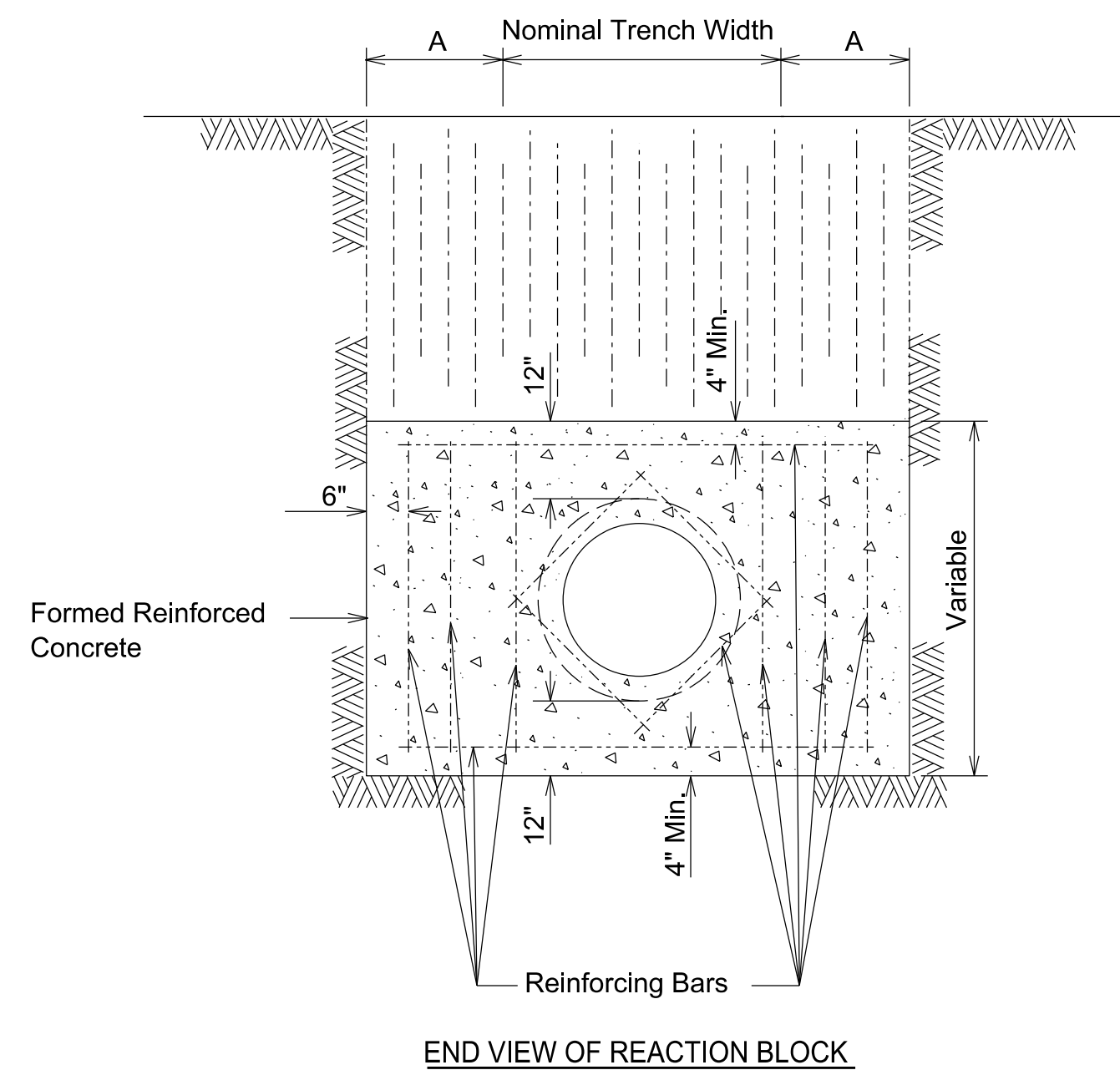


JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
WATER TRANSMISSION MAIN  
PROJECT

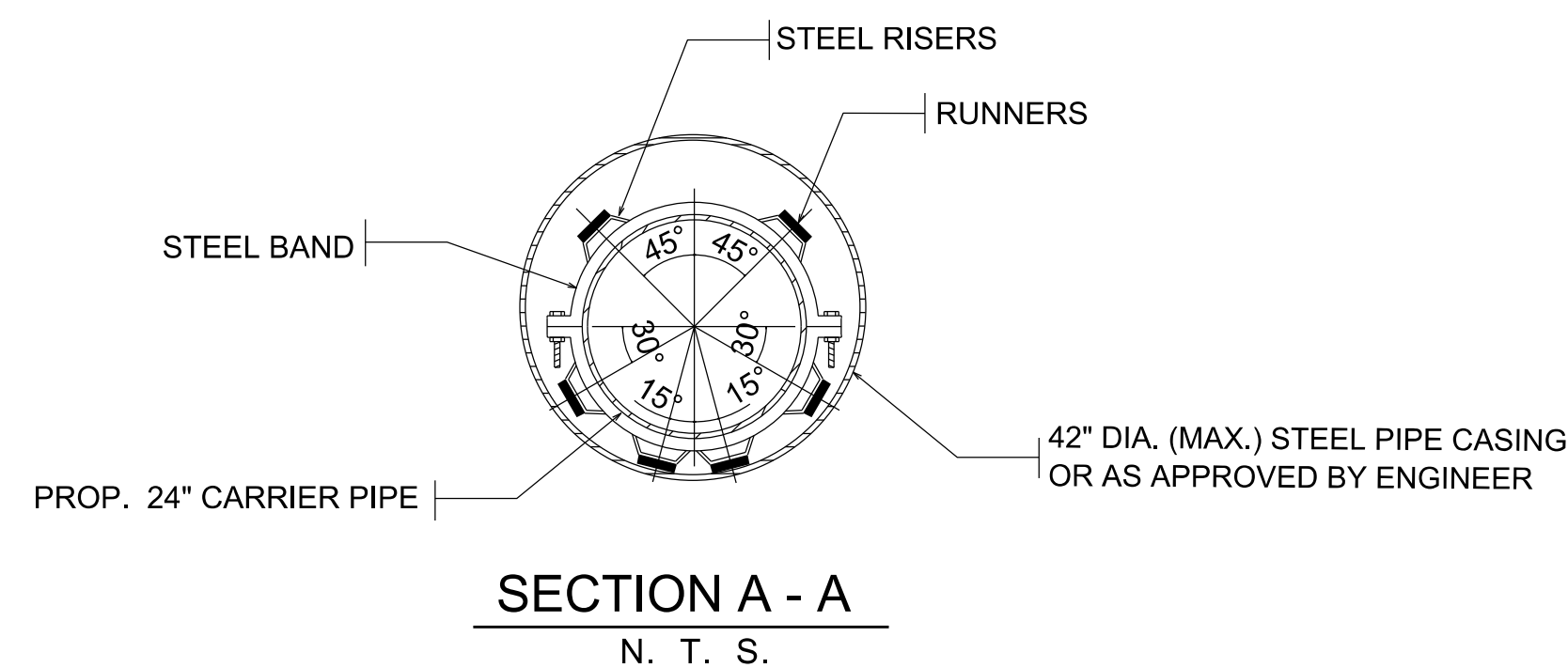


**SIDE VIEW**  
**BORE DETAIL FOR D.I., PVC OR STEEL PIPE**  
N. T. S.

WATER MAINS IN CONDUIT		
WATER MAIN SIZES (INCHES)	NOM. DIA. RCP* OR STEEL (INCHES)	STEEL PIPE THICKNESS (INCHES)
16	30	0.375
20	36	0.438
24	42	0.438
30	48	0.50
36	54	0.50

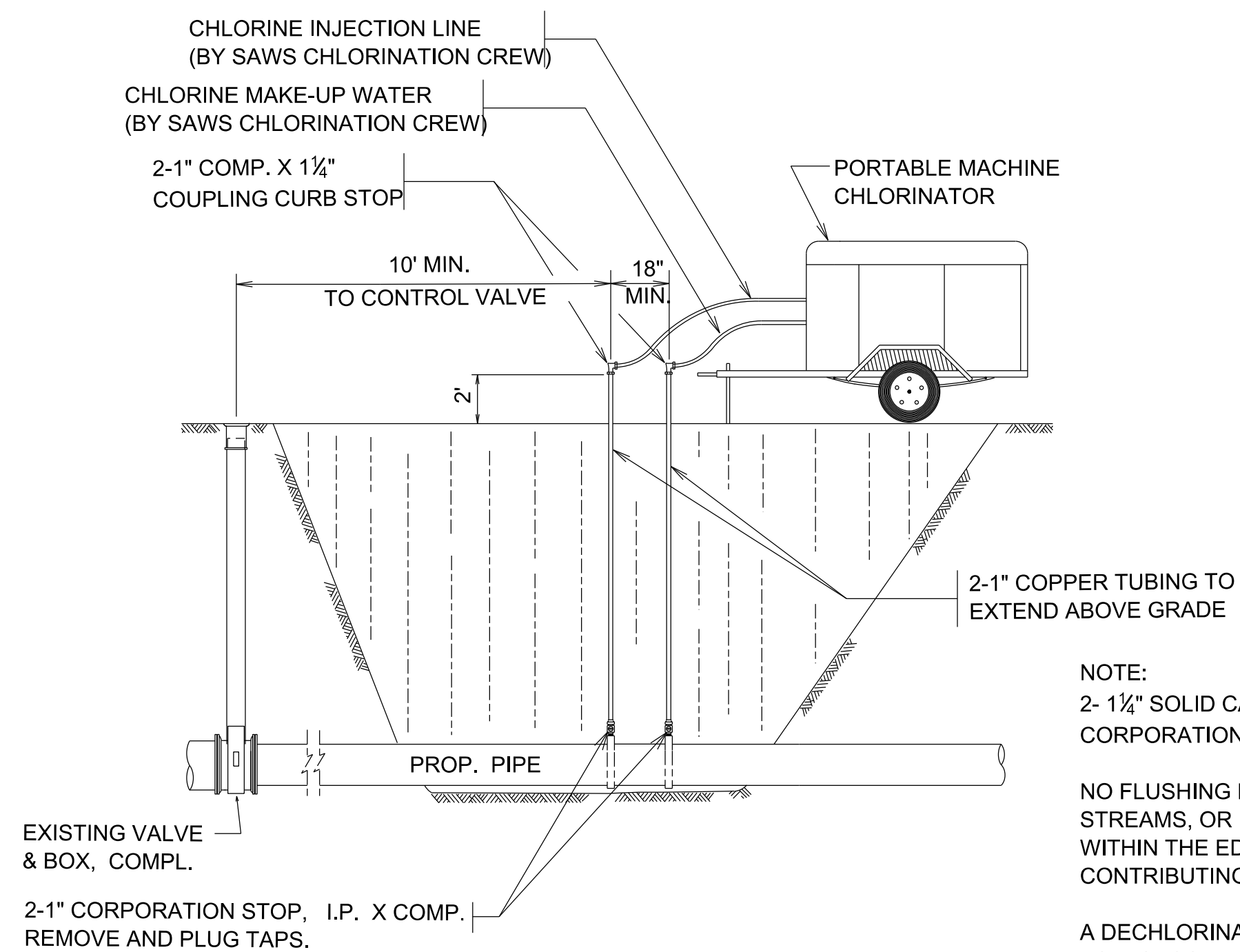


Main Size	A (Min.)	Reinforcing Bar Size	Bearing Surface Required (in Sq. Ft.)
6"	12"	#4	3
8"	12"	#4	5
12"	18"	#4	8
16"	18"	#4	12
20"	28"	#5	16
24"	28"	#5	23
30"	36"	#5	35
36"	36"	#5	50
42"	36"	#5	70



**SECTION A - A**  
**BORE UNDER PAVEMENT**  
N. T. S.

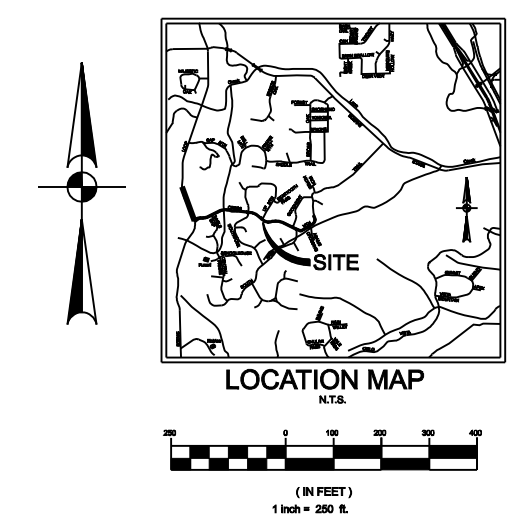
- NOTES:
- CASING INSULATORS IN ACCORDANCE TO SAWS STANDARD MATERIAL SPECIFICATIONS O5-31
  - ALIGNMENT AND GRADE OF CONDUIT WILL BE FLAT UNLESS SPECIFIED ON THE CONSTRUCTION PLANS



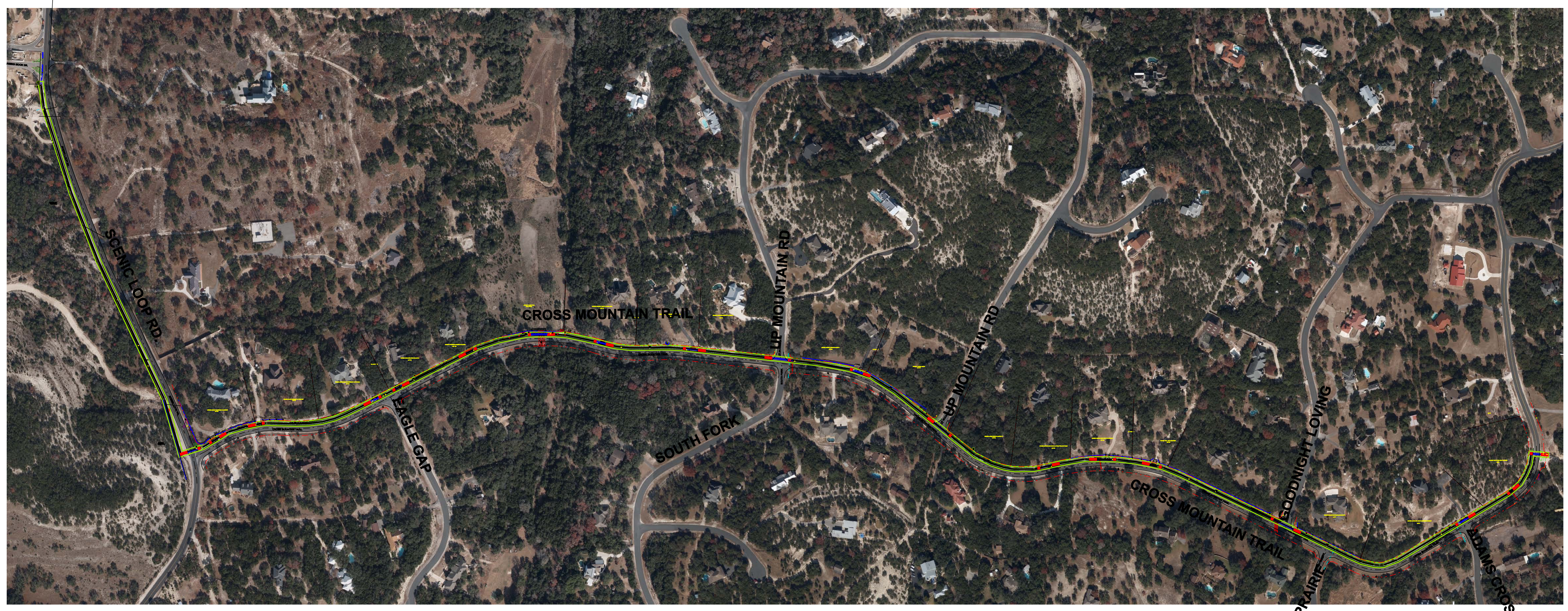
**STANDARD CHLORINATION INSTALLATION**  
N. T. S.

NOTE:  
2- 1½" SOLID CAP. THD. TO BE INSTALLED ON CORPORATION STOP AFTER CHLORINATION  
NO FLUSHING DISCHARGE INTO EXISTING CREEKS, STREAMS, OR RIVERS SINCE THE AREA IS SITUATED WITHIN THE EDWARDS AQUIFER RECHARGE AND CONTRIBUTING ZONES.  
A DECHLORINATION STATION SHALL BE REQUIRED TO DISPOSE ALL DISCHARGE WASTEWATER INTO AN APPROPRIATE FACILITY AS REQUIRED BY STATE AND FEDERAL REGULATIONS.

