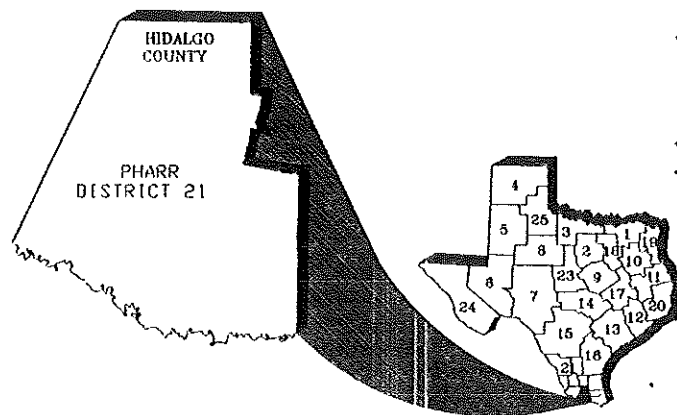
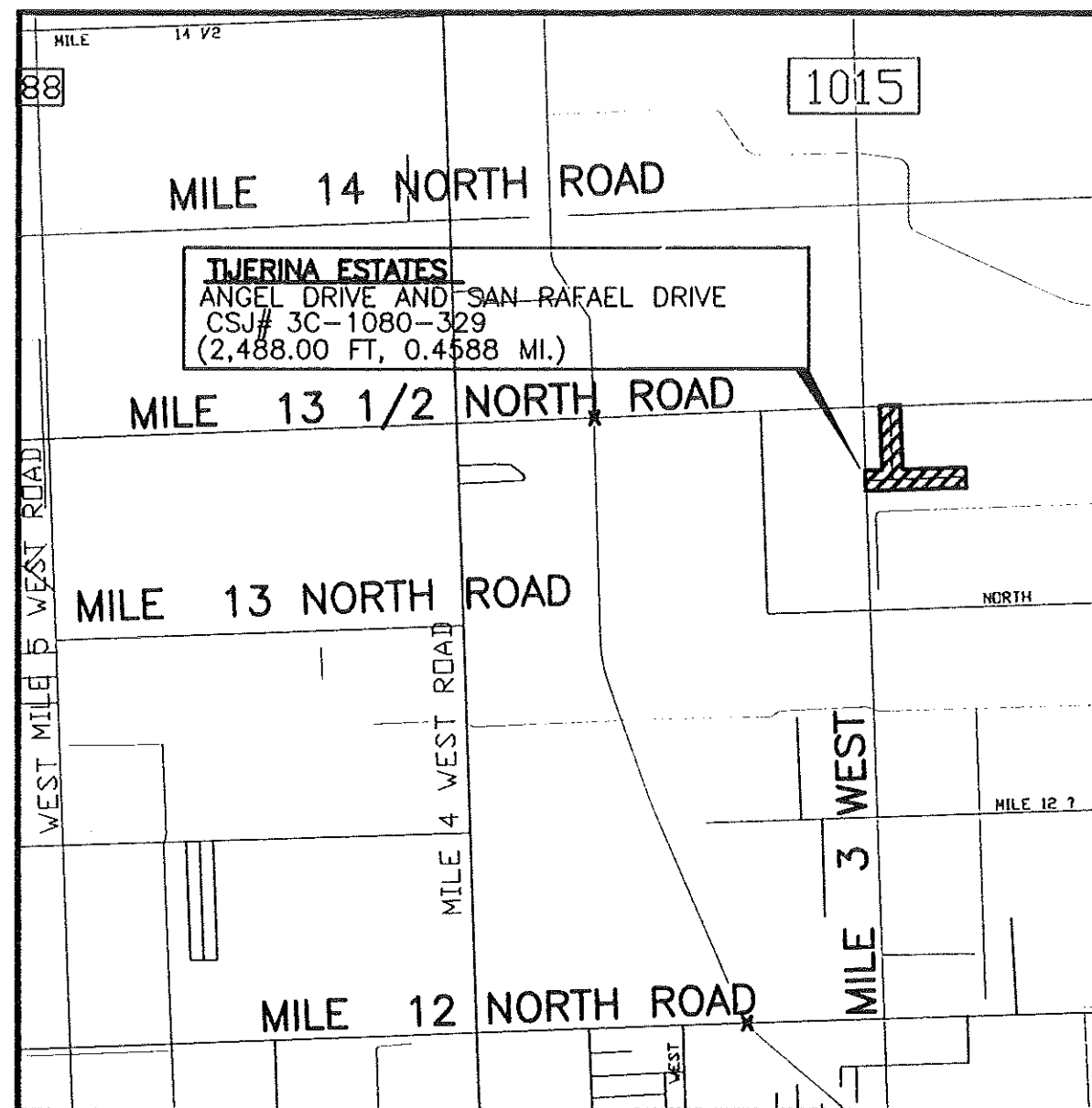




# HIDALGO COUNTY PRECINCT NO. 1

## CONSTRUCTION PLANS FOR BORDER ACCESS COLONIA PROGRAM ROUND III TIJERINA ESTATES

LIMITS: TIJERINA ESTATES (SEE PROJECT LAYOUTS)  
CONSTRUCTION OF LOCAL STREET CONSISTING OF:  
DRAINAGE, GRADING, STRUCTURES, SUBGRADE, FLEXIBLE BASE  
AND ASPHALTIC CONCRETE PAVEMENT.



SCALE: 1" = 2000'

### PROJECT LIMITS DESCRIPTION

| COLONIA NAME     | CSJ #       | ST NAME     | FROM:      | TO:           | NET LENGTH FT. | NET LENGTH MI. |
|------------------|-------------|-------------|------------|---------------|----------------|----------------|
| TIJERINA ESTATES | 3C-1080-329 | ANGEL DRIVE | SAN RAFAEL | MILE 13 1/2 N | 1,100.00       | 0.2088         |
|                  | 3C-1080-329 | SAN RAFAEL  | FM1015     | END OF RD.    | 1,320.00       | 0.2500         |
| TOTAL NET LENGTH |             |             |            |               | 2,420.00       | 0.4588         |

TOTAL AREA OF DISTRIBUTION SOIL= 0.4588 ACRES



RAUL E. SESIN - P.E. No. 86374  
DATE: 12/10/13



### HIDALGO COUNTY PLANNING DEPARTMENT

1304 S. 25 TH. STREET  
EDINBURG TX. 78539  
TEL: (956) 318-2940 ★ FAX: (956) 318-2844  
www.co.hidalgo.tx.us  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

|                                                                       |                  |
|-----------------------------------------------------------------------|------------------|
| APPROVAL<br>COLONIA INFRASTRUCTURE PROGRAM DIRECTOR<br>HIDALGO COUNTY | DATE: 12/18/2013 |
| APPROVAL<br>COUNTY PRECINCT COMMISSIONER<br>PRECINCT No. 1            | DATE: 12-19-13   |
| APPROVAL<br>HIDALGO COUNTY PLANNING DEPT.                             | DATE: 1/15/14    |
| APPROVAL<br>HIDALGO COUNTY DRAINAGE DISTRICT NO. 1 MANAGER            | DATE: 1/16/14    |
| APPROVAL<br>HIDALGO CAMERON COUNTY P.R. DIST. NO. 9 MANAGER           | DATE: 3/26/2014  |

PROJECT DATA  
DESIGN SPEED: 30 MPH  
EXCEPTION: NONE  
EQUATION: NONE  
RAILROAD CROSSING: NONE

STANDARD SHEETS IDENTIFIED ON THE INDEX OF SHEETS HAVE  
BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION  
AS BEING APPLICABLE TO THIS PROJECT.

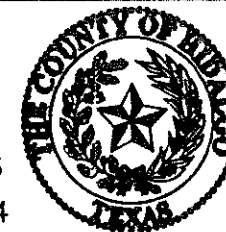
12-10-13

DATE:

EULALIO RAMIREZ, P.E.

SPECIFICATIONS ADOPTED BY THE TEXAS  
DEPARTMENT OF TRANSPORTATION ON  
JUNE 1, 2004 AND SPECIFICATION  
ITEMS LISTED AND DATED AS FOLLOW  
SHALL GOVERN ON THIS PROJECT.  
SPECIAL LABOR PROVISIONS FOR STATE  
PROJECTS.

RAMON GARCIA.....COUNTY JUDGE  
A.C. CUELLAR JR.....PRECINCT NO. 1  
HECTOR PALACIOS.....PRECINCT NO. 2  
JOE FLORES.....PRECINCT NO. 3  
JOSEPH PALACIOS.....PRECINCT NO. 4



QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
184 E. BRIDGES ST.  
EDINBURG, TEXAS 78541  
REGISTRATION NUMBER F-1513  
SURVEYING REGISTRATION NUMBER 100411-00  
LAND SURVEYORS  
PHONE 361-291-6180  
FAX 361-291-6287  
OFFICE@QHEADLEY.COM

TEXAS DEPARTMENT OF TRANSPORTATION

| SHEET NO. | DESCRIPTION                                                                 | SHEET NO. | DESCRIPTION                                        |
|-----------|-----------------------------------------------------------------------------|-----------|----------------------------------------------------|
|           | <b>GENERAL</b>                                                              |           | <b>EROSION CONTROL &amp; POLLUTION PEVENTION</b>   |
| 1         | TITLE SHEET                                                                 | 44        | EROSION CONTROL & POLLUTION PEVENTION NOTES        |
| 2         | INDEX OF SHEETS                                                             | 45        | EROSION CONTROL & POLLUTION PEVENTION DESCRIPTIONS |
| 3         | PROJECT LIMITS DESCRIPTION SHEETS & PLATS                                   | 46 - 47   | EROSION CONTROL & POLLUTION PREVENTION PLANS       |
| 4         | PROJECT EXISTING RIGHT WAY, TOPOGRAPHIC MAP,<br>& DRAINAGE CROSSINGS MAP    |           |                                                    |
| 6         | FEMA AREAS - BFE AND FLOOD ZONES                                            |           |                                                    |
| 7 - 8     | GENERAL NOTES                                                               |           |                                                    |
|           | <b>TRAFFIC CONTROL PLAN SHEETS</b>                                          |           |                                                    |
| 9 - 11    | TRAFFIC CONTROL PLAN GENERAL NOTES<br>& TRAFFIC CONTROL TYPICAL SECTIONS    |           |                                                    |
|           | <b>BARRICADE AND CONSTRUCTION STANDARDS</b>                                 |           |                                                    |
| 12 - 14   | BARRICADE & CONSTRUCTION GENERAL NOTES                                      |           |                                                    |
|           | <b>STORM DRAINAGE IMPROVEMENTS</b>                                          |           |                                                    |
| 15 - 20   | TIJERINA ESTATES-STORM DRAINAGE PLANS AND PROFILE SHEETS                    |           |                                                    |
| 21 - 24   | ESTIMATED QUANTITIES                                                        |           |                                                    |
| 25 - 28   | STANDARD STORM DRAINAGE, DRIVEWAY , PIPE SECTION PROFILES & GATE STRUCTURE  |           |                                                    |
|           | <b>ROAD PAVING IMPROVEMENTS</b>                                             |           |                                                    |
| 29 - 33   | TIJERINA ESTATES-ROAD SECTION, TOPOGRAPHIC, PAVING PLANS AND SIGNAGE SHEETS |           |                                                    |
| 34        | ESTIMATED QUANTITIES                                                        |           |                                                    |
| 35 - 42   | TIJERINA ESTATES-PAVING AND PROFILES PLAN SHEETS                            |           |                                                    |
| 43        | STANDARD TYPICAL TURNAROUND DETAILS                                         |           |                                                    |



**HIDALGO COUNTY  
PLANNING DEPARTMENT**  
1314 S. 25TH STREET  
CORPUS CHRISTI, TX 78409  
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RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1  
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COUNTY COMMISSIONER PAGE 1

QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
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WWW.QHA-INC.COM

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
INDEX OF SHEETS

DAVID RIVERA - P.E. No. 1769  
P-8-13  
SCALE: 1"=50'  
DRAWN BY: LG  
CHECKED BY: AO  
TWO DRAWN BY: Q.H. & ASSOCIATES  
SHEET: 2 OF 47

**TIJERINA SUBDIVISION**

TOTAL AREA OF DISTURBED SOIL= 2.77 ACRES

**SAN RAFAEL DRIVE**

# 6540-62-0309-5100-6200

BEG. STA. 0+00

END STA. 13+20.00

NET LENGTH OF PROJECT: 1,320.00 FT. 0.2500 MI

**ANGEL DRIVE**

# 6540-62-0309-5100-6200

BEG. STA. 0+00

END STA. 11+00

NET LENGTH OF PROJECT: 1,100.00 FT. 0.2088 MI



**HIDALGO COUNTY  
PLANNING DEPARTMENT**  
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RAUL E. SESH, P.E., C.F.H.  
PLANNING ADMINISTRATOR



*[Signature]*  
EUGENIO MARTI - P.E. No. 7702

DATE: 8-8-13

SCALE: 1"=50'

DRAWN BY: LG

CHECKED BY: AQ

TOPO SURVEY BY: Q.H. & ASSOCIATES

SHEET: 3 OF 47

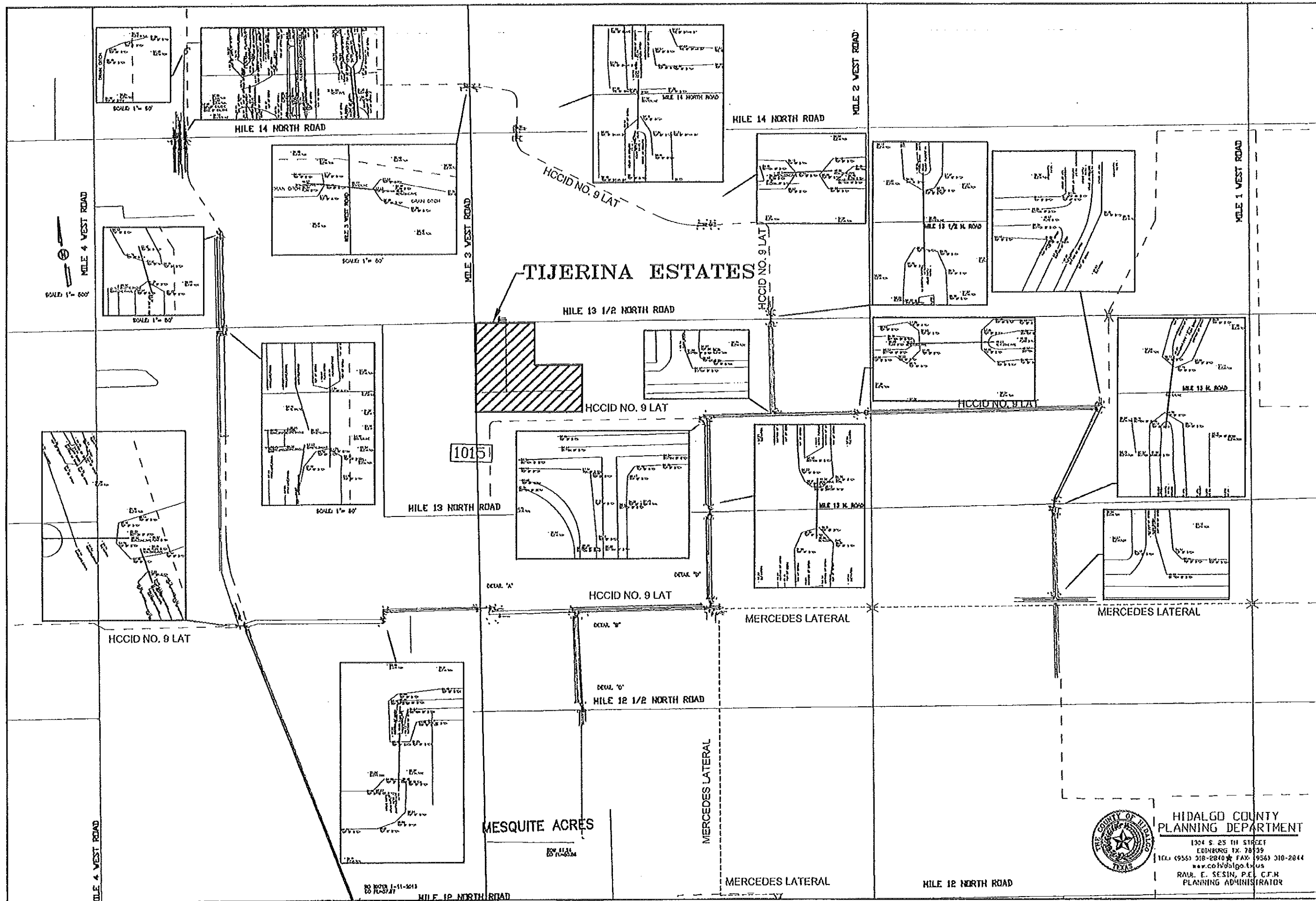
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COLONIA INFRASTRUCTURE PROJECT II  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
PROJECT LIMITS DESCRIPTION  
TIJERINA SUBDIVISION



QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
LAND SURVEYORS  
1001 S. 10TH AVE.  
EDINBURG, TX. 78539  
TEL: (556) 318-2844 FAX: (556) 318-2844  
WWW.CO.HIDALGO.TX.US



HIDALGO COUNTY  
PRECINCT NO. 1  
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WWW.CO.HIDALGO.TX.US  
A.C. GUELLAR JR.  
COUNTY COMMISSIONER PREC. 1



HIDALGO COUNTY  
PLANNING DEPARTMENT  
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RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR



DAVID ALVAREZ - P.E. No. 7700  
8-8-13  
DATE

SCALE 1"=500'  
DRAWN BY LG  
CHECKED BY AQ  
TWO SURVEY BY  
O.H. & ASSOCIATES  
SHEET

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
DRAINAGE AREAS CROSSINGS  
EXHIBIT BASE MAP



QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
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EDINBURG, TEXAS 78149  
TEL: (956) 318-2810 FAX: (956) 318-2844  
www.qhassociates.com

HIDALGO COUNTY  
PRECINCT NO. 1  
COUNTY COMMISSIONER PAGE 1



GENERAL NOTES

- 1. WATER AND DRAINAGE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL CODES AND SPECIFICATIONS.
- 2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES, INCLUDING IRRIGATION LINES, TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN, AND REPAIR CONTRACTOR CAUSED DAMAGE ACCORDING TO CURRENT LOCAL STANDARDS AND AT THE CONTRACTOR'S EXPENSE. COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANY. RELOCATE LINES OR ADJUST AS NECESSARY FOR CONSTRUCTION. (NOT PAY ITEM)
- 3. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES, OBTAIN ALL PERMITS, AND PAY ALL FEES PRIOR TO BEGINNING WORK.
- 4. ALL EXISTING UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE, BASED ON TOPOGRAPHIC SURVEYS AND RECORDED DRAWINGS FROM THE COUNTY. ADDITIONAL UTILITIES MAY BE PRESENT. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE FOR INSTRUCTIONS.
- 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITIES SO THAT WATER AND UNDERGROUND ELECTRIC DO NOT CONFLICT WITH STORM SEWERS. INSTALL ALL UTILITIES PRIOR TO FINAL ASPHALT AND PAVEMENT CONSTRUCTION.
- 7. BACKFILL UTILITY TRENCHES UNDER PAVEMENT AREAS WITH GRANULAR SELECT FILL. BACKFILL UTILITY TRENCHES IN TO BE COMPACTED TO A LEAST 98% OF MAXIMUM PER ASTM D698. TESTING TO BE DONE BY OTHERS.
- 8. ADJUST ALL EXISTING PAVEMENT TO MATCH PROPOSED FINISHED GRADE.
- 9. ALL WATER MAINS SHALL BE PRESSURE DR-18 PVC PIPE. (NAWSC SPECIFICATIONS)
- 10. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE HIDALGO COUNTY PRECINCT No. 1, HIDALGO COUNTY DRAINAGE DISTRICT No. 1, HIDALGO AND CAVERON COUNTY IRRIGATION DISTRICT No. 9, AND NORTH ALAMO WATER SUPPLY COMPANY.
- 11. THE CONTRACTOR SHOULD REMOVE ALL FENCES LOCATED WITHIN THE EASEMENTS, INTERFERING WITH CONSTRUCTION OPERATION AND PROVIDE TEMPORARY FENCING DURING CONSTRUCTION. FENCES SHALL BE REPLACED WITH A NEW FENCE OR UNDAMAGED ORIGINAL FENCING. REMOVAL AND REPLACEMENT OF EXISTING AND TEMPORARY FENCES SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST AND REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.
- 12. CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT MR. RICHARD GARCIA OR GILBERT DAVILA WITH NORTH ALAMO WATER SUPPLY CORP. (N.A.W.S.C.) 48 HOURS PRIOR TO COMMENCEMENT OF WORK @ (956) 383-1618 TO COORDINATE AND MEET ANY ADDITIONAL REQUIREMENTS AND/OR SPECIFICATIONS.
- 13. CONTRACTOR SHALL BE RESPONSIBLE TO CALL DIG TESS 48 HOURS PRIOR TO COMMENCEMENT OF WORK FOR UTILITY SPOTTING @ (1-800-DIG-TESS).
- 14. CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT JOHNNY MICE WITH HIDALGO AND CAVERON COUNTY IRRIGATION DISTRICT No. 9 (H.C.C.I.D.) 48 HOURS PRIOR TO COMMENCEMENT OF WORK @ (956) 565-2411 TO COORDINATE AND MEET ANY ADDITIONAL REQUIREMENTS AND/OR SPECIFICATIONS.
- 16. LOCATIONS OF UNDERGROUND FACILITIES ARE FROM BEST INFORMATION AVAILABLE. NEITHER THE OWNER OR ENGINEER, WARRANT THE ACCURACY OF THE INFORMATION PROVIDED. ANY DEVIATIONS SHALL BE CALLED TO THE ENGINEERS ATTENTION IMMEDIATELY.
- 16. AS DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL INSTALL APPROPRIATE TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH THE MUTCD LATEST EDITION, AND AS APPROVED BY THE ENGINEER.
- 17. ALL MATERIALS AND DEBRIS, EXCEPT CALICHE BASE, RESULTING FROM DEMOLITION IN PREPARATION FOR THE PROPOSED IMPROVEMENTS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THESE MATERIALS AND DEBRIS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED.
- 18. CONTRACTOR SHALL AT ALL TIME PROVIDE ACCESS TO EXISTING RESIDENCES.
- 19. ANY DAMAGES TO FENCES, WALKS, OR PRIVATE PROPERTY SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
- 20. NO OPEN EXCAVATION SHALL BE LEFT OPEN OVERNIGHT. ALL EXCAVATIONS WHICH CANNOT BE BACKFILLED OVERNIGHT SHALL BE COVERED, AS A MINIMUM, WITH STEEL PLATING WHEN IN PAVED AND UNPAVED AREAS SUBJECT TO VEHICULAR LOADING; 4" PLYWOOD, WOOD PLANKING WITH O.S.H.A. ORANGE PLASTIC EXPANDED MESH BARRIER AROUND PERIMETER IN UNPAVED AREAS NOT SUBJECT TO VEHICULAR LOADING, OR AS APPROVED BY THE ENGINEER.
- 21. THE PREPARATION OF THESE PLANS REFLECTS INFORMATION, PROVIDED BY OTHERS, ON THE APPROXIMATE LOCATION AND EXISTENCE OF EXISTING UTILITY AND ADJACENT PHYSICAL FEATURES. HOWEVER, THEY DO NOT IMPLY OR AFFIRM THAT ALL UTILITIES OR PHYSICAL FEATURES ARE SHOWN. GENERALLY, UTILITY SERVICE CONNECTIONS ARE NOT INDICATED ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR NOTIFICATIONS OF THE OWNER IMMEDIATELY UPON ENCOUNTERING UNFORESEEN CONFLICTS.

GENERAL NOTES

- 22. THE APPROXIMATE LOCATIONS OF KNOWN EXISTING UTILITIES ARE SHOWN. CONTRACTOR SHALL DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATIONS IN THE FIELD PRIOR TO COMMENCING WORK. CONTRACTOR TO BE FULLY RESPONSIBLE FOR DAMAGES WHICH MIGHT OCCUR BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE EXISTING UTILITIES.
- 23. PUBLIC AND PRIVATE UTILITY LINES AND CUSTOMER SERVICE LINES MAY EXIST THAT ARE NOT SHOWN ON THE CONSTRUCTION DRAWINGS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE, MAINTAIN AND PROTECT THE INTEGRITY OF THESE LINES. HAND EXCAVATION MAY BE REQUIRED.
- 24. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY TO RELOCATE OR DIVERT ANY UTILITY IN CONFLICT WITH PROPOSED CONSTRUCTION SO AS NOT TO DISRUPT SERVICE OF IT. CONTRACTOR SHALL RESTORE, RELOCATED, OR DIVERTED UTILITY TO ITS ORIGINAL CONDITION AND LOCATION WHEN APPLICABLE UPON COMPLETION OF CONSTRUCTION.
- 25. CONTRACTOR SHALL ADJUST EXISTING NAWSC WATER LINES AS REQUIRED TO INSTALL DRAINAGE IMPROVEMENTS. SAID ADJUSTMENTS SHALL BE COORDINATED WITH NAWSC PRIOR TO COMMENCEMENT OF WORK. SAID WATER LINE ADJUSTMENT SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST AND REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.
- 26. ALL ROAD CROSSINGS SHALL BE REPAIRED WITH 6" COMPACTED CALICHE 95% & 2" HWAC TO 98%.
- 27. CONTRACTOR SHALL ADJUST AND CONNECT WITH NEW SYSTEM EXISTING FIELD DRAIN LINES AT PROPOSED LOCATIONS. SAID WORK SHALL BE COORDINATED WITH H.C.C.I.D. No. 9 PRIOR TO COMMENCEMENT OF WORK. SAID LINE ADJUSTMENTS AND CONNECTIONS SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST AND REFLECTED IN THE UNIT PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.
- 28. CONTRACTOR TO NOTIFY ALL UTILITY COMPANIES FOR VERIFICATION OF LOCATION OF EXISTING FACILITIES PRIOR TO BEGINNING ANY EXCAVATION.
- 29. CONTRACTOR TO MAINTAIN ALL EQUIPMENT AND TRANSPORTATION OF SAID EQUIPMENT WITHIN THE EXISTING RIGHT-OF-WAYS OF THE CITY, COUNTY, OR STATE.
- 30. THE CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR ANY SURFACE IRREGULARITIES, AS DIRECTED BY THE ENGINEER, CAUSED BY THE CONTRACTOR'S WORKING OPERATIONS.
- 31. DURING EXCAVATION OPERATIONS FOR DRAINAGE AND/OR UTILITIES, THE CONTRACTOR SHALL NOT PILE ANY EXCAVATED MATERIAL OR EXCAVATE WITHIN THE DRIP LINE OF TREES THAT ARE TO BE PRESERVED.
- 32. WHERE NEW WATER LINES AND SEWER LINES ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES, NEXT TO MANHOLES) THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC 317 (DESIGN OF SEWAGE SYSTEMS) OR 30 TAC 290 (WATER HYGIENE).
- 33. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING WATER AND SEWER CONNECTIONS TO ALL HOMES AND BUSINESSES IN WORKING ORDER AT ALL TIMES, EXCEPT FOR BRIEF INTERRUPTIONS IN SERVICE FOR CONNECTIONS TO BE REINSTALLED. IN NO CASE SHALL SERVICES BE ALLOWED TO REMAIN OUT OF SERVICE OVERNIGHT.
- 34. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE DRAINAGE AT ALL TIMES DURING CONSTRUCTION OF PROPOSED FACILITIES.
- 35. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES DURING THE INSTALLATION OF THE STRUCTURES, DRAINAGE, IRRIGATION AND ROAD IMPROVEMENTS.
- 36. THE CONTRACTOR SHALL CLEANUP AND RESTORE THE AREA OF OPERATIONS TO A CONDITION AS GOOD AS OR BETTER THAN THAT WHICH EXISTED PRIOR TO INSTALLATION OF ALL ITEMS TO BE CONSTRUCTED.
- 36. THE CONTRACTOR SHALL REMOVE FROM THE PROJECT AREA ALL SURPLUS MATERIAL. THIS SHALL BE INCIDENTAL AND NOT A SEPARATE PAY ITEM UNLESS STATED OTHERWISE. SURPLUS MATERIALS FROM EXCAVATION INCLUDING DIRT, TRASH, ETC., SHALL BE PROPERLY DISPOSED OF AT A SITE ACCEPTABLE TO HIDALGO COUNTY PRECINCT No. 1. THE CONTRACTOR SHALL PROVIDE A LETTER STATING SO. NO EXCESS EXCAVATED MATERIAL SHALL BE DEPOSITED IN LOW AREAS OR ALONG NATURAL DRAINAGE WAYS WITHOUT WRITTEN PERMISSION FROM THE AFFECTED PROPERTY OWNER AND THE HIDALGO COUNTY No. 1. IF THE CONTRACTOR PLACES EXCESS MATERIAL IN THE AREAS WITHOUT WRITTEN PERMISSION, HE WILL BE RESPONSIBLE FOR ALL THE DAMAGE RESULTING FROM SUCH FILL AND CONTRACTOR SHALL REMOVE THE MATERIAL AT OWN COST.
- 37. THE CONTRACTOR IS RESPONSIBLE FOR THE PREPARATION AND SUBMITTAL OF THE TRENCH EXCAVATION PROTECTION PLAN. CONTRACTOR SHALL SUBMIT CONSTRUCTION DETAILS AND DESIGN CALCULATIONS BEARING THE SEAL OF A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS BEFORE CONSTRUCTING THE SHORING. THE ENGINEER RESERVES THE RIGHT TO REJECT DESIGNS NOT MEETING THE REQUIREMENTS OF SECTION 19000.

GENERAL NOTES

38. NEW CALICHE MATERIAL SHALL BE TREATED WITH 0.5% LIME BY DRY WEIGHT OF MATERIAL. THE GRADATION SHALL BE ARGILLACEOUS LESTONE, CALCAREOUS OR CALCAREOUS CLAY PARTICLES, WITH OR WITHOUT STONE CONGLOMERATE GRAVEL, SAND OR GRANULAR MATERIAL.

| TYPE D GRADE 6 |                  |
|----------------|------------------|
| SEIVE No.      | PERCENT RETAINED |
| 2              | 0                |
| 1/2            | 20-60            |
| 4              | 40-75            |
| 40             | 75-85            |

- 39. EXISTING CALICHE TO BE EXCAVATED AND STOCKPILED. SAID EXISTING SECTION SHALL BE USED IN THE BOTTOM HALF OF THE ROAD AND SHALL BE CONSTRUCTED FROM EXCAVATED AND STOCKPILED CALICHE WITH THE COMBINATION OF EXISTING AND NEW TO ATTAIN THE REQUIRED DEPTH. THE BASE SHALL HAVE A MINIMUM OF 4 IN. NEW CALICHE AT THE TOP OF THE BASE SECTION. THE PRODUCT OF THE CRUSHED ASPHALT PAVEMENT (MAX 2" PIECES IN SIZE) AND SALVAGE CALICHE SHALL BE TREATED WITH TWO(2) PERCENT LIME BY DRY WEIGHT OF SALVAGE MATERIAL. SAID FILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY. THE LIME TREATMENT OF THE EXISTING SECTION, SUB-GRADE FILL AND CROSS-SLOPE ROADSIDE DITCH GRADING ITEMS SHALL BE INCIDENTAL AND NOT A SEPARATE PAY ITEM AND SHALL BE REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.
- 40. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT/RELOCATION OF ALL REGULATORY SIGNS REMOVED DUE TO CONSTRUCTION OPERATIONS WITH THE SAME SIGN ON FIXED SUPPORT(S) IMMEDIATELY UPON ITS REMOVAL. APPROVAL BY THE ENGINEER IS NECESSARY BEFORE REMOVING ANY REGULATORY ROADWAY SIGN(S). FLAGGERS ARE REQUIRED TO BE AVAILABLE TO DIRECT TRAFFIC DURING SIGN INTERMEDIATE DOWN TIME. RELOCATION OF ANY DIRECTIONAL SIGN ASSEMBLIES REMOVED DURING CONSTRUCTION OPERATIONS IMMEDIATELY UPON THEIR REMOVAL IS REQUIRED. THESE SIGNS SHALL BE RELOCATED TO A LOCATION IN ACCORDANCE WITH THE LATEST VERSION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". IN NO CASE WILL A SIGN BE REMOVED WITHOUT A REPLACEMENT SIGN AND SUPPORT(S) BEING READILY AVAILABLE AND A LOCATION ESTABLISHED. REMOVAL AND RELOCATION OF THESE SIGNS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED ON THE PROPOSAL.
- 41. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING AREA BETWEEN THE BACK OF CURB/EDGE OF PAVEMENT, ROAD SIDE DITCH AND RIGHT-OF-WAY TO HAVE POSITIVE FLOW TO THE PROPOSED DRAINAGE SYSTEM.
- 43. CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLAN ON STREET CROSSINGS FOR APPROVAL BY HIDALGO COUNTY PRECINCT No. 1 AND PROJECT ENGINEER PRIOR TO COMMENCEMENT OF WORK.
- 44. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING EXISTING TRAFFIC SIGNS (STOP SIGNS, ROAD NAMES, ETC.) TO COMPLETE ROAD AND DRAINAGE IMPROVEMENTS AND REPLACE WITH PROPER FOUNDATION IN ACCORDANCE WITH SPECIFICATIONS. THIS WORK SHALL BE INCIDENTAL AND NOT A SEPARATE PAY ITEM UNLESS STATED OTHERWISE.
- 45. CONTRACTOR SHALL PROVIDE STORM WATER PREVENTION PLAN (SWP3) PRIOR TO COMMENCEMENT OF CONSTRUCTION AS REQUIRED BY HIDALGO COUNTY AND/OR TCEQ.
- 46. CONTRACTOR SHALL RELAY DRIVEWAY PIPE CULVERTS AS PART OF THE ROADSIDE DITCH GRADING OF PROJECT. SAID RELAYING OF CULVERTS SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST AND REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.
- 47. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPROVING ALL EXISTING DRIVEWAYS AS PER PROPOSED CONDITIONS STATED IN DRIVEWAY TABLE WORKSHEET.
- 48. CONTRACTOR SHALL ADJUST EXISTING NAWSC WATER LINE AS NEEDED FOR PROPOSED DRAINAGE IMPROVEMENTS. SAID ADJUSTMENTS SHALL BE COORDINATED WITH NAWSC PRIOR TO COMMENCEMENT OF WORK. SAID WATERLINE ADJUSTMENTS SHALL BE CONSIDERED TO THE PROJECT COST AND REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.



