# CITY OF WOODCREEK

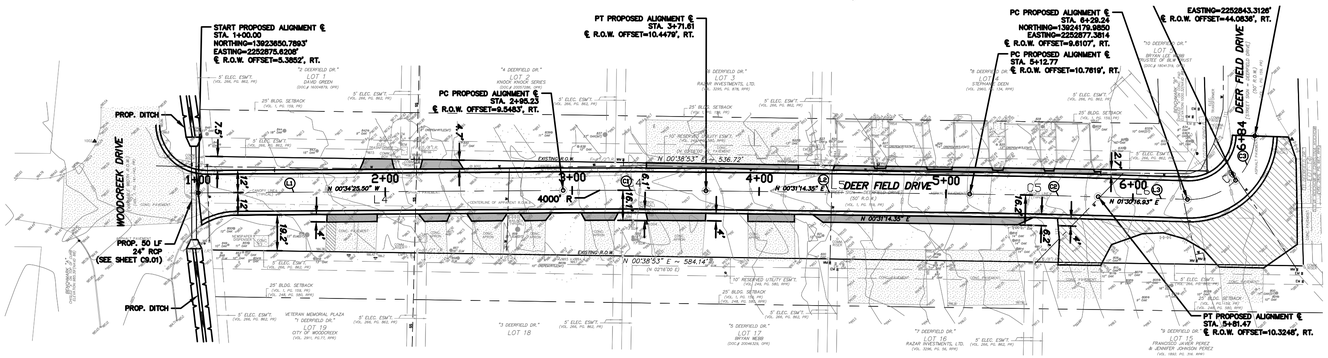
(HAYS COUNTY, TX.)

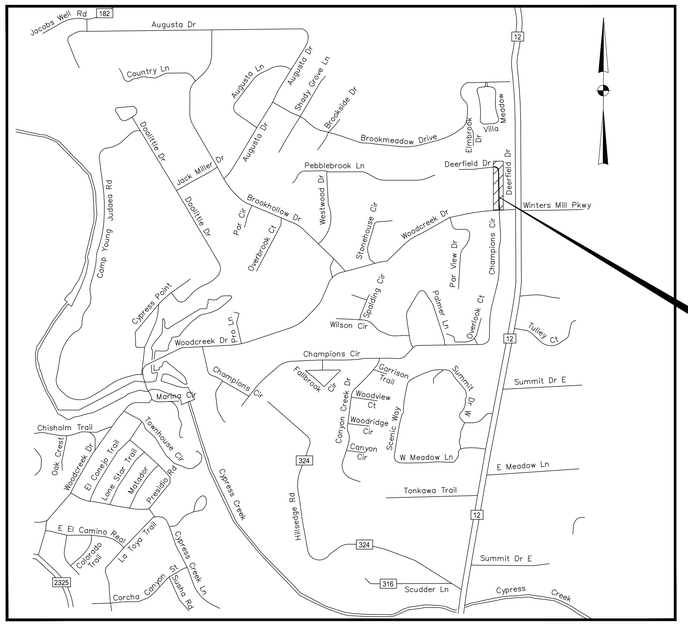
# REHABILITATION OF DEERFIELD DR.

## CIVIL SITE PACKAGE

DEERFIELD DRIVE

WOODCREEK TEXAS, 78676




LOCATION MAP

PROJECT LOCATION


TLC ENGINEERING

8204 WESTGLEN DRIVE
HOUSTON, TEXAS 77063
Phone: 713-868-6900 Fax: 713-868-0001
www.tlceng.com


STATE OF TEXAS
WANZHI LI
85024
LICENSED
PROFESSIONAL ENGINEER

100% SUBMITTAL

| REV. NO. | DATE | | P.E. APPR |
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| | | | |

(Design Engineer)
(Design Firm)

DATE:

_____ _____, P.E.
Director of Engineering

DATE:

INDEX OF SHEETS



NOTE:

CONTRACTOR TO CONTACT CITY OF WOODCREEK CITY ADMINISTRATOR, JIM BURTON MIN. 48 HOURS PRIOR TO CONSTRUCTION @ 512-847-9390

**FOR PERMITTING ONLY**


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CITY OF WOODCREEK
DEERFIELD DRIVE
WOODCREEK Texas, 78676

REVISION

| NO. | DATE |
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PROJECT #
ISSUE:
DATE:
DRAWN BY:

INDEX SHEET

C0.01

DESIGN NOTES:

1. ALL MEASUREMENTS ARE CALLED OUT IN AMERICAN UNIT, FEET AND INCHES.
2. DESIGN SHOULD ABIDE BY TXDOT STANDARD SPECIFICATIONS, ROADWAY DESIGN MANUAL, PAVEMENT MANUAL AND RELATED STANDARDS.
3. ACCORDING TO CITY OF WOODCREEK REQUEST, THE TRAVEL LANE WIDTH LIMITS TO TEN FEET (10'–0").
4. THE ROADWAY SHOULD FURNISH TWO FEET (2'–0") SHOULDERS ALONG THE BOUNDARIES OF BOTH EAST AND WEST TRAVEL LANES.
5. THE ROADWAY ALIGNMENT WAS FORMED FOLLOWING THE EXISTING PAVEMENT ROUTE AND BOUNDARIES TO PROVIDE SIX FEET (6'–0") CLEARANCE BETWEEN THE EAST TRAVEL LANE AND THE EXISTING TREES FOR BYPASSING TREE REMOVAL AND FOUR FEET (4'–0") CLEARANCE BETWEEN THE WEST TRAVEL LANE AND EXISTING COMMUNICATION RISERS FOR SHELTERING THE RISERS.
6. BASED ON THE SURVEY DATA REPORTED, THE ROADWAY PROFILE ACCOMMODATES THE SCATTERED ELEVATIONS OF THE EXISTING ROADWAY PAVEMENT BY MEANS OF CURVE FITTING.
7. EXISTING PAVEMENT EXCAVATION AND STABILIZATION TREATMENT UPGRADING:
   - A DEMOLITION WIDTH SHOULD BE A MINIMUM OF TWENTY–FIVE FEET (25'–0") CONSISTING OF TWO TEN FEET (2 X 10'–0") TRAVEL LANES, A COMBINED FOUR FEET (4'–0") SHOULDERS, AND ONE–FOOT WORKING SPACE.
   - DEMOLITION DEPTH SHOULD REACH TO THE TOP OF THE EXISTING STABILIZATION TREATMENT LAYER.
   - REMOVE ALL LOOSE MATERIALS, DEBRIS, AND BLOW OUT DUST.
   - THE EXISTING STABILIZATION TREATMENT LAYER SHOULD BE INSPECTED AND ASSESSED.
   - CONFIRM THAT THE EXISTING STABILIZATION TREATMENT LAYER IS CONSOLIDATED AND FIRM WITH ADEQUATE STRENGTH FOR CAPABLE OF SUSTAINING THE NEW PAVEMENT DEADLOAD AND VEHICULAR TRAFFIC LOADS CONFORM TO TXDOT PAVEMENT MANUAL AND CST_TIPS_053QTR TABLE–1.
   - IF NECESSARY, EXISTING STABILIZATION TREATMENT LAYER MODIFICATION OR UPGRADING SHOULD BE CONDUCTED TO ENHANCE THE STRENGTH OF THE EXISTING TREATMENT LAYER OR TO INCREASE THE THICKNESS OF THE TREATMENT LAYER FOR ATTAINING THE DESIGNED ROADWAY ELEVATION.
   - BASED ON THE TOTAL DESIGNATED ASPHALT PAVEMENT THICKNESS OF FOUR AND HALF INCHES (4 ½"), THE TOP ELEVATION OF THE STABILIZATION TREATMENT SHOULD NOT BE HIGHER THAN THE SPECIFIED LEVEL THAT EQUALS TO THE DESIGNATED ROADWAY ELEVATION MINUS FOUR AND HALF INCHES (4 ½").
   - EITHER LIME STABILIZATION TREATMENT OR CEMENT STABILIZATION TREATMENT CAN BE USED FOR STABILIZATION TREATMENT MODIFICATION OR UPGRADING PER CONTRACTOR'S PREFERENCE UPON APPROVAL BY THE DESIGN ENGINEER.
8. EXISTING SUBGRADE INVESTIGATION AND MODIFICATION:

   IT IS MANDATORY TO INVESTIGATE THE EXISTING SUBGRADE CONDITION TO FIND OUT WHETHER THE EXISTING SUBGRADE COVERS THE FULL WIDTH OF THE TWENTY–FIVE FEET (25'–0") PAVEMENT, AS WELL AS THE AREA WHERE THE ROADWAY TURNS NORTHWARD TO WESTWARD, TO DETERMINE WHETHER A SUBGRADE MAKE–UP CONSTRUCTION IS NECESSARY.

   OPTION–ONE: CONDUCT SITE BORING AND TEST RIGHT AFTER THE 60% DESIGN SUBMITTAL TO DETERMINE WHETHER SUBGRADE MAKE–UP IS NECESSARY, ESPECIALLY IN THE SCOPE BEYOND THE TWENTY FEET (20'–0") TRAVEL LANES. THEN, INCLUDE THE SUBGRADE MAKE–UP DESIGN IN THE100% DESIGN SUBMITTAL, IF REQUIRED.

   OPTION–TWO: INVESTIGATE THE SUBGRADE CONDITION DURING EXISTING PAVEMENT EXCAVATION OR DEMOLITION CONSTRUCTION TO DETERMINE WHETHER SUBGRADE MAKE–UP IS NECESSARY ON CONDITION THAT SUBGRADE MAKE–UP MATERIALS AND MACHINERY PRESERVED FOR USE WHEN NECESSARY TO PREVENT DELAY OF PROJECT CONSTRUCTION.
9. APPLY 3/16" TACK COAT ATOP THE STABILIZATION TREATMENT LAYER RIGHT BEFORE DEPLOYING THE FIRST COURSE OF ASPHALT FOR BONDING PURPOSE BETWEEN THE STABILIZATION TREATMENT LAYER AND THE FIRST COURSE OF ASPHALT. APPLICATION OF TACK COAT MAY BE ELIMINATED BASED ON ENGINEERING JUDGMENT PERTAINING TO SURFACE ROUGHNESS OF THE STABILIZATION TREATMENT, THE WEATHER DURING CONSTRUCTION AND WORKABILITY OF ASPHALT.
10. HOT MIXTURE AND COLD LAID ASPHALT CONCRETE (HMAC) SHALL BE IMPLEMENTED TO REPAVE THE ROADWAY THAT CONSISTS OF TWO ASPHALT COURSES:
    - 2", MAXIMUM OF 2 ½", SUB–COURSE AS THE BASE LAYER OF THE PAVEMENT.
    - 3/16" TACK COAT IN BETWEEN THE TWO COURSES FOR EMULSIFICATION PURPOSE.
    - 2", MINIMUM 1 ½", TOP COURSE AS THE SURFACE OF THE PAVEMENT.
11. IF THE ROADWAY REPAVING CONFLICTS WITH THE EXISTING UTILITIES AND FACILITIES, ESPECIALLY THOSE PRIVATE FACILITIES SUCH AS MAILBOXES BUILT INSIDE THE ROW OF DEERFIELD DRIVE, THE SPECIFIED FACILITIES SHOULD BE DEMOLISHED OR RELOCATED AT THE OWNER'S COST.
12. STORM DRAINAGE DESIGN PERTAINING TO ENVIRONMENTAL ASSESSMENT AND DRAINAGE DESIGN WITH THE FOLLOWING CONSTRUCTION:
    - FURNISH A 24" CULVERT, AS SHOWN IN SHEET C9–01, AT THE SOUTH END OF DEERFIELD RD.
    - ANY EXISTING SUBSURFACE WATER/SEWER LINE CONFLICT WITH THE CULVERT ALIGNMENT OR ELEVATION SHOULD BE RESOLVED DURING CULVERT CONSTRUCTION.
    - OPEN DITCH ALONG THE NORTH EDGE OF WOODCREEK DRIVE, FLOWING WEST TO EAST WITHIN DEERFIELD RD. R.O.W..

IF UTILITIES NEED TO BE RELOCATED, THIS COULD HAVE LONG LEAD AND CREATE PROJECT DELAYS. DESIGN ENGINEER SHOULD COORDINATE/DESIGN TO MINIMIZE DELAY POTENTIAL

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CITY OF WOODCREEK
DEERFIELD DRIVE
WOODCREEK Texas, 78676

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PROJECT #
ISSUE:
DATE:
DRAWN BY:

DESIGN NOTES

C0.02

## CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.

2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.

4. THE CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.

5. PRIOR TO CONSTRUCTION, THE CONTRACTOR, ALONG WITH CONCURRENCE FROM THE FIELD ENGINEER, SHALL DETERMINE HIS/HER LAY-DOWN AND/OR STAGING AREA LOCATIONS.

6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.

7. TRAFFIC INGRESS AND EGRESS FOR DRIVEWAYS AND PEDESTRIAN ACCESS FACILITIES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

8. THE CONTRACTOR SHALL REMOVE ANY FENCES, POSTS, MAILBOXES, PLANTERS, PERMANENT TRASH CONTAINERS, CULVERTS, ETC. OR SECTIONS THEREOF, THAT ENCROACH WITHIN THE COUNTY'S RIGHT-OF-WAY. NOTE: PRIOR TO CONSTRUCTION, THE PROPERTY OWNER WAS PAID TO RELOCATE OR REPLACE THESE ITEMS OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY. IF THE OWNER HAS FAILED TO DO SO, THE CONTRACTOR WILL REPLACE THEM WITH THE MINIMUM LEVEL OF QUALITY NEEDED TO SECURE THE PROPERTY AND/OR MAINTAIN MAIL DELIVERY. IN THAT CASE, PAYMENT FOR THESE INSTALLATIONS WILL BE INCLUDED AS EXTRA WORK ITEMS OR AS OVERRUNS TO EXISTING PAY ITEMS.

   ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS LOCATED OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   ALSO, IF THESE ITEMS ARE LOCATED WITHIN THE PROJECT RIGHT-OF-WAY AND ARE DESIGNATED TO REMAIN, ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   TREES, BUSHES, SHRUBBERY AND OTHER DAMAGED PLANTINGS DESIGNATED TO REMAIN SHALL BE REPLACED WITHIN 72 HOURS OF REMOVAL AND ARE TO BE THOROUGHLY WATERED-IN. NO SEPARATE PAY.

9. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY TRACKED EQUIPMENT.

10. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PROFESSIONAL LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.

11. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR. TWO COPIES OF STAKING NOTES TO BE PROVIDED TO THE ENGINEER PRIOR TO CONSTRUCTION.

12. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.

13. THE CONTRACTOR SHALL MAINTAIN UPDATED RED-LINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.

14. MOWING, MAINTENANCE, AND CLEAN-UP OF THE PROJECT SHALL MEET THE REQUIREMENT OF SPECIFICATION TXDOT ITEM 580 (NO SEPARATE PAY). MOWING, MAINTENANCE, AND CLEAN-UP IS REQUIRED FOR THE PROJECT LIMITS AND DURATION, REGARDLESS OF THE CONTRACTOR'S SCOPE OF ACTIVITIES WITHIN THE PROJECT LIMITS.

15. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.

16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR AT A SECURED OFF-SITE LOCATION AT NO ADDITIONAL EXPENSE TO THE CONTRACTED FEE. ANY SUITABLE EXCAVATED MATERIAL ON THE PROJECT WHICH IS AVAILABLE AT THE TIME OF NEED; WHETHER FROM STORM SEWER, ROADWAY, AND/OR CHANNEL EXCAVATION, SHALL BE USED BEFORE BORROW IS BROUGHT ON-SITE.

17. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST OR CAST IN PLACE.

## TRAFFIC CONTROL

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE MOST RECENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE TRAFFIC CONTROL PLANS ARE APPROVED BY THE CITY OF WOODCREEK.

2. THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS EXCEPT DURING FLAGGING OPERATION OR PROVIDE DETOURS AROUND THE CONSTRUCTION SITE AND PROVIDE PUBLIC NOTIFICATION.

3. LANE CLOSURES SHALL PROVIDE CONVENIENCE FOR RESIDENTS ACCESS TO AND EXIT FROM THEIR PROPERTIES.

4. DETOURS REQUIRE PRIOR APPROVAL OF THE FIELD ENGINEER AND PRECINCT. DETOUR PLANS, IF ALLOWED, MUST INCLUDE APPROPRIATE DETOUR SIGNAGE, PUBLIC NOTICE VIA SIGNAGE TWO WEEKS IN ADVANCE STATING THE DATES OF THE AGREED UPON DATE OF CLOSURE AND DATE THE ROAD WILL RE-OPEN TO TRAFFIC. CONTRACTOR TO USE (WITH PRIOR APPROVAL OF THE FIELD ENGINEER) HIGH EARLY STRENGTH CONCRETE AND OTHER RELATED CONSTRUCTION METHODS TO MINIMIZE THE DURATION OF THE DETOUR AND TO ENSURE THAT THE ROADWAY IS OPEN ON, OR PRIOR TO, THE AGREED UPON DATE.

5. ONE DAY PRIOR TO THE IMPLEMENTATION OF A TRAFFIC CONTROL PLAN PHASE OR STEP, OR THE IMPLEMENTATION OF AN ADDITIONAL, REVISED, OR NEW TRAFFIC CONTROL ELEMENT, THE CONTRACTOR SHALL MEET WITH THE ENGINEER TO GIVE A DETAILED DESCRIPTION OF THE CONTRACTOR'S PLAN AND PREPARATIONS. THE CONTRACTOR SHALL OBTAIN WRITTEN CONCURRENCE FROM THE ENGINEER THAT ADEQUATE PROJECT PROGRESS HAS BEEN ACHIEVED AND THAT ADEQUATE PREPARATIONS ARE IN PLACE PRIOR TO SWITCHING TRAFFIC. IF, IN THE OPINION OF THE ENGINEER, REQUIRED PROGRESS AND ADEQUATE PREPARATIONS ARE NOT COMPLETE, THE CONTRACTOR SHALL NOT IMPLEMENT THE NEXT PHASE, STEP, OR ELEMENT OF TRAFFIC CONTROL UNTIL INCOMPLETE CONSTRUCTION ITEMS OR PREPARATIONS ARE COMPLETED. TIME EXTENSIONS WILL NOT BE GRANTED FOR DELAYS CAUSED BY THE INCOMPLETE CONSTRUCTION ITEMS OR INADEQUATE CONTRACTOR PREPARATIONS REQUIRED TO IMPLEMENT TRAFFIC CONTROL.

