FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 2013(935)MM		1
STATE	DIST.	COUNTY	
TX	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	12	394	CS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

CITY OF SAN ANTONIO
DEPARTMENT OF CAPITAL IMPROVEMENTS MANAGEMENT SERVICES

SALADO CREEK HIKE AND BIKE TRAIL

PROJECT NO.: STP 2013(935)MM
CONTROL NO.: 0915-12-394
C.S.:
LIMITS: WEST AVE. TO U.S. 281
PROJECT LENGTH: 0.727 MILES
BRIDGE LENGTH: 0.030 MILES

CONSTRUCTION OF HIKE AND BIKE TRAIL.

CLASSIFICATION:
DESIGN SPEED: 20
AVERAGE DAILY TRAFFIC: N/A
AREA OF DISTURBED SOIL: 1.78 AC

FINAL PLANS

LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK ACCEPTED: _____
FINAL CONTRACT COST: $_____
CONTRACTOR: _____

"TDLR INSPECTION REQUIRED"
"TDLR NO.: EABPRJB3804455"

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND SHEET INDEX
2	PROJECT LAYOUT & BORE LOCATIONS
3	CITY OF SAN ANTONIO GENERAL NOTES
4 – 5	SUPPLEMENTAL GENERAL NOTES
6 – 7	TRAIL, LANDSCAPE AND STRUCTURAL SUMMARIES
8	PROJECT SURVEY CONTROL
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10 – 21	BARRICADE AND CONTRUCTION NOTES STANDARDS BC(1)-07 – BC(12)-07
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24	TRAIL TYPICAL SECTION
25 – 27	TRAIL HORIZONTAL ALIGNMENT DATA
28 – 37	TRAIL PLAN AND PROFILE
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40	CROSS WALK STREET SIGNS
41	GENERAL NOTES AND GROUND SIGN MOUNTING
41a	D3 STREET NAME SIGN AND SIGN MOUNTING
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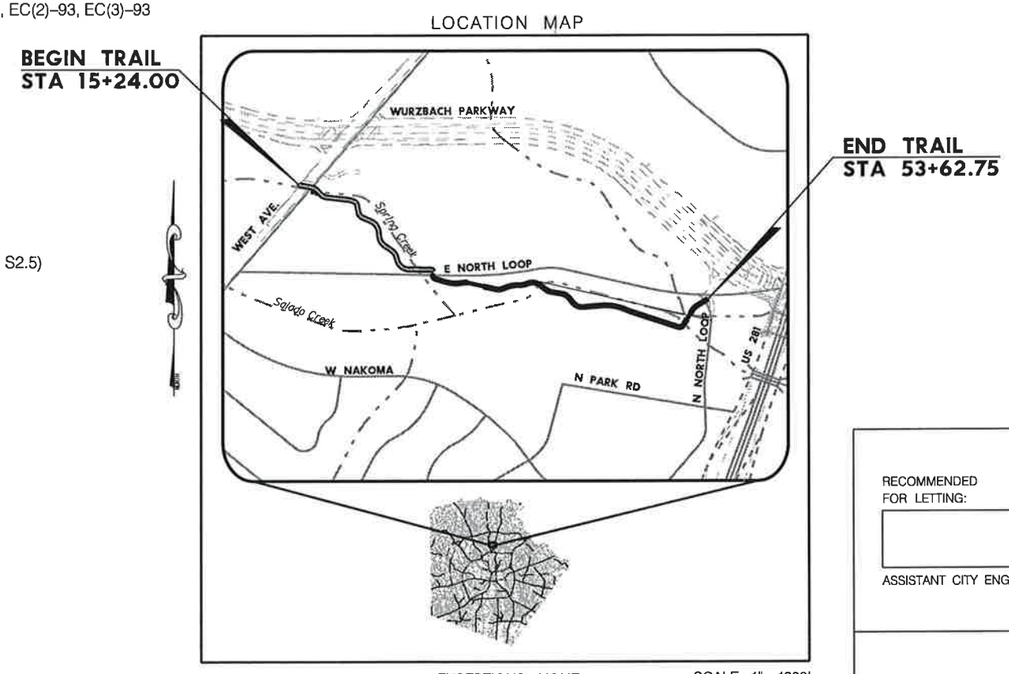
44	SW3P NARRATIVE
45	SW3P PLAN & FLOODPLAIN LIMITS
45a	HYDRAULIC DATA SHEET
46 – 48	TEMPORARY EROSION CONTROL STANDARDS EC(1)-09, EC(2)-93, EC(3)-93
L1.0	OVERALL TREE PRESERVATION PLAN (L1.0)
L1.1 – L1.7	ENLARGED TREE PRESERVATION PLANS (L1.1 – L1.7)
L1.8	HERITAGE TREE LIST (L1.8)
L2.0	TREE PRESERVATION DETAILS (L2.0)
L3.0	OVERALL LANDSCAPE PLAN (L3.0)
L3.1 – L3.7	ENLARGED LANDSCAPE PLANS (L3.1 – L3.7)
L4.0	OVERALL TRAIL SIGNAGE PLAN (L4.0)
L4.1 – L4.4	ENLARGED TRAIL SIGNAGE PLANS (L4.1 – L4.4)
L5.0 – L5.2	TRAIL SIGNAGE DETAILS (L5.0 – L5.2)
S1.1 – S1.8	STRUCTURAL NOTES (S1.1-S1.8)
S2.1 – S2.3	WEST AVENUE – UNDERBRIDGE TRAIL (S2.1 – S2.3)
S2.4 – S2.5	RETAINING WALL AND CULVERT EXTENSION (S2.4 – S2.5)
S2.6	ELEVATED LOW WATER CROSSING – 1 (S2.6)
S2.7	ELEVATED LOW WATER CROSSING – 2 (S2.7)
S3.1 – S3.5 & S3.8	DETAILS
S3.9 – S3.10	TYPICAL DETAILS

LOCATION MAP



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSING: NONE

SCALE: 1" = 1200'

PLANS PREPARED BY:

HDR

1020 NE Loop 410, Suite 400
San Antonio, TX 78209
Texas P.E. Firm Registration No. F-754

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 7/03/13

The seal appearing on this document was authorized by

Jose M. Gonzalez
P.E. # 97348
June 2013

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, JUNE 1, 2004 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRE CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012).

CITY OF SAN ANTONIO

RECOMMENDED FOR LETTING: _____
ASSISTANT CITY ENGINEER

APPROVED FOR LETTING: _____
CITY ENGINEER / DIRECTOR
CAPITAL IMPROVEMENTS
MANAGEMENT SERVICES

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING: _____
DISTRICT DESIGN ENGINEER

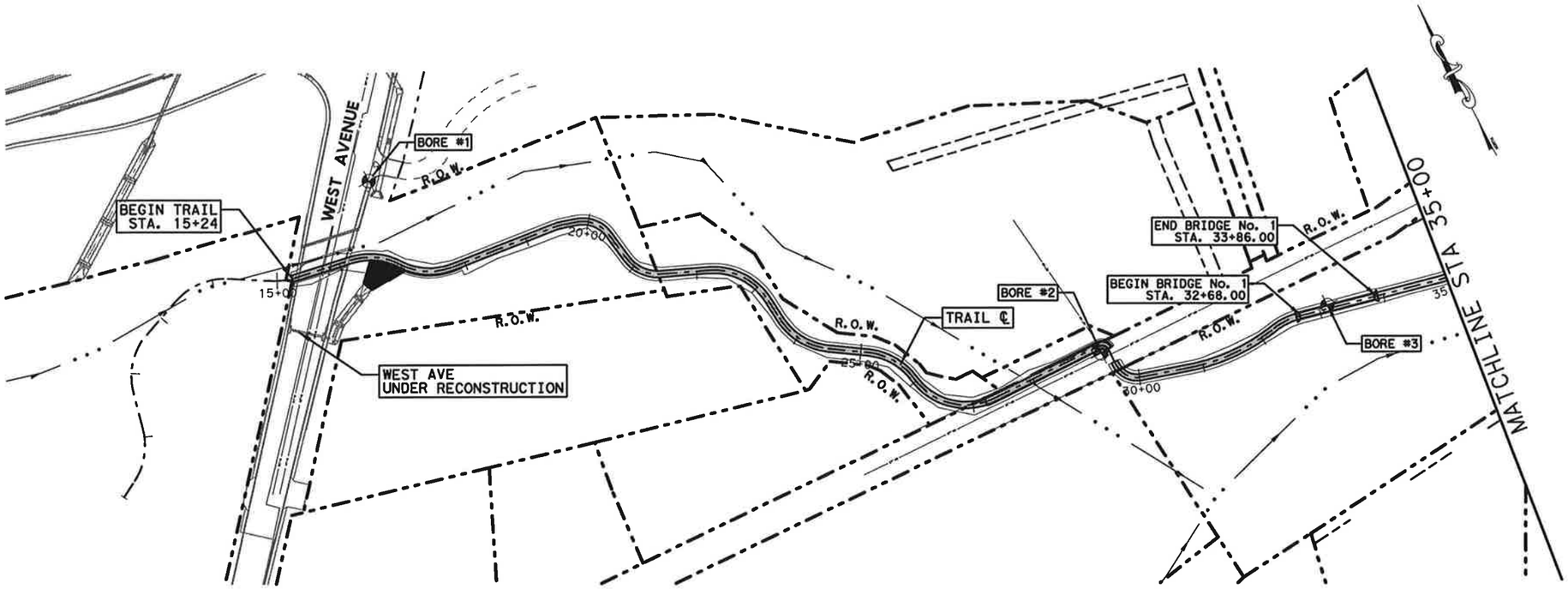
APPROVED FOR LETTING: _____
DIRECTOR, TRAFFIC OPERATIONS DIVISION

RECOMMENDED FOR LETTING: _____
DISTRICT ENGINEER

APPROVED FOR LETTING: _____
DIRECTOR, DESIGN DIVISION

COUNTY BEXAR PROJ. NO. _____
HWY. NO. _____ LETTING DATE _____
DATE ACCEPTED _____

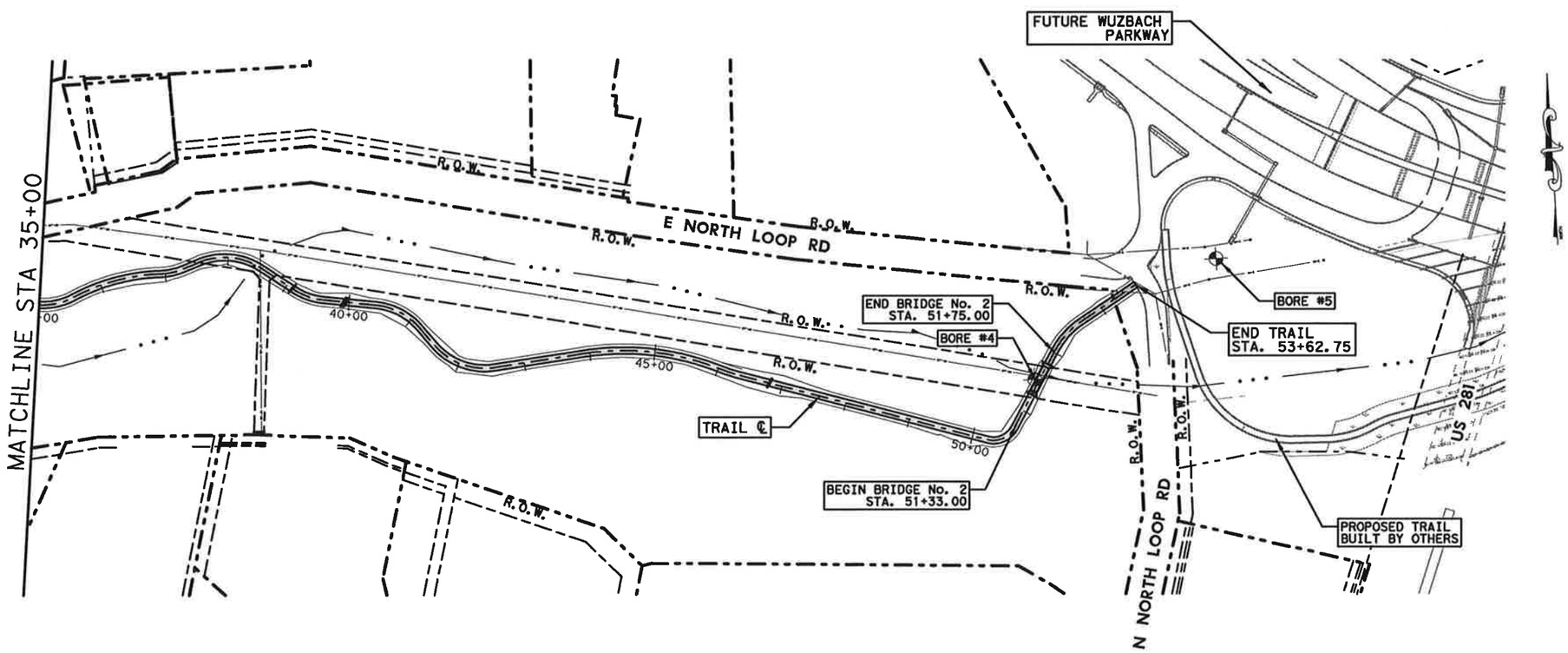
3/7/08



LEGEND

- RIGHT OF WAY
- EASEMENTS
- DITCH FLOW LINE
- BORE LOCATION

CONTRACTOR CAN REQUEST A COPY OF THE BORE LOGS FROM THE CITY, UPON WRITTEN PERMISSION.



NO.	DATE	REVISION	APPR BY

© TxDOT 2012

Texas Department of Transportation

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

HDR Engineering, Inc.
1020 NE Loop 410, Suite 400
San Antonio, TX 78209
Texas P.E. Firm Registration No. F-754
TELE. NO. (210) 841-2800 FAX NO. (210) 841-2828 WWW.HDRINC.COM

0 100 200 300 400
HORIZONTAL SCALE: 1" = 200'

STATE OF TEXAS
Jess W. Swalm
99204
REGISTERED PROFESSIONAL ENGINEER

Jess W. Swalm, P.E. 11-5-2012
JESS W. SWALM, P.E. DATE

SALADO CREEK TRAIL

PROJECT LAYOUT & BORE LOCATIONS

SCALE: 1"=200' SHEET 1 OF 1

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	11/1/2012	161872	2

PLOTDRIVER:HDR+TxDOT+BW+PDF.plt
PENTABLE:0000000000164560.tbl
File Name:SCT-PRJ.dgn
User Name:brooperer
DATE:11/1/2012
PLOTTING TIME:10:51:34 AM

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR CONSTRUCTION JUNE 2008, OR LATEST.
2. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS, BUT NOT INCLUDED IN THE BID PROPOSAL. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED IN THE PAY ITEM TO WHICH IT RELATES.
3. THE CONTRACTOR SHALL PROVIDE ACCESS FOR THE DELIVERY OF MAIL BY THE U.S. POSTAL SERVICE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION ANY DAMAGE DONE TO EXISTING FENCES, CONCRETE ISLANDS, STREET PAVING, CURBS, SHRUBS, BUSHES OR DRIVEWAYS. (NO SEPARATE PAY ITEM).
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SIGNS AND BARRICADES ARE PROPERLY INSTALLED AND MAINTAINED. ALL LOCATIONS AND DISTANCES WILL BE DECIDED UPON IN THE FIELD BY THE CONTRACTOR, USING THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". THE CITY'S CONSTRUCTION INSPECTOR AND TRAFFIC ENGINEERING REPRESENTATIVE WILL ONLY BE RESPONSIBLE TO INSPECT BARRICADES AND SIGNS. IF, IN THE OPINION OF THE TRAFFIC ENGINEERING REPRESENTATIVE AND THE CONSTRUCTION INSPECTOR, THE BARRICADES AND SIGNS DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC, THE CONSTRUCTION INSPECTOR SHALL HAVE THE OPTION TO STOP OPERATIONS UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED.
6. IF THE NEED ARISES, ADDITIONAL BARRICADES AND DIRECTIONAL DEVICES MAY BE ORDERED BY THE TRAFFIC ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
7. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.171 C.P.S. MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
8. CONTRACTOR SHALL NOTIFY THE CITY INSPECTOR TWENTY FOUR (24) HOURS PRIOR TO BACKFILL OF ANY UTILITY TRENCHES TO SCHEDULE FOR DENSITY TEST AS REQUIRED (TELEPHONE NO. 532-2860).
9. CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. IF ANY ARE DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES, THEY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
10. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION TO DETERMINE THE LOCATION OF EXISTING UTILITIES. CONTRACTOR SHALL NOTIFY THE FOLLOWING AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO EXCAVATION OPERATION:

    SAN ANTONIO WATER SYSTEM (SAWS) 233-2010
    BEXAR METROPOLITAN WATER DISTRICT (BEXAR MET) 354-6538 / 357-5741
    COSA DRAINAGE 207-8048
    COSA SIGNAL OPERATIONS 207-7720 / 207-7765
    TEXAS STATE WIDE ONE CALL LOCATOR 1-800-344-8377
    - CITY PUBLIC SERVICE ENERGY
    - TIME WARNER
    - AT&T
    - MCI

11. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES INDICATED ON THE PLANS ARE TAKEN FROM AVAILABLE RECORDS AND ARE NOT GUARANTEED, BUT SHALL BE INVESTIGATED AND VERIFIED BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO AND FOR THE MAINTENANCE AND PROTECTION OF THE EXISTING UTILITIES EVEN IF THEY ARE NOT SHOWN ON THE PLANS. LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HERE ARE APPROXIMATE ONLY. ACTUAL LOCATIONS AND DEPTHS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND HE SHALL BE RESPONSIBLE FOR PROTECTION OF SAME DURING CONSTRUCTION.
12. ALL WASTE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HIS SOLE REPONSIBILITY TO DISPOSE OF THIS MATERIAL OFF THE LIMITS OF THE PROJECT. NO WASTE MATERIAL SHALL BE PLACED IN EXISTING LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS OF EXISTING ARTIFICIAL OR NATURAL DRAINAGE.
13. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIAL IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.
14. THE CONTRACTOR SHALL MAINTAIN ALL ADJOINING STREETS AND TRAVELED ROUTES FREE FROM SPILLED AND /OR TRACKED CONSTRUCTION MATERIALS AND /OR DEBRIS.
15. IF THE CONTRACTOR ENCOUNTERS ANY ARCHAEOLOGICAL DEPOSITS DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR MUST STOP EXCAVATION IMMEDIATELY, CONTACT THE CITY INSPECTOR, AND CALL THE CITY HISTORIC PRESERVATION OFFICE AT 207-7306 OR 207-3327 FOR AN ARCHAEOLOGICAL INVESTIGATION. THE CONTRACTOR CANNOT BEGIN EXCAVATION AGAIN WITHOUT WRITTEN PERMISSION FROM THE CITY.

    IF MORE THAN THREE (3) DAYS ARE REQUIRED FOR INVESTIGATION (NOT INCLUDING HOLIDAY AND WEEKENDS) AND IF THE CONTRACTOR IS UNABLE TO WORK IN OTHER AREAS, THEN THE CONTRACTOR WILL BE ALLOWED TO NEGOTIATE FOR ADDITIONAL CONSTRUCTION TIME UPON WRITTEN REQUEST WITHIN TEN (10) DAYS AFTER THE FIRST NOTICE TO THE CITY OF ARCHAEOLOGICAL INVESTIGATION FOR EACH EVENT.

    IF THE TIME REQUIRED FOR INVESTIGATION IS LESS THAN OR EQUAL TO THREE (3) DAYS FOR EACH EVENT, CONTRACT DURATION WILL NOT BE EXTENDED.
16. IF SUSPECTED CONTAMINATION IS ENCOUNTERED DURING CONSTRUCTION OPERATIONS, C.O.S.A. SHALL BE NOTIFIED IMMEDIATELY WHEN CONTAMINATED SOILS AND /OR GROUNDWATER ARE ENCOUNTERED AT LOCATIONS NOT IDENTIFIED IN THE PLANS. THE NOTIFICATION SHOULD INCLUDE THE STATION NUMBER, TYPE OF CONTAMINATED MEDIA, EVIDENCE OF CONTAMINATION AND MEASURES TAKEN TO CONTAIN THE CONTAMINATED MEDIA AND PREVENT PUBLIC ACCESS. THE CONTAMINATED SOIL AND /OR GROUNDWATER SHALL NOT BE REMOVED FROM THE LOCATION WITHOUT PRIOR C.O.S.A. APPROVAL.

    THE CONTRACTOR MUST STOP THE EXCAVATION IMMEDIATELY AND CONTACT THE C.O.S.A. INSPECTOR. THE CONTRACTOR CANNOT BEGIN EXCAVATION ACTIVITIES WITHOUT WRITTEN PERMISSION FROM THE CITY.
17. CONTRACTOR IS TO INCLUDE A MAILBOX POST BLOCKOUT FOR VACANT LOTS AND ALL RESIDENCES WHICH DO NOT HAVE MAILBOXES AT THE CURB. BLOCKOUTS ARE PROVIDED FOR FUTURE USE BY THE POST OFFICE.

TREE PROTECTION AND PRESERVATION GENERAL NOTES

1. NO UTILITY OR STREET EXCAVATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED AND APPROVED.
2. TREE PROTECTION FENCING SHALL BE REQUIRED. TREE PROTECTION FENCING SHALL BE INSTALLED, MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING SITE CONSTRUCTION. DURING CONSTRUCTION ACTIVITY, AT LEAST A SIX-INCH LAYER OF COARSE MULCH SHALL BE PLACED AND MAINTAINED OVER THE ROOT PROTECTION ZONE (NO SEPARATE PAY ITEM).
3. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN THE VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR FOR GUIDANCE.
4. ROOTS WILL BE CUT WITH A ROCK SAW OR BY HAND, NOT BY AN EXCAVATOR OR OTHER ROAD CONSTRUCTION EQUIPMENT.
5. ALL CURB AND SIDEWALK WORK SHALL USE ALTERNATIVE CONSTRUCTION METHODS TO MINIMIZE EXTENSIVE ROOT DAMAGE TO TREES (REFER TO DETAILS).
6. EXPOSED ROOTS SHALL BE COVERED AT THE END OF THE DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH, OR WET BURLAP.
7. NO EQUIPMENT, VEHICLES OR MATERIALS SHALL OPERATE OR BE STORED WITHIN THE ROOT PROTECTION ZONE OF ANY TREE NEAR THE PROJECT. ROOT PROTECTION ZONE IS 1 FOOT OF RADIUS PER INCH OF TREE'S DIAMETER. A 10-INCH DIAMETER TREE WOULD HAVE A 10 FOOT RADIUS ROOT PROTECTION ZONE AROUND THE TREE. ROOTS OR BRANCHES IN CONFLICT WITH THE CONSTRUCTION SHALL BE CUT CLEANLY ACCORDING TO PROPER PRUNING METHODS. OAK WOUNDS SHALL BE PAINTED OVER WITHIN 30 MINUTES TO PREVENT OAK WILT.
8. SAPLINGS, SHRUBS OR BUSHES TO BE CLEARED FROM THE PROTECTED ROOT ZONE AREA OF A LARGE TREE SHALL BE REMOVED BY HAND AS DESIGNATED BY THE INSPECTOR.
9. NO WIRES, NAILS OR OTHER MATERIAL MAY BE ATTACHED TO PROTECTED TREES.
10. TREES, TREE LIMBS, BUSHES AND SHRUBS LOCATED IN THE CITY STREET OR ALLEY RIGHT-OF-WAY OR PERMANENT EASEMENTS WHICH INTERFERE WITH PROPOSED CONSTRUCTION ACTIVITIES SHALL BE PROPERLY PRUNED FOLLOWING THE ANSI A-300 STANDARDS FOR PRUNING. ALL TREE PRUNING SHALL BE COMPLETED BY A CITY OF SAN ANTONIO TREE MAINTENANCE LICENSED CONTRACTOR (ARTICLE 21-171, CITY CODE) ONLY AFTER APPROVAL FROM THE CAPITAL PROJECTS MANAGEMENT THROUGH THE INSPECTOR.
11. NO EXCESSIVE TREE TRIMMING WILL BE PERMITTED.
12. ALL DEBRIS GENERATED BY THE PRUNING AND TRIMMING OF THE TREES AND /OR BUSHES SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF PROPERLY (NO SEPARATE PAY ITEM).
13. TREES MUST BE MAINTAINED IN GOOD HEALTH THROUGHOUT THE CONSTRUCTION PROCESS. MAINTENANCE MAY INCLUDE, BUT NOT LIMITED TO: WATERING THE ROOT PROTECTION ZONE, WASHING FOLIAGE, FERTILIZATION, PRUNING, ADDITIONAL MULCH APPLICATIONS AND OTHER MAINTENANCE AS NEEDED ON THE PROJECT.
14. ANY TREE REMOVAL SHALL BE APPROVED BY THE CITY ARBORIST. (207-8053)
15. TREES WHICH ARE DAMAGED OR LOST DUE TO THE CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED TO THE CITY'S SATISFACTION.
16. TREE PLANTING FOR MITIGATION OR ENHANCEMENT: ALL PLANTED TREES SHALL BE MAINTAINED IN A HEALTHY CONDITION AT ALL TIMES. THIS INCLUDES IRRIGATION, FERTILIZING, PRUNING AND OTHER MAINTENANCE AS NEEDED ON THE PROJECT. TREES THAT DIE WITHIN TWELVE (12) MONTHS SHALL BE REPLACED WITH A TREE OF EQUAL SIZE AND SPECIES.

ACCESSIBILITY REQUIREMENTS

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN VEHICULAR AND PEDESTRIAN ACCESS AT ALL TIMES TO LOCAL RESIDENCES AND BUSINESSES.
2. WHEN THE WORK REQUIRES THE EXCAVATION OF THE STREET AND THE REMOVAL OF THE EXISTING DRIVEWAY APPROACHES AND SIDEWALKS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY ALL-WEATHER ACCESS TO THE BUSINESSES AND RESIDENCES. THE TEMPORARY DRIVEWAY APPROACHES SHALL BE CONSTRUCTED WITH FLEXIBLE BASE OR GRAVEL MATERIAL AT NO SEPARATE COST TO THE CITY.
3. PRIOR TO INITIATING THE CONSTRUCTION OF NEW DRIVEWAY APPROACHES, THE CONTRACTOR SHALL GIVE ADVANCE WARNING IN PERSON, OR IN WRITING, OF AT LEAST 48 HOURS TO EACH RESIDENCE THAT WILL BE IMMEDIATELY AFFECTED, SO THAT ALTERNATE PLANS MAY BE MADE BY THE RESIDENTS.
4. FOR BUSINESSES WITH MORE THAN ONE DRIVEWAY, AT LEAST ONE DRIVEWAY SHALL REMAIN OPEN WHILE THE OTHER NEW DRIVEWAY APPROACHES ARE CONSTRUCTED. FOR BUSINESSES WITH ONLY ONE DRIVEWAY, THE NEW DRIVEWAY APPROACH SHALL BE CONSTRUCTED IN HALF WIDTHS, UNLESS A TEMPORARY ASPHALT DRIVEWAY IS FIRST INSTALLED AT NO SEPARATE COST TO THE CITY.

MAY 2009

CITY OF SAN ANTONIO CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT			
CITY OF SAN ANTONIO GENERAL NOTES			
40 % SUBMITTAL	PROJECT NO.:		DATE:
DRWN BY: MA	DSGN BY: MA	CHKD BY: MA	SHEET NO.: 3

SUPPLEMENTAL GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE 2004 TXDOT - STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES.

2. ALL PHASES OF WORK UNDER THIS CONTRACT SHALL BE WITH STRICT ADHERENCE TO THE PLANS AND ACCOMPANYING SPECIFICATIONS. WHERE DIFFERENCES OCCUR BETWEEN THESE TWO DOCUMENTS, THE MORE STRINGENT REQUIREMENT SHALL APPLY. FINAL DECISIONS OR JUDGMENTS ON INTERPRETATION OF THE SPECIFICATIONS AND/OR ON MATTERS NOT SPECIFICALLY COVERED BY THE ABOVE DOCUMENTS SHALL BE MADE BY THE CITY OF SAN ANTONIO ENGINEER.

3. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNERS AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTIONS WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

4. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE (S) WITHIN THE PROJECT WORK AREA IN ORDER TO DEVELOP THE CONTRACTOR'S PLANS TO IMPLEMENT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S PLANS SHALL PROVIDE FOR ADEQUATE TRENCH SAFETY SYSTEMS THAT COMPLY WITH, AT A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS, SPECIFICALLY CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL DEVELOP AND IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS. GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

5. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ROCK, SAND, GRAVEL, OR OTHER UNSTABLE CONDITIONS ENCOUNTERED IN ANY WORK IMPLIED BY THESE DRAWINGS. IN THE OFFICE OF HDR ENGINEERING, INC., THE CONTRACTOR MAY REVIEW A COPY OF THE GEOTECHNICAL REPORT FOR THE PROJECT IN ORDER TO OBTAIN KNOWLEDGE OF THE SUBSURFACE CONDITIONS.

6. THE CONTRACTOR SHALL PROVIDE CONTINUOUS ACCESS FOR RESIDENTS AND BUSINESSES.

7. WHENEVER POWER POLES ARE ADJACENT TO THE PROPOSE EXCAVATION, THE CONTRACTOR SHALL PROVIDE PROPER SHORING OR OTHER SUITABLE SUPPORT DURING CONSTRUCTION, IN WHICH METHODS MUST BE APPROVED BY THE OWNER OF THE UTILITY.

8. ALL TRENCHES MUST BE BACKFILLED AT THE END OF EACH WORK DAY. THE CONTRACTOR SHALL NOT LEAVE OPEN TRENCHES DURING NON-WORKING HOURS.

9. CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO BUILDING CODE AND REGULATIONS, AS WELL AS OTHER SAFETY CODES AND INSPECTION PROVISIONS APPLICABLE TO THIS PROJECT.

10. CONTRACTOR SHALL SECURE ALL PERMITS REQUIRED FOR CONSTRUCTION AND SHALL NOTIFY RESPECTIVE GOVERNMENTAL OR UTILITY AGENCIES AFFECTED BY CONSTRUCTION.

11. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE GRADING ELEVATIONS ACCORDING TO THE FOLLOWING TOLERANCES:

PAD ELEVATION	#0.1 FOOT
PAVEMENT	#0.005 FOOT
CURBS, GUTTERS, AND DRAINAGE FACILITIES	#0.002 FOOT
LANDSCAPING	#0.2 FOOT

SHOULD ANY ABOVE MENTIONED ELEVATIONS FOUND TO BE OUT OF LEVEL BEYOND THE STATED TOLERANCE AFTER CONTRACTOR'S OPERATIONS, THE CONTRACTOR SHALL RETURN AND CORRECT THE GRADING AT NO COST TO THE OWNER. ALL EXCESS MATERIALS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

13. "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY VERTICAL AND HORIZONTAL ALIGNMENT.

14. THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESEEDED. 70% VEGITATIVE COVER SHALL BE ESTABLISHED BEFORE ACCEPTANCE OF PHASE.

15. ANY EXISTING SITE IMPROVEMENT OR UTILITY REMOVED, DAMAGED OR UNDERCUT BY CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER AND APPROVED BY THE RESPECTIVE UTILITY AT THE CONTRACTOR'S EXPENSE.

16. DRIVEWAYS, WALKS, AND RETAINING WALLS SHALL BE DEMOLISHED AND REMOVED WHERE NECESSARY FOR NEW CONSTRUCTION.

17. REMOVAL OF EXISTING STORM DRAINS INDICATED ON PLANS SHALL BE INCLUDED IN ITEM 100, PREPARING RIGHT-OF-WAY.

18. CONSTRUCTION OF THIS PROJECT SHALL BE IN ACCORDANCE WITH THE PHASING LAYOUT PLAN. REFER TO THE PHASING LAYOUT PLAN FOR DETOUR ROUTING NOTES.

19. TxDOT" SHALL SIGNIFY TEXAS DEPARTMENT OF TRANSPORTATION.

20. CONTRACTOR SHALL CONTACT THE CONSTRUCTION INSPECTION AND MATERIALS TESTING DIVISION, CITY OF SAN ANTONIO, 207-0748, AT LEAST 24 HOURS PRIOR TO BEGINNING WORK FOR WHICH THE INSPECTION IS DESIRED.

21. MULTI - USE PATH - THE STANDARD MULTI - USE PATH PROPOSED FOR THE PROJECT IS TEN FEET (10') WIDE, ADJUSTMENTS IN THE ALIGNMENT WILL BE ALLOWED TO MANEUVER PAST EXISTING UTILITIES, TREES AND OTHER EXISTING FEATURES. ALIGNMENT ADJUSTMENTS SHALL BE APPROVED BY THE INSPECTOR OR ENGINEER.

22. CONTACT COSA RIGHT OF WAY DEPARTMENT TO GET INFORMATION ON EASEMENTS OBTAINED FOR THIS PROJECT.

23. ALL CLEARING, TREE REMOVAL, AND GRADING FOR THE PROJECT WILL BE SUBSIDIARY TO RIGHT-OF-WAY PREPARATION.

24. CONCRETE BUMP-OUTS FOR TRAIL MARKERS ARE INCIDENTAL TO ITEM 0531 2004.

25. MULTI - USE PATH TO BE CONSTRUCTED TO MEET REQUIREMENTS OF ARCHITECTURAL BARRIER ACT ACCESSIBILITY GUIDELINES FOR OUTDOOR DEVELOPED AREAS.

26. SLOPE CRITERIA: AS PER AASHTO

CROSS SLOPE - 1:50 (2%) MAXIMUM
RUNNING SLOPE - 1:20 ANY DISTANCE
1:10 FOR 30' MAX.
NO TRAIL RUN SLOPES STEEPER THAN 1:10

RESTING INTERVALS REQUIRED FOR ANY SLOPE GREATER THAN 1:12 AT MAX. LIMITS.

27. ALL CONSTRUCTION AREAS MUST BE SAFE FOR PEDESTRIAN TRAFFIC BEFORE, DURING, AND AFTER CONSTRUCTION. WORK SITES SHALL BE CLEANED DAILY OF ALL CONSTRUCTION TRASH, DEBRIS, AND MATERIALS, ETC.

28. CONTRACTOR SHALL WARN ALL EMPLOYEES TO BEWARE OF WILDLIFE WHILE ON THE PROJECT SITE. NEITHER THE CITY OF SAN ANTONIO NOR THE DESIGN CONSULTANT SHALL BE RESPONSIBLE FOR ANY INJURY OR MEDICAL BILLS INCURRED WHILE ON PROJECT.

29. COST OF COMPACTING EXISTING SUBGRADE AND PLACEMENT OF TOPSOIL IN AREAS DISTURBED BY CONSTRUCTION IS SUBSIDIARY TO THE EXCAVATION COST.

30. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE IN ALL DISTURBED AREAS. MINIMUM SLOPES IN DISTURBED AREAS SHALL BE 2%, MAXIMUM SLOPES SHALL BE 3:1.

31. CONTRACTOR TO KEEP DISRUPTION OF SOIL AND EXISTING VEGETATION TO A MINIMUM.

32. INTENT IS FOR PROPOSED GRADE LINE TO GENERALLY FOLLOW EXISTING GRADE. FIELD ADJUSTMENTS MAY BE REQUIRED TO MEET PROJECT INTENT.

33. POSITIVE DRAINAGE MUST BE MAINTAINED ACROSS TRAIL TO THE CREEK. ADJUST GRADING OF TRAIL AND SIDESLOPES AS NECESSARY TO ENSURE NO PONDING OF WATER BY TRAIL. WORK IS TO BE CONSIDERED SUBSIDIARY TO THE PERTIENENT BID ITEMS.

TXDOT GENERAL NOTES

2004 Specification Book (Revised October 1, 2012)

Steel Wrapped or Asbestos Utility Lines:

Existing steel wrapped natural gas and/or asbestos cement (AC) water lines that will no longer be in service are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of other construction, to make tie-ins, etc.) comply with all federal, state and local laws, ordinances and regulations regarding the management of these materials. At a minimum:

1. Contact the Engineer.

2. Remove the minimum amount of pipe needed to perform the proposed work.

3. Cover and secure the ends of the pipe with a double layer of 6 mil plastic. If the pipe is damaged, cover the entire pipe.

4. Move the pipe to an approved temporary site within the project.

5. The Engineer will determine the owner (utility company) of the pipe and will coordinate removal from the project. The contractor will load the pipe onto the removal vehicles but will NOT be responsible for removing the pipe from the project.

6. Removal of the pipe from the trench is subsidiary to the work that created the need for the removal (excavation for structures, roadway, a new line, tie-ins, etc.). The work performed in handling the pipe after it has been removed from the trench (covering with plastic, hauling to the temporary site and later loading on to the disposal vehicles will be paid for through the Force Account procedure.

Contact the Engineer or the City when construction operations are within 400 feet of a signalized intersection to determine/verify the location of loop detectors, conduit, ground-boxes, etc. Repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work.

Remove existing raised pavement markings as the work progresses or as approved. This work is subsidiary to the various bid items. Properly dispose ma terials removed.

To better fit field conditions, the cross sections may be varied when approved.

If there are waste areas or material source areas, follow the Texas Aggregate Quarry and Pit Safety Act requirements.

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface t raffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless oth erwise approved.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

--Item 5--

When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations. For electrical lines and poles shown in the plans, if the lines need to be de-energized or if poles need to be braced, contact the electrical company. Work pertaining to de-energizing lines, bracing poles and other protective measures will not be paid by TxDOT.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, nests containing migratory birds must be avoided and no work will be performed in the nesting areas until the young birds have fledged.

NO.	DATE	REVISION	APPR BY

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STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 6/26/13

SALADO CREEK TRAIL

SUPPLEMENTAL GENERAL NOTES

N.T.S			SHEET 1 OF 2	
DSN: BSP	CK: JMG	DATE	JOB NO.	SHEET NO.
DRN: BSP	CK: JMG	6/26/2013	161872	4

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User Name: lgonzal
DATE: 6/26/2013
PLOTTING TIME: 3:03:07 PM

TXDOT GENERAL NOTES CONT'D

Structures

Bridge and culvert construction operations can not begin until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid items.

--Item 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

--Item 7--
The project's total disturbed area is 1.78 acres. The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, will further establish the authorization requirements for storm water discharges. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

--Item 8--
Working days will be computed and charged in accordance with Article 8.3.5 Calendar Day. Work will only be permitted Monday-Friday, unless otherwise coordinated with the City. Contractor shall provide a minimum of 48 hours advance notice prior to any weekend work.

The number of working days and interim milestones, if any, were calculated using a conceptual time determination schedule that assumes generic resources, production rates, sequences of construction and average weather conditions based on historic data. If requested, the Engineer will supply bidders a CD of the time determination schedule compatible with Primavera Project Planner software. The time determination schedule is provided for informational use only and is not intended for bidding or construction purposes. If the schedule is used for bidding or construction purposes, the bidder accepts the schedule and assumes the responsibility for verifying all aspects of the schedule. The department will not adjust the number of working days and milestones, if any, due to differences in opinion regarding any assumptions made in the preparation of the schedule or for errors, omissions or discrepancies found in the schedule.

Locate and reference with station and offset all manholes and valves within the construction area. Each manhole and valve shall be identified by its owner (SAWS, CPS, etc.). No roadwork will begin until this list has been submitted. Gas valves have to be accessible at all times, therefore; temp. CTB, material stock piles, etc. can not be placed over these valves.

TXDOT GENERAL NOTES CONT'D

--Item 100--
Begin clearing operations after trees and other areas of vegetation to be protected have been identified and approved. Install fencing around features to be protected as shown in the plans or directed. Coordinate all right of way clearing operations with the SW3P.

Trim and remove brush and trees as needed for construction operations. Obtain approval for proposed method of tree and brush trimming and removal. Vertical flailing equipment is not allowed. Treat damaged or cut branches, roots and/or stumps of all oak trees with a commercial tree wound dressing. Disinfect all pruning tools with a solution of 70% alcohol before moving from one tree to another. Unless otherwise approved remove all resulting vegetative debris from the ROW within 24 hours. The Engineer can stop all construction operations if the dressing, cut and removal requirements are not followed.

--Item 164--
Drill seeding of permanent grasses requires the use of approved grass seeding equipment capable of properly storing and metering the release of small seeds (such as Bermuda grass) separately from fluffy type seeds (such as bluestems). Equipment manufactured for planting grain crops is acceptable for planting temporary cool season seeds, but not for planting the permanent seed mix.

When drill seeding is required, cultivate the area to a depth of 4 in. after the fertilizer has been applied and before placing the seed.

If performing a permanent seeding in an area with established temporary grass cover and mowing is performed instead of tilling, seed and fertilizer may be distributed simultaneously during "Broadcast Seeding" operations, provided each component is applied at the specified rate.
--Item 166--
Use a fertilizer with an analysis of 13-13-13 (50% of the total N must be sulfur coated urea) to apply 60 lbs of actual N per acre. This requires 460 lbs of 13-13-13 per acre or .095 lbs per SY of area.