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RAUL E. SESIN, P.E., C.F.H.  
PLANNING ADMINISTRATOR

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A.C. CUELLAR JR.  
COUNTY COMMISSIONER PCT. 1

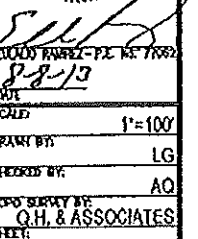
QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
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GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
GENERAL NOTES

8-2-13  
1"=100'  
CHECKED BY: LG  
DESIGNED BY: AQ  
TOPO SURVEY BY: Q.H. & ASSOCIATES  
SHEET: 7 OF 47

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL CITY, COUNTY, STATE, FEDERAL, AND OSHA REGULATIONS.
2. CONTRACTOR SHALL REFER TO THE PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF DRIVES, VESTIBULES, SLOPE PAVING, RAMPS, SIDEWALKS, EXITS & ENTRANCE LOCATIONS.
3. ALL DISTURBED AREAS ARE TO RECEIVE FOUR INCHES OF TOPSOIL, SEED, MULCH, AND WATER.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
5. CONTRACTOR IS RESPONSIBLE FOR PROTECTION AND REPLACEMENT OF ALL PROPERTY CORNERS.
6. CONTRACTOR SHALL MATCH EXISTING PAVEMENT IN GRADE, SIZE, TYPE AND ALIGNMENT, WHERE APPLICABLE.
7. CONTRACTOR SHALL REMOVE PAVEMENT & CONCRETE IN ACCORDANCE WITH SITE WORK SPECIFICATIONS.
8. THE EARTHWORK FOR ALL DRAINAGE TRENCHES SHALL BE IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
9. GENERAL CONTRACTOR IS TO COORDINATE WITH APPROPRIATE UTILITY COMPANIES PRIOR TO CONSTRUCTION, ADJUSTMENT, OR RELOCATION OF EXISTING UTILITIES AS DESIGNATED ON PLANS.
10. CONTRACTOR SHALL REFER TO PLANS AND SPECS. FOR ACTUAL LOCATION OF ALL UTILITY, TO INCLUDE, SANITARY SEWER LINES, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL AND TELEPHONE SERVICE. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND ASSURE PROPER DEPTHS ARE ACHIEVED, AS WELL AS, COORDINATE WITH ANY UTILITY COMPANIES FOR APPROVED LOCATIONS AND SCHEDULING OF TIE-INS/CONNECTIONS TO THEIR FACILITIES.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING THE DAMAGE DONE TO ANY EXISTING ITEM DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO, OR BETTER THAN, EXISTING CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE AND NOTIFY CONSTRUCTION MANAGER PRIOR TO STARTING CONSTRUCTION.
12. SITEWORK FOR THIS PROJECT SHALL MEET OR EXCEED THE ADA SPECIFICATIONS\*.
13. CONTRACTOR TO REMOVE OR RELOCATE, IN A PROPER MANNER, WHEN APPLICABLE, ALL EXISTING BUILDINGS, FOUNDATIONS, BASEMENTS, CONNECTING IMPROVEMENTS, DRAIN PIPES, SANITARY SEWER PIPES, POWER POLES AND GUY WIRES, WATER METERS AND WATER LINES, WELLS, SIDEWALKS, SIGN POLES, UNDERGROUND GAS, SEPTIC TANKS, AND ASPHALT WITHIN CONSTRUCTION LIMITS AND WHERE NEEDED, TO ALLOW FOR NEW CONSTRUCTION AS SHOWN.
14. CONTRACTOR SHALL FOLLOW ALL COUNTY, STATE, AND FEDERAL REGULATIONS IN DISPOSING OF DEMOLISHED MATERIALS REMOVED FROM THIS SITE.
15. PLEASE NOTE, SOME EXISTING ITEMS TO BE REMOVED ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
16. CONTRACTOR SHALL SUBMIT DEWATERING PLAN FOR APPROVAL PRIOR TO ANY DEWATERING ACTIVITIES OCCURRING ON THIS SITE IF NEEDED. THIS IS SUBSIDIARY ITEM. NO PAY ITEM.
17. GEOTECHNICAL STUDY IS PROVIDED IN THE SPECIFICATIONS & BID DOCUMENTS BOOKLET.

- 1.- ADDITIONAL OBSTRUCTIONS NOT SHOWN ELSEWHERE (TREES, MAIL BOXES, FENCES, POLES, ELECTRICAL BOXES, ETC.) WHICH MAY NEED TO BE PERMANENTLY REMOVED OR TEMPORARILY REMOVED & THEN REPLACED SHOULD BE INCLUDED IN UNIT COST. NO DIRECT PAYMENT WILL BE MADE FOR THESE ITEMS.
- 2.- ALL CONSTRUCTION DEBRIS NOT OTHERWISE SHOWN OR NOT WANTED TO BE REMOVED FROM SITE BY CONTRACTOR (INCLUDES CONC., TREES, PIPES, SIGNS, FENCING, ASPHALT, ETC.)
- 3.- ALL DRIVEWAYS (ASPHALT OR CONCRETE) TO BE CONSTRUCTED WITH NEW BASE AND ASPHALT OR CONC. TO R.O.W. OR PROPERTY LINES, UNLESS OTHERWISE SHOWN AND SPECIFIED.
- 4.- EXIST. R.O.P OR PVC PIPES THAT ARE TO BE REMOVED, TRENCH NEEDS BACKFILLED & COMPACTION TO 98% DENSITY. TESTING BY OTHERS.
- 5.- WATER VALVES, MANHOLE TOPS, RIMS AND COVERS SHALL BE ADJUSTED TO FINISH GRADE. (INCLUDES CUTTING MANHOLE SECTIONS TO MEET FINISH GRADE) NO PAY ITEM.
- 6.- ALL ABANDONED AND OLD WATER/STORM LINES IN CONFLICT WITH ROADWAY WORK TO BE REMOVED AND DISPOSED OF SUBSIDIARY ITEM TO ROADWAY WORK. ITEMS NOT IN CONFLICT TO REMAIN IN PLACE.
- 7.- CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF ALL UTILITIES AND FOR ANY REPAIRS AS A RESULT OF DAMAGE DURING CONSTRUCTION.
- 8.- ALL EXISTING ASPHALT DRIVES, CONCRETE DRIVES OR CALICHE DRIVEWAYS WILL BE PAVED TO R.O.W. LINE AND TO ORIGINAL CONDITION IF CONSTRUCTION IS NEEDED. NO PAY ITEM.
- 9.- EXISTING SIDEWALKS, DRIVES & ASPHALT PAVEMENT ETC. ON CONSTRUCTION AREA TO BE REPAIRED TO ORIGINAL CONDITION IF DAMAGED DURING CONSTRUCTION BY CONTRACTOR. (NO PAY ITEM)
- 10.-TESTING REQUIRED FOR ALL OPEN CUT & DRIVEWAYS AND MUST MEET STANDARD 98% COMPACTION. TESTING BY OTHERS.
- 11.-ALL OVERLAY ASPHALT ON EXISTING DRIVES, STREETS, OR PAVEMENT AREAS SHALL BE TO R.O.W. OR PROPERTY LINE TO ORIGINAL CONDITION IF CONSTRUCTION IS NEEDED.
- 12.- TACK COAT TO BE APPLIED PRIOR TO OVERLAYING ASPHALT OR NEW PAVEMENT. NO DIRECT PAYMENT FOR THIS WORK.
- 13.- ASPHALT & PAVEMENT WILL BE PLACED AS LAYDOWN SECTION AT ALL EXISTING ALLEYS AND DRIVEWAYS LOCATIONS AS NEEDED.
- 14.- ALL REMOVED CALICHE, ASPHALT, SUBGRADE, ETC. TO BE HAULED & DISPOSED BY CONTRACTOR TO A SPECIFIC SITE AS PER STATE STANDARDS.
- 15.- IF PLAN SHOWS ONLY ROADSIDE GRADING WITH NO DRIVEWAY CULVERTY REPLACEMENT, AND THEN DURING CONSTRUCTION THERE ARE SOME DRIVEWAY PIPES NEEDED TO BE RELAYED, THEN THE RELAYING OR REPLACEMENT ALONG WITH DRIVEWAY REPAIR WILL BE SUBSIDIARY.



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 URBAN CO. BORDER ACCESS COLONIA PROGRAM  
 TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
 GENERAL CONSTRUCTION NOTES

**CONCRETE ENGINEERS**  
 CONSULTING ENGINEERS  
 10000 W. 10th Ave., Suite 100  
 Denver, CO 80231  
 303-751-1000  
 FAX 303-751-1001


 HIDALGO COUNTY  
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 (817) 368-0753 or Fax: (817) 368-1617  
 communications@hidalgo.net  
 A.C. CUELLAR JR.  
 COUNTY COMMISSIONER PCT. 1

## TRAFFIC CONTROL NOTES

1.- THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL PLAN TO THE ENGINEER FOR APPROVAL. ALL WORK AND MATERIALS REQUIRED FOR TRAFFIC HANDLING SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED PART OF ITEM 502, "BARRICADES, SIGNS, AND TRAFFIC HANDLING". ALL BARRICADES AND SIGNS TO REPLACE DAMAGED ONES.

2.- FLASHING WARNING LIGHTS AND/OR FLAGS SHALL BE USED TO CALL ATTENTION TO THE EARLY WARNING SIGNS.

3.- STEADY BURN (TY C) WARNING LIGHTS SHALL BE USED TO MARK CHANNELIZING DEVICES AT MIGHT WAS NEEDED.

4.- ADDITIONAL SIGNS, BARRICADES AND/OR OTHER CHANNELIZING DEVICES MAY BE REQUIRED AND/OR ADJUSTED AS DIRECTED BY THE ENGINEER.

5.- SIGN AND/OR BARRICADE LOCATIONS SHALL BE IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND/OR THE BC STANDARD SHEETS.

6.- EXISTING CONNECTING ROADS AND PRIVATE DRIVES SHALL BE KEPT OPEN TO TRAFFIC AT ALL TIMES, EXCEPT AS OTHERWISE PROVIDED FOR OR APPROVED BY THE ENGINEER.

7.- ALL STRIPING AND SIGNING, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH THE "T.M.U.T.C.D."

8.- WHEN CONSTRUCTION OPERATIONS RESULT IN DROP OR MORE THAN 2" NEXT TO TRAVEL WAY, A 3:1 SLOPE AND 4.0' BUFFER ZONE WILL BE REQUIRED DURING NON WORKING HOURS.

9.- FOR POSTED SPEED EXCEEDING 45 M.P.H., ADVISORY SPEED SIGNS WITH APPROPRIATE WARNINGS SIGNS, SHALL BE POSTED IN THE VICINITY OF SPECIFIED WORK ZONES WITHIN THE PROJECT, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

10.- LENGTH AND SPACING OF CHANNELIZING DEVICES SHALL BE AS SHOWN ON THE BC STANDARDS AND THE "T.M.U.T.C.D." OTHER SIGNS MAY BE USED IN ADDITION TO THOSE REQUIRED BY BARRICADE STANDARDS.

11.- NON-REMOVEABLE WORK ZONE STRIPING FOR THIS PROJECT REQUIRED BY THE "T.M.U.T.C.D." SHALL CONSIST OF THERMOPLASTIC MATERIAL AND SHALL BE IN ACCORDANCE WITH THE "WORK ZONE PAVEMENT MARKINGS" STANDARD WZ(STPM)-97.

12.- ALL WORK SHALL BE DONE EXPEDITIOUSLY DURING DAYLIGHT HOURS, AS DIRECTED BY THE ENGINEER. NECESSARY FLAGGERS AND APPROPRIATE SIGNING TO SAFETY GUIDE TRAFFIC THROUGH THE WORK AREA WILL BE REQUIRED AS DIRECTED BY THE ENGINEER.

13.- REFER TO STANDARD SHEETS BC(1)-99 THRU BC(9)-98 FOR OTHER PERTINENT INFORMATION NOT SHOWN.

14.- THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL REALTIONS AND RESPONSIBILITIES TO THE PUBLIC" OF THE STANDARD SPECIFICATIONS AND TO SPECIAL PROVISION "DETOUR, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC."

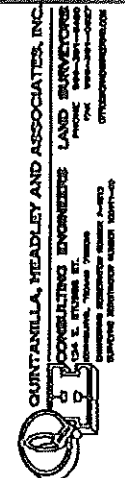
16.- REFER TO STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES (JUNE 1, 2004 EDITION) TO SEE COMPACTION REQUIREMENTS FOR BASE COURSES ALSO SHOWED IN PROPOSED TYPICAL SECTION OF EACH COLONIA (SHEET 04).



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COLONIA INFRASTRUCTURE PROJECT II  
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TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
TRAFFIC CONTROL NOTES  
SHEET



11000 LABEL - P.L. No. 77002  
8-28-13  
SCALE 1"=50'  
DRAWN BY: LG  
CHECKED BY: AO  
DESIGNED BY: Q.H. & ASSOCIATES  
P.E.T.  
9 OF 47

# TRAFFIC CONTROL NARRATIVE

## SEQUENCE OF WORK

INSTALL PROJECT LIMIT SIGNS, ADVANCE WARNING SIGNS, AND CROSSROAD BARRICADE SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLAN (TCP) AND OR AS DIRECTED BY THE ENGINEER. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE MUTCD, AND SHALL BE IN PLACE PRIOR TO COMMENCING ANY CONSTRUCTION. SIGNS TO REMAIN IN PLACE FOR THE DURATION OF THE PROJECT AND UNTIL COMPLETION AND ACCEPTANCE OF THE PROJECT BY TXDOT.

## PHASE I

INSTALL ALL SW3P DEVICES ACCORDING TO THE SW3P PLAN AND STANDARDS. ADJUST ALL UTILITIES THAT ARE IN CONFLICT WITH THE PROPOSED CONSTRUCTION. INSTALL PROPOSED DRAINAGE ROADWAY CROSS CULVERTS AND DRIVEWAY/COUNTY ROADSIDE DRAINS AS SHOWN IN THE PLANS. CUT ROADWAY DITCHES TO PROPOSED GRADE ELEVATIONS AS SHOWN IN THE PLANS. CONTRACTOR SHALL MAINTAIN 3:1 MAXIMUM SLOPE ADJACENT TO THE ROADWAY TRAVEL SURFACE. EXCAVATED MATERIAL SHALL BE SALVAGED AND USED THROUGHOUT THE PROJECT AS DIRECTED BY THE ENGINEER.

## PHASE II

CONSTRUCT PROPOSED ACCORDING TO TCP STANDARD 7/32 TCP (1-2)-98 9/32. THE CONTRACTOR WILL BE REQUIRED TO OPEN UP THE ROADWAY TO TRAFFIC AT THE END OF DAYS WORK. THE CONTRACTOR SHALL ASSURE THAT ALL DROP OFF CONDITIONS ARE SAFE AND IN ACCORDANCE WITH THE MUTCD AND TXDOT TCP STANDARDS. CONTRACTOR SHALL BE ALLOWED TO WORK ON SEVERAL STREETS AT ONE TIME AS LONG AS ACCESS IS MAINTAINED AT THE END OF DAYS WORK.

## PHASE III

PLACE FINAL OVERLAY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. COMPLETE ROADWAY DITCH SLOPE GRADES TO MATCH THE TOP EDGE OF THE ACP PAVEMENT.

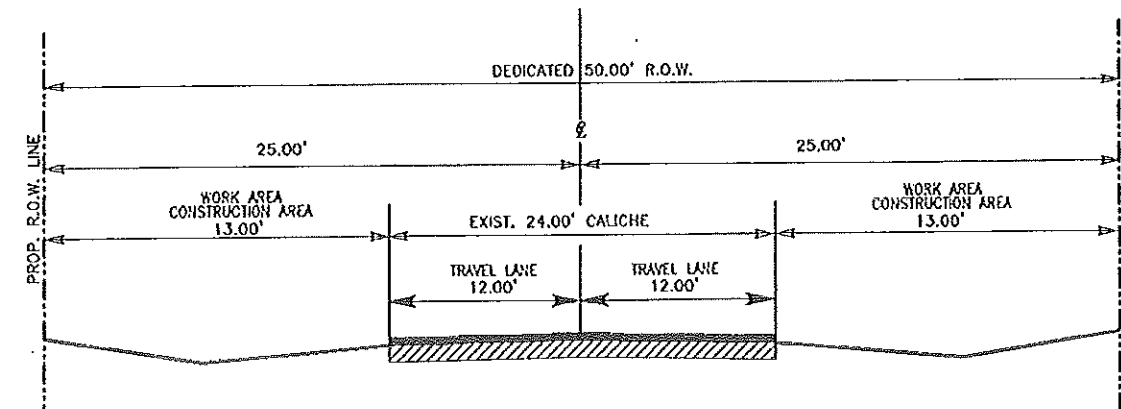
## FINAL CLEAN UP

UPON COMPLETION OF THE WORK AND BEFORE THE FINAL ACCEPTANCE IS MADE, THE CONTRACTOR SHALL SHAPE AND FINISH SUCH PORTIONS OF THE RIGHT-OF-WAY AS MAY HAVE BEEN DISTURBED DURING THE CONSTRUCTION AND WILL BE REQUIRED TO LEAVE THE ENTIRE RIGHT-OF-WAY IN A SMOOTH, CLEAN AND NEAT CONDITIONS TO THE SATISFACTION OF THE ENGINEER.

## NOTES:

- 1.- THE CONTRACTOR WILL PHASE CONSTRUCTION SO THAT ONE TRAVEL LANE OF TEN FT. IN WIDTH MINIMUM, IS MAINTAINED OPEN TO LOCAL TRAFFIC AT ALL TIMES
- 2.- THE CONTRACTOR WILL COORDINATE WITH HOMEOWNERS WHEN RECONSTRUCTING ENTRANCES SO THAT ACCESS IS REASONABLY AVAILABLE AT ALL TIMES.
- 3.- THE CONTRACTOR WILL ENSURE THAT AT NO TIME WILL THERE BE A STRAIGHT DROP GREATER THAN SIX INCH BETWEEN EXISTING TRAVEL LANES.
- 4.- IF THE GRADE CHANGE BETWEEN THE EXISTING LANE AND THE CONSTRUCTION LANE IS GREATER THAN TWO INCHES, THE COORDINATOR WILL ENSURE THAT A TRANSITION SLOPE OF 3' TO 1' IS MAINTAINED THROUGHOUT THE WORK AREA.
- 5.- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL THROUGH THE WORK AREA AT ALL TIMES, MORE ESPECIALLY AT TIMES WHEN THERE IS ONLY TRAVEL ONE LANE OPEN TO LOCAL TRAFFIC.

## PHASE I

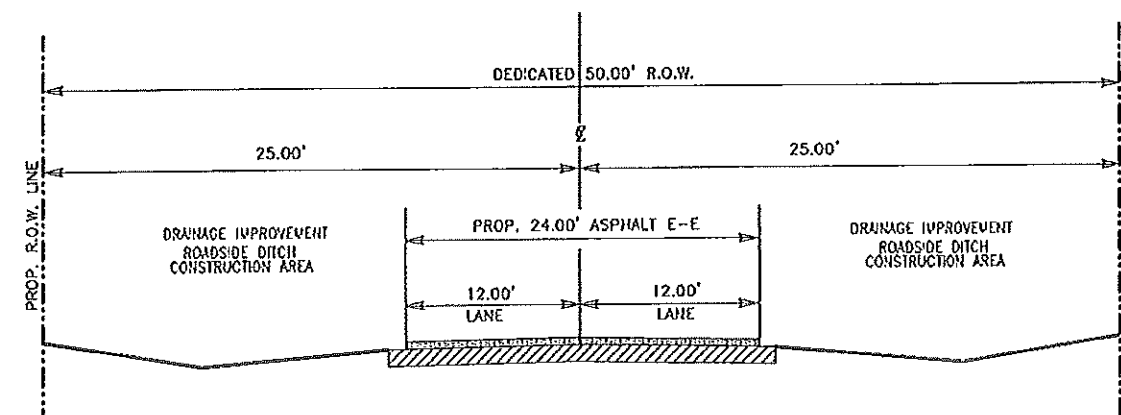


TYPICAL WORK CROSS-SECTION

N.T.S.

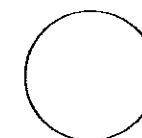
SAN RAFAEL DRIVE - LENGTH OF PROJECT: 1,320.00 FT.  
ANGEL DRIVE - LENGTH OF PROJECT: 1,100.00 FT.

## PHASE II



FINAL STREET CROSS-SECTION

N.T.S.



PIPE DRAINAGE SYSTEM

SAN RAFAEL DRIVE - LENGTH OF PROJECT: 1,320.00 FT.  
ANGEL DRIVE - LENGTH OF PROJECT: 1,100.00 FT.



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TRAFFIC CONTROL NOTES  
& TYPICAL SECTION



RAUL E. SESIN - P.E. No. 77082

4-29-14

SCALE 1"=50'

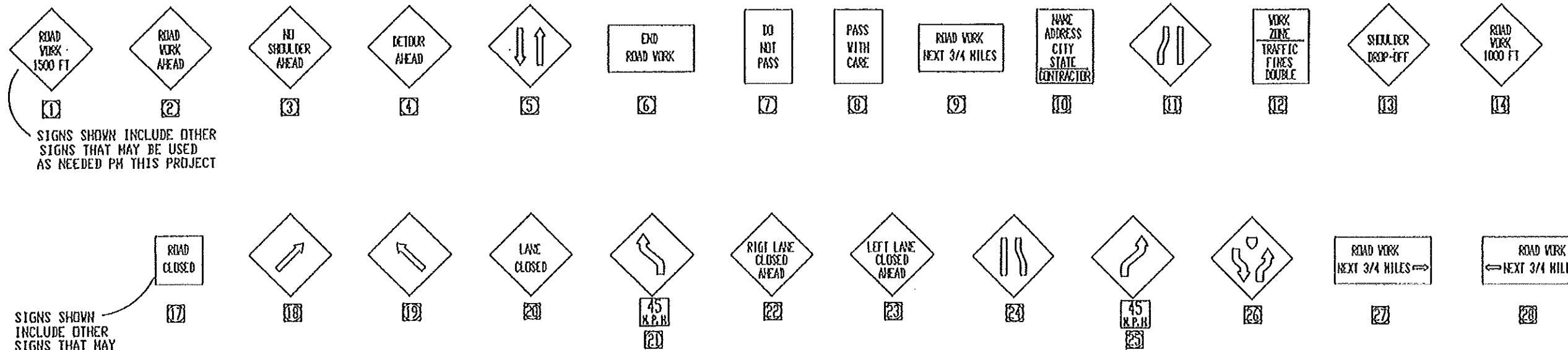
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TITLE SHEET

Q.H. & ASSOCIATES

10 OF 47



SIGNS SHOWN INCLUDE OTHER SIGNS THAT MAY BE USED AS NEEDED PM THIS PROJECT

SIGNS SHOWN INCLUDE OTHER SIGNS THAT MAY BE USED AS NEEDED ON THIS PROJECT

#### GENERAL NOTES:

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, TxDOT 1993 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES. "LEGAL REGULATIONS AND RESPONSIBILITIES TO THE PUBLIC" OF THE STANDARD SPECIFICATIONS.

THE PORTION OF THIS PROJECT WHICH COINCIDES WITH EXISTING ROAD AND/OR PRIVATE DRIVES SHALL BE KEPT OPEN TO THE TRAFFIC AT ALL TIMES, UNLESS OTHERWISE PROVIDED FOR OR APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN AT ALL TIMES A TWO WAY ROADWAY AS SHOWN ON THE TYPICAL SECTIONS FOR THE TRAFFIC CONTROL PLAN SHEETS.

WHEN CONNECTING PROPOSED ROADWAYS AND/OR DETOUR TO SECTIONS OF EXISTING PAVEMENT BEING USED BY TRAFFIC AND SUCH OPERATIONS RESULT IN A DROP-OFF OF MORE THAN 2-INCHES, A 3:1 SLOPE WITH VERTICAL PANELS AND A 4-FOOT BUFFER ZONE WILL BE REQUIRED. THIS WORK SHALL BE DONE EXPEDITIOUSLY DURING DAYLIGHT HOURS.

NECESSARY FLAGGERS AND APPROPRIATE SIGNING TO SAFELY GUIDE TRAFFIC THROUGH THE WORK AREA WILL BE REQUIRED AS DIRECTED AND/OR APPROVED BY THE ENGINEER.

ADEQUATE SIGNS AND BARRICADES SHALL BE INSTALLED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO OPENING ANY SECTION TO TRAFFIC. OTHER SIGNS MAY BE USED IN ADDITION TO THOSE REQUIRED BY THE BARRICADE STANDARDS.

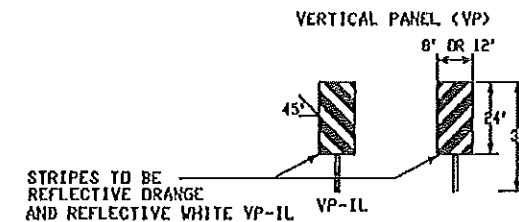
THE CONTRACTOR SHALL HAVE AT ALL TIMES ENOUGH BARRICADES AND SIGNS ON HAND TO REPLACE THOSE DAMAGED.

CHANNELIZING SHALL BE REQUIRED ALONG THE EDGE OF THE PORTIONS OF THE ROADWAY OPEN TO TRAFFIC.

ALL WORK AND MATERIALS REQUIRED FOR CONSTRUCTION OF DETOURS WILL NOT BE PAID FOR DIRECTLY.

STOP SIGNS OF INTERSECTION STREET SHALL BE ADJUSTED DURING THE VARIOUS CONSTRUCTION PHASES. ALL EXISTING REGULATORY SIGNS SHALL NOT BE REMOVED UNTIL TEMPORARY SIGN SUPPORTS HAVE BEEN INSTALLED TO ALLOW FOR IMMEDIATE REPLACEMENT OF PROPOSED RELOCATED SIGNS.

EXCAVATED MATERIAL SHALL BE HANDLED BY CONTRACTOR IN SUCH A WAY THAT IT SHALL NOT BLOCK DRAINAGE.



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TRAFFIC CONTROL SIGNAGE  
DETAIL SHEET



DATE: 8-2-13  
SCALE: 1"=50'  
DRAWN BY: LG  
CHECKED BY: AQ  
DATE: 8-2-13  
SHEET: 11 OF 47

## 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 TRAFFIC CONTROL DEVICES, CONSTRUCTION PAVEMENT MARKINGS, AND TYPICAL CONSTRUCTION SIGNS. THE INFORMATION CONTAINED IN THESE SHEETS MEET OR EXCEED THE REQUIREMENTS SHOWN IN THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD).
- 2.- THE DEVELOPMENT AND DESIGN OF THE TRAFFIC CONTROL PLAN 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) "POLICY ON THE GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" OR THE TxDOT "ROADWAY DESIGN MANUAL."
- 6.- WHEN PROJECTS ABUT, THE ENGINEER(S) MAY OMIT THE END ROAD WORK, TRAFFIC FINES DOUBLE, AND OTHER ADVANCE WARNINGS SIGNS IF THE SIGNING WOULD BE REDUNDANT AND THE WORK AREAS APPEAR CONTINUOUS TO THE MOTORISTS. IF THE ADJACENT PROJECT IS COMPLETED FIRST, THE CONTRACTOR WILL ERECT THE NECESSARY WARNING SIGNS AS SHOWN ON THESE SHEETS, THE TCP SHEETS OR AS DIRECTED BY THE ENGINEER. THE BEGIN ROAD WORK NEXT X MILES SIGN WILL BE REVISED TO SHOW APPROPRIATE WORK ZONE DISTANCE.
- 7.- THE ENGINEER MAY REQUIRE DUPLICATE CONSTRUCTION WARNING SIGNS ON THE MEDIAN SIDE OF THE 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 DESIGN FOR TEXAS," LATEST EDITION. SIGN DETAILS NOT SHOWN ON 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 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 OBSERVE WARNING SIGNS STATE LAW, BEGIN ROAD WORK NEXT X MILES, CONTRACTOR AND END ROAD WORK SIGNS SHALL BE ERECTED AT OR NEAR THE CSJ LIMITS AND THE WORK ZONE TRAFFIC FINES DOUBLE SIGN WITH PLAQUE SHALL BE ERECTED IN ADVANCE OF THE CSJ LIMITS.
- 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.

ONLY PRE-QUALIFIED PRODUCTS SHALL BE USED. A COPY OF THE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST" (CWZTCD) DESCRIBES PRE-QUALIFIED PRODUCTS AND THEIR SOURCES AND MAY BE OBTAINED BY CONTRACTING.

STANDARDS ENGINEER  
TRAFFIC OPERATIONS DIVISION - TE  
TEXAS DEPARTMENT OF TRANSPORTATION  
126 EAST 11TH STREET  
AUSTIN, TEXAS 78701-2483  
PHONE (512) 416-3120  
FAX (512) 416-3289

INSTRUCTIONS TO LOCATE THE "CWZTCD" ON TxDOT WEBSITE ARE:

START AT WEBSITE - WWW.DOT.STATE.TX.US  
CLICK ON "ABOUT TxDOT",  
CLICK ON "ORGANIZATIONAL CHART",  
CLICK ON "TRAFFIC OPERATIONS BOX",  
CLICK ON "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES",  
CLICK ON "VIEW PDF",  
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HIDALGO COUNTY  
PLANNING DEPARTMENT  
1334 S. 25TH STREET  
EDINBURG, TX 78539  
TEL. (956) 318-2010 FAX (956) 318-2014  
WWW.CO.HIDALGO.TX.US  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1  
1000 WEST 10TH ST.  
EDINBURG, TX 78539  
COMMUNICATIONS SECTION  
C.C. GILLER, JR.  
COUNTY CLERK



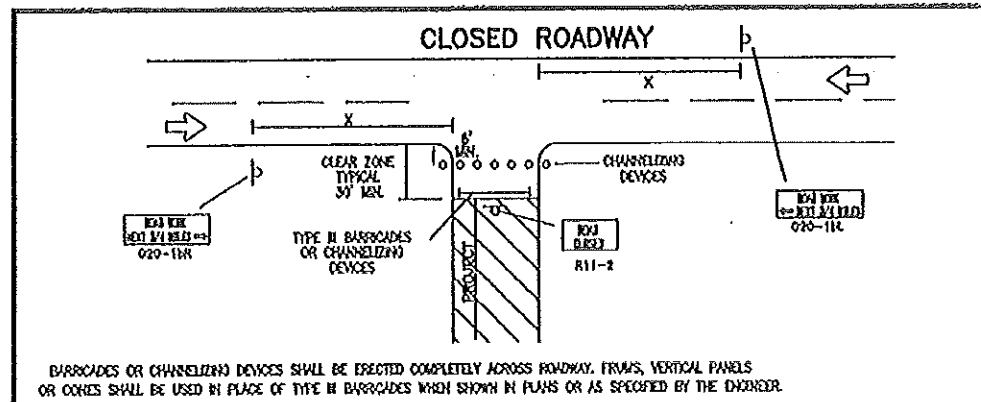
QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
CONSULTING ENGINEERS AND SURVEYORS  
1000 WEST 10TH ST.  
EDINBURG, TX 78539  
PHONE (956) 318-2010  
FAX (956) 318-2014

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
BARRICADE GENERAL NOTES  
SHEET

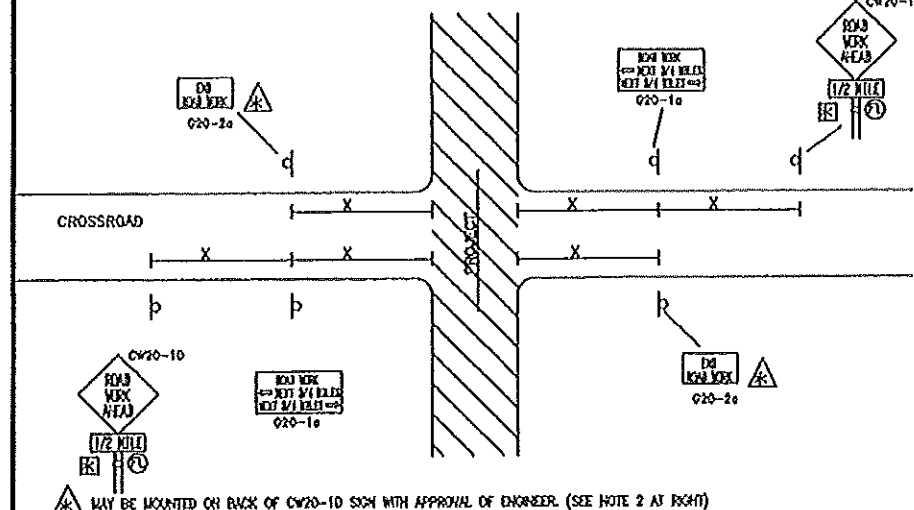


8-8-13  
SCALE 1"=50'  
DRAWN BY LG  
CHECKED BY AQ  
DESIGNED BY O.H. & ASSOCIATES  
DATE

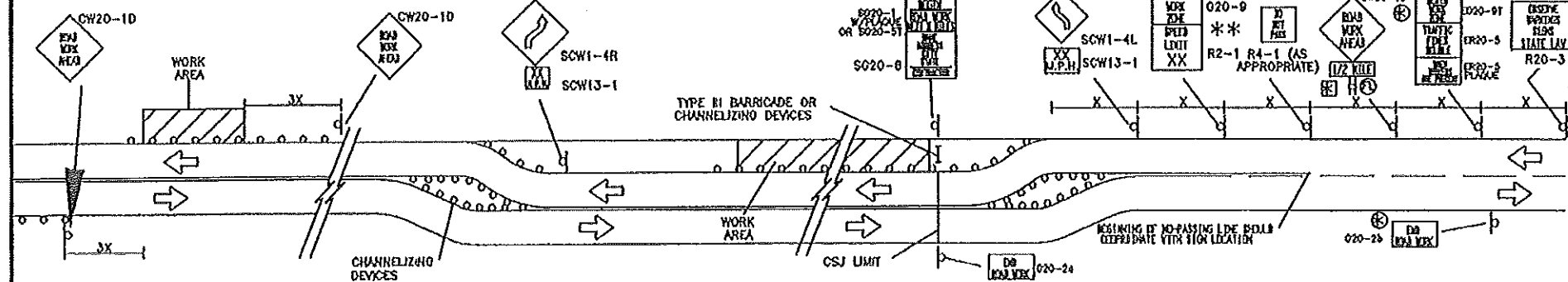
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TYPICAL LOCATION OF CROSSROAD SIGNS



TYPICAL DETAILS FOR WORK AREAS IN VARIOUS LOCATION WITHIN CSJ LIMITS



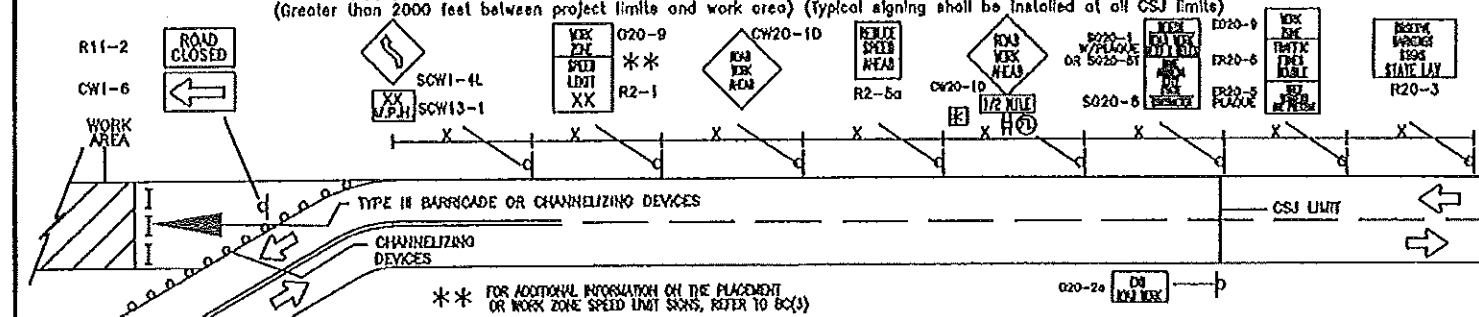
TYPICAL SIGNING AND TRAFFIC CONTROL DEVICE DETAILS FOR WORK BEGINNING AT THE CSJ LIMITS (LESS THAN 2000 FEET BETWEEN PROJECT LIMITS AND WORK AREA) (TYPICAL SIGNING SHALL BE INSTALLED AT ALL CSJ LIMITS)

WHEN EXTENDED DISTANCES OCCUR BETWEEN WORK AREAS, THE ENGINEER/INSPECTOR SHOULD ENSURE ADDITIONAL ROAD WORK AHEAD (W20-10) SIGNS ARE PLACED IN ADVANCE OF THESE WORK AREAS TO REMIND DRIVERS THEY ARE STILL WITHIN THE PROJECT LIMITS. SEE THE APPLICABLE TOP SHEETS FOR EXACT LOCATION AND SPACING OF SIGNS AND CHANNELIZING DEVICES.

\*\* FOR ADDITIONAL INFORMATION ON THE PLACEMENT OR WORK ZONE SPEED LIMIT SIGNS, REFER TO B(3)

THESE SIGNS SHALL BE USED WHEN ADVANCE SIGNS ARE REQUIRED OUTSIDE THE CSJ LIMITS. THEY INSTRUCT THE MOTORIST OF EXISTING OR LEADING A WORK ZONE WHERE TRAFFIC LINES MAY DOUBLE IF WORKERS ARE PRESENT.