6. TRAFFIC CONTROL PER THE CONTRACT IS REQUIRED FOR THE ENTIRE DURATION OF THE PROJECT, INCLUDING THE PUNCHLIST PERIOD. PAYMENT FOR TRAFFIC CONTROL THAT IS PROPERLY INSTALLED FOR LESS THAN A FULL MONTH SHALL BE BASED ON A PERCENTAGE BASIS OF THE TIME INSTALLED. TRAFFIC CONTROL PAYMENTS TO THE CONTRACTOR SHALL END 10 DAYS AFTER SUBSTANTIAL COMPLETION, ALTHOUGH PROPER TRAFFIC CONTROL MUST BE MAINTAINED UNTIL PUNCHLIST COMPLETION.

7. THE PURPOSE OF THE CONSTRUCTION SEQUENCE AND TRAFFIC HANDLING OUTLINED HEREIN IS TO DOCUMENT A VIABLE TCP THAT CAN BE UTILIZED TO CONSTRUCT THE PROJECT. IT IS THE BASIS OF ESTIMATION FOR THE TRAFFIC CONTROL BID ITEMS, AND IS TO BE UTILIZED AND IMPLEMENTED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

   IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT TCP, HE/SHE SHALL PREPARE AND SUBMIT THE ALTERNATIVE TCP TO THE COUNTY FOR APPROVAL NO LESS THAN 10 WORKING DAYS PRIOR TO THE PROPOSED IMPLEMENTATION DATE. THE TCP SHALL BE DRAWN TO SCALE AND SIGNED & SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. UPON APPROVAL BY HAYS COUNTY, THE ALTERNATIVE PLAN SHALL BECOME THE BASIS FOR A "CHANGE IN CONTRACT" TO REVISE THE TRAFFIC CONTROL BID ITEMS ACCORDINGLY AND BECOME PART OF THE CONTRACT DOCUMENTS.

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CITY OF WOODCREEK
DEERFIELD DRIVE
WOODCREEK Texas, 78676

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PROJECT #
ISSUE:
DATE:
DRAWN BY:

GENERAL NOTES

C0.03

| SUMMARY OF ROADWAY QUANTITIES - DEERFIELD DRIVE | | | | | | |
|---|---|---|---|---|---|---|
| P & P SHEET NO. | STATION TO STATION | | EXCAVATION (ROADWAY) (5") | HMAC SURFACE (5") | 2ND HMAC SURFACE (2") | LIME TRT (SUBGRADE) |
| | | | CY | CY | CY | SY |
| PAVEMENT | | | | | | |
| C3.01 - C3.02 | 1+00.00 | 6+84.22 | | | | |
| TOTAL | | | 19.0270 | 19.9148 | 4.6326 | 1571.0220 |
| | | | | | | |
| PAVEMENT APRON | | | | | | |
| C3.02 | 5+59.85 | 6+84.22 | | | | |
| TOTAL | | | 5.0851 | 5.0851 | 2.0340 | 165.1974 |

| SUMMARY OF DEMOLITION QUANTITIES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ITEM NO. | | | | | | | | | | |
| DESC. CODE | | | | | | | | | | |
| REMOVAL LAYOUT SHEET NO. | STATION TO STATION | | REMOVE STRIPING | REM STAB BASE & ASPH | REMOVE (SIGN) | REMOVE (MAILBOX) | REMOVE "BLUE" REF MARKER | REMOVE DRIVEWAY CURB | REMOVE CONC CURB BLOCKS | REMOVE WOODEN CURB |
| | | | LF | SY | EA | EA | EA | EA | LF | LF |
| PAVEMENT | | | | | | | | | | |
| C2.01 | 1+00.00 | 6+84.22 | | | | | | | | |
| TOTAL | | | 0 | 1571.0220 | 1 | (4)= 16 | 1 | 1 | 120 | 101 |
| PAVEMENT APRON | | | | | | | | | | |
| C2.01 | 5+59.85 | 6+84.22 | | | | | | | | |
| TOTAL | | | 0 | 165.1974 | | | | | | |

| SUMMARY OF TRAFFIC CONTROL QUANTITIES DEERFIELD DRIVE N&S | | | |
|---|---|---|---|
| ITEM NO. | | | |
| DESC. CODE | | | |
| SHEET NO. | TYPE 3 - BARRICADES | SIGNS | CHANNELIZING DEVICES |
| C7.05 | EA | EA | EA |
| TOTAL | 3 | 7 | 118 |

| SUMMARY OF SWP3 ITEMS | | | | | | |
|---|---|---|---|---|---|---|
| SW3 PLAN SHEET | ITEM DESCRIPTION | ITEM DESCRIPTION | ITEM DESCRIPTION | ITEM DESCRIPTION | ITEM DESCRIPTION | ITEM DESCRIPTION |
| C7.03 | TEMPORARY FILTER | REINFORCED FILTER | STABILIZED CONSTRUCTION | GRATE INLET PROTECTION | CURB INLET PROTECTION | ROCK FILTER DAM TYPE 2 |
| | FABRIC FENCE | FABRIC FENCE | ACCESS | | | |
| UNIT | LF | LF | EA | EA | EA | EA |
| TOTAL | 737.95 | 0 | 1 | 0 | 0 | 0 |

| SUMMARY OF PAVEMENT MARKINGS ITEMS - DEERFIELD DRIVE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ITEM NO. | | | | | | | | | | |
| | THERMO-PLASTIC WS12 (90MIL) | THERMO-PLASTIC WS24 (90MIL) | THERMO-PLASTIC (ARROW) (90MIL) | THERMO-PLASTIC (WORD) (90MIL) | THERMO-PLASTIC YS24 (90MIL) | REFLECTIVE RAISED PAV MRKR TY II-B-B | REFLECTIVE RAISED PAV MRKR TY II-A-A | THERMO-PLASTIC WS6-R20 (60MIL) | THERMO-PLASTIC YB4 (60MIL) | THERMO-PLASTIC WS4 (60MIL) |
| LOCATION | LF | LF | EA | EA | LF | EA | EA | LF | LF | LF |
| DEERFIELD DRIVE SB Sta. 1+00.00 to Sta. 1+02 | | 10 | | | | | | | | |
| DEERFIELD DRIVE CL Sta. 1+00.00 to Sta. 6+84.22 | | | | 2 | | 1 | 15 | | 584.22 | 1168.44 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| PROJECT TOTALS: | | 10 | | 2 | | 1 | 15 | | 584.22 | 1168.44 |

| SUMMARY OF TREE PROTECTION ITEMS | | | | |
|---|---|---|---|---|
| SW3 PLAN SHEET | ITEM DESCRIPTION | ITEM DESCRIPTION | ITEM DESCRIPTION | ITEM DESCRIPTION |
| C7.03 | PLACE PROTECTIVE | REMOVE PROTECTIVE | PLACE BOUND WOOD | REMOVE BOUND WOOD |
| | FENCE | FENCE | PLANKING | PLANKING |
| UNIT | LF | LF | LF | LF |
| TOTAL | 74.00 | 74.00 | 9.86 | 9.86 |

NOTE:

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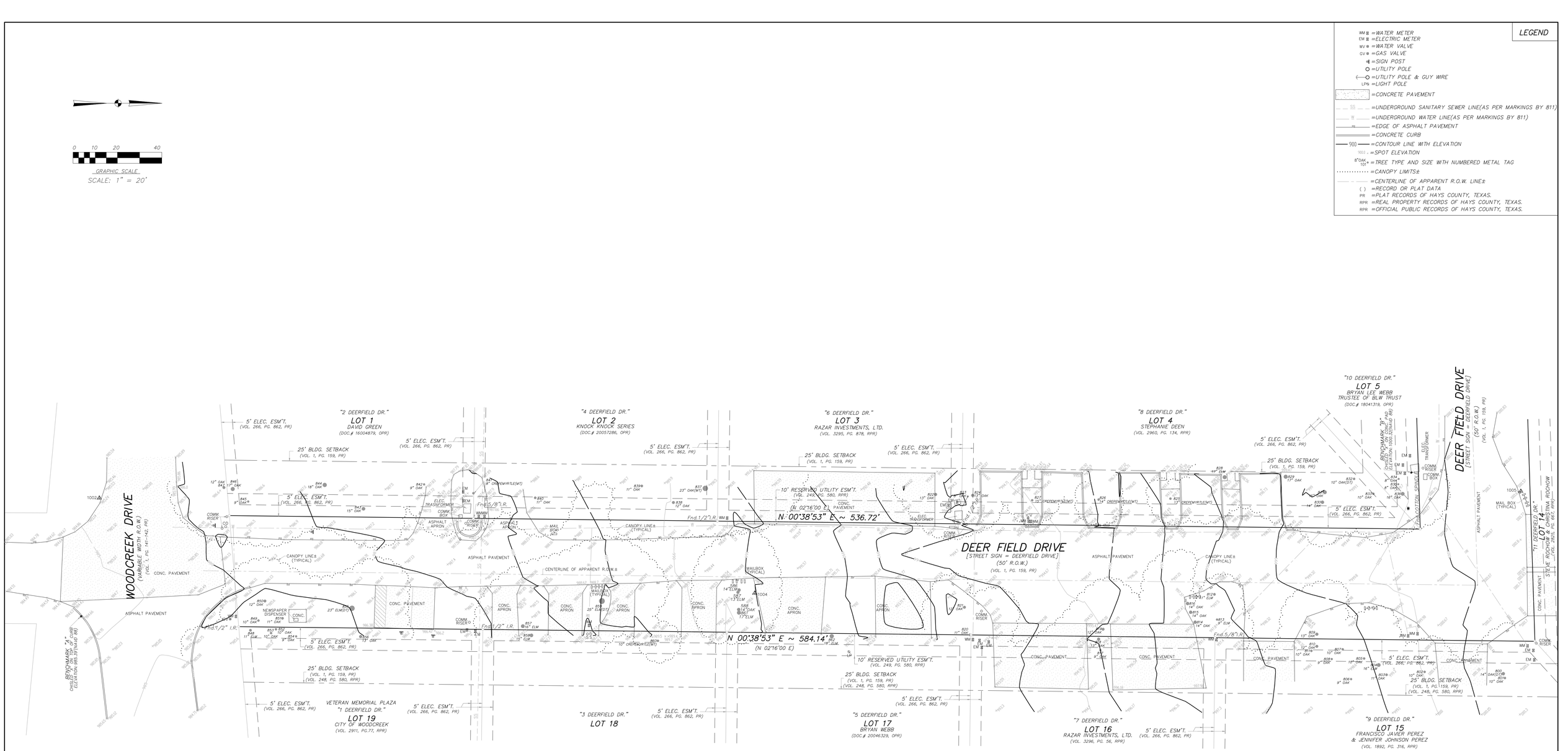
SUMMARY OF QUANTITIES

C0.04




*ADDRESS:*
***DEER FIELD DRIVE,***
***WOODCREEK, TEXAS***

NOTES:
1. DIRECTIONAL CONTROL LINE = D.C.L.
2. ALL DIMENSIONS & ELEVATIONS REPRESENTED HEREON ARE IN U.S. SURVEY FEET.
3. BEARING BASIS = NAD83 TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE 4204, SOURCE: OPUS.
4. ELEVATIONS ARE BASED ON NAVD 88. SOURCE: GPS
5. THIS SURVEY WAS COMPLETED WITHOUT THE BENEFIT OF A TITLE COMMITMENT. THERE MAY EXIST EASEMENTS, SETBACKS, RESTRICTIONS AND CONDITIONS THAT ARE NOT SHOWN.
6. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. UNDERGROUND UTILITIES SHOWN ARE BASED ON THE LOCATION OF ABOVE GROUND PHYSICAL EVIDENCE, AVAILABLE MAPS AND/OR MARKS MADE BY RESPONDENTS OF THE TEXAS811 UTILITY LOCATE SERVICE. TEXAS 811 LOCATE REQUEST MADE JULY 29, 2024, TICKET# 247070613B.
7. NO UNDERGROND MARKINGS OBSERVED FOR ELECTRIC, TELEPHONE OR CABLE TV.
8. SANITARY SEWER DEPTH NOT DETERMINED.
9. SUBJECT TO A EASEMENT 10 FEET IN WIDTH CENTERED ON THE INSTALLED WATER PIPE PER VOL. 210, PG. 128 HAYS COUNTY REAL PROPERTY RECORDS.

PLAT REFERENCE: PLAT RECORDS (PR)
WOODCREEK, SECTION 4-A,B,C & D
VOL. 1 PAGE 159-160 DATE APRIL 3, 1972

**⚠CONTROL POINT TABLE**

| PT. NO. | NORTHING | EASTING | ELEVATION(NAVD 88) | DESCRIPTION |
|---|---|---|---|---|
| BM"A" | 13923586.9953 | 2252901.4720 | 985.39 | CHISLED BOX ON CONC. CURB |
| BM"B" | 13924186.4896 | 2252836.6376 | 1000.32 | CHISLED "X" ON CONC. PAD |
| 1002 | 13923595.2033 | 2252848.1757 | 985.37 | SET 1/2" IRON ROD W/TRAV. CAP |
| 1004 | 13923890.5521 | 2252891.0604 | 990.72 | SET 1/2" IRON ROD W/TRAV. CAP |
| 1005 | 13924235.7696 | 2252845.1127 | 1001.67 | SET 1/2" IRON ROD W/TRAV. CAP |

COORDINATES ARE NAD83 TEXAS STATE PLANE COORDINATE SYSTEM SOUTH CENTRAL ZONE 4204 ADJUSTED TO GROUND USING A SCALE FACTOR OF 1.0001070247 FROM (0,0).

| NO. | DATE | BY | REVISION | CKD. | APPD. |
|---|---|---|---|---|---|
| | | | | | |


Maverick Land Surveying Co.
1856 Lockhill-Selma, Suite 105
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FAX 210-342-9524
TBPELS FIRM No. 10132700

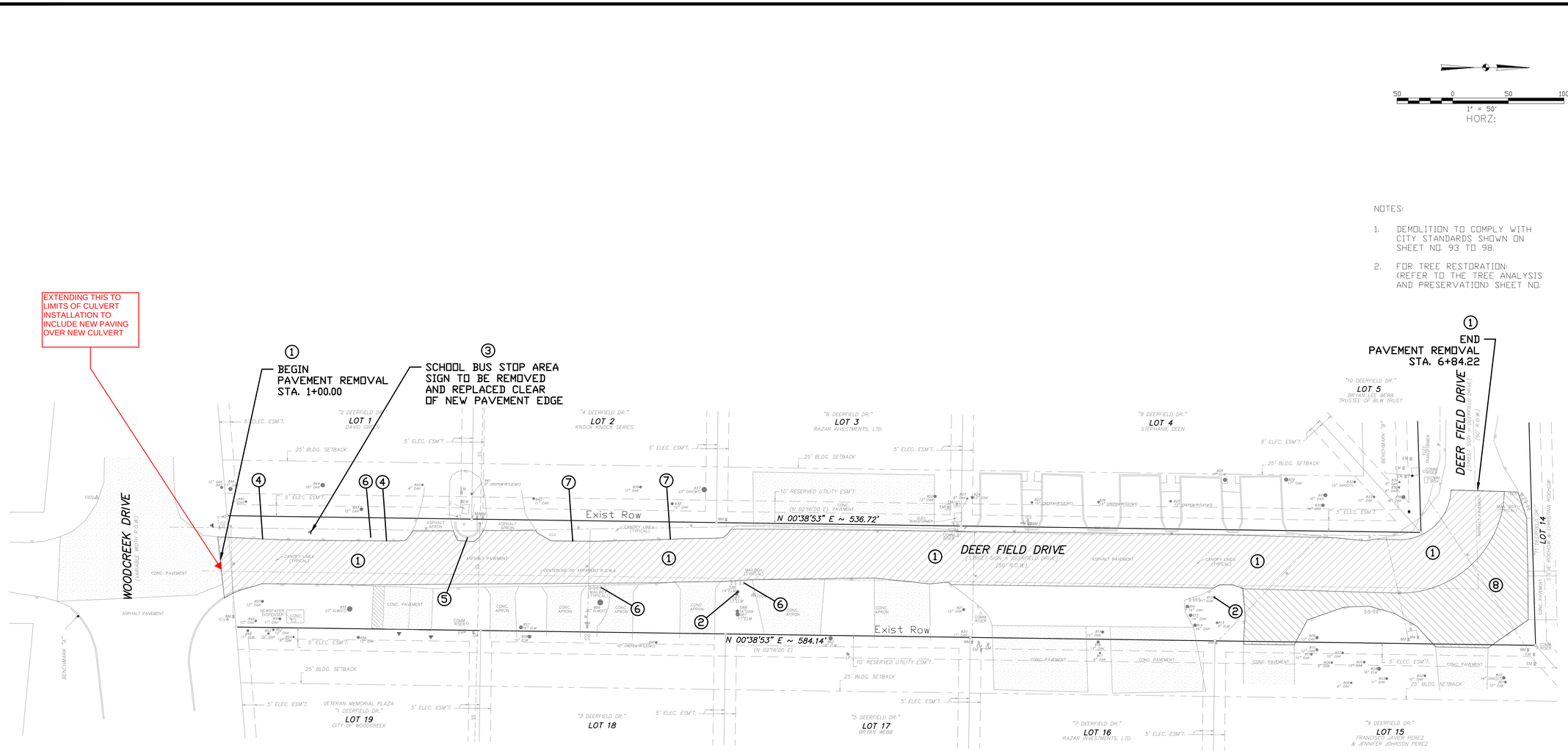


*IMRPOVEMENTS, TREE AND TOPOGRAPHIC SURVEY OF:*

**A PORTION OF DEER FIELD DRIVE**
**WOODCREEK, SECTION 4**
**A, B, C & D**

CITY OF WOODCREEK, HAYS COUNTY, TEXAS

| | | |
|---|---|---|
| DRAWN BY: J.S. | FIELD BY: J.R. | APPROVED BY: JWO |
| SCALE: 1" = 20' | DATE: 7-30-2024 | SHEET 1 OF 1 |
| SHEET SIZE 24"x36" | JOB NO. 59278-0001 | 1 |




NOTES:

1. DEMOLITION TO COMPLY WITH CITY STANDARDS SHOWN ON SHEET NO. 93 TO 98.
2. FOR TREE RESTORATION: (REFER TO THE TREE ANALYSIS AND PRESERVATION) SHEET NO.