--Item 168--
Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time is estimated to be 12 weeks for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

--Item 247--
There is no minimum PI requirement for this project.

--Item 420--
Mass concrete will be measured in place.
Restrict large aggregate size to 61/64" maximum for class "C" concrete used in aesthetic details requiring form liners.

--Item 421--
Use an automated ticket that contains the same information as TxDOT's ticket. Submit the ticket for approval prior to use. The concrete producer will contact the District Laboratory or the Engineer's Office (outside the San Antonio area) to inform TxDOT of scheduled structural concrete batching. Structural concrete includes bridge drill shafts, columns, caps, abutments, deck or top slabs of direct traffic culverts.

--Item 432--
In all riprap slopes, provide 3 inch diameter weep holes at 10 foot maximum spacing and backed with loose graded gravel or crushed stone and galvanized hardware cloth.

Match the slope of the Riprap (Mow Strip) to the slope of the adjacent roadway.

--Item 462--
Use concrete aggregate with two sacks of Portland cement per cubic yard for fill between pre-cast boxes.

The following structures shall be cast-in-place: All.

--Item 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

TXDOT GENERAL NOTES CONT'D

--Item 502--
Place standard markings no later than 14 days after surface treatment operations are completed.

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Treat the pavement drop-offs as shown in the TCP.

After written notification, the time frame to provide properly maintained signs and barricades before considered in non-compliance is 48 hours from receipt of the notification.

Moving an existing sign to a temporary location is subsidiary to this Item. Installations with permanent supports at permanent locations will be paid for under the applicable bid item (s).

Notify the Engineer 5 business days in advance of any temporary or permanent lane, ramp, connector, etc. closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 5 business days advance notice to the Engineer. Unless shown in the TCP, no lane, ramp, connector, etc. closures are allowed during special events. At least one lane has to remain open at all times. For all lane closures, provide written closure information by 1:00PM on the business day prior to the closure. For closures on a Monday or following a Holiday, furnish the information the workday prior to the closure. Lane closures will not be allowed if this reporting requirement is not met.

For closures not listed in the TCP; the lane closures are limited to between the hours of 6:00 am - 7:00 pm, and at least one lane has to remain open at all times.
Avoid placing stockpiles within the roadway's horizontal clear zone. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets.
In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.
--Item 529--
Class "C" concrete is required for machine extruded curb.

--Item 531--
The curb ramp truncated domes will be terra cotta.

The curb ramp locations shown in the plans have taken into account the geometric features of the intersection, traffic signals, and the pavement markings. If anything changes during construction, the location of curb ramps must be adjusted to ensure they meet TAS requirements.

--Item 644--
The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

--Item 666 & 8251--
If TY II material is used (vs. an acrylic or epoxy) as the sealer for the TY I markings, place the TY II a minimum of 14 calendar days (to provide adequate curing) before placing the TY I markings.

--Item 672--
Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

NO.	DATE	REVISION	APPR BY

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STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. 6/26/13 DATE

SALADO CREEK TRAIL

SUPPLEMENTAL GENERAL NOTES

N.T.S SHEET 2 OF 2

DSN: BSP	CK: JMG	DATE	JOB NO.	SHEET NO.
DRN: BSP	CK: JMG	6/26/2013	161872	5

DATE: 6/26/2013
PLOTTING TIME: 3:29:16 PM
File Name: suppgennotes.dgn

TRAIL QUANTITIES

PLAN SHEET NO.	STATION TO STATION	0100 PREPARING ROW	0104 REMOVING CONC (RIPRAP)	0110 EXCAVATION (ROADWAY)	0110 EXCAVATION (CHANNEL UNDER LWC)	0132 EMBANKMENT (FINAL) (ORD COMP) (TY A)	0161 EROSION CONTROL COMPOST (2")	0168 VEGETATIVE WATERING	0423 RETAINING WALL (CAST-IN-PLACE)	0432 RIPRAP (CONC) (4 IN)	0464 RC PIPE (CL III) (24 IN)	0467 SET (TY II) (24 IN) (RCP) (4:1) (C)	0500 MOBILIZATION	0502 BARRICADES, SIGNS AND TRAFFIC HANDLING
		STA	SY	CY	CY	CY	SY	MG	SF	CY	LF	EA	LS	MO
TRAIL PLAN & PROFILE SHEETS														
28	15+24 TO 18+00	2.8		153	40	153	77	6.11	240	20				
29	18+00 TO 22+00	4		223		223	400	6.11						
30	22+00 TO 26+00	4		223		223	400	6.11						
31	26+00 TO 30+00	4		223		223	142	6.11			48	6		6
32	30+00 TO 34+00	4	55	223		223	282	6.11						
33	34+00 TO 38+00	4		223		223	400	6.11					1	
34	38+00 TO 42+00	4		223		223	400	6.11			36	6		
35	42+00 TO 46+00	4		223		223	400	6.11						
36	46+00 TO 50+00	4		223		223	400	6.11			12	2		
37	50+00 TO 53+62.75	4		202		202	321	6.11						
TRAIL PLAN & PROFILE SHEET TOTALS		**38.38**	**55**	**2139**	**40**	**2139**	**3222**	**61.07**	**240**	**20**	**96**	**14**	**1**	**6**

PLAN SHEET NO.	STATION TO STATION	0506 ROCK FILTER DAMS (INSTALL) (TY 3)	0506 ROCK FILTER DAMS (REMOVE)	0506 CONSTRUCTION EXITS (INSTALL) (TY 1)	0506 CONSTRUCTION EXITS (REMOVE)	0506 TEMPORARY SEDIMENT CONTROL FENCE	0531 CONC SIDEWALKS (6")	0644 IN SM RD SN SP&AM(GALV SQ) (CITY OF SAT)	0662 WK ZN PAV MRK NON-REMOV (W) 12" (SLD)	0662 WK ZN PAV MRK NON-REMOV (W) 24" (SLD)	0662 WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	0666 REFL PAV MRK TY I (W) 12" (SLD) (10 OMIL)	0666 REFL PAV MRK TY I (W) 24" (SLD) (10 OMIL)	5530 REMOVABLE BOLLARDS
		LF	LF	SY	SY	LF	SY	EA	LF	LF	LF	LF	LF	EA
TRAIL PLAN & PROFILE SHEETS														
28	15+24 TO 18+00			78	78	550	86							
29	18+00 TO 22+00					800	445				250			
30	22+00 TO 26+00					800	445							
31	26+00 TO 30+00					800	188	4	44	30	195	44	30	2
32	30+00 TO 34+00	130	130			560	313							
33	34+00 TO 38+00					800	445							
34	38+00 TO 42+00					800	445							
35	42+00 TO 46+00					800	445							
36	46+00 TO 50+00					800	445				50			
37	50+00 TO 53+62.75	55	55	78	78	636	357				31			1
TRAIL PLAN & PROFILE SHEET TOTALS		**185**	**185**	**156**	**156**	**7346**	**3614**	**4**	**44**	**30**	**526**	**44**	**30**	**3**

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SALADO CREEK TRAIL

TCP, TRAIL, SIGNING & SW3P SUMMARY

N.T.S. SHEET 1 OF 2

DSN: BSP	CK: JWS	DATE	JOB NO.	SHEET NO.
DRN: BSP	CK: JWS	7/3/2013	161872	6

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STRUCTURAL QUANTITIES

ITEM-CODE			DESCRIPTION	Quantity		Comments:
ITEM NO:	DESC CODE	SP NO:		Unit	Quantity	
			West Ave. Underbridge Trail			**Length = 199.00 feet**
420	2001		Concrete trail - structural section	CY	92.00	Sta 15+24.00 to 17+23.00
			Culvert Extension, Trail & Concrete Slope Protection			**Length = 209.34 feet**
420	2001		Trail	CY	112.00	Sta 27+20.00 to 29+29.34
420	2001		Sloped riprap	CY	45.00	
529	2011		Curb-sawtooth	LF	419.00	
			Elevated Low Water Crossing - 1			**Length = 118.00 feet**
420	2001		Footings at end wing walls	CY	3.00	Sta 32+68.00 to 33+86.00
416	2001		18" diameter concrete support piers	VLF	504.00	
420	2009		Support walls	CY	20.00	Plus 5' transitions each end.
420	2029		Concrete deck	CY	44.00	
420	2001		End transitions	CY	10.00	
529	2011		Curb	LF	236.00	
420	2001		Concrete void retainers	LF	234.00	
			Elevated Low Water Crossing - 2			**Length = 42.00 feet**
420	2001		Footings	CY	6.00	Sta 51+33.00 to 51+75.00
420	2009		Support walls	CY	14.00	Plus 5' transitions each end.
420	2029		Concrete deck	CY	16.00	
420	2001		End transitions	CY	10.00	
529	2011		Curb	LF	84.00	

LANDSCAPE QUANTITIES

ITEM	DESCRIPTION	Qty.	Unit
A. TREE PRESERVATION			
100-2002	Preparing Right of Way (Tree)	38	sta
SS1018-2001	Tree Trunk Protection	60	ea
SS1018-2001	Tree Pruning	60	ea
SS1018-2001	Tree Protection Fencing	1,800	ea
SS1018-2001	Mulch	200	cy
B. LANDSCAPE (Trail)			
160-2003	Furnishing and Placing Topsoil	3,915	sy
164-2047	Cellulose Fiber Mulch (Perm)	0.81	ac
180-2001	Native & Wildflower Seeding	0.81	ac
C. SIGNAGE			
636-2002	Trail Ends Ahead Sign	9	s.f.
636-2002	Temporary End of Trail Sign	9	s.f.
636-2002	Entering Flood Zone Sign	3	s.f.
636-2002	R1-1 Stop Sign	7	s.f.
636-2002	W1-5 Curve Warning Sign	14	s.f.
666-2042	Pavement Markings (Stop Bar)	18	lf
666-2096	Pavement Markings (Word "Stop")	3	ea
SS1000	1/4 Mile Marker	2	ea
SS1000	Creek Crossing Marker	4	ea

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SALADO CREEK TRAIL

LANDSCAPING & STRUCTURAL SUMMARY

N. T. S.

SHEET 2 OF 2

DSN: BSP	CK: JWS	DATE	JOB NO.	SHEET NO.
DRN: BSP	CK: JWS	12/3/2012	161872	7

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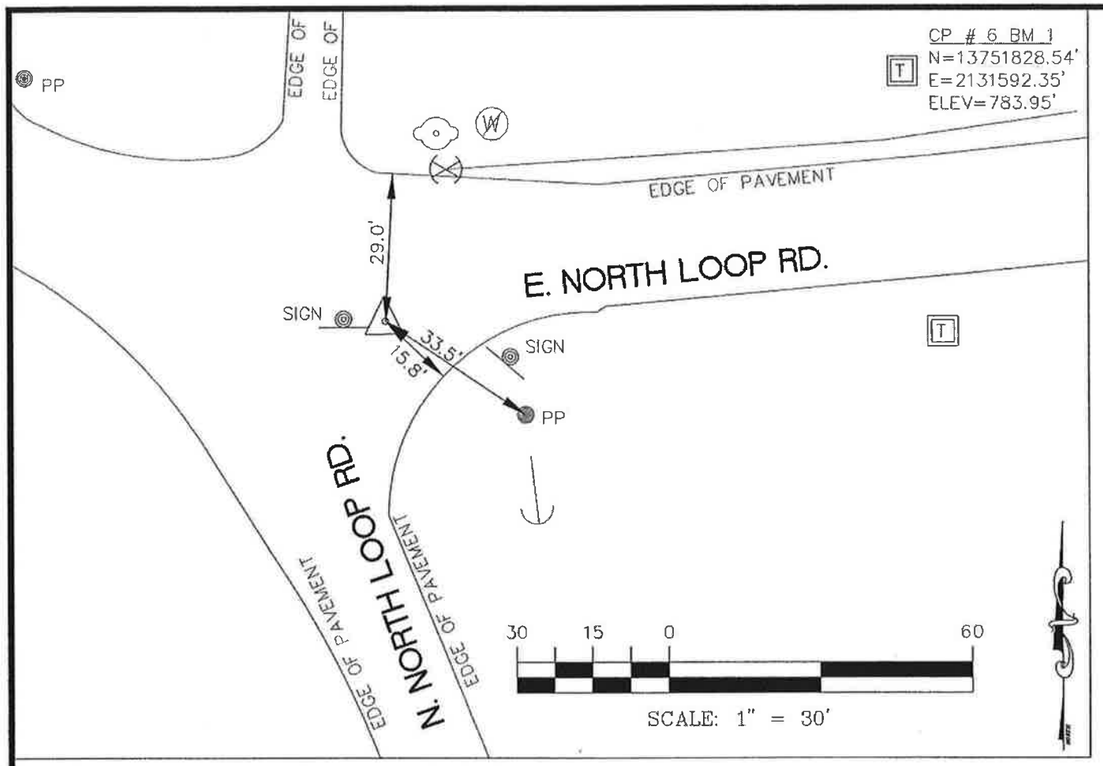
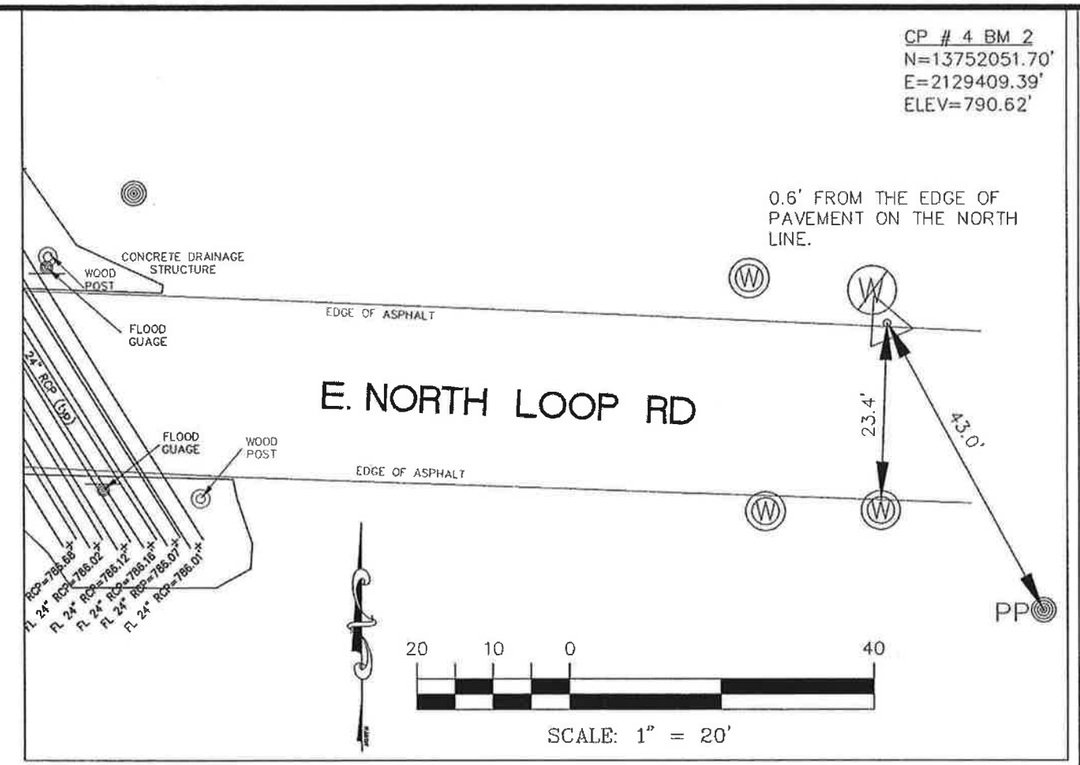
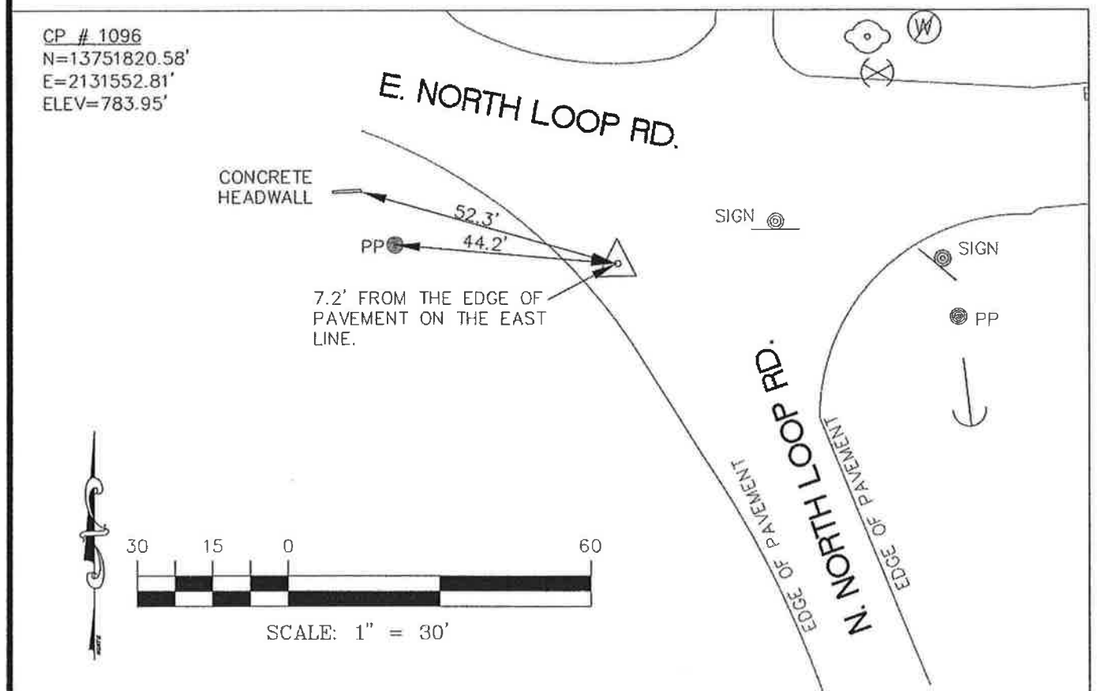


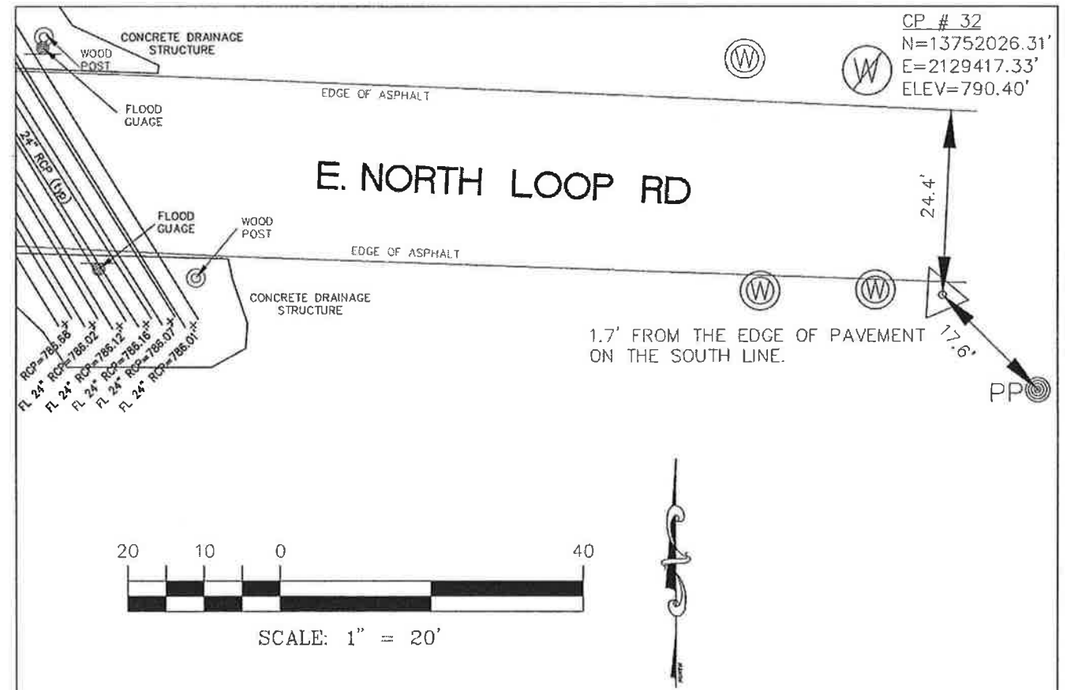
SET MAG NAIL WITH WASHER, IN THE INTERSECTION OF THE SOUTH LINE OF E. NORTH LOOP RD. AND THE EAST LINE OF N. NORTH LOOP RD.



SET 1/2-INCH IRON ROD WITH BLUE CAP ON THE NORTH LINE OF E. NORTH LOOP RD., 95.3 FEET EAST OF A DRAINAGE STRUCTURE LOCATED ON E. NORTH LOOP RD.



SET MAG NAIL WITH WASHER, IN THE INTERSECTION OF THE SOUTH LINE OF E. NORTH LOOP RD. AND THE WEST LINE OF N. NORTH LOOP RD.



SET 1/2-INCH IRON ROD WITH BLUE CAP ON THE SOUTH LINE OF E. NORTH LOOP RD., 95.3 FEET EAST OF A DRAINAGE STRUCTURE LOCATED ON E. NORTH LOOP RD.

HORIZONTAL DATUM
COORDINATES ARE BASED ON NAD83 (CORS), TEXAS STATE PLANE COORDINATE SYSTEM SOUTH CENTRAL ZONE (4204). COORDINATES AND DISTANCES ARE IN U.S. SURVEY FEET. DISPLAYED COORDINATE VALUES ARE SURFACE AND DERIVED BY MULTIPLYING GRID COORDINATES BY 1.00017 (SAF: 1.00017).

THE HORIZONTAL AND VERTICAL CONTROL VALUES WERE OBTAINED BY GPS OBSERVATIONS TO THE FOLLOWING CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS);

HORIZONTAL AND VERTICAL CHECKS WERE MADE TO THE FOLLOWING CONTROL MONUMENTS.

REFERENCE CORS SITE:
RTCM-0754

SYMBOL LEGEND

- POWER POLE
- WATER METER
- ELECTRIC METER
- MANHOLE WATER
- SIGN
- GUY WIRE
- WATER VALVE
- FIRE HYDRANT
- TELEPHONE PEDESTAL

TEXAS DEPARTMENT OF TRANSPORTATION

CITY OF SAN ANTONIO
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SALADO CREEK TRAIL

PROJECT NO.

DATE:	CHK BY:	DATE:	CHK BY:
9-08-11	PH/TL		

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DATE:
FILE:

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type: FRP = Fiberglass; TWT = Thin-Wall; 10BWG = 10 BWG; S80 = Sch 80

Posts (1 or 2)

Anchor Type: UA=Univer-Conc; UB=Univer-Bolt; SA=Slip-Conc; SB=Slip-Bolt; WS=Wedge Steel; WP=Wedge Plastic

Mounting Designation: P = Prefab. "Plain"; T = Prefab. "T"; U = Prefab. "U"

1EXT or 2EXT = # of Ext.; BM = Extruded Wind Beam; WC = 1.12 #/ft Wing Chan.; EXAL= Extruded Aluminum

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN TEXT	DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	Post Type	Posts (1 or 2)	Anchor Type	Mounting Designation	
	1	W11-15	BIKE/PEDESTRIAN (SYMBOLS)	36" X 36"	X		TWT	1	SA	P	
		W11-15P	TRAIL X-ING	24" X 18"	X						
		W16-2AP	300 FT	24" X 12"	X						
	2	W11-15	BIKE/PEDESTRIAN (SYMBOLS)	36" X 36"	X		TWT	1	SA	P	
		W11-15P	TRAIL X-ING	24" X 18"	X						
		W16-7PL	←	24" X 12"	X						
	3	W11-15	BIKE/PEDESTRIAN (SYMBOLS)	36" X 36"	X		TWT	1	SA	P	
		W11-15P	TRAIL X-ING	24" X 18"	X						
		W16-7PL	←	24" X 12"	X						
	4	W11-15	BIKE/PEDESTRIAN (SYMBOLS)	36" X 36"	X		TWT	1	SA	P	
		W11-15P	TRAIL X-ING	24" X 18"	X						
		W16-2AP	300 FT	24" X 12"	X						

ALUMINUM SIGN BLANKS (TYPE A)

Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

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SUMMARY OF SMALL SIGNS

SOSS

REVISIONS	
DN:,CK:TxDOT	7-02
DN:,CK:TxDOT	11-93 2-07
DN:,CK:TxDOT	8-95 9-08
DN:,CK:TxDOT	1-02

DIST	COUNTY	HIGHWAY
SAT	BEXAR	
CONT	JOB	
SECT		

SHEET NO. 9

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Barricade and Construction (BC) Standard Sheets General Notes:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. 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.
4. 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.
5. 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), "A Policy on Geometric Design of Highways and Streets", the TxDOT "Roadway Design Manual" or engineering judgment.
6. 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 shall 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 shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. 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.
9. The temporary 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.
10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
11. 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.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

Worker Safety Apparel Notes:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes prequalified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3134

WEB ADDRESSES FOR REFERENCED DOCUMENTS

Compliant Work Zone Traffic Control Devices List (CWZTCD)
http://www.txdot.gov/publications/traffic.htm

Texas Manual on Uniform Traffic Control Devices (TMUTCD)
http://www.txdot.gov/publications/traffic.htm

Standard Highway Sign Designs for Texas (SHSD)
http://www.txdot.gov/publications/traffic.htm

Traffic Engineering Standard Sheets
http://www.txdot.gov/business/disclaim.htm

Material Producer List
http://www.txdot.gov/business/producer-list.htm

Departmental Material Specifications (DMS)
http://www.txdot.gov/services/construction/material-specifications/

Roadway Design Manual
http://www.txdot.gov/services/general-services/manuals.htm

BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS

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4-03 9-07 REVISIONS	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		10

DATE:
FILE:

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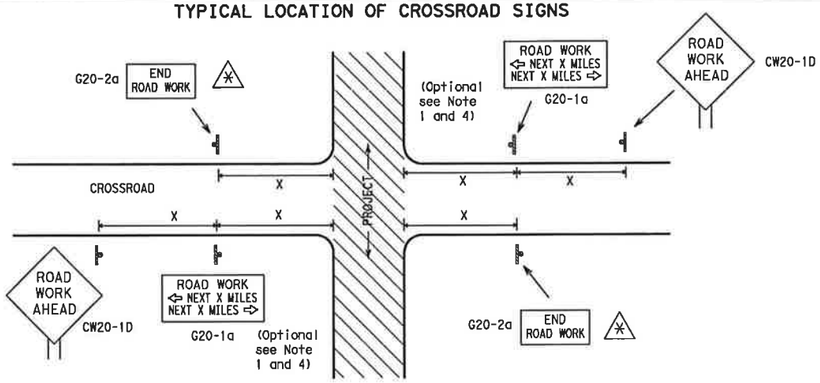
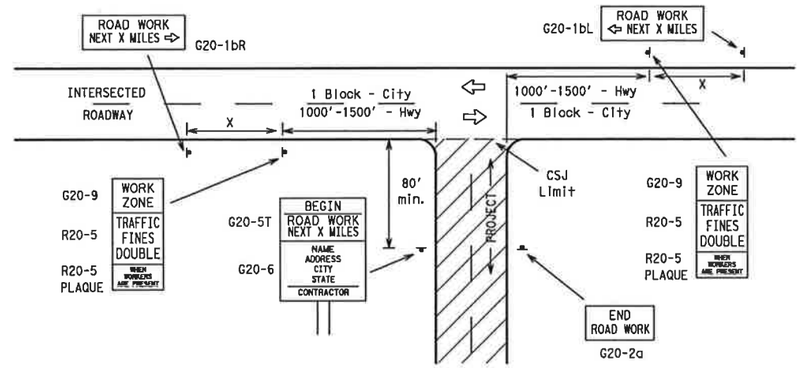
TYPICAL LOCATION OF CROSSROAD SIGNS



✱ May be mounted on back of CW20-1D sign with approval of engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a CW20-1D ROAD WORK AHEAD sign and a G20-2a END ROAD WORK sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" END ROAD WORK (G20-2a) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The G20-1a sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the G20-6 "Contractor Name" sign behind the Type III Barricades for the road closure (see BC(10) also). The G20-1bL and G20-1bR signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING [1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20 [4], CW21, CW22, CW23, CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign Spacing "X" △
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500 [2]
60	600 [2]
65	700 [2]
70	800 [2]
75	900 [2]
80	1000 [2]
✱	✱ [3]

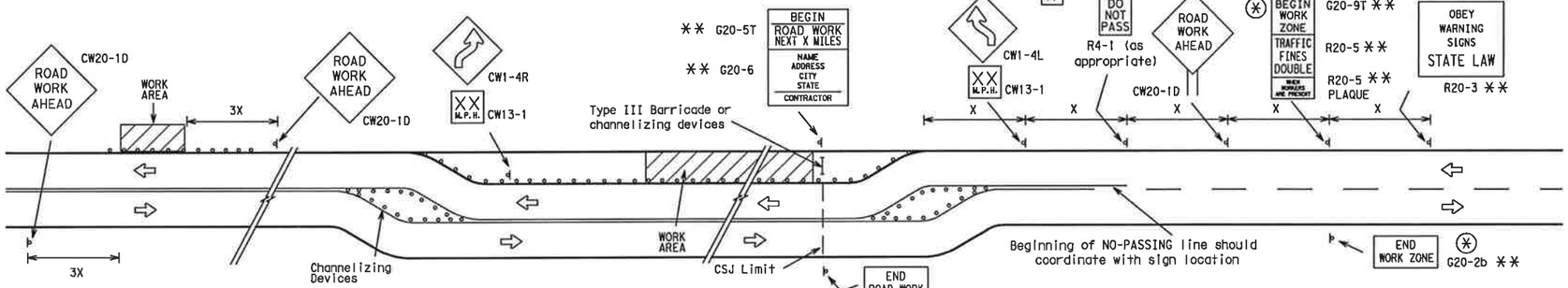
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

General Notes:

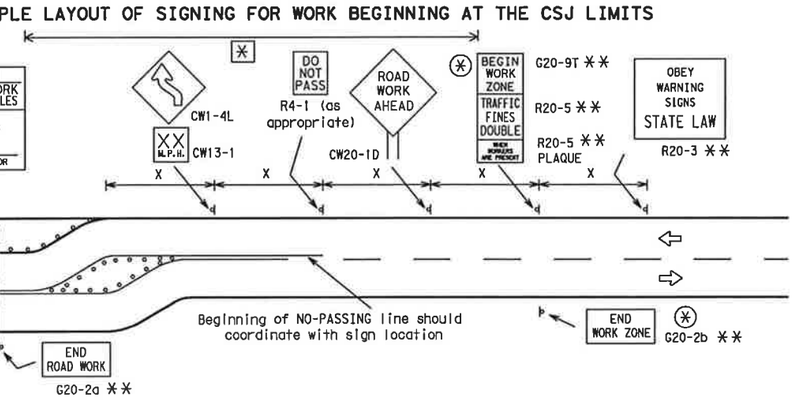
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have ½ mile or more advance warning.
4. 36" x 36" ROAD WORK AHEAD (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

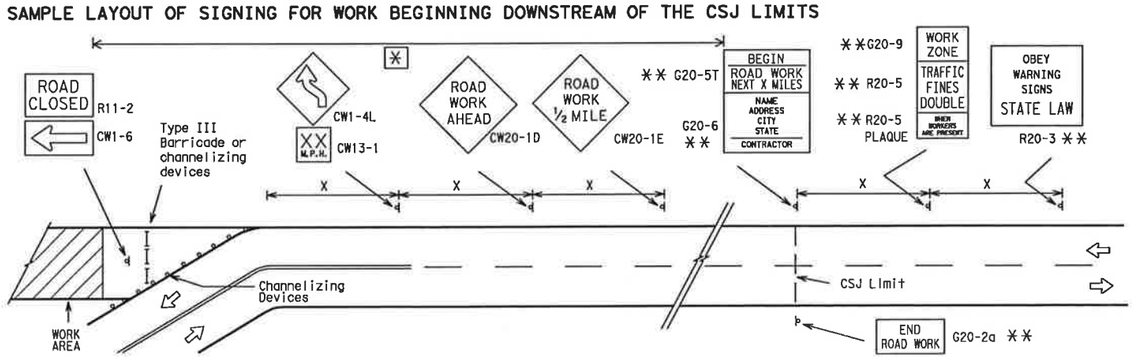


When extended distances occur between minimal work areas, the Engineer/Inspector should ensure additional Road Work Ahead (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and G20-5T sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

(✱) The G20-9T and G20-2b shall be used when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a work zone where traffic fines may double if workers are present.

✱✱ Required CSJ Limit signing. See Note 10 on BC(1).

[✱] Area for placement of "ROAD WORK AHEAD" sign and other signs or devices as called for on the Traffic Control Plan.

LEGEND

- Sign
- Channelizing Devices
- Type III Barricade
- X See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

R20-3
Legend/Border - Black
Background - White

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BARRICADE AND CONSTRUCTION PROJECT LIMIT STANDARD

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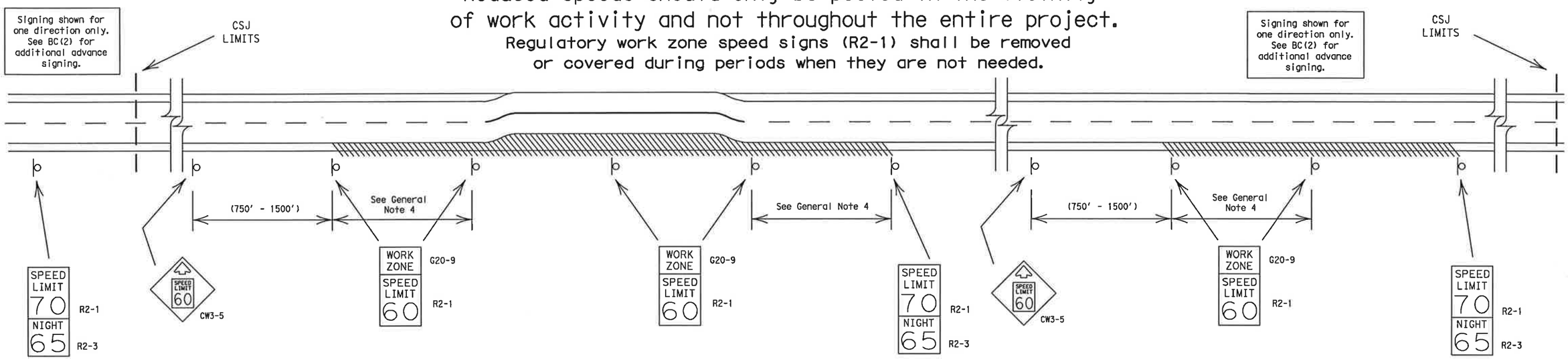
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 15 feet of pavement edge or actually on the pavement.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES:

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, errection and maintenance of the CW3-5 sign, G20-9 plaque and the R2-1 and R2-3 signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless otherwise noted.
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only.
   Work Zone Speed Limits should only be posted as approved for each project.

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BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT STANDARD

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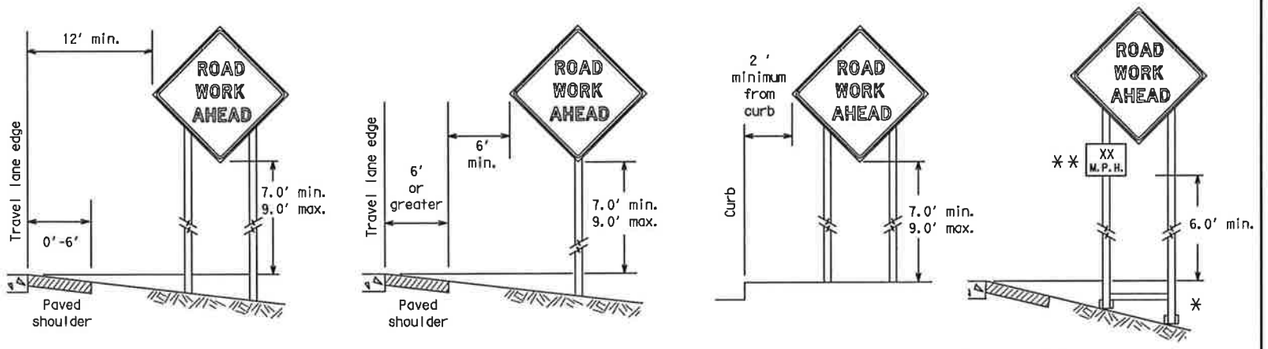
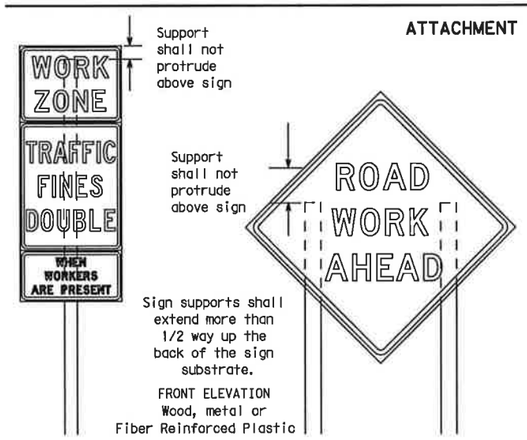
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



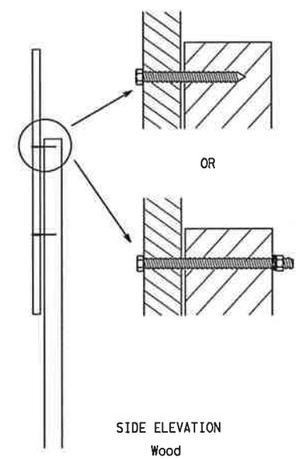
✳ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

✳✳ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same guage material.



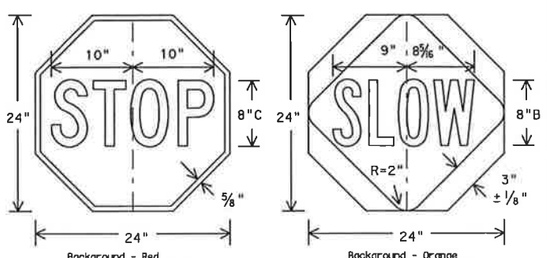
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails will NOT be allowed.