MISCELLANEOUS DETAILS



JOB NO.  
**10-7003**



REVISIONS	
No.	Description

LEGEND	
	PROP. 24" WATER MAIN
	PROP. TREE PROTECT LIMITS
	R.O.W.
	SURVEYED TREES
	BORER PIT
	TREE PROTECTION FENCE

Date: 05/02/2011	Drawn by: TMJ
Designed by: TMJ	Checked by: JGR
Scale: AS NOTED ABOVE	Approved by: JGR

**San Antonio Water System**

**GENERAL NOTES**

- ALL PROTECTED SIZE TREES AFFECTED BY CONSTRUCTION SHALL HAVE THE LIMBS AND ROOTS TRIMMED AND PRUNED ACCORDING TO ITEM No. 802. (TREE PRUNING, SOIL AMENDING AND FERTILIZATION), UNLESS SPECIFIED TREES SHALL RECEIVE LEVEL 1 PROTECTION AS PER ITEM No. 801. (TREE AND LANDSCAPE PROTECTION) AND AS DETAILED IN 1.1.2.
- ALL TREES SHALL REMAIN UNLESS NOTED ON THE CITY APPROVED PLANS.
- NO SITE PREPARATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND PROTECTION MEASURES HAVE NOT BEEN COMPLETED AND APPROVED BY THE CITY ARBORIST OFFICE.
- TREE PROTECTION FENCING SHALL BE MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING SITE CONSTRUCTION.
- THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN THREE INCHES (3") IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN THE VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR IF ROOTS LARGER THAN THREE INCHES (3") WITHIN THE FIVE FOOT (5') ROOT PROTECTION ZONE NEED TO BE PRUNED.
- THE ROOT PROTECTION ZONE IS THAT AREA SURROUNDING A TREE, AS MEASURED BY A RADIUS FROM THE TREE TRUNK, IN WHICH NO EQUIPMENT, VEHICLES OR MATERIALS MAY OPERATE OR BE STORED. THE REQUIRED RADIUS LENGTH IS ONE FOOT (1') PER DIAMETER INCH OF THE TREE. FOR EXAMPLE, A TEN INCH (10") DIAMETER TREE WOULD HAVE A TEN FOOT (10') RADIUS ROOT PROTECTION ZONE AROUND THE TREE. ROOTS OR BRANCHES THAT ARE IN CONFLICT WITH THE CONSTRUCTION SHALL BE CUT CLEANLY ACCORDING TO PROPER PRUNING METHODS. LIVE OAK WOUNDS SHALL BE PAINTED OVER, WITHIN TWENTY (20) MINUTES TO PREVENT OAK WILT.
- NO DISTURBANCE SHALL OCCUR CLOSER TO THE TRUNK THAN HALF THE ROOT PROTECTION ZONE AREA.
- TREES, SHRUBS OR BUSHES TO BE CLEARED FROM PROTECTED ROOT ZONE AREAS SHALL BE REMOVED BY HAND.
- TREES DAMAGED OR LOST DUE TO CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED.
- EXPOSED ROOTS SHALL BE COVERED AT THE END OF EACH DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH OR WET BURLAP.
- ANY TREE REMOVAL SHALL BE APPROVED BY THE CITY ARBORIST OFFICE PRIOR TO ITS REMOVAL.

**TREE CANOPY**  
**24" WATER LINE**  
**TOTAL: 130,695.31sq ft**  
**TOTAL: 3.00 acres**

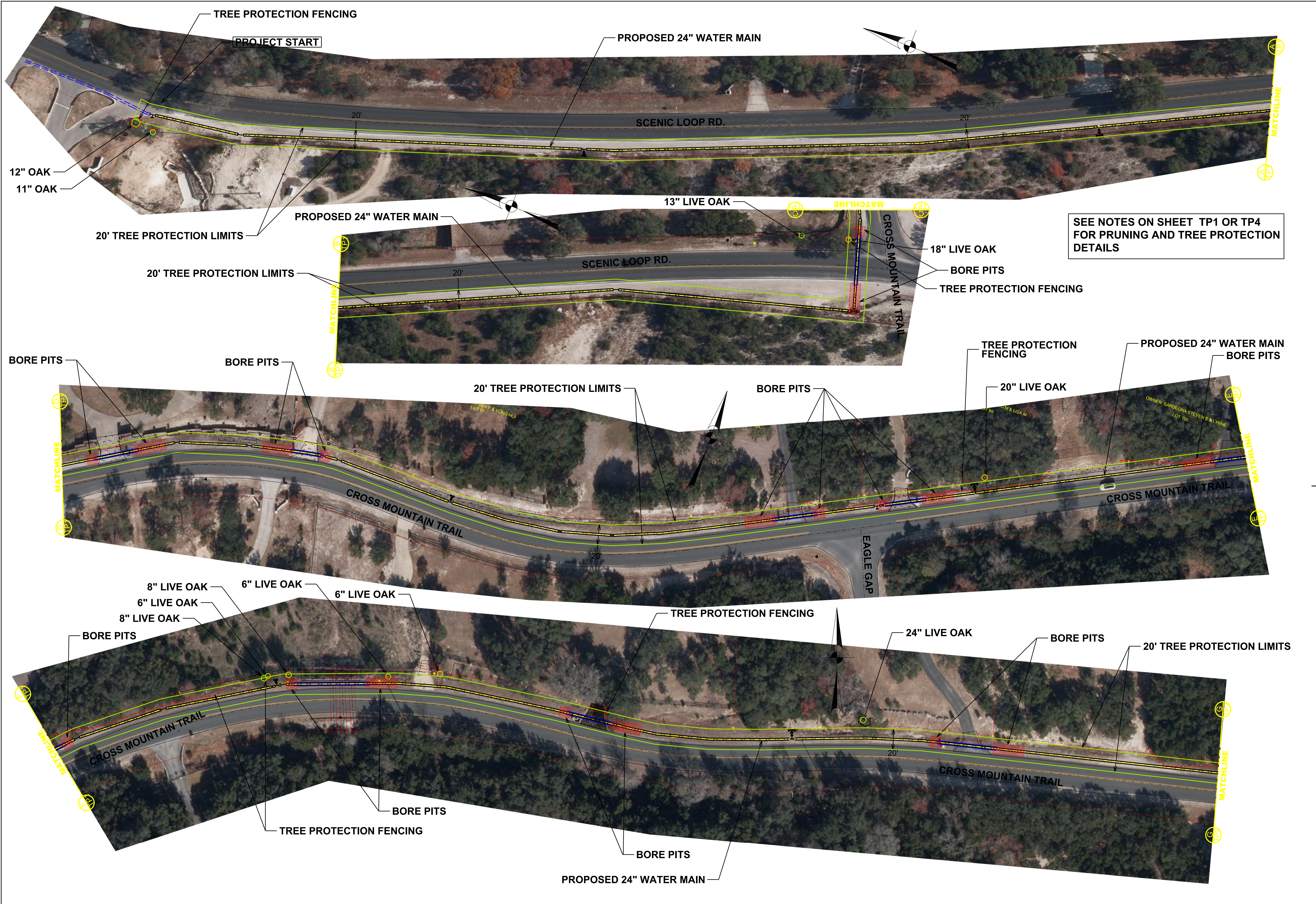
**TREE CANOPY IN NON FLOOD PLAIN**  
**TOTAL: 0.00sq ft**  
**TOTAL REMOVED: 0.00sq ft**  
**TOTAL PRESERVED: 100 %**

**TREE CANOPY IN FLOOD PLAIN**  
**TOTAL: 0.00sq ft**  
**TOTAL REMOVED: 0.0sq ft**  
**TOTAL PRESERVED: 100%**

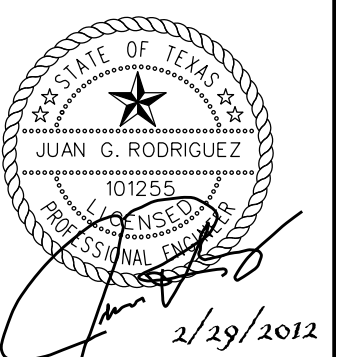
SAWS JOB NO. 10-7003  
**CROSS MOUNTAIN TRAIL**  
**24" WATER TRANSMISSION MAIN**  
**PROJECT**

TREE PROTECTION PERMIT  
 OVERALL LAYOUT

**DRAWING NO.**  
**TP1**  
 24 OF 35



JOB NO.  
**10-7003**



No.	Description	Drn.	Approved	Date

**LEGEND**

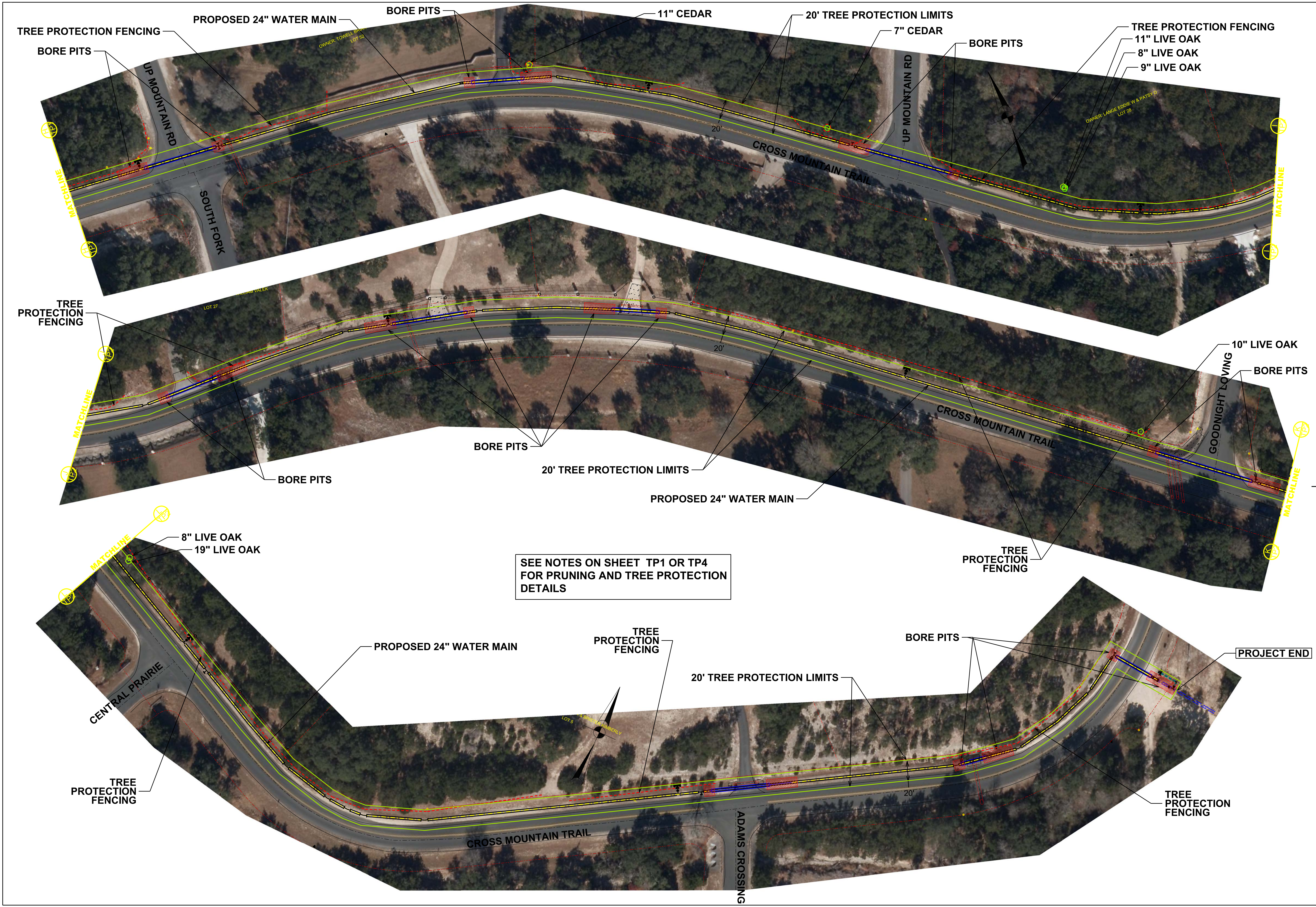
- PROP. 24" WATER MAIN
- PROP. TREE PROTECT LIMITS
- R.O.W.
- SURVEYED TREES
- BORE PIT
- TREE PROTECTION FENCE

Date: 05/02/2011  
 Drawn by: TMJ  
 Designed by: TMJ  
 Checked by: JR  
 Scale: AS NOTED ABOVE  
 Approved by: JGR



SAWS JOB NO. 10-7003  
 CROSS MOUNTAIN TRAIL  
 24" WATER TRANSMISSION MAIN  
 PROJECT  
 TREE PERMIT  
 PROTECTION PLAN

DRAWING NO.  
**TP2**  
25 OF 35



JOB NO.  
**10-7003**

DATE: 2/29/2012

DATE: 05/02/2011

Drawn by: TMJ  
Designed by: TMJ  
Checked by: JGR  
Scale: AS NOTED ABOVE  
Approved by: JGR

**San Antonio Water System**

SAWS JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
24" WATER TRANSMISSION MAIN  
PROJECT

PLAN AND PROFILE DRAWING  
STA. 00+00 TO STA. 04+50

DRAWING NO.  
**TP3**  
26 OF 35

No.	Description	Drn.	Approved	Date

LEGEND

- PROP. 24" WATER MAIN
- PROP. TREE PROTECT. LIMITS
- R.O.W.
- SURVEYED TREES
- BORE PIT
- TREE PROTECTION FENCE





## SITE DESCRIPTION

PROJECT NAME AND LOCATION: 24" WATER TRANSMISSION MAIN - CROSS MOUNTAIN TRAIL PROJECT (SAWS JOB NO. 10-7003)

THE PROPOSED 24-INCH DIAMETER WATER MAIN INSTALLATION SHALL COMMENCE AT THE EXISTING 24-INCH WATER MAIN TIE-IN LOCATED AT THE SOUTHWEST CORNER OF THE SCENIC LOOP AND RISING MOON DR. INTERSECTION LOCATED IN NORTHWEST SAN ANTONIO, TEXAS.

THE 24-INCH WATER MAIN SHALL BE CONVEYED APPROXIMATELY 0.30 MILE (1,600 LF) SOUTHWARD ALONG SCENIC LOOP AND DIVERT EASTWARD AT THE SCENIC LOOP AND CROSS MOUNTAIN TRAIL, AND SHALL CONTINUE EASTWARD ALONG CROSS MOUNTAIN TRAIL APPROXIMATELY 1.14 MILE (6040 LF) TO A TIE-IN 24-INCH WATER MAIN LOCATED APPROXIMATELY 500 FEET NORTHEAST FROM THE CROSS MOUNTAIN TRAIL AND ADAM'S CROSSING INTERSECTION.

CONTACT AND PHONE NO.: (CONTRACTOR)

PROJECT DESCRIPTION: THE PROJECT CONSISTS OF INSTALLING APPROXIMATELY 7,650 LINEAR FEET OF 24" Ø WATER MAIN WHICH

INCLUDES BUT NOT LIMITED TO PIPELINE INSTALLATION, FITTINGS, VALVES, HYDRANTS, BORES, TREE PRESERVATION, TRAFFIC

CONTROL AND EROSION CONTROL MEASURES.

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBANCE ACTIVITIES WILL INCLUDE PREPARING EXISTING PUBLIC RIGHT-OF-WAYS, CLEARING AND GRUBBING, TRENCHING, BORING PIT AREAS, EROSION AND SEDIMENT CONTROLS, AND TOPSOIL WORK FOR FINAL SEEDING.

TOTAL PROJECT AREA (ACRES): APPROX. 3.16 ACRE

TOTAL AREA TO BE DISTURBED: APPROX. 3.0 ACRE

WEIGHTED RUNOFF COEFFICIENT: (AFTER CONSTRUCTION)  $C_{WEIGHTED} = 0.57$  (POST-CONSTRUCTION)

$C_{PERVIOUS} = 0.55$  (POST-CONSTRUCTION), PERVIOUS AREA = 2.99 ACRE

$C_{IMPERVIOUS} = 0.90$  (POST-CONSTRUCTION), IMPERVIOUS AREA = 0.17 ACRE

EXISTING CONDITION OF SOIL VEGETATIVE COVER AND % OF VEGETATIVE COVER: (CONTRACTOR TO PROVIDE)

DESCRIPTION OF WATER DISCHARGED NOT ASSOCIATED WITH CONSTRUCTION: (CONTRACTOR TO PROVIDE)

NAME OF RECEIVING WATERS: THE DISTURBED AREAS WILL ULTIMATELY DISCHARGE INTO AN EXISTING UNNAMED TRIBUTARY CREEK WHICH IS PART OF THE LEON CREEK SYSTEM.