LEGEND

| | |
|---|---|
| ① | REMOVE EXIST. PAVING |
| ② | TREES TO BE PRESERVED SEE TREE PROTECTION SHT. NO. C7.06 |
| ③ | SCHOOL BUS STOP AREA SIGN TO BE REMOVED AND RELOCATED |
| ④ | REMOVE WOODEN LOGS CURB |
| ⑤ | REMOVE MEDIAN CONCRETE CURB |
| ⑥ | REMOVE AND REPLACE MAIL BOXES CLEAR OF NEW PAVEMENT EDGE |
| ⑦ | REMOVE CONCRETE BLOCKS CURB |
| ⑧ | REMOVE EXIST. ASPHALT APRON |

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# CITY OF WOODCREEK
## DEERFIELD DRIVE
## WOODCREEK Texas, 78676

REVISION

| NO. | DATE |
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PROJECT #
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DEMOLITION SHEET

C2.01

RECOMMEND MOVING THIS SOUTH SO THAT CULVERT IS MORE PARALLEL WITH WOODCREEK AND FURTHER FROM COMM BOXES ON CORNER

PROJECT SHOULD START SOUTH OF NEW CULVERT INSTALLATION

START PROPOSED ALIGNMENT ℄
STA. 1+00.00
NORTHING=13923650.7893'
EASTING=2252875.6208'
℄ R.O.W. OFFSET=5.3852', RT.

PROP. DITCH

2' SHOULDER LINE

PROP. 50 LF
24" RCP
(SEE SHEET C9.01)

PROP. DITCH

PT PROPOSED ALIGNMENT ℄
STA. 3+71.61
℄ R.O.W. OFFSET=10.4479', RT.

PROPOSED HMAC SURFACE OVERLAY FROM THE WEST R.O.W. LINE @ DRIVEWAY (TYP)

PC PROPOSED ALIGNMENT ℄
STA. 2+95.23
℄ R.O.W. OFFSET=9.5483', RT.

PROPOSED 4' HMAC SURFACE OVERLAY @ EAST DRIVEWAY (TYP)

REFER TO THE TREE PROTECTION DETAIL SHEET C7.06

CURVE DATA
PI=X 2252873.283 Y 13923884.210
R=4000.00'
Δ=001.0944 (d)
L=76.404'
T=38.203'

MATCH LINE STA. 5+00.00
(SEE SHEET C3.02 2 OF 2)

| CONTROL POINT | NORTHING | EASTING |
|---|---|---|
| START | 13923650.7893 | 2252875.6208 |
| END | 13924215.8920 | 2252843.3126 |

BEGIN PROP. PAVEMENT
VPC-1
STA 1+00.00
TP EL=986.130
MATCH EXIST PAVEMENT

VPI-1
STA 1+66.234
TP EL=986.943

VPT-1 / VPC-2
STA 2+32.469
TP EL=988.104

VPI-2
STA 2+68.094
TP EL=988.945

VPT-2 / VPC3
STA 3+03.719
TP EL=990.034

VPI-3
STA 3+39.344
TP EL=991.181

VPT-3
STA 3+74.969
TP EL=992.195

VPC-4
STA 4+18.260
TP EL=993.346

VPI-4
STA 4+48.531
TP EL=994.238

VPT-4 / VPC-5
STA 4+78.802
TP EL=995.305

℄ WOODSCREEK DR.

PROP TP

EXIST WEST EOP

EXIST ℄ PAVED ROAD

EXIST EAST EOP

EXIST PAVEMENT
TOP EL=986.015

PROP 24" RCP
(SEE SHEET 9.01)

MATCH LINE STA. 5+00.00

1+00 2+00 3+00 4+00 5+00

1000 995 990 985


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PLAN AND PROFILE

C3.01
1 OF 2


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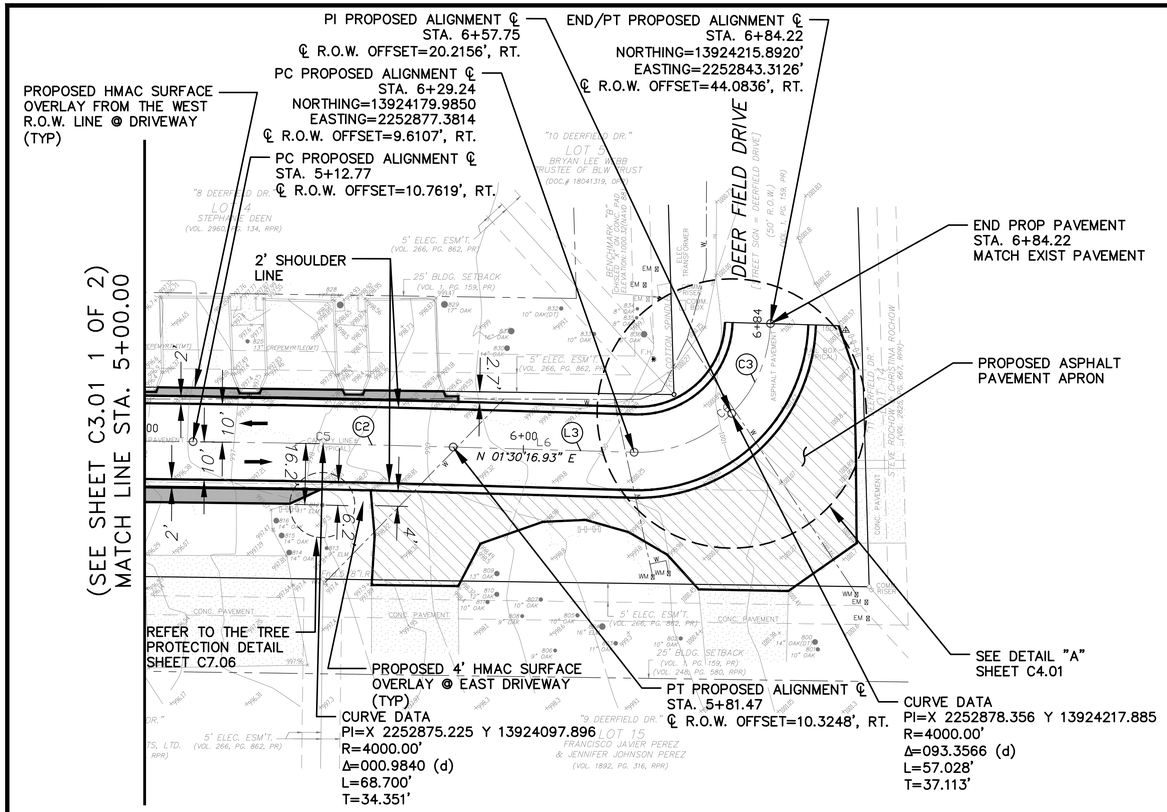


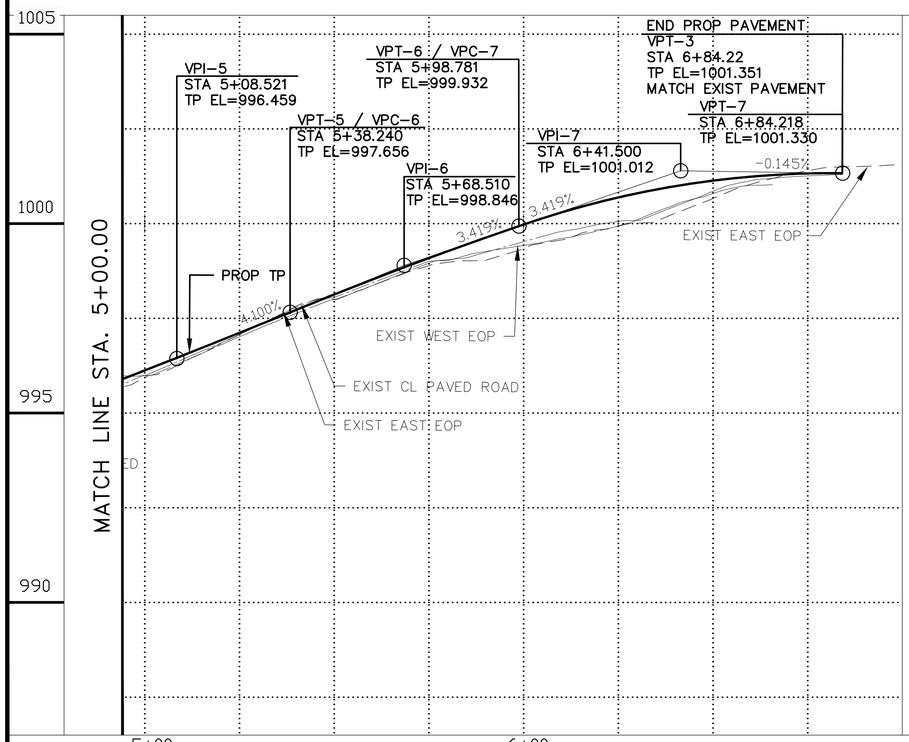


**A-1_Curve Fitting 100 to 268**
**Left Edge-1 OF Woodcreek**

| Curve-A | PI | PC | PT | Ex= | K= |
|---|---|---|---|---|---|
| Sta= | 184.047 | 100.000 | 268.094 | -0.187 | 189 |
| Ele= | 987.393 | 986.181 | 988.980 | L= | 168.094 |
| BENDING | | 1.220% | 2.110% | PI Peak | 987.580 |

**B-1_Curve Fitting 268 to 421**
**Left Edge-1 OF Woodcreek**

| Curve-B | PI | PC | PT | Ex= | K= |
|---|---|---|---|---|---|
| Sta= | 344.547 | 268.094 | 421.000 | -0.250 | 117 |
| Ele= | 991.027 | 988.980 | 993.575 | L= | 152.91 |
| BENDING | | 2.350% | 3.660% | PI Peak | **990.776** |

**C-1_Fitting 421 TO 586- Straight Line**
**Left Edge-1 OF Woodcreek**

| Curve-C | PI | | PT | Ex= | K= |
|---|---|---|---|---|---|
| Sta= | 494.755 | 421.000 | 568.510 | 0.000 | N/A |
| Ele= | 996.274 | 993.575 | 998.973 | L= | 147.510 |
| BENDING | | 3.660% | 3.660% | PI Peak | **996.274** |

**D-1_Fitting 586 to 684**
**Left Edge-1 OF Woodcreek**

| Curve-D | PI | PC | PT | Ex= | K= |
|---|---|---|---|---|---|
| Sta= | 626.364 | 568.510 | 684.218 | 0.464 | 36.046 |
| Ele= | 1000.627 | 998.973 | 1001.351 | L= | 115.708 |
| BENDING | | 3.660% | 0.450% | PI Peak | **1001.091** |

## PROFILE CURVE FITTING

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PLAN AND PROFILE

C3.02
2 OF 2

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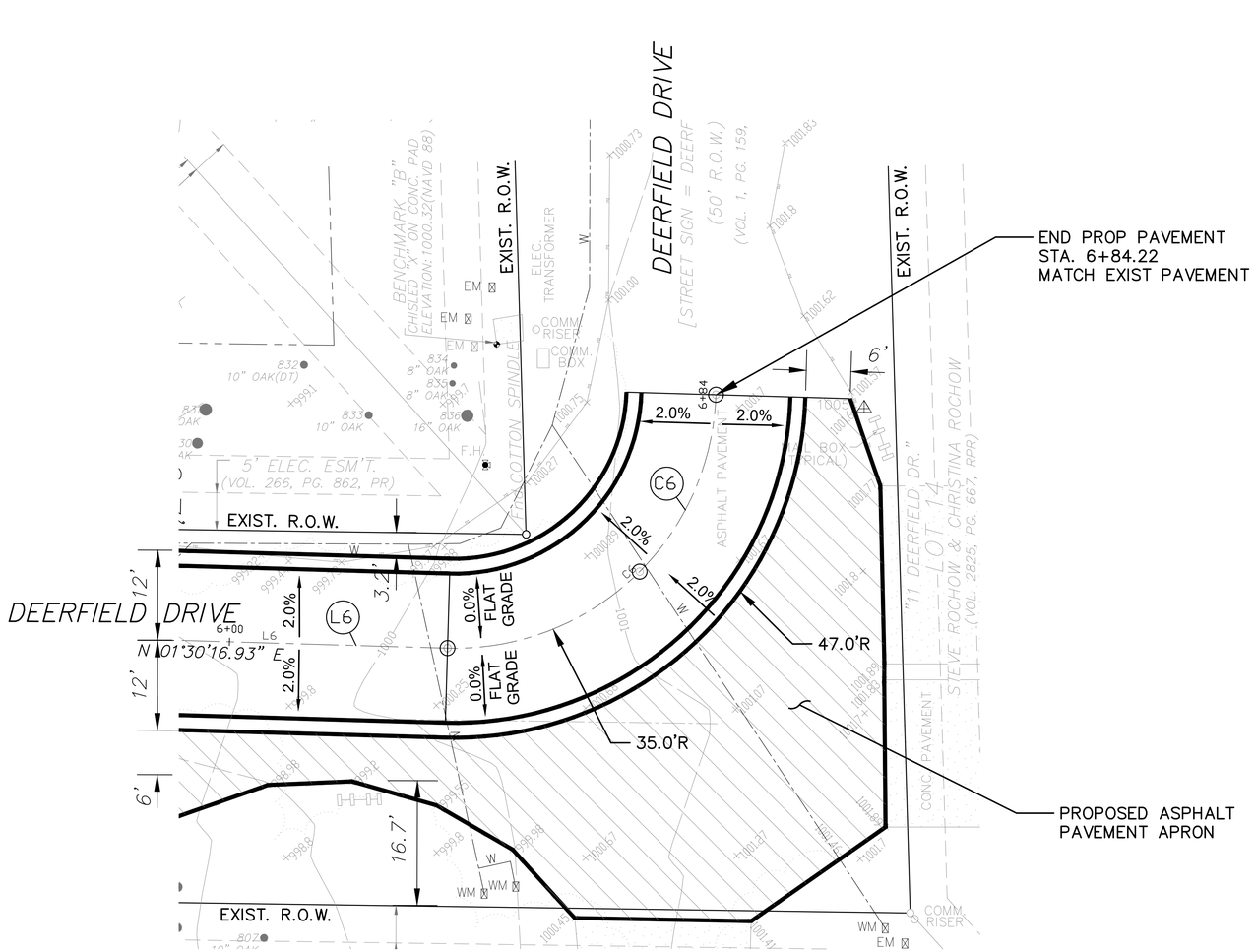


DETAIL "A"
N.T.S.

**Finalized Control Points for Linesand Curves**

| Line # | Length | Start-North | End-East | Start-North | End-North |
|---|---|---|---|---|---|
| L1 | 195.2262 | 13923650.7893 | 2252875.6208 | 13923846.0057 | 2252873.6658 |
| Bearing//Station | **0** | **-34.0000** | **-25.571** | **100.0000** | **295.22616** |
| L2 | 141.1420 | 13923922.4109 | 2252873.6304 | 13924063.5471 | 2252874.9130 |
| Bearing//Station | **0** | **31.0000** | **14.41605** | **371.63256** | **512.77458** |
| L3 | 47.7739 | 13924132.228 | 2252876.1270 | 13924179.9850 | 2252877.3814 |
| Bearing//Station | **1** | **30** | **16.61** | **581.46666** | **629.241** |

**Curves: Radius = 4000' for C1 and C2; Radius=35' for C3**

| Curve # | Length | Start-North | End-East | Start-North | End-North |
|---|---|---|---|---|---|
| C1/R=4000' | 76.4064 | 13923846.0057 | 2252873.6658 | 13923922.4109 | 2252873.6304 |
| Sweep//Station | 1 | 5 | 40 | **295.2262** | **371.6326** |
| C2/R=4000' | 68.6921 | 13924063.5471 | 2252874.9130 | 13924132.2276 | 2252876.1270 |
| Sweep//Station | 0 | 59 | 2 | **512.7746** | **581.4667** |
| C3/R=35' | 54.9779 | 13924179.985 | 2252877.3814 | 13924214.9850 | 2252842.3814 |
| Sweep//Station | 90 | 0 | 0 | **629.2405** | **684.2184** |

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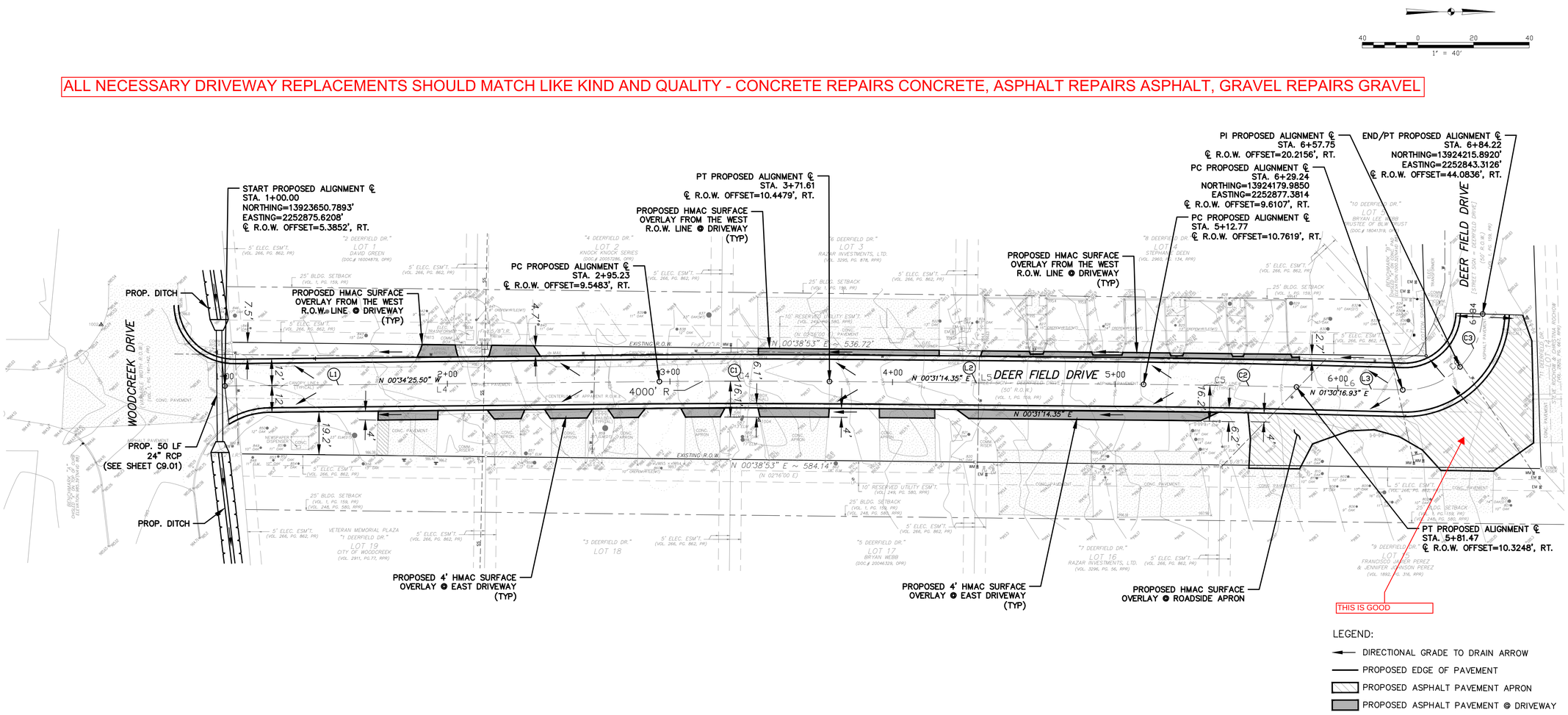
DETAILS