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

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. 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, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall 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.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
6. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
7. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
8. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
10. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nightime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday. or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Engineer may allow the use of smaller size construction warning signs on secondary roads or city streets where speeds are low if the sign size is listed as an option on the "Typical Construction Warning Sign Size and Spacing" chart shown on BC(2).
2. The Contractor shall furnish the sign sizes shown in plans, the BC Sheets, the TCP sheets or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type C (High Specific Intensity), shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type E (Fluorescent Prismatic), shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This type of sign support meets the crashworthiness standards regardless of the direction of impact. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face. These materials can damage the retroreflectivity of sheeting.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact.
6. Rubber (such as tire inner tubes) shall NOT be used for sandbags.
7. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
8. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
9. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES STANDARD

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				SALADO
	DIST		COUNTY	SHEET NO.
	SAT		BEXAR	13

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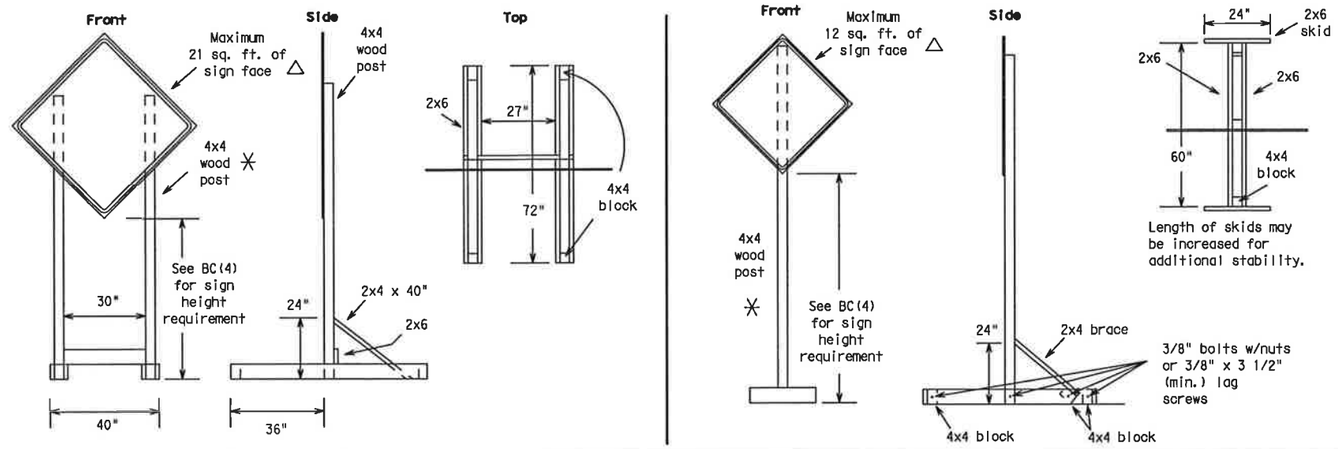
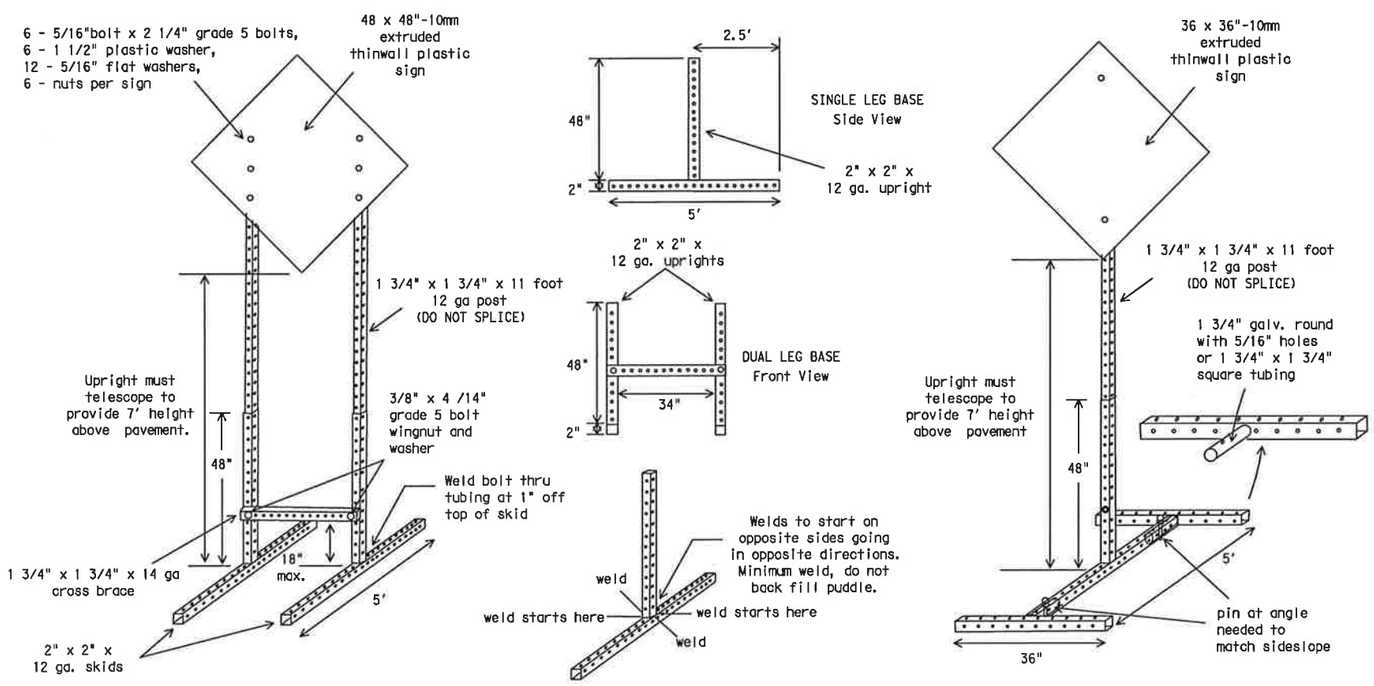
SKID MOUNTED WOOD SIGN SUPPORTS

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

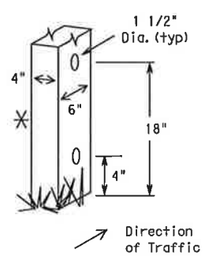


SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).



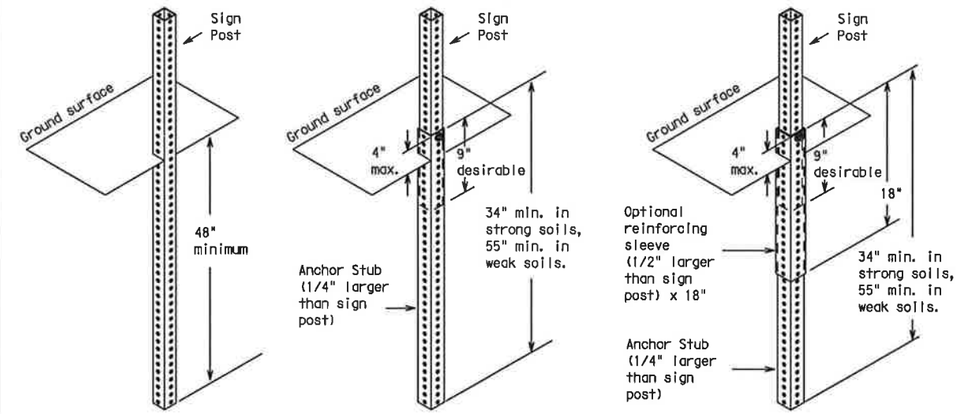
WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

Nominal Post Size	No. of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.

PERFORATED SQUARE METAL TUBING



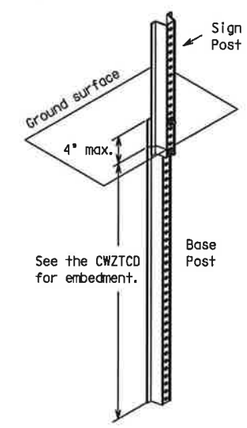
OPTION 1 (Direct Embedment)

OPTION 2 (Anchor Stub)

OPTION 3 (Anchor Stub and Reinforcing Sleeve))

WING CHANNEL

Lap-splice/base bolted anchor



GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. More details of approved Long/Intermediate and Short Term supports can be found on the CWZTCD list. See BC(1) for website location.
3. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
4. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

□ See BC(4) for definition of "Work Duration."

✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT STANDARD

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PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 720 feet. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

Word or Phrase	Abb.	Word or Phrase	Abb.
Access Road	ACCS RD	Major	MAJ
Air Quality	AIR QLTY	Miles	MI
Alternate	ALT	Miles Per Hour	MPH
Avenue	AVE	Minor	MNR
Best Route	BEST RTE	Monday	MON
Boulevard	BLVD	Normal	NORM
Bridge	BRDG	North	N
Cannot	CANT	Northbound	(route) N
Center	CNTR	Parking	PKING
Construction Ahead	CONST AHEAD	Parking Lot	PRK LOT
Detour Route	DETOUR RTE	Road	RD
Do Not	DONT	Right Lane	RGT LN
East	E	Saturday	SAT
Eastbound	(route) E	Service Road	SERV RD
Emergency	EMER	Shoulder	SHLDR
Emergency Vehicle	EMER VEH	Slippery	SLIP
Entrance, Enter	ENT	South	S
Express Lanes	EXP LANE	Southbound	(route) S
Expressway	EXPWY	Speed	SPD
XXXX Feet	XXXX FT	Street	ST
Fog Ahead	FOG AHD	Sunday	SUN
Freeway	FRWY, FWY	Telephone	PHONE
Freeway Blocked	FWY BLKD	Temporary	TEMP
Friday	FRI	Thursday	THURS
Hazardous Driving	HAZ DRIVING	To Downtown	TO DWNTN
Hazardous Material	HAZMAT	Traffic	TRAF
High-Occupancy Vehicle	HOV	Travelers	TRVLRS
Highway	HWY	Tuesday	TUES
Hours	HR	Time Minutes	TIME MIN
Information	INFO	Upper Level	UPPR LVL
It Is	ITS	Vehicle	VEH
Junction	JCT	Warning	WARN
Left	LFT	Wednesday	WED
Left Lane	LFT LN	Weight Limit	WT LIMIT
Lane Closed	LN CLSD	West	W
Lower Level	LOWR LVL	Westbound	(route) W
Maintenance	MAINT	Wet Pavement	WET PVMT
		Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT
RIGHT X LANES CLOSED	RIGHT X LANES OPEN
CENTER LANE CLOSED	DAYTIME LANE CLOSURES
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE
EXIT CLOSED	RIGHT LN TO BE CLOSED
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI
XXXXXXXX BLVD CLOSED	

Other Condition List

ROADWORK XXX FT	ROAD REPAIRS XXXX FT
FLAGGER XXXX FT	LANE NARROWS XXXX FT
RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
DETOUR X MILE	ROUGH ROAD XXXX FT
ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
BUMP XXXX FT	US XXX EXIT X MILES
TRAFFIC SIGNAL XXXX FT	LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE RIGHT	FORM X LINES RIGHT
DETOUR NEXT X EXITS	USE XXXXX RD EXIT
USE EXIT XXX	USE EXIT I-XX NORTH
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N
TRUCKS USE US XXX N	WATCH FOR TRUCKS
WATCH FOR TRUCKS	EXPECT DELAYS
EXPECT DELAYS	PREPARE TO STOP
REDUCE SPEED XXX FT	END SHOULDER USE
USE OTHER ROUTES	WATCH FOR WORKERS
STAY IN LANE *	

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXX TO XXXXXXX
US XXX TO FM XXXX

Warning List

SPEED LIMIT XX MPH
MAXIMUM SPEED XX MPH
MINIMUM SPEED XX MPH
ADVISORY SPEED XX MPH
RIGHT LANE EXIT
USE CAUTION
DRIVE SAFELY
DRIVE WITH CARE

** Advance Notice List

TUE-FRI XX AM- X PM
APR XX- XX X PM-X AM
BEGINS MONDAY
BEGINS MAY XX
MAY X-X XX PM - XX AM
NEXT FRI-SUN
XX AM TO XX PM
NEXT TUE AUG XX
TONIGHT XX PM- XX AM

** See Application Guidelines Note 6.

Application Guidelines

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limted to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work

Wording Alternatives

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the CW20-7a Flagger Symbol, are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow panel provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) STANDARD

BC(6)-07

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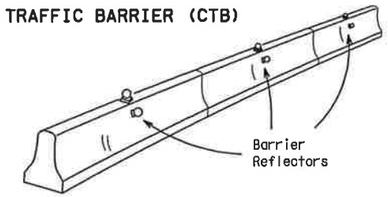
BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

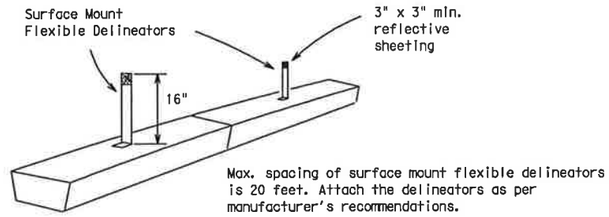
1. Barrier Reflectors shall be prequalified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors (Type C Delineators) can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 502.

CONCRETE TRAFFIC BARRIER (CTB)

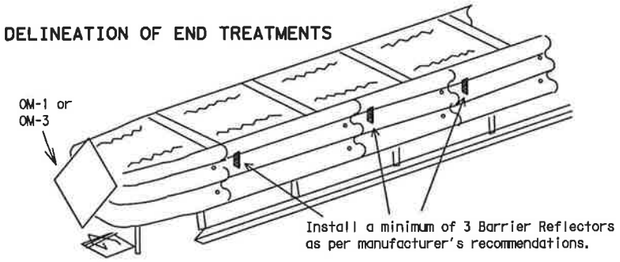


3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented. Yellow Barrier Reflectors shall be made with Type E Fluorescent Prismatic Yellow Retroreflective Sheeting. White reflectors shall be made with Type D White Prismatic sheeting.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS



	APPROACHING TRAFFIC	
	BOTH SIDES	ONE SIDE
DELINEATION	OM-1	OM-3 or Vertical Panel

END TREATMENTS FOR CTB'S USED IN WORK ZONES

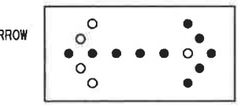
End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

TYPICAL FLASHING ARROW PANEL

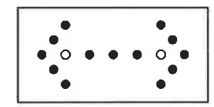
Arrow Panels may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Panel should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Panels should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Panel.
4. The Flashing Arrow Panel should be able to display the following symbols:

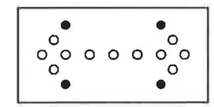
Flashing RIGHT (LEFT) ARROW



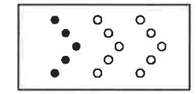
Flashing DOUBLE ARROW



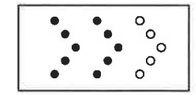
Flashing CAUTION

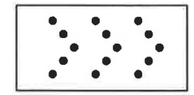


5. The "CAUTION" display consists of four corner lamps flashing simultaneously.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Panel shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.



Sequential Chevron





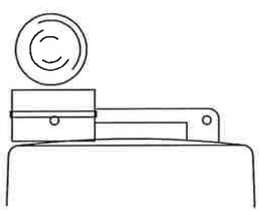
REQUIREMENTS

TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

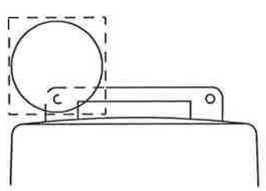
ATTENTION: Flashing Arrow Panels shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW PANEL FROM THE RIGHT-OF-WAY OR PLACE THE ARROW PANEL BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

11. The Flashing Arrow Panel shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Panel SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Panel provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted arrow panels should be 7 feet from roadway to bottom of panel.



Type C Warning Light or approved substitute mounted adjacent to the travel way.



Warning reflector may be round or square. Must have a reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type E Sheeting (Fluorescent Prismatic) meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. 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.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. 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.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type D (Non-fluorescent Prismatic).
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the dates shown in the CWZTCD to ensure that the TMA meets the age requirements and the crashworthiness criteria established by the Federal Highway Administration (FHWA) for TMAs.
4. Refer to the CWZTCD for a list of approved TMAs.
5. TMAs are required on freeways unless otherwise noted in the plans.
6. A TMA should be used anytime that it can be positioned approximately 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
7. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR STANDARD

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BC(7)-07

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DATE: 9-07	REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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		DIST		COUNTY	SHEET NO.
		SAT		BEXAR	16

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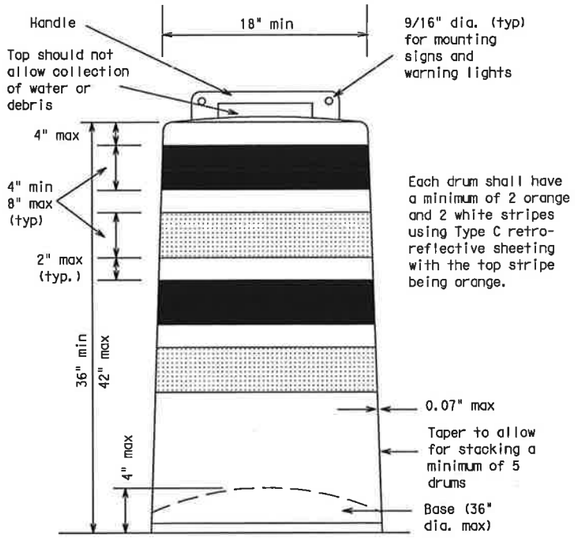


GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. 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.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Prequalified plastic drums shall meet the following requirements:

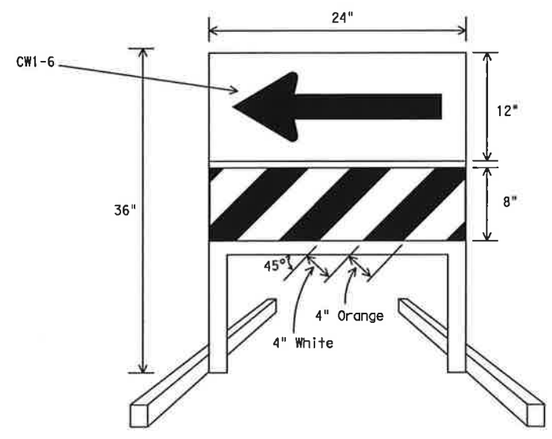
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. 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 light, warning reflector unit or approved compliant sign.
6. 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-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. 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 base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a minimum unballasted weight of 7.7 lbs. and maximum unballasted weight of 11 lbs. The wall of the drum body shall be a minimum of 0.07 inch in thickness. Weight of any drum supplied shall not vary more than 0.5 lb. from that of the prequalified sample.
10. Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

1. 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) retroreflective sheeting shall be supplied unless otherwise specified in the plans.
2. 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 delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

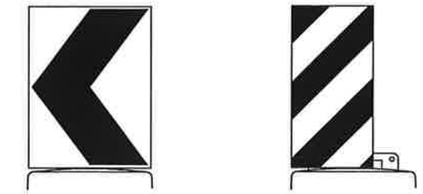
BALLAST

1. Unballasted 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.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
4. 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.
5. Ballast shall not be placed on top of drums.
6. Adhesives may be used to secure base of drums to pavement.



DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type E Fluoprescent Prismatic Orange above a rail with Type C High Specific Intensity retroreflective sheeting in alternation 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer

12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type E (Fluorescent Prismatic) sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type C (High Specific Intensity). Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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REVISIONS
4-03
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DIST		COUNTY	SHEET NO.
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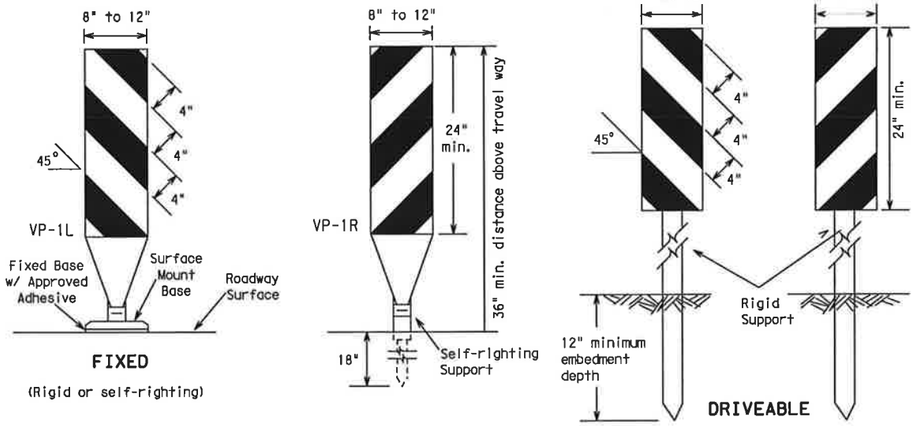
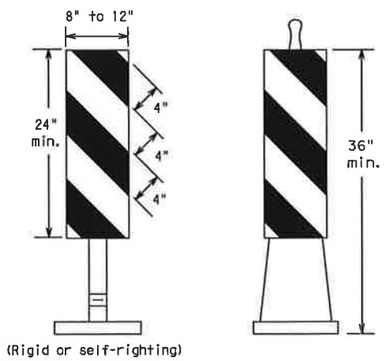
CHANNELIZING DEVICES

VERTICAL PANELS (VPs)

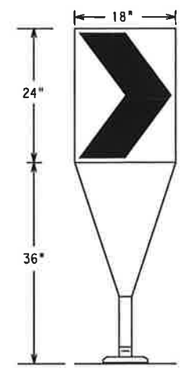


1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, shall have a minimum of 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is greater than 36 inches, a panel stripe of 6 inches shall be used.



PORTABLE

CHEVRONS



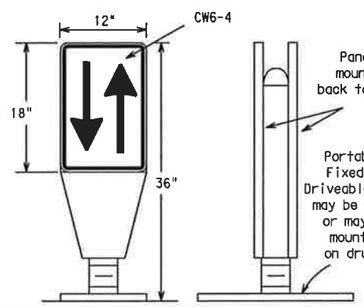
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

GENERAL NOTES:

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh approximately 35 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.
8. Examples on this sheet are commonly used channelizing devices in work zones. For other devices, refer to the CWZTCD.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

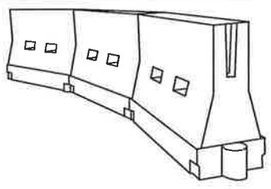


1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with simple tubular markers or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. Tubular markers or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black nonreflective legend. Sheeting for the OTLD shall be retroreflective Type E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting the requirements of DMS-8300.

Posted Speed	Formula	Minimum Desirable Taper Lengths ✱✱ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'
35		205'	225'	245'	35'	70'-90'
40		265'	295'	320'	40'	80'-100'
45	L=WS	450'	495'	540'	45'	90'-110'
50		500'	550'	600'	50'	100'-125'
55		550'	605'	660'	55'	110'-140'
60		600'	660'	720'	60'	120'-150'
65		650'	715'	780'	65'	130'-165'
70		700'	770'	840'	70'	140'-175'
75		750'	825'	900'	75'	150'-185'
80		800'	880'	960'	80'	160'-195'

✱✱Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS



LONGITUDINAL CHANNELIZING DEVICES

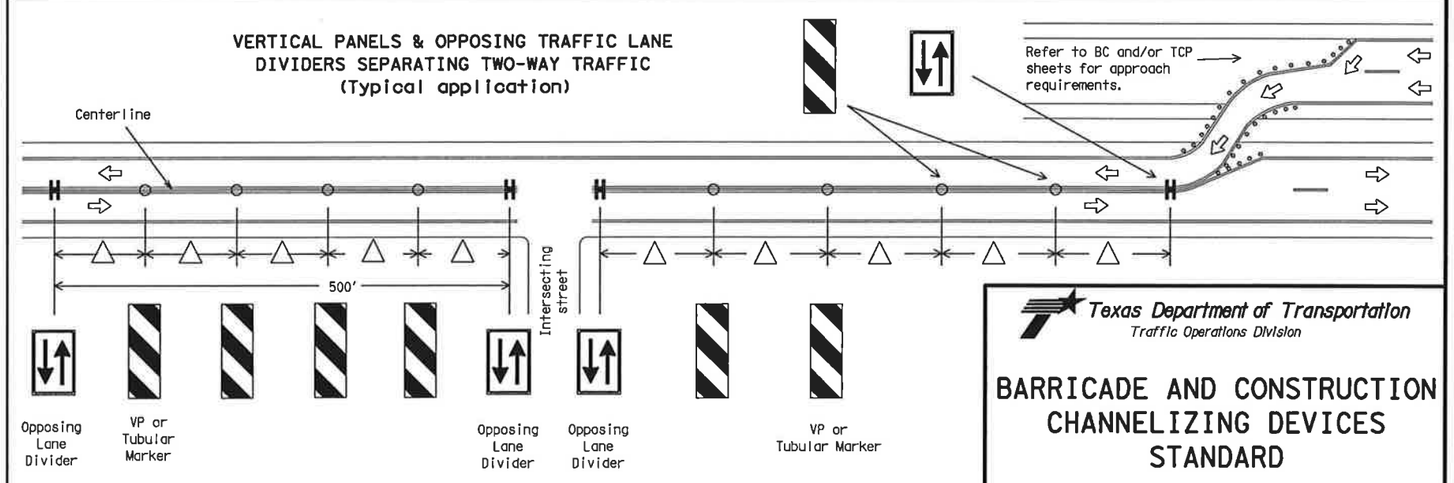
1. Longitudinal channelizing devices are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. **They are not designed to contain or redirect a vehicle on impact.**
2. Longitudinal channelizing devices may be used instead of a line of cones or drums.
3. Longitudinal channelizing devices shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Longitudinal channelizing devices should not be used to provide positive protection for obstacles, pedestrians or workers.
5. Longitudinal channelizing devices shall be retroreflective, or supplemented with retroreflective delineation as required for temporary barriers on BC(7)-07.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall be not less than 32 inches in height.

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS SEPARATING TWO-WAY TRAFFIC (Typical application)



△ Spacing between the VP's or tubular markers shall not exceed 100 feet. On roadways with speeds less than 45 MPH, spacing between the tubular markers or VP's shall be as shown on the channelizing spacing table shown on this page. If the table shows spacing greater than 100 feet based on the roadway speed, then use a maximum of 100 feet spacing between the tubular markers or VP's. Every fifth channelizing device shall be an OTLD, except when the OLTD must be spaced closer to accomodate an intersection. Spacing between the OTLD shall not exceed 500 feet.

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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	DIST		COUNTY	SHEET NO.
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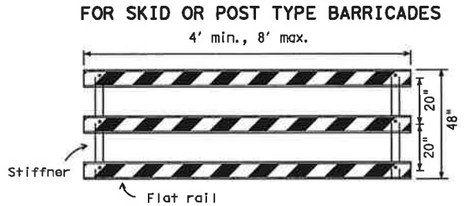
TYPE III BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type III Barricades and a list of all materials used in the construction of Type III Barricades.
2. Type III Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

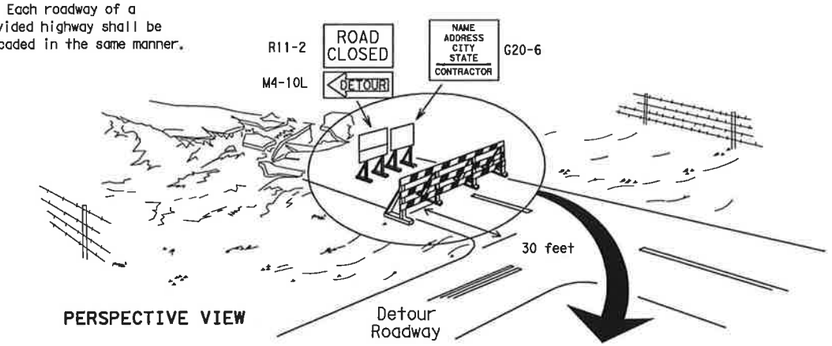
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



Stiffner may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

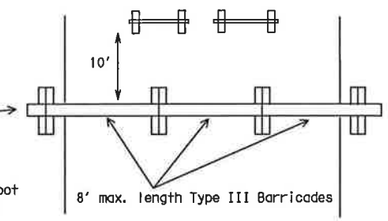
TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

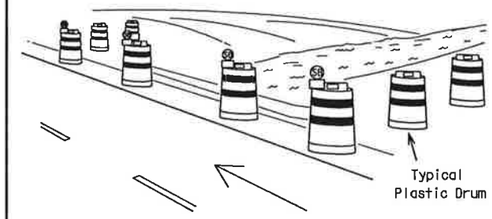
The three rails on Type III barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type III Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

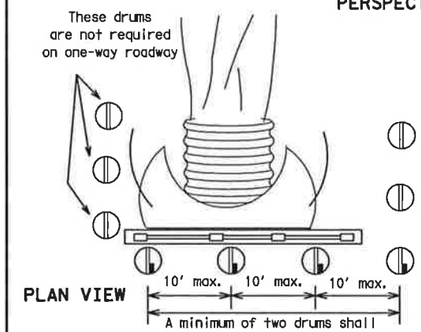


PERSPECTIVE VIEW

1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

These drums are not required on one-way roadway

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

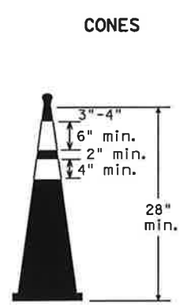


PLAN VIEW

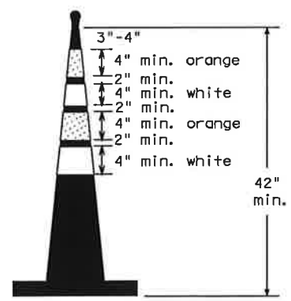
Legend

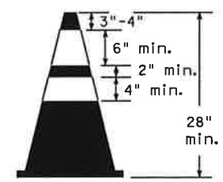
- Plastic drum
- Plastic drum with steady burn light or yellow warning reflector
- SB — Steady burn warning light or yellow warning reflector

CONES

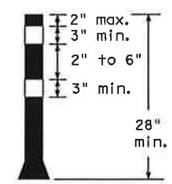


Two-Piece cones





One-Piece cones

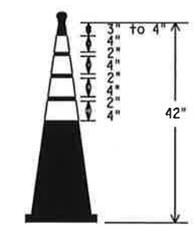


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

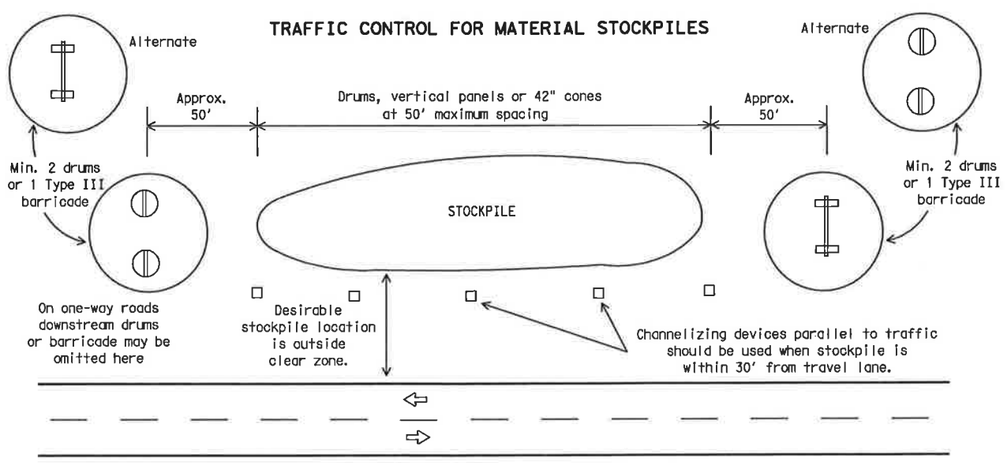
1. Traffic cones and tubular markers shall be a minimum of 28 inches in height when used either on freeways or at nighttime.
2. Cones or tubular markers shall be predominantly orange, fluorescent red-orange, or fluorescent yellow-orange. They should be kept clean and bright for maximum visibility.
3. Cones used only for daytime operations do not require the reflectorized bands.
4. Cones and tubular markers used for nighttime operations shall be reflectorized. Reflectorized material shall have a smooth, sealed outer surface that displays the same approximate color during the day and night. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
5. When used at night, appropriate personnel shall ensure that cones and tubular markers remain in their proper location and in an upright position.
6. Reflectorization of 28"cones shall consist of a minimum 6 inch band placed at least 3 inches but not more than 4 inches from the top, supplemented by a minimum 4 inch band spaced a minimum of 2 inches below the 6 inch band.
7. Reflectorization of 42" cones shall be provided by alternating 4 to 6" orange and white stripes with orange on top.
8. Reflectorization of tubular markers shall be a minimum of two 3 inch bands placed a maximum of 2 inches from the top with a maximum of 6 inches between bands.
9. One-piece cones or tubular markers are generally suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels, drums or two-piece cones for long term usage. Care should be taken to ensure they remain in their proper location and in an upright position.
10. Cones or tubular markers used on each project shall be of the same size and shape.
11. The handle may be designed as a hook or other shape, fabricated from non-rigid materials similar to the cone material, and may extend up to a maximum of 8 inches above the top of cone. Length of the handle shall not be considered with regard to the overall height of the cone.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type C encapsulated bead (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

TRAFFIC CONTROL FOR MATERIAL STOCKPILES



Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

10 of 12 BC(10)-07

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9-07 REVISIONS	CONT	SECT	JOB	HIGHWAY
				SALADO
	DIST		COUNTY	SHEET NO.
	SAT		BEXAR	19

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

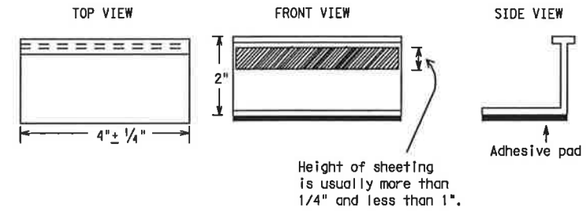
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway, shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than two weeks, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

Raised Pavement Markers used as Guidemarks

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PREFABRICATED PAVEMENT MARKINGS-PERMANENT	DMS-8240
PREFABRICATED PAVEMENT MARKINGS-REMOVABLE	DMS-8241
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS STANDARD

BC(11)-07

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2-98
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CONT	SECT	JOB	HIGHWAY
			SALADO

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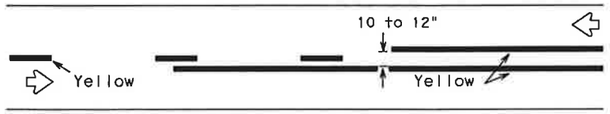
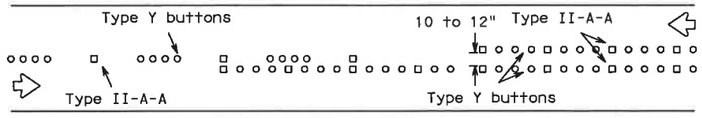
PAVEMENT MARKING PATTERNS

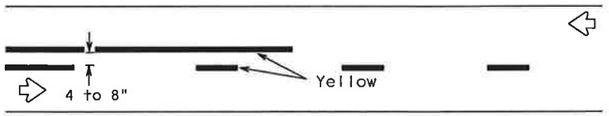
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



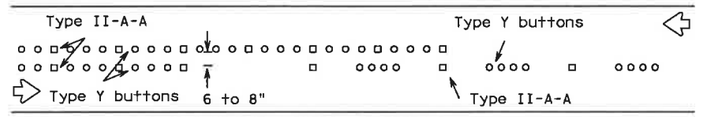
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



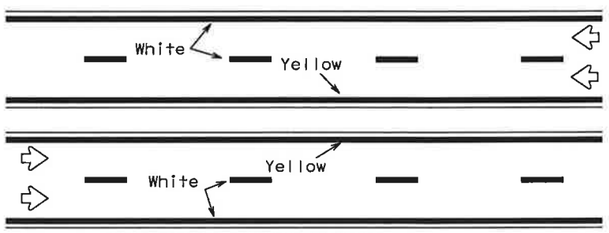
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



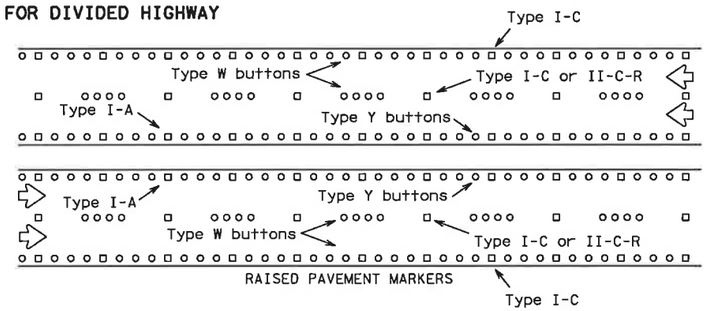
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



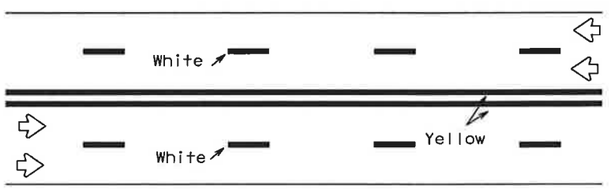
REFLECTORIZED PAVEMENT MARKINGS



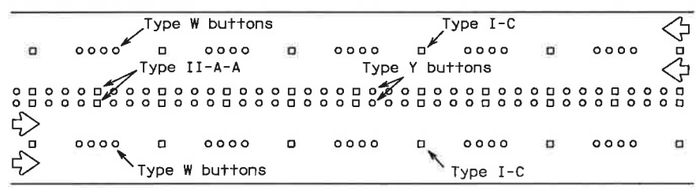
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



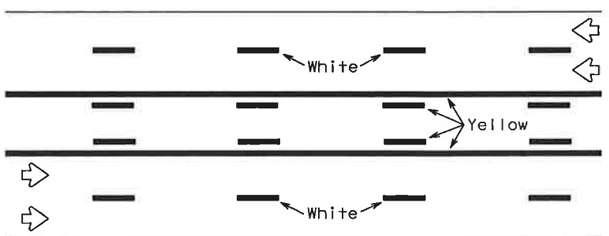
REFLECTORIZED PAVEMENT MARKINGS



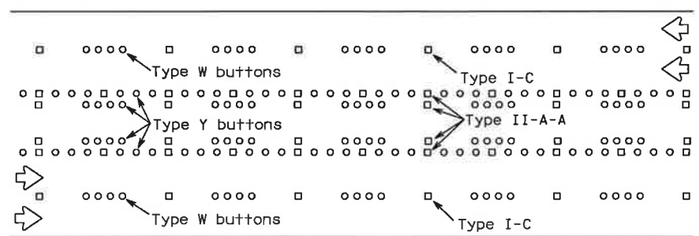
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE



REFLECTORIZED PAVEMENT MARKINGS



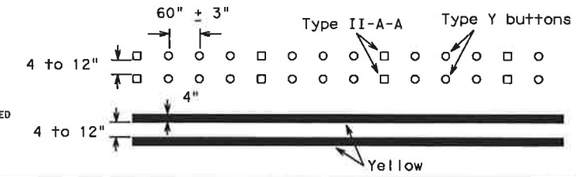
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

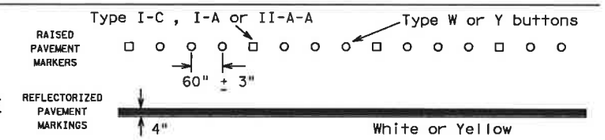
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

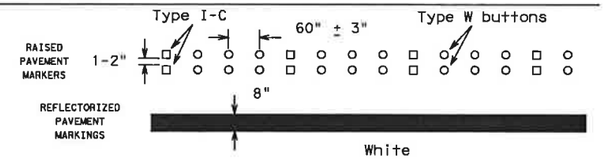


EDGE LINE OR SINGLE NO-PASSING LINE



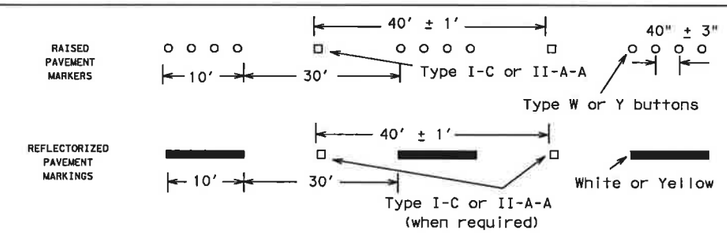
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)



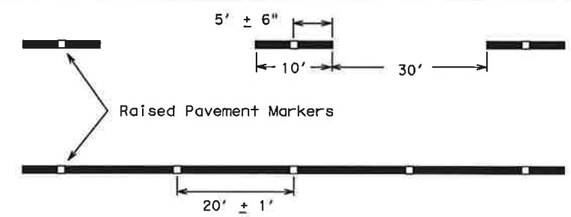
BROKEN LINE

(FOR CENTER LINE OR LANE LINE.)