IDENTIFY STORMWATER DISCHARGE POINTS: (CONTRACTOR TO PROVIDE)

A DESCRIPTION AND TIME FRAME FOR INSTALLATION OF STABILIZATION PRACTICES IN CONJUNCTION WITH CONSTRUCTION: APPROXIMATELY 12 MONTH CONSTRUCTION TIME FRAME

## EROSION AND SEDIMENTATION CONTROLS

### SOIL STABILIZATION PRACTICES:

- HYDROMULCHING
- TEMPORARY SEEDING
- PERMANENT PLANTING, SODDING OR SEEDING
- MULCHING
- SOIL RETENTION BLANKET
- BUFFER ZONES
- PRESERVATION OF NATURAL RESOURCES

### OTHER:

DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND DONE WITHIN 21 DAYS.

### STRUCTURAL PRACTICES:

- SILT FENCES
- HAY BALES
- GRAVEL FILTRATION BAGS
- ROCK BERMS
  - DIVERSION, INTERCEPTOR OR PERIMETER DIKES
  - DIVERSION, INTERCEPTOR OR PERIMETER SWALES
  - DIVERSION, DIKE AND SWALE COMBINATIONS
- PAVED FLUMES
- ROCK BEDDING AT CONSTRUCTION EXIT (STABILIZED ENTRANCE)
- TIMBER MATTING AT CONSTRUCTION EXIT (STABILIZED ENTRANCE)
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM INLET SEDIMENT TRAP
- STONE OUTLET SEDIMENT STRUCTURES
- CURBS AND GUTTERS
- STORM SEWERS
- VELOCITY CONTROL STRUCTURES
- GEOTEXTILES

### OTHER:

### NARRATIVE – SEQUENCE OF CONSTRUCTION (STORMWATER MANAGEMENT) ACTIVITIES:

THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS: INSTALL SEDIMENT CONTROL FENCES, ROCK BERMS, FILTRATION BAGS AND

CONSTRUCTION EXITS. REMOVE / INSTALL / ADJUST TEMPORARY EROSION, SEDIMENT, AND STORM WATER POLLUTION

CONTROL MEASURES. SITE CLEANUP AND REVEGETATION OF DISTURBED AREAS. REMOVAL OF TEMPORARY CONTROL

DEVICES.

### A DESCRIPTION OF MAINTENANCE

PROCEDURES FOR CONTROL MEASURES USED: DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION

SHALL BE INSPECTED FOR EVIDENCE OF POLLUTANTS ENTERING THE CREEK SYSTEMS. LOCATIONS WHERE VEHICLE AND

EQUIPMENT ENTER, EXIT OR TRAVEL THROUGH THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING.

CONTRACTOR SHALL PROVIDE CONTROL MEASURES TO REPAIR / REPLACE APPURTENANCES AS NEEDED.

STORMWATER MANAGEMENT: CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE TO EXISTING STORM WATER

SYSTEMS. STORM WATER DISCHARGE SHALL BE CONVEYED THROUGH EXISTING STORM DRAIN SYSTEMS, CULVERTS, CHANNELS,

NATURAL STREAMS, DITCHES, ETC. ALL DISTURBED AREAS SHALL BE RESTORED TO BETTER CONDITIONS.

### A DESCRIPTION OF PERMANENT

STORM WATER MANAGEMENT CONTROLS: (NOT APPLICABLE)

### OTHER EROSION AND SEDIMENTATION CONTROLS

#### MAINTENANCE:

ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER THE SURROUNDING EXPOSED GROUND HAS DRIED SUFFICIENTLY TO PREVENT FURTHER DAMAGE FROM HEAVY EQUIPMENT. THE AREAS ADJACENT TO CREEKS AND DRAINAGEWAYS SHALL HAVE PRIORITY, FOLLOWED BY DEVICES PROTECTING STORM SEWER INLETS.

#### INSPECTION:

AN INSPECTION WILL BE PERFORMED BY THE CONTRACTOR EVERY 14 DAYS AS WELL AS AFTER EVERY 1/2" OR MORE OF RAIN (RECORDED ON A NON-FREEZING RAIN GAUGE TO BE LOCATED AT THE PROJECT SITE). AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE CORRECTED BEFORE THE NEXT SCHEDULED INSPECTION.

#### WASTE MATERIALS:

ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION AND THE TRASH WILL BE HAULED TO A LOCAL DUMP. NO CONSTRUCTION MATERIALS WILL BE BURIED ON SITE.

#### HAZARDOUS WASTE (INCLUDING SPILL REPORTING):

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, GASOLINE, MOTOR OIL, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS AND MEETS REPORTING REQUIREMENTS, THE NATIONAL RESPONSE CENTER SHOULD BE CONTACTED AT 800-424-8802 AND ANY REQUIRED CHANGES MADE TO THE SWPPP. IN THE EVENT OF A LIFE THREATENING SPILL THE SAN ANTONIO FIRE DEPARTMENT SHOULD BE NOTIFIED AS WELL AS THE APPROPRIATE CITY INSPECTORS.

SANITARY WASTE (NOT APPLICABLE)

OFFSITE EXCAVATION SOURCE LOCATION (NOT APPLICABLE)

OFFSITE FILL SOURCE LOCATION STAGING AREAS FOR FILL MATERIAL SHALL BE DETERMINED BY THE CONTRACTOR.

OFFSITE VEHICLE TRACKING (NOT APPLICABLE)

HAUL ROADS DAMPENED FOR DUST CONTROL.

LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN

EXCESS DIRT ON ROAD TO BE REMOVED DAILY

STABILIZED CONSTRUCTION ENTRANCE.

#### OTHER:

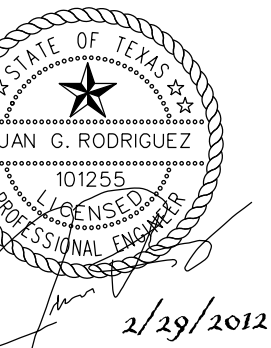
CERTIFICATION THAT SITE DISTURBANCE AND / OR DISCHARGES WILL NOT EFFECT LISTED ENDANGERED SPECIES AND THEIR HABITAT. WHAT METHOD IS USED TO SATISFY THE ENDANGERED SPECIES REQUIREMENTS? \_\_\_\_\_

#### REMARKS:

DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT ENTERS RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, BODY OF WATER, STREAM BED OR FLOODPLAIN CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED AS SOON AS POSSIBLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSE WORK, PILING DEBRIS OR OTHER OBSTRUCTION PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK.

JOB NO.

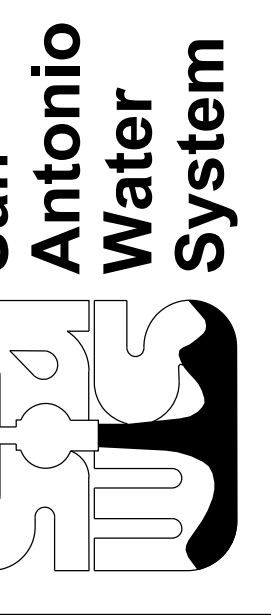
**10-7003**



Date	Approved	REVISIONS	
		Drn.	Description

INFORMATION	
No.	Description

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Designed by: JGR	Checked by: JGR
Scale: AS NOTED ABOVE	Approved by: JGR
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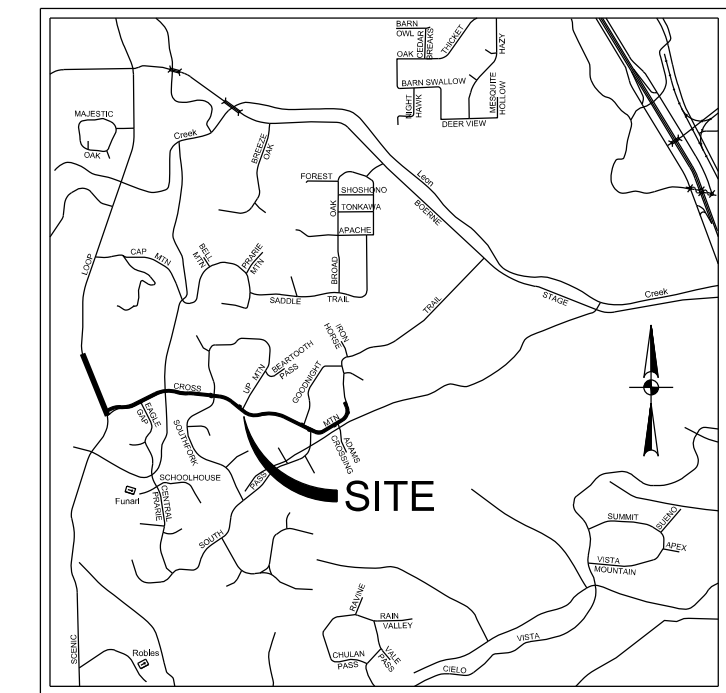
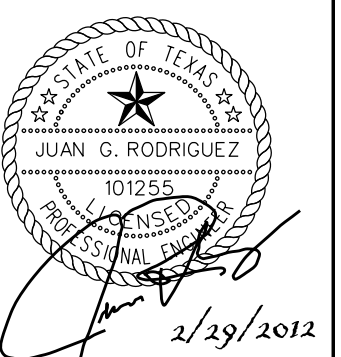


JOB NO. 10-7003  
 CROSS MOUNTAIN TRAIL  
 24" WATER TRANSMISSION MAIN  
 PROJECT  
 EROSION CONTROL & SEDIMENTATION PLAN  
 SW3P NARRATIVE

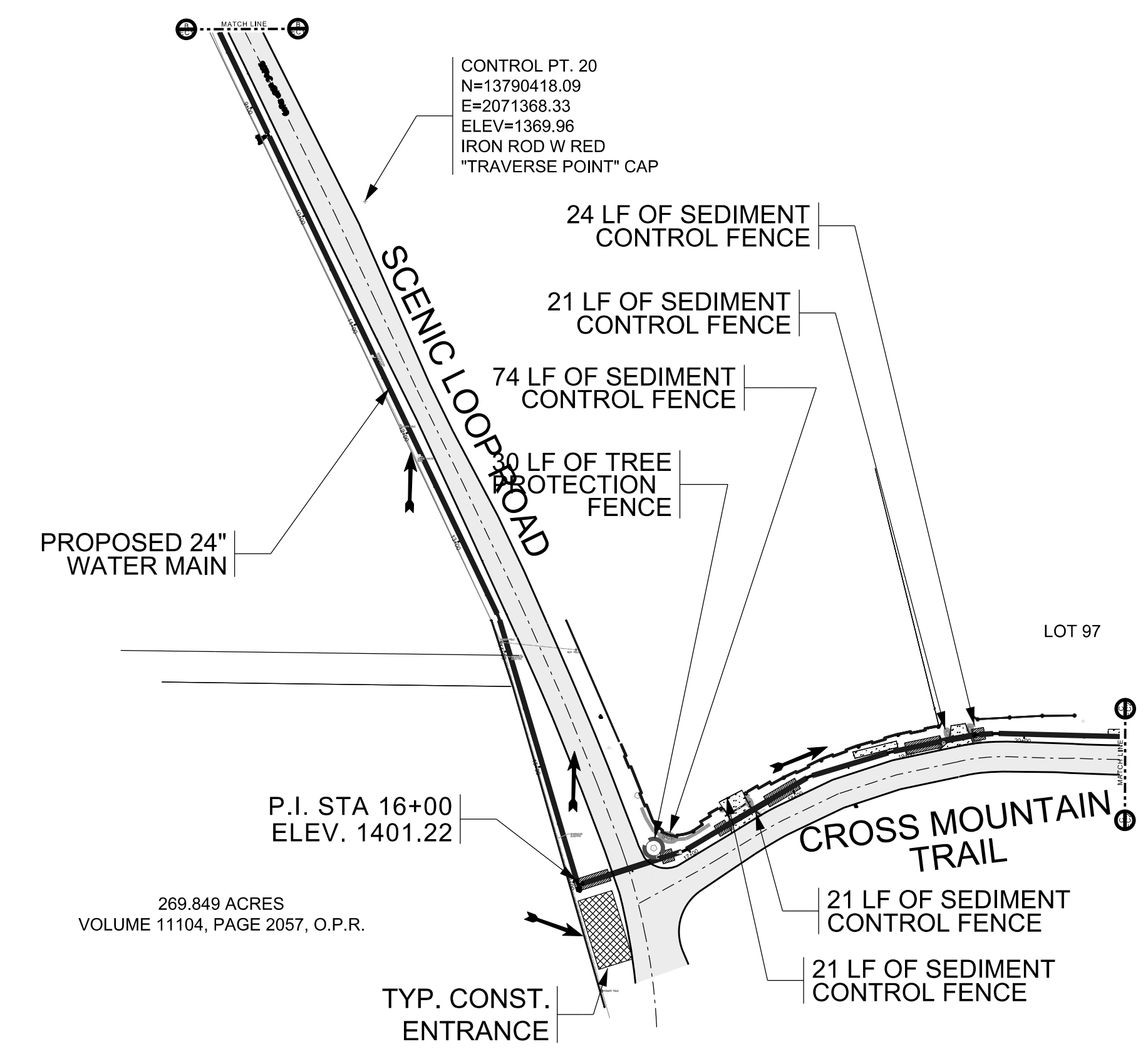
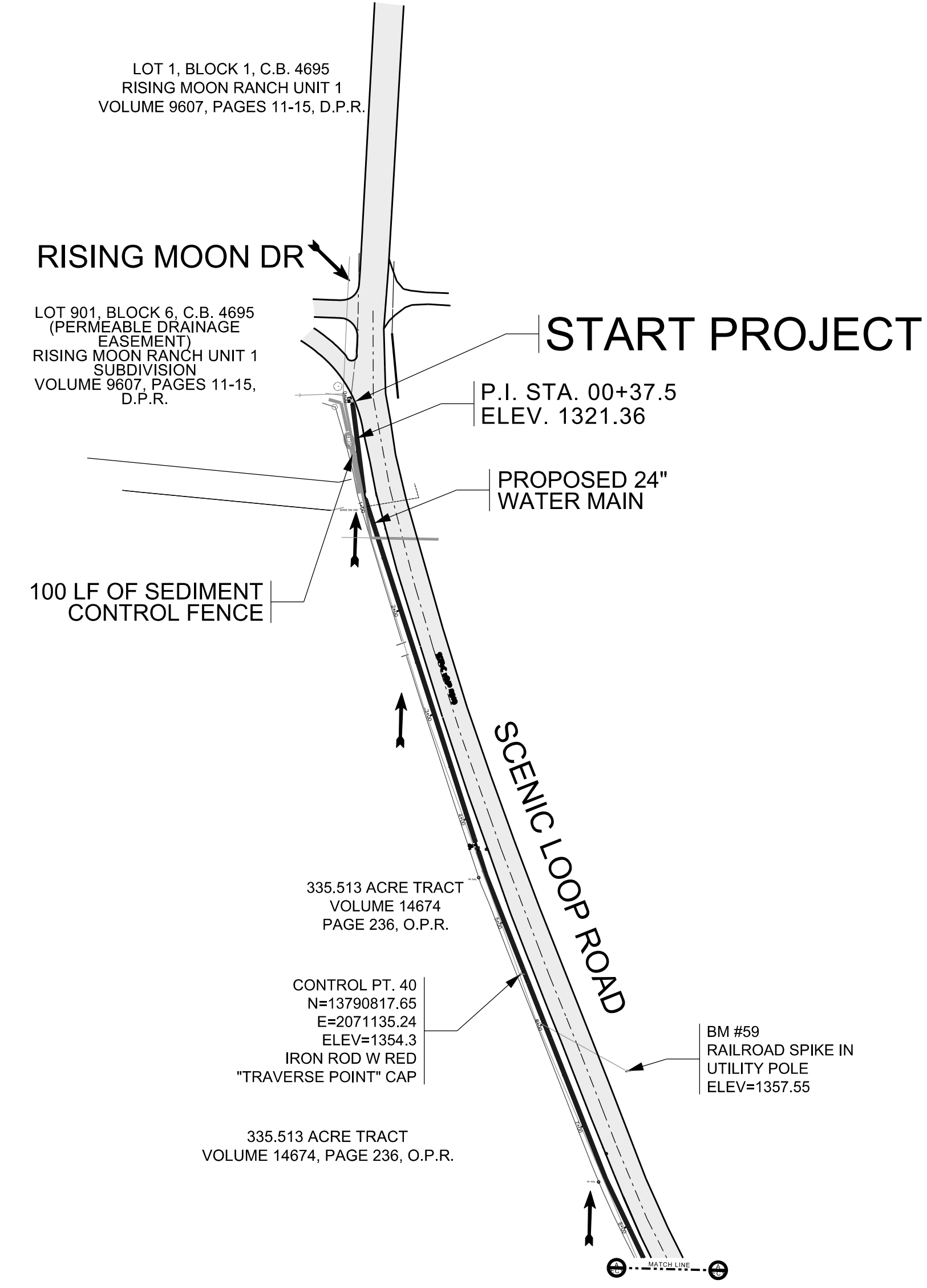
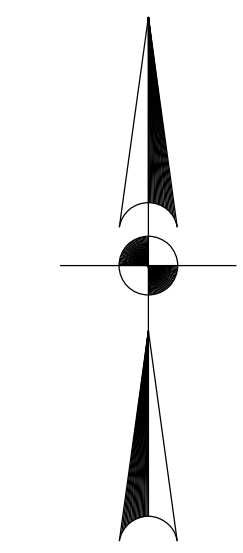
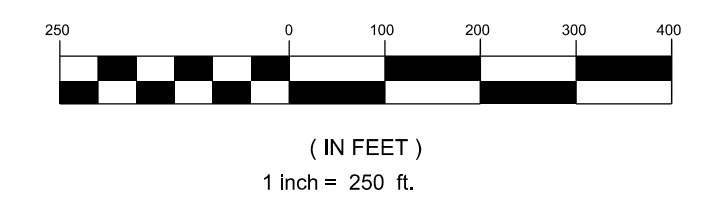
DRAWING NO.