C4.01

ALL NECESSARY DRIVEWAY REPLACEMENTS SHOULD MATCH LIKE KIND AND QUALITY - CONCRETE REPAIRS CONCRETE, ASPHALT REPAIRS ASPHALT, GRAVEL REPAIRS GRAVEL




**Finalized Control Points for Linesand Curves**

| Line # | Length | Start-North | End-East | Start-North | End-North |
|---|---|---|---|---|---|
| L1 | 195.2262 | 13923650.7893 | 2252875.6208 | 13923846.0057 | 2252873.6658 |
| Bearing//Station | **0** | **-34.0000** | **-25.571** | **100.0000** | **295.22616** |
| L2 | 141.1420 | 13923922.4109 | 2252873.6304 | 13924063.5471 | 2252874.9130 |
| Bearing//Station | **0** | **31.0000** | **14.41605** | **371.63256** | **512.77458** |
| L3 | 47.7739 | 13924132.228 | 2252876.1270 | 13924179.9850 | 2252877.3814 |
| Bearing//Station | **1** | **30** | **16.61** | **581.46666** | **629.241** |

**Curves: Radius = 4000' for C1 and C2; Radius=35' for C3**

| Curve # | Length | Start-North | End-East | Start-North | End-North |
|---|---|---|---|---|---|
| C1/R=4000' | 76.4064 | 13923846.0057 | 2252873.6658 | 13923922.4109 | 2252873.6304 |
| Sweep//Station | 1 | 5 | 40 | **295.2262** | **371.6326** |
| C2/R=4000' | 68.6921 | 13924063.5471 | 2252874.9130 | 13924132.2276 | 2252876.1270 |
| Sweep//Station | 0 | 59 | 2 | **512.7746** | **581.4667** |
| C3/R=35' | 54.9779 | 13924179.985 | 2252877.3814 | 13924214.9850 | 2252842.3814 |
| Sweep//Station | 90 | 0 | 0 | **629.2405** | **684.2184** |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GRADING PLAN

C5.01
1 OF 1

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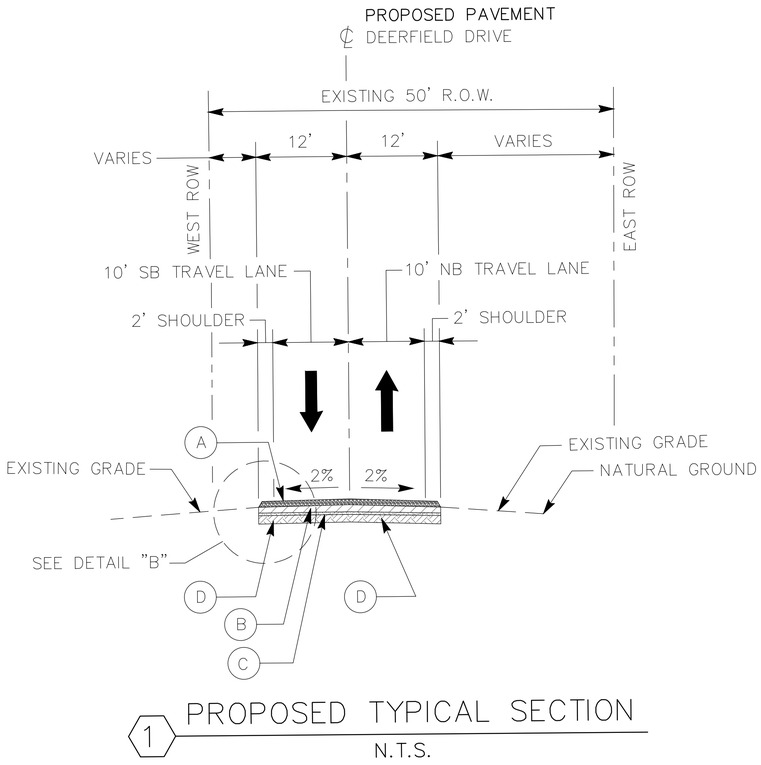
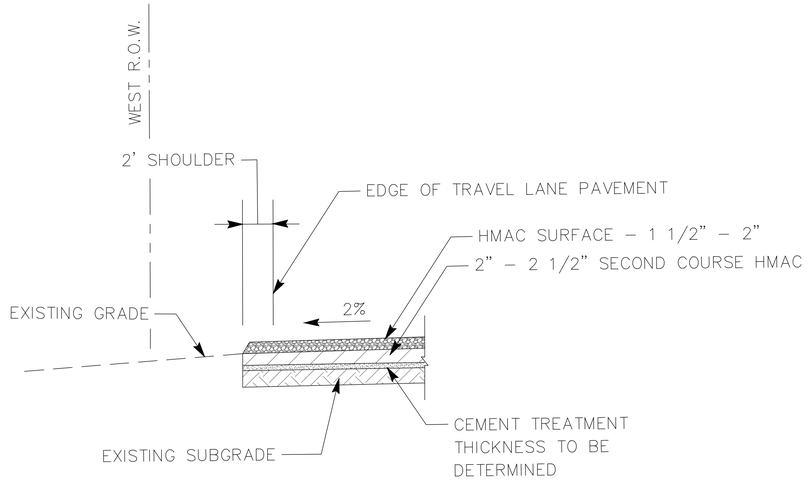



1 PROPOSED TYPICAL SECTION

N.T.S.

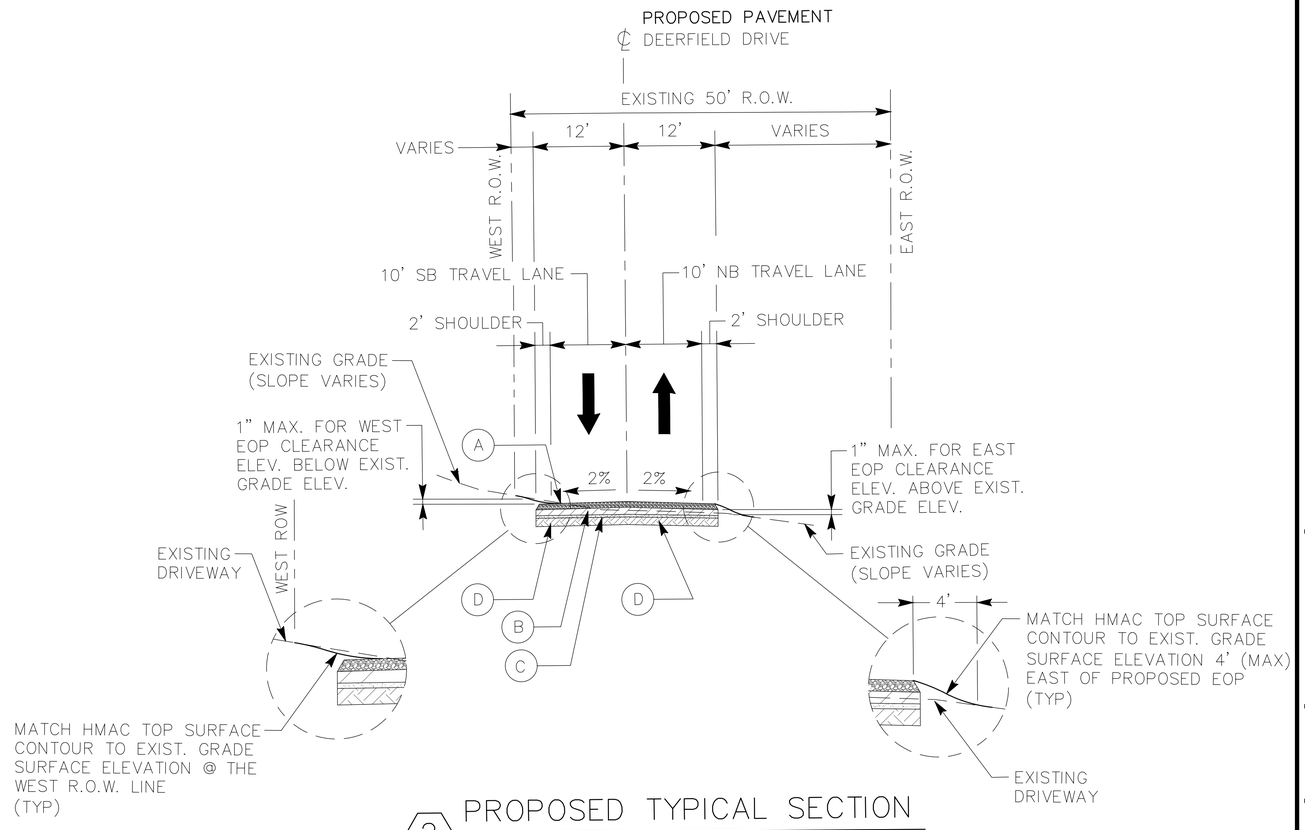



B DETAIL

N.T.S.

LEGEND:

- (A) 1 1/2" – 2" HMAC SURFACE
- (B) 2" – 2 1/2" SECOND COURSE HMAC
- (C) CEMENT BASE TREATMENT
- (D) EXISTING SUBGRADE
- (E) THE CLIENT SHOULD DETERMINE THE TYPICAL SECTIONS PRIOR TO STARTING 60% DESIGN
- NEW TRAVEL LANE




2 PROPOSED TYPICAL SECTION

N.T.S.

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TYPICAL SECTIONS

C6.01

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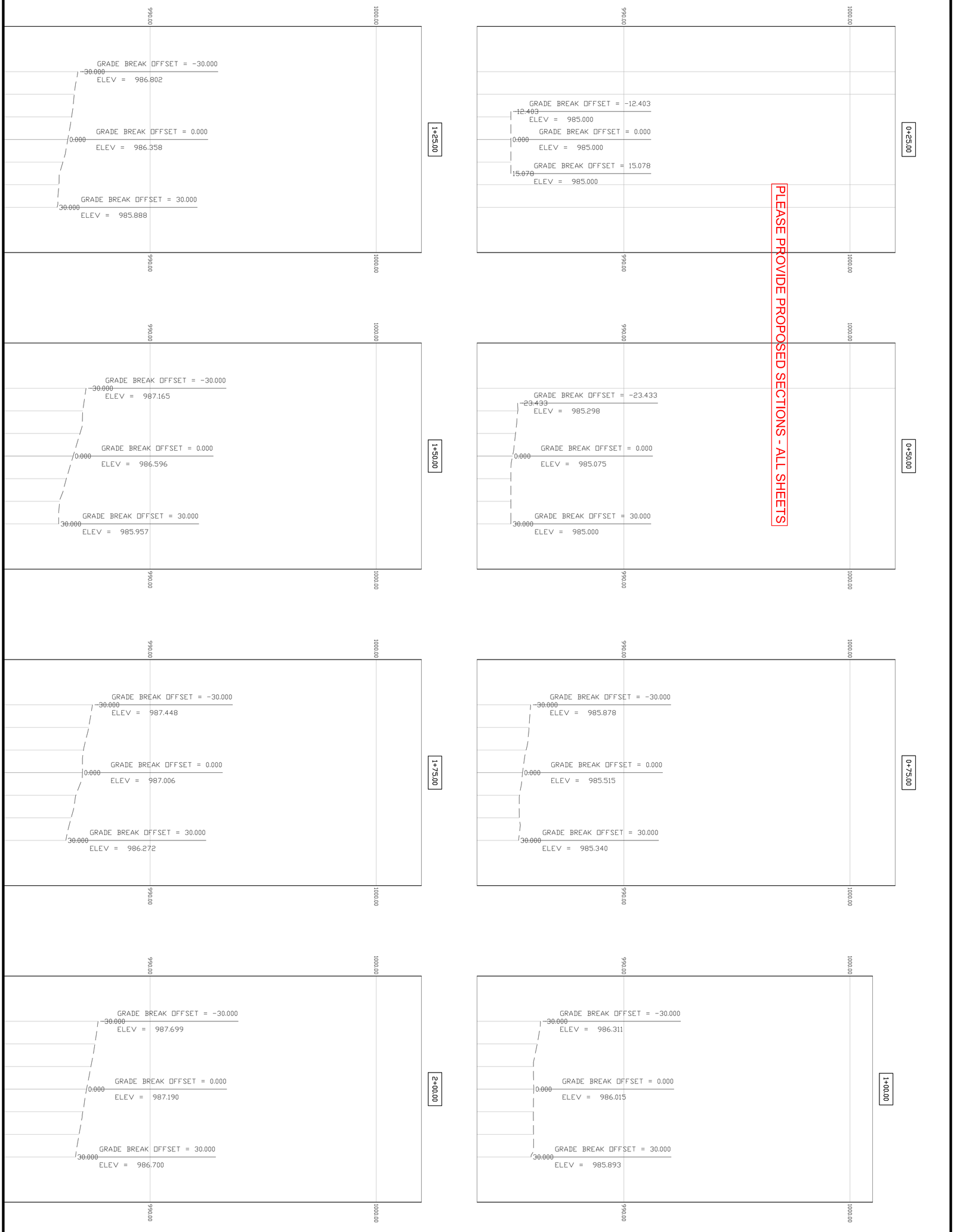


C6.02
1 OF 4

EXIST. CROSS SECTIONS

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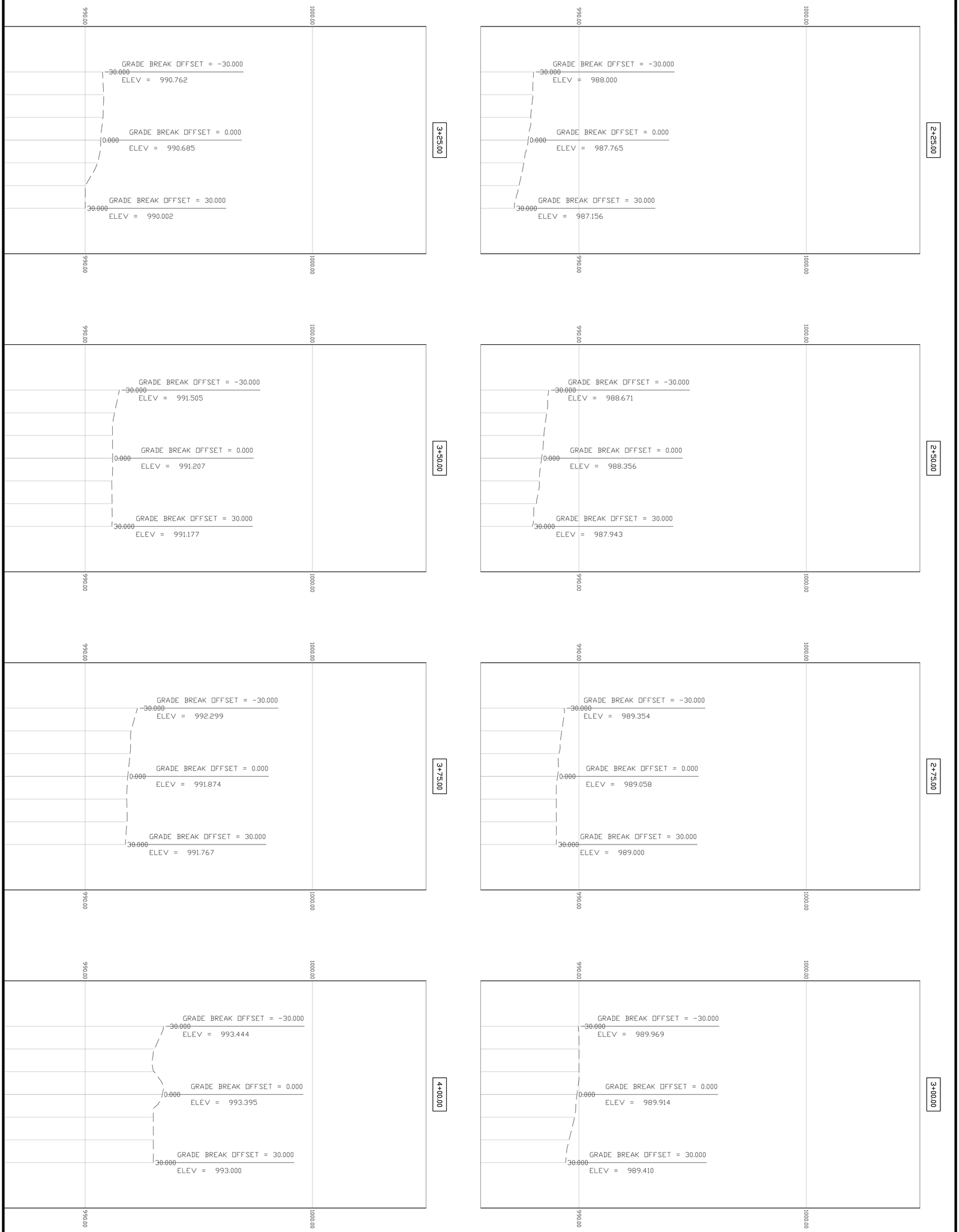