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

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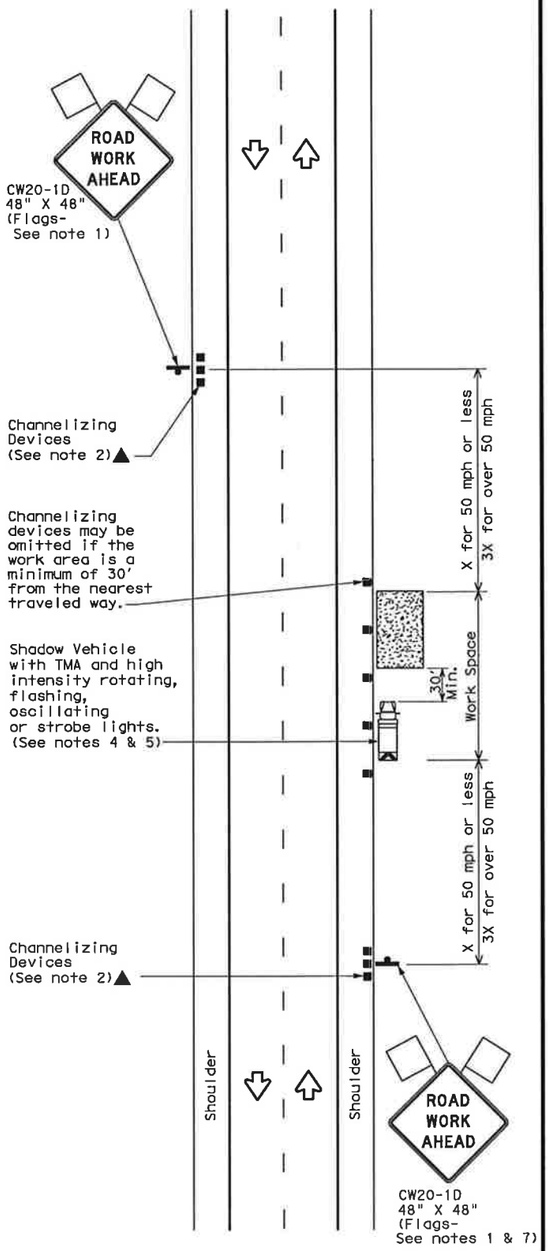
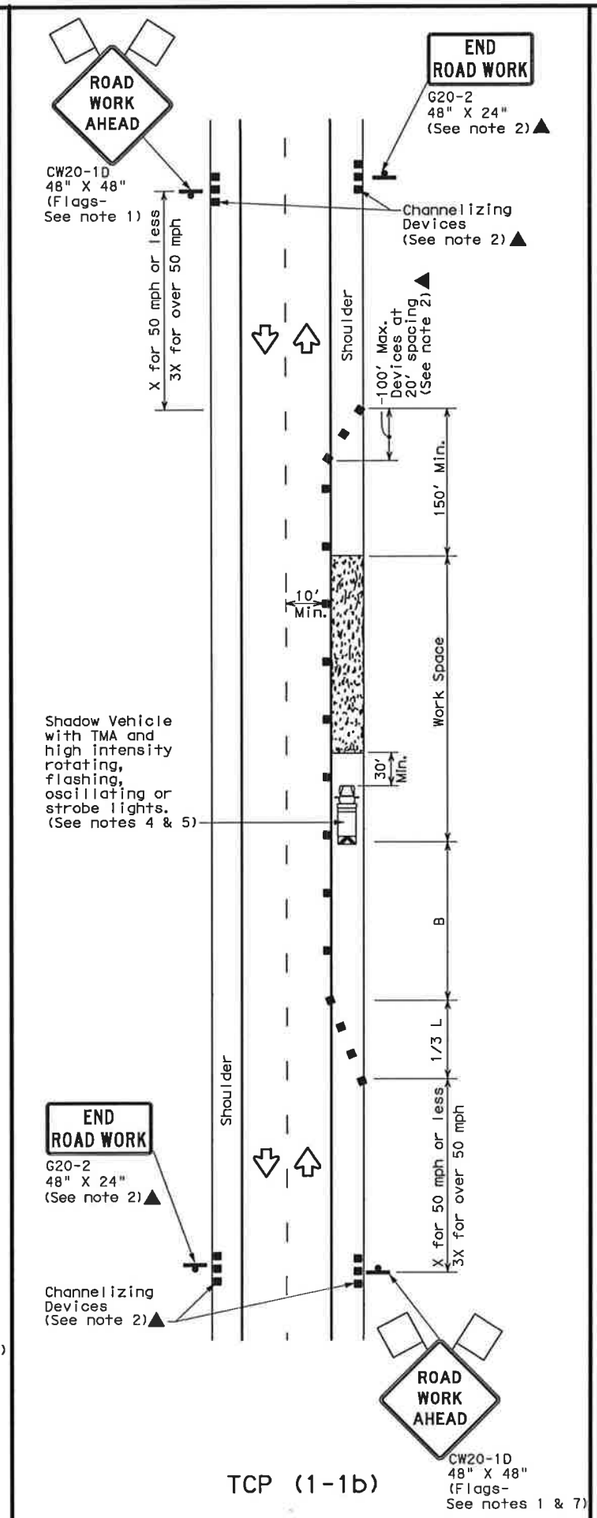


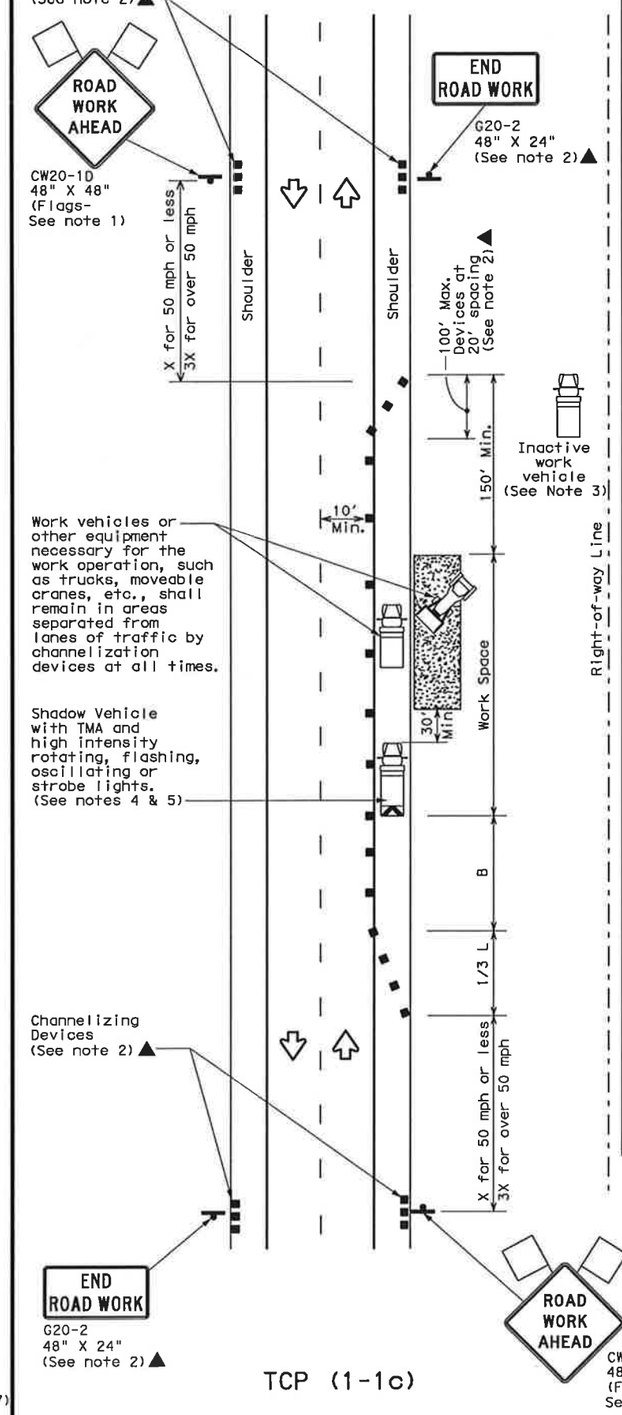
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed ✱	Formula	Minimum Desirable Taper Lengths ✱✱ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

✱ Conventional Roads Only
✱✱ Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-12

©TxDOT December 1985

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
SAT	BEXAR		22

REVISIONS
2-94 2-12
8-95
1-97
4-98

DATE:
FILE:

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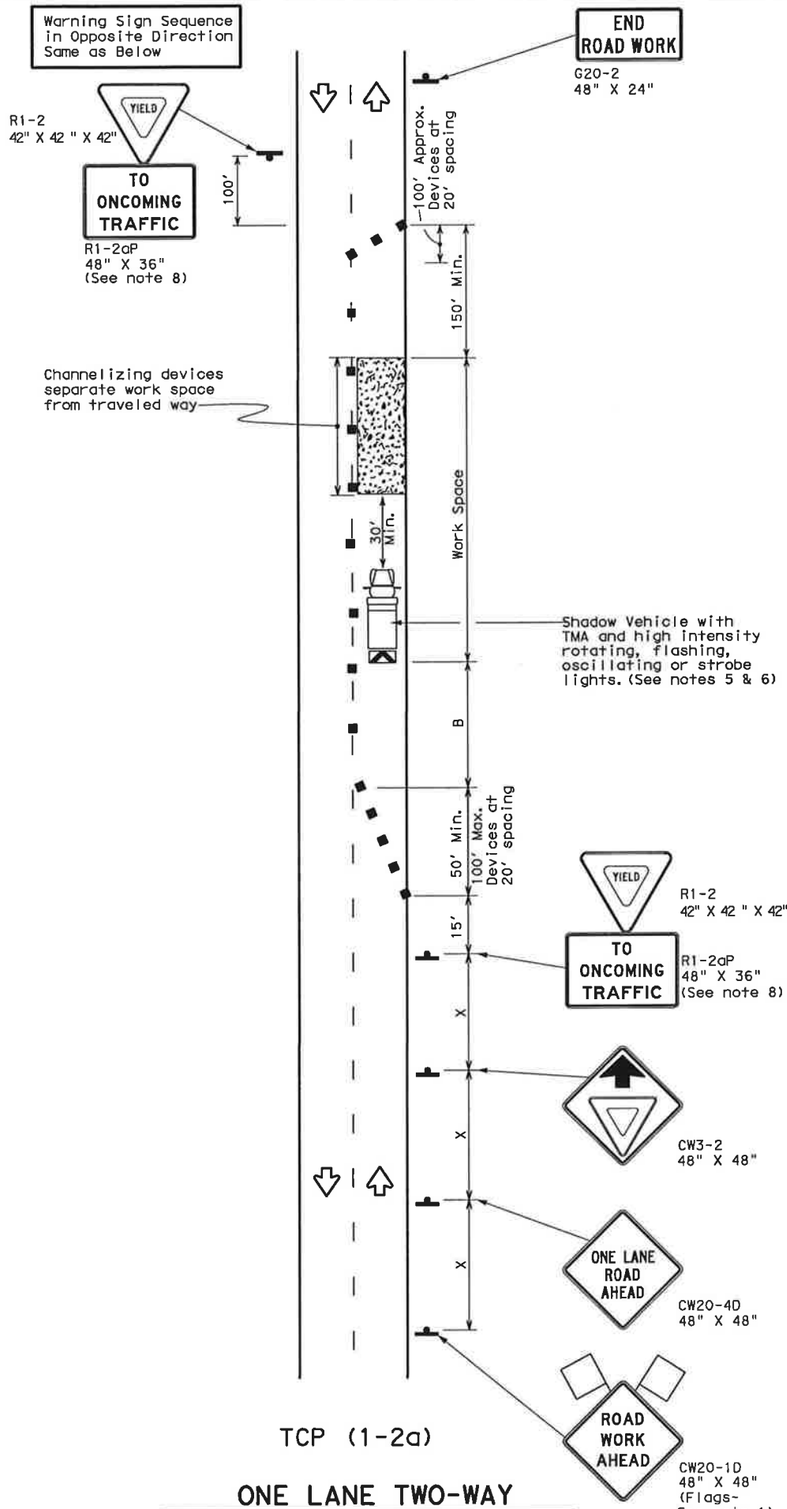
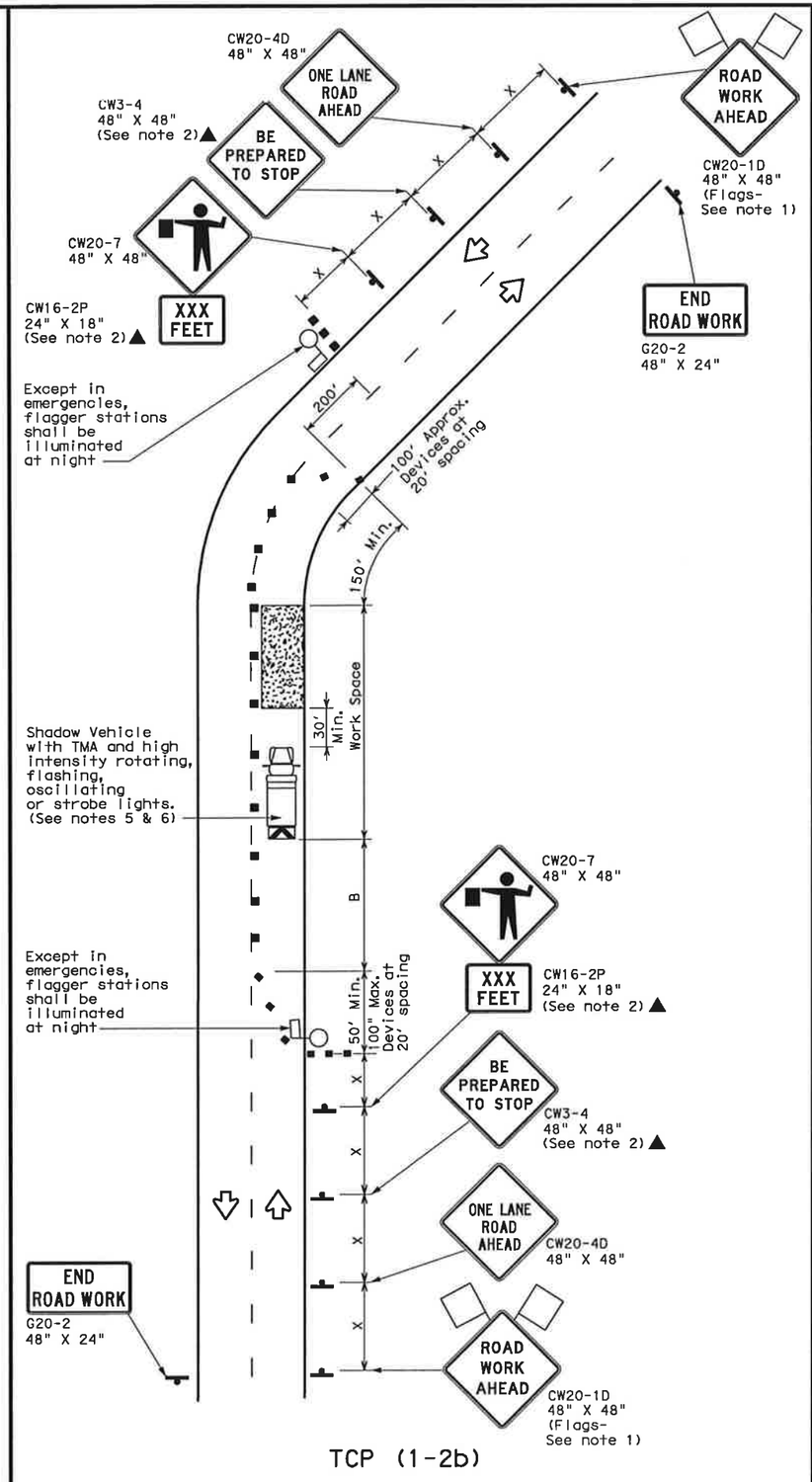


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-12

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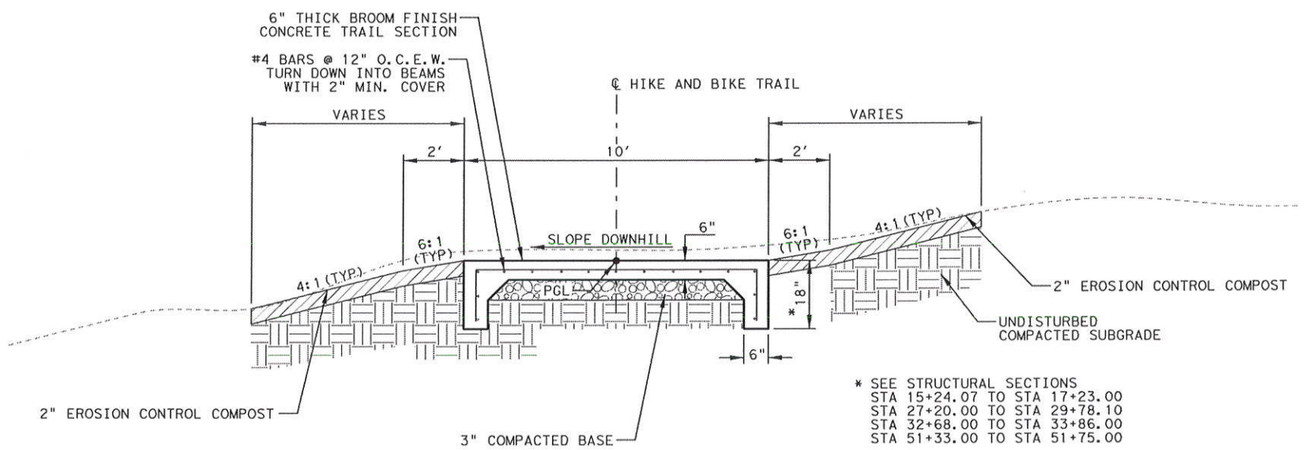
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
SAT	BEXAR		23

REVISIONS
4-90 2-12
2-94
1-97
4-98

DATE:
FILE:



* SEE STRUCTURAL SECTIONS
STA 15+24.07 TO STA 17+23.00
STA 27+20.00 TO STA 29+78.10
STA 32+68.00 TO STA 33+86.00
STA 51+33.00 TO STA 51+75.00

TYPICAL SECTION: 6" CONCRETE HIKE AND BIKE TRAIL

STA 17+23.00 TO STA 27+20.00
STA 29+78.10 TO STA 32+68.00
STA 33+86.00 TO STA 51+33.00
STA 51+75.00 TO STA 53+62.75

SLOPES:

PREFERRED CROSS SLOPE - 2% (1/50) ON SECTIONS OF TRAIL WHERE RETAINING WALLS DO NOT EXIST. SIDE SLOPE SHALL NOT EXCEED 4:1.

NOTES:

1. HYDROMULCH/SEED ALL GROUND SURFACES DISTRUBED BY CONSTRUCTION
2. COST OF COMPACTING EXISTING SUBGRADE AND PLACEMENT OF TOPSOIL IN AREAS DISTURBED BY CONSTRUCTION IS SUBSIDIARY TO THE EXCAVATION COST.
3. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE IN ALL DISTURBED AREAS. MINIMUM SLOPES IN DISTURBED AREAS SHALL BE 2%, MAXIMUM SLOPES SHALL BE 3:1.
4. CONTRACTOR TO KEEP DISRUPTION OF SOIL AND EXISTING VEGETATION TO A MINIMUM.

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CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

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STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 6/26/13

SALADO CREEK TRAIL

TYPICAL SECTION

SHEET 1 OF 1

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN:	CK:	6/11/2013	161872	24

PLOTDRIVER: HDR-TxDOT-BW.PDF.pltPENTABLE: 000000000016456D.tbl
File Name: SCT-TYP-SECT-01.dgn
User: Name: e-aztog
DATE: 6/11/2013
PLOTTING TIME: 3:36:24 PM

SALADO CREEK TRAIL (TRAILCL)

Beginning chain TRAILCL description

Point TRAILCL01 N 13,752,554.5348 E 2,127,971.2268 Sta 10+00.07
Course from TRAILCL01 to PC TRAILCL-1 N 60° 35' 47.77" E Dist 29.9388

Curve Data

Curve TRAILCL-1
P.I. Station 10+73.57 N 13,752,590.6215 E 2,128,035.2616
Delta = 47° 04' 48.12" (LT)
Degree = 57° 17' 44.81"
Tangent = 43.5643
Length = 82.1702
Radius = 100.0000
External = 9.0773
Long Chord = 79.8779
Mid. Ord. = 8.3219
P.C. Station 10+30.01 N 13,752,569.2334 E 2,127,997.3090
P.T. Station 11+12.18 N 13,752,632.9792 E 2,128,045.4437
C.C. N 13,752,656.3519 E 2,127,948.2135
Back = N 60° 35' 47.77" E
Ahead = N 13° 30' 59.64" E
Chord Bear = N 37° 03' 23.71" E
Course from PT TRAILCL-1 to PC TRAILCL-2 N 13° 30' 59.64" E Dist 58.6614

Curve Data

Curve TRAILCL-2
P.I. Station 12+23.68 N 13,752,741.3935 E 2,128,071.5048
Delta = 55° 42' 18.19" (RT)
Degree = 57° 17' 44.81"
Tangent = 52.8412
Length = 97.2237
Radius = 100.0000
External = 13.1026
Long Chord = 93.4395
Mid. Ord. = 11.5847
P.C. Station 11+70.84 N 13,752,690.0158 E 2,128,059.1544
P.T. Station 12+68.06 N 13,752,760.1392 E 2,128,120.9092
C.C. N 13,752,666.6432 E 2,128,156.3847
Back = N 13° 30' 59.64" E
Ahead = N 69° 13' 17.84" E
Chord Bear = N 41° 22' 08.74" E
Course from PT TRAILCL-2 to PC TRAILCL-3 N 69° 13' 17.84" E Dist 67.0743

Curve Data

Curve TRAILCL-3
P.I. Station 13+83.13 N 13,752,800.9608 E 2,128,228.4953
Delta = 51° 16' 41.56" (RT)
Degree = 57° 17' 44.81"
Tangent = 47.9959
Length = 89.4974
Radius = 100.0000
External = 10.9216
Long Chord = 86.5402
Mid. Ord. = 9.8463
P.C. Station 13+35.14 N 13,752,783.9340 E 2,128,183.6210
P.T. Station 14+24.64 N 13,752,776.6012 E 2,128,269.8500
C.C. N 13,752,690.4381 E 2,128,219.0964
Back = N 69° 13' 17.84" E
Ahead = S 59° 30' 00.60" E
Chord Bear = S 85° 08' 21.38" E
Course from PT TRAILCL-3 to PC TRAILCL-4 S 59° 30' 00.60" E Dist 67.7879

Curve Data

Curve TRAILCL-4
P.I. Station 15+10.23 N 13,752,733.1573 E 2,128,343.6035
Delta = 20° 11' 47.87" (LT)
Degree = 57° 17' 44.81"
Tangent = 17.8097
Length = 35.2498
Radius = 100.0000
External = 1.5735
Long Chord = 35.0676
Mid. Ord. = 1.5492
P.C. Station 14+92.42 N 13,752,742.1964 E 2,128,328.2582
P.T. Station 15+27.67 N 13,752,729.9719 E 2,128,361.1260
C.C. N 13,752,828.3594 E 2,128,379.0117
Back = S 59° 30' 00.60" E
Ahead = S 79° 41' 48.47" E
Chord Bear = S 69° 35' 54.53" E
Course from PT TRAILCL-4 to PC TRAILCL-5 S 79° 41' 48.47" E Dist 90.3063

Curve Data

Curve TRAILCL-5
P.I. Station 16+59.08 N 13,752,706.4682 E 2,128,490.4176
Delta = 44° 41' 22.35" (RT)
Degree = 57° 17' 44.80"
Tangent = 41.1043
Length = 77.9980
Radius = 100.0000
External = 8.1183
Long Chord = 76.0358
Mid. Ord. = 7.5087
P.C. Station 16+17.98 N 13,752,713.8200 E 2,128,449.9761
P.T. Station 16+95.98 N 13,752,672.8005 E 2,128,513.9983
C.C. N 13,752,615.4325 E 2,128,432.0904
Back = S 79° 41' 48.47" E
Ahead = S 35° 00' 26.11" E
Chord Bear = S 57° 21' 07.29" E

SALADO CREEK TRAIL (TRAILCL) (CONT'D)

Curve Data

Curve TRAILCL-6
P.I. Station 17+41.16 N 13,752,635.7914 E 2,128,539.9194
Delta = 48° 37' 49.80" (LT)
Degree = 57° 17' 44.81"
Tangent = 45.1838
Length = 84.8762
Radius = 100.0000
External = 9.7341
Long Chord = 82.3514
Mid. Ord. = 8.8706
P.C. Station 16+95.98 N 13,752,672.8005 E 2,128,513.9983
P.T. Station 17+80.85 N 13,752,630.7844 E 2,128,584.8249
C.C. N 13,752,730.1685 E 2,128,595.9063
Back = S 35° 00' 26.11" E
Ahead = S 83° 38' 15.91" E
Chord Bear = S 59° 19' 21.01" E
Course from PT TRAILCL-6 to PC TRAILCL-7 S 83° 38' 15.91" E Dist 164.0912

Curve Data

Curve TRAILCL-7
P.I. Station 19+53.79 N 13,752,611.6202 E 2,128,756.7002
Delta = 10° 06' 50.95" (RT)
Degree = 57° 17' 44.81"
Tangent = 8.8493
Length = 17.6525
Radius = 100.0000
External = 0.3908
Long Chord = 17.6296
Mid. Ord. = 0.3893
P.C. Station 19+44.95 N 13,752,612.6008 E 2,128,747.9055
P.T. Station 19+62.60 N 13,752,609.1103 E 2,128,765.1861
C.C. N 13,752,513.2167 E 2,128,736.8240
Back = S 83° 38' 15.91" E
Ahead = S 73° 31' 24.97" E
Chord Bear = S 78° 34' 50.44" E
Course from PT TRAILCL-7 to PC TRAILCL-8 S 73° 31' 24.97" E Dist 18.8218

Curve Data

Curve TRAILCL-8
P.I. Station 20+13.20 N 13,752,594.7573 E 2,128,813.7144
Delta = 64° 53' 15.10" (RT)
Degree = 114° 35' 29.61"
Tangent = 31.7846
Length = 56.6251
Radius = 50.0000
External = 9.2474
Long Chord = 53.6472
Mid. Ord. = 7.8041
P.C. Station 19+81.42 N 13,752,603.7721 E 2,128,783.2350
P.T. Station 20+38.04 N 13,752,563.3331 E 2,128,818.4871
C.C. N 13,752,555.8253 E 2,128,769.0540
Back = S 73° 31' 24.97" E
Ahead = S 8° 38' 09.86" E
Chord Bear = S 41° 04' 47.42" E
Course from PT TRAILCL-8 to PC TRAILCL-9 S 8° 38' 09.86" E Dist 45.3669

Curve Data

Curve TRAILCL-9
P.I. Station 21+16.78 N 13,752,485.4868 E 2,128,830.3103
Delta = 58° 09' 57.27" (LT)
Degree = 95° 29' 34.68"
Tangent = 33.3722
Length = 60.9112
Radius = 60.0000
External = 8.6564
Long Chord = 58.3290
Mid. Ord. = 7.5650
P.C. Station 20+83.41 N 13,752,518.4807 E 2,128,825.2992
P.T. Station 21+44.32 N 13,752,472.3412 E 2,128,860.9844
C.C. N 13,752,527.4901 E 2,128,884.6190
Back = S 8° 38' 09.86" E
Ahead = S 66° 48' 07.14" E
Chord Bear = S 37° 43' 08.50" E
Course from PT TRAILCL-9 to PC TRAILCL-10 S 66° 48' 07.14" E Dist 73.7864

Curve Data

Curve TRAILCL-10
P.I. Station 22+79.12 N 13,752,419.2436 E 2,128,984.8821
Delta = 62° 46' 28.14" (RT)
Degree = 57° 17' 44.81"
Tangent = 61.0097
Length = 109.5621
Radius = 100.0000
External = 17.1417
Long Chord = 104.1639
Mid. Ord. = 14.6333
P.C. Station 22+18.11 N 13,752,443.2760 E 2,128,928.8051
P.T. Station 23+27.67 N 13,752,358.3846 E 2,128,989.1671
C.C. N 13,752,351.3611 E 2,128,889.4141
Back = S 66° 48' 07.14" E
Ahead = S 4° 01' 39.00" E
Chord Bear = S 35° 24' 53.07" E

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CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

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STATE OF TEXAS
Jess W. Swaim
99204
REGISTERED PROFESSIONAL ENGINEER

Jess W. Swaim P.E. 11-5-12
JESS W. SWAIM, P.E. DATE

SALADO CREEK TRAIL HORIZONTAL ALIGNMENT DATA

N.T.S SHEET 1 OF 3

DSN: TWT	CK:	DATE	JOB NO.	SHEET NO.
DRN:	CK: BSP	11/1/2012	161872	25

PLOTDRIVER: HDR+TxDOT+BW+PDF.plt
PSNTABLE: 0000000000145801.tbl
File Name: SCT-HC.dgn
User Name: Scpeter
DATE: 11/1/2012
PLOTTING TIME: 10:52:50 AM

SALADO CREEK TRAIL (TRAILCL) (CONT'D)

Course from PT TRAILCL-10 to PC TRAILCL-11 S 4° 01' 39.00" E Dist 31.1064

Curve Data

Curve TRAILCL-11					
P.I. Station	24+07.99	N	13,752,278.2689	E	2,128,994.8080
Delta =	52° 24' 04.90"	(LT)			
Degree =	57° 17' 44.81"				
Tangent =	49.2076				
Length =	91.4576				
Radius =	100.0000				
External =	11.4513				
Long Chord =	88.3033				
Mid. Ord. =	10.2747				
P.C. Station	23+58.78	N	13,752,327.3550	E	2,128,991.3519
P.T. Station	24+50.24	N	13,752,251.0585	E	2,129,035.8077
C.C.		N	13,752,334.3785	E	2,129,091.1049
Back	= S 4° 01' 39.00" E				
Ahead	= S 56° 25' 43.90" E				
Chord Bear	= S 30° 13' 41.45" E				

Course from PT TRAILCL-11 to PC TRAILCL-12 S 56° 25' 43.90" E Dist 61.3801

Curve Data

Curve TRAILCL-12					
P.I. Station	25+54.28	N	13,752,193.5219	E	2,129,122.5021
Delta =	46° 12' 56.30"	(RT)			
Degree =	57° 17' 44.81"				
Tangent =	42.6697				
Length =	80.6615				
Radius =	100.0000				
External =	8.7231				
Long Chord =	78.4925				
Mid. Ord. =	8.0232				
P.C. Station	25+11.62	N	13,752,217.1170	E	2,129,086.9497
P.T. Station	25+92.28	N	13,752,151.5282	E	2,129,130.0679
C.C.		N	13,752,133.7971	E	2,129,031.6525
Back	= S 56° 25' 43.90" E				
Ahead	= S 10° 12' 47.60" E				
Chord Bear	= S 33° 19' 15.75" E				

Course from PT TRAILCL-12 to PC TRAILCL-13 S 10° 12' 47.60" E Dist 5.2351

Curve Data

Curve TRAILCL-13					
P.I. Station	26+79.30	N	13,752,065.8839	E	2,129,145.4982
Delta =	78° 33' 29.69"	(LT)			
Degree =	57° 17' 44.81"				
Tangent =	81.7882				
Length =	137.1100				
Radius =	100.0000				
External =	29.1871				
Long Chord =	126.6198				
Mid. Ord. =	22.5929				
P.C. Station	25+97.51	N	13,752,146.3761	E	2,129,130.9962
P.T. Station	27+34.62	N	13,752,064.1303	E	2,129,227.2676
C.C.		N	13,752,164.1073	E	2,129,229.4117
Back	= S 10° 12' 47.60" E				
Ahead	= S 88° 46' 17.29" E				
Chord Bear	= S 49° 29' 32.45" E				

Course from PT TRAILCL-13 to PC TRAILCL-14 S 88° 46' 17.29" E Dist 178.8723

Curve Data

Curve TRAILCL-14					
P.I. Station	29+23.63	N	13,752,060.0779	E	2,129,416.2341
Delta =	90° 46' 59.86"	(RT)			
Degree =	572° 57' 28.06"				
Tangent =	10.1377				
Length =	15.8447				
Radius =	10.0000				
External =	4.2398				
Long Chord =	14.2385				
Mid. Ord. =	2.9774				
P.C. Station	29+13.49	N	13,752,060.2952	E	2,129,406.0988
P.T. Station	29+29.34	N	13,752,049.9465	E	2,129,415.8782
C.C.		N	13,752,050.2975	E	2,129,405.8844
Back	= S 88° 46' 17.29" E				
Ahead	= S 2° 00' 42.56" W				
Chord Bear	= S 43° 22' 47.36" E				

Course from PT TRAILCL-14 to PC TRAILCL-15 S 2° 00' 42.56" W Dist 26.0487

Curve Data

Curve TRAILCL-15					
P.I. Station	29+83.10	N	13,751,996.2195	E	2,129,413.9910
Delta =	75° 10' 31.48"	(LT)			
Degree =	159° 09' 17.80"				
Tangent =	27.7114				
Length =	47.2341				
Radius =	36.0000				
External =	9.4304				
Long Chord =	43.9182				
Mid. Ord. =	7.4729				
P.C. Station	29+55.39	N	13,752,023.9139	E	2,129,414.9638
P.T. Station	30+02.62	N	13,751,988.1932	E	2,129,440.5146
C.C.		N	13,752,022.6501	E	2,129,450.9416
Back	= S 2° 00' 42.56" W				
Ahead	= S 73° 09' 48.92" E				
Chord Bear	= S 35° 34' 33.18" E				

SALADO CREEK TRAIL (TRAILCL) (CONT'D)

Course from PT TRAILCL-15 to PC TRAILCL-16 S 73° 09' 48.92" E Dist 76.3444

Curve Data

Curve TRAILCL-16					
P.I. Station	31+53.01	N	13,751,944.6343	E	2,129,584.4578
Delta =	27° 43' 44.41"	(LT)			
Degree =	19° 05' 54.94"				
Tangent =	74.0453				
Length =	145.1887				
Radius =	300.0000				
External =	9.0028				
Long Chord =	143.7759				
Mid. Ord. =	8.7405				
P.C. Station	30+78.97	N	13,751,966.0808	E	2,129,513.5865
P.T. Station	32+24.15	N	13,751,958.6265	E	2,129,657.1690
C.C.		N	13,752,253.2215	E	2,129,600.4785
Back	= S 73° 09' 48.92" E				
Ahead	= N 79° 06' 26.67" E				
Chord Bear	= S 87° 01' 41.12" E				

Curve Data

Curve TRAILCL-17					
P.I. Station	32+45.46	N	13,751,962.6517	E	2,129,678.0860
Delta =	24° 02' 58.05"	(RT)			
Degree =	57° 17' 44.81"				
Tangent =	21.3008				
Length =	41.9742				
Radius =	100.0000				
External =	2.2434				
Long Chord =	41.6668				
Mid. Ord. =	2.1942				
P.C. Station	32+24.15	N	13,751,958.6265	E	2,129,657.1690
P.T. Station	32+66.13	N	13,751,957.8033	E	2,129,698.8277
C.C.		N	13,751,860.4282	E	2,129,676.0659
Back	= N 79° 06' 26.67" E				
Ahead	= S 76° 50' 35.29" E				
Chord Bear	= S 88° 52' 04.31" E				

Course from PT TRAILCL-17 to PC TRAILCL-18 S 76° 50' 35.29" E Dist 222.7679

Curve Data

Curve TRAILCL-18					
P.I. Station	35+22.92	N	13,751,899.3534	E	2,129,948.8767
Delta =	37° 34' 42.10"	(LT)			
Degree =	57° 17' 44.81"				
Tangent =	34.0217				
Length =	65.5866				
Radius =	100.0000				
External =	5.6290				
Long Chord =	64.4174				
Mid. Ord. =	5.3290				
P.C. Station	34+88.90	N	13,751,907.0973	E	2,129,915.7481
P.T. Station	35+54.48	N	13,751,913.4195	E	2,129,979.8545
C.C.		N	13,752,004.4724	E	2,129,938.5099
Back	= S 76° 50' 35.29" E				
Ahead	= N 65° 34' 42.61" E				
Chord Bear	= N 84° 22' 03.66" E				

Curve Data

Curve TRAILCL-19					
P.I. Station	36+24.68	N	13,751,942.4424	E	2,130,043.7713
Delta =	26° 20' 22.52"	(RT)			
Degree =	19° 05' 54.93"				
Tangent =	70.1975				
Length =	137.9138				
Radius =	300.0000				
External =	8.1034				
Long Chord =	136.7026				
Mid. Ord. =	7.8903				
P.C. Station	35+54.48	N	13,751,913.4195	E	2,129,979.8545
P.T. Station	36+92.40	N	13,751,940.0928	E	2,130,113.9295
C.C.		N	13,751,640.2609	E	2,130,103.8883
Back	= N 65° 34' 42.61" E				
Ahead	= S 88° 04' 54.86" E				
Chord Bear	= N 78° 44' 53.87" E				

Curve Data

Curve TRAILCL-20					
P.I. Station	37+10.92	N	13,751,939.4729	E	2,130,132.4401
Delta =	20° 59' 08.23"	(LT)			
Degree =	57° 17' 44.83"				
Tangent =	18.5209				
Length =	36.6268				
Radius =	100.0000				
External =	1.7007				
Long Chord =	36.4224				
Mid. Ord. =	1.6722				
P.C. Station	36+92.40	N	13,751,940.0928	E	2,130,113.9295
P.T. Station	37+29.02	N	13,751,945.5234	E	2,130,149.9448
C.C.		N	13,752,040.0368	E	2,130,117.2766
Back	= S 88° 04' 54.86" E				
Ahead	= N 70° 55' 56.90" E				
Chord Bear	= N 81° 25' 31.02" E				

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CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

HDR Engineering, Inc.
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STATE OF TEXAS
Jess W. Swaim
99204
REGISTERED PROFESSIONAL ENGINEER

Jess W. Swaim, P.E. 11-5-12
JESS W. SWAIM, P.E. DATE

SALADO CREEK TRAIL HORIZONTAL ALIGNMENT DATA

N.T.S

SHEET 2 OF 3

DSN: TWT	CK:	DATE	JOB NO.	SHEET NO.
DRN:	CK: BSP	11/1/2012	161872	26

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PENTABLE: 0000000000000000
File Name: SCT-HC.dgn
User Name: BrooPeter
DATE: 11/1/2012
PLOTTING TIME: 10:52:52 AM

SALADO CREEK TRAIL (TRAILCL) (CONT'D)

Course from PT TRAILCL-20 to PC TRAILCL-21 N 70° 55' 56.90" E Dist 25.5489

Curve Data

Curve TRAILCL-21
P.I. Station 38+07.62 N 13,751,971.1996 E 2,130,224.2294
Delta = 55° 53' 24.08" (RT)
Degree = 57° 17' 44.81"
Tangent = 53.0479
Length = 97.5465
Radius = 100.0000
External = 13.1993
Long Chord = 93.7248
Mid. Ord. = 11.6602
P.C. Station 37+54.57 N 13,751,953.8698 E 2,130,174.0920
P.T. Station 38+52.12 N 13,751,939.4060 E 2,130,266.6940
C.C. N 13,751,859.3564 E 2,130,206.7602
Back = N 70° 55' 56.90" E
Ahead = S 53° 10' 39.02" E
Chord Bear = S 81° 07' 21.06" E

Course from PT TRAILCL-21 to PC TRAILCL-22 S 53° 10' 39.02" E Dist 60.9998

Curve Data

Curve TRAILCL-22
P.I. Station 39+37.41 N 13,751,888.2895 E 2,130,334.9669
Delta = 27° 18' 13.72" (LT)
Degree = 57° 17' 44.81"
Tangent = 24.2885
Length = 47.6541
Radius = 100.0000
External = 2.9074
Long Chord = 47.2045
Mid. Ord. = 2.8252
P.C. Station 39+13.12 N 13,751,902.8465 E 2,130,315.5241
P.T. Station 39+60.77 N 13,751,884.2729 E 2,130,358.9210
C.C. N 13,751,982.8961 E 2,130,375.4579
Back = S 53° 10' 39.02" E
Ahead = S 80° 28' 52.74" E
Chord Bear = S 66° 49' 45.88" E

Course from PT TRAILCL-22 to PC TRAILCL-23 S 80° 28' 52.74" E Dist 81.1734

Curve Data

Curve TRAILCL-23
P.I. Station 40+81.64 N 13,751,864.2855 E 2,130,478.1224
Delta = 43° 17' 54.17" (RT)
Degree = 57° 17' 44.81"
Tangent = 39.6921
Length = 75.5699
Radius = 100.0000
External = 7.5893
Long Chord = 73.7845
Mid. Ord. = 7.0540
P.C. Station 40+41.95 N 13,751,870.8493 E 2,130,438.9768
P.T. Station 41+17.52 N 13,751,832.6624 E 2,130,502.1108
C.C. N 13,751,772.2262 E 2,130,422.4398
Back = S 80° 28' 52.74" E
Ahead = S 37° 10' 58.57" E
Chord Bear = S 58° 49' 55.66" E

Course from PT TRAILCL-23 to PC TRAILCL-24 S 37° 10' 58.57" E Dist 36.4659

Curve Data

Curve TRAILCL-24
P.I. Station 42+09.20 N 13,751,759.6137 E 2,130,557.5235
Delta = 57° 49' 00.23" (LT)
Degree = 57° 17' 44.81"
Tangent = 55.2220
Length = 100.9092
Radius = 100.0000
External = 14.2343
Long Chord = 96.6820
Mid. Ord. = 12.4606
P.C. Station 41+53.98 N 13,751,803.6096 E 2,130,524.1494
P.T. Station 42+54.89 N 13,751,764.4263 E 2,130,612.5354
C.C. N 13,751,864.0458 E 2,130,603.8204
Back = S 37° 10' 58.57" E
Ahead = N 85° 00' 01.19" E
Chord Bear = S 66° 05' 28.69" E

Course from PT TRAILCL-24 to PC TRAILCL-25 N 85° 00' 01.19" E Dist 136.2847

Curve Data

Curve TRAILCL-25
P.I. Station 44+98.17 N 13,751,785.6283 E 2,130,854.8916
Delta = 29° 57' 04.29" (RT)
Degree = 14° 19' 26.20"
Tangent = 106.9971
Length = 209.0988
Radius = 400.0000
External = 14.0633
Long Chord = 206.7261
Mid. Ord. = 13.5856
P.C. Station 43+91.18 N 13,751,776.3035 E 2,130,748.3016
P.T. Station 46+00.28 N 13,751,740.4914 E 2,130,951.9021
C.C. N 13,751,377.8254 E 2,130,783.1616
Back = N 85° 00' 01.19" E
Ahead = S 65° 02' 54.51" E
Chord Bear = S 80° 01' 26.66" E

SALADO CREEK TRAIL (TRAILCL) (CONT'D)

Curve Data

Curve TRAILCL-26
P.I. Station 46+17.76 N 13,751,733.1163 E 2,130,967.7531
Delta = 6° 40' 13.35" (LT)
Degree = 19° 05' 54.94"
Tangent = 17.4828
Length = 34.9260
Radius = 300.0000
External = 0.5090
Long Chord = 34.9063
Mid. Ord. = 0.5081
P.C. Station 46+00.28 N 13,751,740.4914 E 2,130,951.9021
P.T. Station 46+35.20 N 13,751,727.6323 E 2,130,984.3535
C.C. N 13,752,012.4909 E 2,131,078.4575
Back = S 65° 02' 54.51" E
Ahead = S 71° 43' 07.87" E
Chord Bear = S 68° 23' 01.19" E

Course from PT TRAILCL-26 to PC TRAILCL-27 S 71° 43' 07.87" E Dist 388.2060

Curve Data

Curve TRAILCL-27
P.I. Station 50+52.05 N 13,751,596.8743 E 2,131,380.1661
Delta = 77° 01' 09.72" (LT)
Degree = 159° 09' 17.80"
Tangent = 28.6456
Length = 48.3927
Radius = 36.0000
External = 10.0062
Long Chord = 44.8306
Mid. Ord. = 7.8299
P.C. Station 50+23.41 N 13,751,605.8598 E 2,131,352.9663
P.T. Station 50+71.80 N 13,751,621.3607 E 2,131,395.0317
C.C. N 13,751,640.0429 E 2,131,364.2588
Back = S 71° 43' 07.87" E
Ahead = N 31° 15' 42.42" E
Chord Bear = N 69° 46' 17.27" E

Course from PT TRAILCL-27 to PC TRAILCL-28 N 31° 15' 42.42" E Dist 131.3971

Curve Data

Curve TRAILCL-28
P.I. Station 52+33.23 N 13,751,759.3538 E 2,131,478.8069
Delta = 28° 06' 14.63" (RT)
Degree = 47° 44' 47.34"
Tangent = 30.0351
Length = 58.8610
Radius = 120.0000
External = 3.7017
Long Chord = 58.2727
Mid. Ord. = 3.5909
P.C. Station 52+03.20 N 13,751,733.6796 E 2,131,463.2202
P.T. Station 52+62.06 N 13,751,774.6584 E 2,131,504.6502
C.C. N 13,751,671.4057 E 2,131,565.7968
Back = N 31° 15' 42.42" E
Ahead = N 59° 21' 57.05" E
Chord Bear = N 45° 18' 49.73" E

Course from PT TRAILCL-28 to TRAILCL02 N 59° 21' 57.05" E Dist 100.6910

Point TRAILCL02 N 13,751,825.9659 E 2,131,591.2887 Sta 53+62.75

==========

Ending chain TRAILCL description

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STATE OF TEXAS
Jess W. Swaim
99204
REGISTERED PROFESSIONAL ENGINEER

Jess W. Swaim, P.E. 11-5-12
JESS W. SWAIM, P.E. DATE

SALADO CREEK TRAIL HORIZONTAL ALIGNMENT DATA

N.T.S

SHEET 3 OF 3

DSN: TWT	CK:	DATE	JOB NO.	SHEET NO.
DRN:	CK: BSP	11/1/2012	161872	27

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DATE: 11/1/2012
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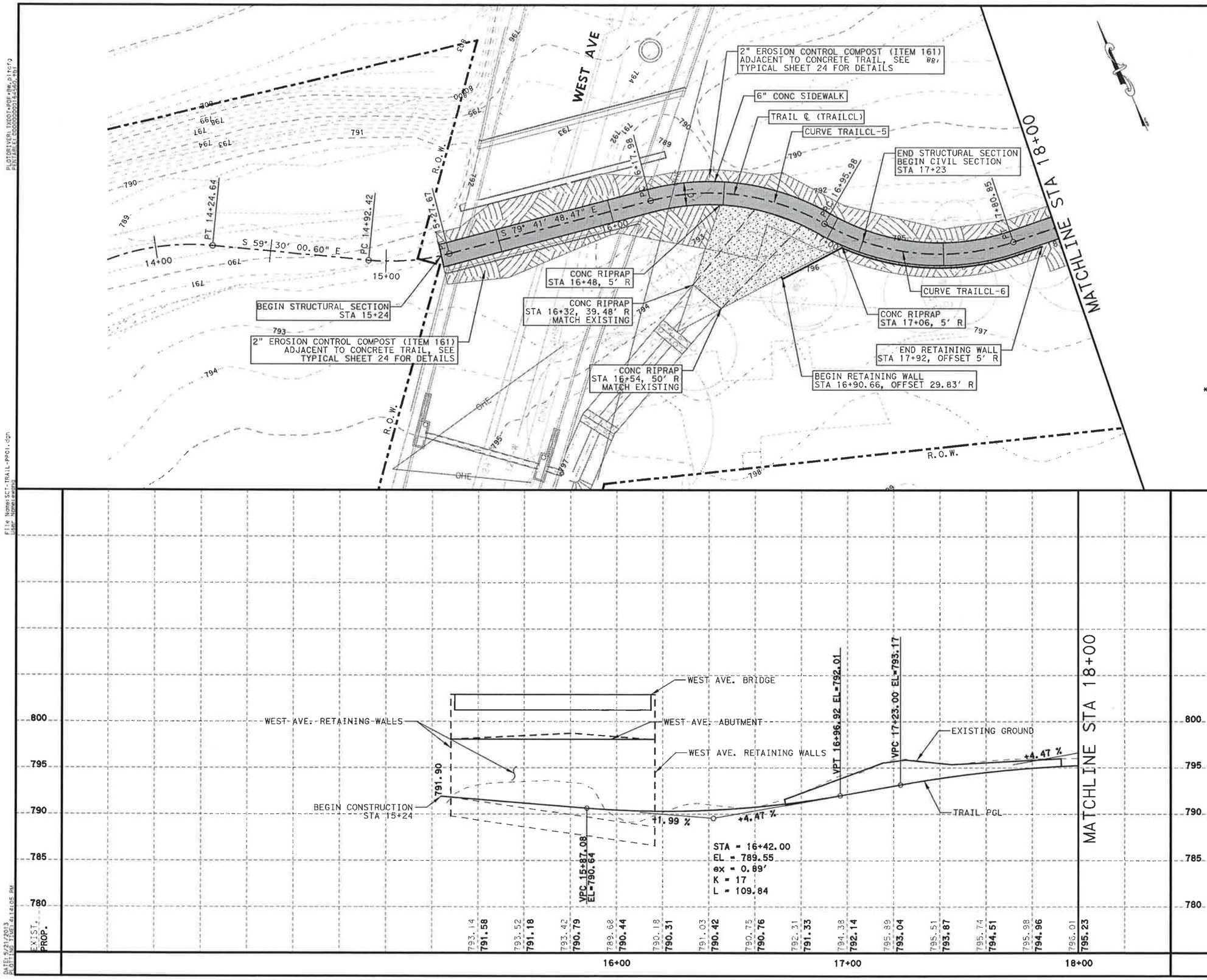

LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT

* PROPOSED WEST AVENUE BRIDGE IS PER TXDOT PLANS, CONTRACTOR TO VERIFY ELEVATIONS PRIOR TO CONSTRUCTION TO PROVIDE ADEQUATE CLEARANCE PER AASHTO BICYCLE GUIDELINES.