TYPICAL DETAIL FOR PROJECT LIMIT AWAY FROM WORK AREA



\*\* FOR ADDITIONAL INFORMATION ON THE PLACEMENT OR WORK ZONE SPEED LIMIT SIGNS, REFER TO B(3)

LEGEND

- d SIGN
- (FL) FLASHING TYPE A-LOW INTENSITY WARNING LIGHT
- OO CHANNELIZING DEVICES
- I TYPE II BARRICADE
- [K] THE TYPE II WARNING LIGHTS SHALL NOT BE USED WITH SIGNS MANUFACTURED WITH TYPE E SHEETING (FLUORESCENT PRISMATIC) MEETING THE REQUIREMENTS OF DEPARTMENTAL MATERIAL SPECIFICATIONS DMS-8300.
- X SEE TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING CHART OR THE TMAUC FOR SIGN SPACING REQUIREMENTS.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

| Posted Speed | Sign A Spacing "X" | Long-term Or Intermediate-term Stationary Approach Warning Signs CW20 and CW21 Series | Short-term stationary or Short Duration Approach Warning Signs CW21 Series | Other Warning Signs |
|--------------|--------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------|
| MPH Speed    | FEET (APPRX.)      | STANDARD INCHES                                                                       | MINIMUM INCHES                                                             | STANDARD INCHES 7   |
| 30           | 120                | 48 x 48                                                                               | 36 x 36                                                                    | 30 x 30             |
| 35           | 160                |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 40           | 240                |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 45           | 230                |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 50           | 400                |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 55           | 500 <sup>1</sup>   |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 60           | 600 <sup>1</sup>   |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 65           | 700 <sup>1</sup>   |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 70           | 800 <sup>1</sup>   |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| 75           | 900 <sup>1</sup>   |                                                                                       | 36 x 36                                                                    | 30 x 30             |
| *            | *                  |                                                                                       |                                                                            |                     |

\* FOR TYPICAL SIGN SPACINGS ON EXPRESSWAYS AND FREEWAYS, SEE PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMAUC) TYPICAL APPLICATION DIAGRAMS OR TCM STANDARD SHEETS. <sup>1</sup> MINIMUM DISTANCE FROM WORK AREA TO FIRST ADVANCE WARNING SIGN AND/OR DISTANCE BETWEEN EACH ADVANCE SIGN.

GENERAL NOTES:

- SPECIAL OR LARGER SIZE SIGNS MAY BE USED AS NECESSARY.
- DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1600 FEET ADVANCE WARNING.
- DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1/2 MILE OR MORE ADVANCE WARNING.
- FOR USE ONLY ON SECONDARY ROADS OR CITY STREETS WHERE SPEEDS ARE LOW.
- ONLY DIAMOND SHAPED WARNING SIGNS SIZES ARE INDICATED.
- SEE SIGN SIZE LISTING IN "TMAUC", APPENDIX A OR THE STANDARD HIGHWAY SIGN DESIGN MANUAL FOR COMPLETE LIST OF AVAILABLE SIGN DESIGNS.
- WHERE TWO SIZES ARE LISTED, SEE SIGN SIZE LISTING IN "TMAUC", APPENDIX A OR THE "STANDARD HIGHWAY SIGN DESIGN" MANUAL FOR PROPER SIZE.

ONLY PRE-QUALIFIED PRODUCTS SHALL BE USED. A COPY OF THE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST" (CWZTCD) DESCRIBES PRE-QUALIFIED PRODUCTS AND THEIR SOURCES AND MAY BE OBTAINED BY CONTRACTING.

STANDARDS ENGINEER  
TRAFFIC OPERATIONS DIVISION - TE  
TEXAS DEPARTMENT OF TRANSPORTATION  
125 EAST 11TH STREET  
AUSTIN, TEXAS 78701-2463  
PHONE (512) 416-3120  
FAX (512) 416-3209

INSTRUCTIONS TO LOCATE THE "CWZTCD" ON TxDOT WEBSITE ARE:

START AT WEBSITE - WWW.DOT.STATE.TX.US  
CLICK ON "ABOUT TxDOT",  
CLICK ON "ORGANIZATIONAL CHART",  
CLICK ON TRAFFIC OPERATIONS BOX,  
CLICK ON "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES",  
CLICK ON "VIEW PDF".  
THIS SITE IS PRINTABLE.



HIDALGO COUNTY  
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RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1  
COUNTY COMMISSIONER DIST. 1



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LAND SURVEYORS  
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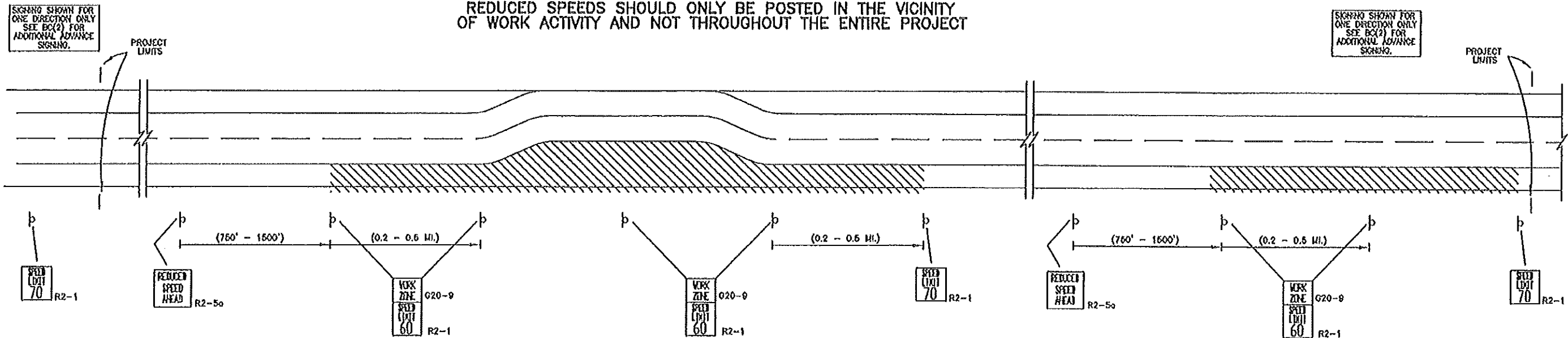
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URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
TYPICAL CONSTRUCTION SIGNAGE  
SHEET



130F 47

# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS WORK ZONE SPEED LIMIT SHALL BE REGULATORY, ESTABLISHED IN ACCORDANCE WITH THE "PROCEDURE FOR ESTABLISHING SPEED ZONES," AND APPROVED BY THE TEXAS TRANSPORTATION COMMISSION.

REDUCED SPEEDS SHOULD ONLY BE POSTED IN THE VICINITY  
 OF WORK ACTIVITY AND NOT THROUGHOUT THE ENTIRE PROJECT



## 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 LIMITS**  
 SIGNS SHOULD BE POSTED AND VISIBLE TO THE MOTORISTS AT ALL TIMES. WORK ACTIVITY IN THE AREA OF REDUCED SPEED ZONE SHOULD BE GREATER THAN 12 CONSECUTIVE HOURS PER DAY. 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 (OVERTURNS)
- c) CONSTRUCTION DETOURS
- d) GRADE
- e) WIDTH

AS LONG AS ANY OF THESE CONDITIONS EXIST, THE WORK ZONE SPEED LIMITS 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 BARRIERS, WORK ACTIVITY IS WITHIN 10 FEET OF PAVEMENT EDGE OR ACTUALLY ON THE PAVEMENT.

**SHORT TERM WORK ZONE SPEED LIMITS**  
 SIGNS SHOULD BE POSTED AND VISIBLE TO THE MOTORISTS ONLY WHEN WORK ACTIVITY IS PRESENT. WORK ACTIVITY IN THE AREA OF REDUCED SPEED SHOULD BE LESS THAN 12 CONSECUTIVE HOURS. WHEN WORK ACTIVITY IS NOT PRESENT, SIGNS SHOULD BE COVERED WITH AN APPROVED SIGN COVER OR REMOVED FROM WORK AREA.

## GENERAL NOTES:

- 1.- REGULATORY WORK ZONE SPEED LIMITS SHOULD BE USED ONLY FOR SECTIONS OF CONSTRUCTION PROJECTS WHERE SPEED CONTROL IS OF MAJOR IMPORTANCE. REGULATORY WORK ZONE SPEED SIGNS (R2-1) SHOULD BE REMOVED DURING PERIODS WHEN THEY ARE NOT NEEDED TO MINIMIZE INTERFERENCE WITH TRAFFIC.
- 2.- REGULATORY WORK ZONE SPEED LIMITS SIGNS SHALL BE PACED ON SUPPORTS AT A 7 FOOT 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 SPEED LIMITS 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.
- 6.- FABRICATION, ERECTION AND MAINTENANCE OF REDUCED SPEED AHEAD SIGN, WORK ZONE PLAQUE AND SPEED LIMIT SIGNS SHALL NOT BE PAID DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 602.
- 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, (IN ORDER OF EFFECTIVENESS):  
 A. FLAGGER STATIONED NEXT TO SIGN.  
 B. LAW ENFORCEMENT.  
 C. PORTABLE CHANGEABLE MESSAGE SIGN (PCMS).  
 D. LOW-POWER RADAR TRANSMITTER.
- 9.- REFER TO "WORK ZONE SPEED LIMIT WORK SHEET 1 AND 2" TO DETERMINE WHEN A CONSTRUCTION SPEED ZONE SHOULD BE REQUIRED.



HIDALGO COUNTY  
 PLANNING DEPARTMENT  
 1301 S. 25TH STREET  
 EDINBURG, TX 78539  
 TEL: (956) 318-2816 FAX: (956) 318-2814  
 WWW.CO.HIDALGO.TX.US  
 RAUL E. SESIN, P.E., C.F.A.  
 PLANNING ADMINISTRATOR

HIDALGO COUNTY  
 PRECINCT NO. 1  
 1902 Ave. Sherman Ave.  
 EDINBURG, TX 78539  
 TEL: (956) 318-2816 FAX: (956) 318-2814  
 WWW.CO.HIDALGO.TX.US  
 COUNTY COMMISSIONER PCT. 1

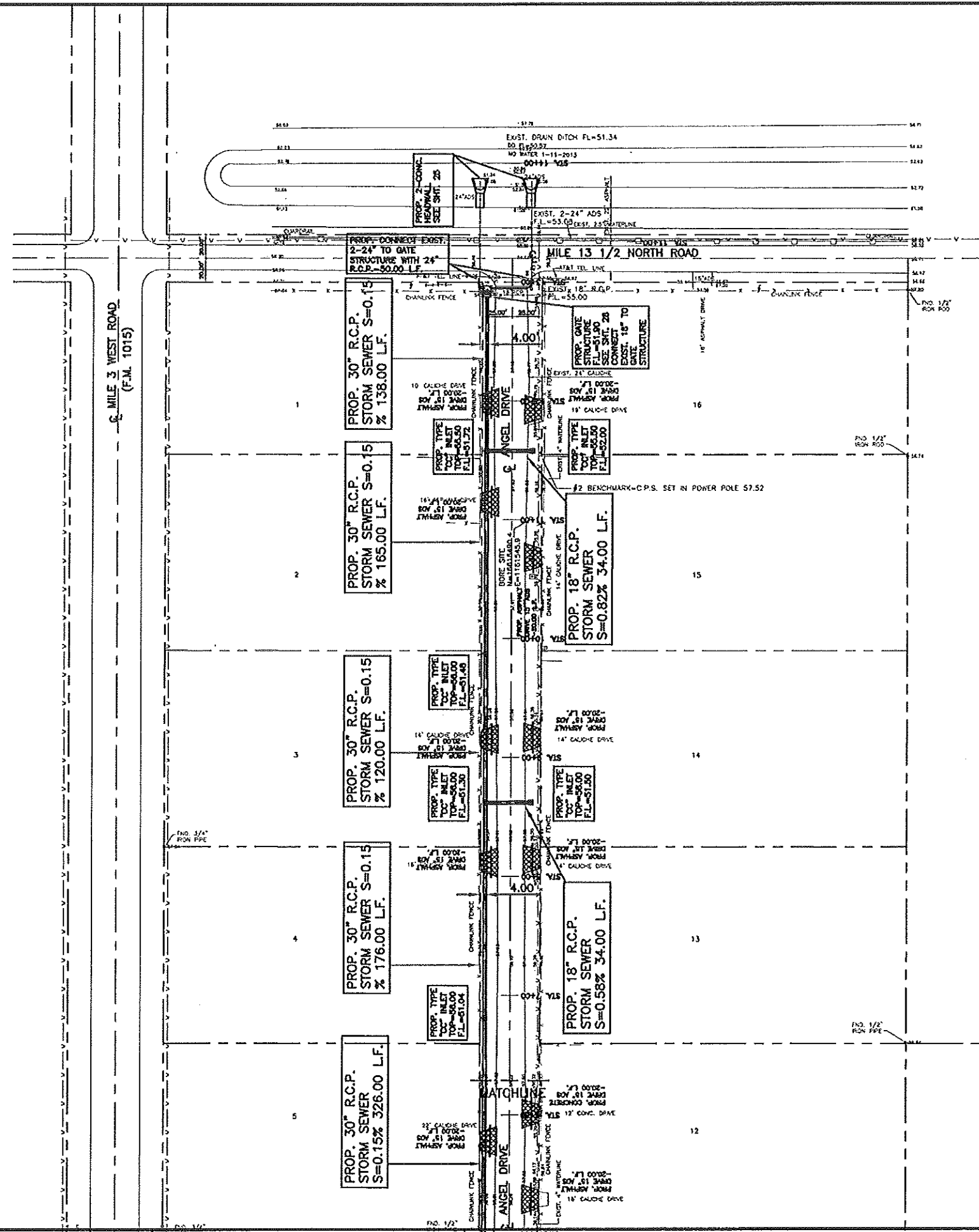
QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
 CONSULTING ENGINEERS  
 10000 N. LOOP W. SUITE 100  
 DALLAS, TEXAS 75243  
 PHONE: (214) 343-1111  
 FAX: (214) 343-1112  
 WWW.QHA-INC.COM

GLO FLOOD & DRAINAGE IMPROVEMENTS  
 COLONIA INFRASTRUCTURE PROJECT II &  
 URBAN CO. BORDER ACCESS COLONIA PROGRAM  
 TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
 TYPICAL WORK ZONE LIMITS  
 SHEET

SEE  
 8-8-13  
 SCALE: 1"=50'  
 DRAWN BY: LG  
 CHECKED BY: AQ  
 TOWN SURVEY BY: Q.H. & ASSOCIATES  
 DECK: 14 OF 47



SCALE: 1" = 100'



#### CONSTRUCTION NOTES:

- 1) CONTRACTOR TO CALL 1-800-DIG TESS FOR VERIFICATION OF ALL UTILITY LOCATIONS BEFORE ANY CONSTRUCTION.
- 2) ONLY UTILITIES FOR WHICH INFORMATION WAS AVAILABLE ARE SHOWN. LOCATIONS AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL NOTIFY ALL UTILITIES COMPANIES FOR VERIFICATION OF LOCATIONS PRIOR TO COMMENCEMENT OF WORK.

#### LEGEND

- \* = PALM TREE
- ↑ = GUY WIRE
- = TREE
- ⚡ = POWER POLE
- ☐ = MAILBOX
- ⊕ = WATER METER
- ⊗ = WATER VALVE
- ⚡ = SIGN
- ⚡ = SERVICE POLE
- ⊕ = FLUSH VALVE
- ⊕ = VALVE MARKER
- ⊕ = TEL PED

1. FOR INTERSECTION INFORMATION SEE INTERSECTION LAYOUT AND ELEVATION SHEET.
2. DRIVEWAYS & TURNOUTS ARE TO BE CONSTRUCTED AS PER TYPE & WIDTHS SHOWN ON THE DRIVEWAY & TURNOUT TABLES.
3. CONTRACTOR SHALL KEEP ACCESS INTO HOMES AVAILABLE THROUGHOUT THE PROJECT.
4. THE CONTRACTOR WILL RELOCATE ALL MAILBOXES. ACCESS BY MAIL DELIVERY TO THE MAILBOXES SHALL BE KEPT AVAILABLE THROUGHOUT THE PROJECT.

#### BENCHMARK INFORMATION.

LOCAL BENCHMARK (REF POINT No. 1)  
POWER POLE EAST @ INTERSECTION ANGEL & SAN RAFAEL DRIVE  
BM. C.P.S. SET  
NORTHING = 16615733.12130  
EASTING = 1161467.36425  
ELEVATION = 57.50

#### BENCHMARK INFORMATION.

LOCAL BENCHMARK (REF POINT No. 2)  
POWER POLE EAST SIDE OF ANGEL DRIVE  
BM. C.P.S. SET  
NORTHING = 16616544.17657  
EASTING = 1161553.02492  
ELEVATION = 56.23



HIDALGO COUNTY  
PLANNING DEPARTMENT

1304 S. 25 TH STREET  
EDINBURG TX 78539  
TEL: (956) 318-2040 FAX: (956) 318-2044  
www.co.hidalgo.tx.us  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1



QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
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1902 Joe Stephens Ave.  
WESLACO, TX 78096  
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A.C. QUELLAR JR.  
COUNTY COMMISSIONER PCT. 1

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM



E. Ruiz  
E. Ruiz - P.E. No. 17062  
11-20-19  
DATE

SCALE: 1" = 100'

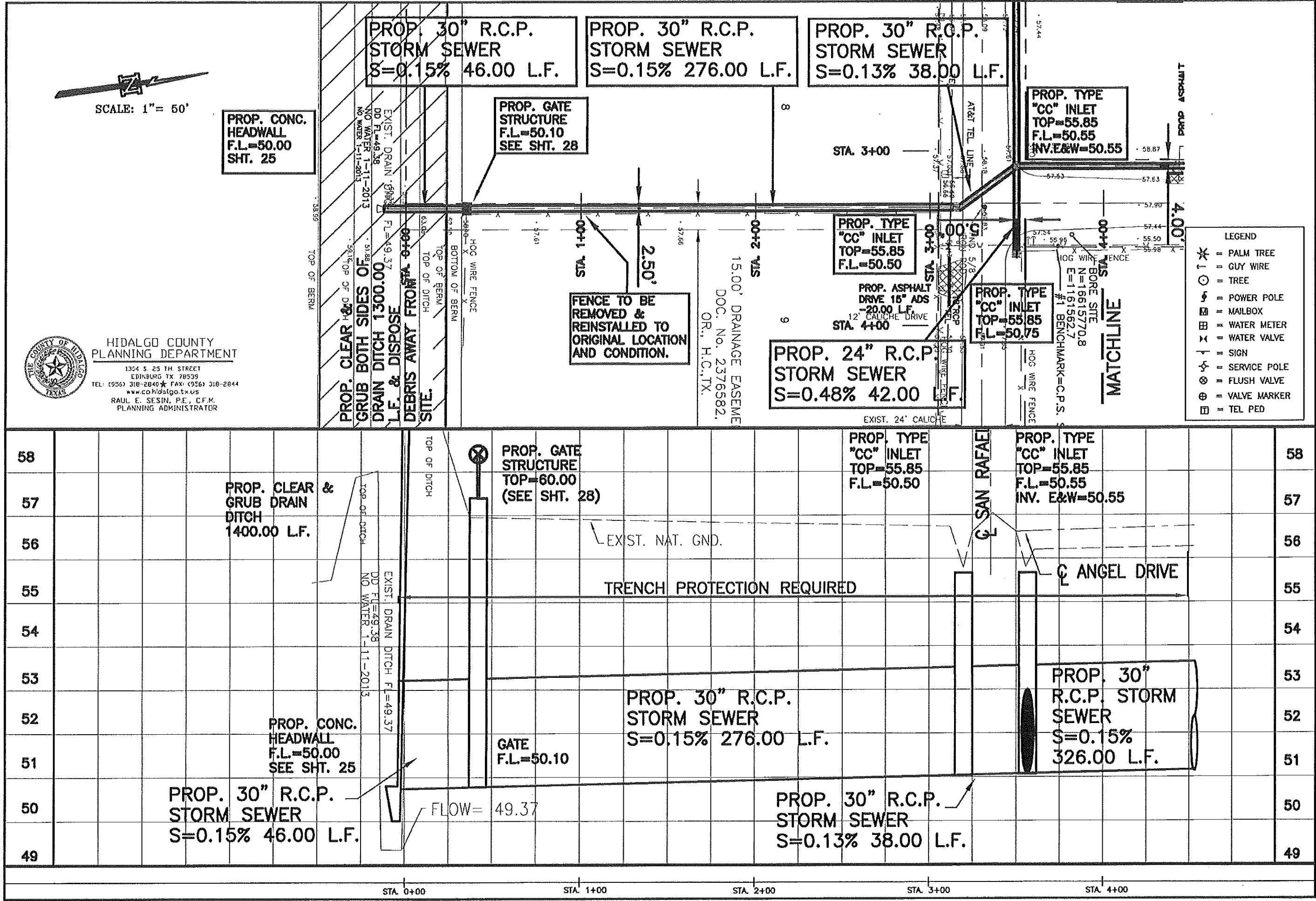
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EDINBURG, TX 78539  
(956) 963-0233 FAX: (956) 963-1417  
Commissioner/County Engineer  
A.C. CUELLAR JR.  
COUNTY COMMISSIONER PCT. 1

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Phone: (956) 963-0233  
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www.qhainc.com

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM

TJERUNA ESTATES BID NO. 6540-62-0309-5100-6200

ANGEL DRIVE - STA. 0+00 TO STA. 4+00

STATE OF TEXAS  
COUNTY OF HIDALGO

11-20-14

SCALE: 1"=50'

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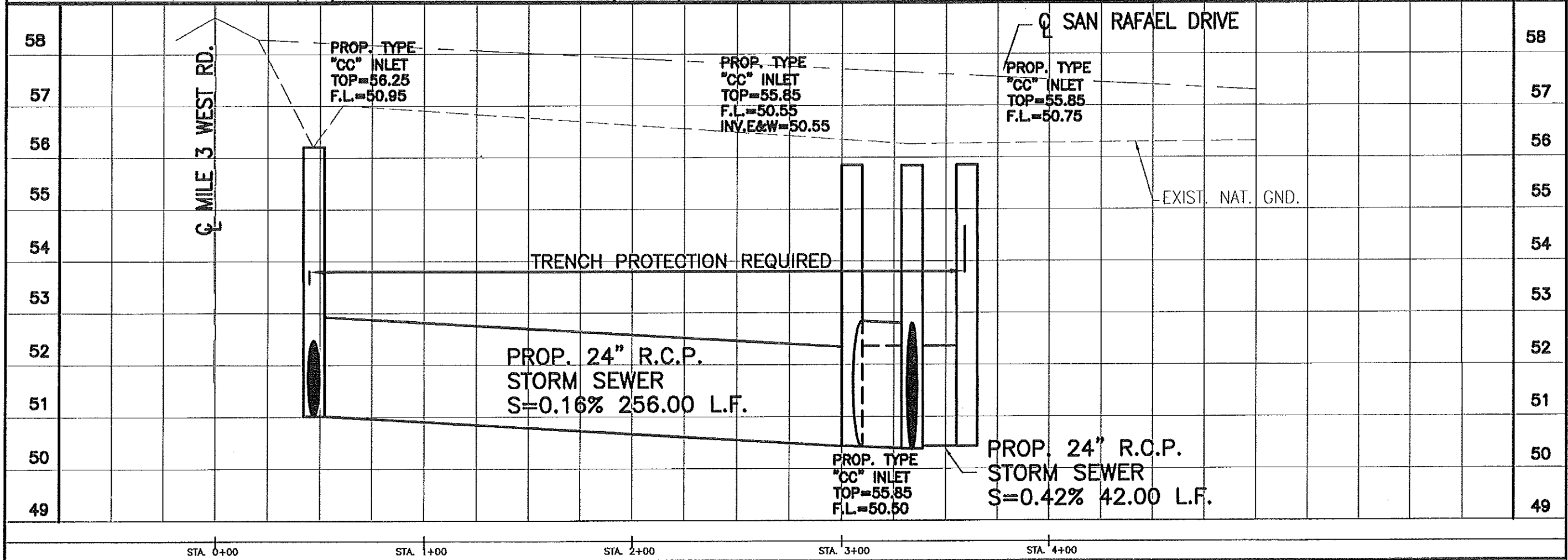
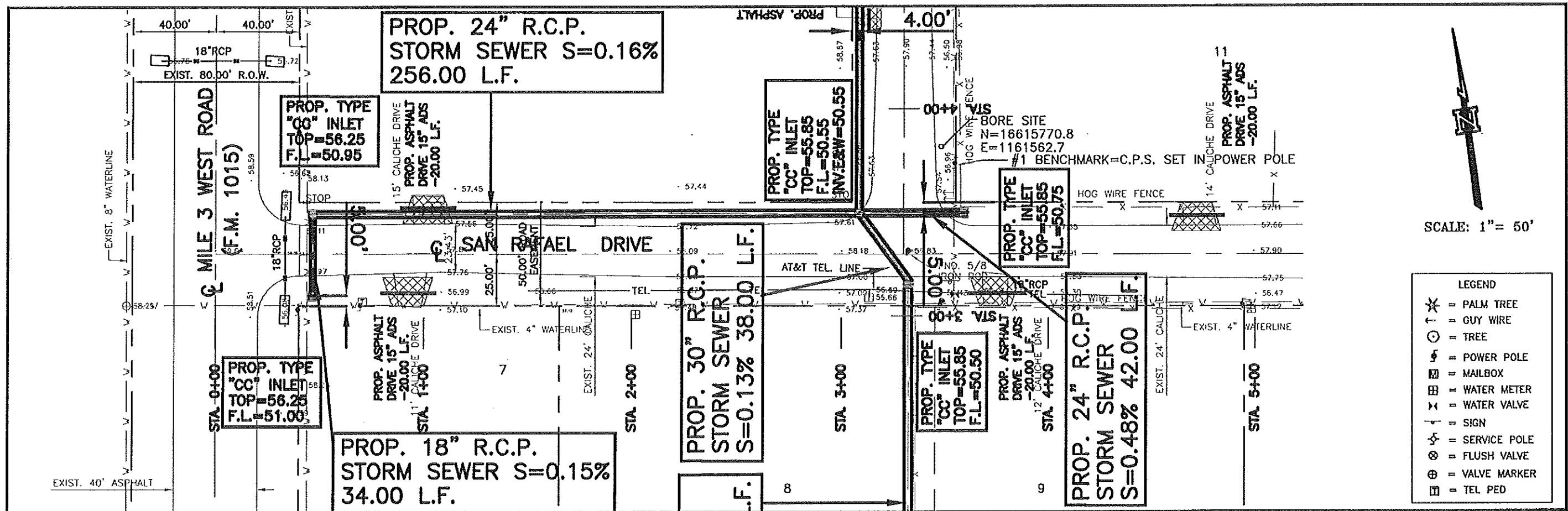
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TOPO SURVEY BY: O.H. & ASSOCIATES

SHEET: 17 OF 47







HIDALGO COUNTY  
PRECINCT NO. 1

1802 Joe Stephens Ave.  
KINGWOOD, TX 77339  
TEL: (281) 944-3733 • FAX: (281) 944-1417  
COMMUNICATIONS DIVISION  
A.C. CUELLAR JR.  
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HOUSTON, TEXAS 77057  
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FAX: (281) 416-1112  
WWW.QH&A.COM

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM

TJERINA ESTATES BID NO. 6540-62-0309-5100-6200

**SAN RAFAEL DRIVE - STA. 0+00 TO STA. 4+00**

STATE OF TEXAS  
COUNTY OF HIDALGO  
JULIAN ALARCON  
REGISTERED PROFESSIONAL ENGINEER  
NO. 177062  
EXPIRATION DATE 12/31/2015

*Julian Alarcon*  
11-20-14

DATE: 11-20-14  
SCALE: 1"=50'  
DRAWN BY: LG  
CHECKED BY: AQ  
TOPO SURVEY BY: Q.H. & ASSOCIATES  
SHEET: 20 OF 47

| DRAINAGE AND DRIVEWAYS PROJECT QUANTITIES |      |      |      |                                          |       |      |
|-------------------------------------------|------|------|------|------------------------------------------|-------|------|
| TIJERINA SUBDIVISION                      |      |      |      |                                          | TOTAL |      |
| ANGEL DRIVE                               |      |      |      |                                          |       |      |
| # 6540-62-0309-5100-6200                  |      |      |      |                                          |       |      |
| EST.                                      | FIN. | ITEM | UNIT | DESCRIPTION                              | EST.  | FIN. |
| 1880                                      |      | 110  | LF   | EXCAVATION (ROADWAY DITCH)               | 1880  |      |
| 1576                                      |      | 402  | LF   | TRENCH EXCAVATION PROTECTION             | 1576  |      |
| 3                                         |      | 432  | EA   | RIP RAP (4") (CONC.) (NO.#3 REBAR)       | 3     |      |
| 1285                                      |      | 464  | LF   | 30" R.C.P. STORM DRAIN CL III            | 1285  |      |
| 50                                        |      | 464  | LF   | 24" R.C.P. STORM DRAIN CL III            | 50    |      |
| 68                                        |      | 464  | LF   | 18" R.C.P. STORM DRAIN CL III            | 68    |      |
| 8                                         |      | 465  | EA   | TYPE "CC" INLETS                         | 8     |      |
| 390                                       |      | 530  | SY   | DRWYS (ASPH CONC PAV) (TYP. P)           | 390   |      |
| 21                                        |      | 530  | SY   | DRWYS (CONC PAV) (3000 PSI)              | 21    |      |
| 240                                       |      | 556  | LF   | 15" ADS PIPE                             | 240   |      |
| 1                                         |      | 5249 | LS   | TEMP SEDMT CONT FENCE (INSTALL & REMOVE) | 1     |      |
| 2                                         |      |      | EA   | CONCRETE CONTROL GATE                    | 2     |      |
| 198                                       |      |      | LF   | REMOVAL EXISTING CULVERT PIPES           | 198   |      |

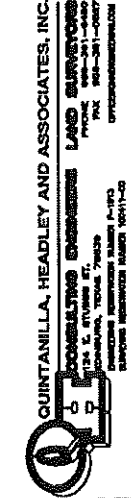


HIDALGO COUNTY  
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www.co.hidalgo.tx.us  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR



EDUARDO RAMIREZ - P.E. No. 77082  
11-20-14  
SCALE: 1"=50'  
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CHECKED BY: AQ  
TOPO SURVEY BY: Q.H. & ASSOCIATES  
SHEET:

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COLONIA INFRASTRUCTURE PROJECT II &  
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TIJERINA SUBDIVISION  
QUANTITY SHEET  
TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200



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Commissioner Gen. Hidalgo  
A.C. CUELLAR JR.  
COUNTY COMMISSIONER PCT. 1

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**HIDALGO COUNTY  
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CIRCUITRIP@CSC.COM

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 TIJERINA SUBDIVISION  
 TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
 QUANTITY SHEET


  
 500 Lb  
 ELIJAH MUHAMMAD - P.O. NO. 7702  
 4-30-14  
 DATE \_\_\_\_\_  
 SCALE \_\_\_\_\_ 1' = 50'  
 MOUNT BY \_\_\_\_\_ LG  
 CHECKED BY \_\_\_\_\_ AQ  
 TYPED BY \_\_\_\_\_  
 O.H. & ASSOCIATES  
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HIDALGO COUNTY  
PRECINCT NO. 1  
1002 Joe Stephens Ave.  
MCKINNA, TX 77058  
(281) 989-6733 • FAX (281) 989-1417  
commissioner@brockhopper.us  
A.C. CUDDELL JR.  
COUNTY COMMISSIONER PCT. 1



| TIJERINA SUBDIVISION                             |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|--------------------------------------------------|-----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--------------------------------------|---------------------------------|------------------|-----------------------------------|--------|-------|
| SAN RAFAEL DRIVE<br># 6540-82-0309-<br>5100-6200 | EXIST.<br>DRIVEWAY<br>WIDTH | EXIST.<br>RCP<br>18" | EXIST.<br>ADS<br>15" | EXIST.<br>PVC<br>15" | EXIST.<br>ADS<br>18" | EXIST.<br>RCP<br>15" | PROP.<br>WIDTH<br>② EDGE<br>OF RDWAY | PROP.<br>WIDTH<br>① ROW<br>LINE | PROP.<br>15" ADS | ITEM 530<br>ACP DRWY<br>AREA (SY) |        |       |
| (STA)                                            | (FT)                        | (FT)                 | (FT)                 | (FT)                 | (FT)                 | (FT)                 | (FT)                                 | (FT)                            | (FT)             | P1                                | PB-1   | PRB-1 |
| 1 0+79.5 (RT)                                    | 11'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 2 1+2.28 (LT)                                    | 15'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 3 3+75.2 (RT)                                    | 12'                         | 16'                  |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 4 4+72.3 (LT)                                    | 14'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 5 5+37.07 (RT)                                   | 12'                         | 16'                  |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 6 6+19.40 (LT)                                   | 12'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 7 6+70.45 (RT)                                   | 14'                         | 18'                  |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 8 6+74.94 (LT)                                   | 14                          |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 9 7+20.91 (LT)                                   | 13'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 10 7+51.18 (RT)                                  | 14'                         | 18'                  |                      |                      |                      |                      | 36                                   | 20                              | 20'              |                                   | 32.50  |       |
| 11 7+77.62 (LT)                                  | 12'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 12 8+50.30 (RT)                                  | 12'                         |                      |                      |                      |                      | 24'                  | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 13 10+8.28 (LT)                                  | 12'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 14 10+60.43 (RT)                                 | 12'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 15 11+38.61 (LT)                                 | 23'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 16 11+40.97 (RT)                                 | 12'                         |                      |                      |                      | 20'                  |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 17 13+5.21 (RT)                                  | 12'                         |                      |                      |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
| 18 13+5.78 (LT)                                  | 12'                         |                      | 22'                  |                      |                      |                      | 25                                   | 20                              | 20'              |                                   | 32.50  |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
|                                                  |                             |                      |                      |                      |                      |                      |                                      |                                 |                  |                                   |        |       |
| TOTAL:                                           |                             |                      |                      |                      |                      |                      |                                      |                                 | 360.00           |                                   | 585.00 |       |



**HIDALGO COUNTY  
PLANNING DEPARTMENT**

1324 S 25 TH STREET  
EDINBURG TX 78539  
TEL: (956) 318-2840 FAX: (956) 318-2844  
[www.co.hidalgo.tx.us](http://www.co.hidalgo.tx.us)  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

11-20-14

1' = 50

10

ENCLOSURE

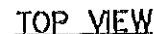
FD-302 (Rev. 11-27-70)

Q.H. & ASSOCIATES

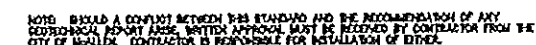
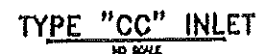
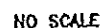
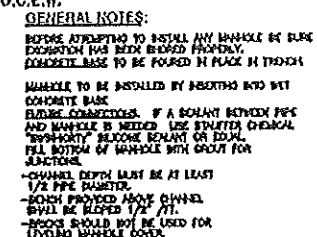
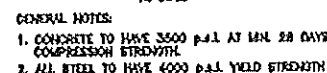
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24 OF 47

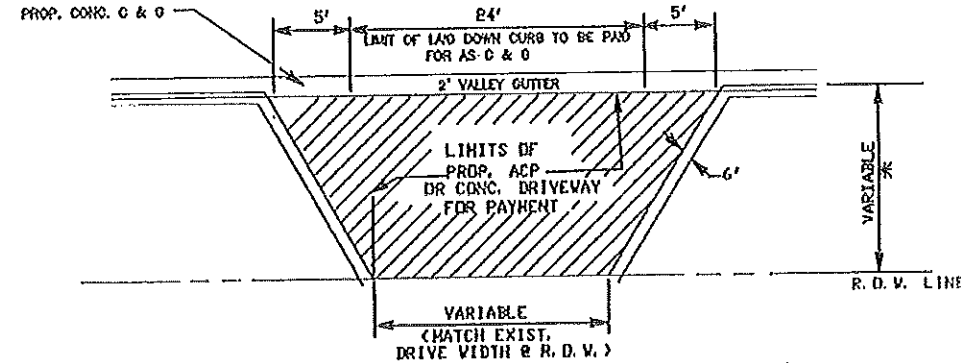
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- CONCRETE HEADWALL DETAIL (POURED IN PLACE)  
N.T.S



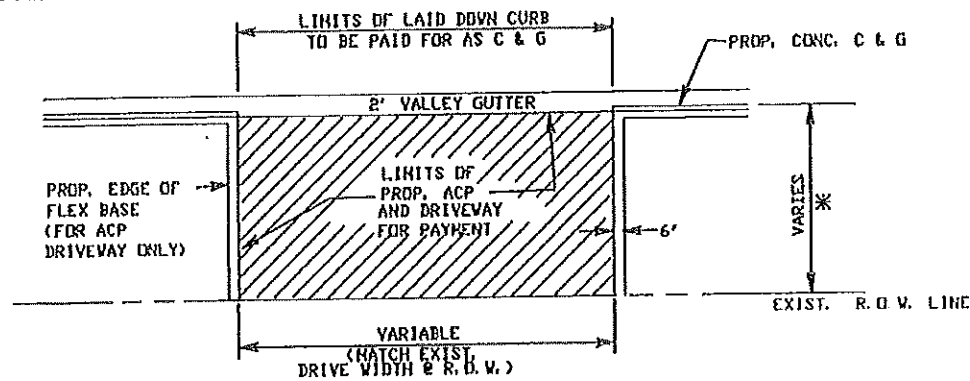
## PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



**PLAN OF PRIVATE AND COMMERCIAL DRIVES**  
(V/DRIVEWAY WIDTH LESS THAN 24')

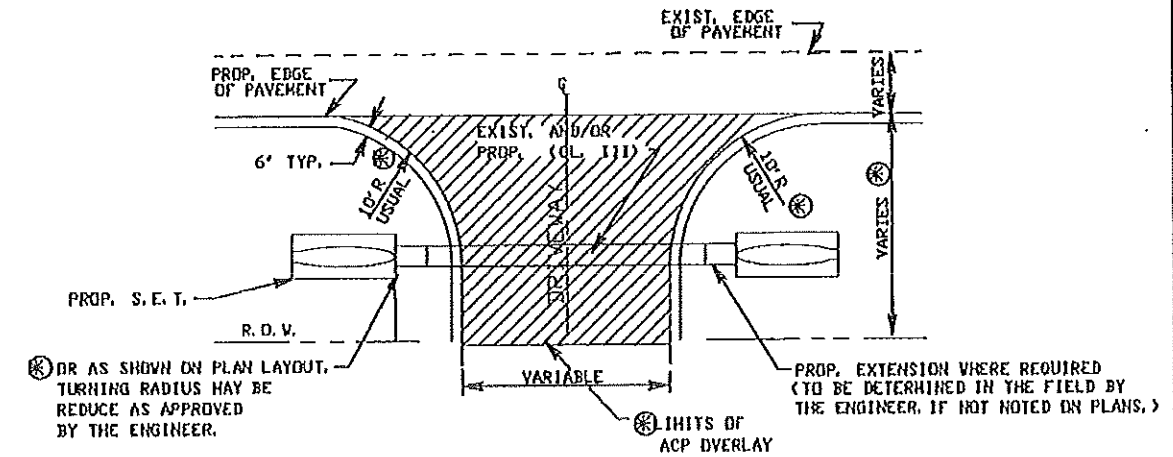
SEE NOTE BELOW

SEE P&P SHEETS



**PLAN OF PRIVATE AND COMMERCIAL DRIVES**  
(V/DRIVEWAY WIDTH EQUAL TO OR GREATER THAN 24' @ R.O.W. LINE)

## PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER

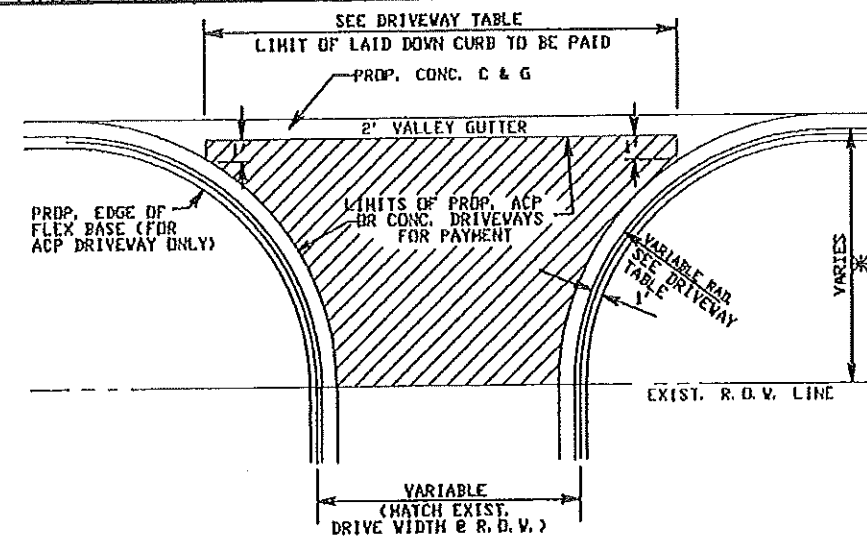


**PLAN OF PRIVATE AND COMMERCIAL DRIVES**  
(V/DRIVEWAY WIDTH LESS THAN 24')

FOR DETAILS SEE DRIVEWAY & TURNOUT DETAILS (TABLE)

**PLAN OF PRIVATE AND COMMERCIAL DRIVES**  
(V/DRIVEWAY WIDTH EQUAL TO OR GREATER THAN 24' @ R.O.W. LINE)

## PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



**PLAN OF PRIVATE AND COMMERCIAL DRIVES**

SEE P&P SHEETS FOR LOCATIONS OF DRIVES

H. T. S.

## DRIVEWAY TYPES

NOTE:

**TY PRB-1**  
EXIST. PAVED CALICHE AND /OR GRAVEL DRIVEWAYS TO BE SCARIFIED AND RECONSTRUCTED WITH 3" NEW AND/OR SALVAGE FLEX. BASE TO MATCH THE PROPOSED WIDENED SECTION. THEN PRIMED AND SURFACED WITH 114#/SY ACP (TY 'D')

**TY PB-1**  
EXIST. UNPAVED PRIVATE OR COMMERCIAL DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" NEW AND/OR SALVAGE FLEX. BASE, PRIMED AND SURFACED WITH 114#/SY ACP.