C6.03
2 OF 4

EXIST. CROSS SECTIONS

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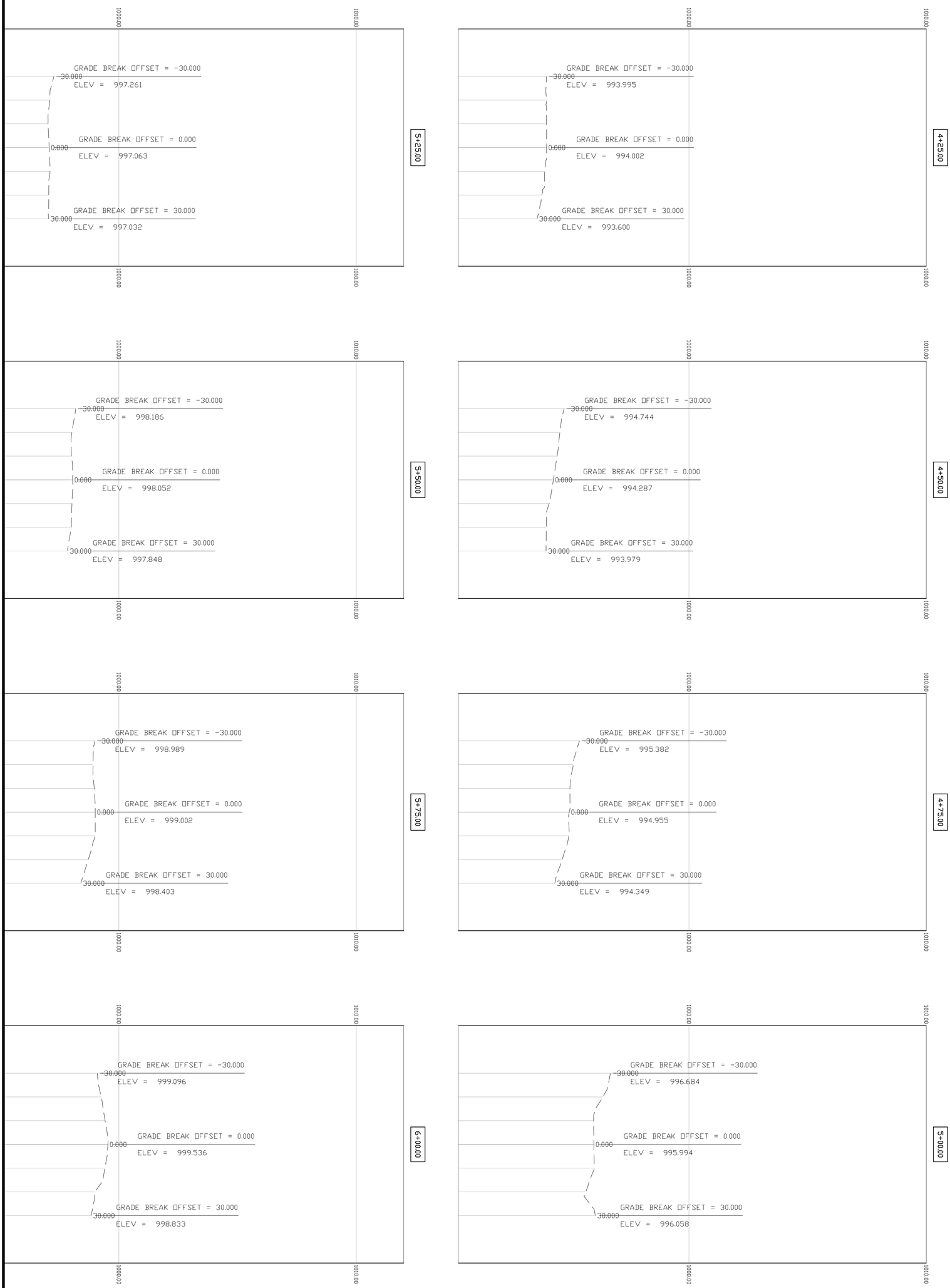


C6.04
3 OF 4

EXIST. CROSS SECTIONS

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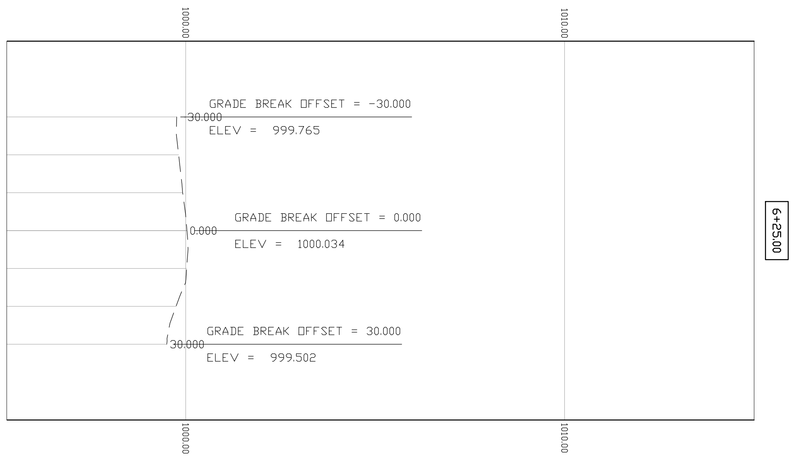


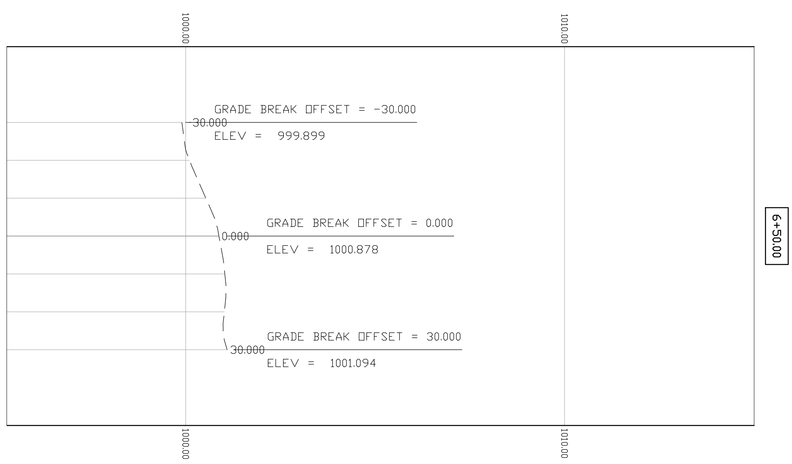


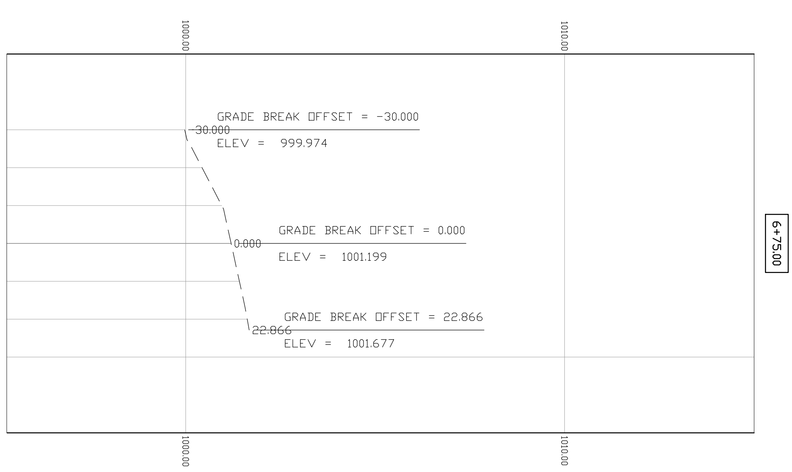


C6.05
4 OF 4

EXIST. CROSS SECTIONS

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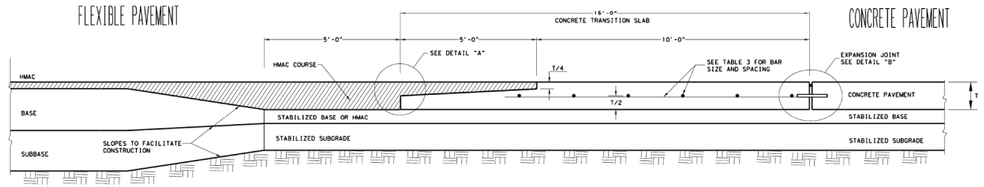
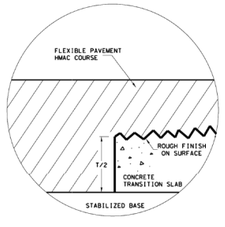
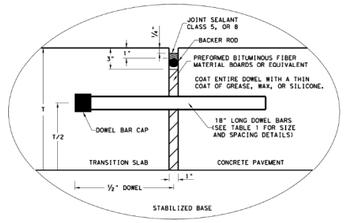
FILE:




TYPICAL JUNCTION OF CONCRETE PAVEMENT WITH FLEXIBLE PAVEMENT
(NOT TO SCALE)




DETAIL "A"




DETAIL "B"

GENERAL NOTES

1. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATIONS FOR "CONCRETE PAVEMENT" AND "REINFORCING STEEL."
2. DETAILS FOR PAVEMENT WIDTH AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS.
3. MATCH THE LONGITUDINAL JOINTS OF THE CONCRETE TRANSITION SLAB WITH ADJOINING CONCRETE PAVEMENT. PROVIDE EQUIVALENT TIEBARS OR TRANSVERSE BARS AT THESE LONGITUDINAL JOINTS, SEE TABLE NO. 2.
4. REFER TO DMS-6310, "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
5. TRANSITION SLABS WILL BE PAID UNDER ITEM 360, "CONCRETE PAVEMENTS."

TABLE NO. 1 DOWELS (SMOOTH BARS)

| SLAB THICKNESS T (IN.) | BAR DIA. AND LENGTH | SPACING (IN.) |
|---|---|---|
| 7 TO 7.5 | 1" X 18" | 12 |
| 8 TO 10 | 1 ¼" X 18" | 12 |
| 10 TO 13 | 1 ½" X 18" | 12 |

TABLE NO. 2 TIE BARS (DEFORMED BARS)

| SLAB THICKNESS T (IN.) | BAR SIZE | SPACING (IN.) |
|---|---|---|
| 7 TO 7.5 | #5 | 24 |
| 8 TO 13 | #6 | 24 |

TABLE NO. 3 TRANSITION SLAB STEEL (DEFORMED BARS)

| SLAB THICKNESS T (IN.) | BAR SIZE | SPACING (IN.) TRANSVERSE DIRECTION | SPACING (IN.) LONGITUDINAL DIRECTION |
|---|---|---|---|
| 7 TO 7.5 | #5 | 24 | 12 |
| 8 TO 13 | #6 | 24 | 12 |

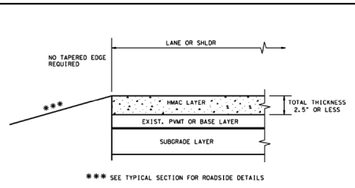
ADJUST SPACING OF LONGITUDINAL BARS AS NEEDED TO ACCOMODATE DOWEL BAR SPACING.

Texas Department of Transportation | Design Division Standard

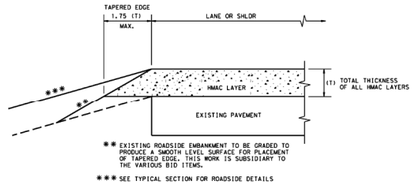
**CONCRETE PAVEMENT DETAILS**
**TRANSITION SLAB**
**T-7 to 13 INCHES**

**TRANS-20**

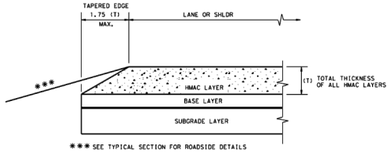
| FILE: trans1tb120.dgn | DN: TxDOT | CK: TxDOT | DW: KN | CK: KW |
|---|---|---|---|---|
| ©TxDOT NOVEMBER 2020 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | DIST | COUNTY | | SHEET NO. |



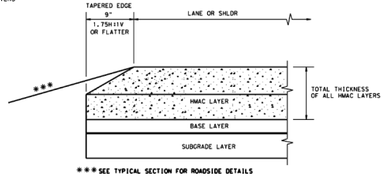

CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS




CONDITION - 2
OVERLAY OF EXISTING PAVEMENT
HMAC THICKNESS 2.5" TO 5"




CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 2.5" TO 5"




CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 5" OR GREATER

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

(NOT TO SCALE)

Texas Department of Transportation | Design Division Standard

**TAPERED EDGE DETAILS**
**HMAC PAVEMENT**

**TE(HMAC)-11**

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| ©TxDOT January 2011 | CONT | SECT | JOB | HIGHWAY |
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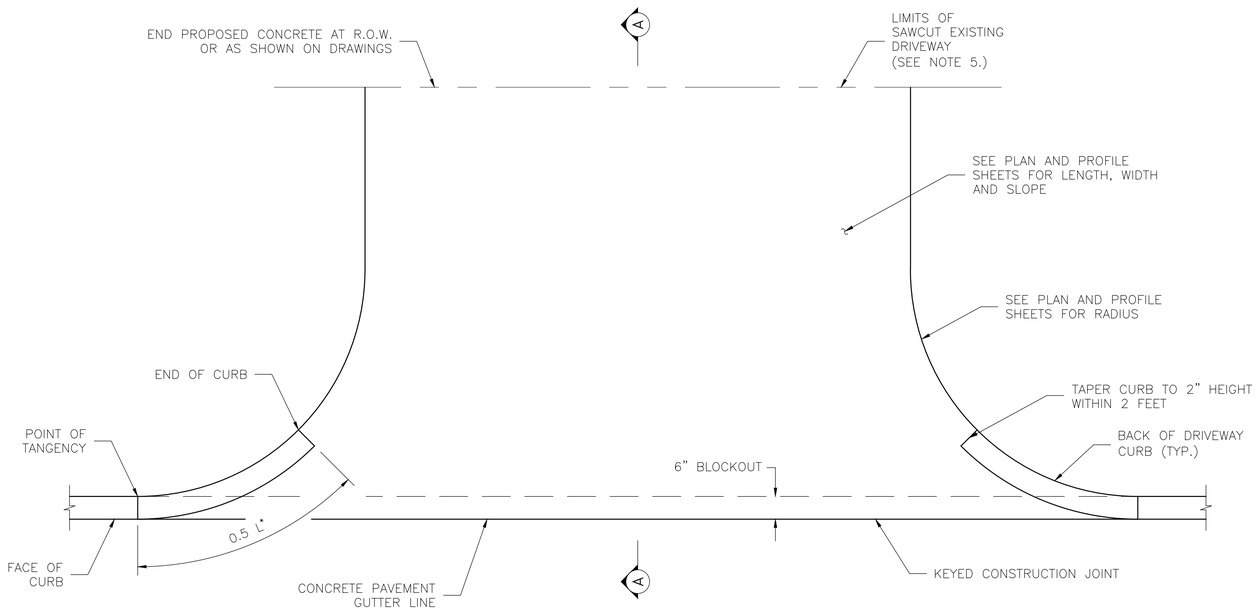
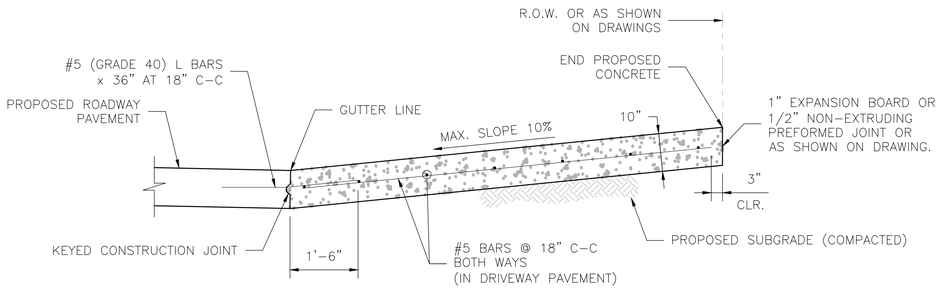
PAVING DETAILS

C7.01

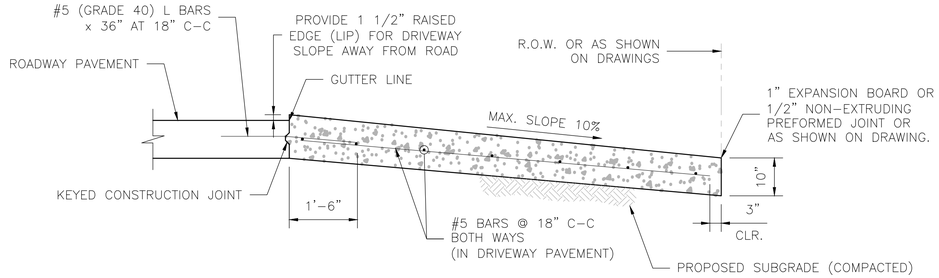



L* = LENGTH OF ARC

PLAN VIEW




SECTION A-A
(DRIVEWAY SLOPES TO ROADWAY)




SECTION A-A
(DRIVEWAY SLOPES AWAY FROM ROADWAY)

## NOTES:

1. SAWCUT EXISTING DRIVEWAY AT R.O.W. LINE OR AS SHOWN ON DRAWING AND REMOVE EXISTING DRIVEWAY TO SAWCUT LINE.
2. IF THERE IS EXISTING CURB ON DRIVEWAY, CONNECT PROPOSED CURB TO EXISTING CURB; OTHERWISE TAPER CURB HEIGHT AS SHOWN.
3. SEE PAVEMENT DETAIL SHEET FOR CONCRETE CURB REINFORCEMENT.
4. THIS DRIVEWAY INSTALLATION IS GOVERNED BY ITEM 360.
5. LIMIT OF SAWCUT OF PAVEMENT TO APPROACH TO EXISTING DRIVEWAYS:
   (A) UP TO THE R.O.W. ALONG WEST SHOULDER
   (B) UP TO 4'-0" BEYOND THE EAST BOUNDRY OF PAVEMENT.