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0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. 5/21/13 DATE

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 15+24 TO STA 18+00

SCALE: 1"=40'-H 1"=10'-V

SHEET 1 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	28

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DATE: 5/21/2013
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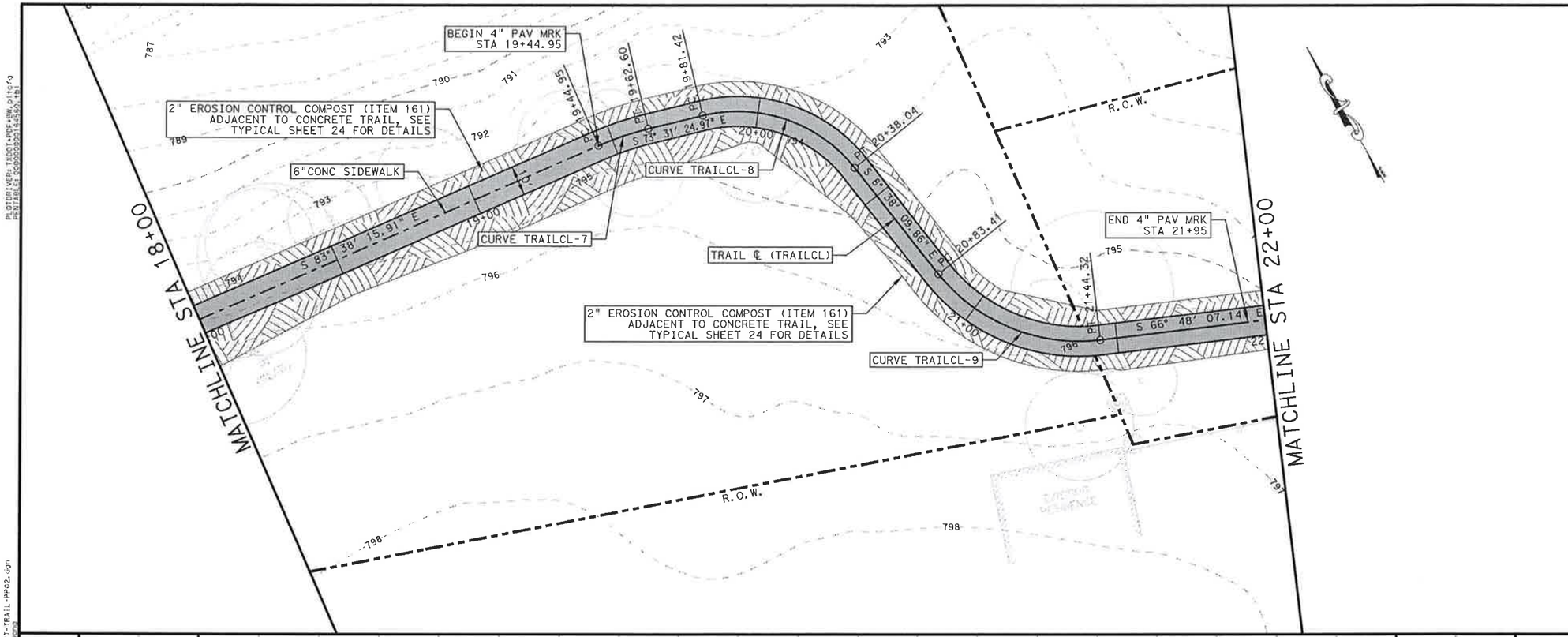
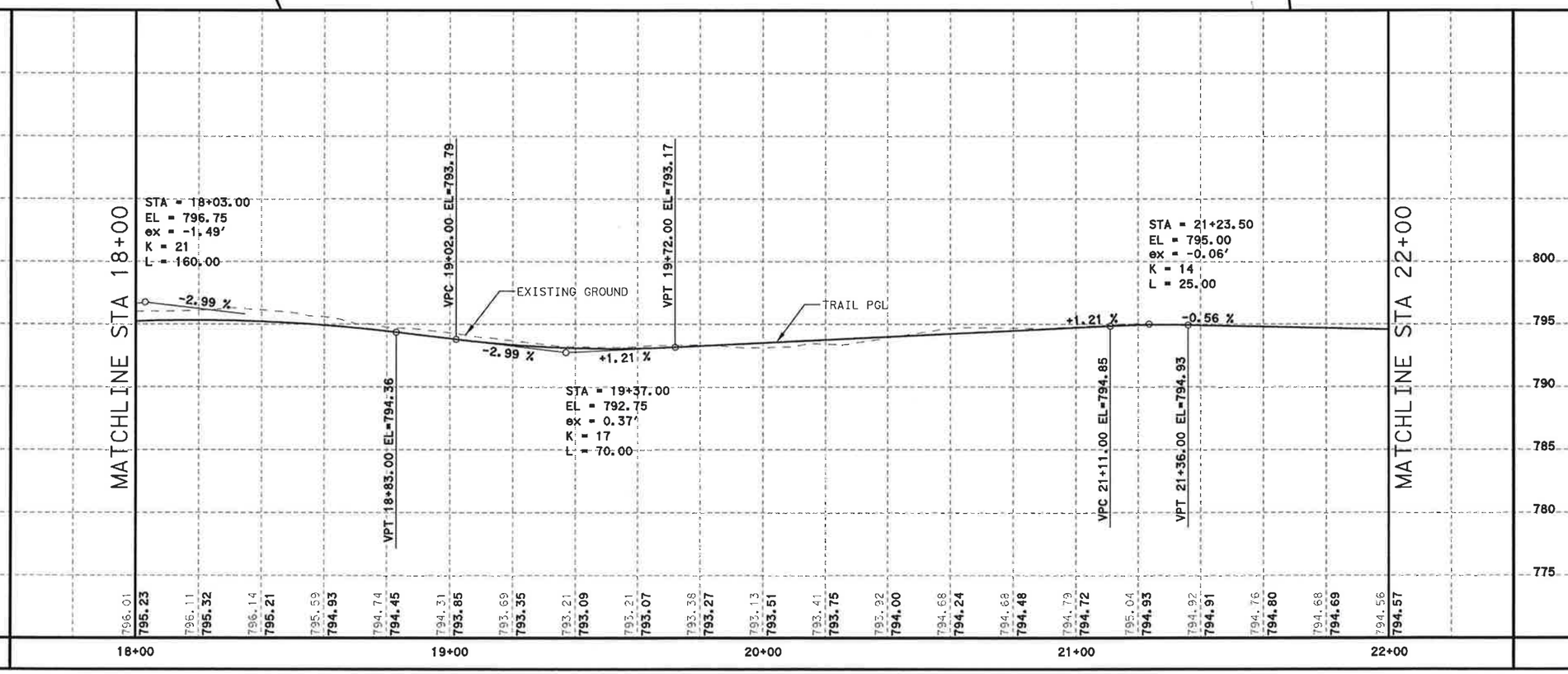


LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT



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0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. 5/21/13 DATE

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 18+00 TO STA 22+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 2 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	29

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DATE: 5/21/2013
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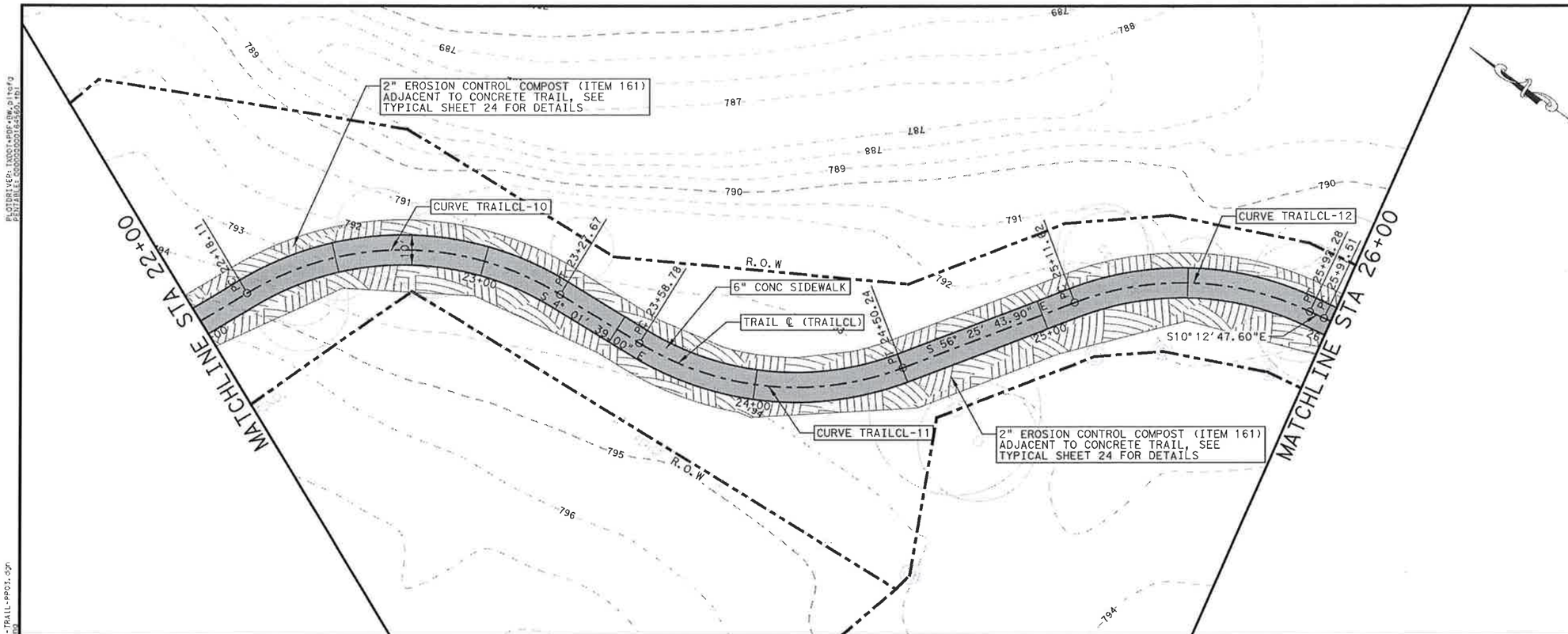
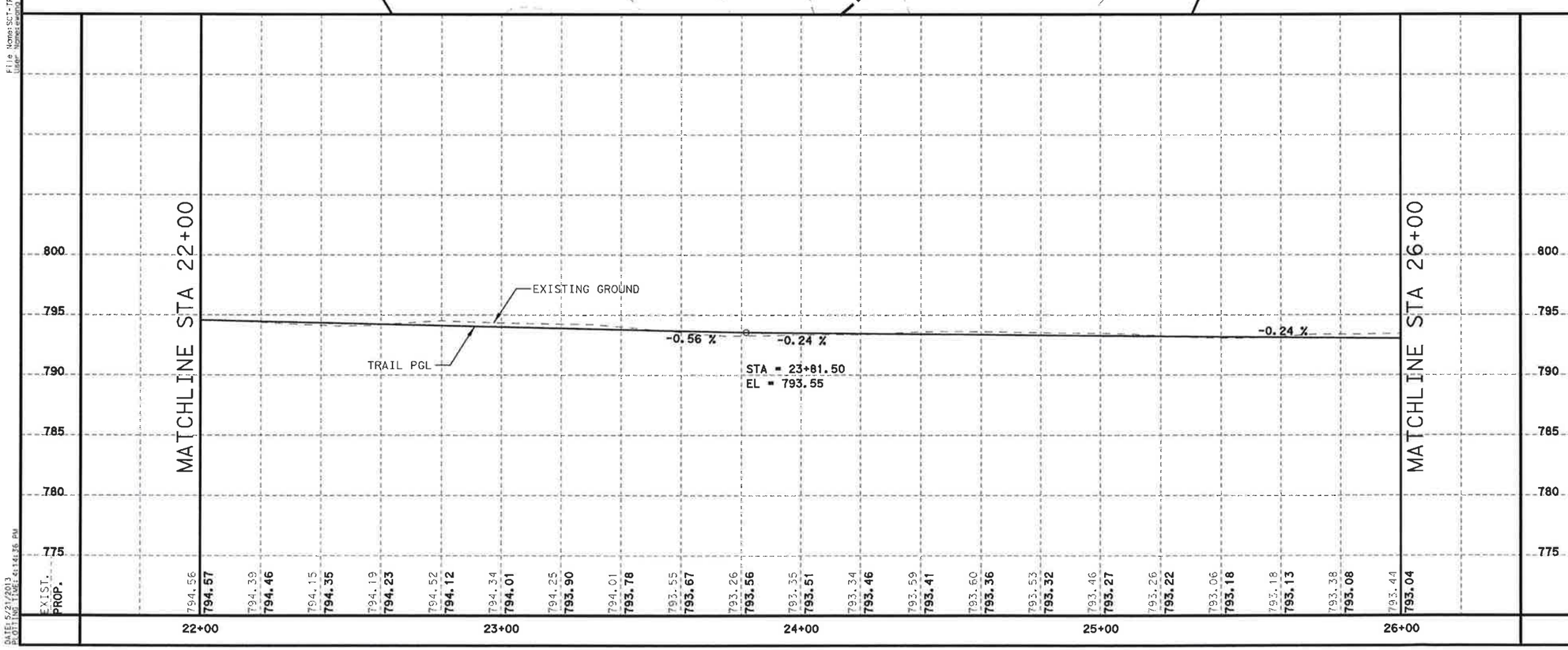


LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT



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0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
JOSE M. GONZALEZ
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LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 5/21/13

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 22+00 TO STA 26+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 3 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	30

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User Name: gonzalejm
DATE: 5/21/2013
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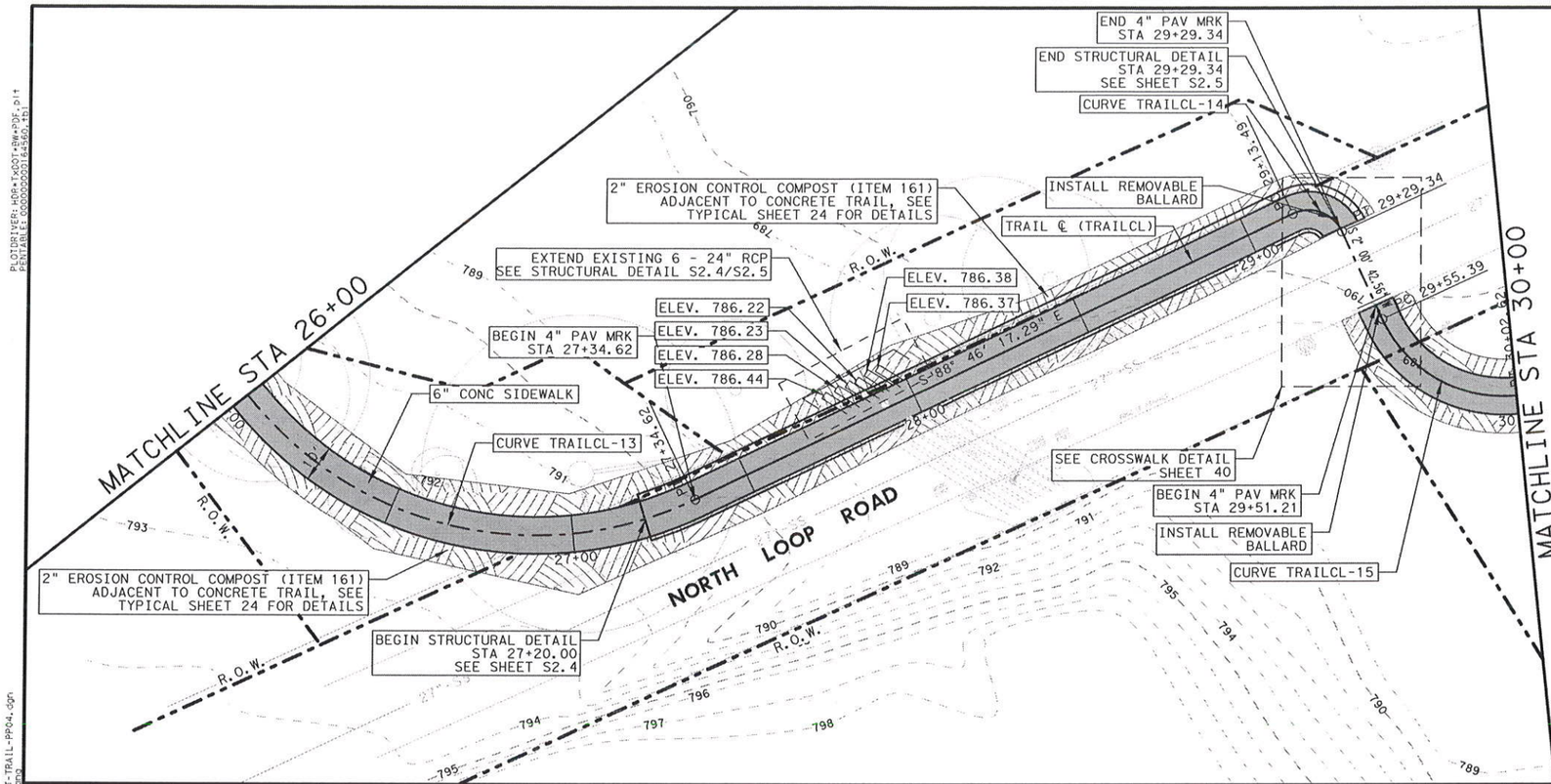

LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT

NOTE:

1. PIPE ELEVATION AND SLOPES MAY BE ADJUSTED IN THE FIELD TO MATCH EXISTING GRADE OF THE CREEK.
2. POSITIVE DRAINAGE MUST BE MAINTAINED THROUGH CROSSING.
3. LOCATION OF CULVERTS MAY BE ADJUSTED IN FIELD TO MATCH EXISTING CONDITIONS, SPOT ELEVATIONS SHOWN ARE APPROXIMATE ELEVATIONS.
4. LOW WATER CROSSINGS INTENT TO PASS LOW FLOWS UNDER THE TRAIL. DESIGN FREQUENCY AND WATER SURFACE ELEVATIONS OF THE CROSSING NOT CALCULATED.

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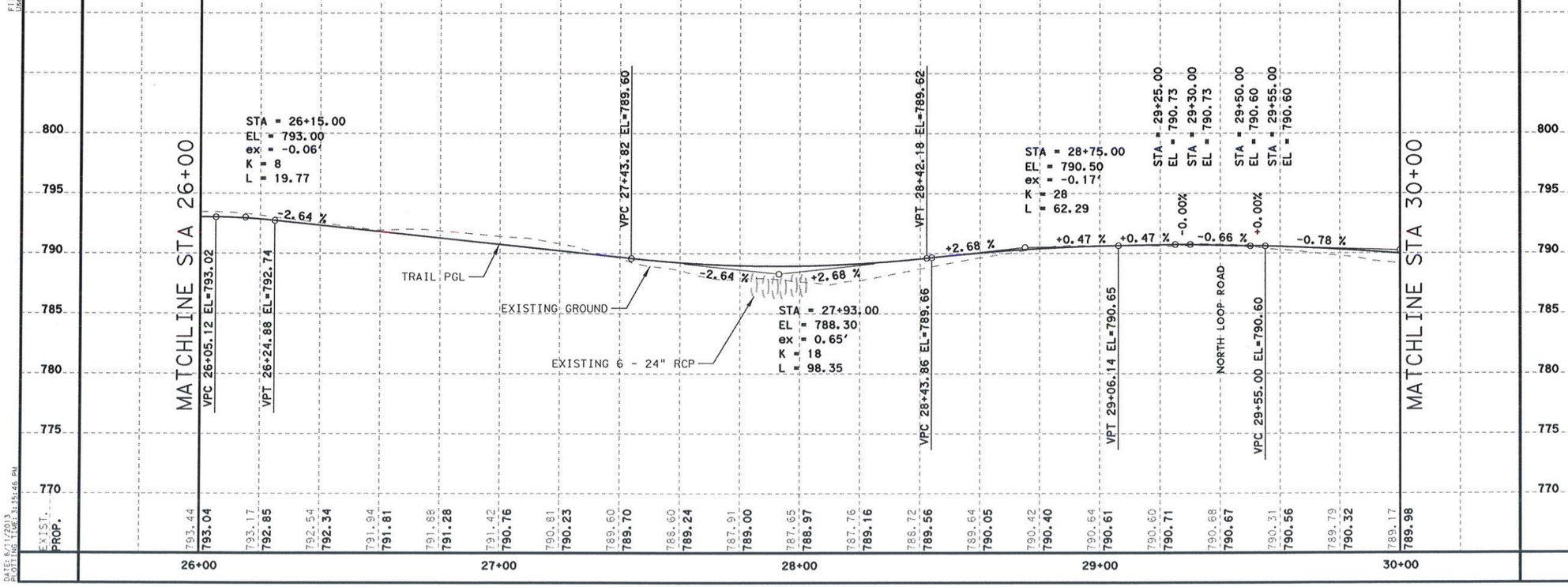
0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'
0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 6/26/13



SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 26+00 TO STA 30+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 4 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	6/11/2013	161872	31

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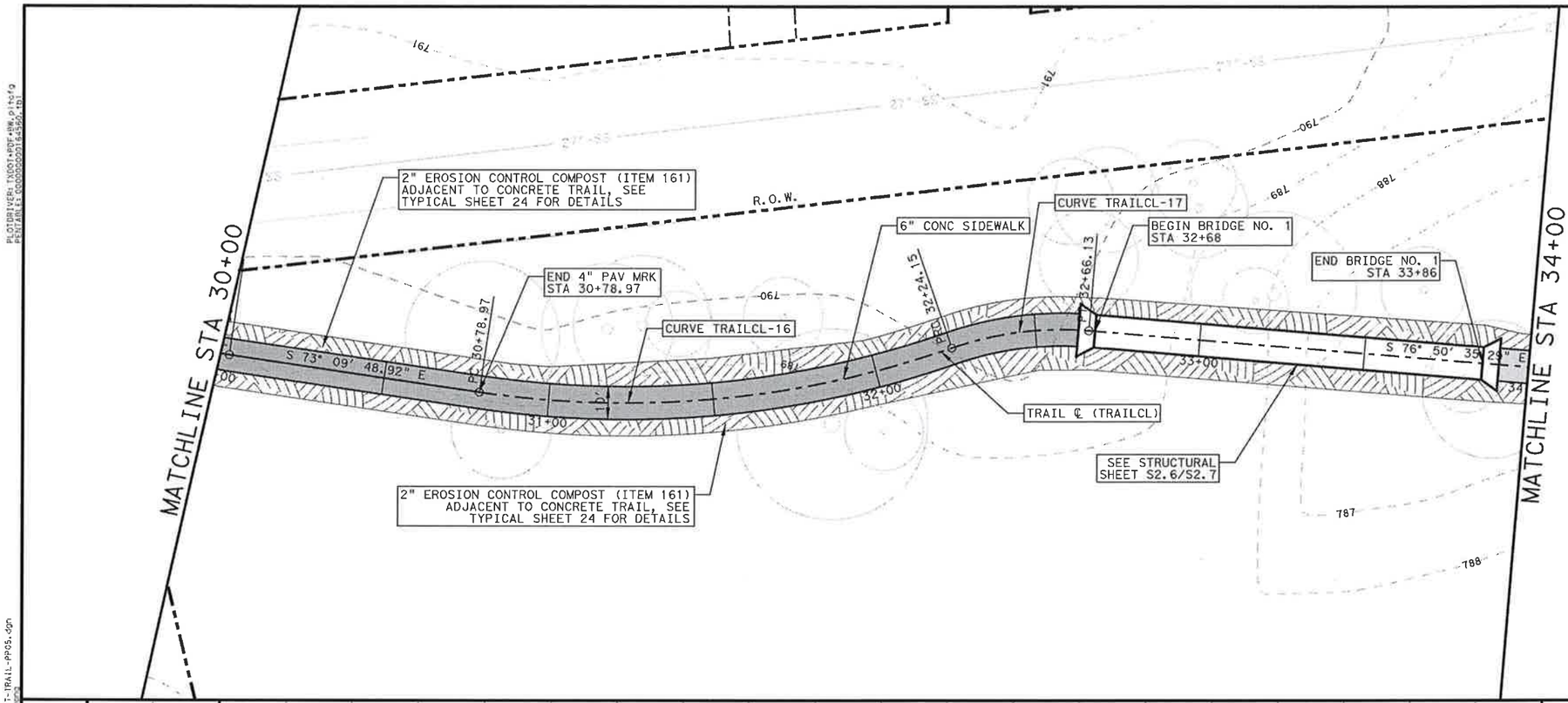
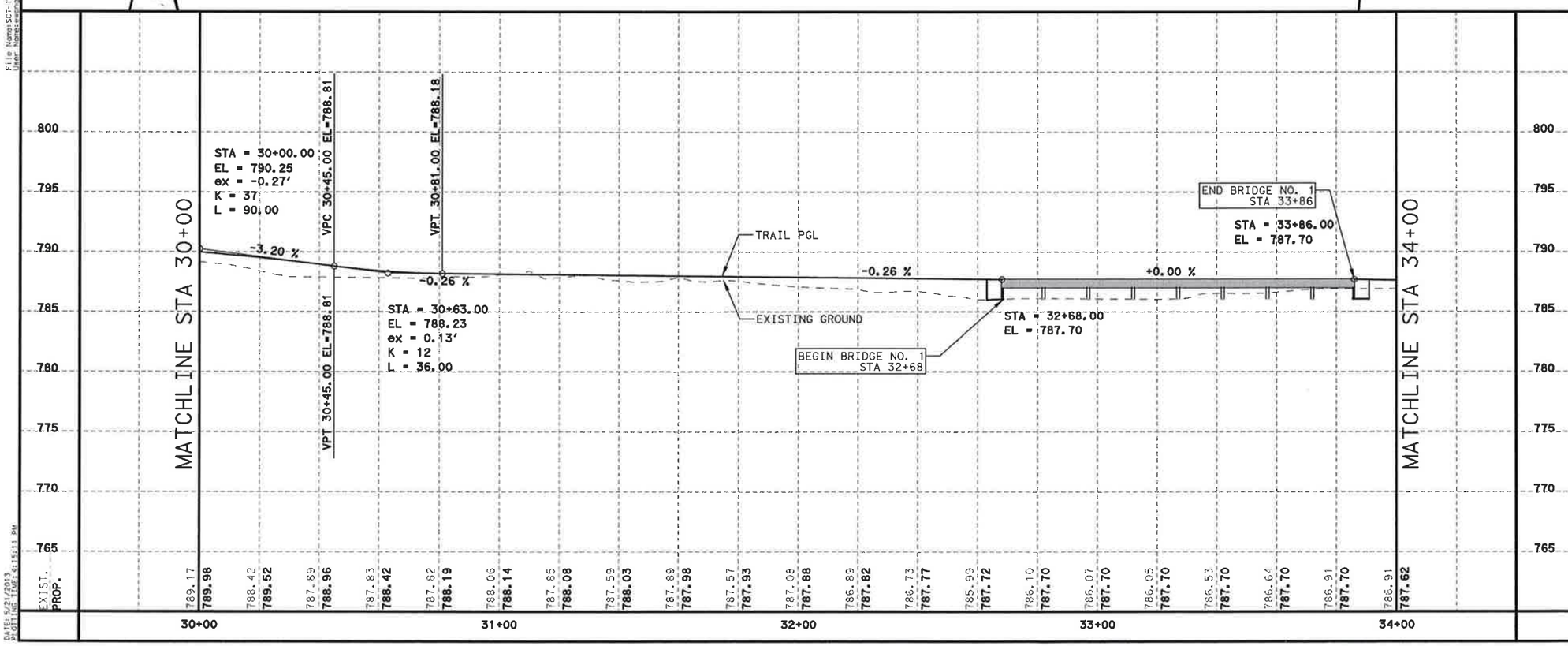


LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT



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HORIZONTAL SCALE: 1" = 40'

VERTICAL SCALE: 1" = 10'

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97348
LICENSED PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. — DATE 5/21/13

SALADO CREEK TRAIL

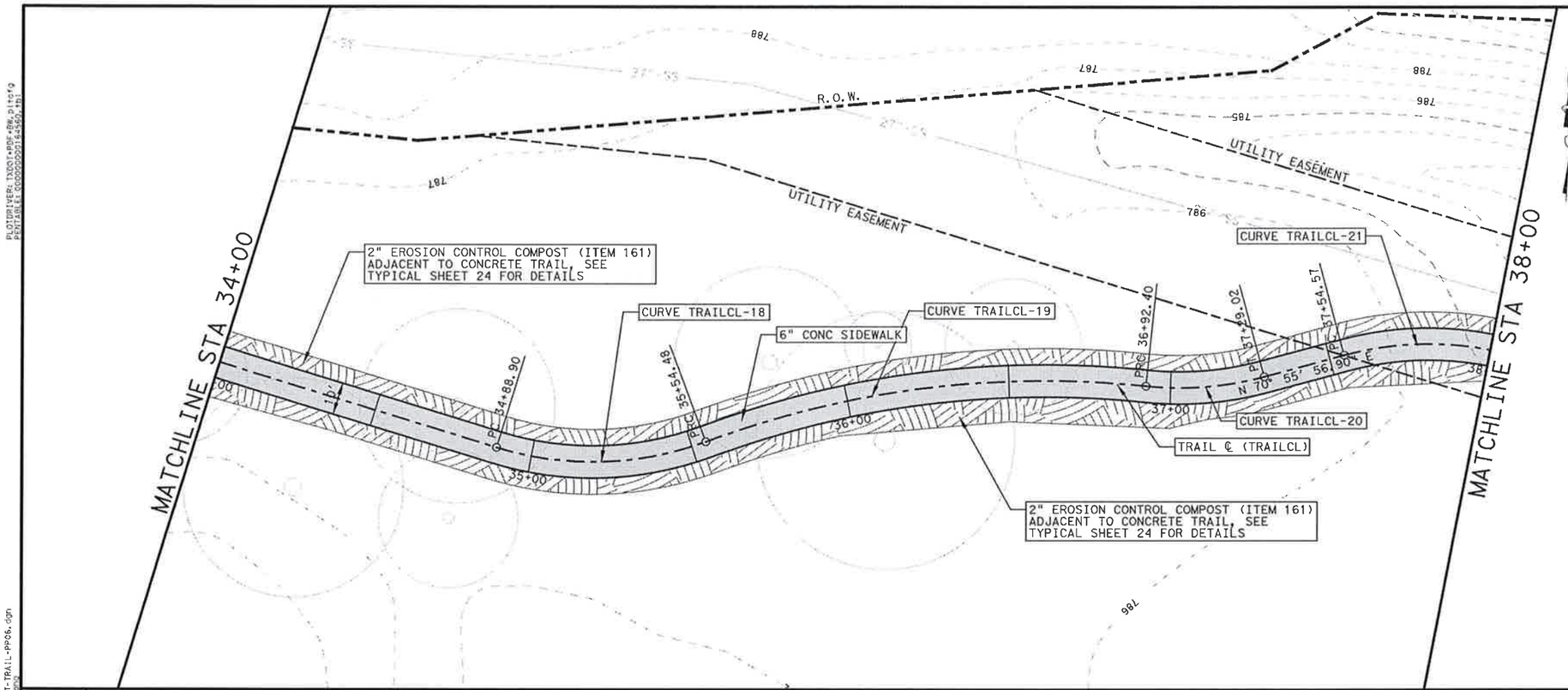
HIKE & BIKE PLAN & PROFILE

STA 30+00 TO STA 34+00

SCALE: 1"=40'-H 1"=10'-V

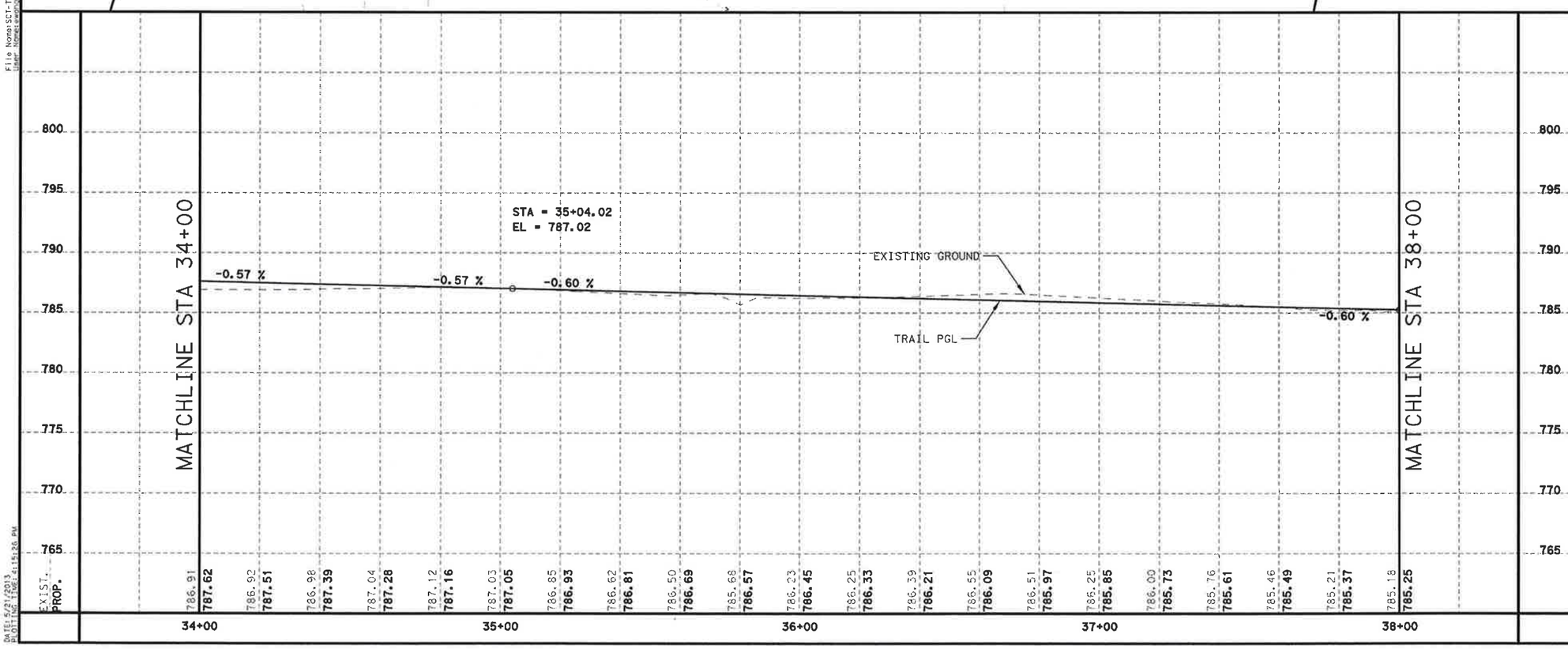
SHEET 5 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	32



LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT



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CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

HDR Engineering, Inc.
1020 NE Loop 410, Suite 400
San Antonio, TX 78209
Texas P.E. Firm Registration No. F-754
TELE. NO. (210) 841-2800 FAX NO. (210) 841-2828 WWW.HDRINC.COM

0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 5/21/13

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 34+00 TO STA 38+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 6 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	33

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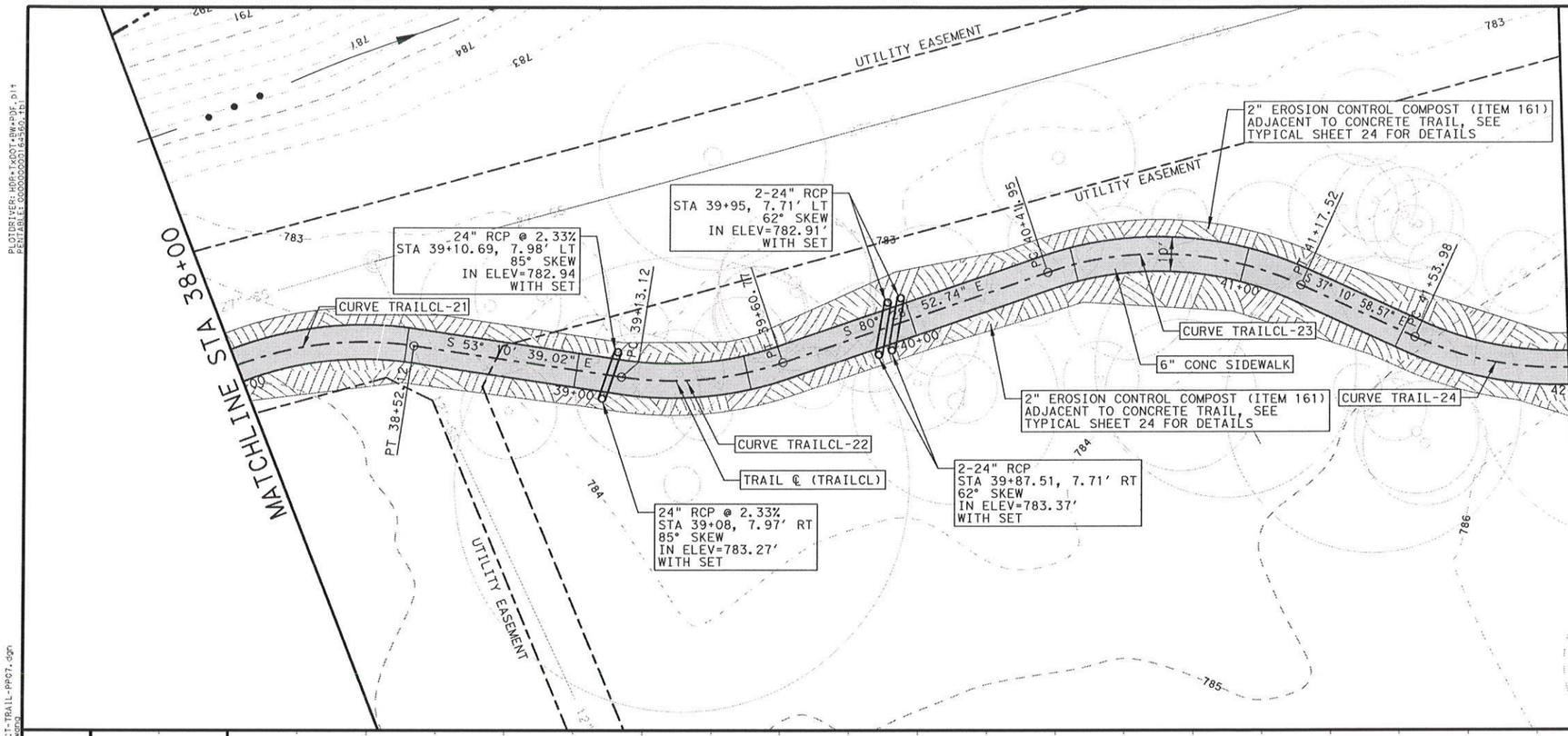
PENTABLE: C:\DOCUMENTS\PENTABLES\Default.tbl
File Name: SCT-TRAIL-PP06.dgn
User Name: gwong
DATE: 5/21/2013
PLOT TIME: 1:05:46:15:26 PM



LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT

NOTE:

1. PIPE ELEVATION AND SLOPES MAY BE ADJUSTED IN THE FIELD TO MATCH EXISTING GRADE OF THE CREEK.
2. POSITIVE DRAINAGE MUST BE MAINTAINED THROUGH CROSSING.
3. LOCATION OF CULVERTS MAY BE ADJUSTED IN FIELD TO MATCH EXISTING CONDITIONS, SPOT ELEVATIONS SHOWN ARE APPROXIMATE ELEVATIONS.
4. LOW WATER CROSSINGS INTENT TO PASS LOW FLOWS UNDER THE TRAIL. DESIGN FREQUENCY AND WATER SURFACE ELEVATIONS OF THE CROSSING NOT CALCULATED.