**EC1**

28 OF 35



LOCATION MAP  
N.T.S.



GENERAL NOTES

- DO NOT DISTURB ANY VEGETATED AREAS (TREES, GRASS, WEEDS, BRUSH, ETC.) THAT ARE NOT AUTHORIZED PER C.O.S.A TREE PERMIT. CONTRACTOR SHALL BE RESPONSIBLE TO RESTORE ANY DISTURBED AREA THAT IS NOT PART OF THE TREE PERMIT AT HIS OWN EXPENSE.
- CONSTRUCTION ENTRANCE / EXIT LOCATIONS, CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD TO BE DETERMINED IN THE FIELD. ALL BEST MANAGEMENT PRACTICE AS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. CONTRACTOR SHALL PROVIDE A STORM WATER POLLUTION PREVENTION PLAN FOR THIS PROJECT AND SUBMIT TO THE REGULATORY AGENCY ACCORDINGLY. (NO SEPARATE PAY ITEM)
- ALL STORM WATER POLLUTION PREVENTION CONTROLS SHALL BE MAINTAINED AND IN WORKING CONDITIONS AT ALL TIMES, ESPECIALLY AFTER ANY RAINFALL THAT MAY OCCUR DURING CONSTRUCTION.
- STORM WATER POLLUTION PREVENTION CONTROLS SHALL BE CONSTRUCTED WITHIN THE SITE BOUNDARIES AND INSTALLED ACCORDINGLY. SOME OF THESE FEATURES MAY BE SHOWN OUTSIDE THE SITE BOUNDARIES FOR VISUAL CLARITY.
- BEST MANAGEMENT PRACTICE APPURTENANCES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADIEND AREAS. BEST MANAGEMENT PRACTICE APPURTENANCES MAY BE REMOVED IN STAGES ONCE THE WATERSHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED IN ACCORDANCE WITH TPDES REQUIREMENTS.
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- REFER TO TEMPORARY EROSION CONTROL NOTES ON SHEET GN1 FOR ADDITIONAL INFORMATION.

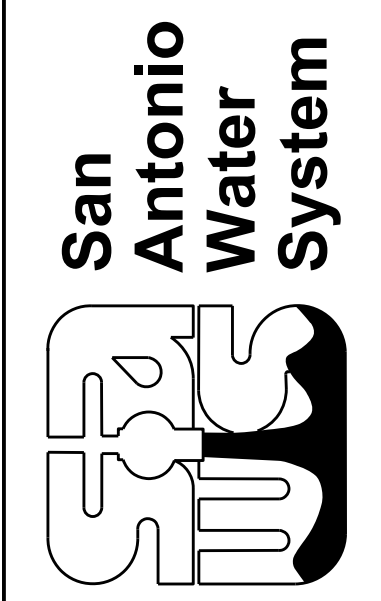
LEGEND	
	CONSTRUCTION ENTRANCE/EXIT
	SEDIMENT CONTROL FENCE
	TREE PROTECTION FENCE
	ROCK FILTER DAM TYPE 4
	DRAINAGE ARROWS
	PROPOSED WATER MAIN

REVISIONS	No.	Description	Drm.	Approved	Date

INFORMATION

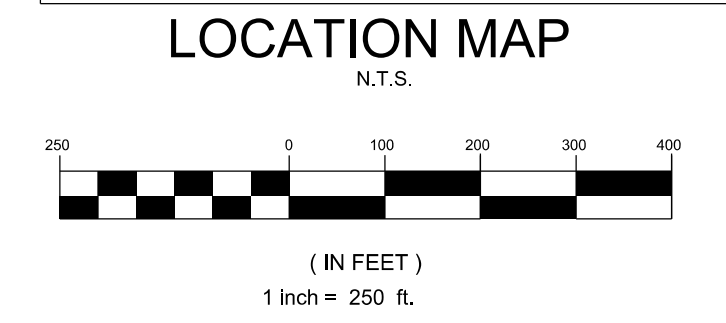
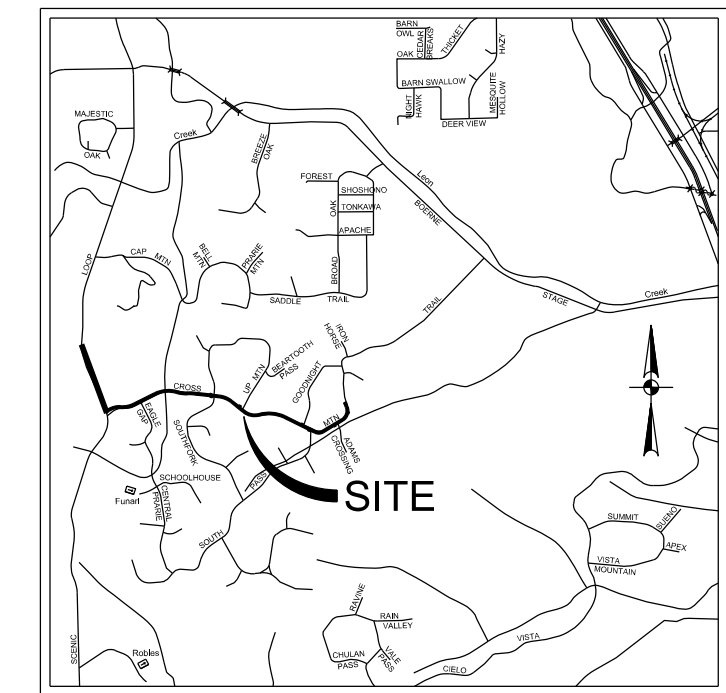
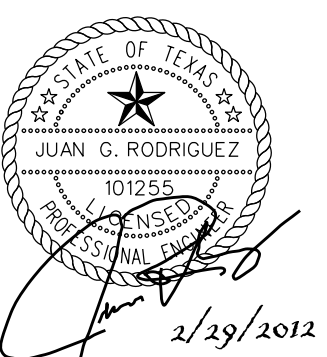
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Drawn by: TMJ
Designed by: TMJ
Checked by: JGR
Scale:
Approved by: JGR
Map No:



SAWS JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
24" WATER TRANSMISSION MAIN  
PROJECT

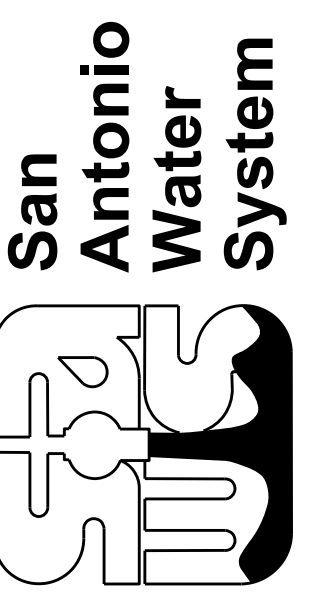
EROSION CONTROL & SEDIMENTATION PLAN



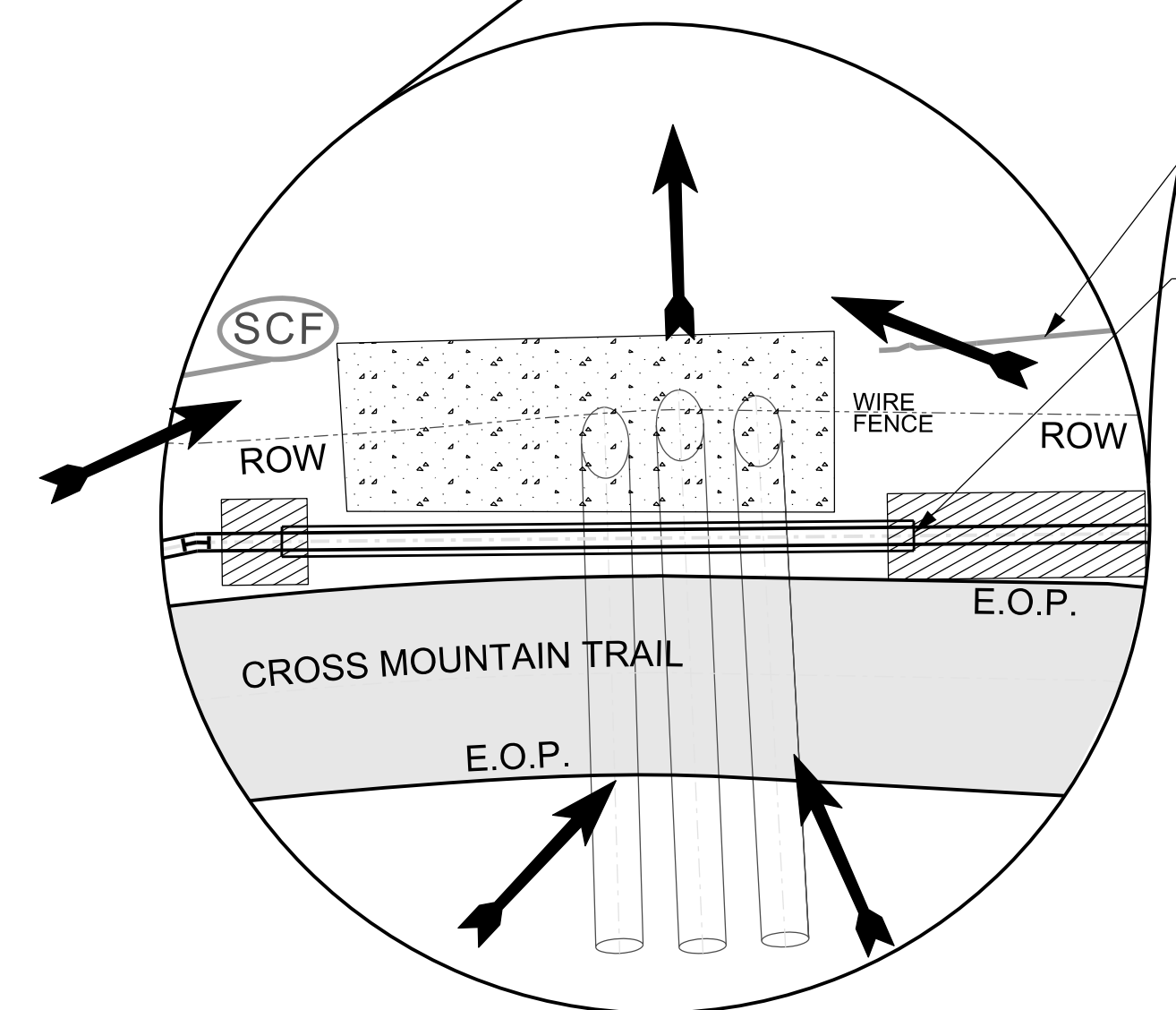
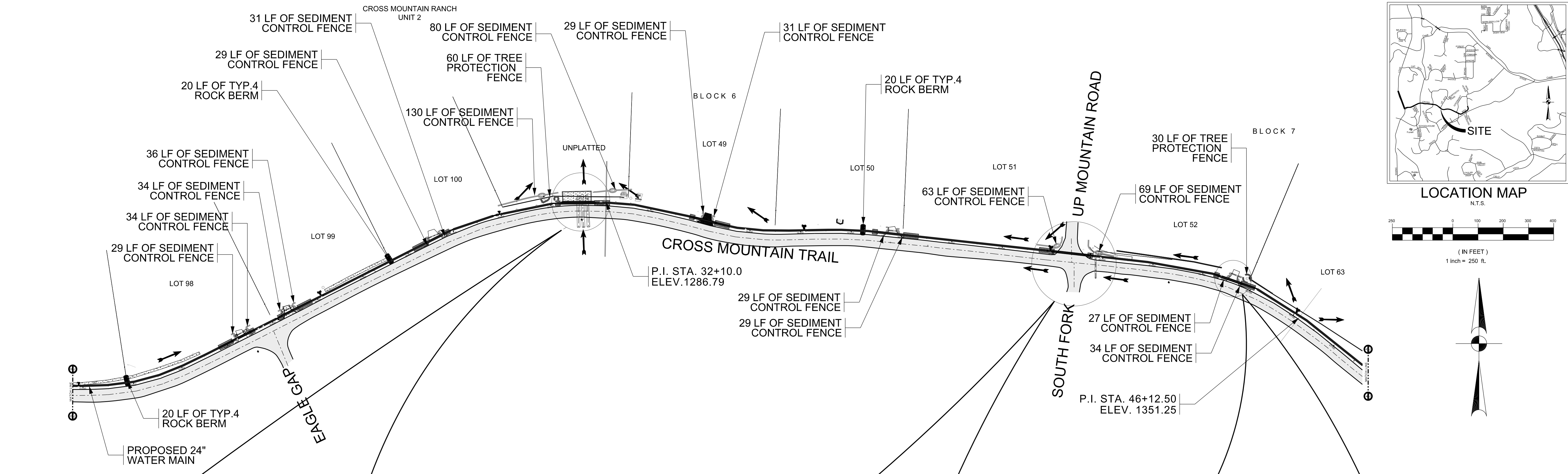
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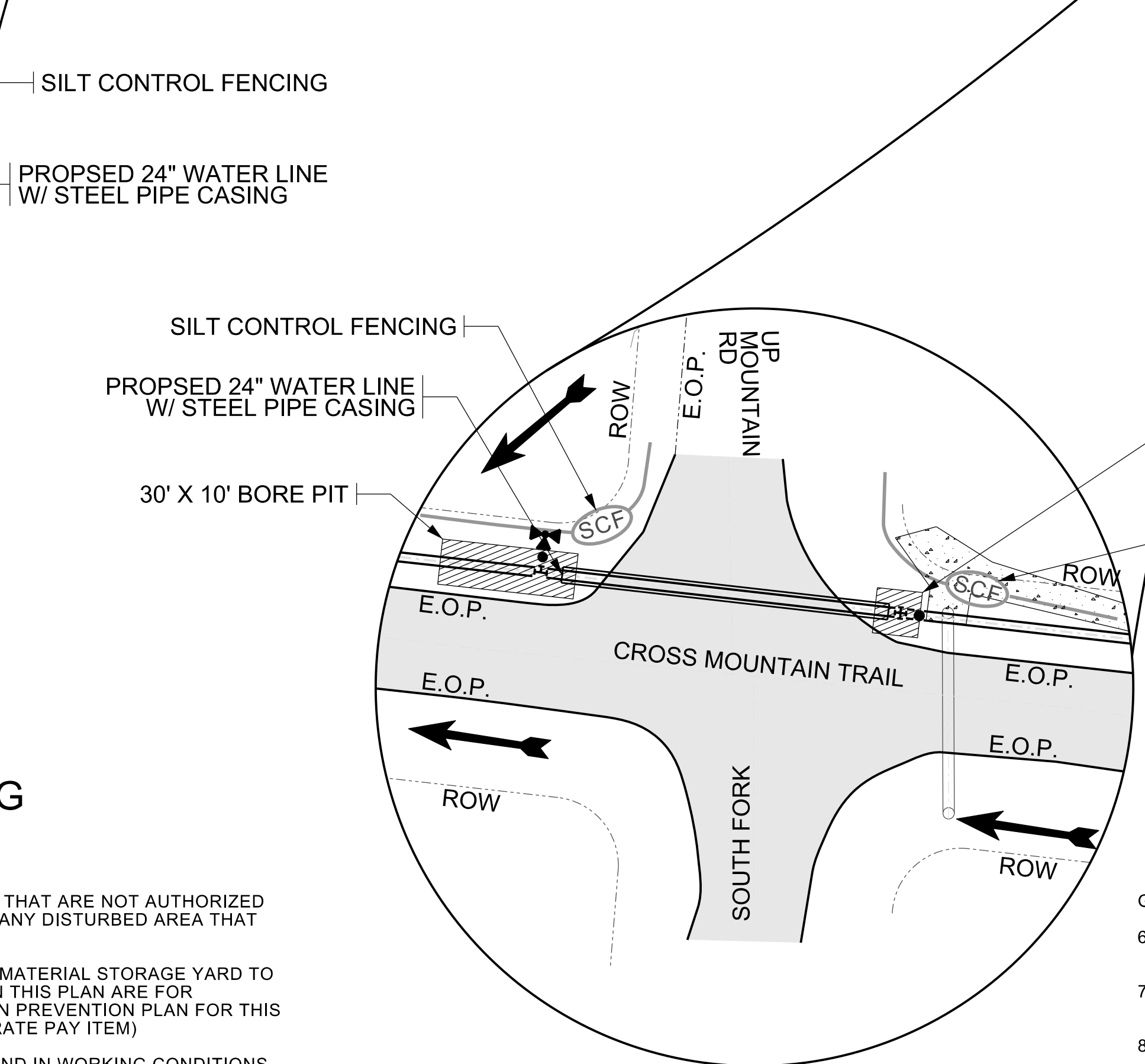
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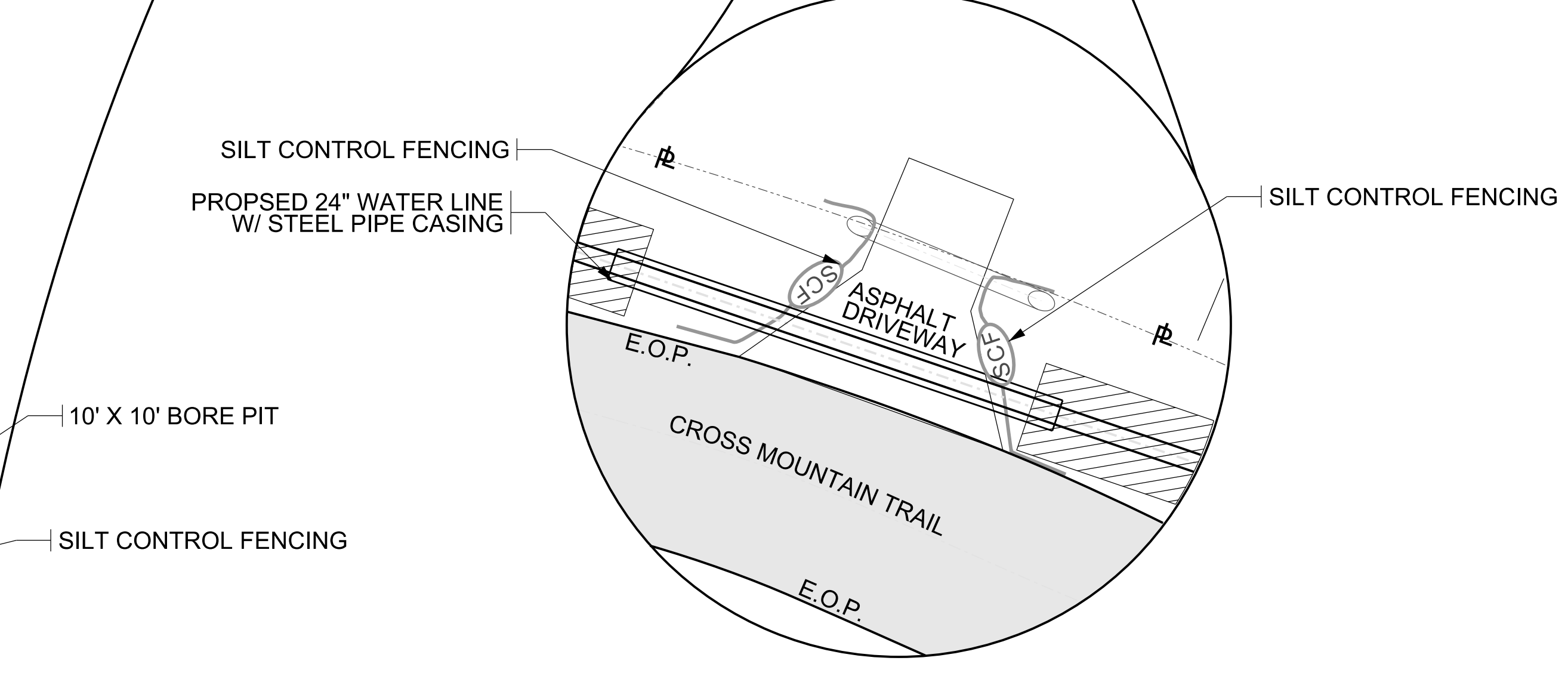
SAWS JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
24" WATER TRANSMISSION MAIN  
PROJECT  
EROSION CONTROL & SEDIMENTATION PLAN