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DRIVEWAY DETAILS

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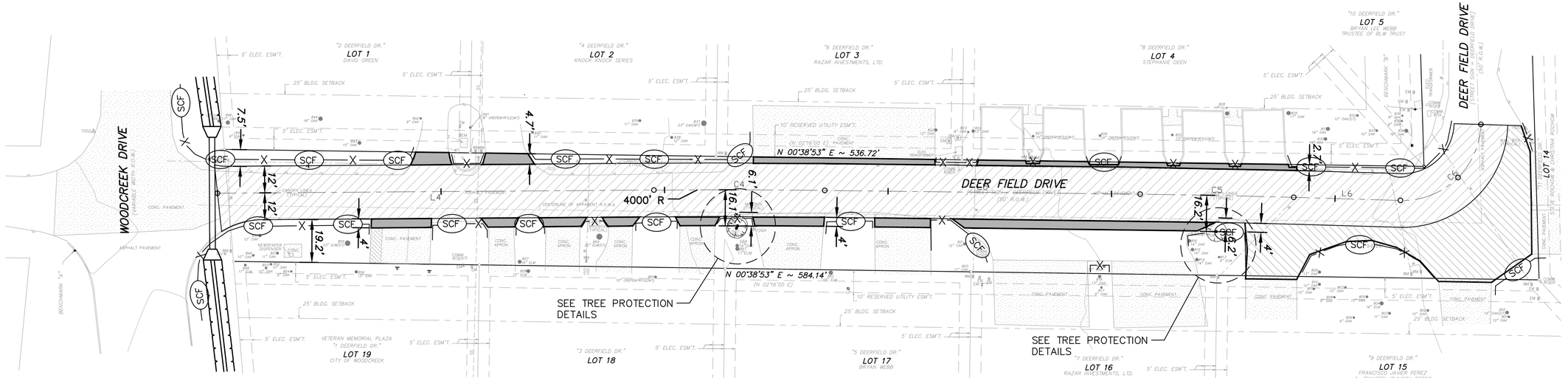


50 0 50 100
1" = 50'
HORZ:

NOTES:

1. STABILIZED CONSTRUCTION ACCESS QUANTITY INCLUDED FOR CONSTRUCTION EXITS ACTUAL LOCATION TO BE DETERMINED BY CONTRACTOR.
2. FILTER FENCING IS NOT TYPICALLY REQUIRED ALONG THE R.O.W. LINE UNLESS STORM WATER FLOWS FROM THE R.O.W. ONTO PRIVATE PROPERTY, WHICH SHOULD BE AVOIDED.

LEGEND:

- SCF — SEDIMENT CONTROL FENCE (SEE TXDOT DETAIL EC(1)–16)
- REFER TO TREE PROTECTION DETAILS (TXDOT DETAIL TPD–19)
- PROPOSED ROAD PAVING
- PROPOSED APRON PAVING

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SWPPP SHEET

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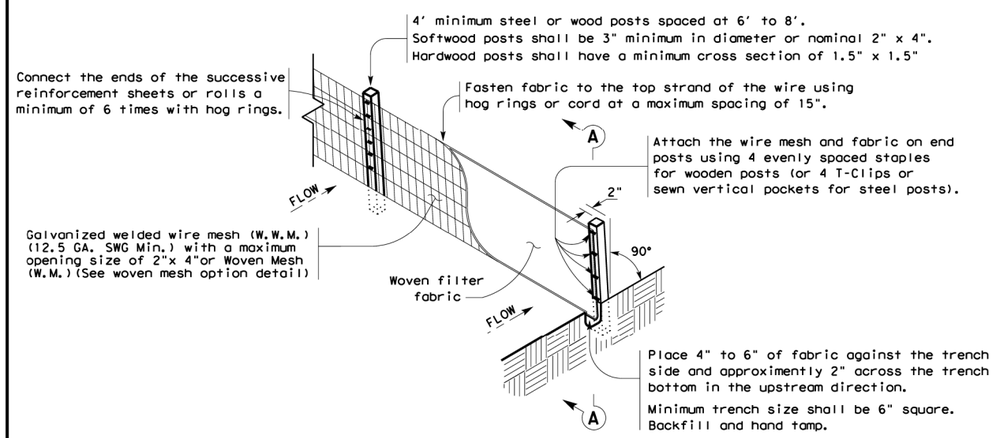
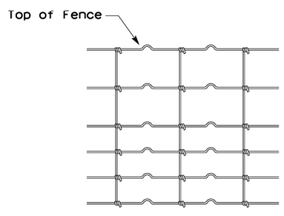
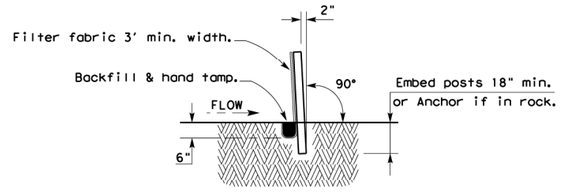



## TEMPORARY SEDIMENT CONTROL FENCE

SCF




## SECTION A-A

## HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

### 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 maximum 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.

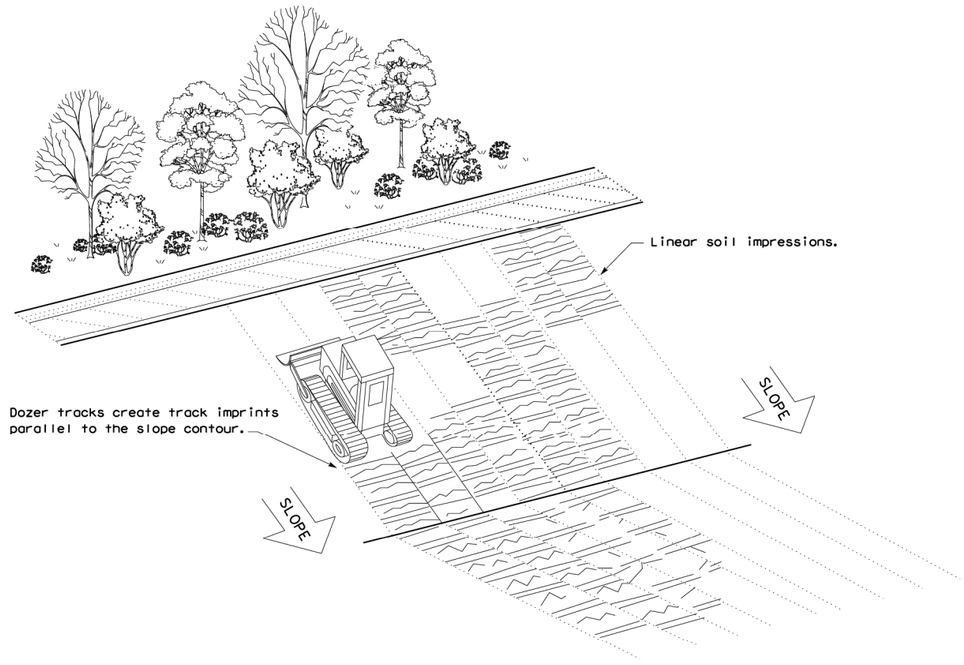
### LEGEND

Sediment Control Fence

SCF

## GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.




## VERTICAL TRACKING

Texas Department of Transportation — Design Division Standard

# TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
## FENCE & VERTICAL TRACKING
## EC(1)-16

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| ©TxDOT: JULY 2016 | CONT | SECT | JOB | HIGHWAY | | |
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SWPPP DETAILS

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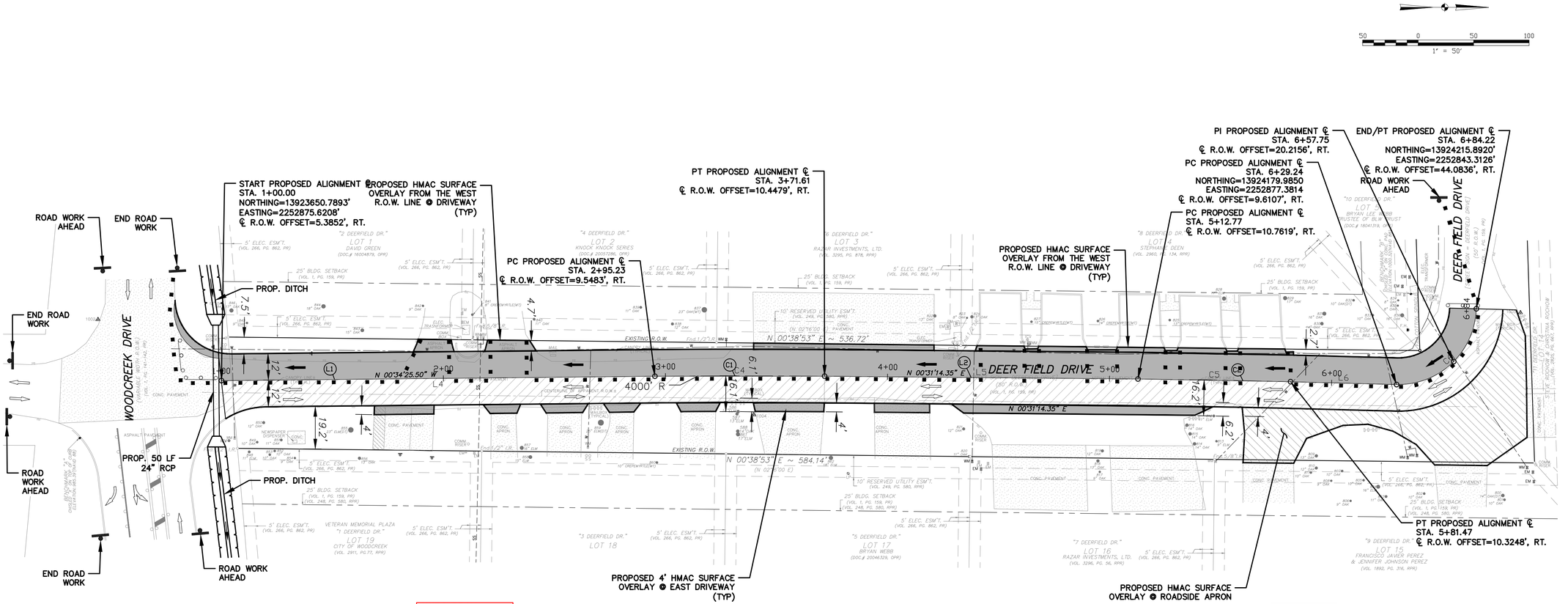


MAKE SURE ALL SPECIFICATION ITEMS MATCH PROJECT MANUAL

GENERAL NOTES:

1. PRIOR TO ANY PHASE, IMPLEMENT ADVANCE WARNING SIGNS IN ACCORDANCE WITH HAYS COUNTY BARRICADE AND CONSTRUCTION STANDARDS (BC) AND SHOWN IN THE TCP.
2. PRIOR TO ANY PHASE, PLACE CHANNELIZING DEVICES AND BARRICADES AS SHOWN IN THE PLANS.
3. MAINTAIN ACCESS TO ALL PROPERTY OWNER'S DRIVEWAY THROUGHOUT CONSTRUCTION. REFER TO TCP ITEM ___, TEMPORARY ACCESS DRIVEWAYS SHALL PROVIDE AN ALL–WEATHER SURFACE AND SHALL BE MAINTAINTED BY THE CONTRACTOR IN A CONDITION ACCEPTABLE TO THE ENGINEER. WHERE INDICATED IN THE BID DOCUMENTS, ASPHALT MILLINGS MAY BE USED FOR TEMPORARY DRIVEWAYS.

PHASE 1 SOUTHBOUND ROADWAY CONSTRUCTION:

TRAFFIC OPERATIONS:

1. BEGIN TRAFFIC MERGE AT WOODCREEK DRIVE.
2. CONTRACTOR TO REFER TO ITEM ___ FOR INSTALLING TEMPOARY PAVEMENT.
3. THE EXISTING NORTHBOUND TRAFFIC LANE WILL BE SWITCHED TO ONE LANE FOR NORTHBOUND AND SOUTHBOUND TRAFFIC.

CONSTRUCTION:

1. DEMOLISH EXISTING SOUTHBOUND LANE (SEE SHEET C2.01, DEMOLITION PLAN).
2. CONSTRUCT PROPOSED SOUTHBOUND 10' LANE AND 2" SHOULDER FROM STATION 1+00 TO STATION 6+85.22 (END).
3. ALL DRIVEWAYS ON THE WEST SIDE OF ROADWAY WILL BE INSTALLED ONE HALF AT A TIME TO ALLOW FOR RESIDENTS ACCESS.

PHASE 2 NORTHBOUND ROADWAY CONSTRUCTION:

TRAFFIC OPERATIONS:

1. THE TRAFFIC ON THE OLD NORTHBOUND ROADWAY WILL BE SWITCHED TO THE NEWLY CONSTRUCTED SOUTHBOUND LANES (TWO WAY TRAFFIC).
2. MODIFY TRANSITION FROM SOUTHBOUND TO NORTHBOUND BETWEEN WOODCREEK DRIVE AND TO STATION 6+85.22 (END).

CONSTRUCTION:

1. DEMOLISH EXISTING NORTHBOUND LANE (SEE SHEET C2.01, DEMOLITION PLAN)
2. CONSTRUCT 10' TRAFFIC LANE AND 2' SHOULDER PROPOSED NORTHBOUND ROAD PAVEMENT FROM STATION 1+00 TO 6+84.22 (END) TO W. BELFORT BLVD.
3. ALL DRIVEWAYS ON THE EAST SIDE OF ROADWAY WILL BE INSTALLED ONE HALF SIDE AT A TIME TO ALLOW FOR RESIDENTS ACCESS.

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CONSTRUCTION SEQUENCE

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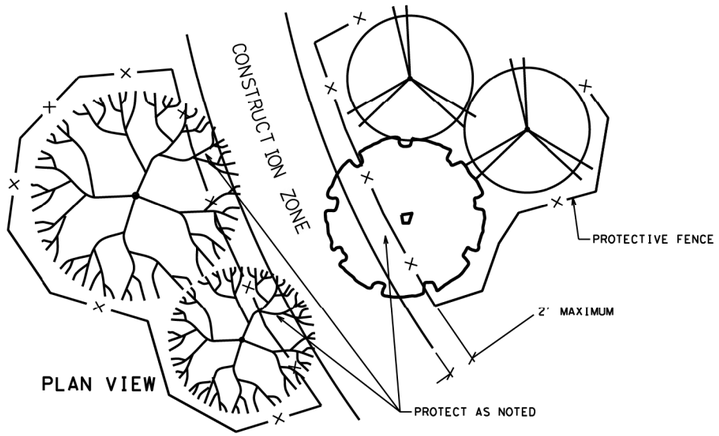
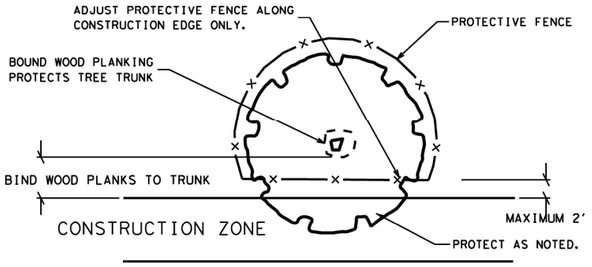
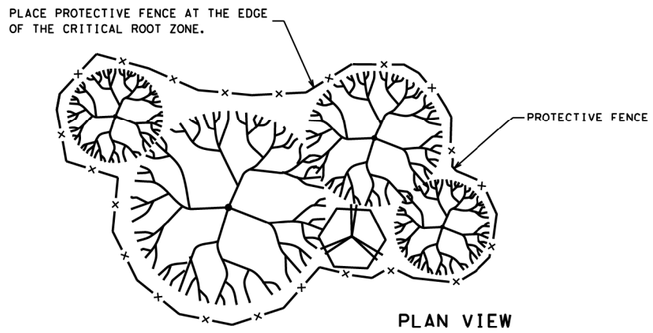


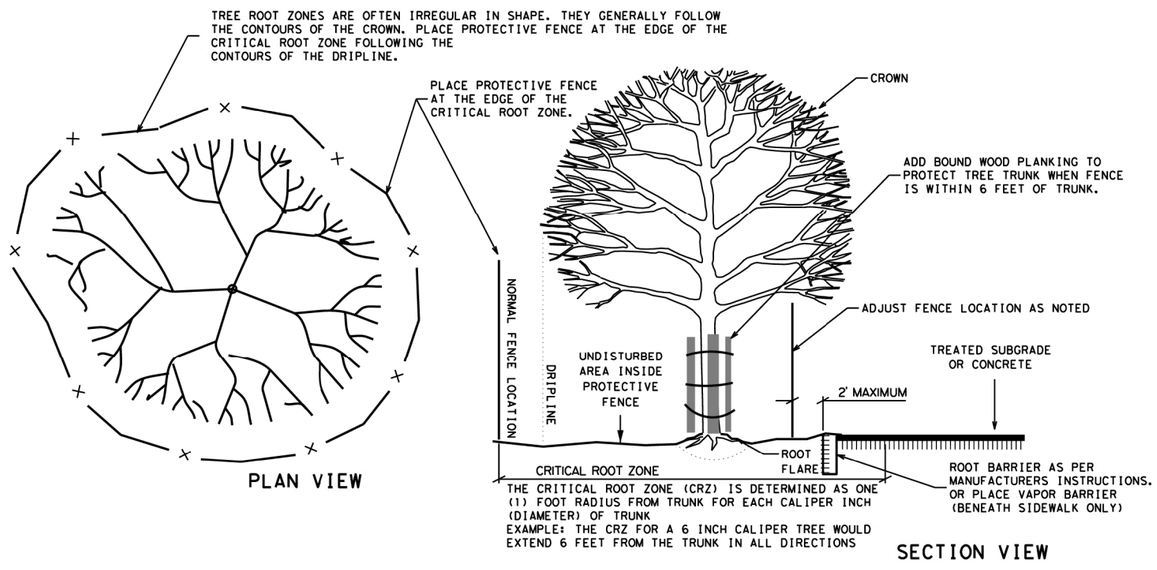

LINEAR CONSTRUCTION THROUGH STAND OF TREES




PLAN VIEW
PAVING UNDER TREES




TYPICAL TREE GROUPING PROTECTION




TYPICAL TREE PROTECTION

## NOTES:

CRITICAL ROOT ZONE IS 1 FT. AWAY FROM TREE TRUNK FOR EVERY 1 IN. OF TREE DIAMETER MEASURED AT 4 FT. HEIGHT.

WATER TREES EVERY 2 WEEKS WITH A MINIMUM OF 100 GALLONS PER TREE.

SPRAY TREE WITH WATER TO REMOVE CONSTRUCTION DUST WHEN DIRECTED.