**TY P1**  
EXIST. PAVED DRIVEWAYS TO BE PAVED WITH 114#/SY ACP TY 'D'.



**HIDALGO COUNTY PLANNING DEPARTMENT**  
1301 S. 25TH STREET  
CORPUS CHRISTI, TX 78409  
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RAUL E. SESIN, P.E., C.F.H.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1  
1302 Ave. Duval  
Corpus Christi, TX 78409  
TEL: (361) 318-2810 FAX: (361) 318-2844  
www.co.hidalgo.tx.us  
COUNTY CLERK

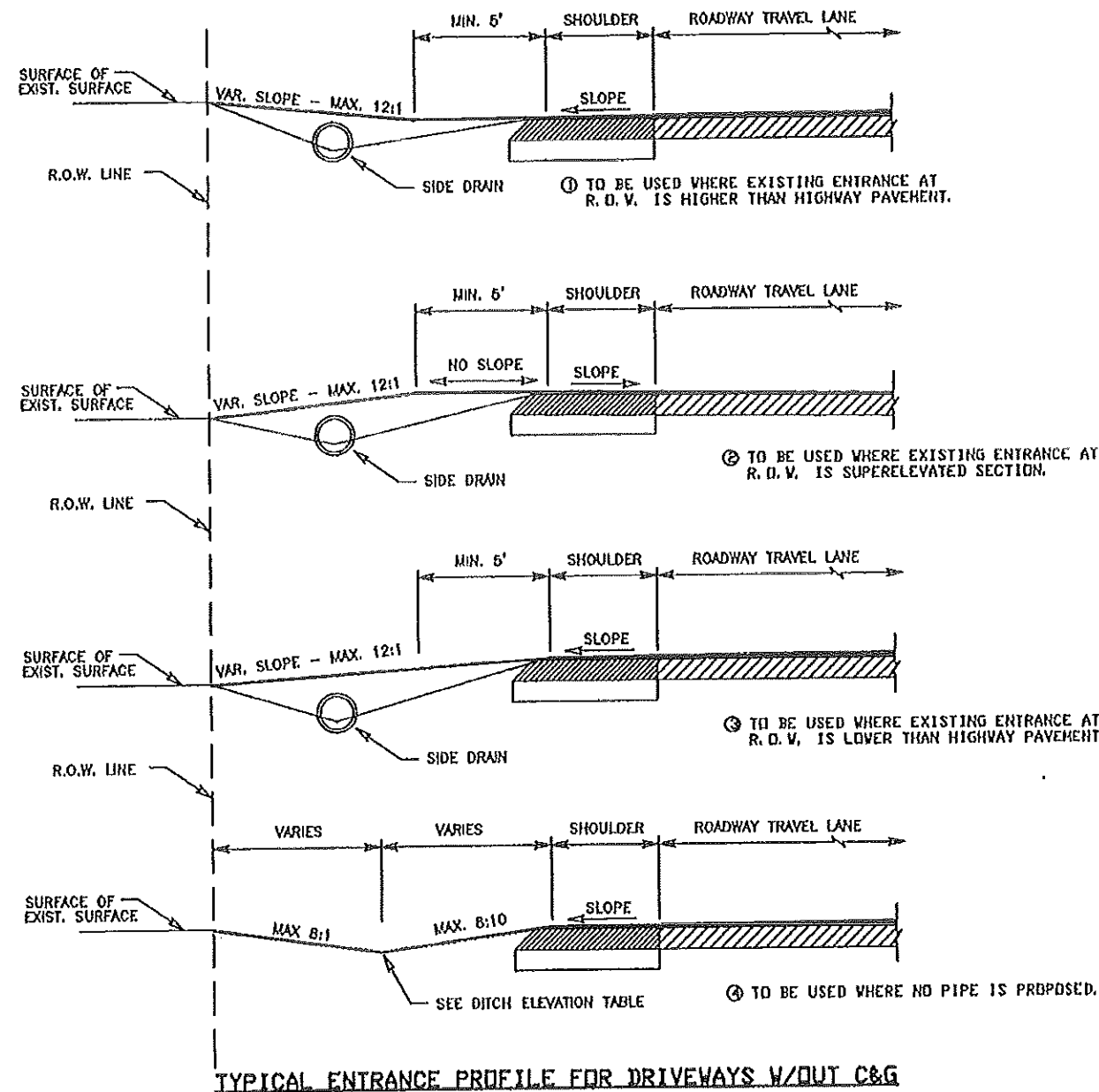


QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
CONSULTING ENGINEERS AND SURVEYORS  
1111 E. 11TH STREET, SUITE 100  
CORPUS CHRISTI, TX 78401  
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GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
DRIVEWAYS SECTIONS  
DETAIL SHEET



8-8-13  
SCALE: 1"=50'  
DRAWN BY: LG  
CHECKED BY: AQ  
DATE: 8-8-13  
BY: R.E.S.



#### NOTES:

ALL ENTRANCES CONSTRUCTED ON THIS PROJECT ARE SUBJECT TO CONCURRENCE WITH EXISTING GOVERNING REGULATIONS AS SET OUT BY THE STATE HIGHWAY COMMISSION.

ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 SLOPE WILL BE CONSTRUCTED.

ALL FLEXIBLE BASE USED FOR PRIVATE DRIVES & COMMERCIAL DRIVES WILL NOT REQUIRE LIME TREATMENT.

EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER.

PROP. WIDTH OF DRIVEWAYS TO MATCH EXISTING WIDTH AT R.O.W. LINE.

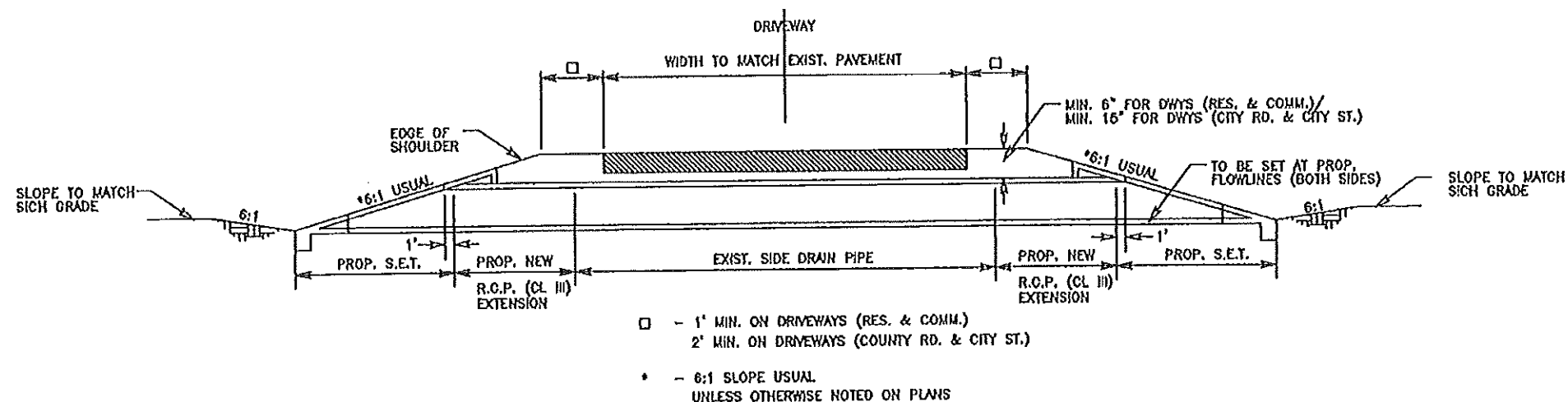
114 #/SY ACP (COMPACTED) IS EQUAL TO 1 IN. DEPTH.  
171 #/SY ACP (COMPACTED) IS EQUAL TO 1 IN. DEPTH.

SIDE DRAINS TO BE INSTALLED WHERE ROADWAY DITCH DRAINAGE IS NECESSARY, AS INDICATED ON PLANS AND/OR AS DIRECTED BY THE ENGINEER.

SIDE DRAINS TO BE INSTALLED WHERE WITH A MINIMUM OF 6" COVER BY PROPOSED RESIDENTIAL & COMMERCIAL MATERIAL OR 15" COVER OF PROPOSED COUNTY RD. & CITY STREET ROADWAY MATERIAL.

AVERAGE DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS ARE FOR ESTIMATING PURPOSES ONLY.

THE RATE OF PRIME SHALL BE 0.10 GAL/SY FOR PRIVATE AND/OR COMMERCIAL DRIVEWAYS AND 0.20 GAL/SY FOR PUBLIC DRIVEWAYS.



HIDALGO COUNTY  
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1304 S. 25 TH STREET  
EDINBURG, TX 78539  
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WWW.CO.HIDALGO.TX.US  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1



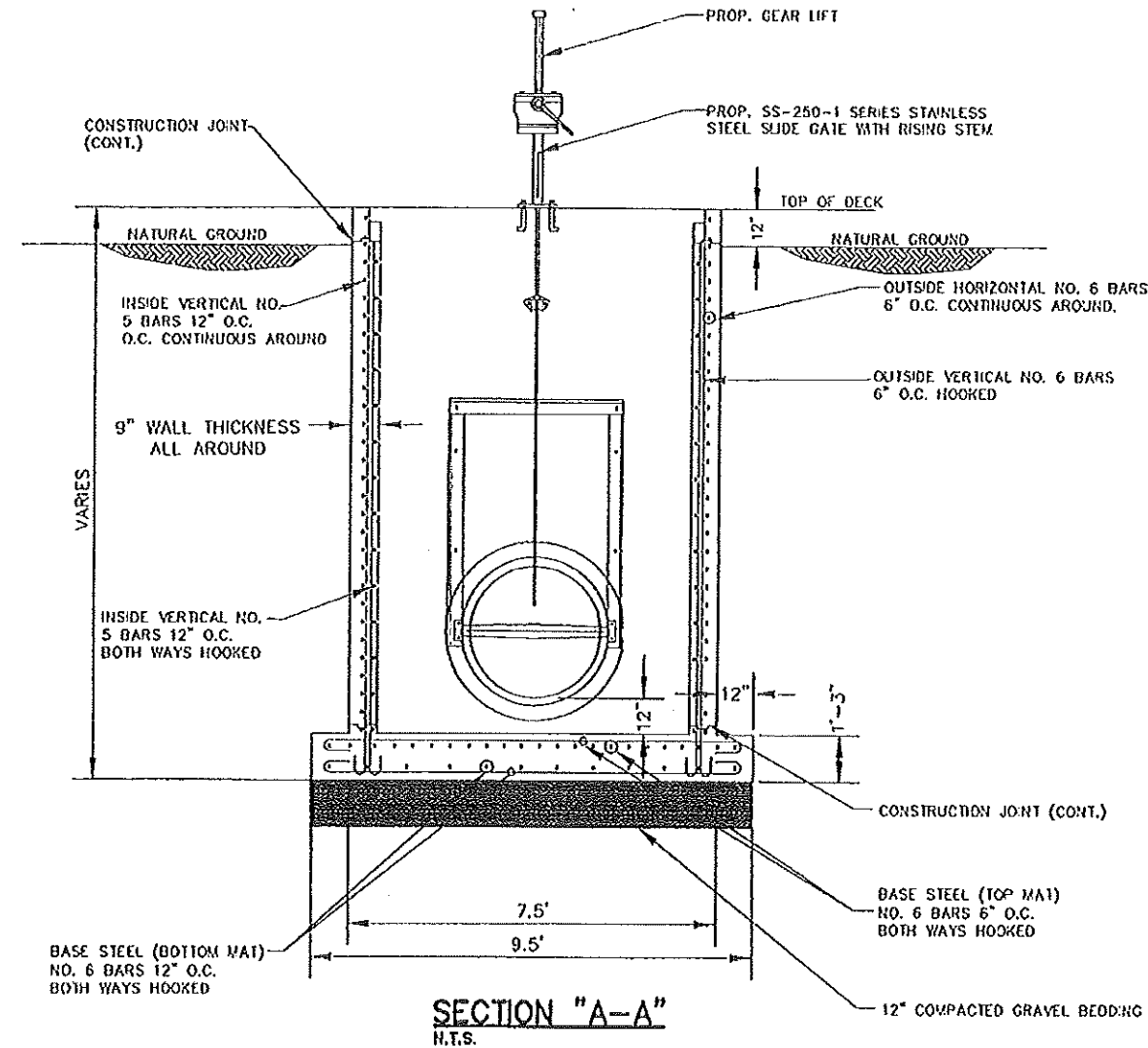
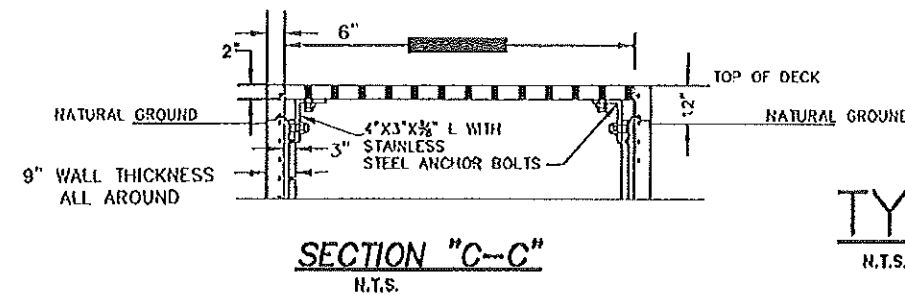
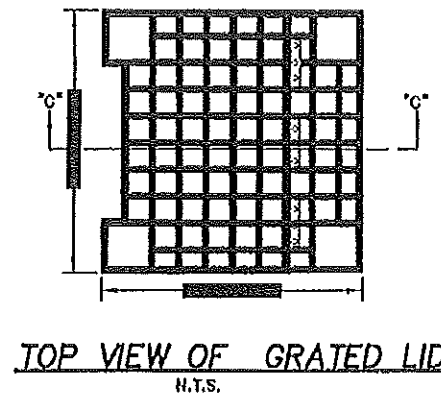
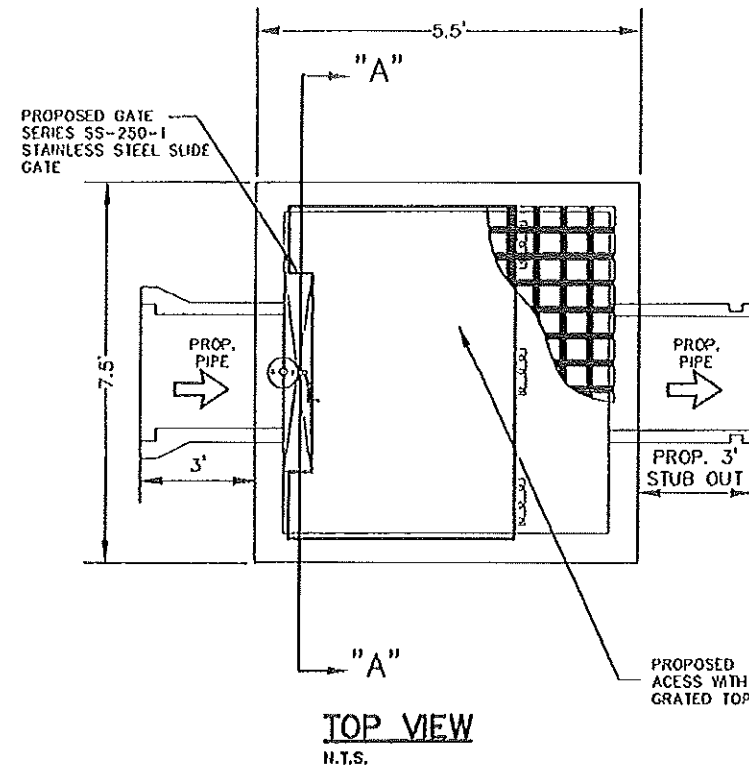
QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
CONSULTING ENGINEERS, LAND SURVEYORS  
1001 E. 11TH STREET, SUITE 100  
EDINBURG, TEXAS 78541  
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GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TUJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
DRIVEWAY PROFILE SECTION  
DETAIL SHEET



8-8-13  
SCALE: 1"=50'  
DRAWN BY: LG  
CHECKED BY: AQ  
TPO DRAWN BY: O.H. & ASSOCIATES  
SHEET: 27 OF 47

- STEEL NOTES**
1. CHAMFER ALL EXPOSED CONC. CORNERS
  2. REINFORCING STEEL CLEARANCES  
FACES EXPOSED TO WATER = 2-1/2"  
FACES EXPOSED TO EARTH = 3"  
FACES EXPOSED TO AIR = 2"
  3. LAP OR ANCHOR ALL STEEL A MINIMUM OF 30" DIA.'S ALL HORIZ. STEEL CONTINUOUS AROUND CORNERS.
  4. ALL REINFORCING STEEL TO BE 60K
  5. CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF 3000 P.S.I. AT 28 DAYS
- NOTES**
- ALL REINFORCING STEEL TO BE #5 @ 6" E.W.



## TYPICAL GATE DETAIL

N.T.S.



HIDALGO COUNTY  
PLANNING DEPARTMENT  
1304 S. 25TH STREET  
EDINBURG, TX 78539  
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RAUL E. SCSN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

HIDALGO COUNTY  
PRECINCT NO. 1  
COUNTY COMMISSIONER DIST. 1



QUINTANILLA, HEADLEY AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
LAND SURVEYORS  
P.L.L.C.  
1000 N. 10TH STREET, SUITE 100  
EDINBURG, TX 78539  
TEL: (354) 318-2810 FAX: (354) 318-2844  
www.co.hidalgo.tx.us

GLO FLOOD & DRAINAGE IMPROVEMENTS  
COLONIA INFRASTRUCTURE PROJECT II &  
URBAN CO. BORDER ACCESS COLONIA PROGRAM  
TIJERINA ESTATES BID NO. 6540-62-0309-5100-6200  
TYPICAL GATE STRUCTURE DETAIL  
AND GENERAL NOTES



SCALE: 1"=50'  
DRAWN BY: LG  
CHECKED BY: AO  
TWO REVIEW BY: O.H. & ASSOCIATES  
DATE: 8-2-13  
28 OF 47

GENERAL NOTES

1. NEW CALICHE MATERIAL SHALL BE TREATED WITH EN-1 ROAD STABILIZER, AT THE MANUFACTURERS SUGGESTED APPLICATION RATE, IF THE PLASTICITY INDEX OF SAID MATERIAL IS GREATER THAN 12. THE GRADATION SHALL BE ARGILLACEOUS LIMESTONE, CALCAREOUS OR CALCAREOUS CLAY PARTICLES, WITH OR WITHOUT STONE CONGLOMERATE GRAVEL, SAND OR GRANULAR MATERIAL.

TYPE D GRADE 6

| SIEVE No. | PERCENT RETAINED |
|-----------|------------------|
| 2         | 0                |
| 1/2       | 20-60            |
| 4         | 40-75            |
| 40        | 75-85            |

2. HIDALGO COUNTY PRECINCT No 1 WILL RETAIN OWNERSHIP OF BASE MATERIAL GENERATED ON THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOADING OF BASE MATERIAL FOR RELOCATION TO AN APPROVED SITE ASSIGNED BY HIDALGO COUNTY PRECINCT No 1. THE COUNTY WILL BE RESPONSIBLE FOR THE HAULING OF THE MATERIAL. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED ON THE PROPOSAL.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT/RELOCATION OF ALL REGULATORY SIGNS REMOVED DUE TO CONSTRUCTION OPERATIONS WITH THE SAME SIGN ON FIXED SUPPORT(S) IMMEDIATELY UPON ITS REMOVAL. APPROVAL BY THE ENGINEER IS NECESSARY BEFORE REMOVING ANY REGULATORY ROADWAY SIGN(S). FLAGGERS ARE REQUIRED TO BE AVAILABLE TO DIRECT TRAFFIC DURING SIGN INTERMEDIATE DOWN TIME. RELOCATION OF ANY DIRECTIONAL SIGN ASSEMBLIES REMOVED DURING CONSTRUCTION OPERATIONS IMMEDIATELY UPON THEIR REMOVAL IS REQUIRED. THESE SIGNS SHALL BE RELOCATED TO A LOCATION IN ACCORDANCE WITH THE LATEST VERSION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". IN NO CASE WILL A SIGN BE REMOVED WITHOUT A REPLACEMENT SIGN AND SUPPORT(S) BEING READILY AVAILABLE AND A LOCATION ESTABLISHED. REMOVAL AND RELOCATION OF THESE SIGNS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED ON THE PROPOSAL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING AREA BETWEEN THE BACK OF CURB/EDGE OF PAVEMENT, ROAD SIDE DITCH AND RIGHT-OF-WAY TO HAVE POSITIVE FLOW TO THE PROPOSED DRAINAGE SYSTEM.



This seal appearing on this document was authorized by  
Raul E. Sesin, P.E., No. 65374  
on the above designated date.

**04/09/14**

COMMISSIONER **A.C. CUELLAR, JR.**  
HIDALGO COUNTY PRECINCT No. 1



HIDALGO COUNTY  
PLANNING DEPARTMENT  
1301 S. 25 TH STREET  
EDINBURG, TX 78539  
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RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

**PRECINCT 1 DRAINAGE PROJECT**  
**TIJERINA SUBDIVISION**  
GENERAL NOTES

|             |        |         |
|-------------|--------|---------|
| PROJECT NO. | 6      |         |
| STATE       | COUNTY | CITY    |
| TEXAS       | 21     | HIDALGO |

ROADWAY PROJECT QUANTITIES

| Item No | Description                               | Qty   | Units |
|---------|-------------------------------------------|-------|-------|
| 110     | EXCAVATION (ROADWAY)                      | 843   | CY    |
| 164     | CELL FIBER SEEDING (PERM)(URBAN)(CLAY)    | 5,563 | SY    |
| 152     | 6" RD GRADER WORK (DENS CONT.) SUBGRADE   | 22.76 | STA   |
| 247     | 8" FL BS (CMP IN PLC)(TY D)               | 7,081 | SY    |
| 275     | EN-1 ROAD STABILIZER FOR SUBGRADE (6")    | 7,081 | SY    |
| 276     | EN-1 ROAD STABILIZER FOR BASE COURSE (8") | 7,081 | SY    |
| 310     | ASPH MATRL (MC-30)                        | 1,214 | GAL   |
| 340     | 2" ASPH CONC. TY D                        | 6,069 | SY    |
| 500     | MOBILIZATION                              | 1     | LS    |
| 2500    | TYPICAL STRIPPING AND PERMANENT PAVEMENT  | 1     | LS    |
|         | MARKINGS                                  |       |       |

\*ITEM 276 WILL ONLY BE NEEDED IF THE PLASTICITY INDEX OF THE NEW CALICHE MATERIAL, USED FOR THE BASE COURSE, IS GREATER THAN 12.



*R. E. Sesin*

04/09/14

RAUL E. SESIN, P.E. No. 66374

This seal appearing on this document was authorized by Raul E. Sesin P.E. No. 66374 on the above designated date.

COMMISSIONER A.C. CUELLAR JR.  
HIDALGO COUNTY PRECINCT No. 1



HIDALGO COUNTY  
PLANNING DEPARTMENT

1304 S. 25 TH. STREET  
EDINBURG, TX 78559  
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RAUL E. SESIN, P.E., C.F.M.  
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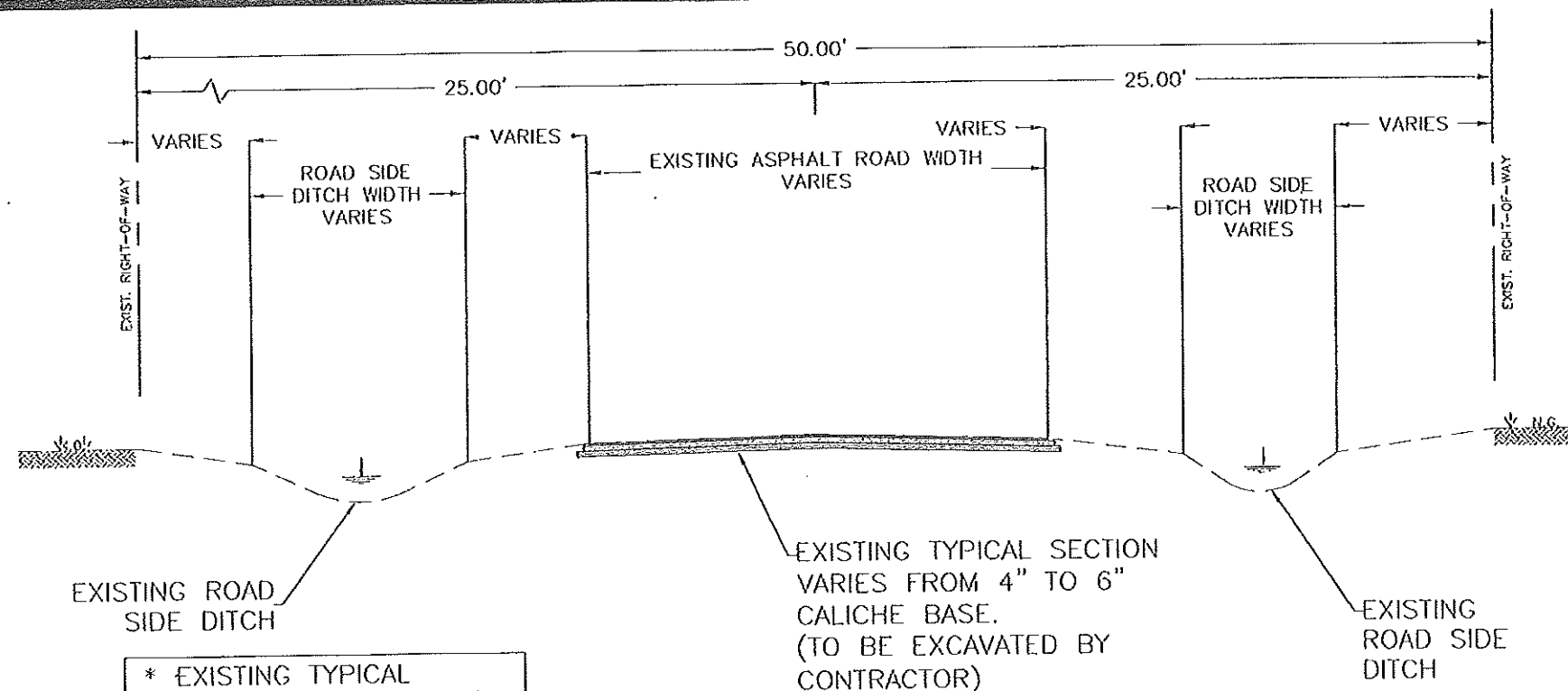
PRECINCT 1 DRAINAGE PROJECT

TIJERINA SUBDIVISION

PROJECT QUANTITIES

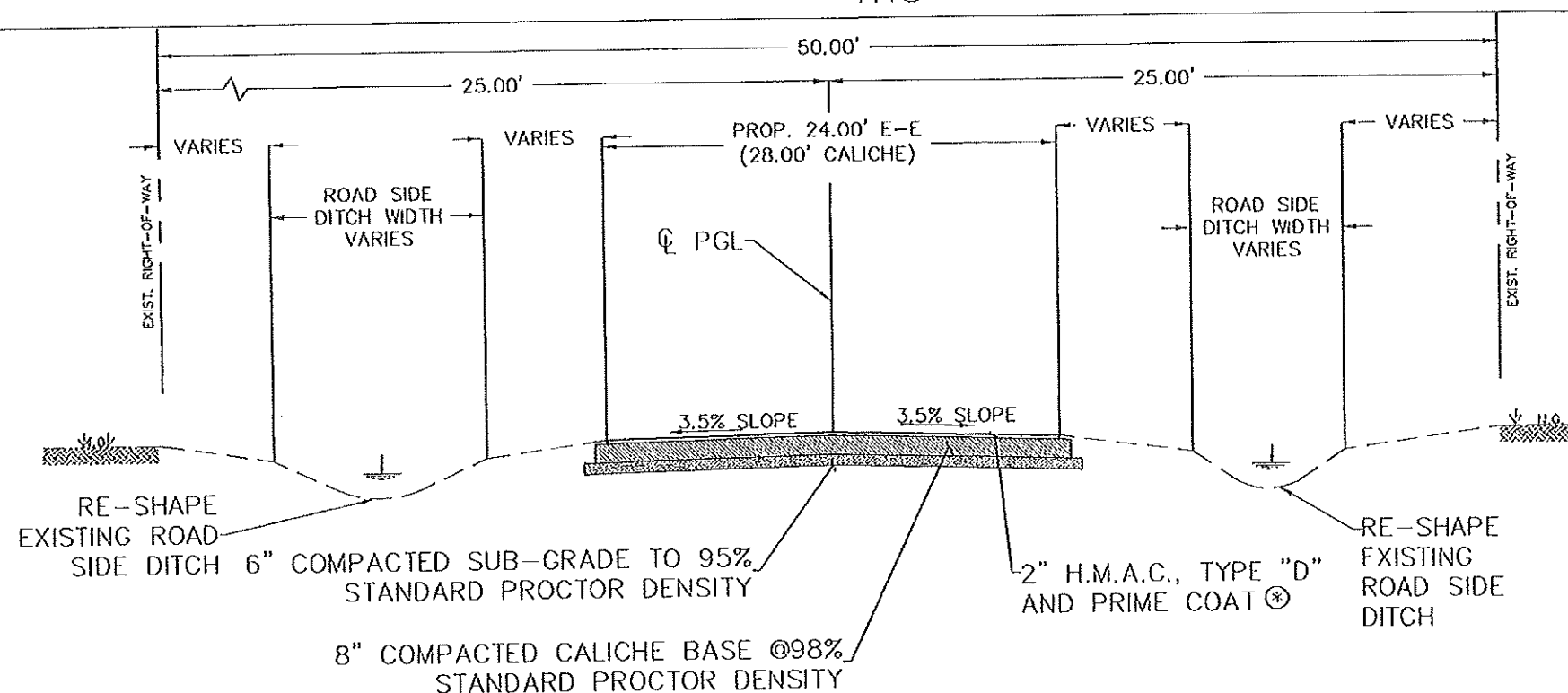
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| PROJECT NO. | PROJECT NO. |         | SHEET NO.   |
| 6           |             |         | 101         |
| STATE       | DSR.        | COUNTY  |             |
| TEXAS       | 21          | HIDALGO |             |
| COUNT.      | SECT.       | JOB     | HS-TASK NO. |
|             |             |         |             |

Drawn: EYD: T:\jerra Sood\Valdara-Projet1\quantities.dwg Plotted by: Cynthia Jones 04/09/2014 10:05:26 AM



\* EXISTING TYPICAL SECTION VARIES FROM 4" TO 6" CALICHE BASE.