**INSET 1**  
SEDIMENT CONTROL FENCE  
INSTALLATION AT CREEK CROSSING



**INSET 2**  
TYP. STREET INTERSCETION  
LAYOUT

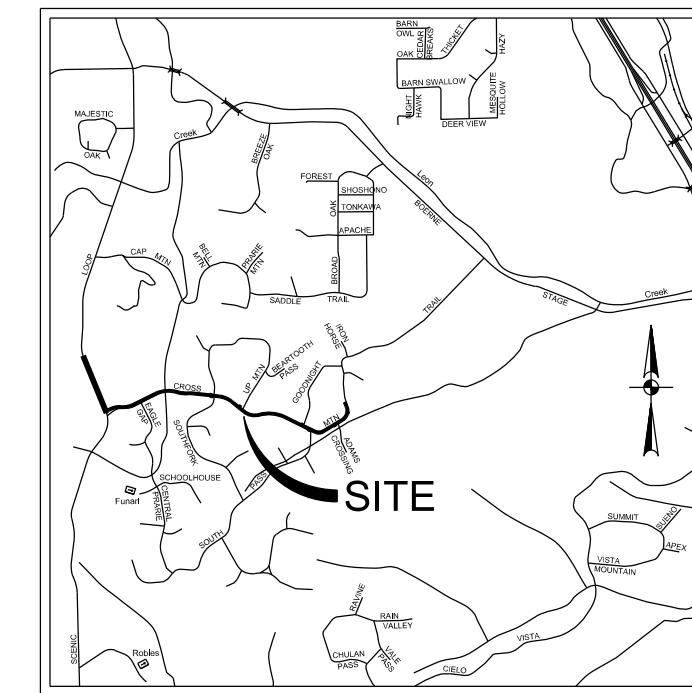
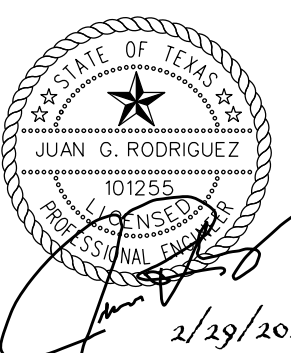


**INSET 3**  
TYP. SEDIMENT CONTROL FENCE  
INSTALLATION AT DRIVEWAYS

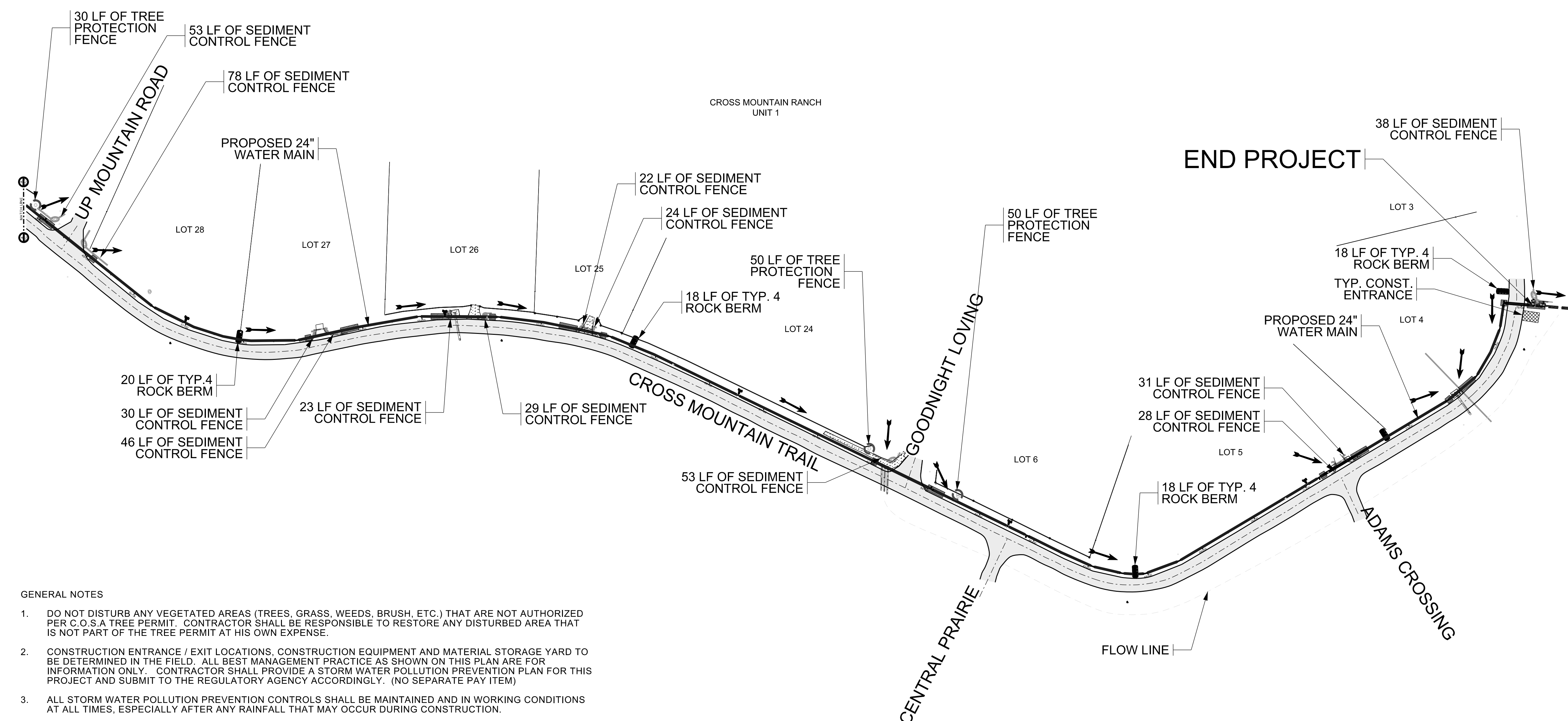
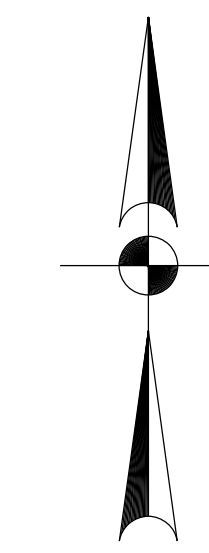
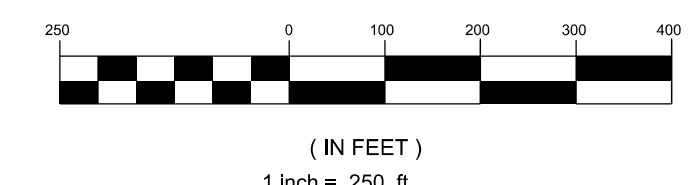
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- GENERAL NOTES (CONT.)
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LEGEND	
	CONSTRUCTION ENTRANCE/EXIT
	SEDIMENT CONTROL FENCE
	TREE PROTECTION FENCE
	ROCK FILTER DAM TYPE 4
	DRAINAGE ARROWS
	PROPOSED WATER MAIN



LOCATION MAP  
N.T.S.



**GENERAL NOTES**

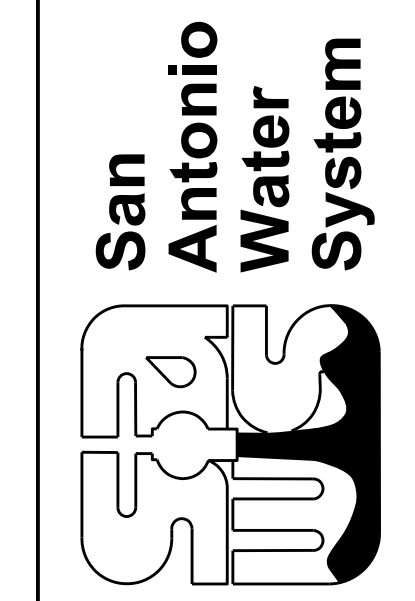
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LEGEND	
	CONSTRUCTION ENTRANCE/EXIT
	SEDIMENT CONTROL FENCE
	TREE PROTECTION FENCE
	ROCK FILTER DAM TYPE 4
	DRAINAGE ARROWS
	PROPOSED WATER MAIN

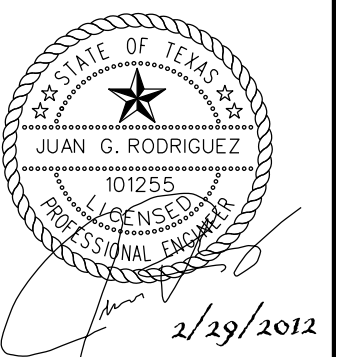
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Designed by: TMJ	Checked by: JGR
Scale:	Approved by: JGR
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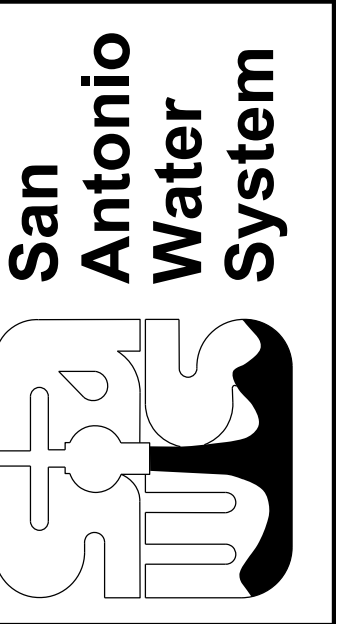
SAWS JOB NO. 10-7003  
CROSS MOUNTAIN TRAIL  
24" WATER TRANSMISSION MAIN  
PROJECT  
EROSION CONTROL & SEDIMENTATION PLAN



REVISIONS	Date	Approved
No.	Description	

INFORMATION
Date: 12/19/2011
Drawn by: TMJ
Designed by: TMJ
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Map No:

San Antonio Water System
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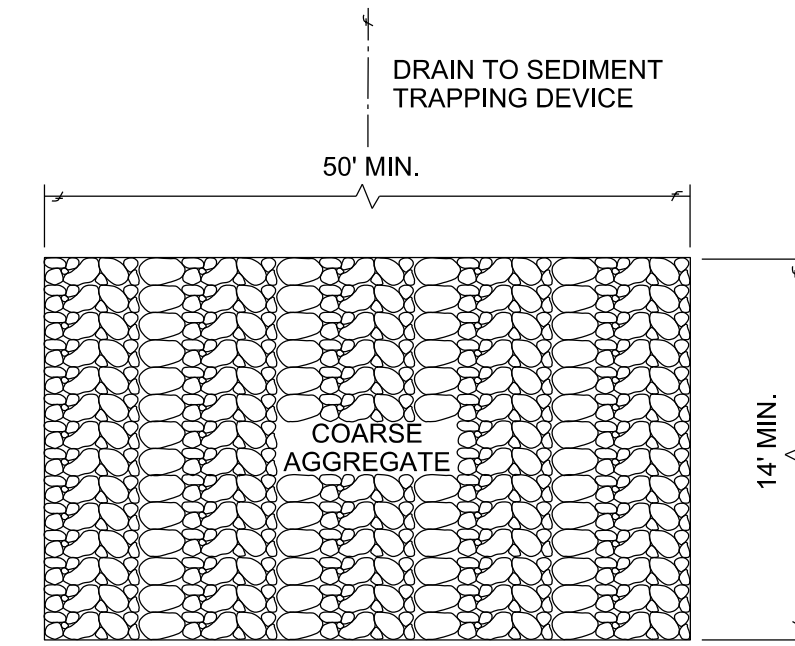