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VERTICAL SCALE: 1" = 10'

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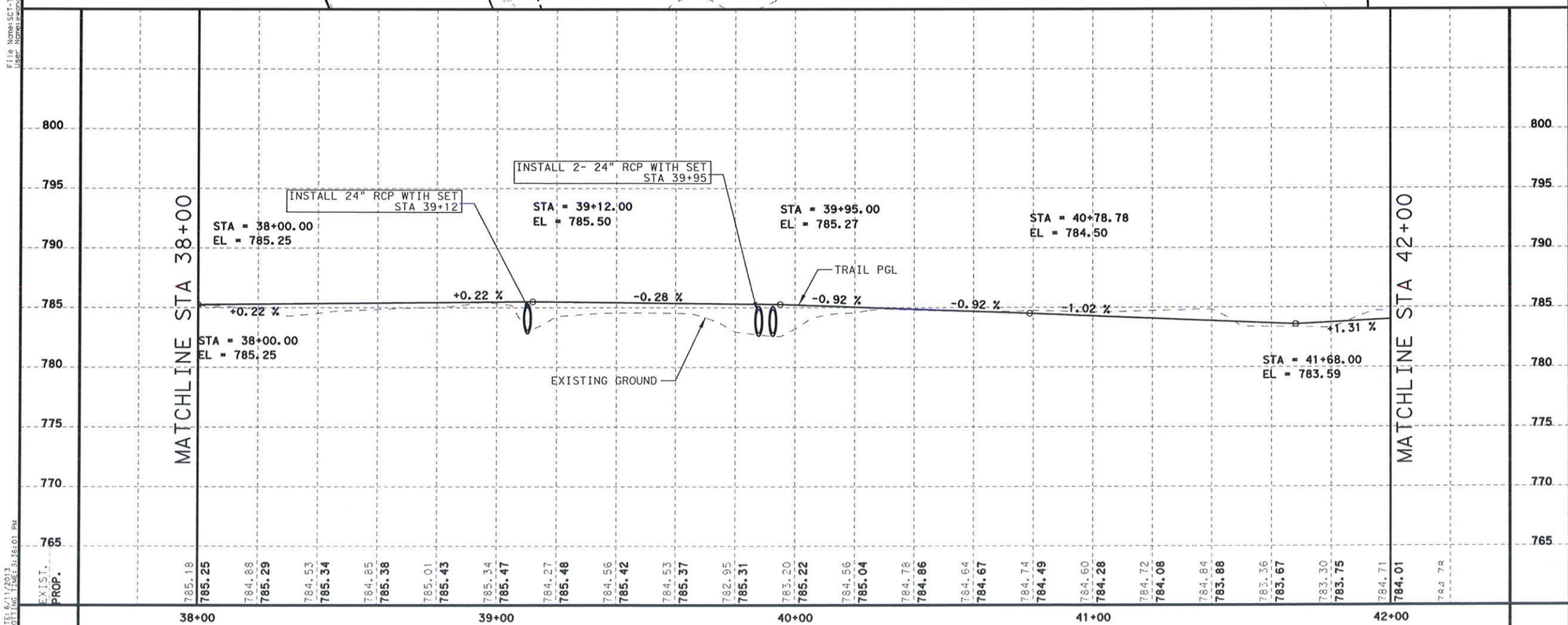
JOSE M. GONZALEZ, P.E. — DATE 6/26/13



SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 38+00 TO STA 42+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 7 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	6/11/2013	161872	34

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User Name: swong

DATE: 6/11/2013
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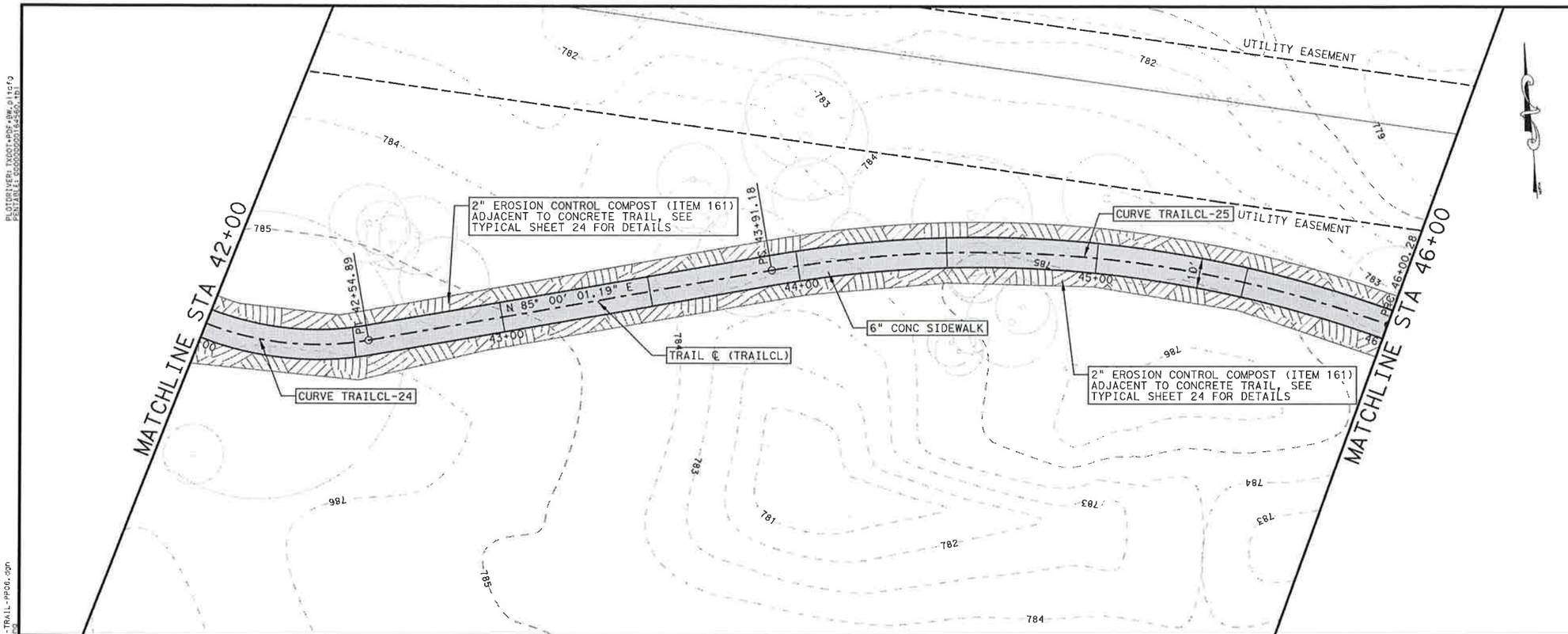
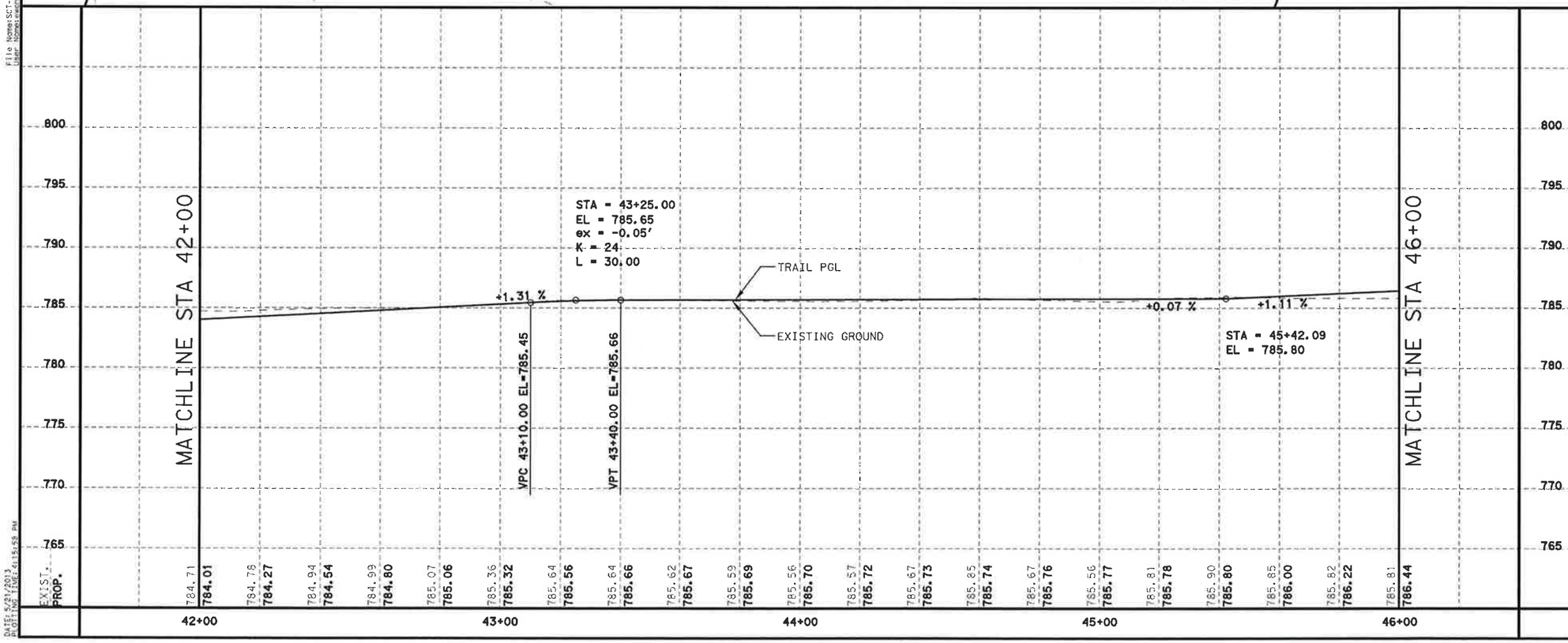


LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT



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0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. 5/21/13 DATE

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 42+00 TO STA 46+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 8 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	35

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PENTABLE: 000000000014560.tbl
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User Name: Jose Gonzalez
DATE: 5/21/2013
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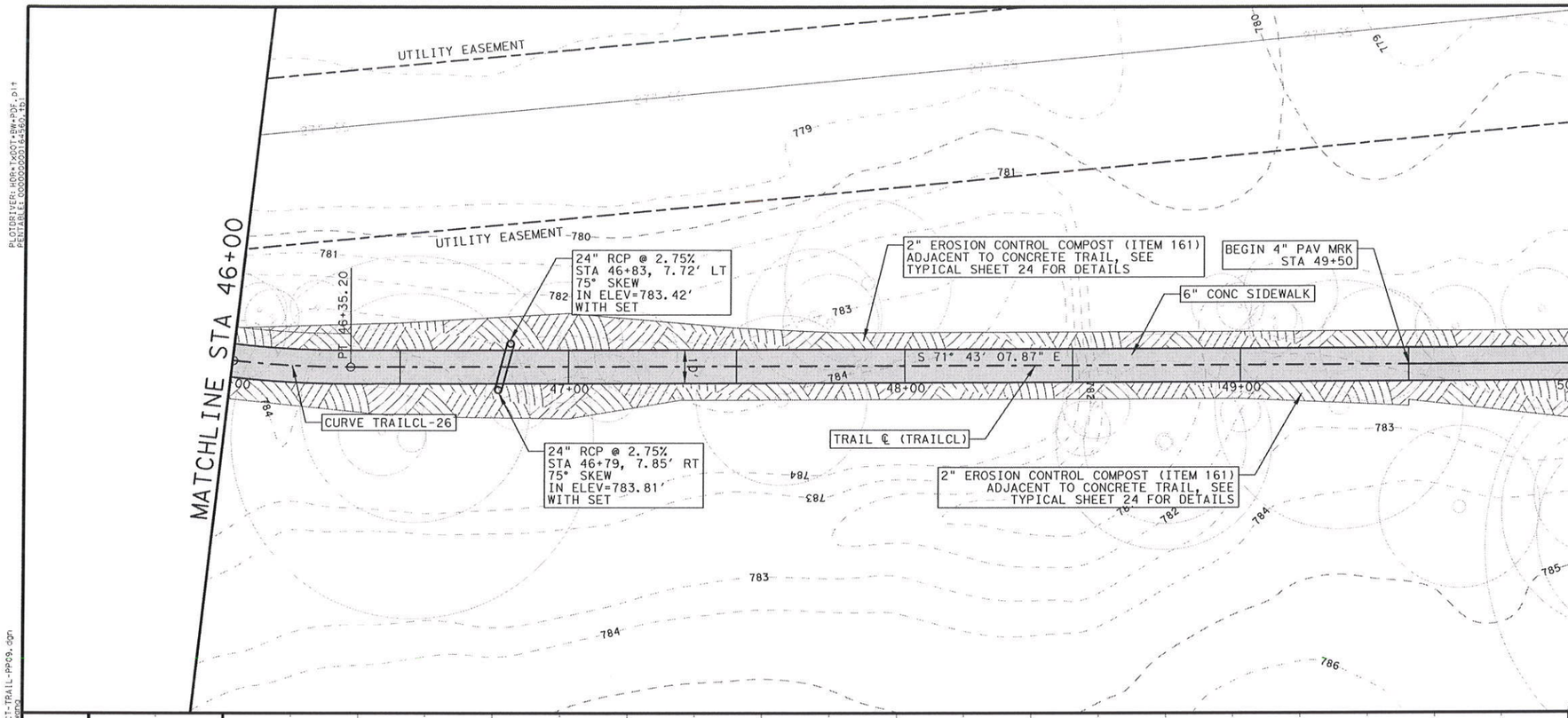

LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING GUY WIRE
- EXISTING POWER/TELE POLES
- APPROX. R.O.W.
- CREEK FLOWLINE
- UTILITY EASEMENT

NOTE:

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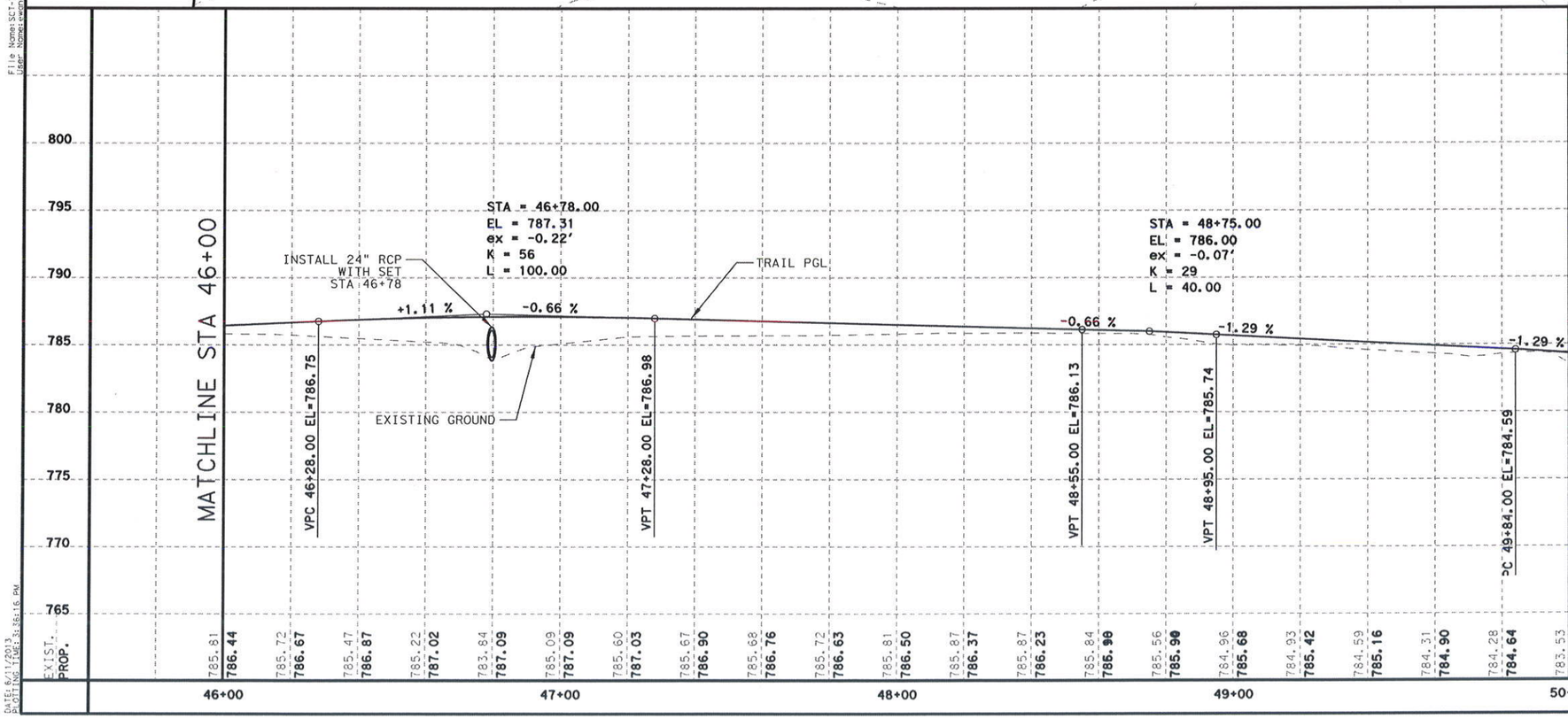
HORIZONTAL SCALE: 1" = 40'

VERTICAL SCALE: 1" = 10'



STATE OF TEXAS
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PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. DATE 6/26/13

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 46+00 TO STA 50+00

SCALE: 1"=40'-H
1"=10'-V

SHEET 9 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	6/11/2013	161872	36

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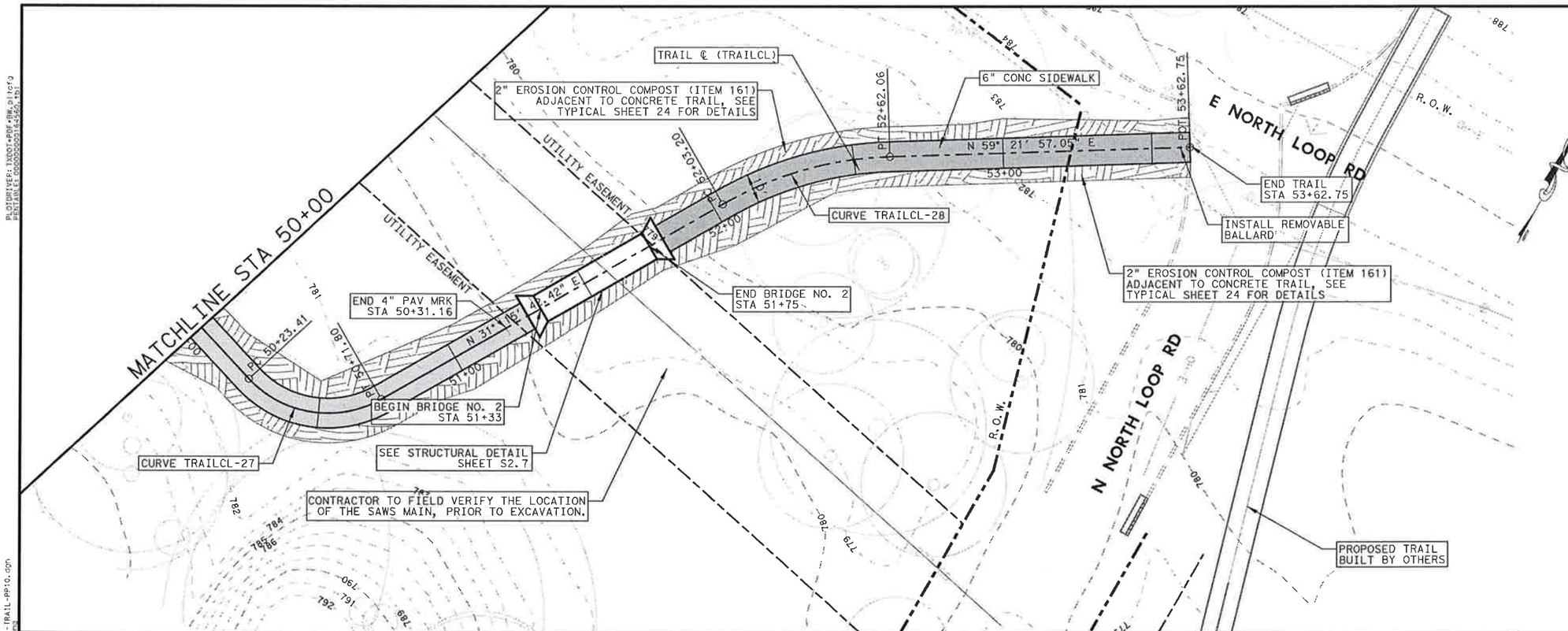
PENTABLE: 000000000016+560.tbl
File Name: SCT-TRAIL-PP09.dgn
User Name: ewong
DATE: 6/11/2013
PLOT TIME: 3:36:16 PM



LEGEND

- PROPOSED CONCRETE TRAIL
- PROPOSED EROSION CONTROL COMPOST
- MISC. CONCRETE RIPRAP
- EXISTING TREES
- EXISTING MANHOLE
- EXISTING WATER METER
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- APPROX. R.O.W.
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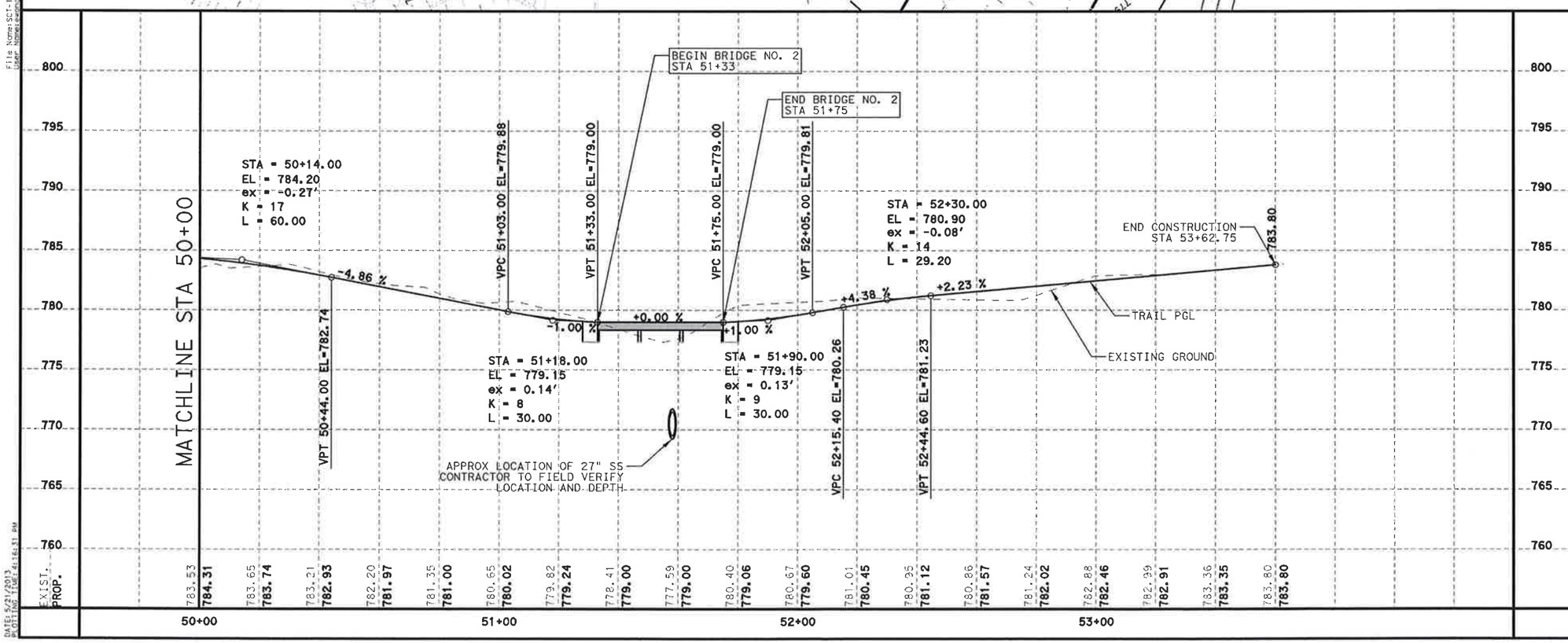

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0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

0 5 10 15 20
VERTICAL SCALE: 1" = 10'

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. 5/21/13 DATE

SALADO CREEK TRAIL

HIKE & BIKE PLAN & PROFILE

STA 50+00 TO STA 54+06.68

SCALE: 1"=40'-H
1"=10'-V

SHEET 10 OF 10

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	5/21/2013	161872	37

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PENTABLE: C:\DOCUMENTS\164562.tbl
File Name: SCT-TRAIL-PP10.dgn
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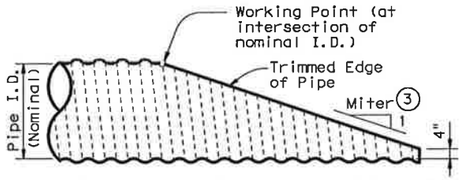
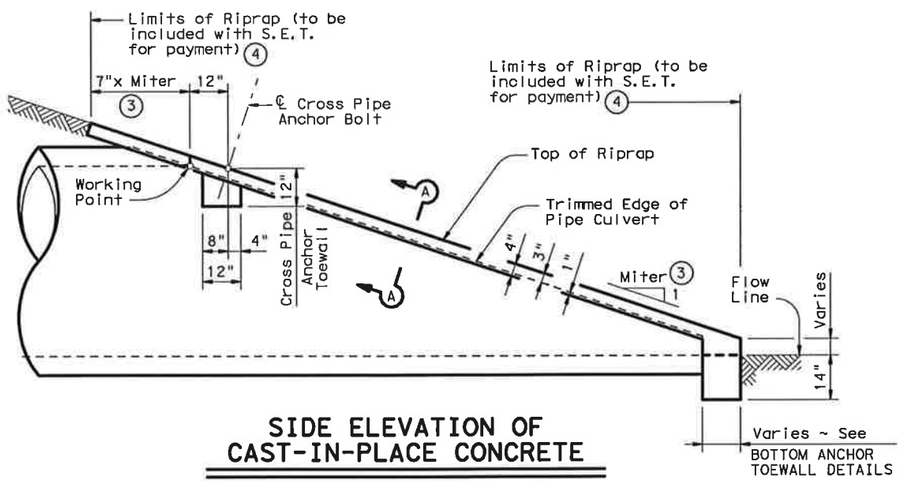
DATE: 5/21/2013
PLOTTED: 5/21/2013 4:18:31 PM



NOTE: All Pipe Runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

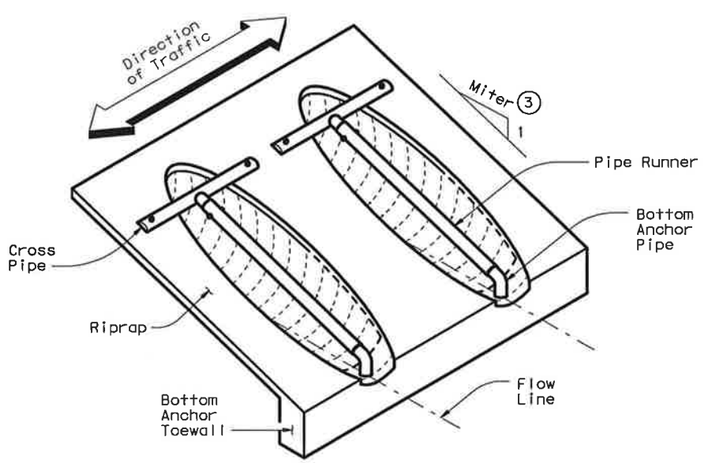
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert. Details of Concrete Pipe Culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing Concrete Pipe Culvert. Details of Corrugated Metal Pipe Culvert are similar. Pipe Runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS & PIPE RUNNER LENGTHS (1)(2)

Nominal Culvert I.D.	Pipe Culvert Spa - G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1'- 7"	3'- 5"	N/A	N/A	N/A	5'-10"	N/A	N/A	N/A	8'- 1"	N/A	N/A	N/A	12'- 9"
27"	1'- 8"	3'- 8"	N/A	N/A	5'- 5"	6'-11"	N/A	N/A	7'- 7"	9'- 7"	N/A	N/A	11'-11"	14'-11"
30"	1'-10"	3'-11"	N/A	N/A	6'- 4"	8'- 0"	N/A	N/A	8'- 9"	11'- 0"	N/A	N/A	13'- 8"	17'- 0"
33"	1'-11"	4'- 2"	6'- 2"	6'- 5"	7'- 3"	9'- 1"	8'- 6"	8'-10"	10'- 0"	12'- 5"	13'- 3"	13'- 9"	15'- 5"	19'- 2"
36"	2'- 1"	4'- 5"	6'-11"	7'- 3"	8'- 2"	10'- 2"	9'- 6"	9'-11"	11'- 2"	13'-10"	14'- 9"	15'- 3"	17'- 2"	21'- 3"
42"	2'- 4"	4'-11"	8'- 6"	8'-10"	9'-11"	12'- 4"	11'- 7"	12'- 0"	13'- 6"	16'- 8"	17'- 9"	18'- 5"	20'- 8"	25'- 7"
48"	2'- 7"	5'- 5"	10'- 1"	10'- 5"	11'- 9"	N/A	13'- 7"	14'- 2"	15'-10"	N/A	20'- 9"	21'- 6"	24'- 2"	N/A
54"	3'- 0"	5'-11"	11'- 8"	12'- 1"	N/A	N/A	15'- 8"	16'- 3"	N/A	N/A	23'-10"	24'- 8"	N/A	N/A
60"	3'- 3"	6'- 5"	13'- 3"	N/A	N/A	N/A	17'- 9"	N/A	N/A	N/A	26'-10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS (2) ARE NOT REQUIRED

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (No Skew)	Always required
42" to 60"	Always required	Always required

STANDARD PIPE SIZES & MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10'- 0"
4" STD	4.500"	4.026"	19'- 8"
5" STD	5.563"	5.047"	34'- 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Size of Pipe Runner shall be as shown in the tables. Cross Pipe shall be the same size as the Pipe Runner. Cross Pipe Stub Out and Bottom Anchor Pipe shall be the next smaller size pipe as shown in the STANDARD PIPE SIZES table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT "Roadway Design Manual".

(3) Miter = Slope of Mitered Pipe Culvert End

(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple Pipe Culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

LEVELS DISPLAYED | ACC:

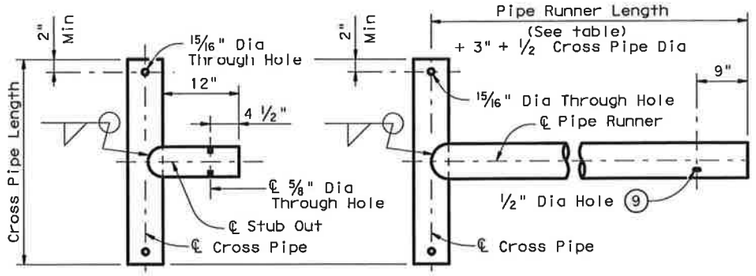
SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

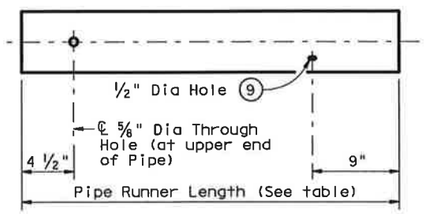
SETP-CD

FILE: setpcdse.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				38
11-10: Add note for synthetic fibers.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	BEXAR				



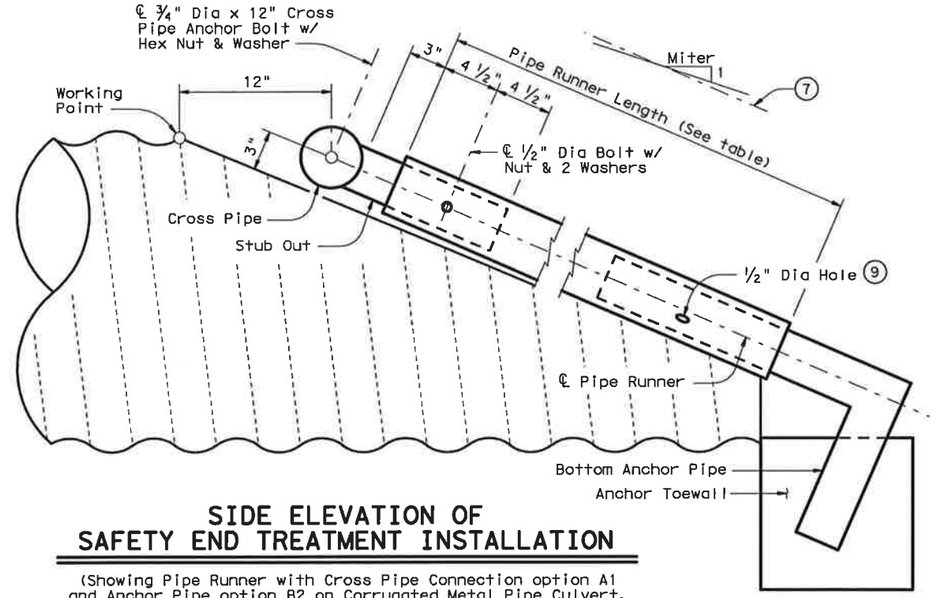
OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS



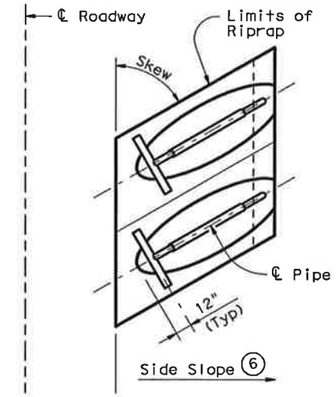
NOTE: The separate Pipe Runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

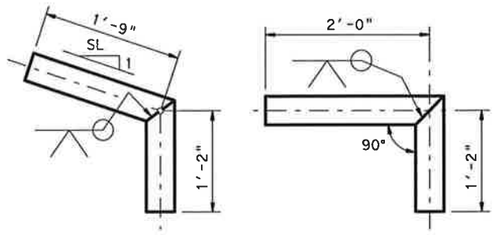


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

(Showing Pipe Runner with Cross Pipe Connection option A1 and Anchor Pipe option B2 on Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Riprap not shown for clarity)

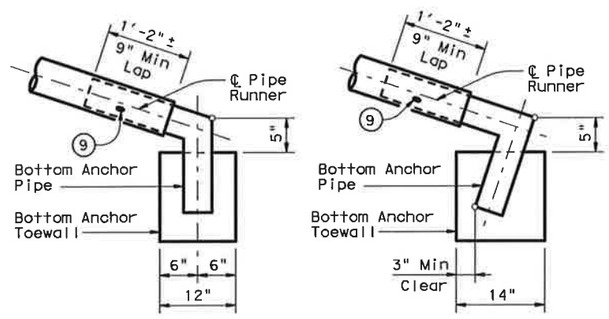


PLAN OF SKEWED INSTALLATION



OPTION B1 OPTION B2

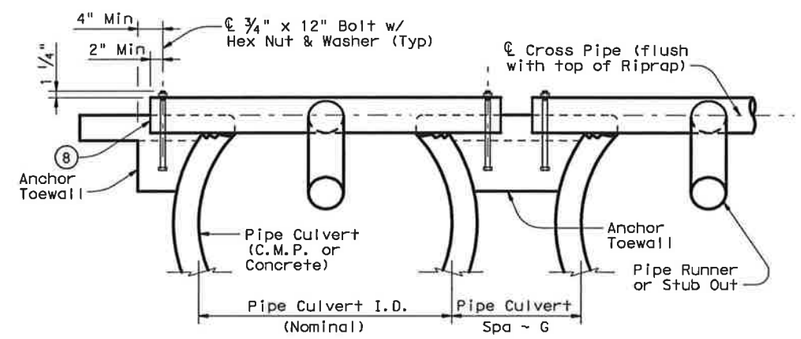
BOTTOM ANCHOR PIPE DETAILS (10)



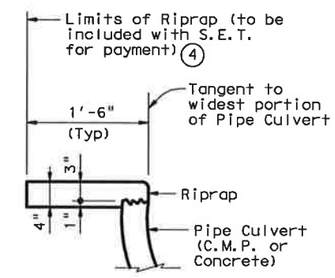
OPTION B1 OPTION B2

BOTTOM ANCHOR TOEWALL DETAILS

(Culvert & Riprap not shown for clarity)



SHOWING CROSS PIPE & ANCHOR TOEWALL



SHOWING TYPICAL PIPE CULVERT & RIPRAP

SECTION A-A

(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, & 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of Pipe Runner may vary slightly from Side Slope of Riprap and trimmed Culvert Pipe edge.