EXISTING CROSS SECTION  
NTS



ANGEL RD STA 3+39.48-STAY 13+18 & SAN RAFAEL STA 0+00-12+99  
PROPOSED ROAD CROSS SECTION  
NTS

REVISED DATE: 4/8/14

  
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04/09/14

COMMISSIONER A.C. CUELLAR, JR.  
HIDALGO COUNTY PRECINCT No. 1

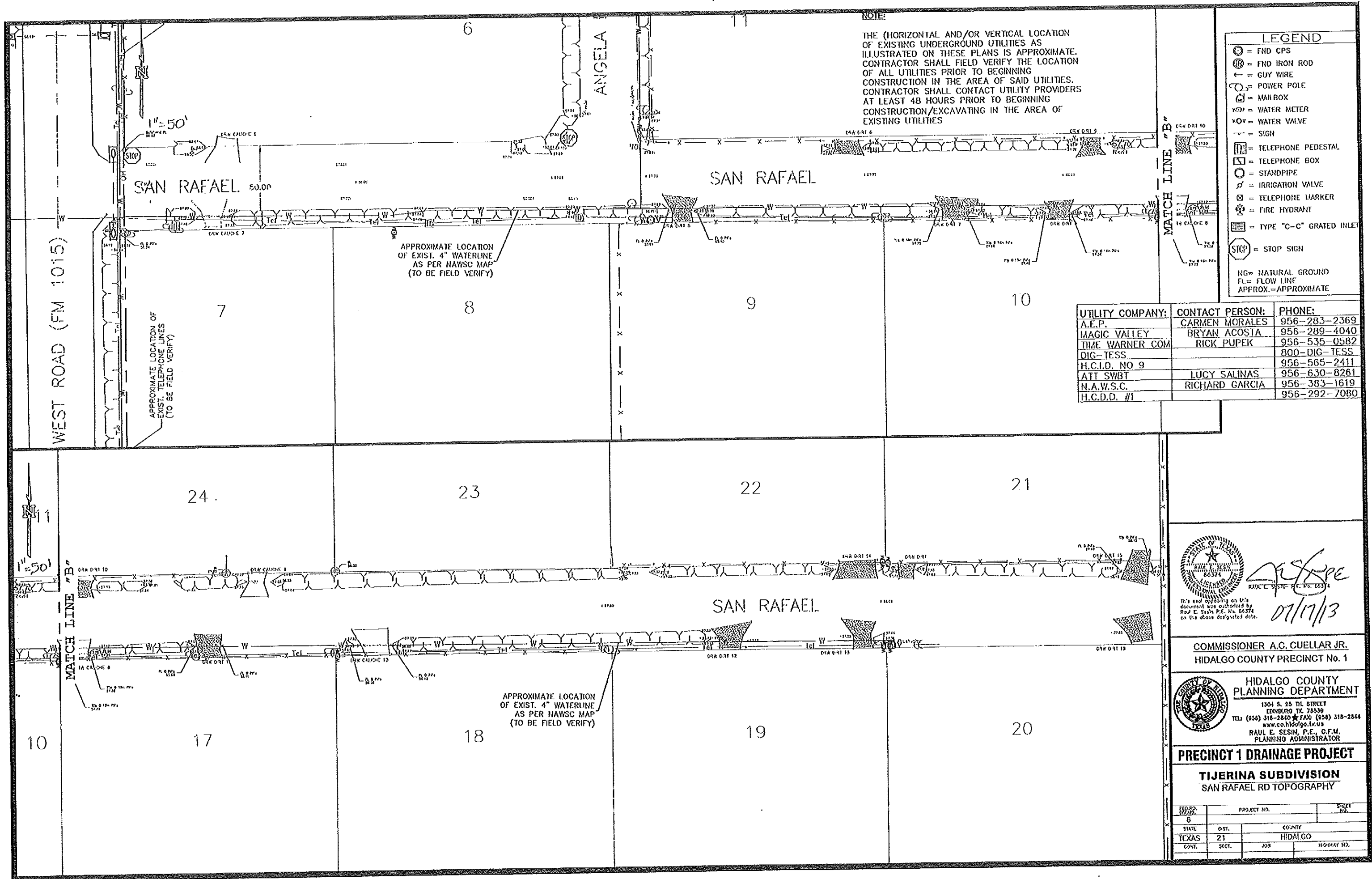
  
HIDALGO COUNTY  
PLANNING DEPARTMENT  
1501 S. 25th STREET  
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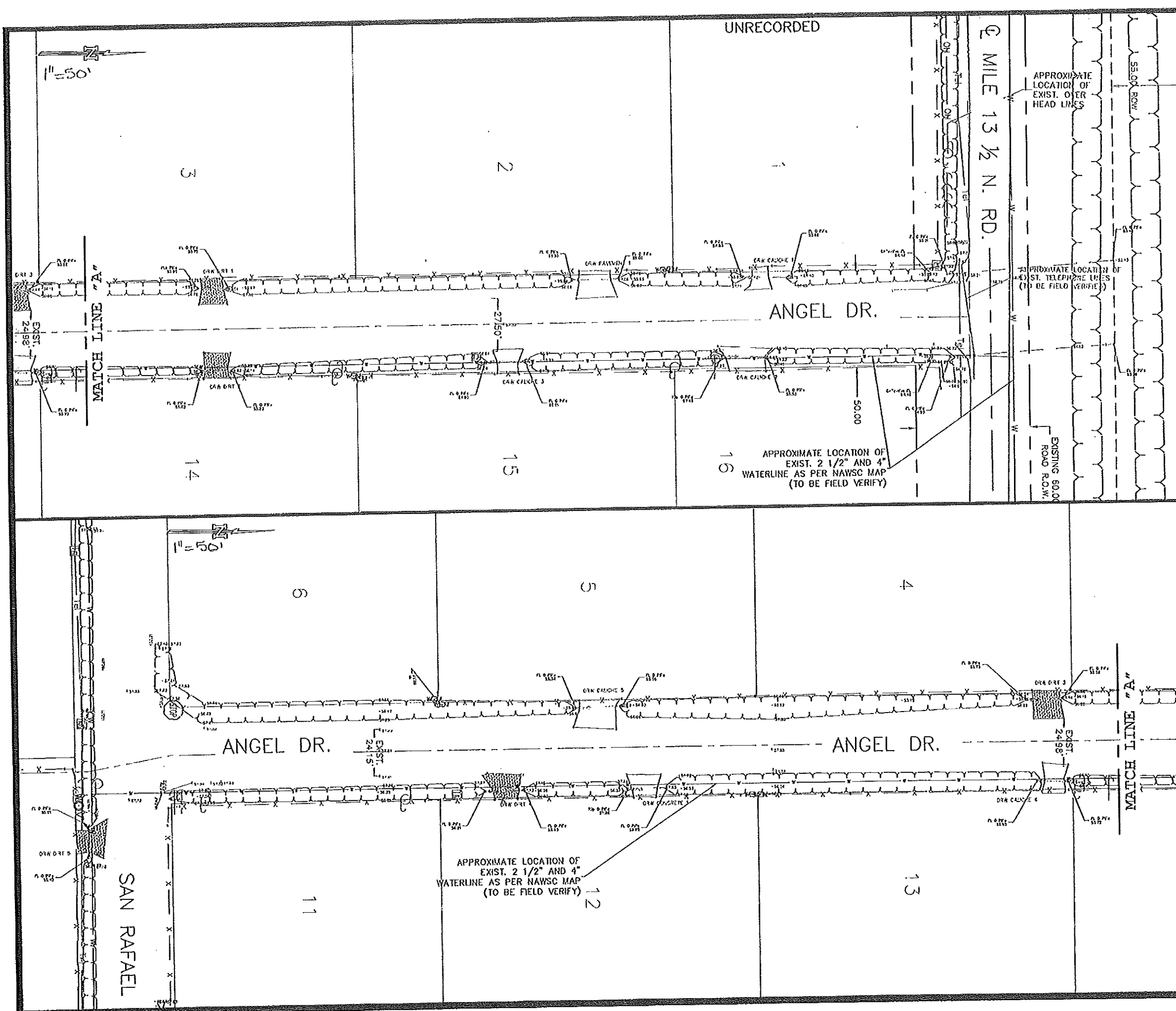
**PRECINCT 1 DRAINAGE PROJECT**

**TIJERINA SUBDIVISION**

PROPOSED AND EXISTING RD CROSS SECTIONS

| PROJECT NO. | SHEET NO.  |
|-------------|------------|
| 6           | 5          |
| STATE       | COUNTY     |
| TEXAS       | 21 HIDALGO |





**NOTE:**  
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**LEGEND**

|  |                             |
|--|-----------------------------|
|  | = FND GPS                   |
|  | = FND IRON ROD              |
|  | = CUI WIRE                  |
|  | = POWER POLE                |
|  | = MAILBOX                   |
|  | = WATER METER               |
|  | = WATER VALVE               |
|  | = SIGN                      |
|  | = TELEPHONE PEDESTAL        |
|  | = TELEPHONE BOX             |
|  | = STANDPIPE                 |
|  | = IRRIGATION VALVE          |
|  | = TELEPHONE MARKER          |
|  | = FIRE HYDRANT              |
|  | = TYPE \"C-C\" GRATED INLET |
|  | = STOP SIGN                 |

NG= NATURAL GROUND  
 FL= FLOW LINE  
 APPROX.= APPROXIMATE

| UTILITY COMPANY: | CONTACT PERSON: | PHONE:       |
|------------------|-----------------|--------------|
| A.E.P.           | CARMEN MORALES  | 956-283-2369 |
| MAGIC VALLEY     | BRYAN ACOSTA    | 956-289-4040 |
| TIME WARNER COM  | RICK PUPEK      | 956-535-0582 |
| DIG-TESS         |                 | 800-DIG-TESS |
| H.C.I.D. NO 9    |                 | 956-565-2411 |
| ATT SWBT         | LUCY SALINAS    | 956-630-8261 |
| N.A.W.S.C.       | RICHARD GARCIA  | 956-383-1619 |
| H.C.D.D. #1      |                 | 956-292-7080 |

07/17/13

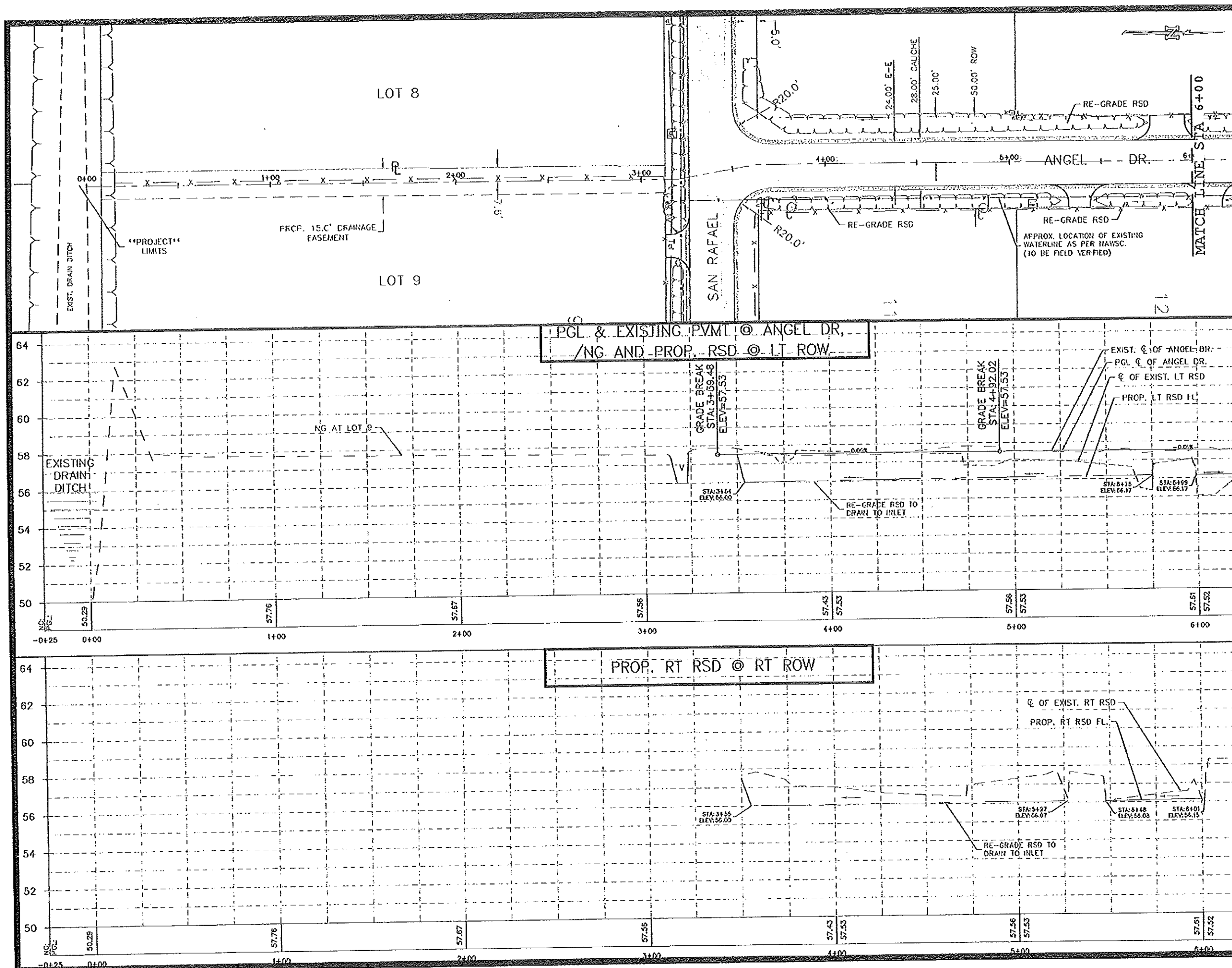
COMMISSIONER A.C. CUELLAR JR.  
 HIDALGO COUNTY PRECINCT No. 1

**HIDALGO COUNTY PLANNING DEPARTMENT**  
 1504 S. 25 TH. STREET  
 EDINBURG, TX 78539  
 TEL: (956) 318-2840 FAX: (956) 318-2844  
 WWW.CO.HIDALGO.TX.US  
 RAUL E. SESIN, P.E., C.F.M.  
 PLANNING ADMINISTRATOR

**PRECINCT 1 DRAINAGE PROJECT**

**TIJERINA SUBDIVISION**  
 ANGEL RD TOPOGRAPHY

|             |             |             |
|-------------|-------------|-------------|
| TITLE SHEET | PROJECT NO. | SHEET NO.   |
| 6           |             |             |
| STATE       | COUNTY      |             |
| TEXAS       | HIDALGO     |             |
| CONT.       | SECT.       | SECTION     |
|             | 303         | HIGHWAY 170 |



\*NOTE:  
SEE QUINTANILLA HEADLEY & ASSOC.  
STORM SEWER PLANS FOR DRAINAGE  
INFORMATION

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*Raul E. Sesin*  
RAUL E. SESIN, P.E., No. 85374

04/09/14

COMMISSIONER A.C. CUÉLLAR JR.  
HIDALGO COUNTY PRECINCT No. 1



HIDALGO COUNTY  
PLANNING DEPARTMENT

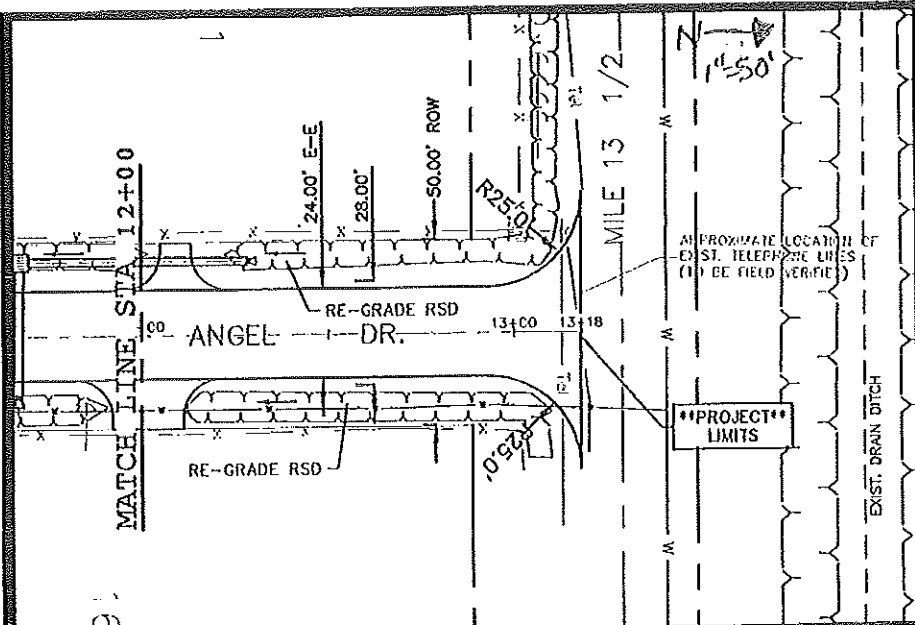
1301 S. 25th STREET  
EDINBURG, TX 78539  
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www.co.hidalgo.tx.us  
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**PRECINCT 1 DRAINAGE PROJECT**

**TIJERINA SUBDIVISION**  
PGL AND STORM LINE PLAN AND PROFILE  
ANGEL DR. STA 0+00 - STA 6+00

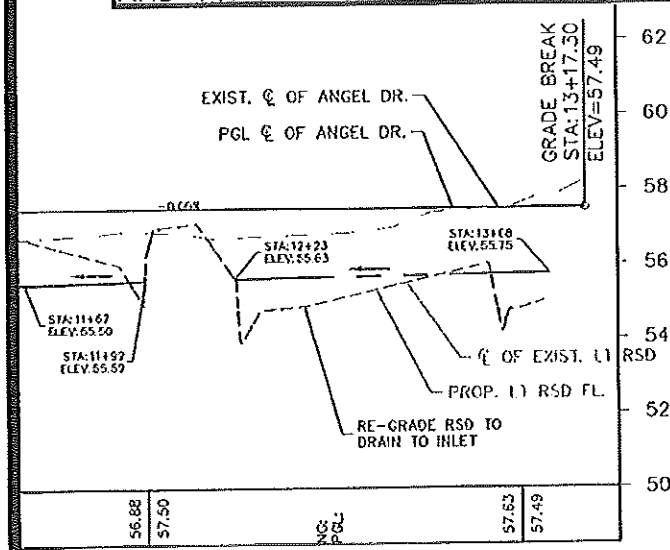
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| DATE          | 02/11/14 | CITY        | HIDALGO   |
| CO.           | TEXAS    | SECT.       | 21        |
| REVISED DATE: | 4/8/14   | DESIGNED BY | JDS       |
|               |          | CHECKED BY  | H.S. HART |



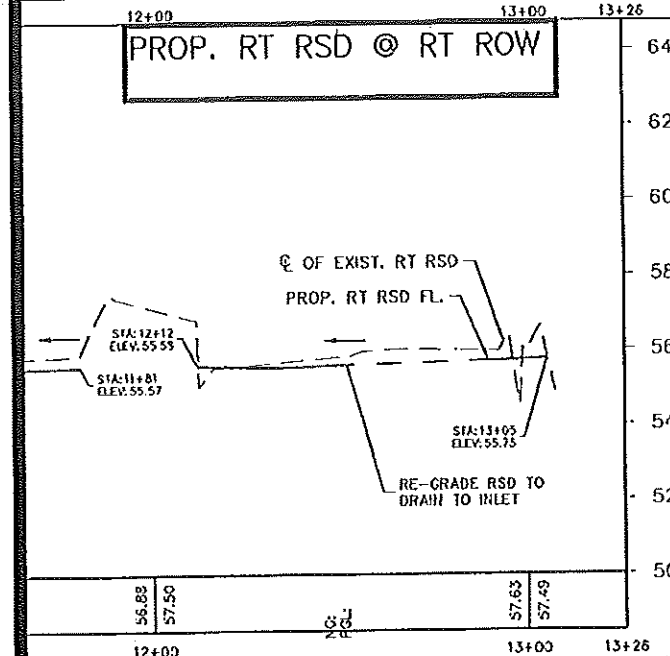


\*NOTE:  
SEE QUINTANILLA HEADLEY & ASSOC.  
STORM SEWER PLANS FOR DRAINAGE  
INFORMATION

PGL & EXISTING PVMT @ ANGEL DR./NG  
AND PROP. RSD @ LT ROW

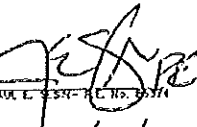


PROP. RT RSD @ RT ROW



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UTILITIES



  
RAUL E. SESIN, P.E., No. 66374

This seal appearing on this document was authorized by Raul E. Sesin P.E. No. 66374 on the above designated date 07/17/13

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**COMMISSIONER A.C. CUELLAR JR.**  
HIDALGO COUNTY PRECINCT No. 1

---



**HIDALGO COUNTY  
PLANNING DEPARTMENT**

1304 S. 23 TH STREET  
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www.co.hidalgo.tx.us

RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

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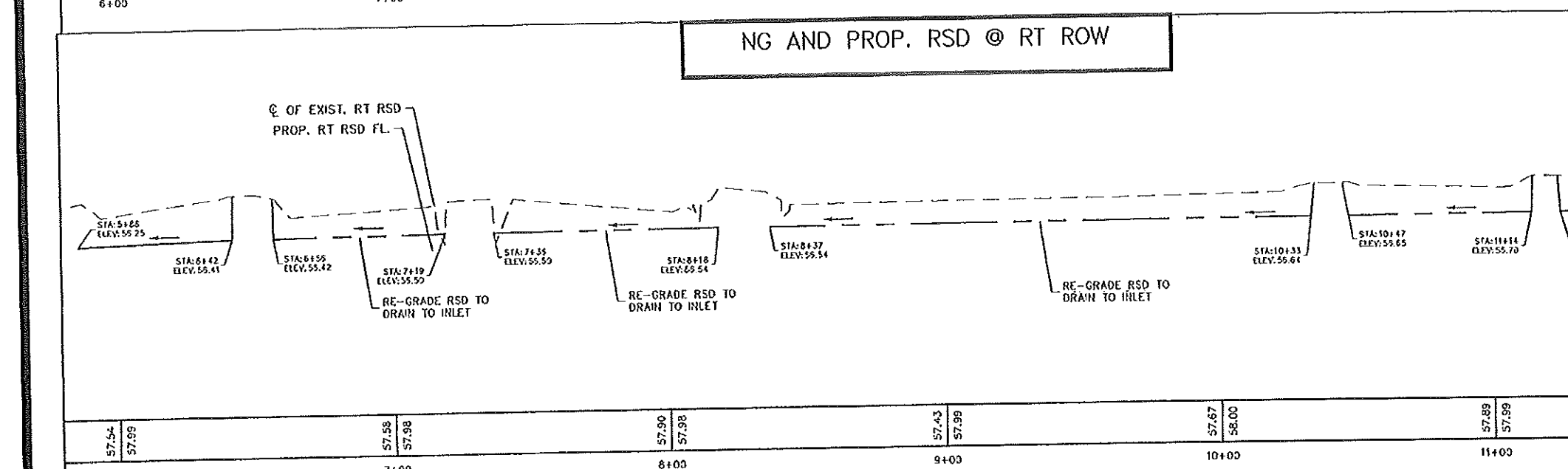
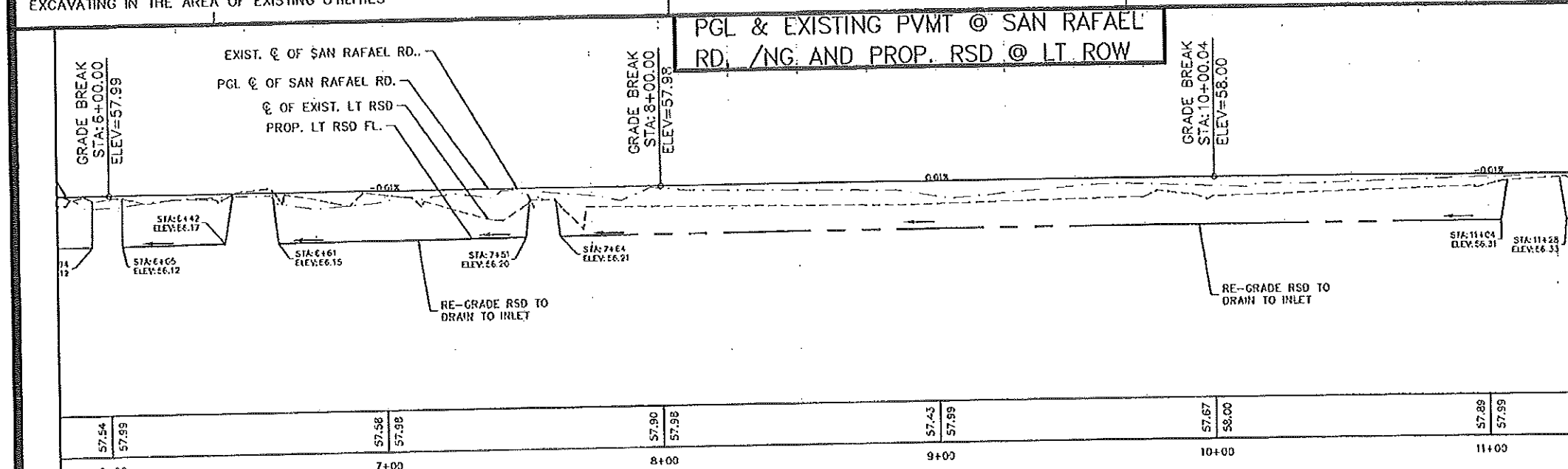
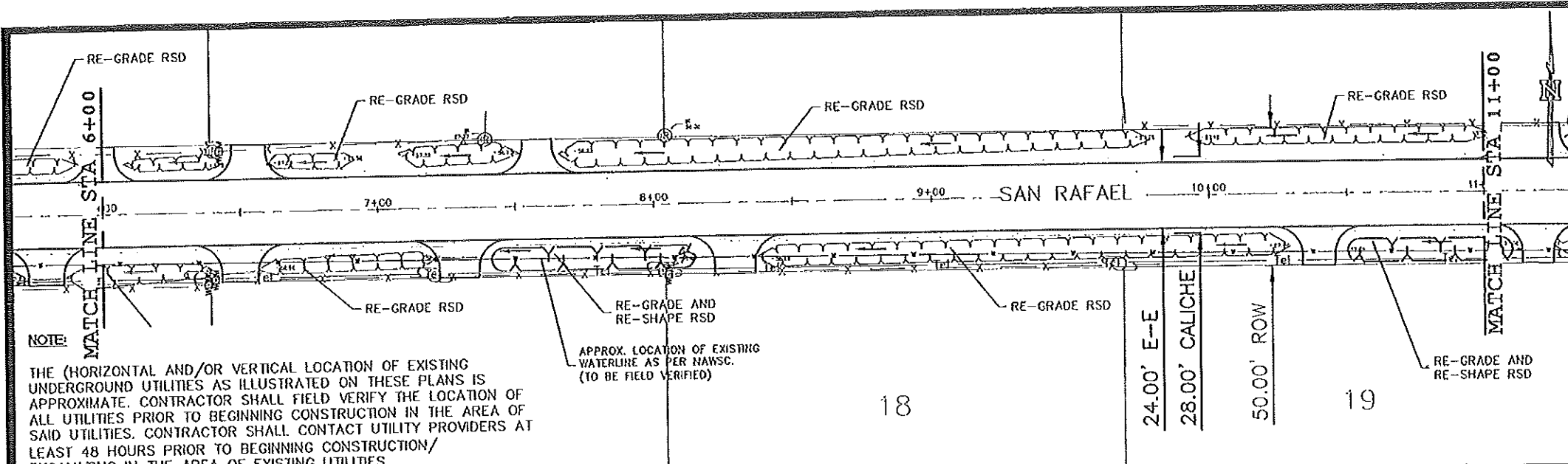
**PRECINCT 1 DRAINAGE PROJECT**

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**TIJERINA SUBDIVISION**  
PGL AND STORM LINE PLAN AND PROFILE  
ANGEL DR. STA 12+00 - STA 13+26

|             |             |     |             |
|-------------|-------------|-----|-------------|
| PROJECT NO. | PROJECT NO. |     | SHEET NO.   |
| 6           |             |     |             |
| STATE       | COUNTY      |     |             |
| TEXAS       | HIDALGO     |     |             |
| COUNT.      | SEC.        | JOB | WETLAND NO. |
|             |             |     |             |





\*NOTE:  
SEE QUINTANILLA HEADLEY & ASSOC.  
STORM SEWER PLANS FOR DRAINAGE  
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*R. E. Sesin*  
RAUL E. SESIN, P.E., No. 65374  
07/17/13

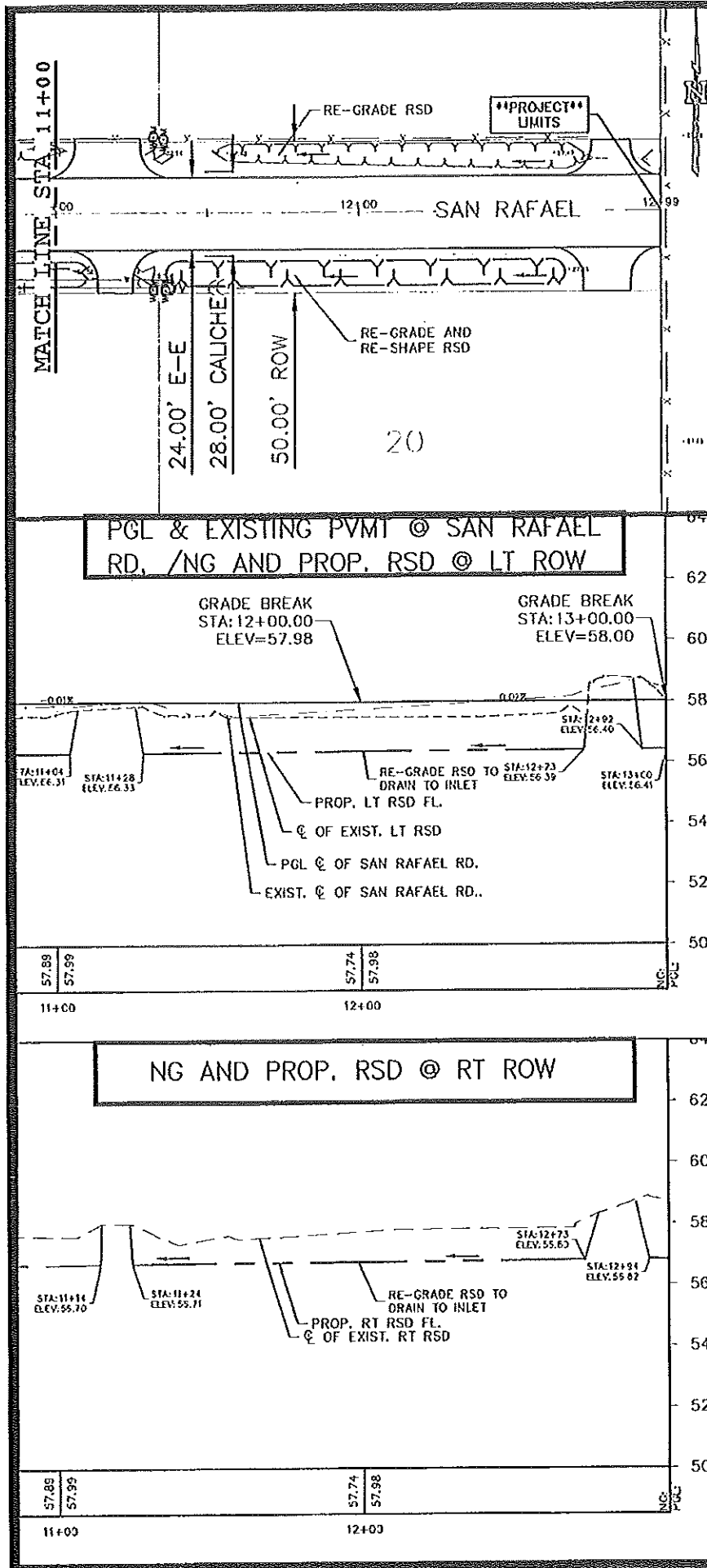
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www.co.hidalgo.tx.us  
RAUL E. SESIN, P.E., C.F.M.  
PLANNING ADMINISTRATOR

**PRECINCT 1 DRAINAGE PROJECT**

**TIJERINA SUBDIVISION**  
PGL AND STORM LINE PLAN AND PROFILE  
SAN RAFAEL ST STA 6+00 - STA 11+00

|             |           |
|-------------|-----------|
| PROJECT NO. | SHEET NO. |
| 6           | 100       |
| STATE       | COUNTY    |
| TEXAS       | HIDALGO   |
| CONT.       | SECTION   |
|             | SECTION   |



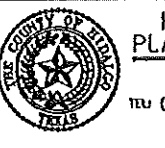
\*NOTE:  
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07/17/13

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HIDALGO COUNTY PRECINCT No. 1



HIDALGO COUNTY  
PLANNING DEPARTMENT

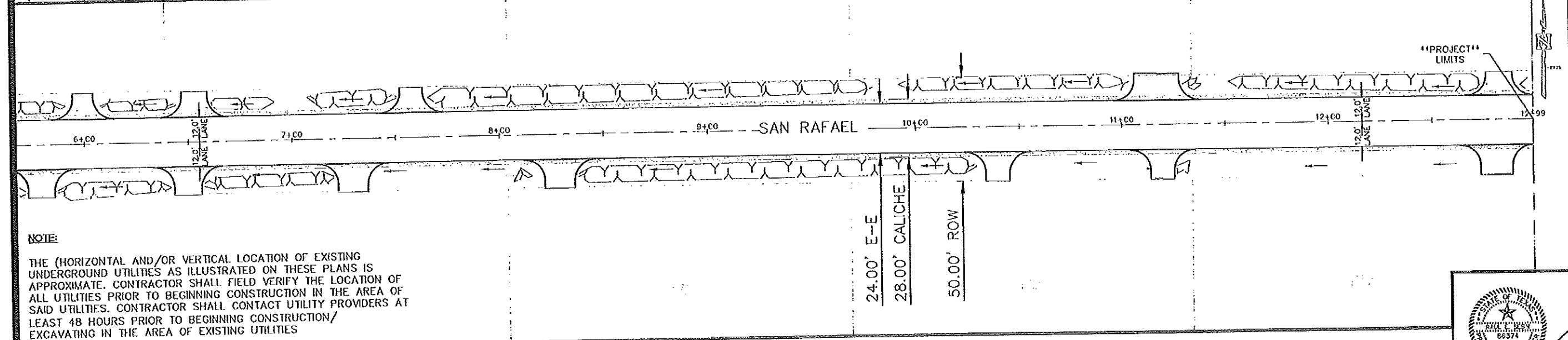
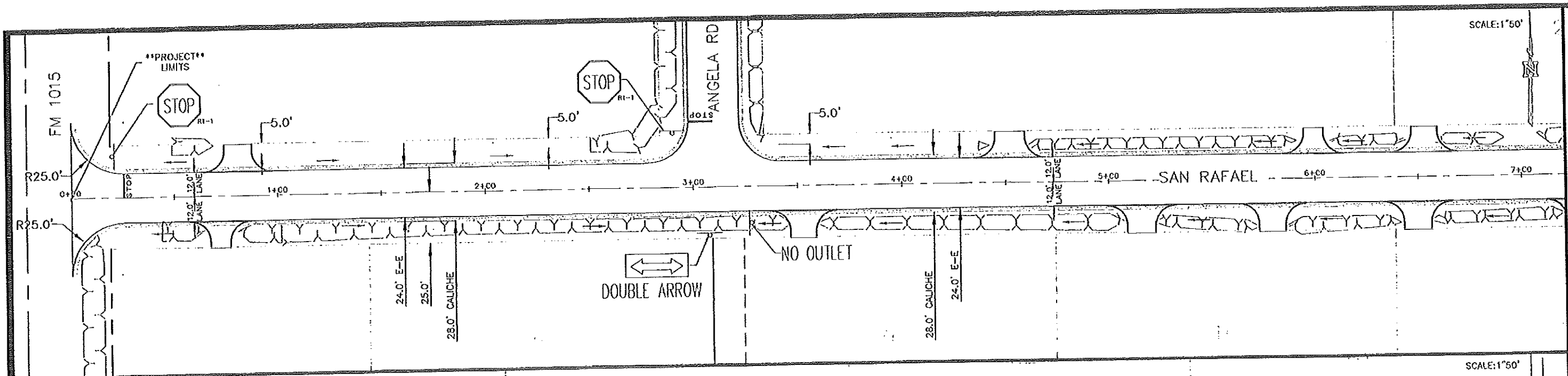
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**PRECINCT 1 DRAINAGE PROJECT**

**TIJERINA SUBDIVISION**  
PGL AND STORM LINE PLAN AND PROFILE  
SAN RAFAEL ST. STA 11+00 - STA 12+00

|             |       |        |           |   |
|-------------|-------|--------|-----------|---|
| PROJECT NO. | 6     |        | SHEET NO. | 1 |
| STATE       | TEXAS | COUNTY | HIDALGO   |   |
| CONTRACT    | 21    | JOB    | H210000   |   |





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SCALE: 1"=50'

SCALE: 1"=50'



*R. E. Sesin*  
 RAUL E. SESIN, P.E., No. 85374  
 09/11/13

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**PRECINCT 1 DRAINAGE PROJECT**

**TIJERINA SUBDIVISION**  
 SAN RAFAEL ST. SIGNING PLAN

|         |             |            |
|---------|-------------|------------|
| MAP NO. | PROJECT NO. | SHEET NO.  |
| 6       |             | 10         |
| STATE   | CITY        | COUNTY     |
| TEXAS   | 21          | HIDALGO    |
| CDN.    | SECT.       | JOB        |
|         |             | HOFMAN 112 |



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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>

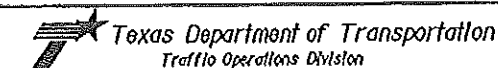
Standard Highway Sign Designs for Texas (SHSD)  
<http://www.txdot.gov/publications/traffic.htm>

Traffic Engineering Standard Sheets  
<http://www.txdot.gov/business/disciplines.htm>

Material Producer List  
<http://www.txdot.gov/business/producerlist.htm>

Departmental Material Specifications (DMS)  
<http://www.txdot.gov/services/construction/materialspecifications/>

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



## BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

1 of 12

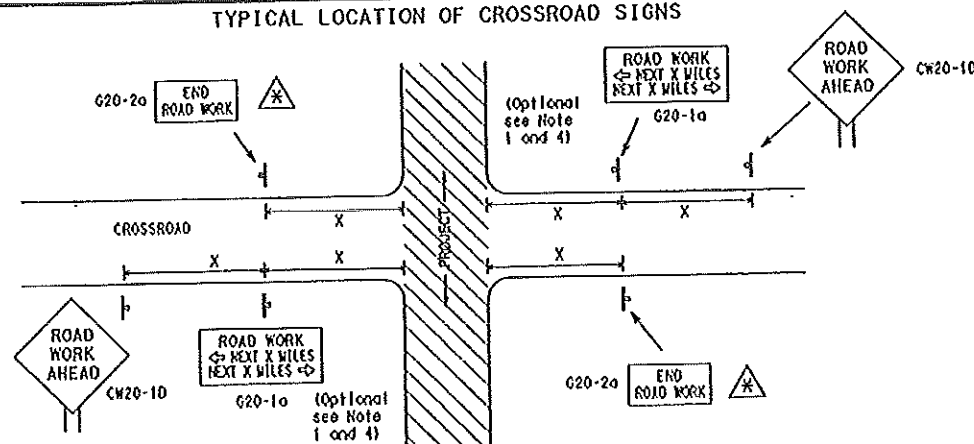
BC(1)-07

| © TxDOT 11-4-02 | DATE | REVISIONS | BY | CHK | DATE | BY | CHK | DATE |
|-----------------|------|-----------|----|-----|------|----|-----|------|
| 4-03            | 9-07 |           |    |     |      |    |     |      |
|                 |      |           |    |     |      |    |     |      |
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|                 |      |           |    |     |      |    |     |      |

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DISCLAIMER:

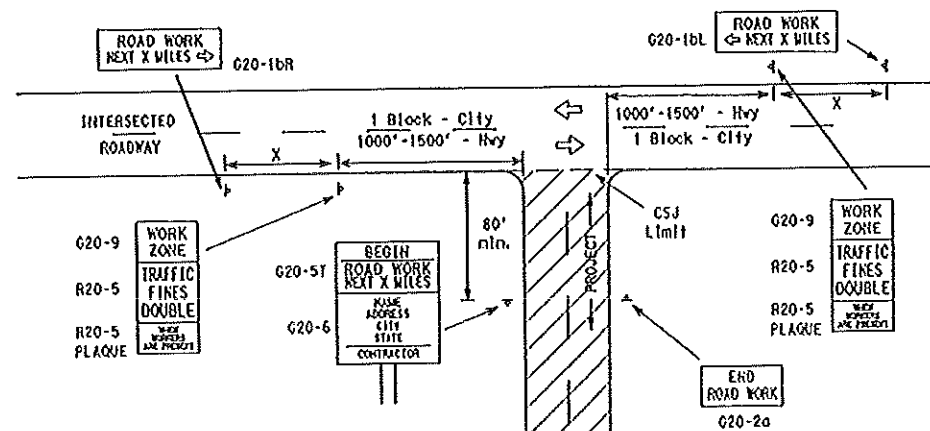
### TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of CW20-10 sign with approval of engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a CW20-10 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 (CW20-10) 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.