SAWS JOB NO. 10-7003 CROSS MOUNTAIN TRAIL 24" WATER TRANSMISSION MAIN PROJECT	EROSION CONTROL DETAILS
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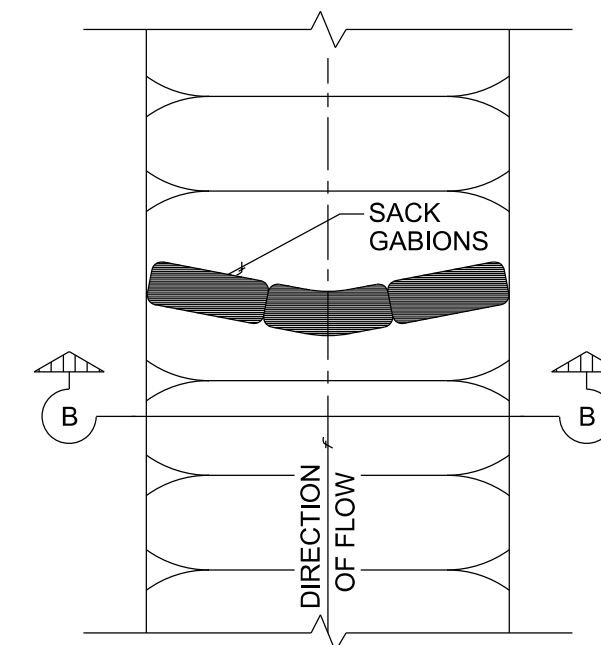
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**GENERAL NOTES**

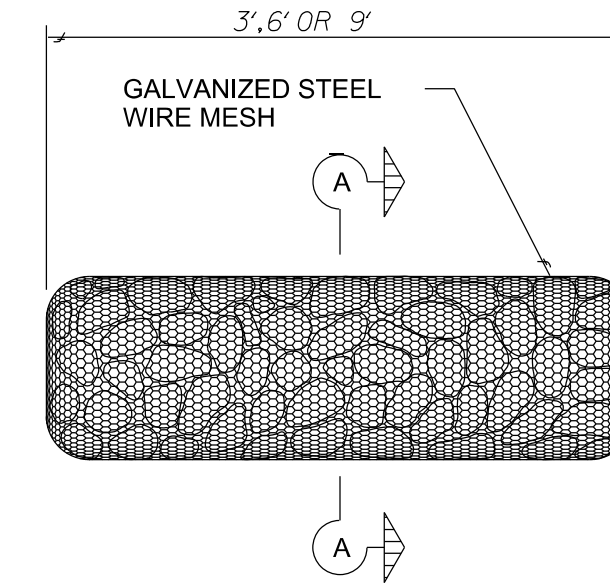
- IF SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, FILTER DAMS SHOULD BE PLACED NEAR THE TOE OF SLOPES WHERE EROSION IS ANTICIPATED, UPSTREAM AND/OR DOWNSTREAM AT DRAINAGE STRUCTURES, AND IN ROADWAY DITCHES AND CHANNELS TO COLLECT SEDIMENT.
- MATERIALS (AGGREGATE, WIRE MESH, SANDBAGS, ETC.) SHALL BE AS INDICATED BY THE SPECIFICATION FOR ROCK FILTER DAMS FOR EROSION AND SEDIMENTATION CONTROL.
- THE ROCK FILTER DAM DIMENSIONS SHALL BE AS INDICATED ON THE SW3P PLANS.
- SIDE SLOPES SHOULD BE 2:1 OR FLATTER. DAMS WITHIN THE SAFETY ZONE SHALL HAVE SIDESLOPES OF 6:1 OR FLATTER.
- MAINTAIN A MINIMUM OF 1' BETWEEN TOP OF ROCK FILTER DAM WEIR AND TOP OF EMBANKMENT FOR FILTER DAMS AT SEDIMENT TRAPS.
- FILTER DAMS SHOULD BE EMBEDDED A MINIMUM OF 4" INTO EXISTING GROUND.
- THE SEDIMENT TRAP FOR PONDING OF SEDIMENT LADEN RUNOFF SHALL BE OF THE DIMENSIONS SHOWN ON THE PLANS.
- ROCK FILTER DAM TYPES 2 & 3 SHALL BE SECURED WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. THE AGGREGATE SHALL BE PLACED ON THE MESH TO THE HEIGHT AND SLOPES SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE AGGREGATE AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE, THE MESH SHOULD BE SECURED OR STAKED TO THE STREAM BED PRIOR TO AGGREGATE PLACEMENT.
- SACK GABIONS SHOULD BE STAKED DOWN WITH 3/4" DIA. REBAR STAKES.
- FLOW OUTLET SHOULD BE ONTO A STABILIZED AREA (VEGETATION, ROCK, ETC.).
- THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



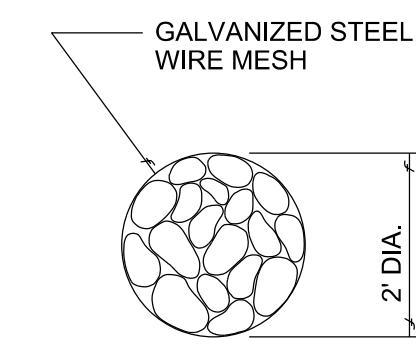
**PLAN**



**PLAN VIEW**



**TYPE 4 (SACK GABIONS)**



**SECTION A-A**

**ROCK FILTER DAM USAGE GUIDELINES**

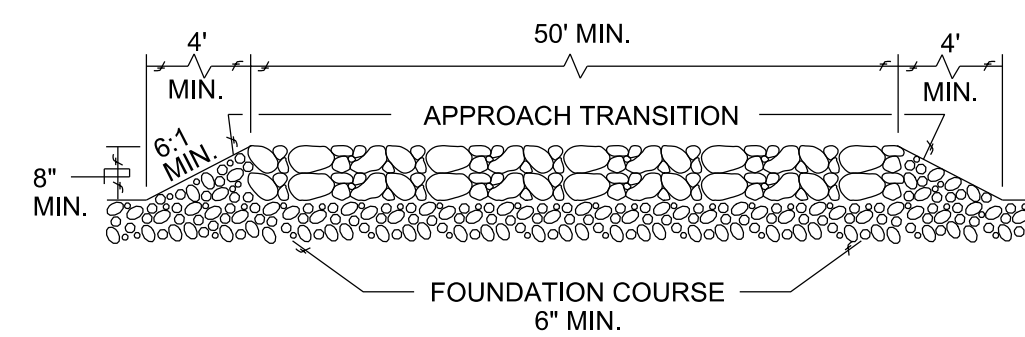
ROCK FILTER DAMS SHOULD BE CONSTRUCTED DOWNSTREAM FROM DISTURBED AREAS TO INTERCEPT SEDIMENT FROM OVERLOAD RUNOFF AND/OR CONCENTRATED FLOW. THE DAMS SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THROUGH RATE OF 60 GPM/FT OF CROSS SECTIONAL AREA. A 2-YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE.

TYPE 1 (18" HIGH WITH NO WIRE MESH): TYPE 1 MAY BE USED AT THE TOE OF SLOPES, AROUND INLETS, IN SMALL DITCHES, AND AT DIKE OR SWALE OUTLETS. THIS TYPE OF DAM IS RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA OF 5 ACRES OR LESS. TYPE 1 MAY NOT BE USED IN CONCENTRATED HIGH VELOCITY FLOWS (APPROX. 8 FT./SEC. OR MORE) IN WHICH AGGREGATE WASH OUT MAY OCCUR. SANDBAGS MAY BE USED AT THE EMBEDDED FOUNDATION (4" DEEP MIN.) FOR BETTER FILTERING EFFICIENCY OF LOW FLOWS IF CALLED FOR ON THE PLANS OR DIRECTED BY THE ENGINEER.

TYPE 2 (18" HIGH WITH WIRE MESH): TYPE 2 MAY BE USED IN DITCHES AND AT DIKE OR SWALE OUTLETS.

TYPE 3 (36" HIGH WITH WIRE MESH): TYPE 3 MAY BE USED IN STREAM FLOW AND SHOULD BE SECURED TO THE STREAM BED.

TYPE 4 (SACK GABIONS): TYPE 4 MAY BE USED IN DITCHES AND SMALLER CHANNELS TO FORM AN EROSION CONTROL DAM.

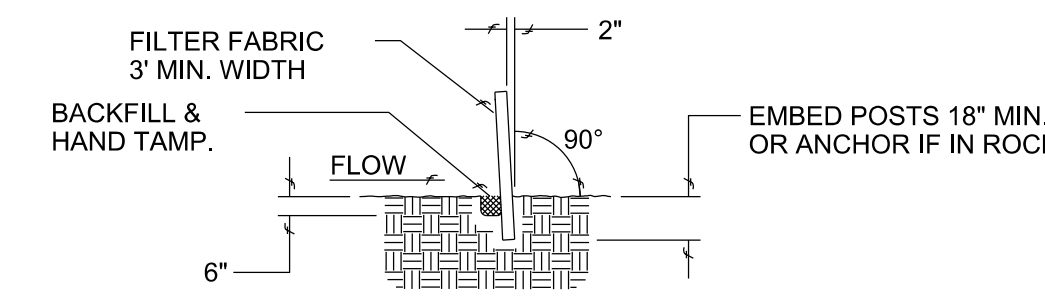


**PROFILE**

**CONSTRUCTION EXIT (TYPE 1)**

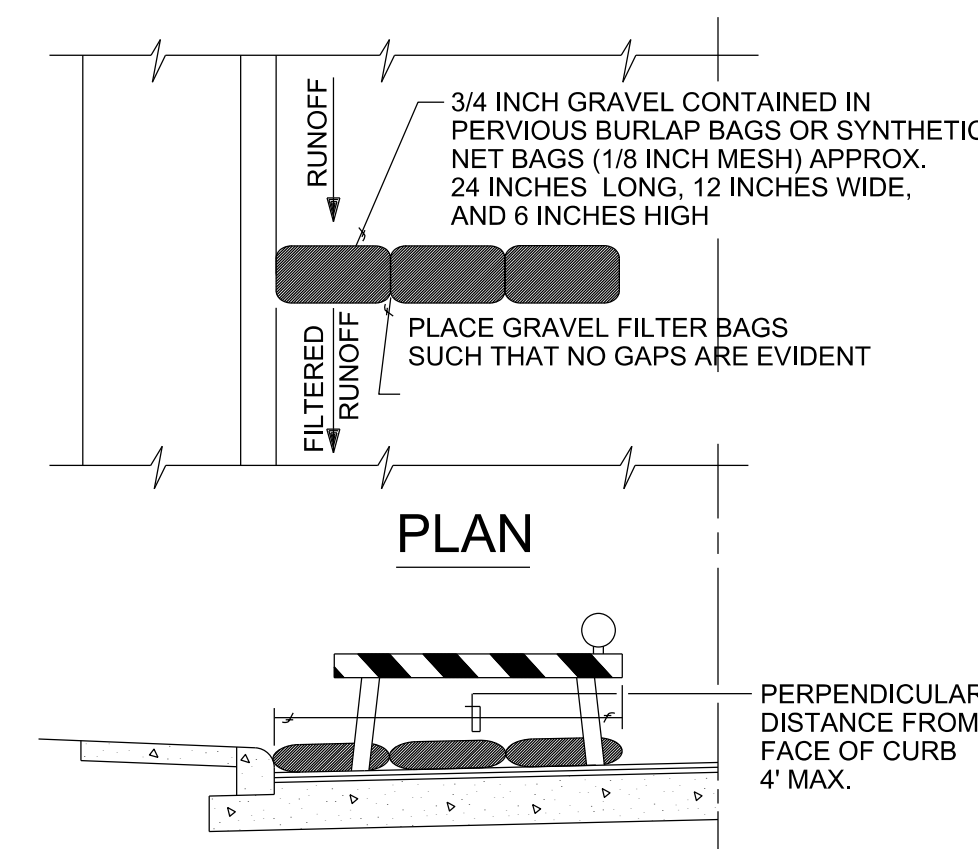
**GENERAL NOTES**

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



**SECTION A-A**

**PLAN SHEET LEGEND**

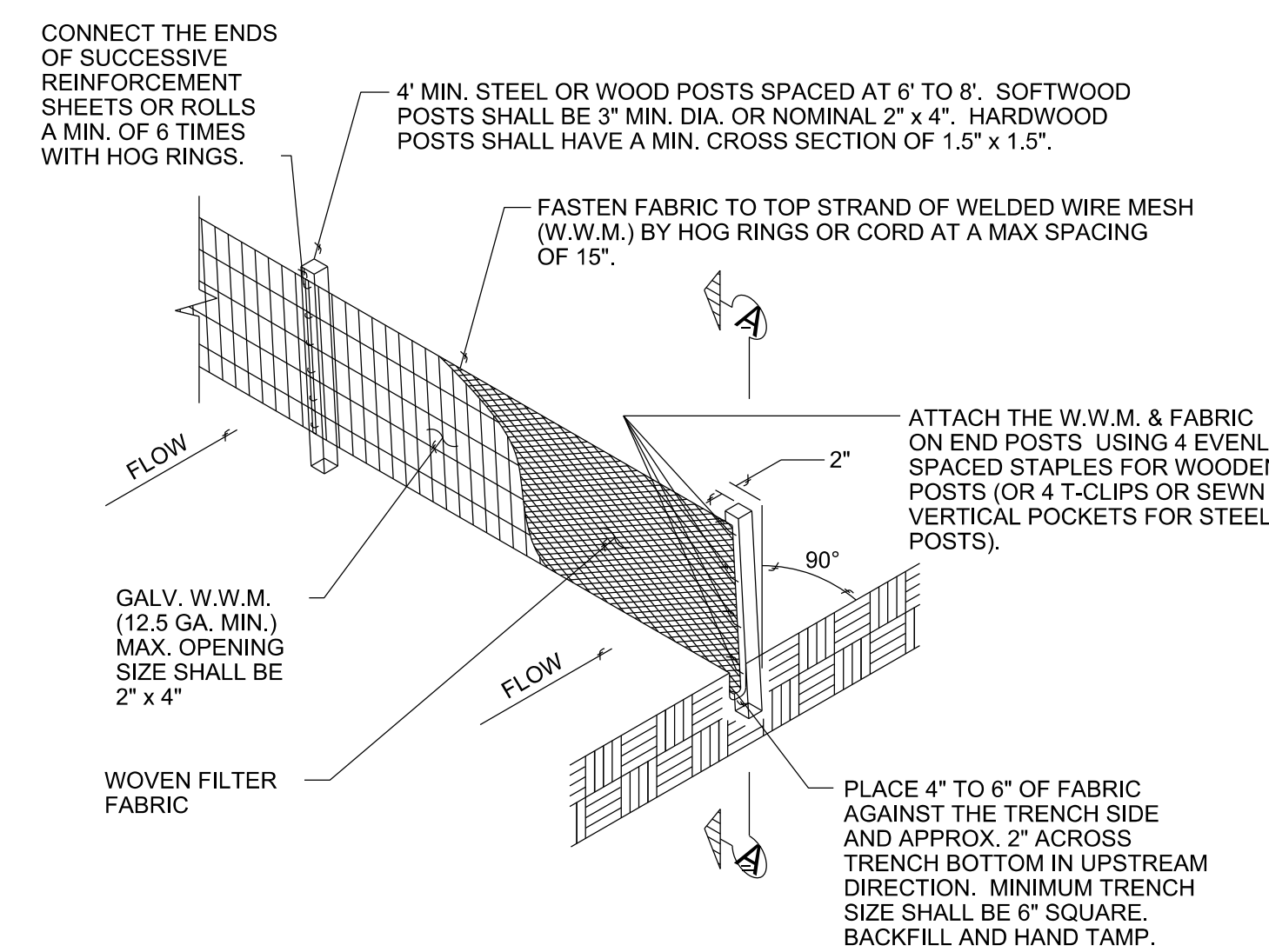


**ELEVATION**

NOTE: STRADDLE GRAVEL FILTER BAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. SEE BARRICADE CONSTRUCTION SIGN DETAILS. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAG CONFIGURATION.