(8) Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, the 1/2" hole shall be inspected to ensure that the lap of the Pipe Runner with the Bottom Anchor Pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the Runner) may be substituted for the mitered and welded joint in the Bottom Anchor Pipe.

GENERAL NOTES:

Pipe Runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

The Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Pipe Runners, Cross Pipes, and Anchor Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Bolts and nuts shall conform to ASTM A307.

All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

ACC:
LEVELS DISPLAYED
1

Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

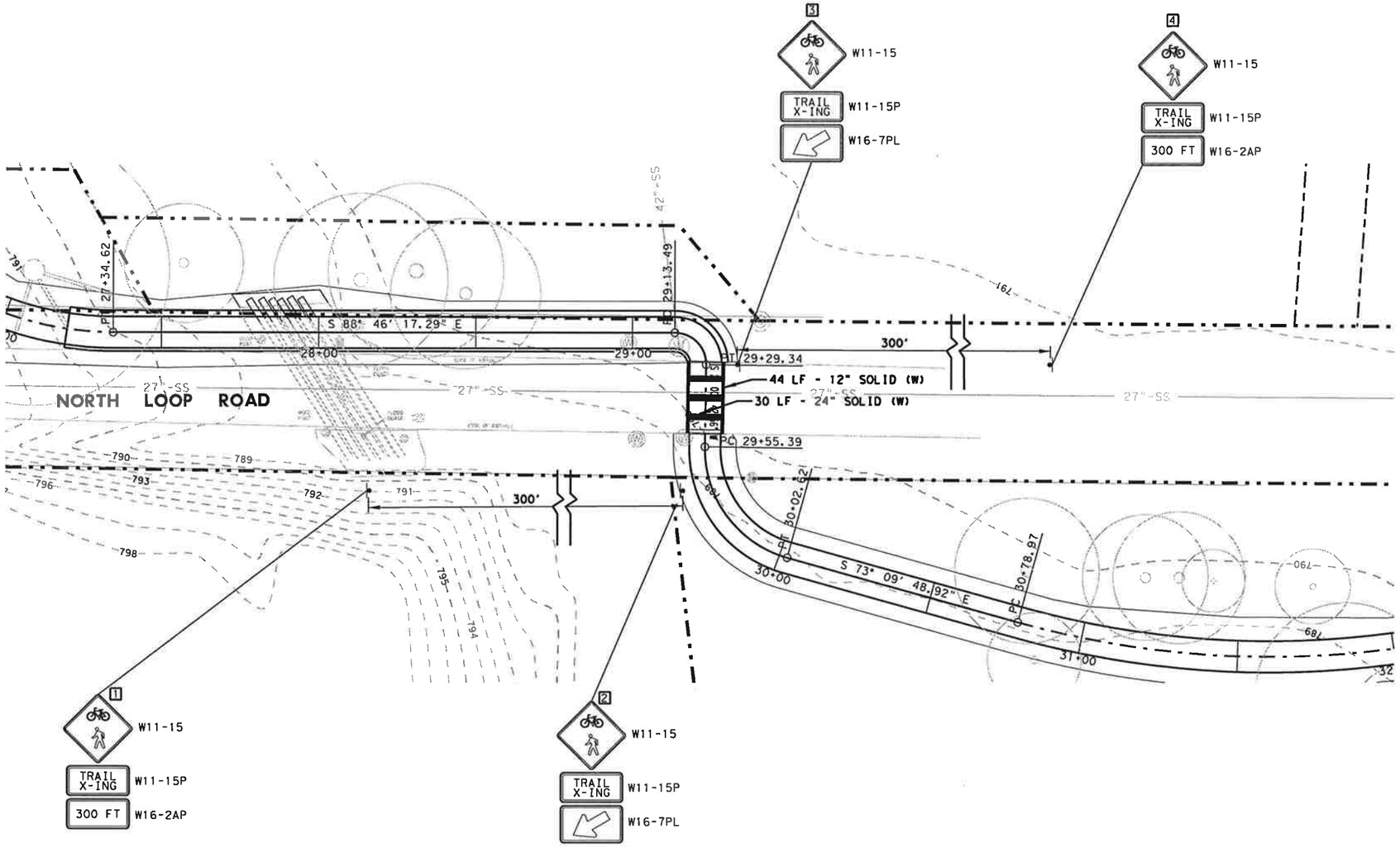
SETP-CD

FILE: setpcdse.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF	
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT			SHEET
REVISIONS					39
11-10: Add note for synthetic fibers.	COUNTY		CONTROL	SECT	JOB	HIGHWAY

PLOTDRIVER: HDR+TxDOT+BW+WinLASER.plt
PENTABLE: 0000000000164560.tbl
File Name: SCT-TRAIL-SIGN-PP04.dgn
User Name: bsanp
DATE: 4/1/2013
PLOTTING TIME: 2:31:11 PM

LEGEND

STREET SIGN POLE 4



NO.	DATE	REVISION	APPR BY

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Texas Department of Transportation

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

HDR Engineering, Inc.
1020 NE Loop 410, Suite 400
San Antonio, TX 78209
Texas P.E. Firm Registration No. F-754
TELE. NO. (210) 841-2800 FAX NO. (210) 841-2828 WWW.HDRINC.COM

0 20 40 60 80
HORIZONTAL SCALE: 1" = 40'

STATE OF TEXAS
Andrew J. Ballard
59027
REGISTERED PROFESSIONAL ENGINEER
59027

ANDREW J. BALLARD, P.E. — DATE 4-1-13

SALADO CREEK TRAIL

PROPOSED CROSSWALK STREET SIGNS

N.T.S — SHEET 1 OF 1

DSN: BSP	CK: AJB	DATE	JOB NO.	SHEET NO.
DRN: BSP	CK: AJB	4/1/2013	161872	40

GENERAL NOTES

1.) THE EXISTING SIGNS LOCATED ON THE JOBSITE ARE THE PROPERTY OF THE CITY OF SAN ANTONIO. THROUGHOUT THE PERIOD OF THE CONTRACT, THE CONTRACTOR SHALL PROTECT THESE SIGNS SUCH THAT THEY ARE NOT DAMAGED IN THE COURSE OF CONSTRUCTION ACTIVITY. SUCH PROTECTION SHALL INCLUDE THE PERIOD AFTER SIGNS ARE REMOVED FROM INSTALLATION AND STORED BY THE CONTRACTOR OR DELIVERED TO TRAFFIC OPERATIONS. THE ASSISTANT TRAFFIC SUPERINTENDENT (207-7765) MUST BE NOTIFIED 48 HOURS IN ADVANCE PRIOR TO DELIVERY.

2.) AFTER SIGNS ARE REMOVED FROM INSTALLATION AND ARE BEING STORED BY THE CONTRACTOR, THE CONTRACTOR SHALL CONTACT THE TRAFFIC OPERATIONS SECTION OF THE PUBLIC WORKS DEPARTMENT (207-7765) AND ARRANGE FOR A CONVENIENT TIME TO DELIVER CITY SIGNS AND POLES.

3.) PRIOR TO THE START OF CONSTRUCTION, ALL EXISTING SIGNS WITHIN THE AREA OF CONSTRUCTION WILL BE INVENTORIED AND DOCUMENTED JOINTLY BY THE TRAFFIC ENGINEERING (207-7720) CONSTRUCTION INSPECTION AND THE CONTRACTOR. THIS DOCUMENT WILL BE JOINTLY SIGNED BY BOTH PARTIES REFLECTING THE SIGN TYPE, SIGN SIZE, SIGN CONDITION, SIGN LOCATION, REFLECTIVITY ADEQUACY, ETC. THE CONTRACTOR IS HELD ACCOUNTABLE FOR THESE SIGNS THROUGHOUT THE PROJECT AND AT THE PROJECTS COMPLETION.

4.) ALL GROUND MOUNTED SIGNS SHALL USE HIGH INTENSITY REFLECTIVE SHEETING.

5.) ALL OVERHEAD SIGNS SHALL USE DIAMOND GRADE REFLECTIVE SHEETING.

6.) ALL BLANKS TO BE ALUMINUM ALLOY NO. 5052-H38.

7.) "T" DENOTES THICKNESS OF SIGN BLANKS.

8.) ALL HOLES SHALL BE 3/8" DIAMETER DRILLED OR PUNCHED AS SHOWN ON EACH BLANK DETAIL AND SHALL BE FREE OF BURRS AND/OR ROUGH EDGES.

9.) SIGN BLANK CORNERS TO BE ROUNDED AS SHOWN ON EACH DETAIL.

10.) ALL SIGN BLANK TO BE ETCHED, DEGREASED, AND HAVE AN ALODINE FINISH PRIOR TO APPLICATION OF LEGENDS.

11.) ALL DETAILS ARE NOT TO SCALE.

12.) ALL DIMENSIONS ARE IN INCHES.

13.) ALL SIGNS SHALL BE MANUFACTURED AND INSTALLED IN CONFORMANCE TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND STANDARD HIGHWAY SIGNS (FHWA) LATEST EDITION.

14.) REINSTALLATION OF PREVIOUSLY EXISTING SIGNS, WHERE REQUIRED BY THE CITY TRAFFIC ENGINEER, SHALL BE AT THE CONTRACTOR'S EXPENSE.

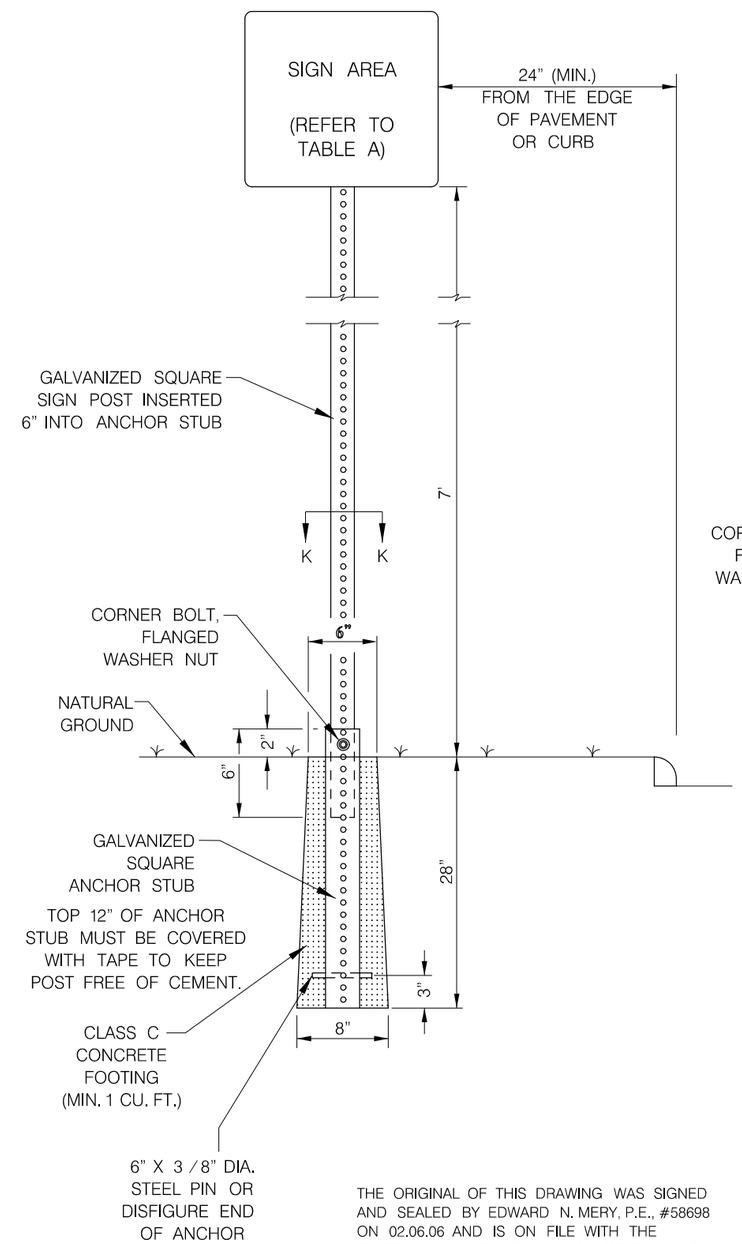
TYPICAL GROUND SIGN INSTALLATION

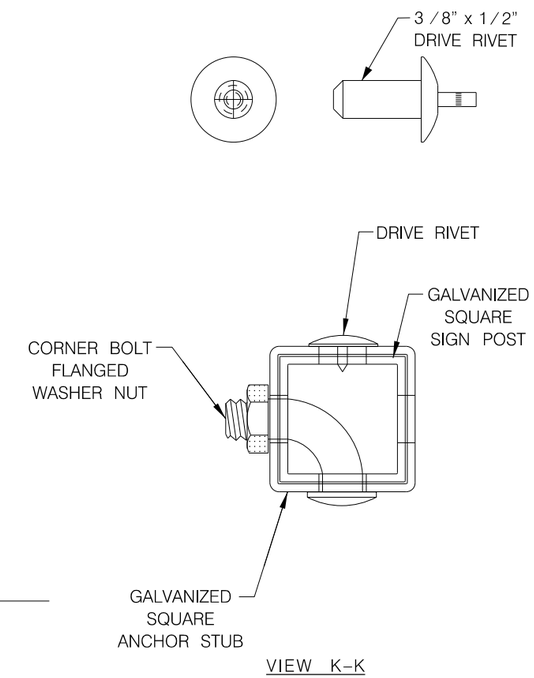
METAL TUBING	SIGN AREA	
	≤ 10 SQ. FT.	> 10 SQ. FT.
GALVANIZED SQUARE SIGN POST (PERFORATED)	1-3/4" x 1-3/4" (14 GAUGE)	2" x 2" (12 GAUGE)
GALVANIZED SQUARE ANCHOR STUB (PERFORATED)	2" X 2" (14 GAUGE)	2-1/4" x 2-1/4" (14 GAUGE)

TABLE A

TYPE "U" MOUNT

PERFORATED SQUARE METAL TUBING (DRIVEABLE)





VIEW K-K

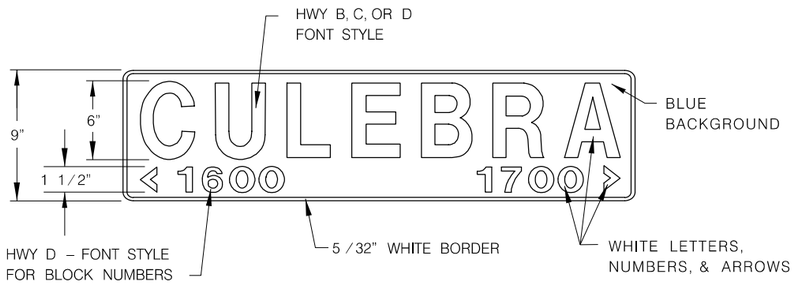
THE ORIGINAL OF THIS DRAWING WAS SIGNED AND SEALED BY EDWARD N. MERY, P.E., #58698 ON 02.06.06 AND IS ON FILE WITH THE TRAFFIC ENGINEERING DIVISION OF THE PUBLIC WORKS DEPARTMENT, CITY OF SAN ANTONIO.

FEBRUARY 2006

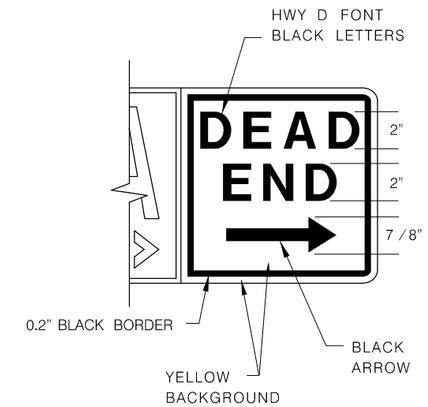
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

TRAFFIC SIGN STANDARDS
GENERAL NOTES AND GROUND SIGN MOUNTING
SHEET 1 OF 4

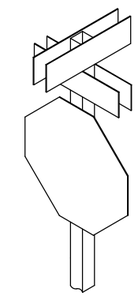
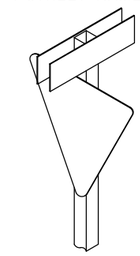
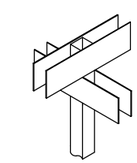
% SUBMITTAL	PROJECT NO.:		DATE:
DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F./E.N.M.	SHEET NO.: 41 OF

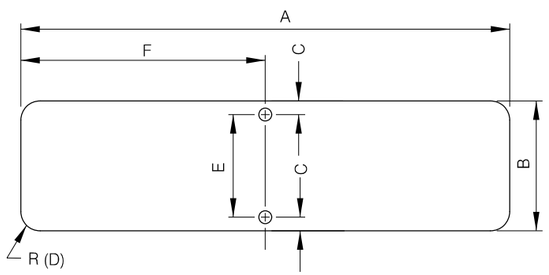


9" D3 – STREET NAME SIGN



NEW 9" D3 W / DEAD END OR NO OUTLET SIGNAGE

STREET SIGN ASSEMBLY EXAMPLES	PAY ITEMS			
	ITEM	UNIT	DESCRIPTION	QUANTITY
STOP SIGN WITH 2 STREET NAMES 	531.3	EA.	R1-1 STOP	1
	531.57-P	EA.	9-IN STREET NAME PLATE (4 PLATES)	2
YIELD SIGN WITH 1 STREET NAME 	531.4	EA.	R1-2 YIELD	1
	531.57-P	EA.	9-IN STREET NAME PLATE (2 PLATES)	1
2 STREET SIGNS 	531.57	EA.	9-IN STREET NAME SIGN (2 PLATES)	1
	531.57-P	EA.	9-IN STREET NAME PLATE (2 PLATES)	1

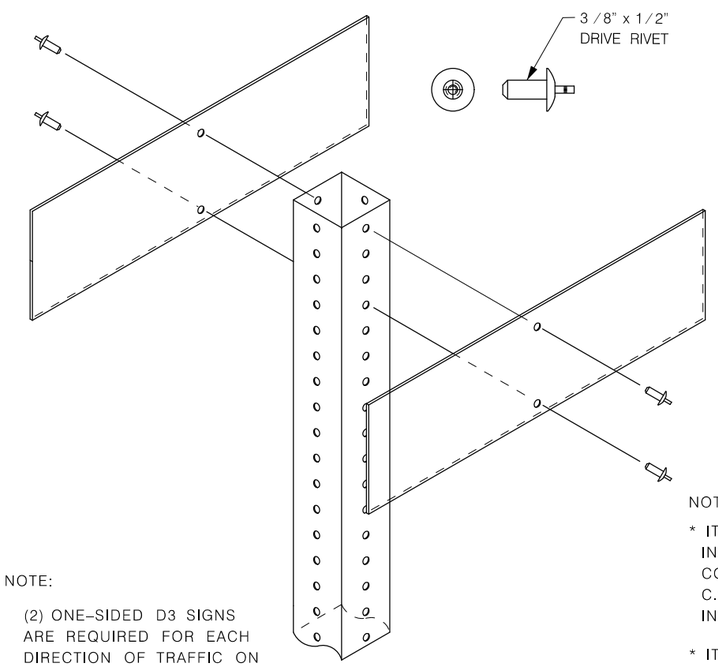


HEIGHT	9" (228 mm)
LENGTH	24" (600 MM) MIN. 54 (1350 MM) MAX. 6" (150 MM) INCREMENTS OF LENGTH
THICKNESS	0.125" (3MM)
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209) GOLD CHROMATE FINISH
SIGN FACE MATERIALS	BLUE FILM OVER HIGH INTENSITY FP-85, SECTION 718 AND L-S-300C
LEGENDS AND SYMBOLS	SERIES D (USUAL) SERIES C OR B FOR MAXIMUM LENGTH SIGN BLANK, IF NECESSARY
COLOR	WHITE LEGEND ON BLUE BACKGROUND
LETTER TRACKING	10%

TABLE – D3 SIGNS

A	B	C	D	E	F	T
24"	9"	1/2"	3/4"	8"	12"	0.125"
30"	9"	1/2"	3/4"	8"	15"	0.125"
36"	9"	1/2"	3/4"	8"	18"	0.125"
42"	9"	1/2"	3/4"	8"	21"	0.125"
48"	9"	1/2"	3/4"	8"	24"	0.125"
54"	9"	1/2"	3/4"	8"	27"	0.125"

NOTE: A 30" LONG OR GREATER PLATE SHALL BE USED WHEN A "DEAD END" OR "NO OUTLET" SUPPLEMENT IS REQUIRED.



NOTE:

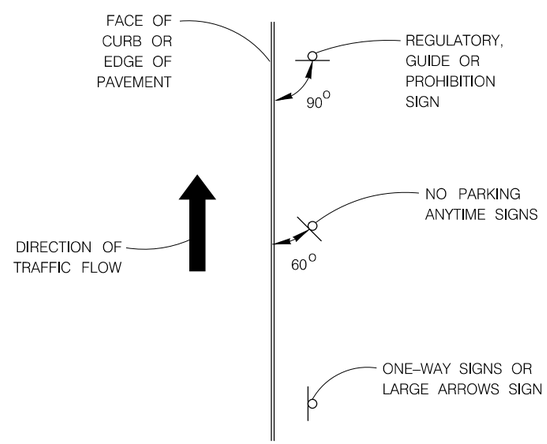
(2) ONE-SIDED D3 SIGNS ARE REQUIRED FOR EACH DIRECTION OF TRAFFIC ON EACH POLE.

D3 SIGN TO POLE INSTALLATION

NOTE:

* ITEM 531.57 "9-INCH STREET NAME" SIGN (1-EA.) INCLUDES THE INSTALLATION OF (2) ONE-SIDED D3 SIGNS. THIS SHALL BE FULL COMPENSATION FOR MATERIALS AND LABOR AS DESCRIBED IN C.O.S.A. STANDARD SPECIFICATIONS AND GROUND SIGN MOUNTING STANDARD DETAIL.

* ITEM 531.57-P "9-INCH STREET NAME PLATE" (1-EA.) INCLUDES THE INSTALLATION OF (2) ONE-SIDED D3 SIGNS ON TOP OF EXISTING SIGN (I.E., STOP SIGN OR YIELD SIGN), EXTRA LENGTH POLE AND APPURTENANCES REQUIRED TO MEET SPECIFICATIONS.



TYPICAL GROUND MOUNTED SIGN PLACEMENT

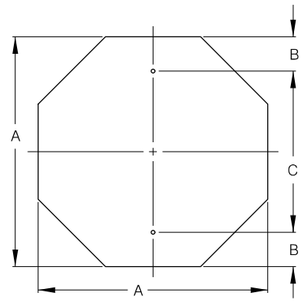
THE ORIGINAL OF THIS DRAWING WAS SIGNED AND SEALED BY EDWARD N. MERY, P.E., #58698 ON 02.06.06 AND IS ON FILE WITH THE TRAFFIC ENGINEERING DIVISION OF THE PUBLIC WORKS DEPARTMENT, CITY OF SAN ANTONIO.

JULY 2010

CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

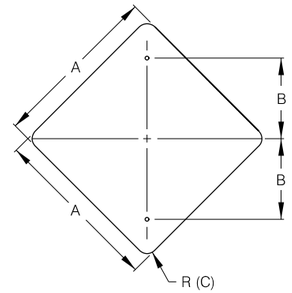
TRAFFIC SIGN STANDARDS
D3 STREET NAME SIGN AND SIGN MOUNTING
SHEET 2 OF 4

% SUBMITTAL	PROJECT NO.:		DATE:
DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F./E.N.M.	SHEET NO.: 41a OF



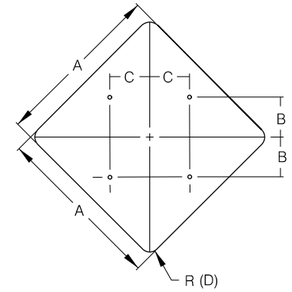
OCTAGONAL

A	B	C	T
24	3	18	0.080
30	3	24	0.080
36	3	30	0.100



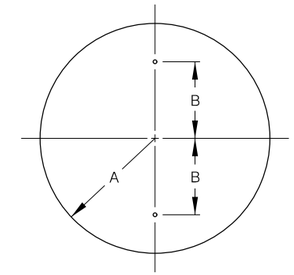
DIAMOND (A)

A	B	C	T
18	9	1 1/2	0.080
24	12	1 1/2	0.080
30	15	1 7/8	0.080
36	18	2 1/4	0.100



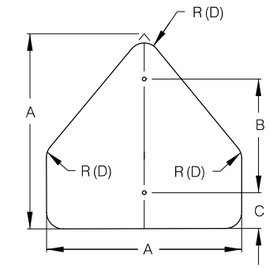
DIAMOND (B)

A	B	C	D	T
48	15	15	3	0.100



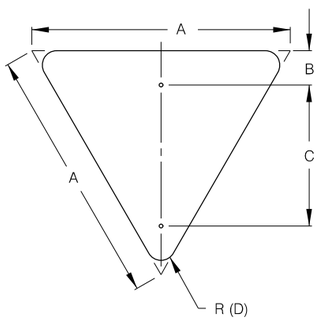
CIRCLE

A	B	T
18	15	0.100



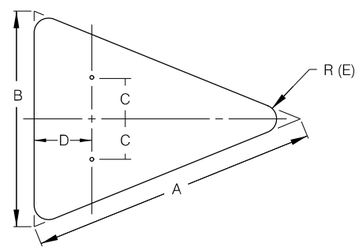
PENTAGON (SCHOOL)

A	B	C	D	T
36	24	3	2 1/4	0.100



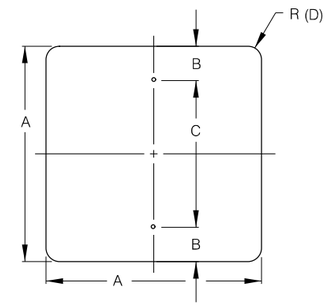
EQUILATERAL TRIANGLE

A	B	C	D	T
36	2	24	2	0.100



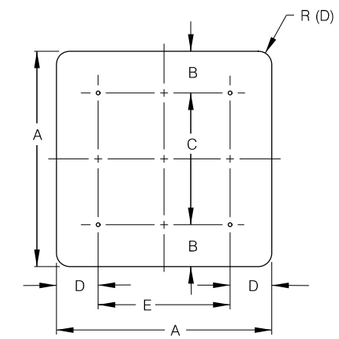
ISOSCELES TRIANGLE

A	B	C	D	E	T
40	30	7 1/2	12	1 7/8	0.100
48	36	9	15	2 1/4	0.100



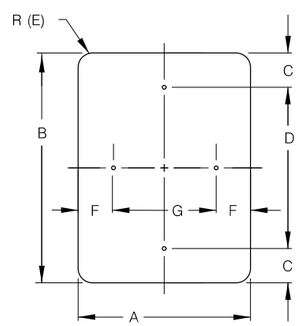
SQUARE (A)

A	B	C	D	T
18	1 1/2	15	1 1/2	0.080
24	3	18	1 1/2	0.080
30	3	24	1 7/8	0.080



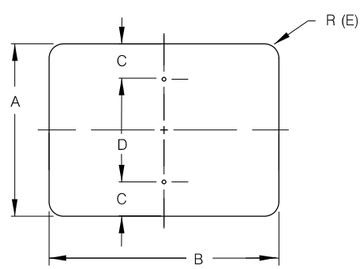
SQUARE (B)

A	B	C	D	E	F	T
48	6	36	9	30	3	0.100



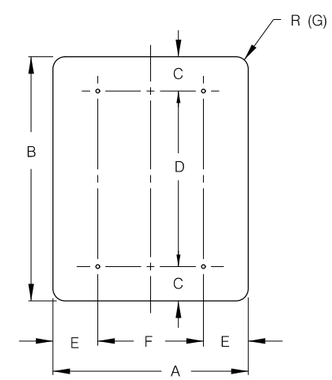
VERTICAL / HORIZONTAL RECTANGLE

A	B	C	D	E	F	G	T
12	18	1 1/2	15	1 1/2	1 1/2	9	0.080
12	36	3	30	1 1/2	1 1/2	9	0.080
18	24	1 1/2	21	1 1/2	1 1/2	15	0.080
24	30	3	24	1 1/2	3	18	0.080
24	36	3	30	1 1/2	3	18	0.080
24	48	6	36	1 7/8	3	18	0.080
30	36	3	30	1 7/8	3	24	0.080



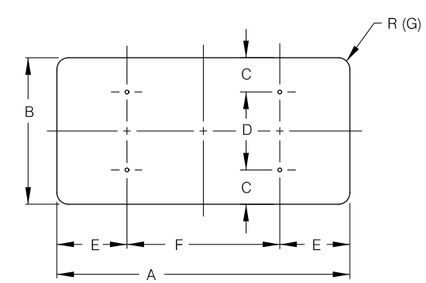
HORIZONTAL RECTANGLE

A	B	C	D	E	T
6	12	1	4	1/4	0.080
6	18	1	4	1/4	0.080
20	36	1 1/2	17	1 1/2	0.080



VERTICAL RECTANGLE

A	B	C	D	E	F	G	T
5	7 3/4	1/2	6 3/4	1/2	4	1/4	0.100
48	60	6	48	9	30	3	0.100



HORIZONTAL RECTANGLE

A	B	C	D	E	F	G	T
48	24	2	20	2	44	1 7/8	0.100
48	36	3	30	3	42	2 1/4	0.100
60	24	2	20	2	56	1 1/2	0.100
60	36	3	30	3	54	2 1/4	0.100
48	30	3	24	3	42	1 7/8	0.100
60	30	3	24	3	54	1 7/8	0.100

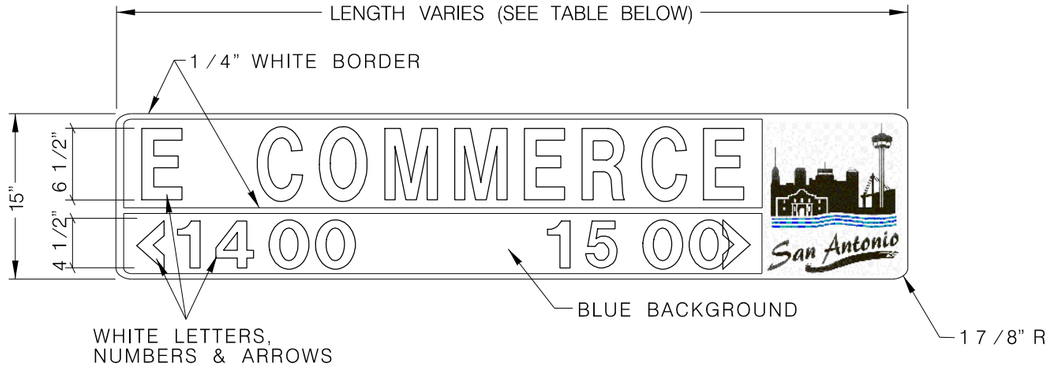
THE ORIGINAL OF THIS DRAWING WAS SIGNED AND SEALED BY EDWARD N. MERY, P.E., #58698 ON 02.06.06 AND IS ON FILE WITH THE TRAFFIC ENGINEERING DIVISION OF THE PUBLIC WORKS DEPARTMENT, CITY OF SAN ANTONIO.

FEBRUARY 2006

CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

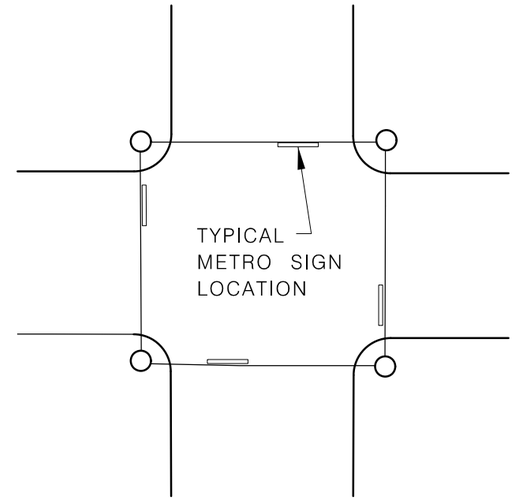
TRAFFIC SIGN STANDARDS
GROUND MOUNTED SIGN SIZES
SHEET 3 OF 4

% SUBMITTAL	PROJECT NO.:		DATE:
DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F. / E.N.M.	SHEET NO.: 42 OF

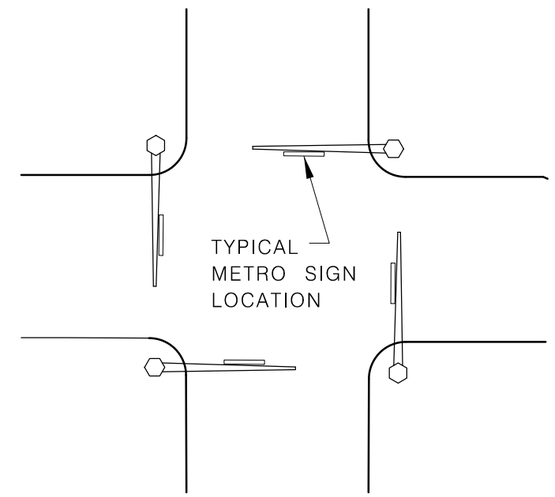


15" METRO – STREET NAME SIGNS

TYPICAL METRO SIGN PLACEMENT

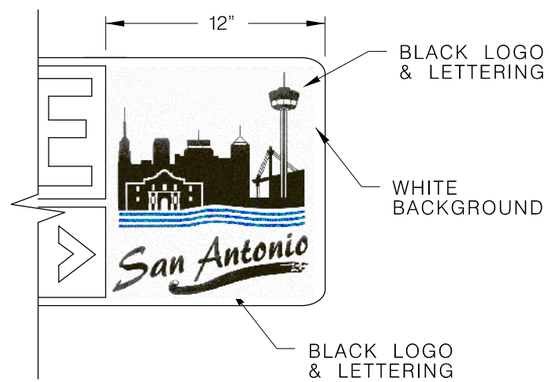


SPAN WIRE INSTALLATION



MAST ARM INSTALLATION

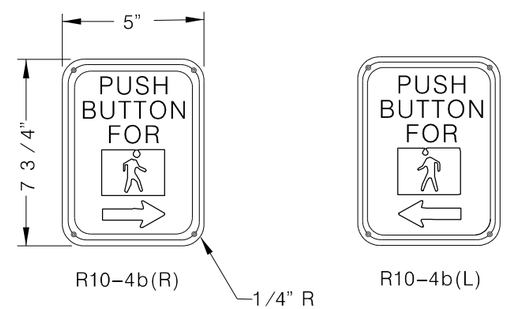
15" METRO w/CITY SKY LINE



HEIGHT	15" (381 MM)
LENGTH	48" (1200 MM) MIN. 72" (1800 MM) MAX.** 1' (300 MM) INCREMENTS OF LENGTH
THICKNESS	0.125" (3 MM)
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209) GOLD CHROMATE FINISH
SIGN FACE MATERIALS	BLUE FILM OVER DIAMOND GRADE FP-85, SECTION 718 AND L-S-300C
LEGENDS AND SYMBOLS	SERIES D (USUAL) SERIES C OR B FOR MAXIMUM LENGTH SIGN BLANK, IF NECESSARY
COLOR	WHITE LEGEND ON BLUE BACKGROUND
LETTER TRACKING	17% (USUAL) 10% (MIN.)

** SIGN PLATE LONGER THAN 72" MUST BE APPROVED BY THE CITY TRAFFIC ENGINEER

* DIAMOND GRADE SHEETING 5052-H38 ALUMINUM SUBSTRATE



PEDESTRIAN PUSHBUTTON SIGNS

R10-10 *(30" X 36")

R3-5L *(30" X 36")

R10-9 *(30" X 24")

R10-12 *(30" X 36")

LEFT TURN SIGNS

THE ORIGINAL OF THIS DRAWING WAS SIGNED AND SEALED BY EDWARD N. MERY, P.E., #58698 ON 02.06.06 AND IS ON FILE WITH THE TRAFFIC ENGINEERING DIVISION OF THE PUBLIC WORKS DEPARTMENT, CITY OF SAN ANTONIO.

FEBRUARY 2006

CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

TRAFFIC SIGN STANDARDS

METRO STREET NAME SIGN AND SIGN PLACEMENT

SHEET 4 OF 4

____% SUBMITTAL	PROJECT NO.:_____	DATE:_____
DRWN. BY: A.F.G.	DSGN. BY: E.N.M.	CHKD. BY: J.D.F./E.N.M.	SHEET NO.: 42a OF__

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must prevent erosion and sedimentation in accordance with Item 1122.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (SW3P) and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: ☒Yes ☐No

Note: If amount of soil disturbance changes, permit requirements may change.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

The Contractor shall adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required

☐ Nationwide Permit 14 - PCN Required

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1.

2.

3.

4.

401 Best Management Practices: (Not applicable if no USACE permit)

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Sedimentation Chambers

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☐ No Action Required ☒ Required Action

Action No.

1. Minimize removal of riparian vegetation and use stone riprap to dissipate and control the velocity of stormwater entering the drainage.

2. Review TPWD Texas Wildscapes website, TPWD Texas Plant Information Database, and the Lady Bird Johnson Wildflower Center's Recommended Native Plants database and Native Plant Alternatives to Invasives as a part of landscape selection.

3.

4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

3. Should any listed species be encountered, they shall be handled by personnel permitted to handle state or federally listed species.

4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropiate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the follwing are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Does the project involve the demolition of a span bridge?

☐ Yes ☒ No (No further action required)

If "Yes", a pre-demolition notification must be submitted to the Texas Department of State Health Services, 20 calendar days prior to the demolition of the bridges(s) on the project. Contact TxDOT's hazardous material Coordinator at 210-615-6486 for ossisstance with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☒ Required Action

Action No.

1. Do not leave excavations open overnight if possible or provide escape ramps to prevent wildlife from becoming trapped. Inspect excavations in the morning for trapped wildlife.

2.

3.

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic August 2012.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: JAB
©TxDOT August 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	12	510	
	DIST		COUNTY	SHEET NO.
				154

SITE DESCRIPTION

PROJECT NAME AND LOCATION: SALADO CREEK TRAIL – SALADO CREEK FROM WEST AVE TO US 281.

CONTACT AND PHONE NO.: DAVID MCBETH, P.E.
CITY OF SAN ANTONIO PROJECT MANAGER
(210) 207– 6342

PROJECT DESCRIPTION: CONSTRUCTION OF A 10' WIDE CONCRETE TRAIL CONNECTING WALKER RANCH ROW TO THE PROPOSED WURZBACH PARKWAY TRAIL

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL INCLUDE THE EXCAVATION AND GRADING FOR STRUCTURES, AND DRAINAGE PIPES.

TOTAL PROJECT AREA (ACRES): 4.48 ACRES

TOTAL AREA TO BE DISTURBED: 1.78 ACRES

WEIGHTED RUNOFF COEFFICIENT: (AFTER CONSTRUCTION) 0.67

EXISTING CONDITION OF SOIL, VEGETATIVE COVER AND % OF VEGETATIVE COVER: IN AREAS NOT CURRENTLY PAVED, SOILS ARE MOSTLY FLAT 1% TO 5%, EXCEPT AT LOCATION OF EXISTING CULVERT, AND HAVE LIGHT TO MEDIUM VEGETATIVE COVER. SEE GEOTECH FOR SOIL CLASSIFICATIONS.

DESCRIPTION OF WATER DISCHARGED NOT ASSOCIATED WITH CONSTRUCTION: N/A

NAME OF RECEIVING WATERS: SALADO CREEK, AND PANTHER CREEK

IDENTIFY STORMWATER DISCHARGE POINTS:

STORM WATER WILL BE DISCHARGE INTO SALADO AND PANTHER CREEK.

A DESCRIPTION AND TIME FRAME FOR INSTALLATION OF STABILIZATION PRACTICES IN CONJUNCTION WITH CONSTRUCTION: ALL TEMPORARY BEST MANAGMENT PRACTICES SHALL BE PLACED PRIOR TO SOIL DISTURBING ACTIVITIES.

EROSION AND SEDIMENTATION CONTROLS

SOIL STABILIZATION PRACTICES:

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

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:

- X SILT FENCES
- ___ HAY BALES
- ___ GRAVEL FILTRATION BAGS
- X ROCK BERMS
- ___ DIVERSION, INTERCEPTOR OR PERIMETER DIKES
- ___ DIVERSION, INTERCEPTOR OR PERIMETER SWALES
- ___ DIVERSION, DIKE AND SWALE COMBINATIONS
- ___ PAVED FLUMES
- X 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 SW3P MEASURES, DETOUR SIGNS, AND ADVANCED WARNING SIGNS AS SHOWN ON PLAN. INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH TxDOT BC SHEETS. CONSTRUCT PROPOSED DRAINAGE STRUCTURES, SIDEWALK AND MISCELLANEOUS ELEMENTS.

A DESCRIPTION OF MAINTENANCE PROCEDURES FOR CONTROL MEASURES USED:

WATER VEGETATED AREA AS NEEDED TO MAINTAIN STABILIZED CONDITIONS AND MAINTAIN SW3P MEASURES PER THE TPDES GENERAL PERMIT.