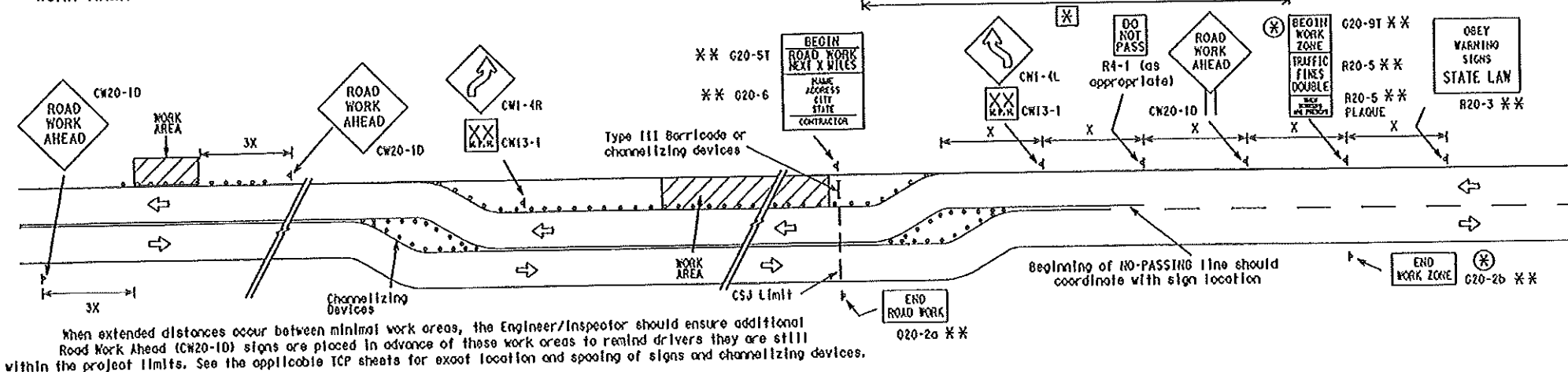
### T-INTERSECTION



#### CSJ LIMITS AT T-INTERSECTION

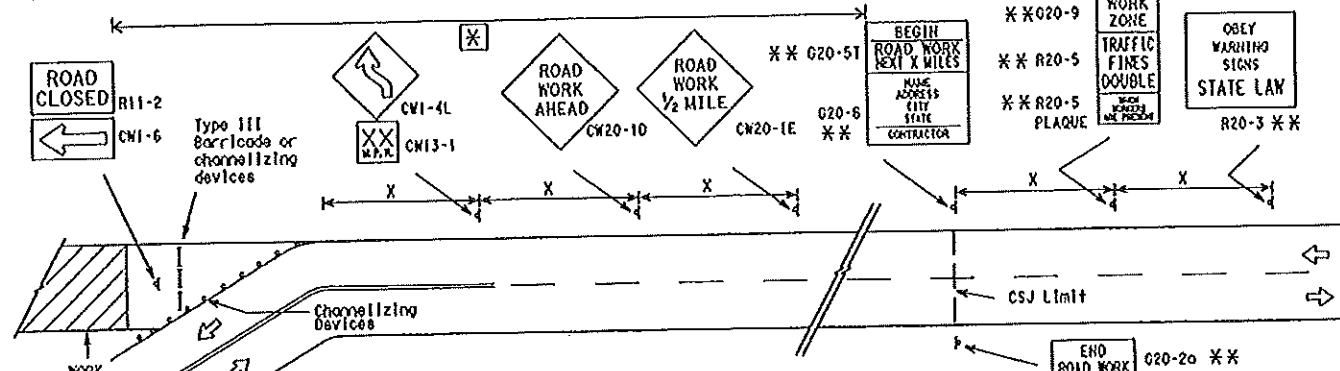
1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the G20-6 "Contractor Name" sign behind the Type III Barricade 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.

### 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 (CW20-10) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TSP sheets for exact location and spacing of signs and channelizing devices.

### 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 detour 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
- I Type III Barricade
- X See Typical Construction Warning Sign Size and Spacing chart or the TMDOT for sign spacing requirements.

### TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING<sup>1,5,6</sup>

| Sign Number or Series                          | Conventional Road | Expressway/Freeway | SPACING      |                   |
|------------------------------------------------|-------------------|--------------------|--------------|-------------------|
|                                                |                   |                    | Posted Speed | Sign Spacing "X"  |
| CW20<br>CW21<br>CW22<br>CW23<br>CW25           | 48" x 48"         | 48" x 48"          | MPII         | Feet (Approx.)    |
|                                                |                   |                    | 30           | 120               |
|                                                |                   |                    | 35           | 160               |
|                                                |                   |                    | 40           | 240               |
|                                                |                   |                    | 45           | 320               |
| CW1, CW2,<br>CW7, CW8,<br>CW9, CW11,<br>CW14   | 36" x 36"         | 48" x 48"          | 50           | 400               |
|                                                |                   |                    | 55           | 500 <sup>2</sup>  |
|                                                |                   |                    | 60           | 600 <sup>2</sup>  |
|                                                |                   |                    | 65           | 700 <sup>2</sup>  |
|                                                |                   |                    | 70           | 800 <sup>2</sup>  |
| CW3, CW4,<br>CW5, CW6,<br>CW8-3,<br>CW10, CW12 | 48" x 48"         | 48" x 48"          | 75           | 900 <sup>2</sup>  |
|                                                |                   |                    | 80           | 1000 <sup>2</sup> |
|                                                |                   |                    | *            | *                 |

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

Δ 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 1/2 mile or more advance warning.
4. 36" x 36" ROAD WORK AHEAD (CW20-10) 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 "TMDOT", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.



R20-3  
Legend/Border - Black  
Background - White

Texas Department of Transportation  
Traffic Operations Division

### BARRICADE AND CONSTRUCTION PROJECT LIMIT STANDARD

2 of 12 BC(2)-07

| DATE | REVISIONS | BY | CHK | DATE | BY | CHK | DATE |
|------|-----------|----|-----|------|----|-----|------|
| 9-07 |           |    |     |      |    |     |      |

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.

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



**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.

- 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

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.

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:

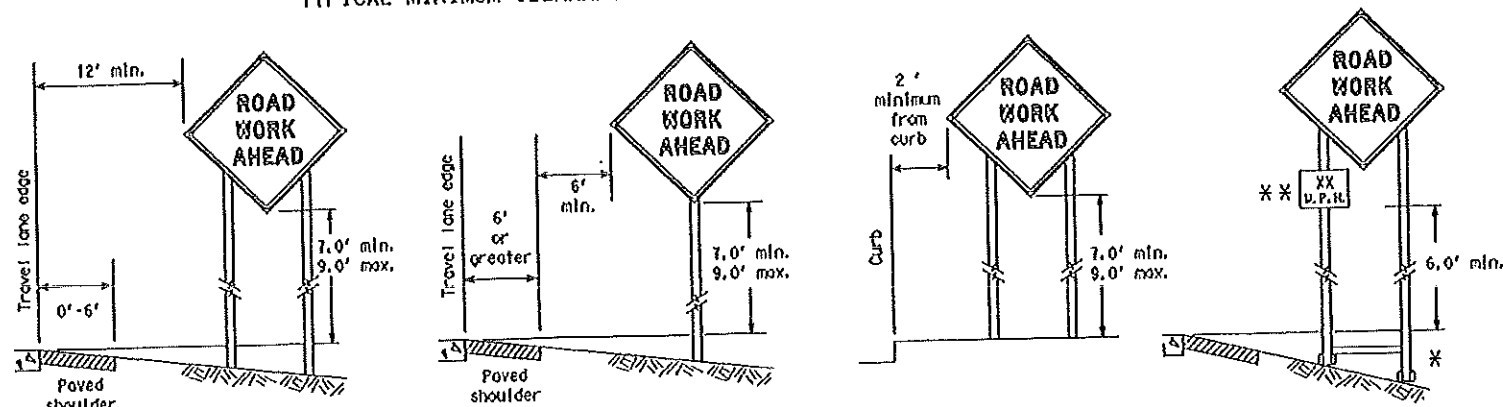
|                    |                |
|--------------------|----------------|
| 40 mph and greater | 0.2 to 2 miles |
| 35 mph and less    | 0.2 to 1 mile  |
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection 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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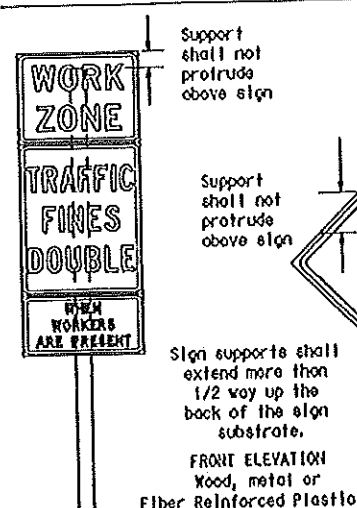
## TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



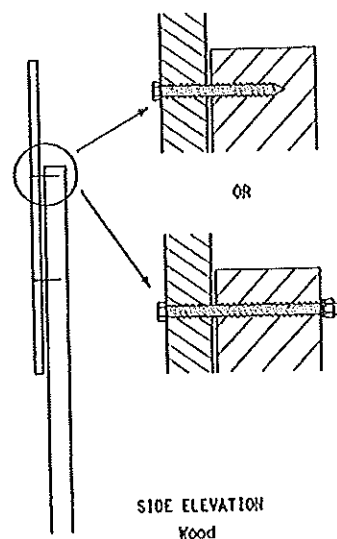
\* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

\*\* 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 splice 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 gauge material.

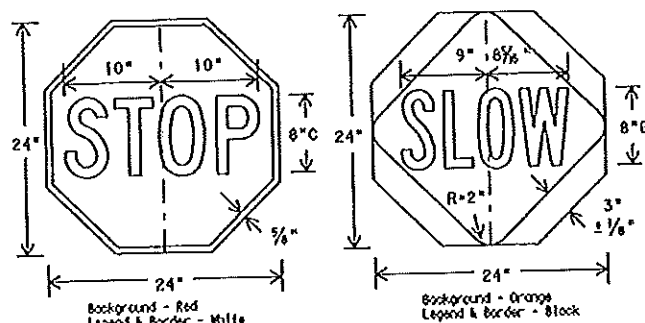


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports.

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 retroreflective.
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 TxDOT.



## 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 BC Sheets or the SWD 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 CH2TCO. The signs shall meet the required mounting heights shown on the BC Sheets or the SWD 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 TxDOT 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 nighttime 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 Speciflo Intensity), shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type E (Fluorescent Prismatlo), 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 glass 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 studs 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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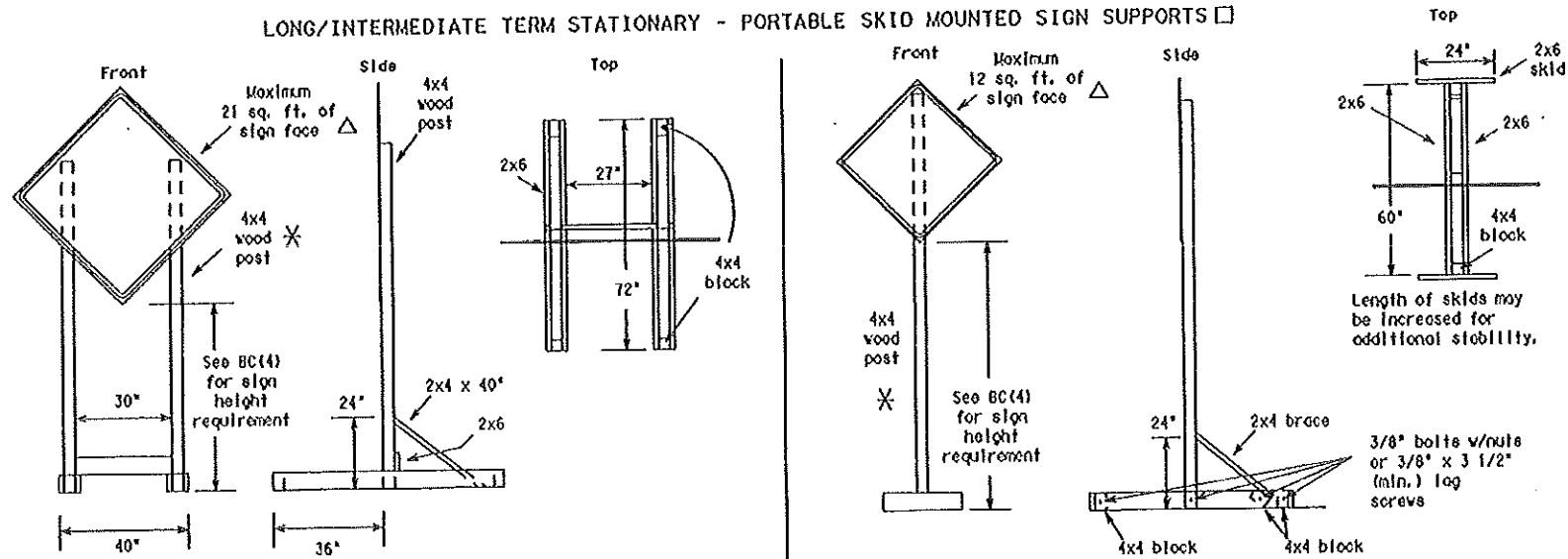
BC(4)-07

| © TxDOT 11-4-02 | REVISED | REVISED | REVISED | REVISED |
|-----------------|---------|---------|---------|---------|
| 9-07            | REVISED | REVISED | REVISED | REVISED |
|                 | REVISED | REVISED | REVISED | REVISED |
|                 | REVISED | REVISED | REVISED | REVISED |

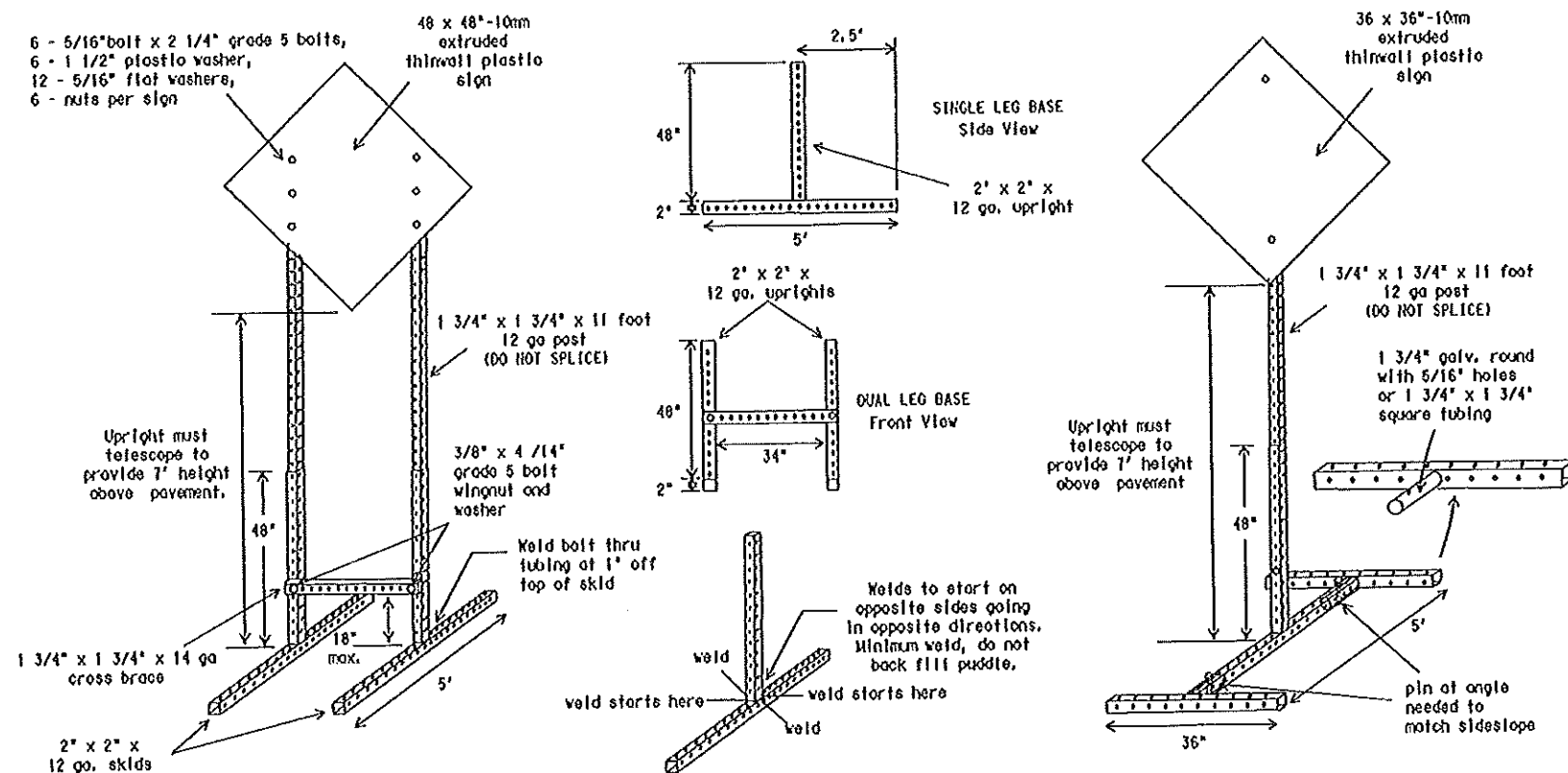
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## SKID MOUNTED WOOD SIGN SUPPORTS

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

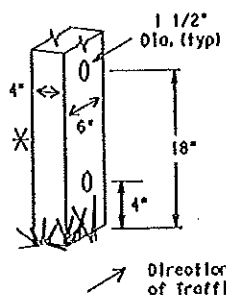


## SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



### WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the STD 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)).



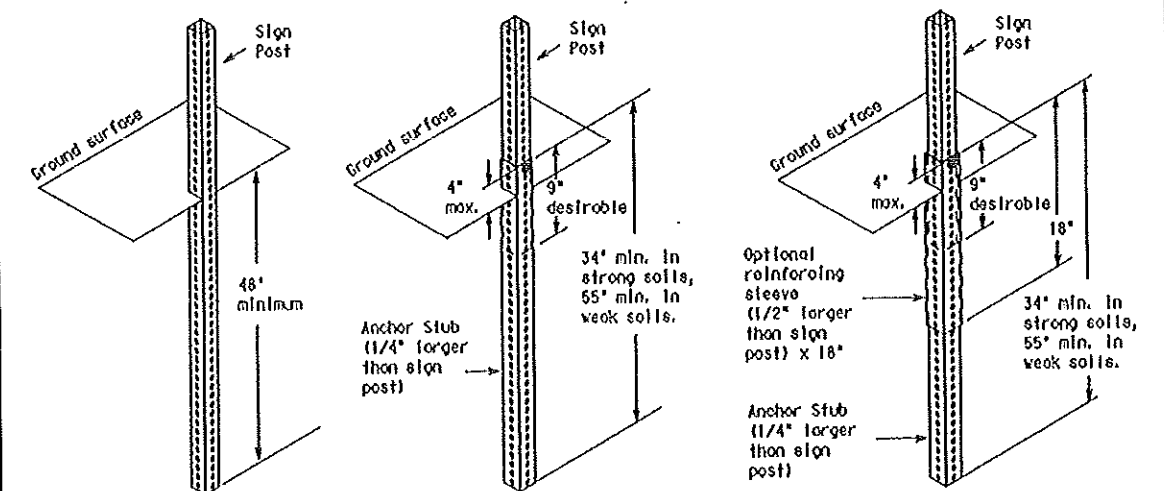
### WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

| Nominal Post Size | No. of Posts | Maximum Sq. feet of Sign Face | Minimum Soil Embedment | Drilled Holes 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 CWZTCO 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

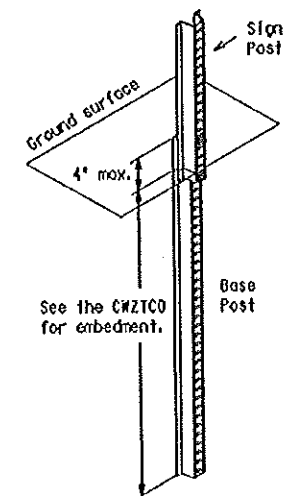


OPTION 1  
(Direct Embedment)

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 CWZTCO 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 CWZTCO 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 CWZTCO 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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BC(5)-07

| © TxDOT 11-4-02 | REV       | DATE | BY | CHK | APP | DATE |
|-----------------|-----------|------|----|-----|-----|------|
| 9-07            | ADDITIONS |      |    |     |     |      |
|                 |           |      |    |     |     |      |
|                 |           |      |    |     |     |      |

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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 QLT     | Miles          | MI        |
| Alternate              | ALT         | Miles Per Hour | MPH       |
| Avenue                 | AVE         | Minor          | MIN       |
| Best Route             | BEST RTE    | Monday         | MON       |
| Boulevard              | BLVD        | Normal         | NORM      |
| Bridge                 | BRDG        | North          | N         |
| Canal                  | CANT        | Northbound     | (route) N |
| Center                 | CNTR        | Parking        | PKING     |
| Construction Ahead     | CONST AHEAD | Parking Lot    | PRK LOT   |
| Detour Route           | DETOUR RTE  | Road           | RD        |
| Do Not                 | DOHT        | Right Lane     | RTG 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, FMY   | Telephone      | PHONE     |
| Freeway Blocked        | FRWY BLKD   | Temporary      | TEMP      |
| Friday                 | FRI         | Thursday       | THURS     |
| Hazardous Driving      | HAZ DRIVING | To Downtown    | TO DNTN   |
| Hazardous Material     | HAZMAT      | Traffic        | TRAF      |
| High Occupancy Vehicle | HOV         | Travelers      | TRVLRS    |
| Highway                | HMY         | 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<br>CLOSED<br>X MILE |
| ROAD<br>CLOSED<br>AT SH XXX |
| ROAD<br>CLSD AT<br>FM XXXX  |
| RIGHT X<br>LANES<br>CLOSED  |
| CENTER<br>LANE<br>CLOSED    |
| NIGHT<br>LANE<br>CLOSURES   |
| VARIOUS<br>LANES<br>CLOSED  |
| EXIT<br>CLOSED              |
| MALL<br>DRIVEWAY<br>CLOSED  |
| XXXXXXXX<br>BLVD<br>CLOSED  |

#### Other Condition List

|                                |                                |                               |
|--------------------------------|--------------------------------|-------------------------------|
| FRONTAGE<br>ROAD<br>CLOSED     | ROADWORK<br>XXX FT             | ROAD<br>REPAIRS<br>XXXX FT    |
| SHOULDER<br>CLOSED<br>XXX FT   | FLAGGER<br>XXXX FT             | LANE<br>NARROWS<br>XXXX FT    |
| RIGHT LN<br>CLOSED<br>XXX FT   | RIGHT LN<br>NARROWS<br>XXXX FT | TWO-WAY<br>TRAFFIC<br>XX MILE |
| RIGHT X<br>LANES<br>OPEN       | MERGING<br>TRAFFIC<br>XXXX FT  | CONST<br>TRAFFIC<br>XXX FT    |
| DAYTIME<br>LANE<br>CLOSURES    | LOOSE<br>GRAVEL<br>XXXX FT     | UNEVEN<br>LANES<br>XXXX FT    |
| I-XX SOUTH<br>EXIT<br>CLOSED   | DETOUR<br>X MILE               | ROUGH<br>ROAD<br>XXXX FT      |
| EXIT XXX<br>CLOSED<br>X MILE   | ROADWORK<br>PAST<br>SH XXXX    | ROADWORK<br>NEXT<br>FRI-SUN   |
| RIGHT LN<br>TO BE<br>CLOSED    | BUMP<br>XXXX FT                | US XXX<br>EXIT<br>X MILES     |
| X LANES<br>CLOSED<br>TUE - FRI | TRAFFIC<br>SIGNAL<br>XXXX FT   | LANES<br>SHIFT *              |

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

#### 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 limited 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.

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 Flagging 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.

### Phase 2: Possible Component Lists

#### Action to Take/Effect on Travel List

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

#### Location List

|                                |
|--------------------------------|
| AT<br>FM XXXX                  |
| BEFORE<br>RAILROAD<br>CROSSING |
| NEXT<br>X<br>MILES             |
| PAST<br>US XXX<br>EXIT         |
| XXXXXXXX<br>TO<br>XXXXXXXX     |
| US XXX<br>TO<br>FM XXXX        |

#### Warning List

|                             |
|-----------------------------|
| SPEED<br>LIMIT<br>XX MPH    |
| MAXIMUM<br>SPEED<br>XX MPH  |
| MINIMUM<br>SPEED<br>XX MPH  |
| ADVISORY<br>SPEED<br>XX MPH |
| RIGHT<br>LANE<br>EXIT       |
| USE<br>CAUTION              |
| DRIVE<br>SAFELY             |
| DRIVE<br>WITH<br>CARE       |

#### \*\* Advance Notice List

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

\*\* See Application Guidelines Note 6.

#### Warning 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.

Texas Department of Transportation  
Traffic Operations Division

BARRICADE AND CONSTRUCTION  
PORTABLE CHANGEABLE  
MESSAGE SIGN (PCMS)  
STANDARD

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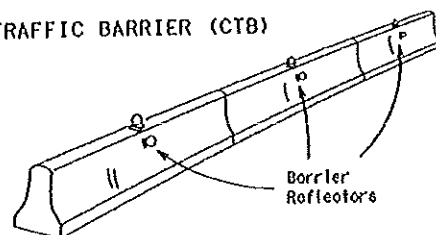
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| © TxDOT 11-4-02 | DATE | REVISION | BY | CHK | DATE |
| 9-07            | DATE | REVISION | BY | CHK | DATE |
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## BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

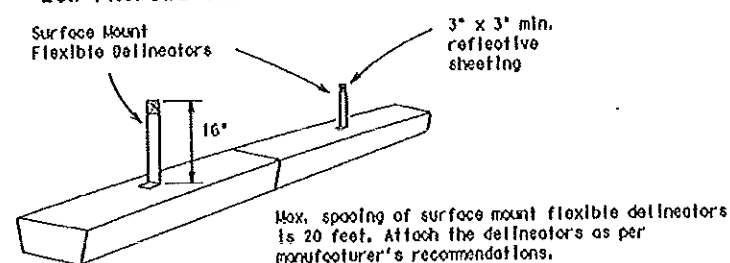
- Barrier Reflectors shall be prequalified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors (Type C Delineators) can be found at the Material Producer List web address shown on BC(11).
- Color of Barrier Reflectors shall be as specified in the TxDOT. The cost of the reflectors shall be considered subsidiary to item 502.

### CONCRETE TRAFFIC BARRIER (CTB)

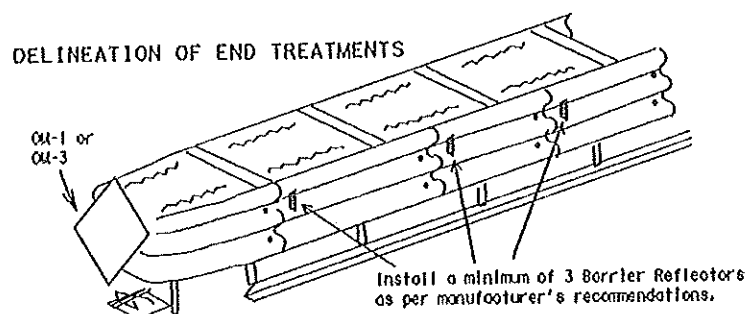


- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- 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. White reflectors shall be made with Type D White Prismatic sheeting. Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.

### LOW PROFILE CONCRETE BARRIER (LPCB)



### DELINEATION OF END TREATMENTS

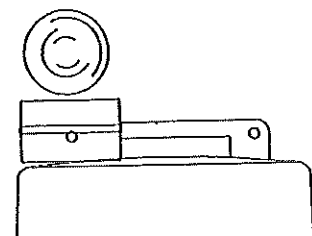


| DELINEATION  | APPROACHING TRAFFIC |                        |
|--------------|---------------------|------------------------|
|              | BOTH SIDES          | ONE SIDE               |
| OU-1 or OU-3 | OU-1                | OU-3 or Vertical Panel |

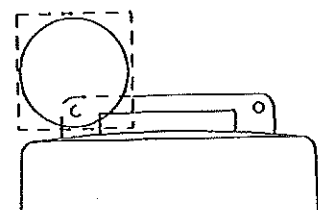
### END TREATMENTS FOR CTB'S USED IN WORK ZONES

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 CRZTCO List for approved end treatments and manufacturers.

### WARNING LIGHTS



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 shall meet the requirements of the TxDOT.
- Warning lights shall NOT be installed on barricades.
- 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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

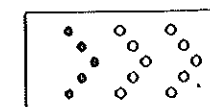
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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

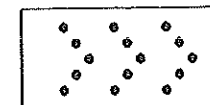
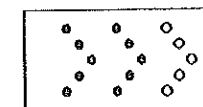
- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
- The warning reflector shall be yellow in color and shall be manufactured using a sign substrate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

## 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.

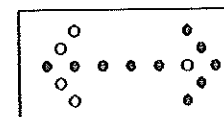


Sequential Chevron

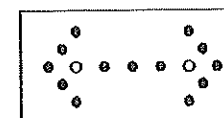


- The Flashing Arrow Panel should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
- Flashing Arrow Panels should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
- 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.
- The Flashing Arrow Panel should be able to display the following symbols:

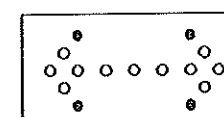
### Flashing RIGHT (LEFT) ARROW



### Flashing DOUBLE ARROW



### Flashing CAUTION



### 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.

- The "CAUTION" display consists of four corner lamps flashing simultaneously.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.

- The Flashing Arrow Panel shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Panel SHALL NOT BE USED to laterally shift traffic.
- A full matrix POMS 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.
- Minimum mounting height of trailer mounted arrow panels should be 7 feet from roadway to bottom of panel.

## TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350).
- Refer to the CRZTCO for the requirements of Level 2 or Level 3 TMAs.
- Refer to the dates shown in the CRZTCO to ensure that the TMA meets the age requirements and the crashworthiness criteria established by the Federal Highway Administration (FHWA) for TMAs.
- Refer to the CRZTCO for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is on an extended distance from the TMA.

Texas Department of Transportation  
Traffic Operations Division

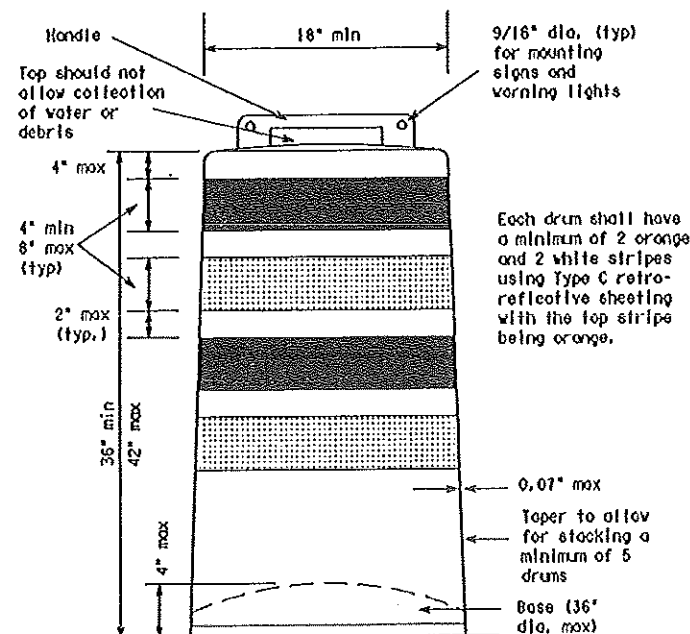
## BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR STANDARD

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BC(7)-07

| © TxDOT 11-4-02 | REVISED | DATE | BY | CHKD | DATE | BY | CHKD | DATE | BY |
|-----------------|---------|------|----|------|------|----|------|------|----|
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#### GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
- The Contractor shall have a maximum of 24 hours to replace any plastic drums 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:

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.

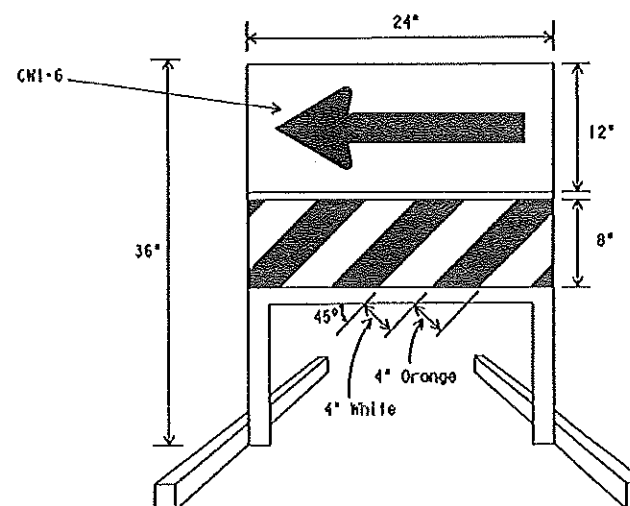
- Drum body shall have a minimum unballasted weight of 7.7 lbs. and maximum unballasted weight of 11 lbs. The wall of the drum body shall be a minimum of 0.07 inch in thickness. Weight of any drum supplied shall not vary more than 0.5 lb. from that of the prequalified sample.
- Drum and base shall be marked with manufacturer's name and model number.