**GRAVEL FILTER BAGS**

N.T.S. ITEM NO. 530



**TEMPORARY SEDIMENT CONTROL FENCE**



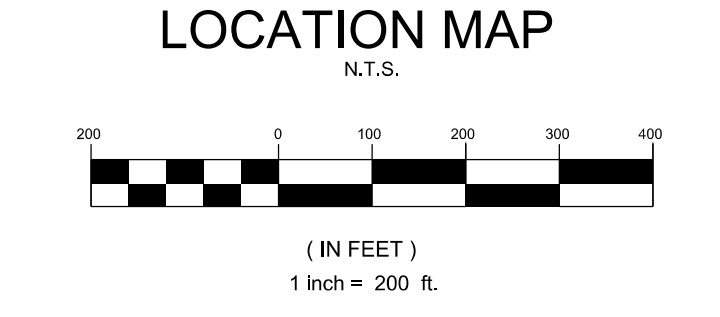
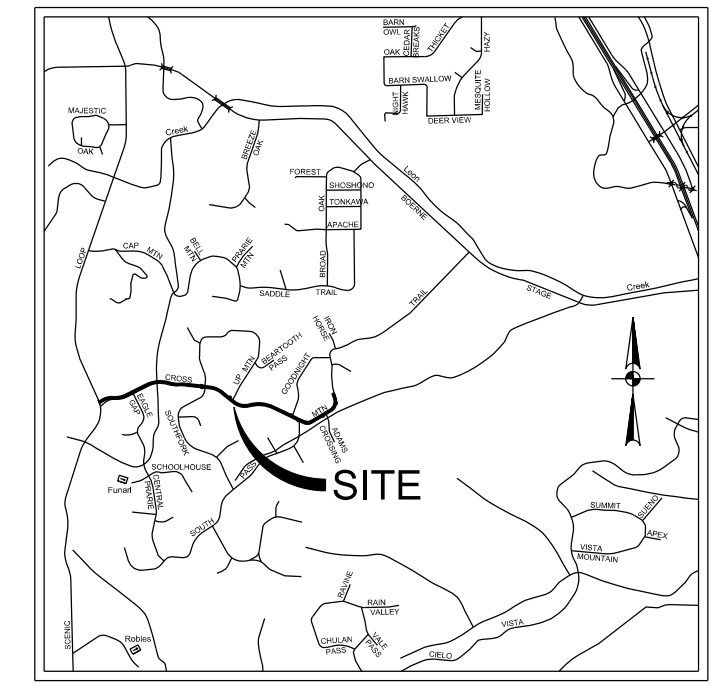
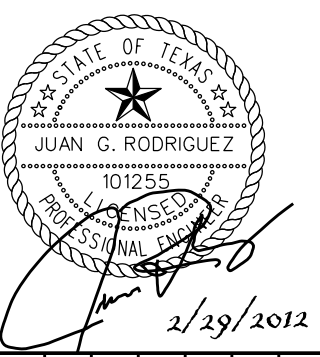
**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

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.

**GENERAL NOTES**

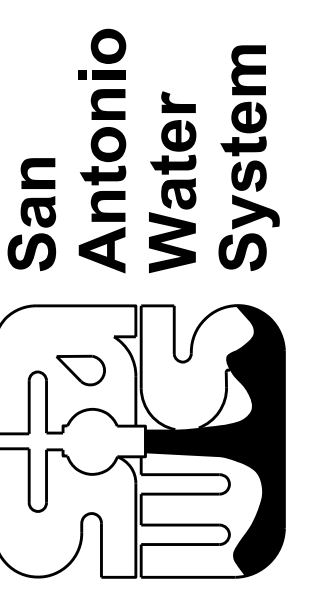
- THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



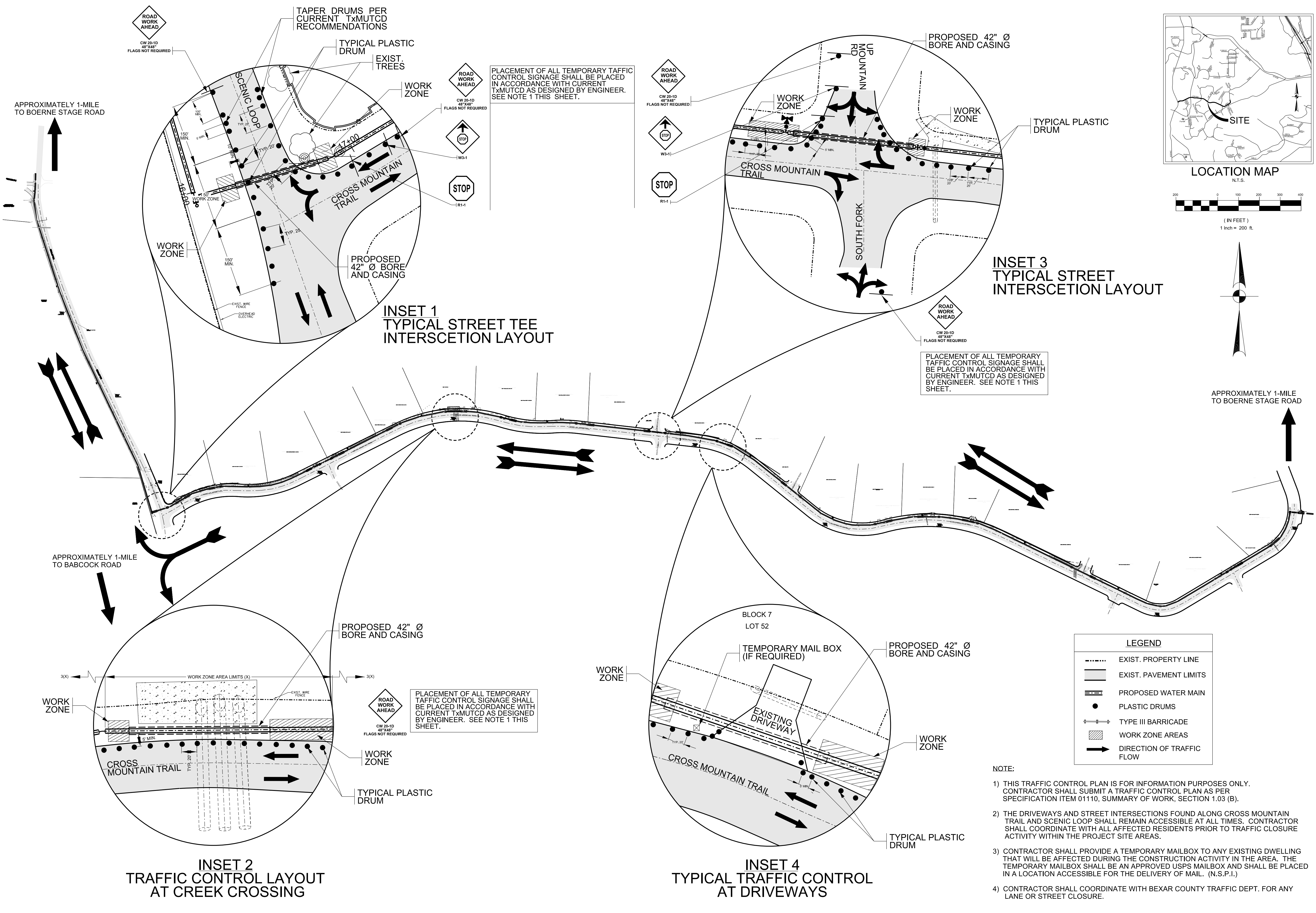
REVISIONS	Date	Approved
No.	Description	

INFORMATION  
SEE LEGEND THIS SHEET

Date: 12/19/2011  
 Drawn by: JGR  
 Designed by: JGR  
 Checked by: JP  
 Scale:  
 Approved by: JGR  
 Map No:



SAWS JOB NO. 10-7003  
 CROSS MOUNTAIN TRAIL  
 24" WATER TRANSMISSION MAIN  
 PROJECT  
 TRAFFIC CONTROL LAYOUT



PLACEMENT OF ALL TEMPORARY TRAFFIC CONTROL SIGNAGE SHALL BE PLACED IN ACCORDANCE WITH CURRENT T&MUTCD AS DESIGNED BY ENGINEER. SEE NOTE 1 THIS SHEET.

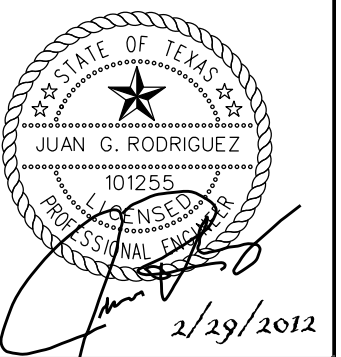
PLACEMENT OF ALL TEMPORARY TRAFFIC CONTROL SIGNAGE SHALL BE PLACED IN ACCORDANCE WITH CURRENT T&MUTCD AS DESIGNED BY ENGINEER. SEE NOTE 1 THIS SHEET.

PLACEMENT OF ALL TEMPORARY TRAFFIC CONTROL SIGNAGE SHALL BE PLACED IN ACCORDANCE WITH CURRENT T&MUTCD AS DESIGNED BY ENGINEER. SEE NOTE 1 THIS SHEET.

**LEGEND**

-----	EXIST. PROPERTY LINE
=====	EXIST. PAVEMENT LIMITS
-----	PROPOSED WATER MAIN
●	PLASTIC DRUMS
--- ---	TYPE III BARRICADE
▨	WORK ZONE AREAS
→	DIRECTION OF TRAFFIC FLOW

- NOTE:
- 1) THIS TRAFFIC CONTROL PLAN IS FOR INFORMATION PURPOSES ONLY. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN AS PER SPECIFICATION ITEM 01110, SUMMARY OF WORK, SECTION 1.03 (B).
  - 2) THE DRIVEWAYS AND STREET INTERSECTIONS FOUND ALONG CROSS MOUNTAIN TRAIL AND SCENIC LOOP SHALL REMAIN ACCESSIBLE AT ALL TIMES. CONTRACTOR SHALL COORDINATE WITH ALL AFFECTED RESIDENTS PRIOR TO TRAFFIC CLOSURE ACTIVITY WITHIN THE PROJECT SITE AREAS.
  - 3) CONTRACTOR SHALL PROVIDE A TEMPORARY MAILBOX TO ANY EXISTING DWELLING THAT WILL BE AFFECTED DURING THE CONSTRUCTION ACTIVITY IN THE AREA. THE TEMPORARY MAILBOX SHALL BE AN APPROVED USPS MAILBOX AND SHALL BE PLACED IN A LOCATION ACCESSIBLE FOR THE DELIVERY OF MAIL. (N.S.P.I.)
  - 4) CONTRACTOR SHALL COORDINATE WITH BEXAR COUNTY TRAFFIC DEPT. FOR ANY LANE OR STREET CLOSURE.



Revisions	Date	Approved	Description
No.			

INFORMATION

Date: 12/20/2011  
 Drawn by: JGR  
 Designed by: JGR  
 Checked by: JP  
 Scale: N/A  
 Approved by: JGR  
 Map No:



SAWS JOB NO. 10-7003  
 CROSS MOUNTAIN TRAIL  
 24" WATER TRANSMISSION MAIN  
 TRAFFIC CONTROL AND BARRICADES DETAILS

Barricade and Construction (BC) Standard Sheets General Notes:

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of traffic control devices, construction pavement markings, and typical construction signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO) "Policy on the Geometric Design of Highways and Streets" or the TxDOT "Roadway Design Manual".
- When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor will erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign will be revised to show appropriate work zone distance.
- The Engineer may require duplicate construction warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- As shown on BC(2), the OBSERVE WARNING SIGNS STATE LAW, BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be obtained by contacting:  
 Standards Engineer  
 Traffic Operations Division - TE  
 Texas Department of Transportation  
 132 East 11th Street  
 Austin, Texas 78701-2483  
 Phone (512) 416-3320  
 Fax (512) 416-3299

Instructions to locate the "CWZTCD" on TxDOT website are:  
 Start at website - www.dot.state.tx.us  
 Click on "About TxDOT";  
 Click on "Organizational Chart";  
 Click on Traffic Operations Div.;  
 Click on "Compliant Work Zone Traffic Control Devices";  
 Click on "View PDF";  
 This site is printable.