STORMWATER MANAGEMENT:

STORM WATER MANAGEMENT DURING CONSTRUCTION WILL BE HANDLED WITHIN THE CREEK BEDS THEMSELVES

A DESCRIPTION OF PERMANENT STORM WATER MANAGEMENT CONTROLS:

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: SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE EXCAVATION SOURCE LOCATION

OFFSITE FILL SOURCE LOCATION

OFFSITE VEHICLE TRACKING

- ___ HAUL ROADS DAMPENED FOR DUST CONTROL.
- X LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- X EXCESS DIRT ON ROAD TO BE REMOVED DAILY
- X 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? CONTRACTOR SHALL MAINTAIN AND REPLACE RECCOMMENDED BEST MANAGEMENT PRACTICES AS NEEDED AT THE CONTRACTOR'S EXPENSE PER COSA SPECIFICATION ITEM 540.6

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, STREAMBED 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, FALSEWORK, PILING DEBRIS OR OTHER OBSTRUCTION PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK

NON–COMPLIANCE WITH THE MAINTNANCE AND UP–KEEP OF ALL SW3P MEASURES WILL RESULT IN POTENTIAL FEDERAL STATE, AND LOCAL FINES AND/OR OTHER ENFORCEMENT MEASURES, INCLUDING WORK STOPPAGE.

STATE OF TEXAS
Jess W Swim
99204
REGISTERED PROFESSIONAL ENGINEER

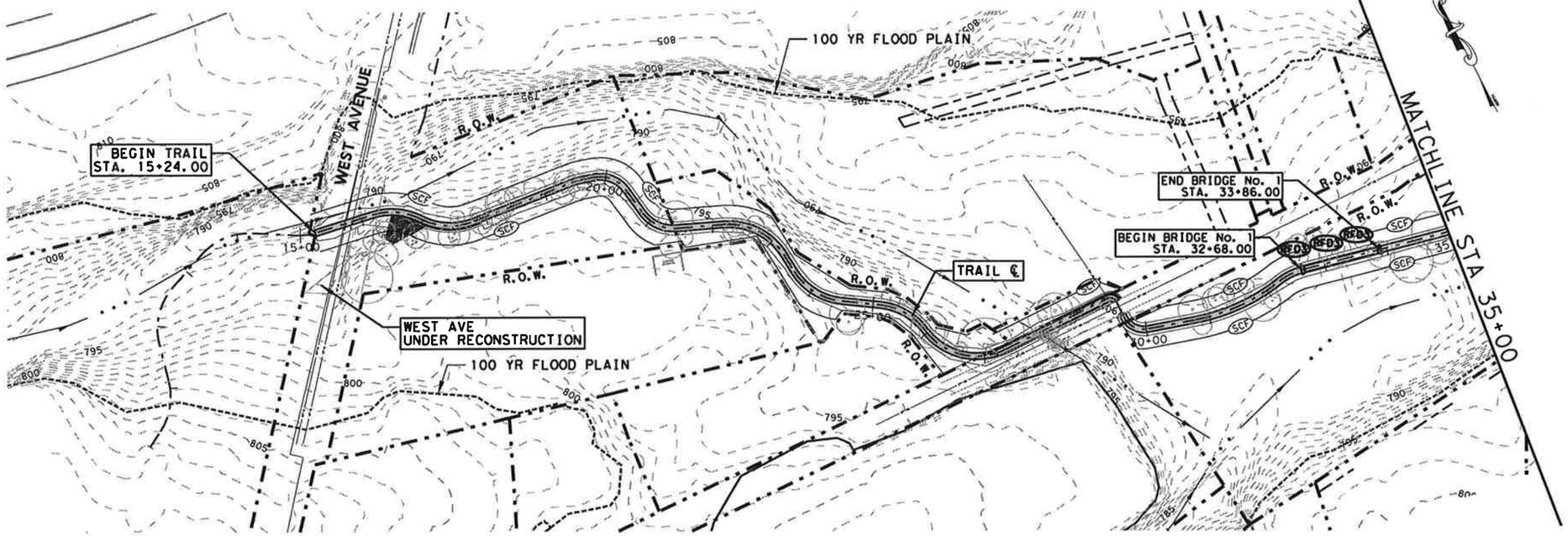
Jess W. Swim P.E. 11-5-12
JESS W. SWIM, P.E. DATE

JANUARY 2005

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

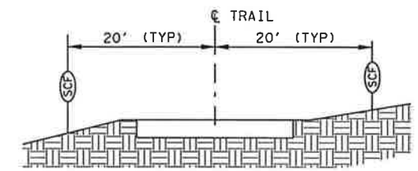
STORM WATER POLLUTION PREVENTION PLAN (SWP3) NARRATIVE

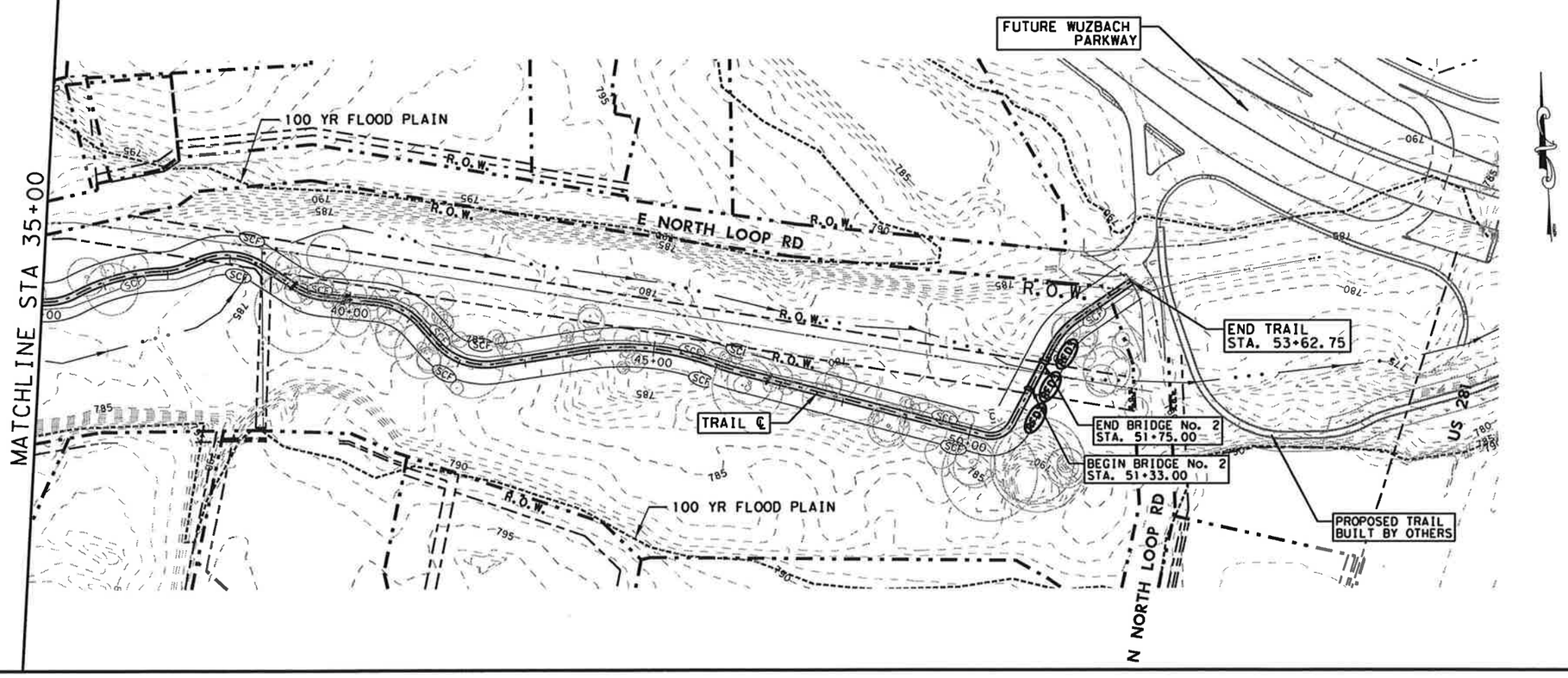
	PROJECT NO.:	DATE: 11/2/2012
DRWN. BY: BP	DSGN. BY: BP / CHKD. BY: JMG	PAGE NO.: 44



LEGEND

- RIGHT OF WAY
- EASEMENTS
- DITCH FLOW LINE
- 100 YEAR FLOOD PLAIN
- SCF — SEDIMENT CONTROL FENCE
- HFD — ROCK FILTER DAM





NO.	DATE	REVISION	APPR BY

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Texas Department of Transportation

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

HDR Engineering, Inc.
1020 NE Loop 410, Suite 400
San Antonio, TX 78209
Texas P.E. Firm Registration No. F-754
TELE. NO. (210) 841-2800 FAX NO. (210) 841-2828 WWW.HDRINC.COM

0 100 200 300 400
HORIZONTAL SCALE: 1" = 200'

STATE OF TEXAS
Jess W Swaim
99204
REGISTERED PROFESSIONAL ENGINEER

Jess W. Swaim P.E. 11-5-12
JESS W. SWAIM, P.E. DATE

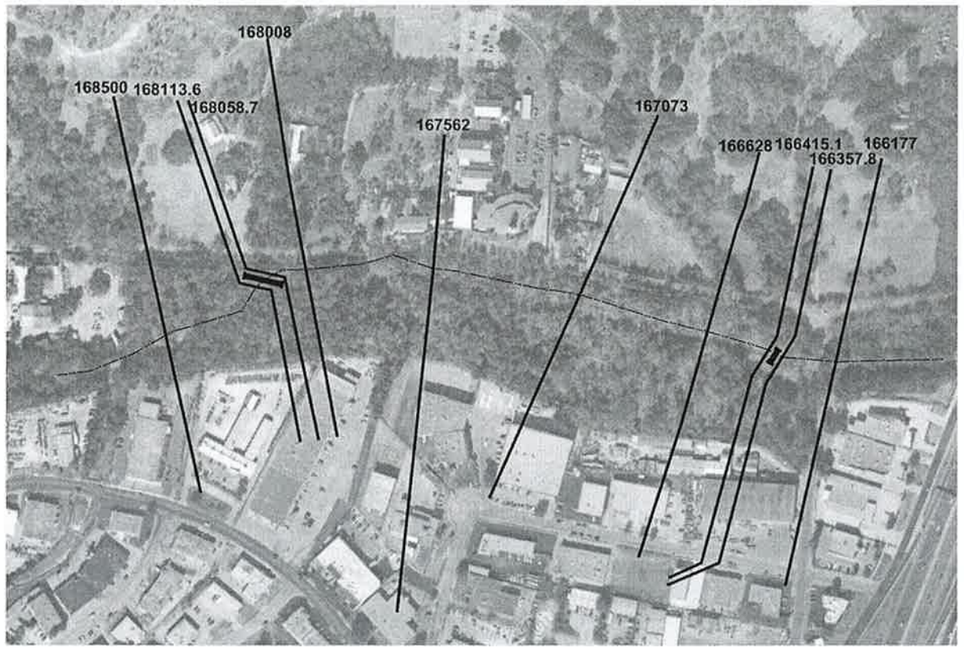
SALADO CREEK TRAIL STORM WATER POLLUTION PREVENTION PLAN & FLOODPLAIN LIMITS

SCALE: 1"=200' SHEET 1 OF 1

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN: TWT	CK:	11/5/2012	161872	45

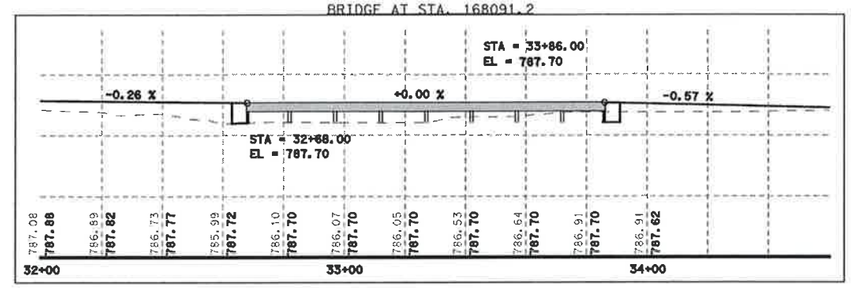
PLOTDRIVER: HDR+TxDOT+BW+W(nwLASER.pltPENTABLE: C:\DGN\DGN01\45(80.tbl
File Name: SCT-SW3P-01.dgn
User Name: bcoester
DATE: 11/5/2012
PLOTTING TIME: 8:50:35 AM

HEC-RAS CROSS SECTION LOCATIONS

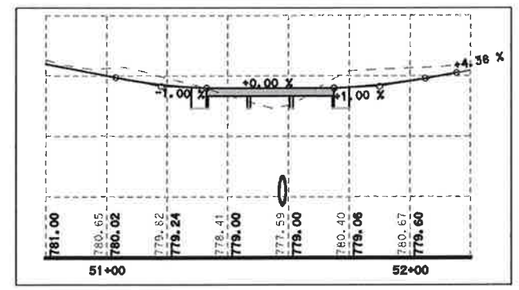


STREAM CROSS SECTIONS & ROAD PROFILE

BRIDGE AT STA. 168091.2



BRIDGE AT STA. 166398.7



HYDROLOGIC COMPUTATIONS

*FLOW RATE OBTAINED FROM THE EFFECTIVE DFIRM SALADO CREEK HYDRAULIC MODEL

10 YEAR	8248 CFS
50 YEAR	15758 CFS
100 YEAR	19185 CFS
500 YEAR	30678 CFS

NOTES:

1. HEC-RAS 4.1 WAS USED FOR HYDRAULIC ANALYSIS AND DESIGN

SALADO CREEK

Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
				(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
1	168500	10PCT	PROP	793.37	793.15		0.74	0.01	723.72	722.62	7525.38		3.94
1	168500	10PCT	SE2	793.61	793.41		0.78	0.00	731.91	829.07	7418.93		3.71
1	168500	2PCT	PROP	795.92	795.65		0.61	0.00	855.39	3111.02	12946.98		4.55
1	168500	2PCT	SE2	796.06	795.84		0.65	0.00	857.59	3229.34	12529.66		4.40
1	168500	1PCT	PROP	796.86	796.59		0.57	0.00	864.50	4457.89	14727.11		4.74
1	168500	1PCT	SE2	797.00	796.73		0.61	0.00	865.70	4558.49	14625.51		4.63
1	168500	02PCT	PROP	799.83	799.30		0.48	0.00	1091.92	6293.38	21384.83		5.23
1	168500	02PCT	SE2	799.99	799.37		0.52	0.00	1093.82	6335.82	21342.18		5.19
1	168113.6	10PCT	PROP	792.64	792.43	789.13			577.52	171.34	8076.66		3.64
1	168113.6	10PCT	SE2	792.82	792.62	789.49	0.17	0.00	589.58	266.84	7982.16		3.66
1	168113.6	2PCT	PROP	795.31	795.04	790.58			751.20	1534.13	14223.87		4.27
1	168113.6	2PCT	SE2	795.43	795.18	790.89	0.13	0.00	754.15	1865.35	13892.65		4.25
1	168113.6	1PCT	PROP	796.30	796.02	791.16			783.88	2640.16	16544.84		4.41
1	168113.6	1PCT	SE2	796.40	796.13	791.46	0.12	0.00	784.93	3076.23	16108.77		4.38
1	168113.6	02PCT	PROP	799.15	798.83	792.89	0.03	0.00	1046.57	6913.14	23759.98	4.88	4.77
1	168113.6	02PCT	SE2	799.17	798.86	793.15	0.09	0.00	1047.67	7601.92	23070.60	5.48	4.73
1	168091.2BR U	10PCT	PROP	792.83	792.43	789.77			577.52	595.67	7361.32		3.51
1	168091.2BR U	2PCT	PROP	795.30	795.04	791.17			751.20	3174.62	11723.89		3.62
1	168091.2BR U	1PCT	PROP	796.29	796.02	791.86			783.88	4591.66	13051.72		3.73
1	168091.2BR U	02PCT	PROP	799.11	798.79	793.32	0.02	0.00	1044.72	7775.04	22997.66	5.30	4.81
1	168091.2BR D	10PCT	PROP	792.58	792.38	789.68			577.65	595.67	7361.32		3.36
1	168091.2BR D	2PCT	PROP	795.25	794.98	791.00			757.42	3174.62	11723.89		3.49
1	168091.2BR D	1PCT	PROP	796.23	795.95	791.55			788.37	4591.66	13051.72		3.59
1	168091.2BR D	02PCT	PROP	799.09	798.77	793.17	0.05	0.00	927.91	6798.97	23872.26	6.77	4.86
1	168058.7	10PCT	PROP	792.58	792.38	789.09	0.31	0.01	577.65	98.05	8151.95		3.56
1	168058.7	10PCT	SE2	792.85	792.45	789.42	0.39	0.01	579.88	133.81	8114.19		3.69
1	168058.7	2PCT	PROP	795.25	794.98	790.45	0.29	0.02	757.42	1142.21	14615.79		4.26
1	168058.7	2PCT	SE2	795.30	795.03	790.75	0.34	0.02	770.38	1309.74	14448.26		4.34
1	168058.7	1PCT	PROP	796.23	795.95	790.98	0.29	0.02	788.37	2116.07	17068.93		4.42
1	168058.7	1PCT	SE2	796.28	795.99	791.29	0.33	0.02	792.50	2435.90	16740.10		4.45
1	168058.7	02PCT	PROP	799.04	798.72	792.72	0.26	0.03	923.39	6028.41	24645.71	5.88	4.83
1	168058.7	02PCT	SE2	799.09	798.76	793.01	0.29	0.03	927.72	6614.44	24056.99	6.58	4.81
1	168008	10PCT	PROP	792.25	791.91	789.32	1.51	0.01	429.82	156.16	8068.83		4.69
1	168008	10PCT	SE2	792.25	791.91	789.32	1.51	0.01	429.87	159.33	8098.67		4.69
1	168008	2PCT	PROP	794.93	794.47	790.84	1.54	0.01	563.95	1137.45	14620.55		5.06
1	168008	2PCT	SE2	794.94	794.47	790.84	1.53	0.01	564.08	1140.02	14617.98		5.06
1	168008	1PCT	PROP	795.92	795.41	791.43	1.54	0.01	592.00	1838.61	17348.39		5.07
1	168008	1PCT	SE2	795.93	795.42	791.43	1.53	0.01	592.19	1841.74	17343.26		5.06
1	168008	02PCT	PROP	798.75	798.11	793.28	1.54	0.03	680.56	4449.92	26228.08		6.85
1	168008	02PCT	SE2	798.76	798.12	793.28	1.53	0.03	680.98	4465.03	26222.97		6.84

Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
				(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
1	166628	10PCT	PROP	787.62	787.25	784.29	1.22	0.01	593.25		8248.00		4.89
1	166628	10PCT	SE2	787.65	787.30	784.29	1.12	0.01	594.71		8248.00		4.82
1	166628	2PCT	PROP	790.15	789.63	786.76	0.87	0.05	717.49		15757.43	0.57	5.80
1	166628	2PCT	SE2	790.22	789.71	786.76	0.82	0.05	726.80		15757.21	0.79	5.72
1	166628	1PCT	PROP	790.98	790.37	787.26	0.90	0.06	793.30		19181.38	3.62	6.31
1	166628	1PCT	SE2	791.05	790.45	787.26	0.85	0.06	811.03		19180.99	4.01	6.23
1	166628	02PCT	PROP	793.81	792.64	788.76	0.78	0.06	946.25	904.23	29749.79	23.98	7.19
1	166628	02PCT	SE2	793.70	792.95	788.76	0.74	0.06	957.10	982.07	29571.27	24.67	7.08
1	166415.1	10PCT	PROP	786.39	786.04	783.38			465.50	41.98	8206.02		4.75
1	166415.1	10PCT	SE2	786.53	786.21	783.37	0.22	0.00	497.42	53.06	8194.94		4.68
1	166415.1	2PCT	PROP	789.24	788.87	785.23			667.01	1094.09	14663.91		5.05
1	166415.1	2PCT	SE2	789.38	789.00	785.23	0.17	0.01	671.18	1151.14	14508.86		4.93
1	166415.1	1PCT	PROP	790.03	789.51	785.94			747.18	1688.42	17496.58		5.41
1	166415.1	1PCT	SE2	790.14	789.74	785.94	0.18	0.02	761.24	1747.98	17437.32		5.30
1	166415.1	02PCT	PROP	792.75	792.25	787.67			975.60	4085.42	26592.58		6.03
1	166415.1	02PCT	SE2	792.88	792.39	787.63	0.17	0.03	1018.50	4135.10	26542.90		5.93
1	166398.7BR U	10PCT	PROP	786.39	786.04	783.51			485.50	228.71	8034.63		4.38
1	166398.7BR U	2PCT	PROP	789.24	788.87	785.36			667.01	3119.87	12669.98		4.18
1	166398.7BR U	1PCT	PROP	790.03	789.51	786.00			747.18	4570.94	16186.01		4.78
1	166398.7BR U	02PCT	PROP	792.75	792.25	787.73			975.69	8457.04	21610.96		4.70
1	166398.7BR D	10PCT	PROP	786.32	786.00	783.19			385.08	228.71	8034.63		4.23
1	166398.7BR D	2PCT	PROP	789.17	788.71	784.79			515.86	3119.87	12669.98		4.39
1	166398.7BR D	1PCT	PROP	789.94	789.37	785.44			561.49	4570.94	16186.01		5.11
1	166398.7BR D	02PCT	PROP	792.67	791.86	787.34			1019.77	8457.04	21610.96		5.19
1	166357.8	10PCT	PROP	786.32	786.00	783.04	1.09	0.05	385.08	23.88	8224.12		4.85
1	166357.8	10PCT	SE2	786.32	786.00	783.04	1.09	0.05	385.08	23.88	8224.12		4.85
1	166357.8	2PCT	PROP	789.17	788.71	784.64	0.75	0.03	515.86	484.25	15273.75		5.57
1	166357.8	2PCT	SE2	789.17	788.71	784.63	0.75	0.03	515.86	484.25	15273.75		5.57
1	166357.8	1PCT	PROP	789.94	789.37	785.29	0.86	0.04	561.49	746.60	18435.40		5.19
1	166357.8	1PCT	SE2	789.94	789.37	785.29	0.86	0.04	561.49	746.60	18435.40		5.19
1	166357.8	02PCT	PROP	792.67	791.86	787.20	0.85	0.04	1019.77	1780.42	26874.49	23.09	7.44
1	166357.8	02PCT	SE2	792.67	791.86	787.19	0.85	0.04	1019.77	1780.46	26874.45	23.09	7.44
1	166177	10PCT	PROP	785.17	784.36	783.07			285.95		8248.00		7.24
1	166177	10PCT	SE2	785.17	784.36	783.07			285.95		8248.00		7.24
1	166177	2PCT	PROP	788.39	787.66	785.04			530.69	590.55	14979.32	188.13	7.01
1	166177	2PCT	SE2	788.39	787.66	785.04			530.69	590.55	14979.32	188.13	7.01
1	166177	1PCT	PROP	789.04	788.11	785.72			579.56	840.46	18032.55	311.99	7.93
1	166177	1PCT	SE2	789.04	788.11	785.72			579.56	840.46	18032.55	311.99	7.93
1	166177	02PCT	PROP	791.79	790.60	787.64			882.57	1945.95	27596.78	1135.28	9.10
1	166177	02PCT	SE2	791.79	790.60	787.64			882.57	1945.95	27596.78	1135.28	9.10

NO.	DATE	REVISION	APPR BY

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Texas Department of Transportation

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HORIZONTAL SCALE: 1" = 500'

STATE OF TEXAS
JOSE M. GONZALEZ
97348
LICENSED
PROFESSIONAL ENGINEER

JOSE M. GONZALEZ, P.E. 7/03/13
DATE

SALADO CREEK TRAIL

HIKE & BIKE HYDRAULIC DATA SHEET

SHEET 1 OF 1

DSN:	CK:	DATE	JOB NO.	SHEET NO.
DRN:	CK:	7/3/2013	161872	45a

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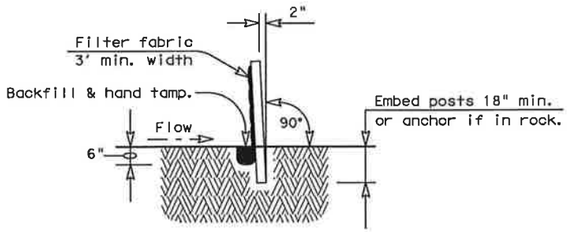


SECTION A-A

GENERAL NOTES

1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

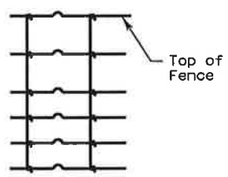
Sediment Control Fence —— SCF ——

SEDIMENT CONTROL FENCE USAGE GUIDELINES

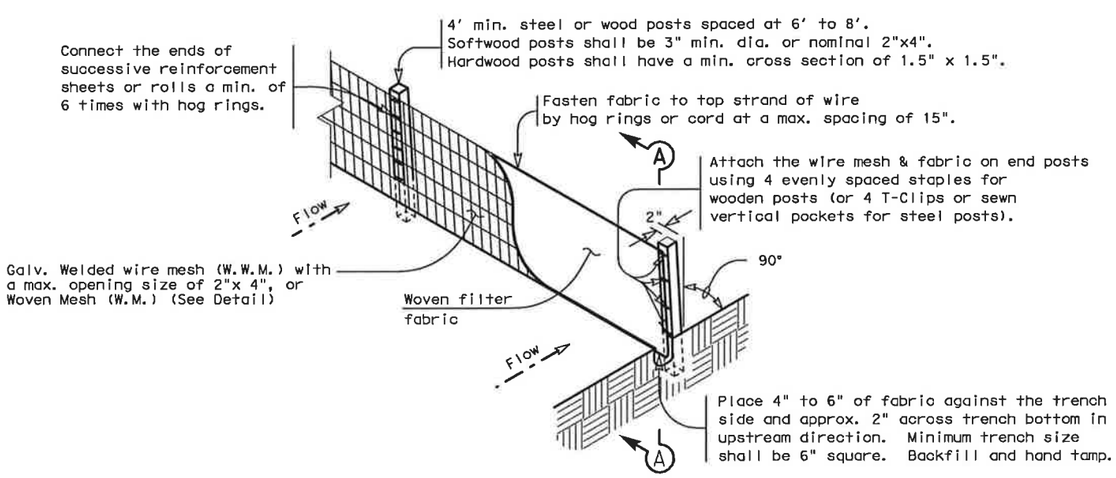
A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

Galv. Hinge Joint knot woven mesh (12.5 Ga. Min.) requires a minimum of five horizontal wires spaced at a max. 12 inches apart and all vertical wires spaced at a max. 12 inches apart.

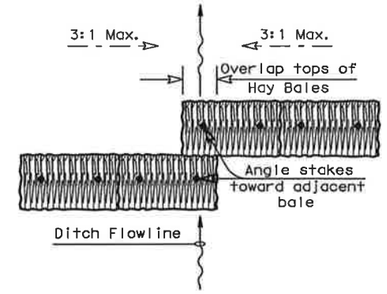


Hinge Joint Knot Woven Mesh (Option)

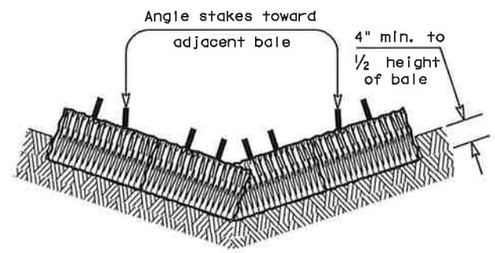


TEMPORARY SEDIMENT CONTROL FENCE

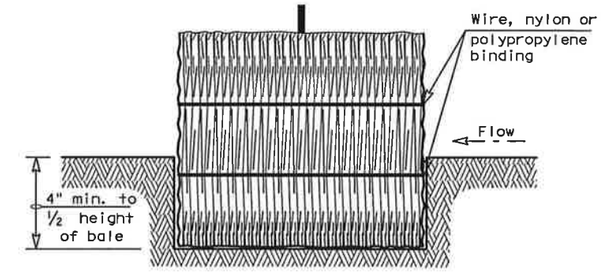
—— SCF ——



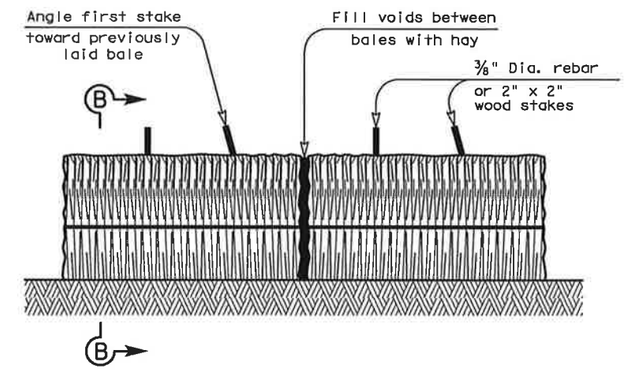
PLAN VIEW



PROFILE VIEW



SECTION B-B



BALED HAY FOR EROSION CONTROL

—— BH ——

PLANS SHEET LEGEND

Baled Hay —— BH ——

BALED HAY USAGE GUIDELINES

A Baled Hay installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT^2 of cross sectional area. Baled hay may be used at the following locations:

1. Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
2. Where the installation will be required for less than 3 months.
3. Where the contributing drainage area is less than ½ acre.

For Baled Hay installations in small ditches, the additional following considerations apply:

1. The ditch sideslopes should be graded as flat as possible to maximize the drainage flowrate thru the hay.
2. The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay.

Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.

GENERAL NOTES

1. Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.
2. Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetative matter.
3. Hay bales shall be embedded in the soil a minimum of 4" and where possible ½ the height of the bale.
4. Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
5. Hay bales shall be securely anchored in place with ⅜" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & BALED HAY

EC(1)-09

FILE: ec109.dgn	DN: TxDOT	CK: AM	DW: TV	CK: BD
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REVISIONS				
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		46

DATE:
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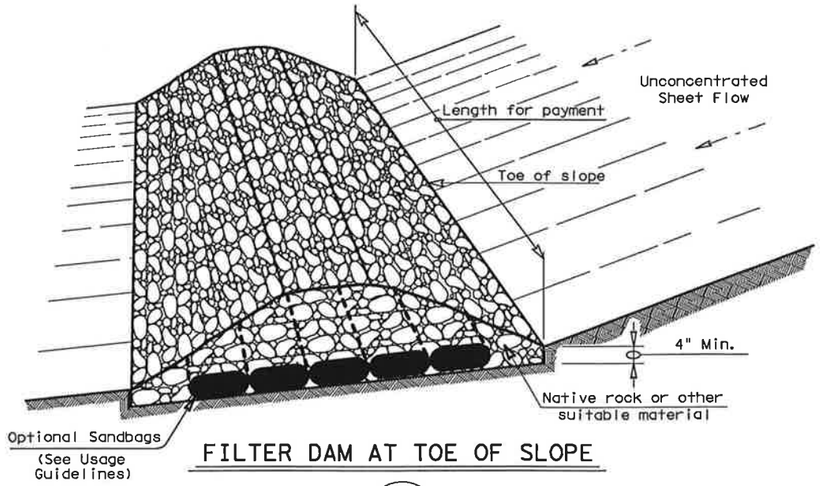
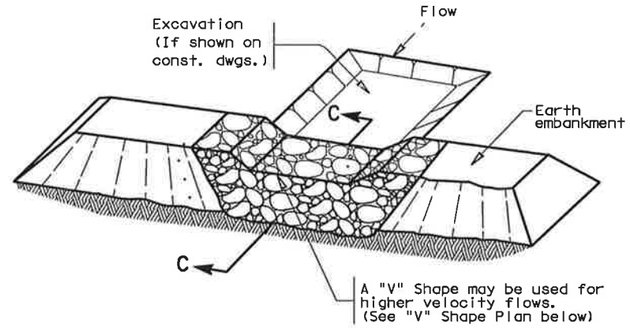


FILTER DAM AT TOE OF SLOPE

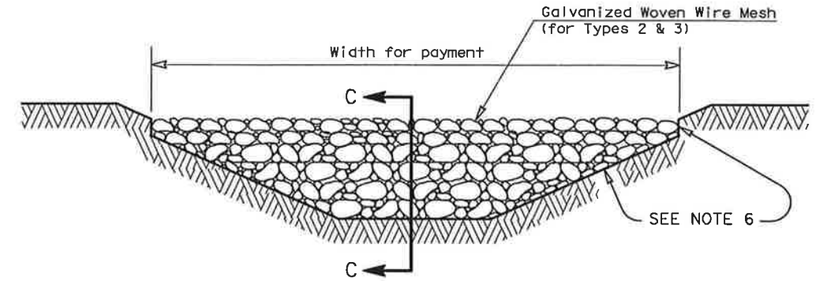
RFD1 — TYPE 1



FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2

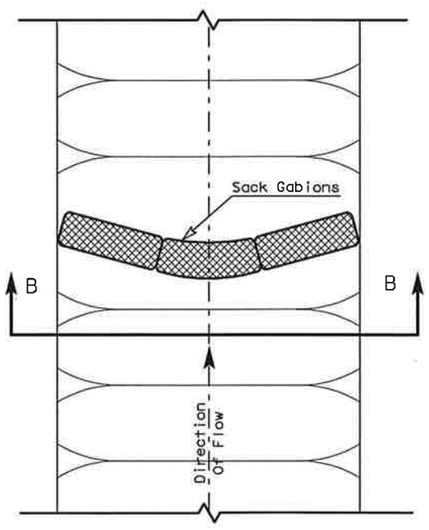
TYPE 1 OR TYPE 2



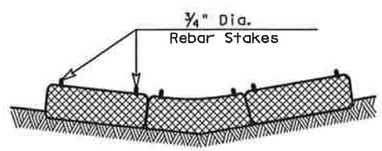
FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

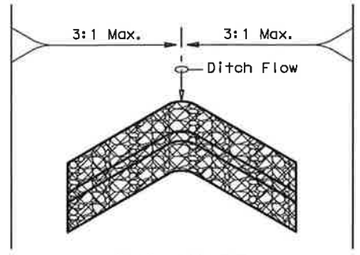
TYPE 1 OR TYPE 2



PLAN VIEW

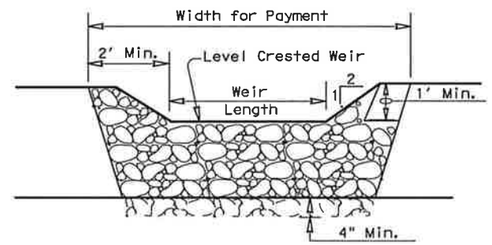


SECTION B-B

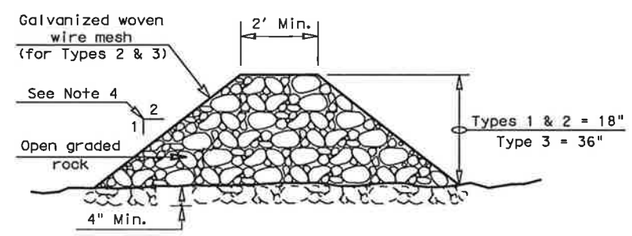


"V" SHAPE

(Plan View)



PROFILE



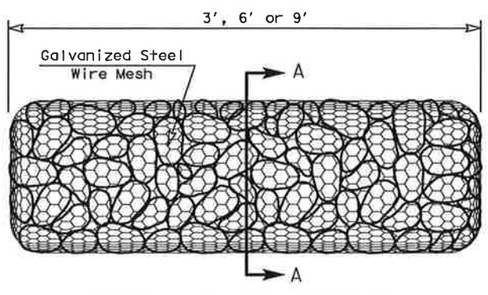
SECTION C-C

PLANS SHEET LEGEND

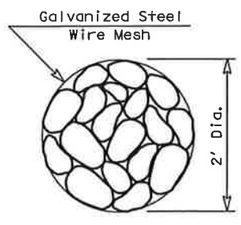
Type 1 Rock Filter Dam — RFD1

Type 2 Rock Filter Dam — RFD2

Type 3 Rock Filter Dam — RFD3



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 overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 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.

GENERAL NOTES

1. 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.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. 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 & 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.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes.
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-93

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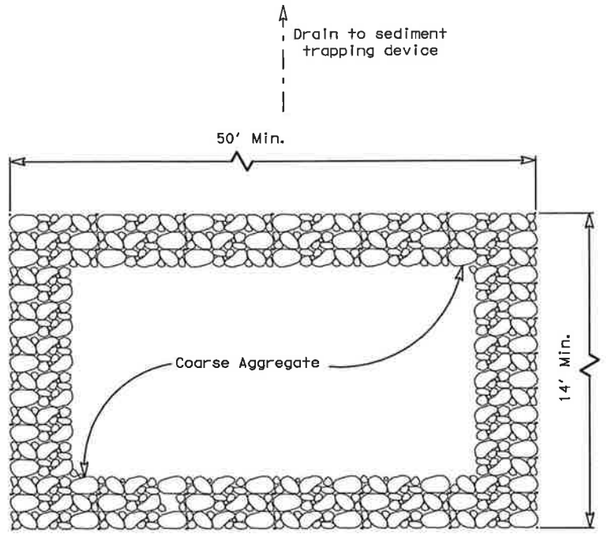

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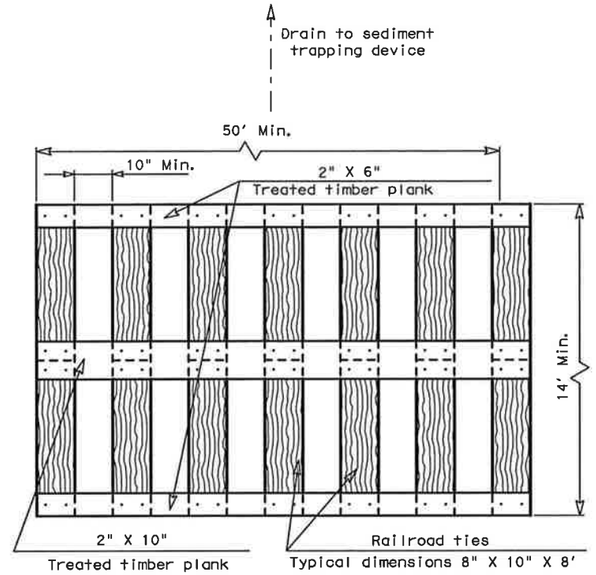

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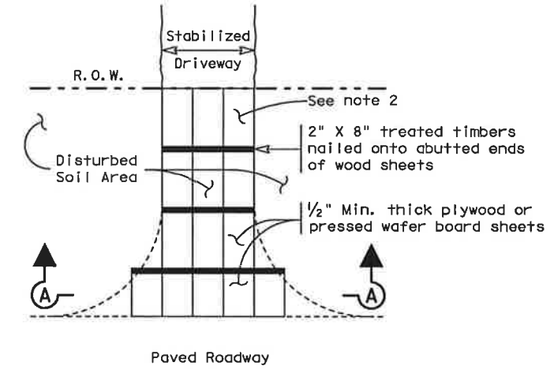

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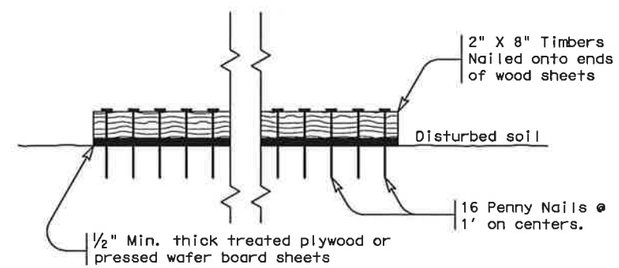

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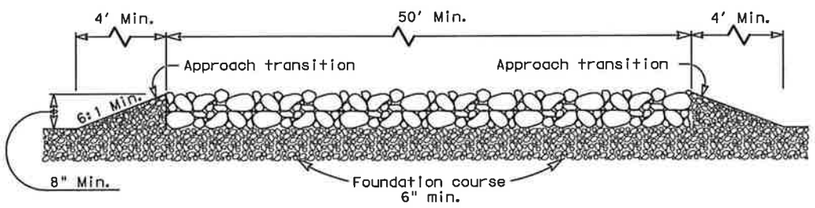
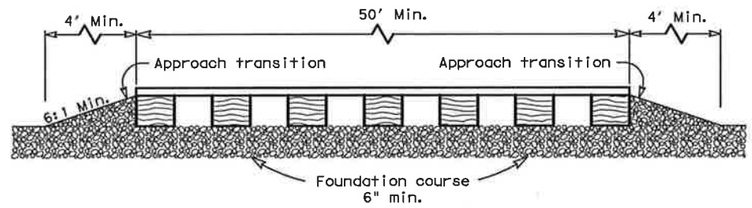


PROFILE

CONSTRUCTION EXIT (TYPE 1)

GENERAL NOTES

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



PROFILE

CONSTRUCTION EXIT (TYPE 2)

GENERAL NOTES

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

CONSTRUCTION EXIT (TYPE 3)

GENERAL NOTES

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-93

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