#### RETROREFLECTIVE SHEETING

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

#### BALLAST

- 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.
- 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.
- 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.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

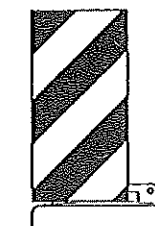


#### DIRECTION INDICATOR BARRICADE

- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- 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 Fluorescent Prismatic Orange above a roll with Type C High Specific Intensity retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- 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 D10a, 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

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- 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.
- Other sign messages (text or symbols) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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

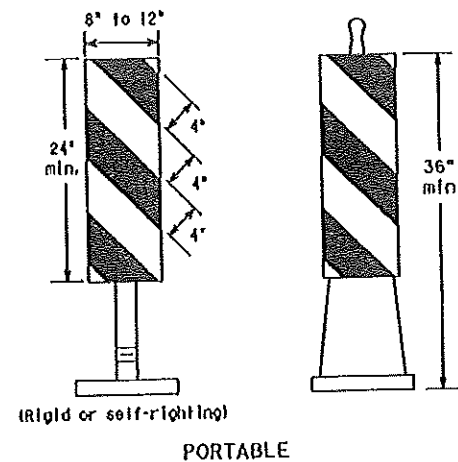
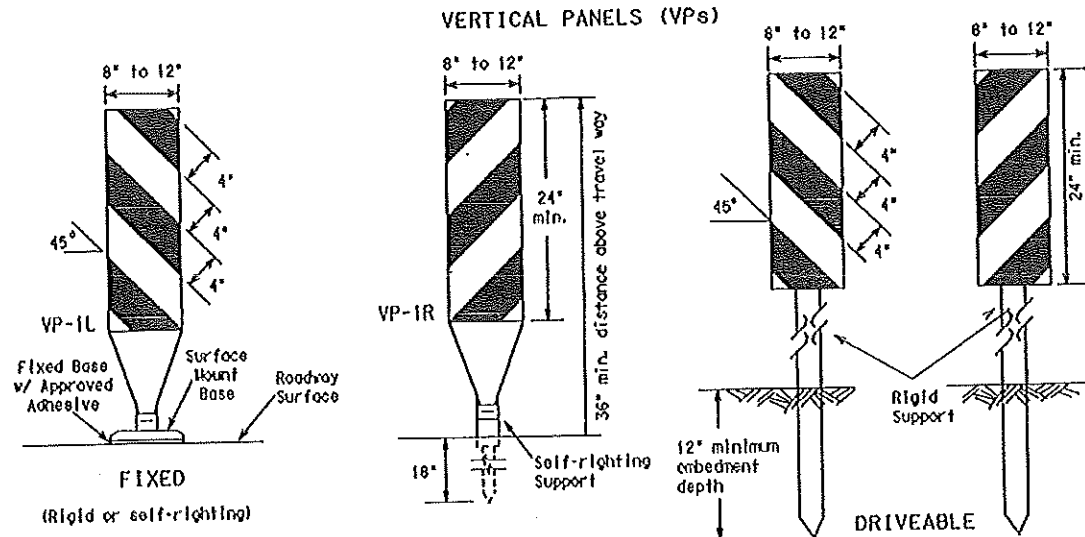
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| © TxDOT 11-4-02 | DATE      | BY   | CHK | APP | REV |
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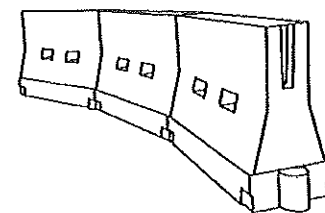
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## CHANNELIZING DEVICES



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 Specifity 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.

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



#### LONGITUDINAL CHANNELIZING DEVICES

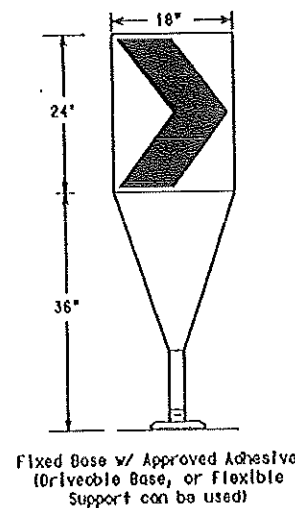
1. Longitudinal channelizing devices are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. Longitudinal channelizing devices may be used instead of a line of 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(1)-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.

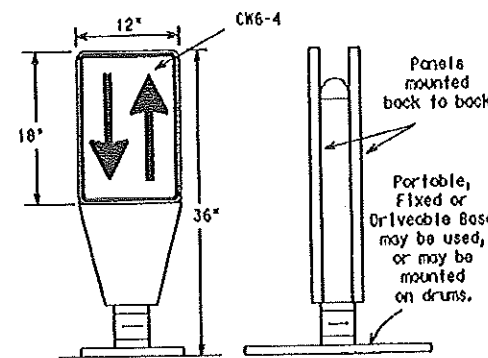
If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall be not less than 32 inches in height.

#### CHEVRONS



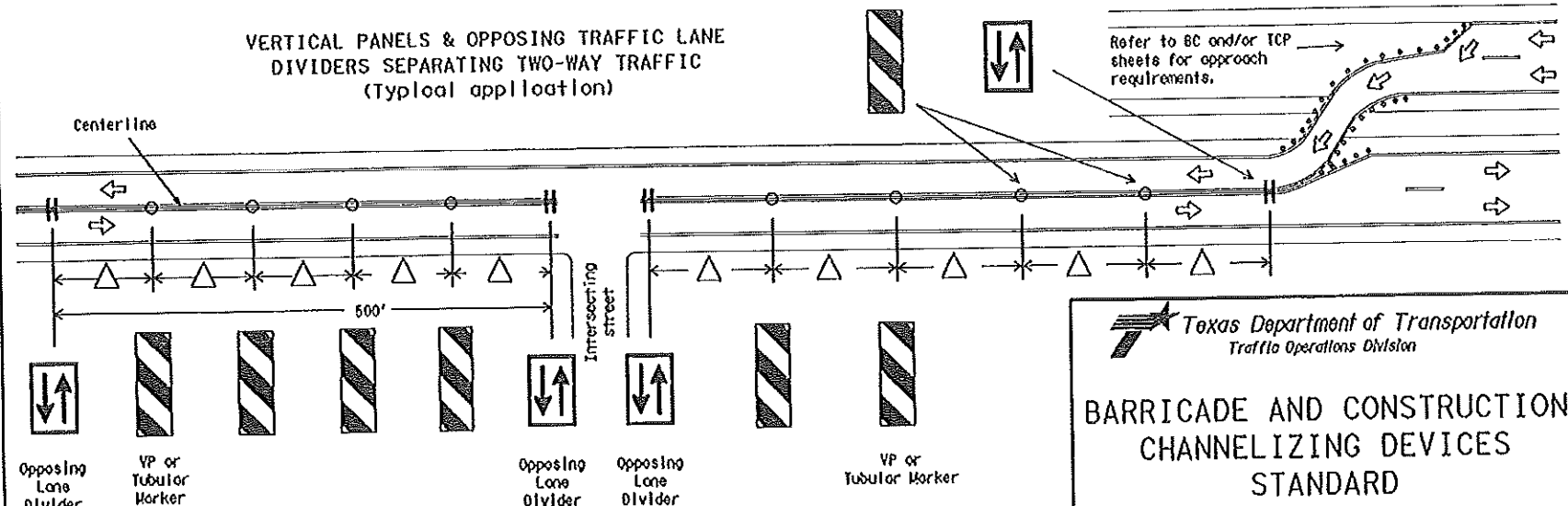
1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of 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. Spooling should be such that the material 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 non-reflective 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.

#### 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 VP's.
3. Spooling between the OTLD shall not exceed 500 feet. Tubular markers or VP's placed between the OTLD's should not exceed 100 foot spooling.
4. The OTLD shall be orange with a black non-reflective 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.

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



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

#### 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 spooling 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 also where 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, non-reflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spooling 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.

| Posted Speed | Formula               | Minimum Desirable Taper Lengths X % |            |            | Suggested Maximum Spooling of Channelizing Devices |             |
|--------------|-----------------------|-------------------------------------|------------|------------|----------------------------------------------------|-------------|
|              |                       | 10' Offset                          | 11' Offset | 12' Offset | On a Taper                                         | On a Taper  |
| 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           |                       | 330'                                | 365'       | 395'       | 45'                                                | 90' - 110'  |
| 50           | $L = WS$              | 450'                                | 495'       | 540'       | 50'                                                | 100' - 125' |
| 55           |                       | 550'                                | 605'       | 660'       | 55'                                                | 110' - 140' |
| 60           |                       | 660'                                | 720'       | 780'       | 60'                                                | 120' - 150' |
| 65           |                       | 770'                                | 835'       | 900'       | 65'                                                | 130' - 165' |
| 70           | $L = WS$              | 880'                                | 950'       | 1020'      | 70'                                                | 140' - 175' |
| 75           |                       | 990'                                | 1065'      | 1140'      | 75'                                                | 150' - 185' |
| 80           |                       | 1100'                               | 1180'      | 1260'      | 80'                                                | 160' - 195' |

\*\*Taper lengths have been rounded off.  
L=Length of Taper (ft.) X=Width of Offset (ft.)  
S=Posted Speed (MPH)

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## BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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BC(9)-07

| DATE | REVISIONS | BY | CHK | APP | DATE |
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| 9-07 |           |    |     |     |      |

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## TYPE III BARRICADES

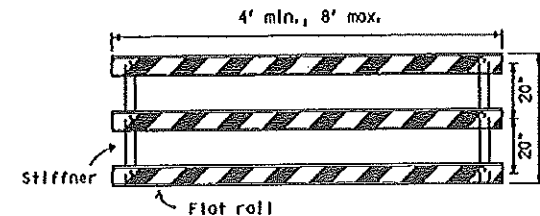
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type III Barricades and a list of all materials used in the construction of Type III Barricades.
2. Type III Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades 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 rolls, 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 rolls. 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. Sandbags shall not be stacked in a manner that covers any portion of a barricade rolls 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 fire 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

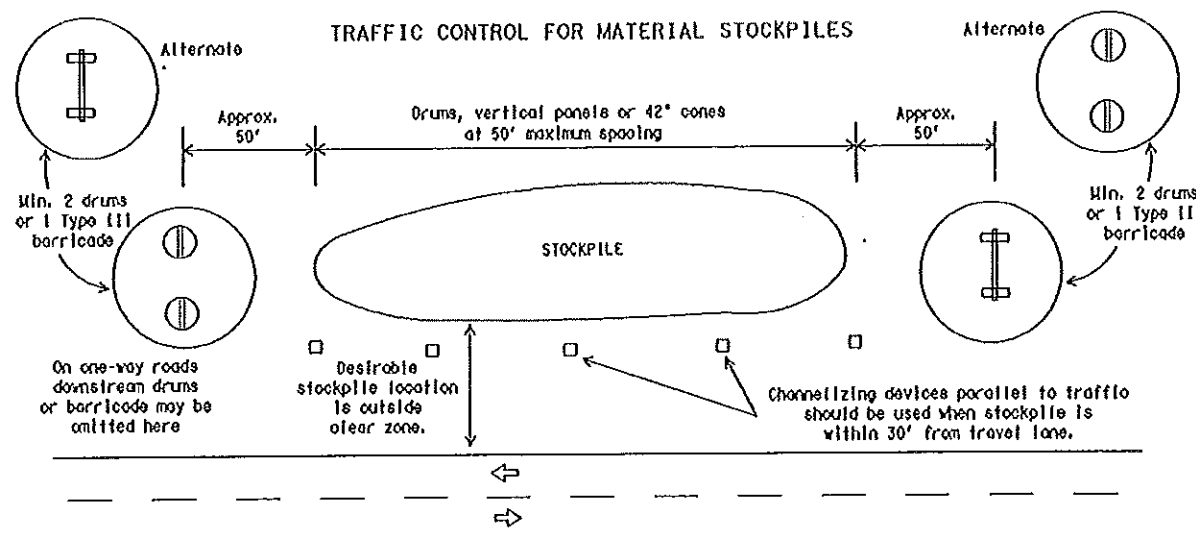


### TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



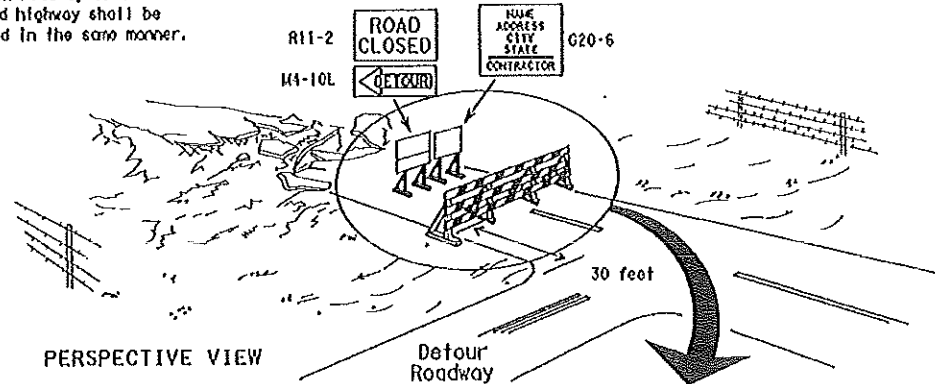
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

### TRAFFIC CONTROL FOR MATERIAL STOCKPILES



## TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION

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

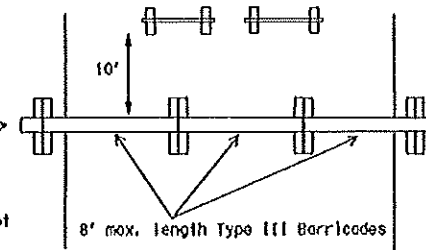


### PERSPECTIVE VIEW

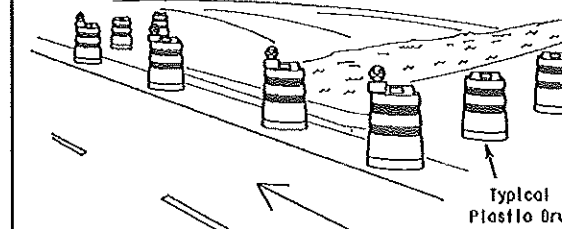
The three rolls on Type III barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

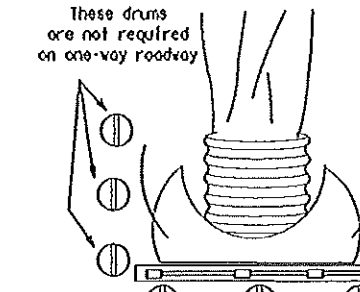
### PLAN VIEW



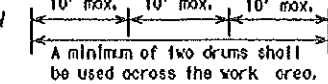
## CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



### PERSPECTIVE VIEW



### PLAN VIEW

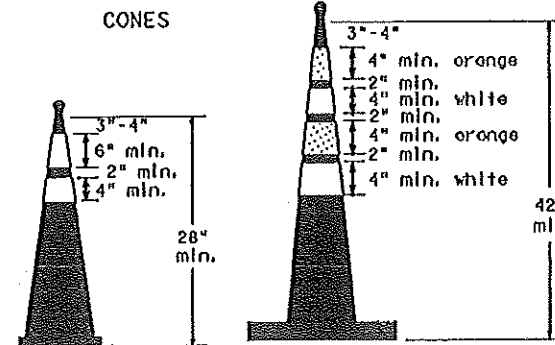


### Legend

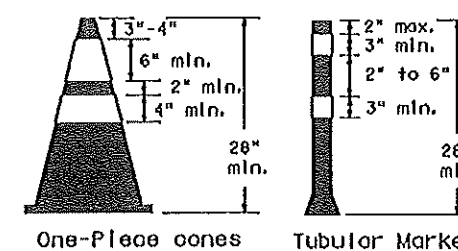
- Plastic drum
- Plastic drum with steady burn light or yellow warning reflector
- Steady burn warning light or yellow warning reflector

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)

### CONES



### Two-Piece cones

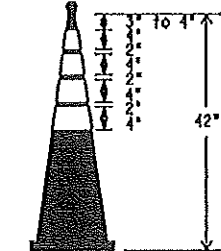


### One-Piece cones

### 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 night.
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. 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.



### EDGE LINE 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.

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## BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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| DATE | REVISIONS | BY   | CHK | DATE   | BY | CHK       |
|------|-----------|------|-----|--------|----|-----------|
| 9-07 | 11-4-02   | CVL  | SEC | JAS    |    |           |
|      |           | LIST |     | COUNTY |    | SHEET NO. |

109A

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DATE:  
FILE:

## 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 W2(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(112).
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 (roll back) shall meet the requirements of DMS-8240.

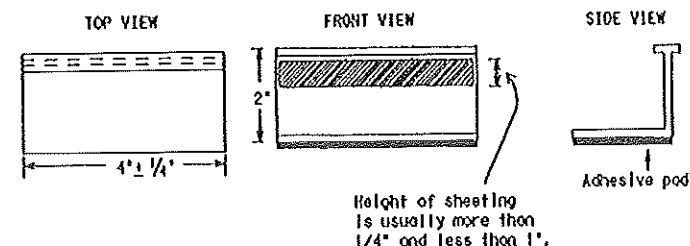
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 discernible 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. Block-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 W2(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

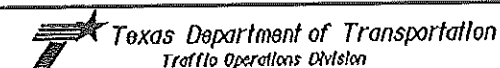
1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied 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(11).



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS STANDARD

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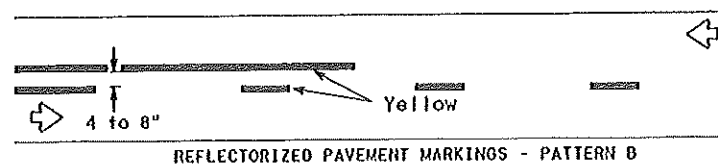
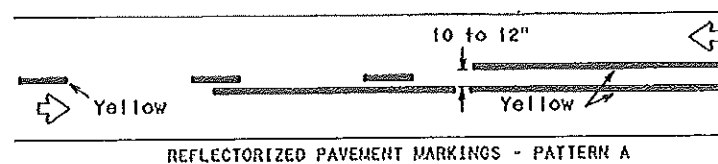
| © TxDOT February 1998 | REV  | DESCRIPTION | DATE | BY |
|-----------------------|------|-------------|------|----|
| 2-98                  | 1-02 | REVISIONS   |      |    |
| 11-02                 |      |             |      |    |
| 9-07                  |      |             |      |    |

109B

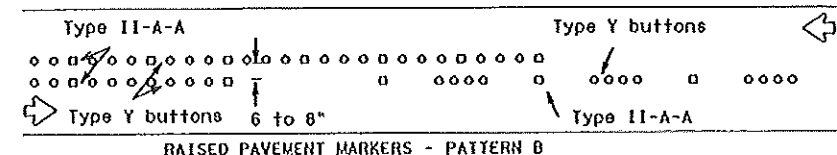
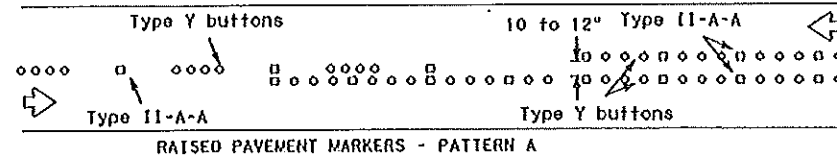
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## PAVEMENT MARKING PATTERNS

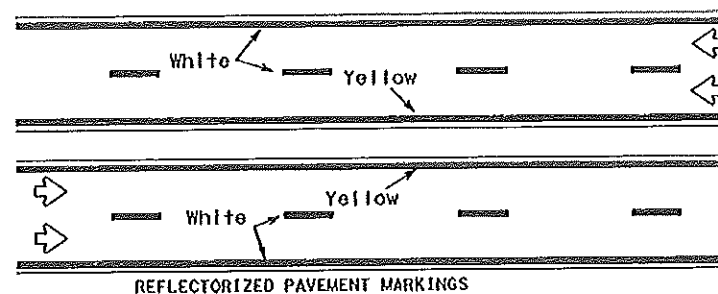
### CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



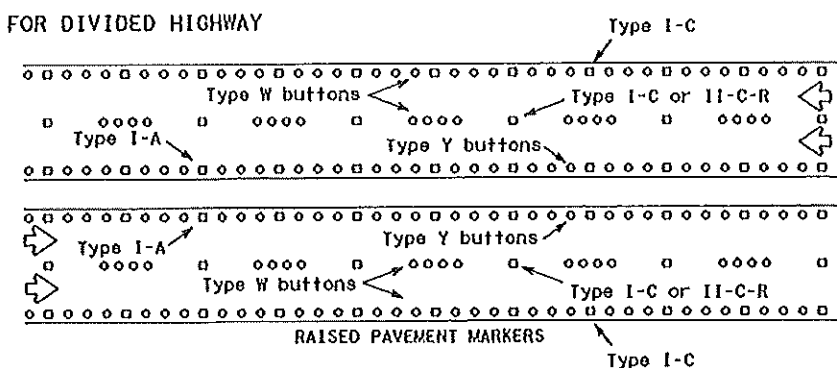
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.



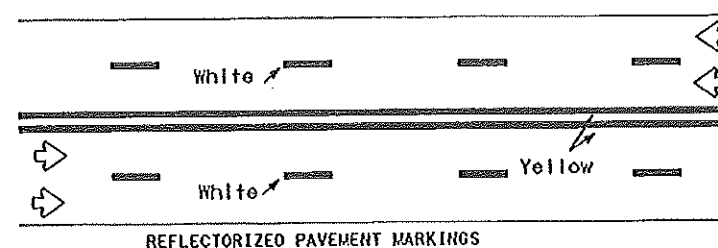
### EDGE & LANE LINES FOR DIVIDED HIGHWAY



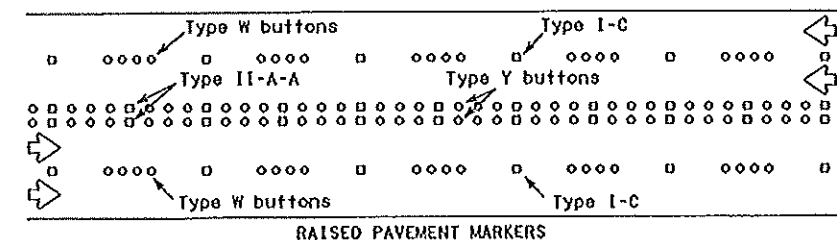
Prefabricated markings may be substituted for reflectorized pavement markings.



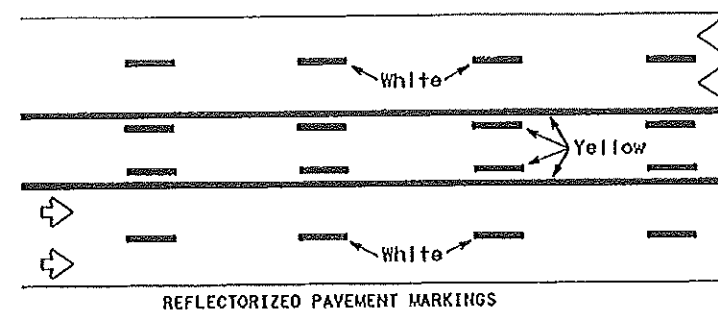
### LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



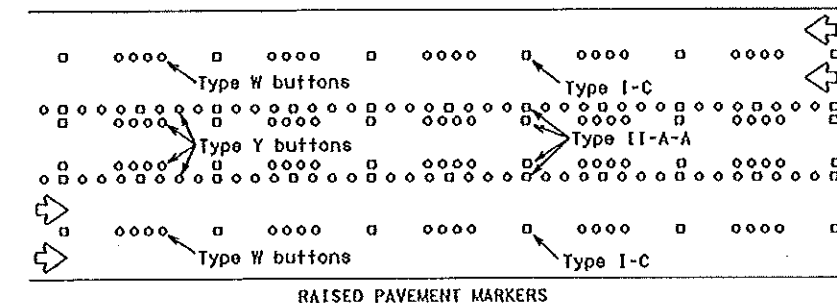
Prefabricated markings may be substituted for reflectorized pavement markings.



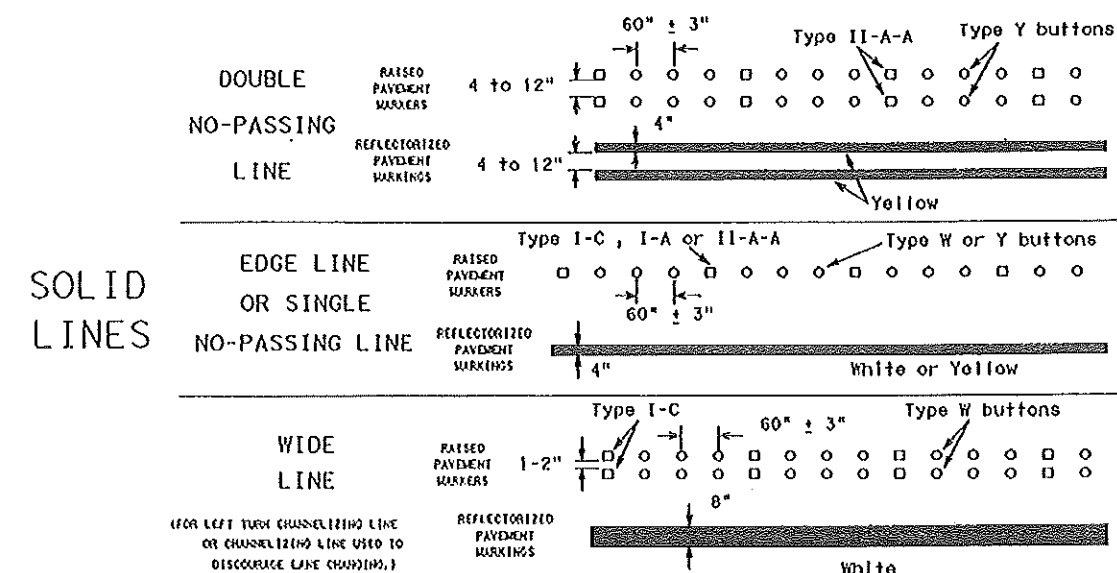
### TWO-WAY LEFT TURN LANE



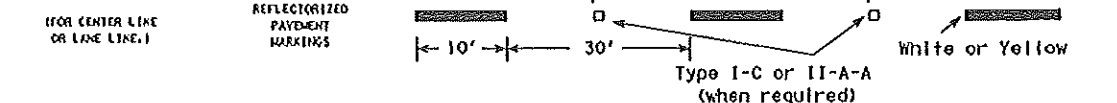
Prefabricated markings may be substituted for reflectorized pavement markings.



## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

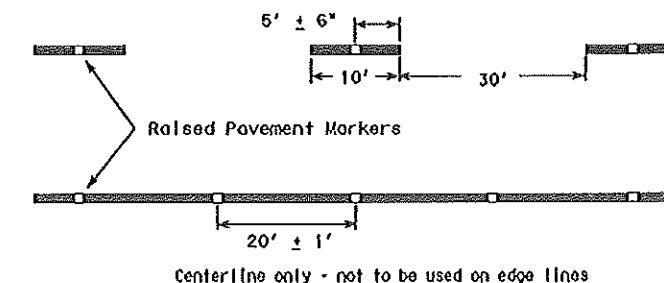


## BROKEN LINE



## 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.



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

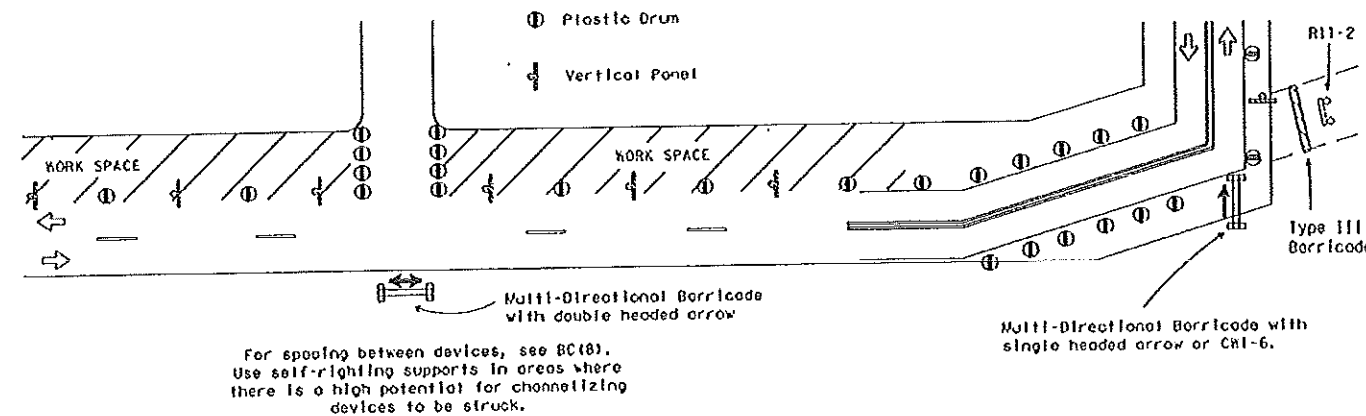
## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

12 of 12 BC(12)-07

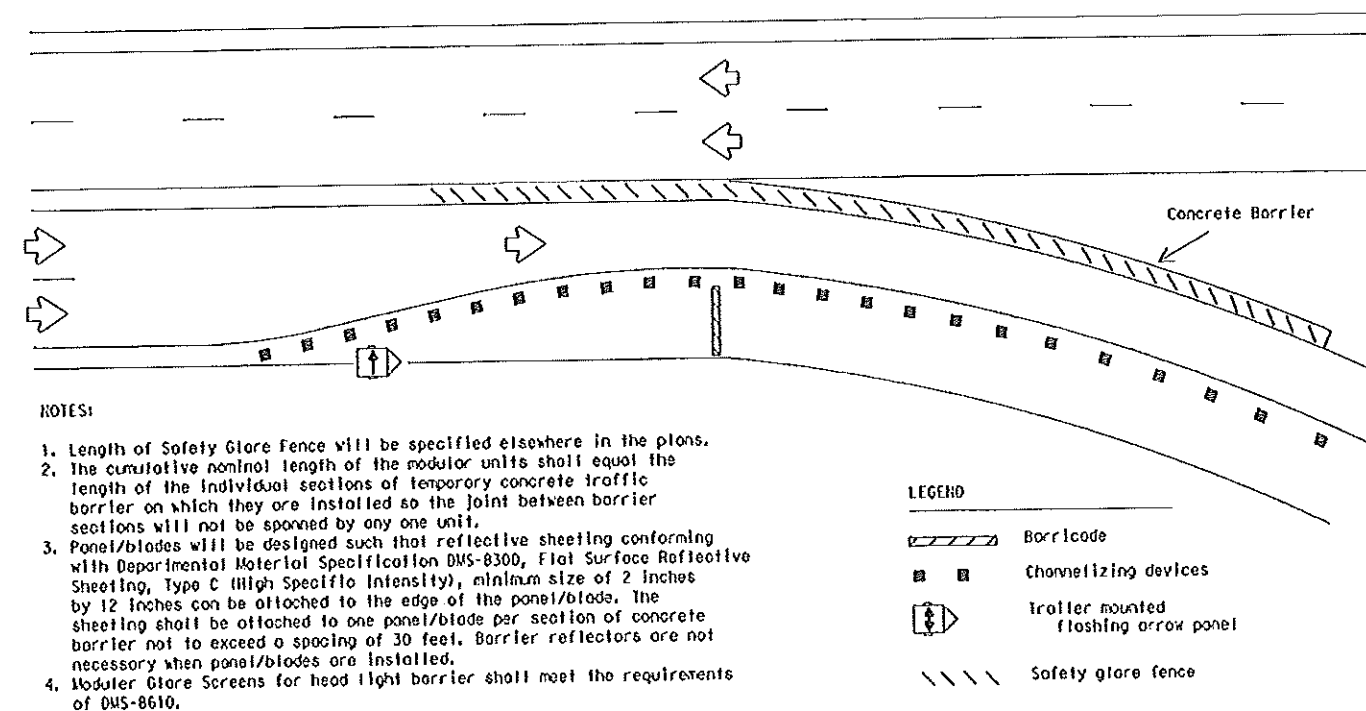
| © TxDOT February 1993 | REV | DATE | BY    | CHK  | APP | REVISION |
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| 1-97                  | 1   | 2-98 | 11-02 | 9-07 |     |          |

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## CHANNELIZING DEVICES FOR URBAN ROADWAY TYPE PROJECT



## BARRIER DELINEATION WITH SAFETY GLARE FENCE



Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCO) describes pre-qualified products and their sources and may be obtained by contacting:

Standards Engineer  
Traffic Operations Division - TC  
Texas Department of Transportation  
125 East 11th Street  
Austin, Texas 78701-2483  
Phone (512) 416-3120  
Fax (512) 416-3299

Instructions to locate the "CWZTCO" on TxDOT website are:

Start at website - [www.dot.state.tx.us](http://www.dot.state.tx.us)  
Click on "About TxDOT",  
Click on "Organizational Chart",  
Click on Traffic Operations Box,  
Click on "Compliant Work Zone Traffic Control Devices",  
Click on "View PDF".  
This site is printable.

PREQUALIFICATION PROCEDURES ARE OBTAINED FROM:

CONSTRUCTION DIVISION-MATERIALS AND TESTS SECTION  
TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)  
125 EAST 11th STREET  
AUSTIN, TX 78701-2483

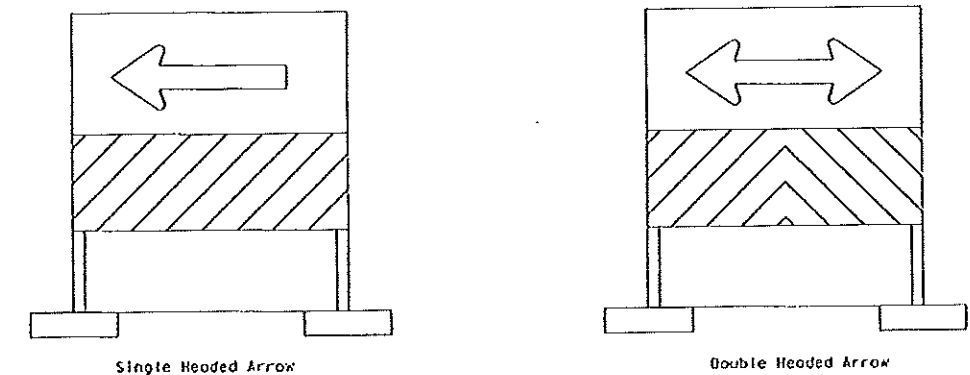
DEPARTMENTAL MATERIAL SPECIFICATIONS

|                                  |          |
|----------------------------------|----------|
| FLAT SURFACE REFLECTIVE SHEETING | DMS-8300 |
| DELINATORS AND OBJECT MARKERS    | DMS-8600 |
| MODULAR GLARE SCREENS            | DMS-8610 |

| COLOR  | USAGE            | SIGN SHEETING                    |
|--------|------------------|----------------------------------|
| ORANGE | BACKGROUND       | TYPE E (FLUORESCENT PRISMATIC)   |
| WHITE  | BACKGROUND       | TYPE C (HIGH SPECIFIC INTENSITY) |
| BLACK  | LEGEND & BORDERS | VINYL NON-REFLECTIVE SHEETING    |

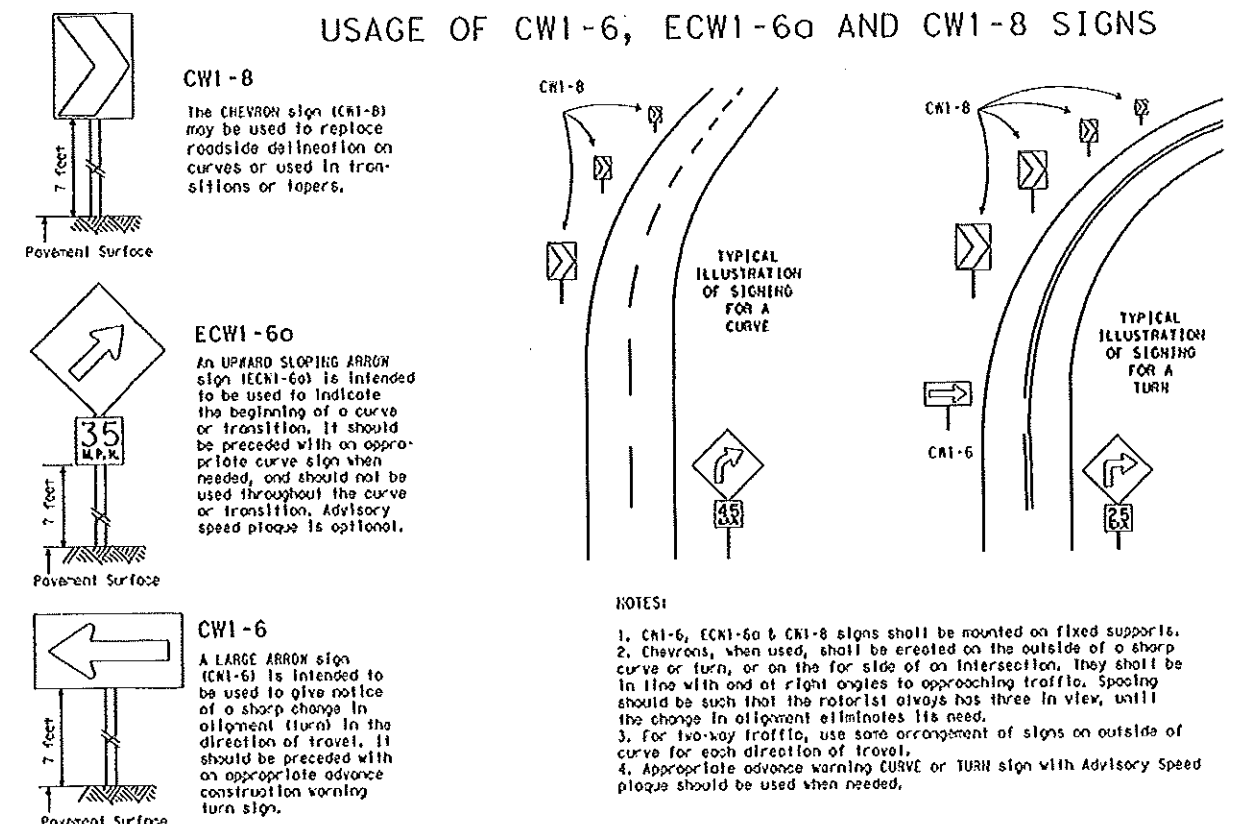
REFER TO THE BC SHEETS FOR SHEETING REQUIREMENT ON CHANNELIZING DEVICES.