CONSTRUCTION FENCE SHALL BE 4 FT. TALL.

DO NOT PERFORM WORK OR STORE EQUIPMENT WITHIN PROTECTED AREA.

COVER THE CRITICAL ROOT ZONE BETWEEN THE PROTECTED AREA AND THE CONSTRUCTION ZONE WITH 4 IN. OF MULCH

PERFORM TREE TRIMMING AND WOUND REPAIR PER STANDARD SPECIFICATIONS.

DAMAGED AND EXPOSED ROOTS SHALL BE TRIMMED AND TREATED PER STANDARD SPECIFICATIONS. BACKFILL EXPOSED ROOTS WITH TOPSOIL WITHIN 24 HOURS OF EXPOSURE.

PLACE PLASTIC UNDER CONCRETE PLACED IN THE CRITICAL ROOT ZONE.

PLACE A ROOT BARRIER IN THE CRITICAL ROOT ZONE AT THE EDGE OF TREATED SUBGRADE TO THE DEPTH OF THE SUBGRADE.

ALL WORK IS SUBSIDIARY TO BID ITEM.

Texas Department of Transportation | Austin District Standard

# TREE PROTECTION DETAILS

TPD-19(AUS)



REVISIONS
06/16: SHEET CREATED
04/19: APPROVED

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TREE PROTECTION DETAIL

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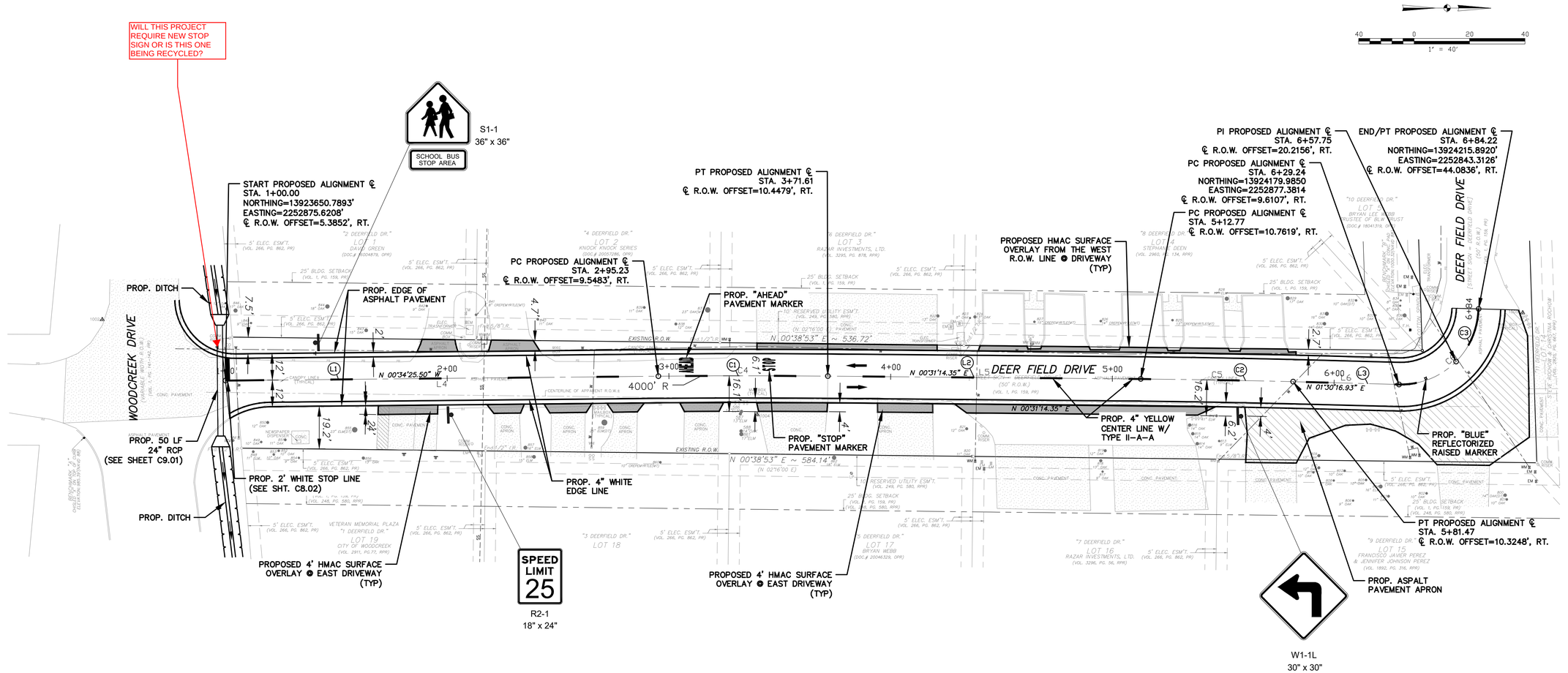


LEGEND:

- PROP. 2' "STOP LINE" PAVEMENT MARKING (SEE SHT. C8.02)
- AHEAD PROP. "AHEAD" WHITE PAVEMENT MARKING WORD
- STOP PROP. "STOP" WHITE PAVEMENT MARKING WORD
- PROP. 4" "YELLOW" CENTER LINE W/ TYPE II-A-A
- PROP. 4" WHITE EDGE LINE OF 2' SHOULDER
- PROP. "BLUE" REFLECTORIZE TYPE II-B-B RAISED MARKER
- PROP. ASPHALT PAVEMENT APRON
- PROP. ASPHALT PAVEMENT @ DRIVEWAY

NOTES:

1. ALL OF THE PROPOSED MARKINGS SHOWN ARE TO BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD PAVEMENT MARKING DETAILS AND THE TEXAS M.U.T.C.D. MANUAL, PART 3.
2. CONTRACTOR SHALL REMOVE ANY EXISTING PAVEMENT MARKINGS IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION WHERE PROPOSED PAVEMENT MARKINGS ARE TO BE INSTALLED.
3. CONTRACTOR TO FIELD VERIFY THE LOCATION AND LIMITS OF THE EXISTING OR PROPOSED ROADWAY BEFORE THE INSTALLATION OR REMOVAL OF ANY PAVEMENT MARKINGS.
3. REFER TO SHEET C8.03 FOR SIGN MOUNTING DETAILS.

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PAVEMENT MARKINGS AND SIGNAGE

C8.01
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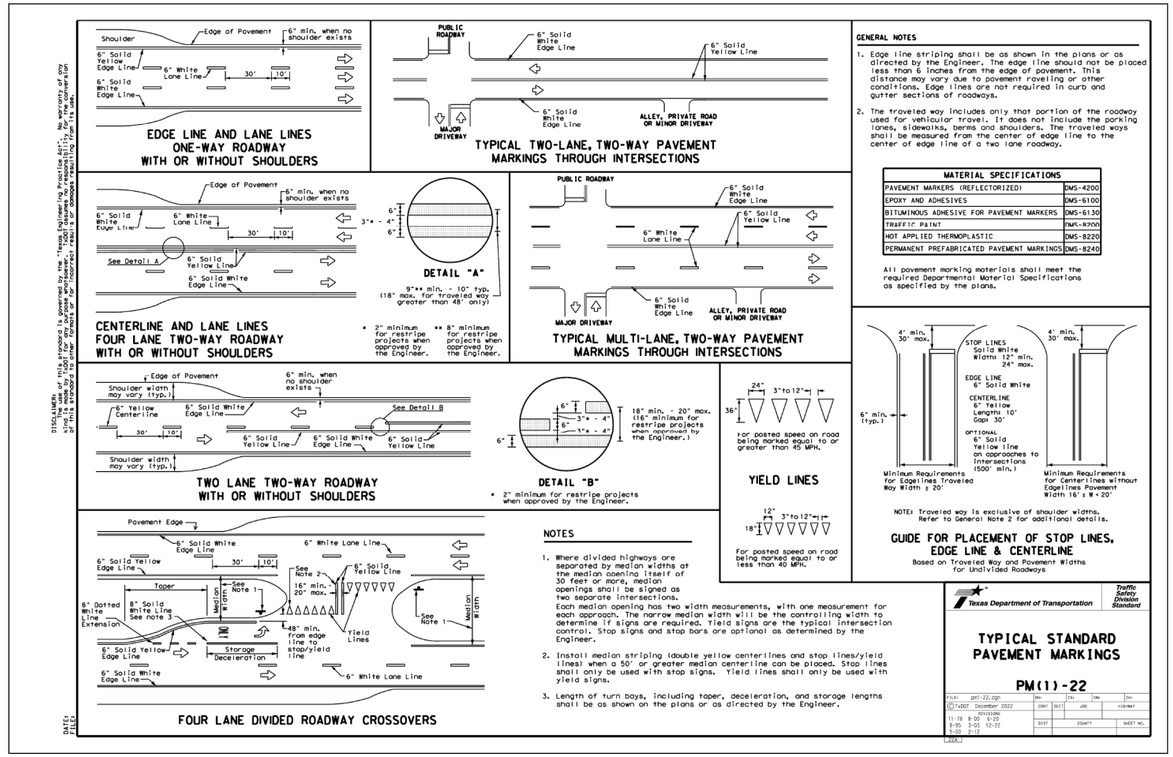


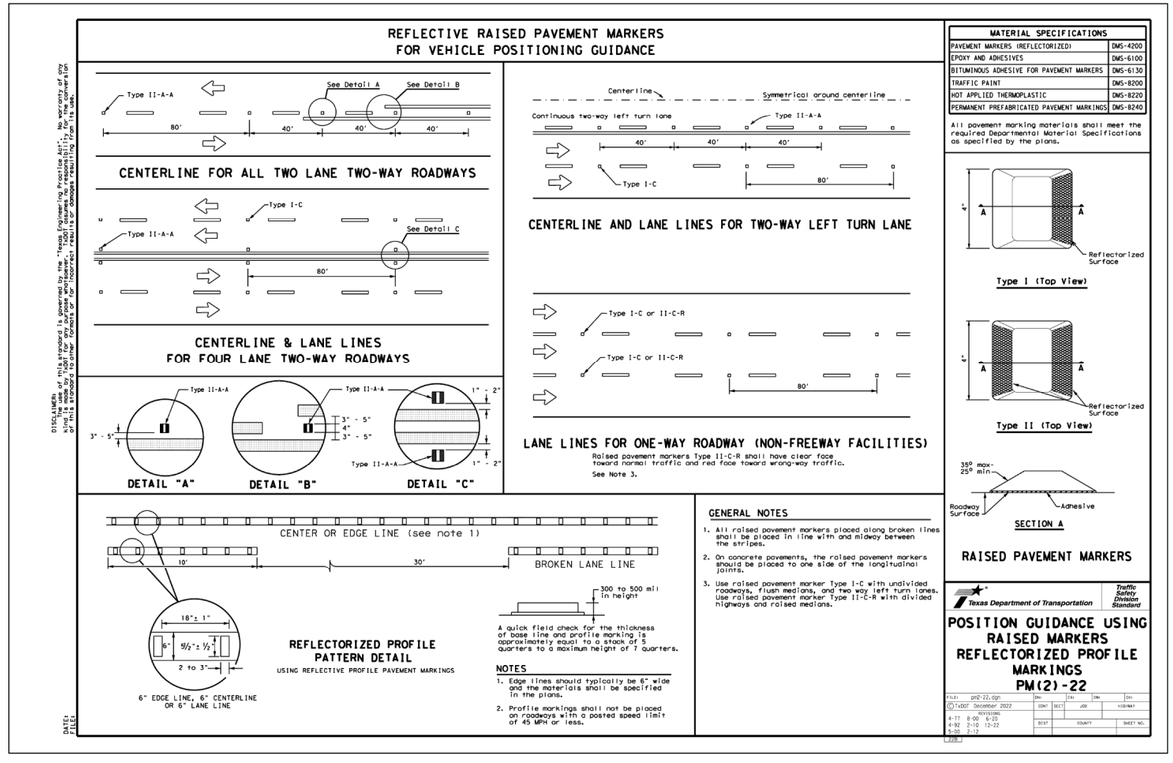


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PAVEMENT MARKINGS DETAILS

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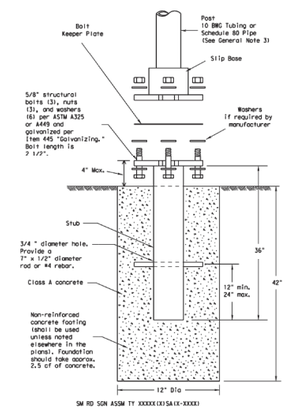
# TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

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NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the followings
   - 55,000 PSI minimum yield strength
   - 70,000 PSI minimum tensile strength
   - 20% minimum elongation in 2"

   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the followings
   - 46,000 PSI minimum yield strength
   - 62,000 PSI minimum tensile strength
   - 21% minimum elongation in 2"

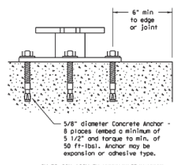
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:
   http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

## CONCRETE ANCHOR




SM RD SGN ASSM TY XXXXX(1)SB(E-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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| 9-08 REVISIONS | CONT | SECT | JOB | HIGHWAY |
| | DIST | COUNTY | | SHEET NO. |

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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.

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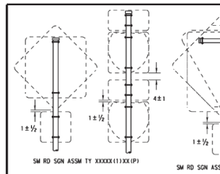
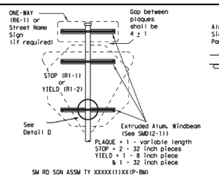
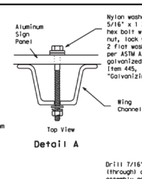



SM RD SGN ASSM TY XXXXX(1)XX(I)

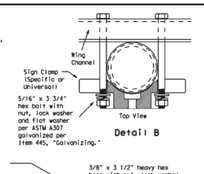
SM RD SGN ASSM TY XXXXX(1)XX(T)




SM RD SGN ASSM TY XXXXX(1)XX(P-BW)




Detail A

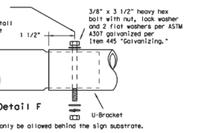



Detail B

GENERAL NOTES:

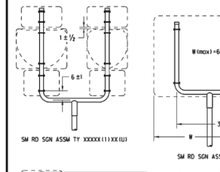
| SIGN SUPPORT | # OF POSTS | MAX. SIGN AREA |
|---|---|---|
| 10 BWG | 1 | 16 SF |
| 10 BWG | 2 | 32 SF |
| Sch 80 | 1 | 32 SF |
| Sch 80 | 2 | 64 SF |

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess plate, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front). Repair galvanized coating on cut edges per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with friction caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



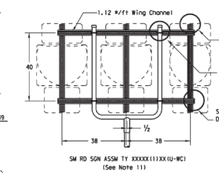

Detail F

Splices shall only be allowed behind the sign substrate.

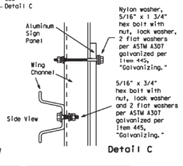



SM RD SGN ASSM TY XXXXX(1)XX(U)

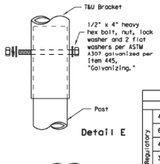
SM RD SGN ASSM TY XXXXX(1)XX(U)



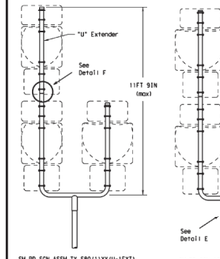

SM RD SGN ASSM TY XXXXX(1)XX(U-MC)
(See Note 11)




Detail C

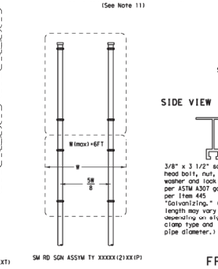



Detail E



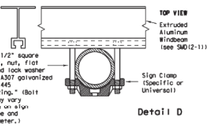

SM RD SGN ASSM TY 580(1)XX(U-1EXT)

SM RD SGN ASSM TY 580(1)XX(U-2EXT)

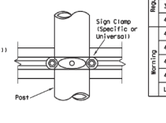



SM RD SGN ASSYM TY XXXXX(2)XX(P)

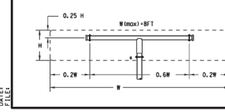
SIDE VIEW




Detail D



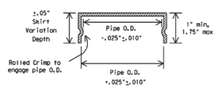

| REQUIRED SUPPORT | | |
|---|---|---|
| | SIGN DESCRIPTION | SUPPORT |
| Regulatory | 48-Inch STOP sign (R1-1) | TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW) |
| | 60-Inch YIELD sign (R1-2) | TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW) |
| | 48x16-Inch ONE-WAY sign (R6-1) | TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW) |
| | 36x48, 48x36, and 48x48-Inch signs | TY 10BWG(1)XX(T) |
| | 48x60-Inch signs | TY 5B0(1)XX(T) |
| | 48x48-Inch signs (diamond or square) | TY 10BWG(1)XX(T) |
| Warning | 48x60-Inch signs | TY 5B0(1)XX(T) |
| | 48-Inch Advance School X-ing sign (S1-1) | TY 10BWG(1)XX(T) |
| | 48-Inch School X-ing sign (S2-1) | TY 10BWG(1)XX(T) |
| | Large Arrow sign (W1-6 & W1-7) | TY 10BWG(1)XX(T) |




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

## FRICTION CAP DETAIL




Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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CITY OF WOODCREEK