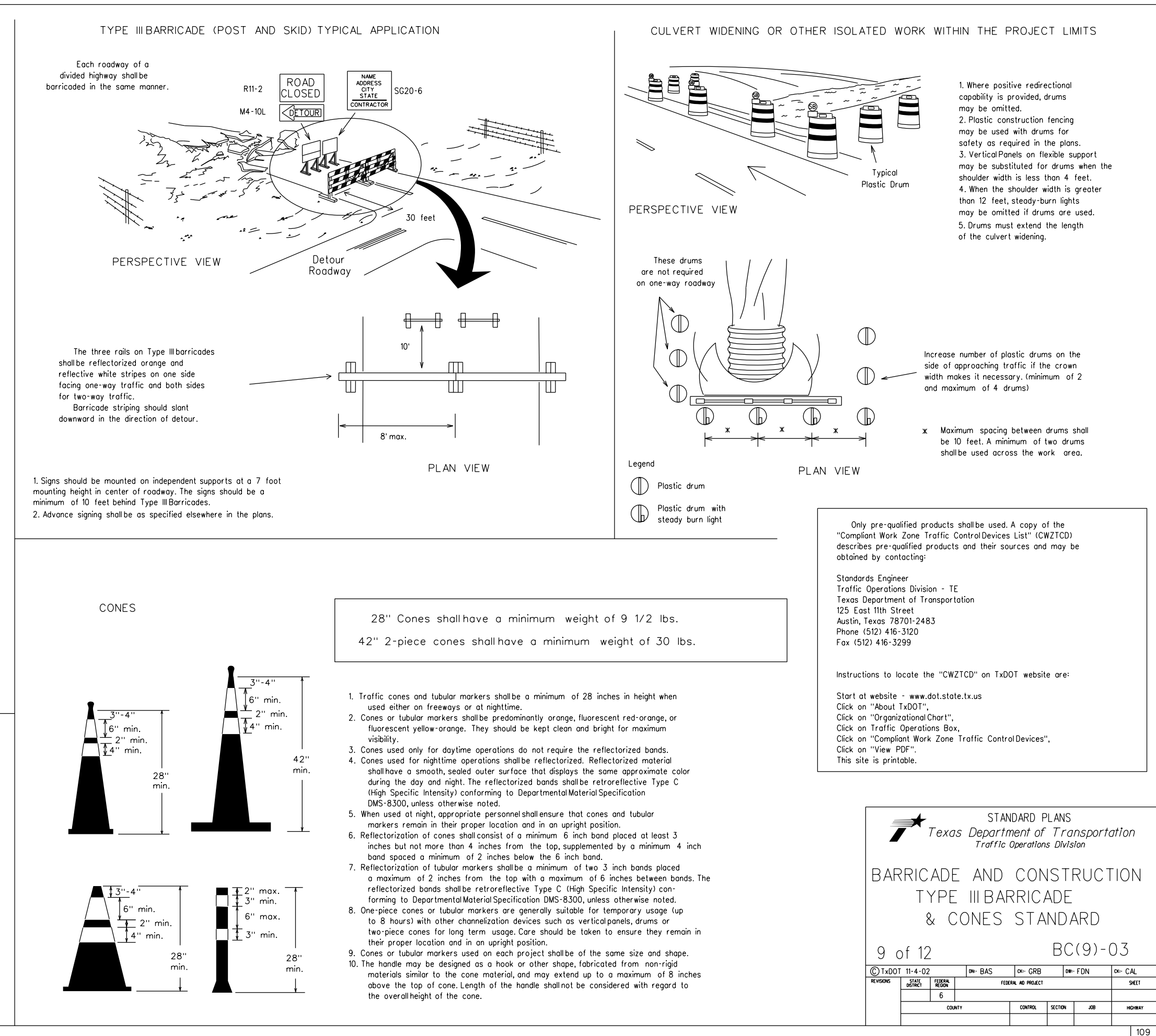
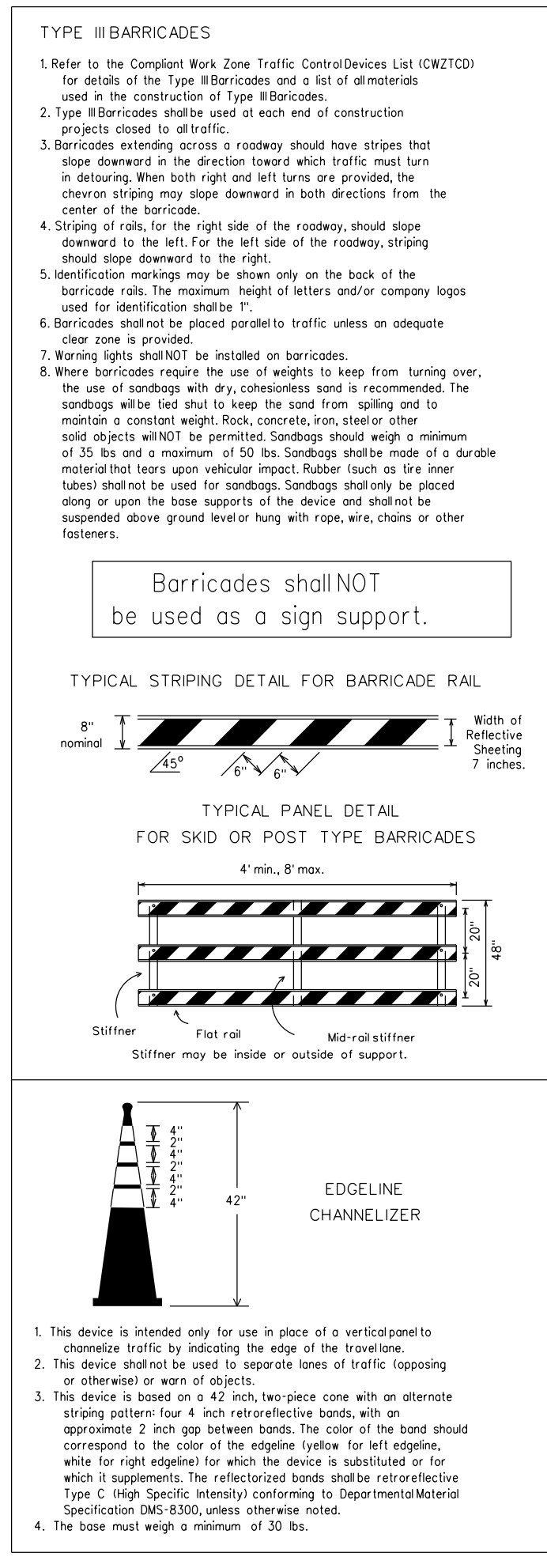
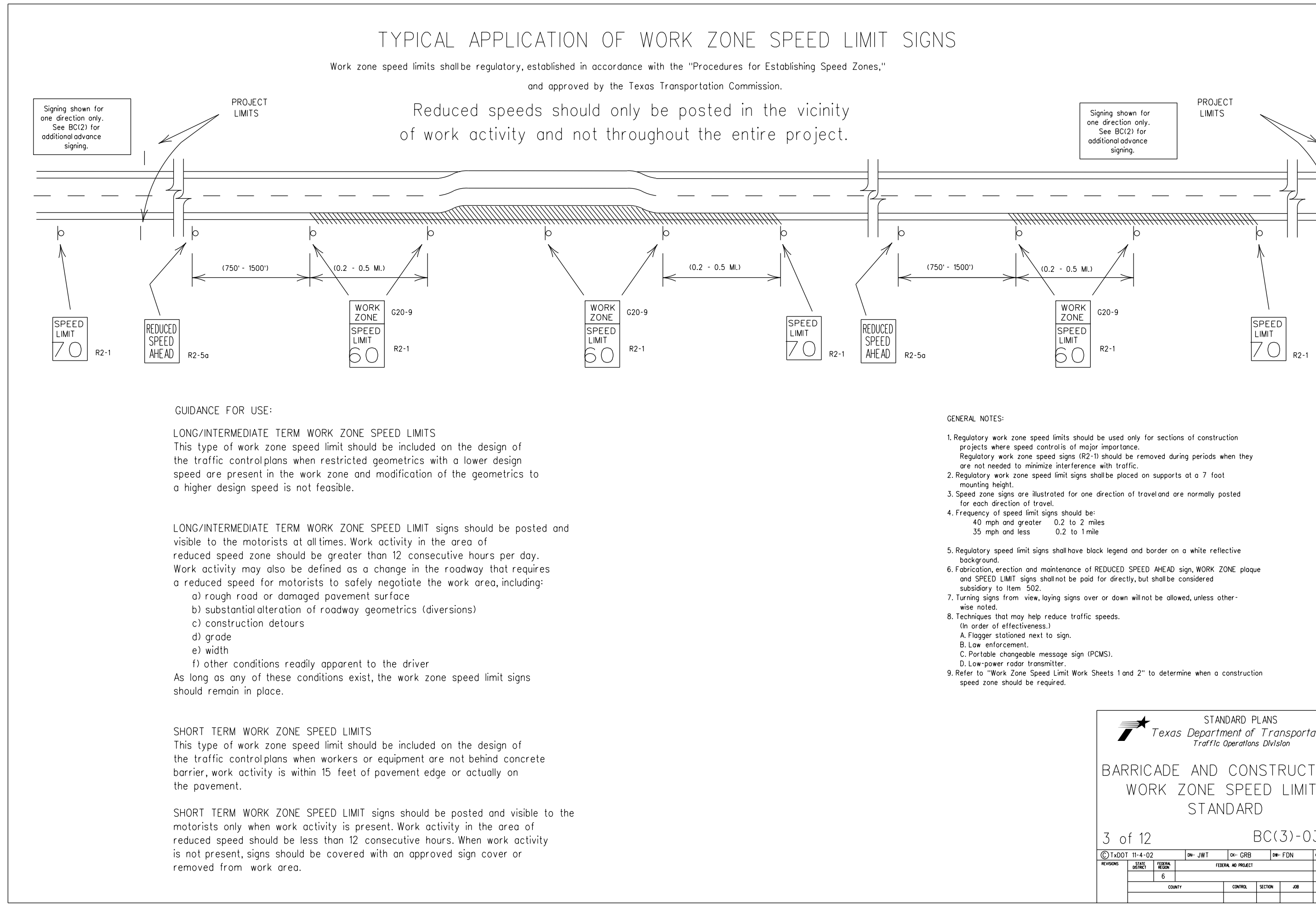
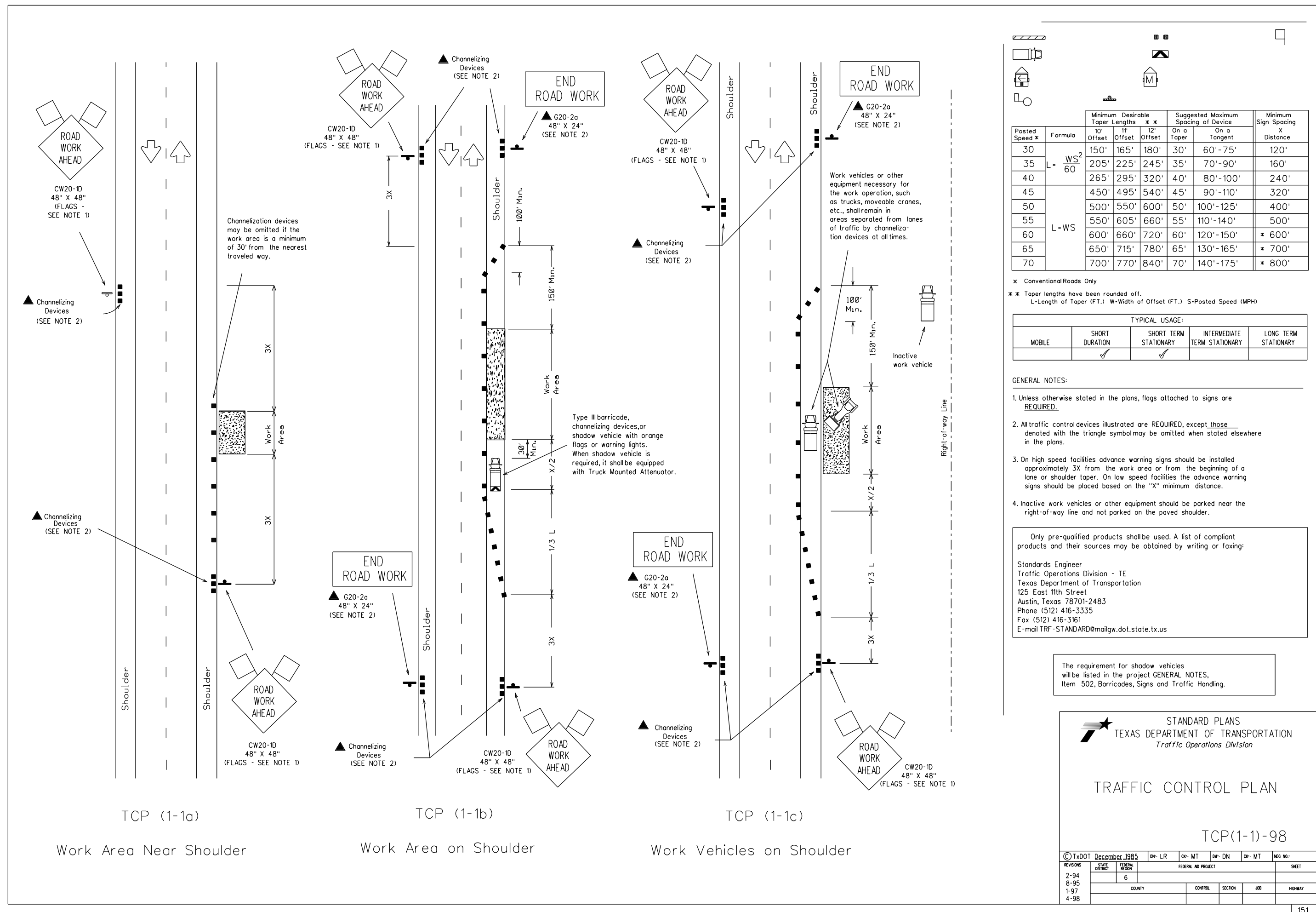
4/03 Revision  
 Revised General Notes

STANDARD PLANS  
 TEXAS DEPARTMENT OF TRANSPORTATION  
 Traffic Operations Division

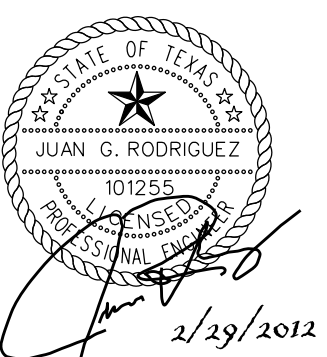
BARRICADE AND CONSTRUCTION  
 GENERAL NOTES  
 AND REQUIREMENTS

1 of 12 BC(1)-03

Sheet	DATE	BY	CHECKED	IN CHARGE	DATE
1	4-03	JGR	JGR	JGR	







Date

Approved

Drn.

Description

No.

INFORMATION

Date: 12/20/2011

Drawn by: JGR

Designed by: JGR

Checked by: JP

Scale: N/A

Approved by: JGR

Map No:

SAWS JOB NO. 10-7003

CROSS MOUNTAIN TRAIL

24" WATER TRANSMISSION PROJECT

TRAFFIC CONTROL AND BARRICADES DETAILS

DRAWING NO.

**TC3**

35 OF 35

### EXAMPLES OF SKID MOUNTED SIGN SUPPORTS

**LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS**

**SHORT TERM STATIONARY/SHORT DURATION - PORTABLE SIGN SUPPORTS**

### EXAMPLES OF GROUND MOUNTED SIGN SUPPORTS

**WING CHANNEL**  
Top-splice-base bolted anchor

**PERFORATED SQUARE METAL TUBING**  
With Anchor

**ATTACHMENT FOR WOODEN SIGN SUPPORTS**

Nails will NOT be allowed.

Each sign should be attached directly to the sign support. Multiple signs should not be joined or spliced by any means. Supports should not be extended or repaired by splicing or other means.

**CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS**

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same. It is not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message modifies the roadway condition.
- When existing permanent signs are moved and relocated due to construction purposes, they should be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they should be installed on crashworthy bases as shown on the SMD Standard sheets. The signs should meet the required mounting heights shown on the BC Sheets or the SMD Standards. The work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor should use crashworthy supports as shown on the BC sheets or the CRZTCO. The signs should meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment should be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to item 502.

**STANDARD PLANS**  
Texas Department of Transportation  
Traffic Operations Division

**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT STANDARD**

5 of 12 BC(5)-03

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	01/07/11	JGR	JGR	JGR	ISSUE FOR PROJECT

### EXAMPLES OF SKID MOUNTED SIGN SUPPORTS

**LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS**

**SHORT TERM STATIONARY/SHORT DURATION - PORTABLE SIGN SUPPORTS**

### EXAMPLES OF GROUND MOUNTED SIGN SUPPORTS

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**STANDARD PLANS**  
Texas Department of Transportation  
Traffic Operations Division

**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT STANDARD**

5 of 12 BC(5)-03

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	01/07/11	JGR	JGR	JGR	ISSUE FOR PROJECT

### GENERAL NOTES

- Drums and delineator (bars) shall comply with the requirements of the current version of the Texas Manual Uniform Traffic Control Devices ("TMUTCD") and the "Compliant Work Zone Traffic Control Devices List" (CWZTCO).
- Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
- The Contractor shall have a maximum of 24 hours to replace any plastic drums or other traffic control devices identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

Prequalified plastic drums shall meet the following requirements:

#### GENERAL DESIGN REQUIREMENTS

- Plastic drums shall be a two-piece design: the "body" of the drum, and the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or turbulence created by passing vehicles.
- Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums or construction devices or sign supports.
- Drums shall present a profile that is a minimum of 18 inches in width of the 36 inch height when viewed from any direction. The height of drum will totally include the base shall be a minimum of 36 inches and a maximum of 42 inches.
- The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning sign, delineator reflector unit or non-plywood sign.
- The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflective space between any two adjacent stripes shall not exceed 2 inches in width.
- Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow bases to be held down when separating the drum body from the base.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high density polyethylene (HDPE) or other approved materials.
- Drum body shall have a minimum unobstructed weight of 7.7 lbs. and maximum unobstructed weight of 11 lbs. The wall of the drum

#### RETROREFLECTIVE SHEETING

- The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Flat Surface Reflective Sheeting - High Specific Intensity (Type C) retro-reflective sheeting shall be supplied unless otherwise specified in the plans.
- The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in place and exhibit no delamination, checking, cracking, or loss of retroreflectivity other than that loss due to abrasion of the shearing surface.

#### BALLAST

- Unobstructed bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
- Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integrally-molded rubber base or a solid rubber base.
- The ballast shall not be heavy objects, water, or any material that would cause hazards to motorists, pedestrians, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

#### WARNING LIGHTS AND DELINEATORS MOUNTED ON PLASTIC DRUMS

- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A flashing warning lights are not intended for delineation and shall not be used in a series.
- Type C steady burn warning lights are intended to be used in a series to delineate the edge of the travel lane or detours, on lane changes, or lane closures, and on other similar conditions.
- Type A and Type C warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights should be installed on a drum that has a sign, chevron or vertical panel.
- Type A Class 1, Type A Class 2, or Type B Reflector Units (ID & M Standards) may be attached to drums to delineate the intended vehicular path. The color of the reflector unit shall correspond to the pavement treatment it is supplementing or for which it is substituting (left edge: yellow or right edge: white). The reflector unit shall be attached to the handle of the drum, using the mounting hole nearest the travel lane and shall be aligned perpendicular to approaching traffic. Delineators may be used as directed by the Engineer. Delineators may not be used as a substitute for warning lights.

#### WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C WARNING LIGHTS

- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
- The warning reflector shall be manufactured using a sign substrate approved for use with plastic drums listed in the CWZTCO.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
- The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and for DMS-8300 (Type D) (Non-Retroreflective Prismatic).
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.

#### TYPICAL DETAIL OF LANE CLOSURE USING PLASTIC DRUMS AS CHANNELIZING DEVICES

#### LEGEND

- Flashing Arrow Panel
- Plastic Drum
- Plastic Drum with warning reflector or other approved channelizing device

#### STANDARD PLANS

Texas Department of Transportation  
Traffic Operations Division

**BARRICADE AND CONSTRUCTION PLASTIC DRUM STANDARD**

7 of 12 BC(7)-03

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	01/07/11	JGR	JGR	JGR	ISSUE FOR PROJECT