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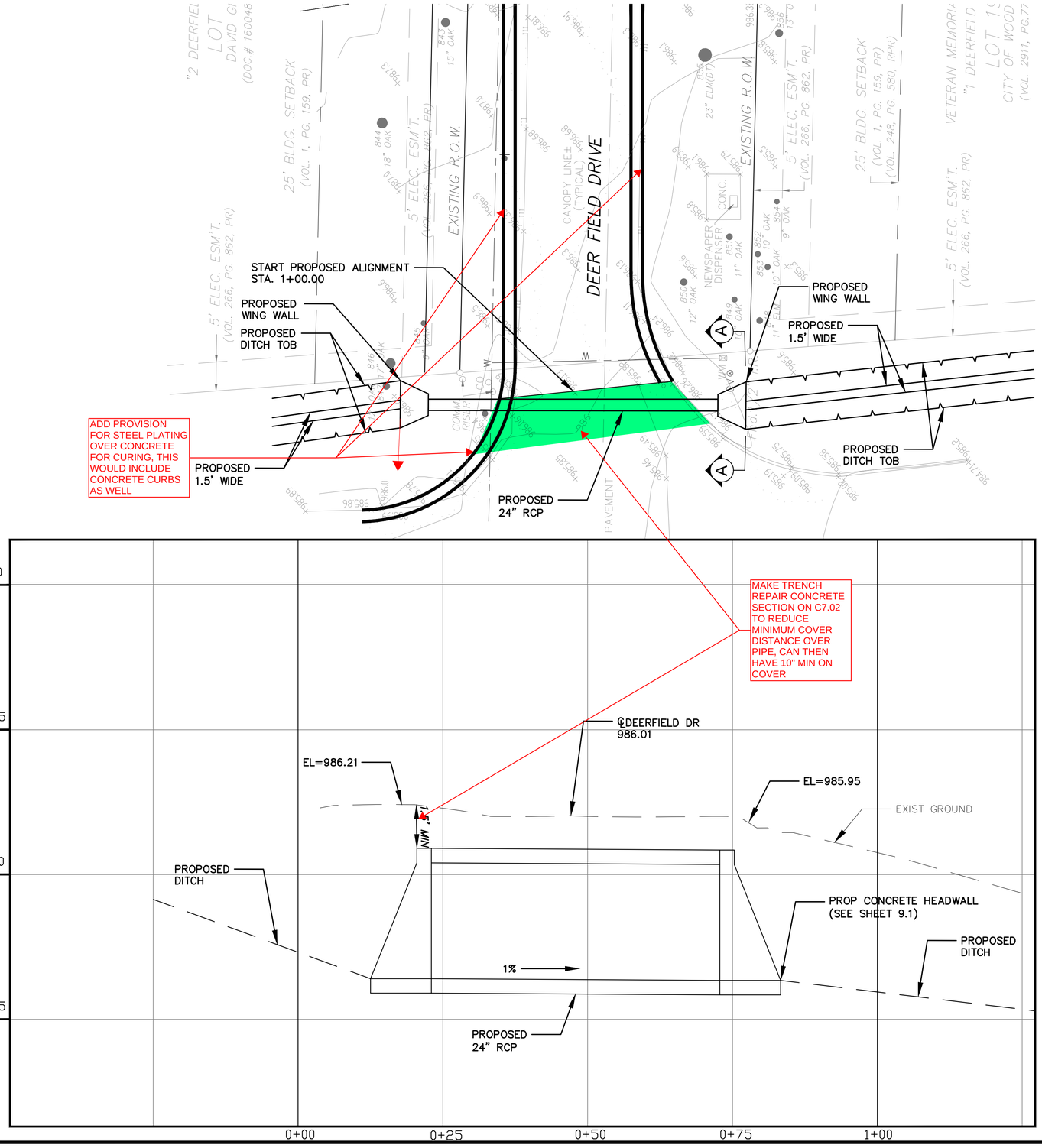
SIGN MOUNTING DETAILS

C8.03



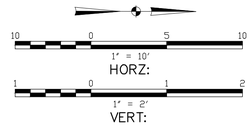
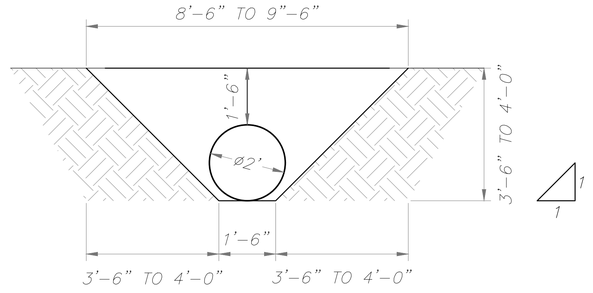




EXHIBIT NOTES:

1. PROPOSED SWALE ON E SIDE OF DEERCREEK TO BE GRADED AT MINIMUM 1%.
2. FIELD VERIFY LOCATION OF WATERLINE TO ENSURE NO CONFLICT WITH PROPOSED 24" CULVERT.
3. SIDE SLOPE ON SWALE MAXIMUM TO BE 1:1.
4. WINGWALL DETAIL SEE TXDOT STANDARD REFERENCED IN SHEET C9.02.




SECTION "A-A"

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CULVERT EXHIBIT

C9.01
1 OF 1

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USER: Jan 02, 2025 - 10:16am jsmart
PLOT TAB: CULVERT EXHIBIT

## TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

| Slope | Dia of Pipe (D) | Values for One Pipe W | X | Y | L | Reinf (Lbs) | Conc (CY) (1) | Values to be Added for Each Addt'l Pipe X and W | Reinf (Lbs) | Conc (CY) (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2:1 | 12" | 4'-7 1/2" | 2'-6" | 2'-10" | 3'-3 3/4" | 88 | 0.6 | 1'-9" | 20 | 0.2 |
| | 15" | 5'-5 3/4" | 2'-9 1/2" | 3'-4" | 3'-10 1/4" | 103 | 0.7 | 2'-2" | 24 | 0.3 |
| | 18" | 6'-4 1/4" | 3'-1" | 3'-10" | 4'-5" | 124 | 0.9 | 2'-8" | 32 | 0.3 |
| | 21" | 7'-2 3/4" | 3'-4 1/2" | 4'-4" | 5'-0" | 143 | 1.1 | 3'-1" | 43 | 0.4 |
| | 24" | 8'-2 1/2" | 3'-9 1/2" | 4'-10" | 5'-7" | 164 | 1.3 | 3'-7" | 50 | 0.5 |
| | 27" | 9'-1" | 4'-1" | 5'-4" | 6'-2" | 179 | 1.5 | 3'-11" | 56 | 0.6 |
| | 30" | 9'-11 1/2" | 4'-4 1/2" | 5'-10" | 6'-8 3/4" | 203 | 1.7 | 4'-4" | 65 | 0.8 |
| | 33" | 10'-10" | 4'-8" | 6'-4" | 7'-3 3/4" | 224 | 2.0 | 4'-8" | 71 | 0.9 |
| | 36" | 11'-8 1/2" | 4'-11 1/2" | 6'-10" | 7'-10 3/4" | 249 | 2.2 | 5'-1" | 81 | 1.0 |
| | 42" | 13'-5 1/2" | 5'-6 1/2" | 7'-10" | 9'-0 1/2" | 298 | 2.8 | 5'-10" | 97 | 1.3 |
| | 48" | 15'-9" | 6'-1 1/2" | 9'-4" | 10'-9 1/2" | 360 | 3.8 | 6'-7" | 117 | 1.7 |
| | 54" | 17'-5 3/4" | 6'-8 1/2" | 10'-4" | 11'-11 1/4" | 427 | 4.5 | 7'-6" | 151 | 2.1 |
| | 60" | 19'-2 3/4" | 7'-3 1/2" | 11'-4" | 13'-1" | 481 | 5.3 | 8'-3" | 174 | 2.5 |
| | 66" | 20'-11 1/2" | 7'-10 1/2" | 12'-4" | 14'-3" | 544 | 6.2 | 8'-9" | 194 | 2.9 |
| | 72" | 22'-8 1/2" | 8'-5 1/2" | 13'-4" | 15'-4 3/4" | 601 | 7.1 | 9'-4" | 213 | 3.3 |
| 3:1 | 12" | 6'-3" | 2'-6" | 4'-3" | 4'-11" | 118 | 0.8 | 1'-9" | 22 | 0.2 |
| | 15" | 7'-5" | 2'-9 1/2" | 5'-0" | 5'-9 1/4" | 137 | 1.1 | 2'-2" | 28 | 0.3 |
| | 18" | 8'-6 3/4" | 3'-1" | 5'-9" | 6'-7 3/4" | 170 | 1.3 | 2'-8" | 37 | 0.5 |
| | 21" | 9'-8 3/4" | 3'-4 1/2" | 6'-6" | 7'-6" | 195 | 1.6 | 3'-1" | 48 | 0.6 |
| | 24" | 11'-0" | 3'-9 1/2" | 7'-3" | 8'-4 1/2" | 227 | 2.0 | 3'-7" | 58 | 0.7 |
| | 27" | 12'-2" | 4'-1" | 8'-0" | 9'-2 3/4" | 251 | 2.3 | 3'-11" | 67 | 0.8 |
| | 30" | 13'-4" | 4'-4 1/2" | 8'-9" | 10'-1 1/2" | 293 | 2.7 | 4'-4" | 77 | 1.0 |
| | 33" | 14'-5 3/4" | 4'-8" | 9'-6" | 10'-11 3/4" | 318 | 3.1 | 4'-8" | 84 | 1.2 |
| | 36" | 15'-7 3/4" | 4'-11 1/2" | 10'-3" | 11'-10" | 351 | 3.5 | 5'-1" | 96 | 1.4 |
| | 42" | 17'-11 1/2" | 5'-6 1/2" | 11'-9" | 13'-6 3/4" | 432 | 4.5 | 5'-10" | 119 | 1.7 |
| | 48" | 21'-1 3/4" | 6'-1 1/2" | 14'-0" | 16'-2" | 537 | 6.1 | 6'-7" | 146 | 2.3 |
| | 54" | 23'-5 1/2" | 6'-8 1/2" | 15'-6" | 17'-10 3/4" | 630 | 7.3 | 7'-6" | 186 | 2.9 |
| | 60" | 25'-9 1/4" | 7'-3 1/2" | 17'-0" | 19'-7 1/2" | 719 | 8.7 | 8'-3" | 219 | 3.4 |
| | 66" | 28'-1" | 7'-10 1/2" | 18'-6" | 21'-4 1/2" | 811 | 10.1 | 8'-9" | 242 | 3.9 |
| | 72" | 30'-4 3/4" | 8'-5 1/2" | 20'-0" | 23'-1 1/4" | 924 | 11.7 | 9'-4" | 272 | 4.4 |
| 4:1 | 12" | 7'-10 3/4" | 2'-6" | 5'-8" | 6'-6 1/2" | 148 | 1.1 | 1'-9" | 24 | 0.3 |
| | 15" | 9'-4" | 2'-9 1/2" | 6'-8" | 7'-8 1/2" | 181 | 1.5 | 2'-2" | 32 | 0.4 |
| | 18" | 10'-9 1/2" | 3'-1" | 7'-8" | 8'-10 1/2" | 221 | 1.9 | 2'-8" | 42 | 0.5 |
| | 21" | 12'-2 3/4" | 3'-4 1/2" | 8'-8" | 10'-0" | 260 | 2.3 | 3'-1" | 57 | 0.7 |
| | 24" | 13'-9 1/2" | 3'-9 1/2" | 9'-8" | 11'-2" | 301 | 2.8 | 3'-7" | 67 | 0.9 |
| | 27" | 15'-3" | 4'-1" | 10'-8" | 12'-3 3/4" | 334 | 3.3 | 3'-11" | 77 | 1.0 |
| | 30" | 16'-8 1/4" | 4'-4 1/2" | 11'-8" | 13'-5 3/4" | 385 | 3.8 | 4'-4" | 89 | 1.3 |
| | 33" | 18'-1 1/2" | 4'-8" | 12'-8" | 14'-7 1/2" | 425 | 4.5 | 4'-8" | 101 | 1.4 |
| | 36" | 19'-7" | 4'-11 1/2" | 13'-8" | 15'-9 3/4" | 472 | 5.1 | 5'-1" | 115 | 1.7 |
| | 42" | 22'-5 3/4" | 5'-6 1/2" | 15'-8" | 18'-1" | 583 | 6.5 | 5'-10" | 141 | 2.1 |
| | 48" | 26'-6 1/4" | 6'-1 1/2" | 18'-8" | 21'-6 3/4" | 730 | 8.9 | 6'-7" | 175 | 2.8 |
| | 54" | 29'-5" | 6'-8 1/2" | 20'-8" | 23'-10 1/2" | 875 | 10.7 | 7'-6" | 226 | 3.6 |
| | 60" | 32'-3 3/4" | 7'-3 1/2" | 22'-8" | 26'-2" | 996 | 12.7 | 8'-3" | 264 | 4.3 |
| | 66" | 35'-2 1/2" | 7'-10 1/2" | 24'-8" | 28'-5 3/4" | 1,140 | 14.9 | 8'-9" | 300 | 4.9 |
| | 72" | 38'-1 1/4" | 8'-5 1/2" | 26'-8" | 30'-9 1/2" | 1,297 | 17.3 | 9'-4" | 334 | 5.6 |
| 6:1 | 12" | 11'-2" | 2'-6" | 8'-6" | 9'-9 3/4" | 224 | 1.9 | 1'-9" | 28 | 0.4 |
| | 15" | 13'-2 1/2" | 2'-9 1/2" | 10'-0" | 11'-6 1/2" | 268 | 2.5 | 2'-2" | 37 | 0.5 |
| | 18" | 15'-2 1/2" | 3'-1" | 11'-6" | 13'-3 1/4" | 330 | 3.2 | 2'-8" | 50 | 0.7 |
| | 21" | 17'-2 3/4" | 3'-4 1/2" | 13'-0" | 15'-0 1/2" | 387 | 3.9 | 3'-1" | 69 | 0.9 |
| | 24" | 19'-4 1/2" | 3'-9 1/2" | 14'-6" | 16'-9" | 453 | 4.8 | 3'-7" | 80 | 1.2 |
| | 27" | 21'-4 3/4" | 4'-1" | 16'-0" | 18'-5 3/4" | 512 | 5.7 | 3'-11" | 96 | 1.4 |
| | 30" | 23'-5 1/4" | 4'-4 1/2" | 17'-6" | 20'-2 1/2" | 593 | 6.7 | 4'-4" | 110 | 1.7 |
| | 33" | 25'-5 1/2" | 4'-8" | 19'-0" | 21'-11 1/4" | 675 | 7.8 | 4'-8" | 127 | 2.0 |
| | 36" | 27'-5 3/4" | 4'-11 1/2" | 20'-6" | 23'-8" | 735 | 9.0 | 5'-1" | 144 | 2.3 |
| | 42" | 31'-6 1/4" | 5'-6 1/2" | 23'-6" | 27'-1 1/2" | 922 | 11.5 | 5'-10" | 179 | 3.0 |
| | 48" | 37'-3 1/2" | 6'-1 1/2" | 28'-0" | 32'-4" | 1,191 | 15.9 | 6'-7" | 231 | 4.0 |
| | 54" | 41'-4 1/4" | 6'-8 1/2" | 31'-0" | 35'-9 1/2" | 1,424 | 19.2 | 7'-6" | 300 | 5.0 |
| | 60" | 45'-4 3/4" | 7'-3 1/2" | 34'-0" | 39'-3" | 1,631 | 22.9 | 8'-3" | 353 | 6.0 |

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.

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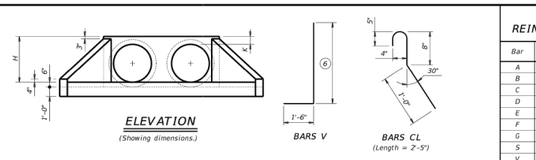



ELEVATION
(Showing dimensions.)




BARS V



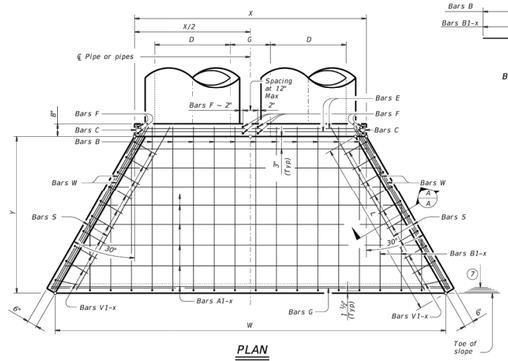

BARS CL
(Length = 2'-5")

## TABLE OF (5) REINFORCING STEEL

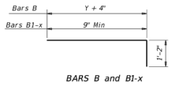
| Bar | Size | Spa | No. |
|---|---|---|---|
| A | #4 | 1'-0" | ~ |
| B | #3 | 1'-6" | ~ |
| C | #4 | 1'-0" | ~ |
| D | #3 | 1'-0" | ~ |
| E | #5 | ~ | 4 |
| F | #5 | ~ | ~ |
| G | #3 | ~ | 2 |
| S | #4 | ~ | 6 |
| V | #4 | 1'-0" | ~ |
| W | #5 | ~ | 4 |

## TABLE OF CONSTANT DIMENSIONS

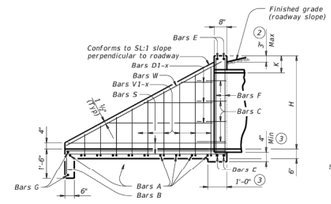
| Dia of Pipe (D) | G | K (4) | H |
|---|---|---|---|
| 12" | 0'-9" | 1'-0" | 2'-0" |
| 15" | 0'-11" | 1'-0" | 2'-3" |
| 18" | 1'-2" | 1'-0" | 2'-6" |
| 21" | 1'-4" | 1'-0" | 2'-9" |
| 24" | 1'-7" | 1'-0" | 3'-0" |
| 27" | 1'-8" | 1'-0" | 3'-3" |
| 30" | 1'-10" | 1'-0" | 3'-6" |
| 33" | 1'-11" | 1'-0" | 3'-9" |
| 36" | 2'-1" | 1'-0" | 4'-0" |
| 42" | 2'-4" | 1'-0" | 4'-6" |
| 48" | 2'-7" | 1'-3" | 5'-3" |
| 54" | 3'-0" | 1'-3" | 5'-9" |
| 60" | 3'-3" | 1'-3" | 6'-3" |
| 66" | 3'-3" | 1'-3" | 6'-9" |
| 72" | 3'-4" | 1'-3" | 7'-3" |



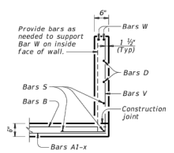

PLAN




BARS B and B1-x




TYPICAL WING ELEVATION




SECTION A-A

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(2) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(3) Provide a 1'-0" footing as shown where required to maintain 4" minimum cover for pipes.

(4) Dimensions shown are usual and maximum.

(5) Quantities shown are for one structure end only (one headwall).

(6) Min Length = $6" + 3" \times \left( \frac{12 \times H - 7}{12 \times L} \right)$

Max Length = $12 \times H - 3" \times \left( \frac{12 \times H - 7}{12 \times L} \right) - 1"$

(7) Lengths of wings based on SL:1 slope along this line.

**MATERIAL NOTES:**
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

**GENERAL NOTES:**
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation | Bridge Division Standard

# CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

## CH-FW-0

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CULVERT DETAILS

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