## MULTI-DIRECTIONAL BARRICADE



1. Multi-directional barricade shall not be used for lane closures.
2. May be used for sharp changes in alignment, or across roadway from stem of "Y" intersection.
3. Typically used for Intermediate Term Stationary, Short Term Stationary or Short Duration work zone operations.
4. See the CWZTCO List for approved designs.

## USAGE OF CWI-6, ECWI-6a AND CWI-8 SIGNS



The five categories of work duration and their time at a location shall be:

- A. Long-term stationary is work that occupies a location more than 3 days.
- B. Intermediate-term stationary is work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.
- C. Short-term stationary is daytime work that occupies a location for more than 1 hour, but less than 12 hours.
- D. Short duration is work that occupies a location up to 1 hour.
- E. Mobile is work that moves intermittently or continuously.

STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION  
Traffic Operations Division

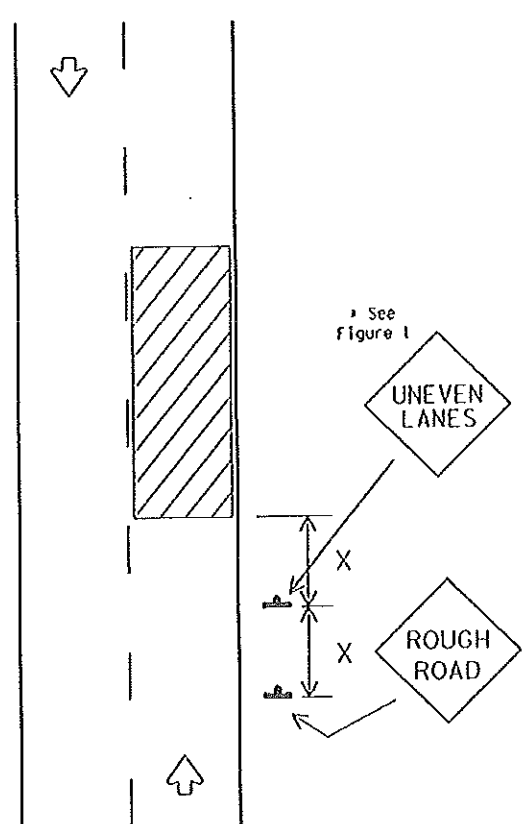
## TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-03

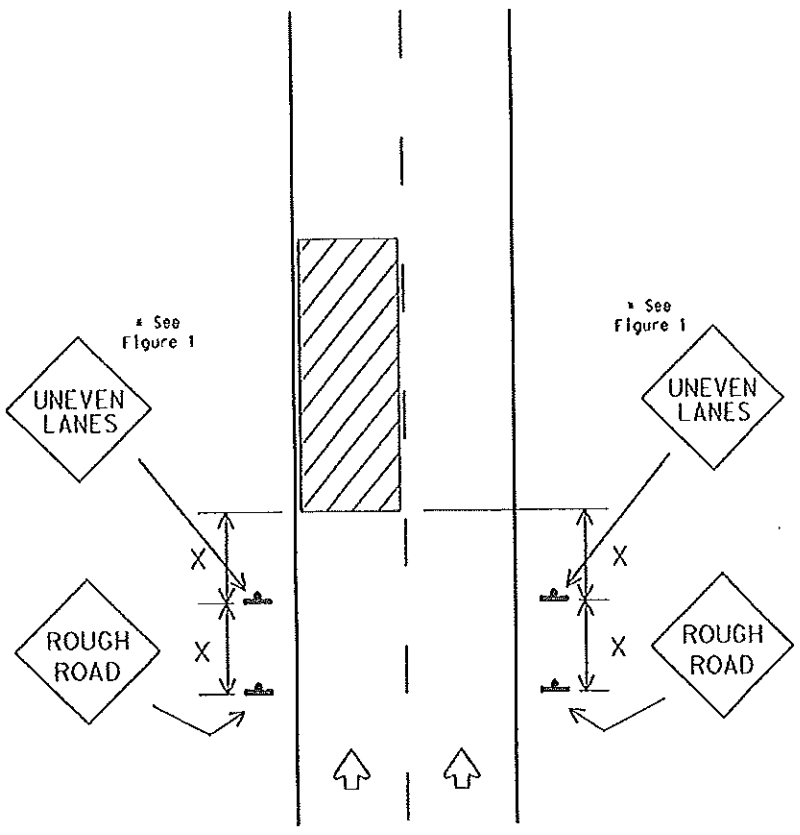
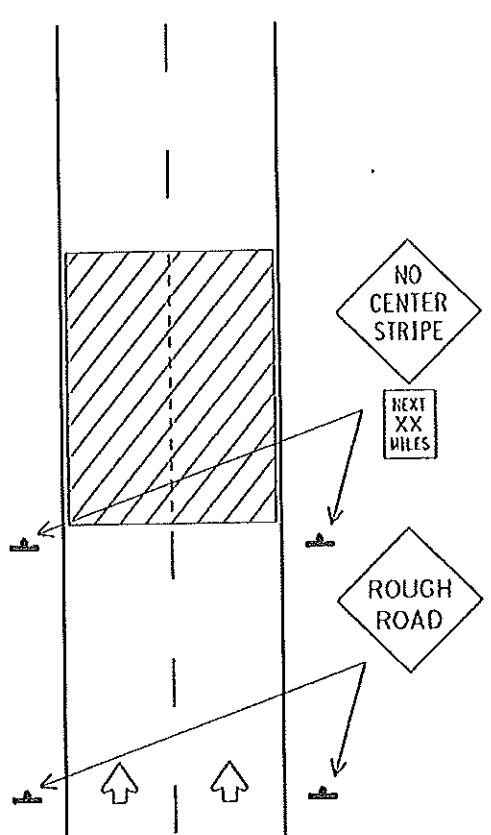
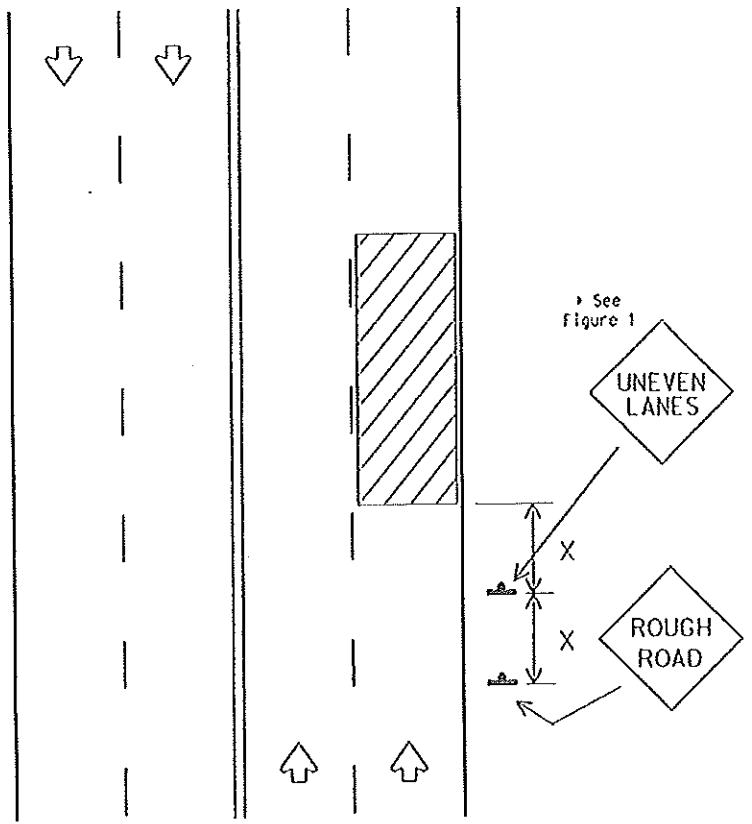
|                       |       |        |       |       |          |
|-----------------------|-------|--------|-------|-------|----------|
| © TxDOT February 1998 | DR-LR | DR-DIN | DR-DN | DR-CB | REV 98.1 |
| REVISIONS             | DATE  | BY     | CHKD  | APP'D | REASON   |
| 4-98                  | 6     |        |       |       |          |
| 3-03                  |       |        |       |       |          |

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|                  |                                                                                                                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ACC:             | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 |
| LEVELS DISPLAYED | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 |



Signing shown for one direction.



"X" distance - See Note 4 on this page.

| DEPARTMENTAL MATERIAL SPECIFICATIONS      |          |  |
|-------------------------------------------|----------|--|
| PLYWOOD SIGN BLANKS                       | DVS-7100 |  |
| ALUMINUM SIGN BLANKS                      | DVS-7110 |  |
| SIGN HARDWARE                             | DVS-7120 |  |
| PREFABRICATED PAVEMENT MARKINGS-PERMANENT | DVS-8240 |  |
| PREFABRICATED PAVEMENT MARKINGS-REMOVABLE | DVS-8241 |  |
| FLAT SURFACE REFLECTIVE SHEETING          | DVS-8300 |  |
| VINYL NON-REFLECTIVE DECAL SHEETING       | DVS-8320 |  |

| COLOR  | USAGE            | SHEETING MATERIAL                   |
|--------|------------------|-------------------------------------|
| ORANGE | BACKGROUND       | TYPE E (FLUORESCENT PRISMATIC)      |
| BLACK  | LEGEND & BORDERS | VINYL NON-REFLECTIVE DECAL SHEETING |

- GENERAL NOTES:
1. If spalling or holes occur, ROUGH ROAD signs should be placed in advance of the condition and may be repeated throughout the project.
  2. UNEVEN LANES sign (W8-11) should be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES sign (W8-16) or Advisory Speed sign (W8-11).
  3. NO CENTER STRIPE signs (W8-12) should be installed if centerlines or lane lines are obscured or obliterated. The signs should remain in place until permanent pavement markings are installed.
  4. Signs shall be spaced at the distances recommended as per BC standards.
  5. When operations are completed and final surface treatment will not be applied as part of this project, advance signs shall be left in place and become the property of the State. These signs shall be installed on approved permanent sign supports as per TxDOT standards. Additional signs may be required as directed by the Engineer. Minimum mounting height of signs is 7 feet. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to the item "BARRICADES, SIGNS AND TRAFFIC HANDLING."
  6. Pavement markings shall be replaced as operations proceed.
  7. Short term markings shall not be used to simulate edge lines.
  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.

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

| FIGURE 1       |                                                                     |                       |
|----------------|---------------------------------------------------------------------|-----------------------|
| Edge Condition | Edge Height (D)                                                     | Warning Devices       |
|                | less than or equal to 1"                                            | Signs: ECW8-8         |
|                | greater than 1" to: 1 1/4" (maximum-planing) 1/2" (typical-overlay) | Signs: CW8-11, ECW8-8 |

Distance "D" may be a maximum of 1/4" for planing operations and 2" for overlay operations if uneven lanes are open to traffic after work operations cease.

STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION  
Traffic Operations Division

SIGNING FOR  
UNEVEN LANES

WZ (UL) -03

|                     |         |      |    |      |      |
|---------------------|---------|------|----|------|------|
| © TxDOT Apr 11 1992 | REVISED | DATE | BY | CHKD | APPD |
| 8-95                | 1       | 8-95 | 6  |      |      |
| 1-97                |         |      |    |      |      |
| 2-98                |         |      |    |      |      |
| 3-03                |         |      |    |      |      |

DISCLAIMER

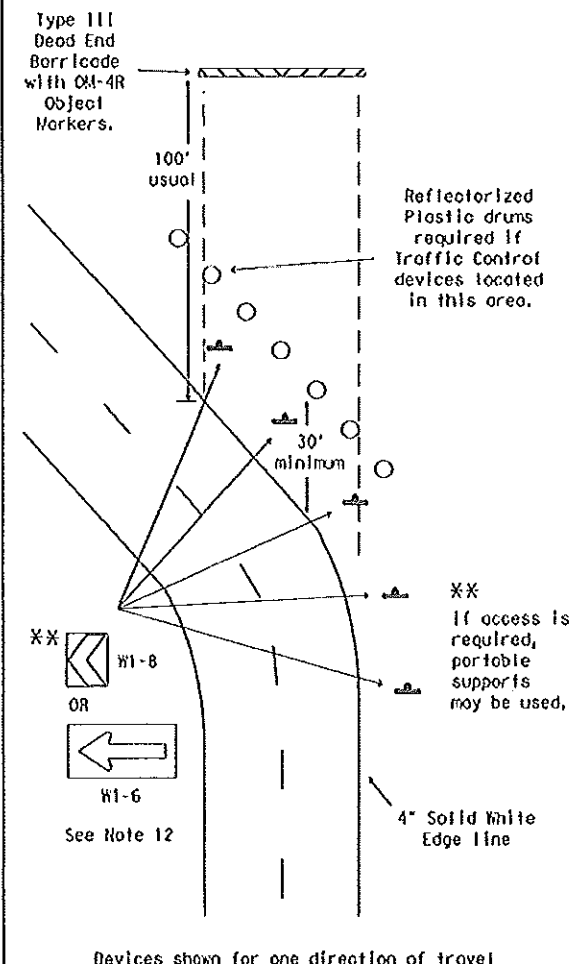
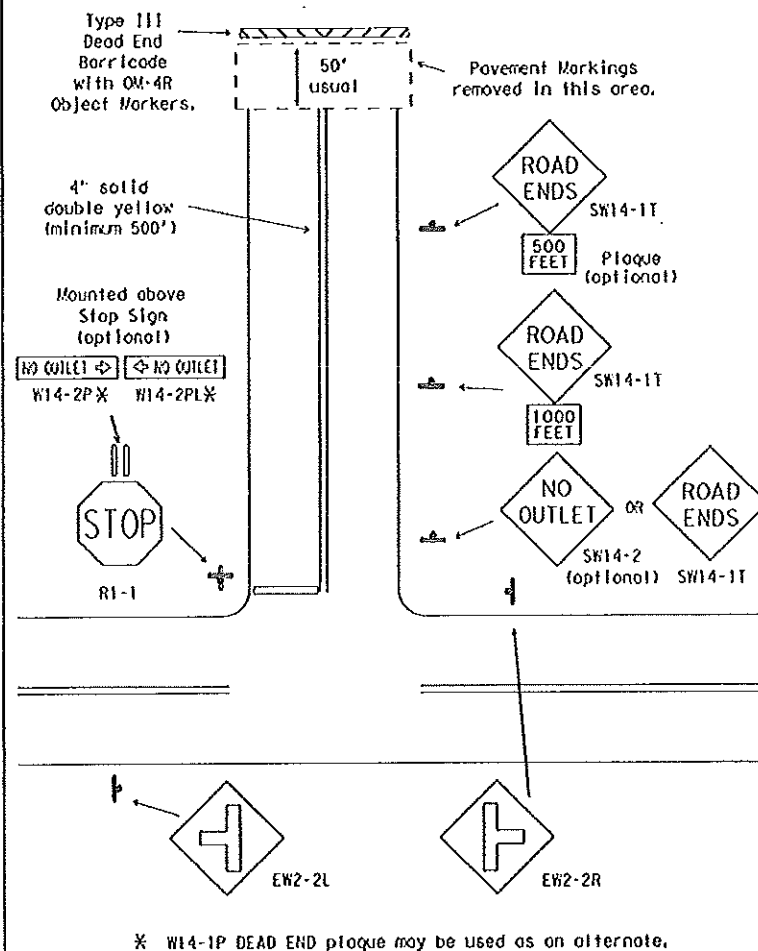
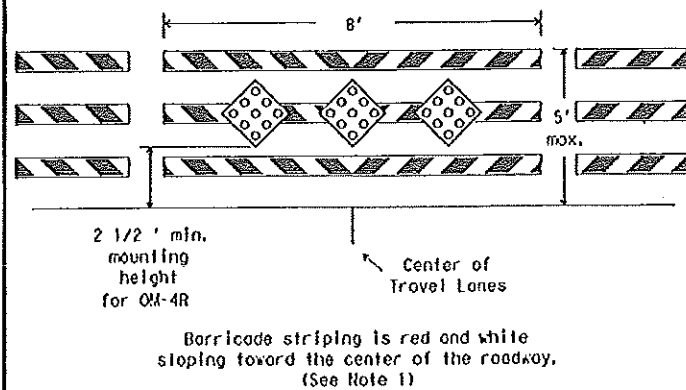
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ACC:

LEVELS DISPLAYED

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

### TYPICAL DEAD END BARRICADE INSTALLATION



| DEPARTMENTAL MATERIAL SPECIFICATIONS |          |  |  |
|--------------------------------------|----------|--|--|
| PLYWOOD SIGN BLANKS                  | DMS-7100 |  |  |
| ALUMINUM SIGN BLANKS                 | DMS-7110 |  |  |
| SIGN HARDWARE                        | DMS-7120 |  |  |
| WINGED CHANNEL POSTS                 | DMS-7130 |  |  |
| FLAT SURFACE REFLECTIVE SHEETING     | DMS-8300 |  |  |
| VINYL NON-REFLECTIVE DECAL SHEETING  | DMS-8320 |  |  |
| DELINEATORS AND OBJECT MARKERS       | DMS-8600 |  |  |

| COLOR  | USAGE            | SHEETING MATERIAL                |  |
|--------|------------------|----------------------------------|--|
| RED    | BACKGROUND       | TYPE C (HIGH SPECIFIC INTENSITY) |  |
| WHITE  | BACKGROUND       | TYPE C (HIGH SPECIFIC INTENSITY) |  |
| YELLOW | BACKGROUND       | TYPE C (HIGH SPECIFIC INTENSITY) |  |
| BLACK  | LEGEND & BORDERS | VINYL NON-REFLECTIVE SHEETING    |  |

- GENERAL NOTES:
- Barricade striping shall be red and white reflective sheeting for all permanent road closures. Orange and white reflective sheeting may be substituted for locations where duration of road closure is expected to be 18 months or less, or when approved by the Engineer. Red and orange reflective sheeting shall not be combined on barricades or locations.
  - Barricades shall be designed and constructed to Compliant Work Zone Traffic Control Device List (CWZTCO) standards in a first-class workmanship manner of clean sound material. Components made of lumber shall be painted with a minimum of two coats of white paint to ensure thorough coverage and a uniform white color. Barricade striping material shall meet the color and retroreflective requirements of Departmental Material Specification DMS-8300, Type C.
  - Post type breakaway supports shall be used as barricade supports. Barricades may be fabricated with "skid" supports if approved by the Engineer. Skid supports should be anchored using sand bags to prevent movement. For construction details of post (fixed Type III barricades) see CWZTCO List Part 0.2.f. The dead end road barricades may also be anchored to the pavement using the bolt down median anchor manufactured by Universal Anchor System shown on SW14FRP. The barricades shall be built using FRP posts and approved rolls as shown on the CWZTCO List.
  - Barricades shall not be placed parallel to traffic unless a minimum adequate clear zone of 30 feet from edge of travel lane is provided.
  - A minimum of one 8-foot wide barricade and three OM-4R object markers shall be required for all locations. Barricades shall extend across all travel lanes and shoulders if shoulders are present. Barricades may be extended to the ROW as directed by Engineer.
  - Stockpiled materials shall not be placed on traffic side of barricades.
  - OM-4 object markers shall be mounted to the middle rail using two 1/2" through bolts with flat washers and lock washers.
  - OM-4 object markers shall be constructed of 0.063 aluminum and shall meet the color and reflective requirements of DMS-8300 Type C and DMS-8600.
  - Plastic drums shall meet the requirements as listed on the CWZTCO list or the BC Standards. Plastic drums may be anchored with adhesive to prevent movement.
  - All signs and chevrons shall be installed with hardware and support of the minimum mounting height in accordance with the SWD and BC Standards. Signs shall be mounted at a 7 foot minimum height. Signs shall not be attached to barricades.
  - Motorists should be able to see at least three chevron signs as they approach the curve and as they drive through the curve from either direction.
  - Delineation devices such as the chevron or large arrow signs shall only be placed on the outside portion of a curve.

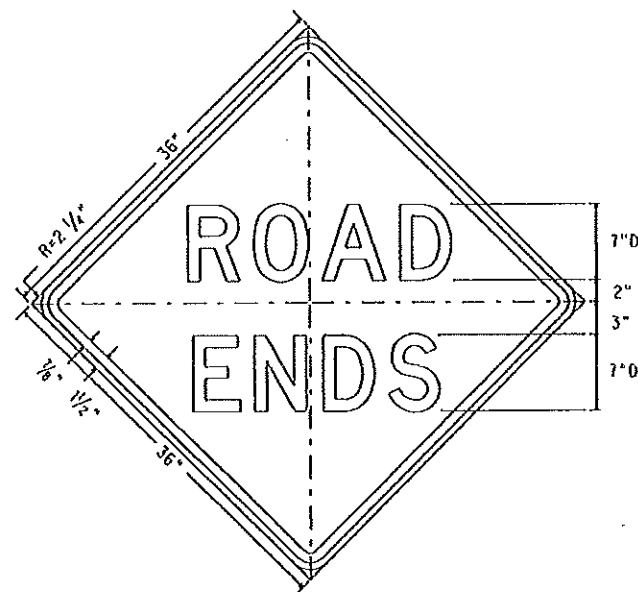
- GENERAL NOTE FOR SIGNS:
- The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways" (TMUTCD), latest edition, and any approved changes thereto.
  - Lateral spacing of text shall provide a balanced appearance.
  - All materials shall conform to Departmental Material Specifications.
  - Legend shall be black and applied by screening process, cut-out vinyl non-reflective sheeting or combination thereof.
  - Sign blanks shall be any material that meets the DMS requirements for permanent sign substrates.

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCO) describes pre-qualified products and their sources and may be obtained by contacting:

Standards Engineer  
Traffic Operations Division - TE  
Texas Department of Transportation  
125 East 11th Street  
Austin, Texas 78701-2483  
Phone (512) 416-3120  
Fax (512) 416-3299

Instructions to locate the "CWZTCO" on TxDOT website are:

Start at website - [www.dot.state.tx.us](http://www.dot.state.tx.us)  
Click on "About TxDOT",  
Click on "Organizational Chart",  
Click on Traffic Operations Box,  
Click on "Compliant Work Zone Traffic Control Devices",  
Click on "View PDF".  
This site is printable.



SW14-1T  
36" X 36"

Letters - Black  
Border - Black  
Background - Yellow Refl.

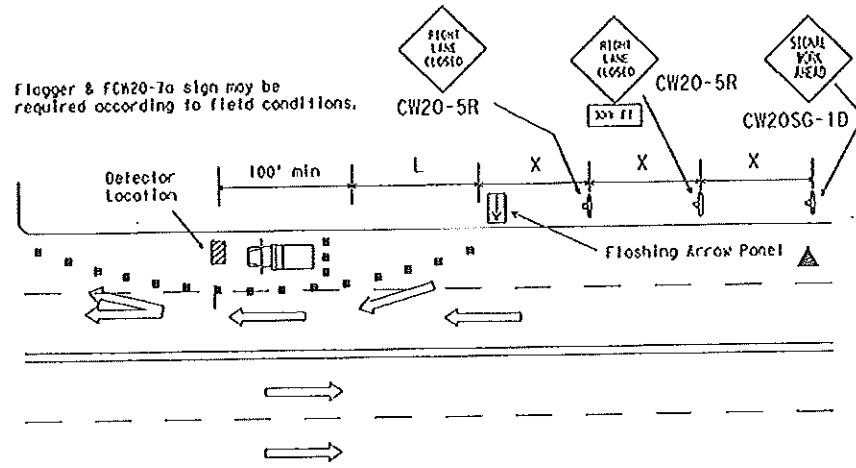
STANDARD PLANS  
Texas Department of Transportation  
Traffic Operations Division

WORK ZONE  
DEAD END  
ROADWAY DETAILS

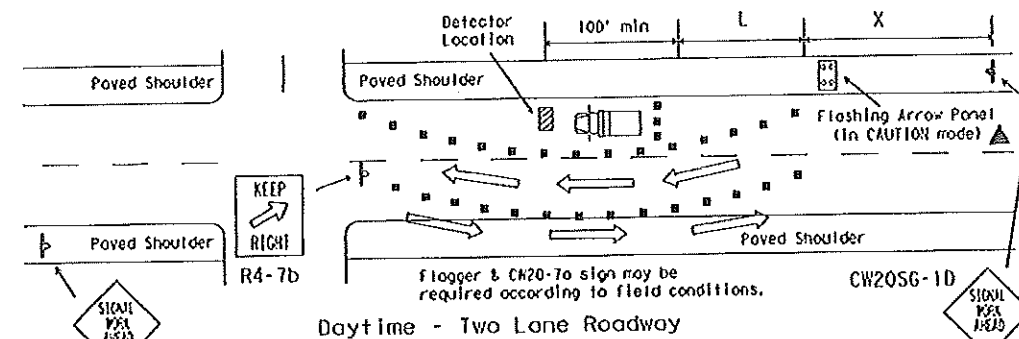
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| REVISION | DATE | BY | CHKD | APP'D | NOTED |
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| 5-03     |      |    |      |       |       |

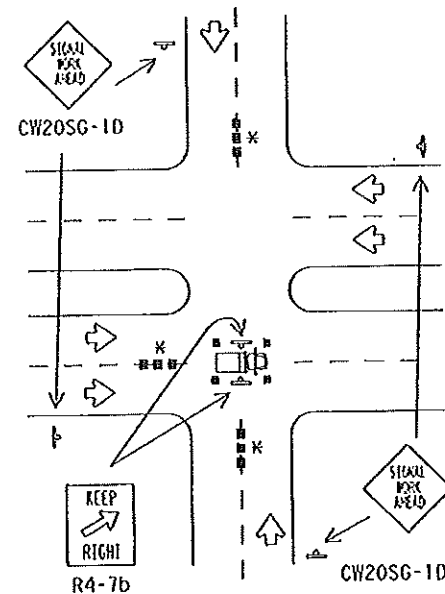
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Daytime - Four Lane Roadway



TYPICAL DETECTOR INSTALLATION  
OR OTHER WORK OPERATIONS THAT ARE SHORT TERM OR SHORT DURATION  
Nighttime Channelizing Devices shall be reflectorized.

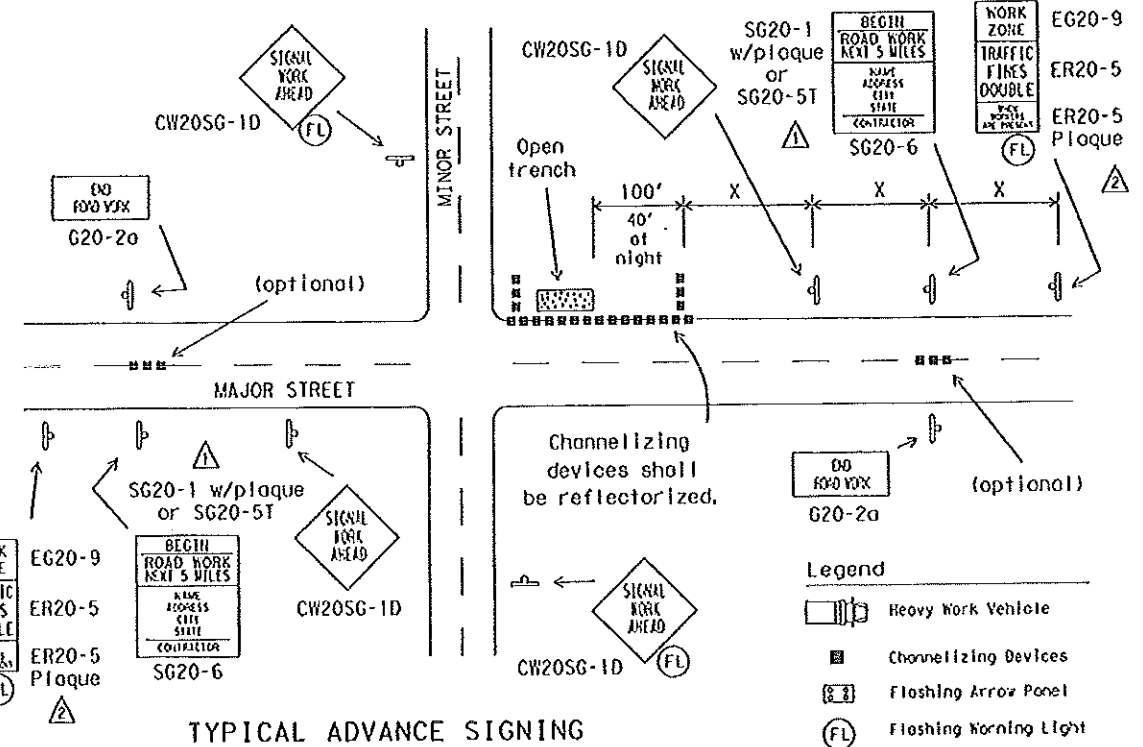


TYPICAL HANGING SIGNAL INSTALLATIONS  
OR OTHER WORK OPERATIONS THAT ARE SHORT TERM OR SHORT DURATION

\* Advance warning channelizing devices are optional.

| Posted Speed | Formula               | Minimum Desirable Taper Lengths (ft.) |            |            | Suggested Maximum Spacing of Device |              | Minimum Sign Spacing (ft.) |
|--------------|-----------------------|---------------------------------------|------------|------------|-------------------------------------|--------------|----------------------------|
|              |                       | 10' Offset                            | 11' Offset | 12' Offset | On a Taper                          | On a Tangent |                            |
| 30           | $L = \frac{WS^2}{60}$ | 150'                                  | 165'       | 180'       | 30'                                 | 60' - 75'    | 120'                       |
| 35           |                       | 205'                                  | 225'       | 245'       | 35'                                 | 70' - 90'    | 160'                       |
| 40           |                       | 265'                                  | 295'       | 320'       | 40'                                 | 80' - 100'   | 240'                       |
| 45           |                       | 450'                                  | 495'       | 540'       | 45'                                 | 90' - 110'   | 320'                       |
| 50           | L = VIS               | 500'                                  | 550'       | 600'       | 50'                                 | 100' - 125'  | 400'                       |
| 55           |                       | 550'                                  | 605'       | 660'       | 55'                                 | 110' - 140'  | 500'                       |
| 60           |                       | 600'                                  | 660'       | 720'       | 60'                                 | 120' - 150'  | 600'                       |
| 65           |                       | 650'                                  | 715'       | 780'       | 65'                                 | 130' - 165'  | 700'                       |
| 70           |                       | 700'                                  | 770'       | 840'       | 70'                                 | 140' - 175'  | 800'                       |
| 75           |                       | 750'                                  | 825'       | 900'       | 75'                                 | 150' - 185'  | 900'                       |

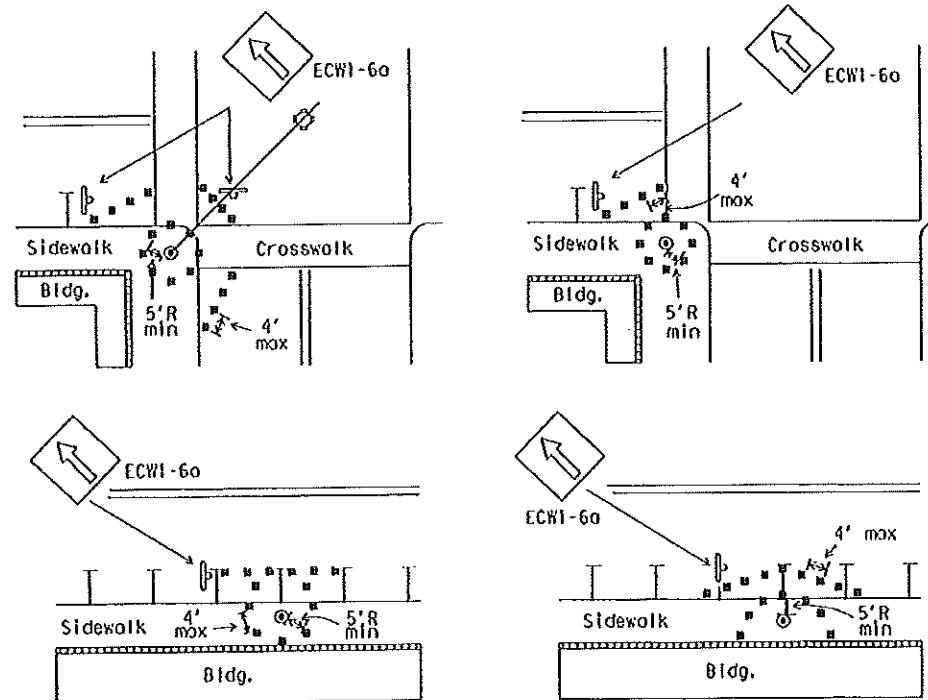
\*\*Taper lengths have been rounded off.  
L=Length of Taper (ft.) W=Width of Offset (ft.) S=Posted Speed (mph)



TYPICAL ADVANCE SIGNING  
FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS  
Observe Warning Signs State Law (R20-3) shall be required.  
See BC(2).  
Location will be as directed by the Engineer.

The arrow panel may be omitted when stated elsewhere in the plans.

1. Typical channelizing device is the 28" cone.
2. Plastic drums or vertical panels may be used if approved by the Engineer.
3. For several closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections of the project limits.
4. See details elsewhere in the plans for advance signing requirements.
5. Advance signs shall be in place when signal construction operations are in progress.
6. The contractor shall remove advance signs when no construction operations are underway.
7. Obstructions or hazards of the work area shall be clearly marked and delineated at all times.
8. All holes, trenches or other hazardous areas shall be adequately protected by lights or other protective devices.
9. Trenches shall be covered or surrounded with orange plastic construction fence as directed by the Engineer.
10. Flaggers and FCW20-7a sign may be required according to field conditions.
11. Vehicles parked in roadway shall be equipped with two strobes.
12. High level flags of corners of vehicle may also be used.
13. Work operations that require work vehicle in traveled way 20 minutes or less may use cones, high level flags and strobes as advance warning devices.
14. Cones should only be placed around vehicle.
15. Flaggers may be used on high speed rural intersections.



Channelizing devices should not be placed closer than 5 foot radius (minimum) to signal poles.  
Parking may be eliminated by placing channelizing devices in spaces.  
If pedestrian walkways are blocked, refer to the Texas Manual on Uniform Traffic Control Devices (TMUCD) Part 6.

TYPICAL RESTRICTED PEDESTRIAN MOVEMENTS  
FOR ALL WORK OPERATIONS REGARDLESS OF WORK DURATION

STANDARD PLANS  
Texas Department of Transportation  
Traffic Operations Division

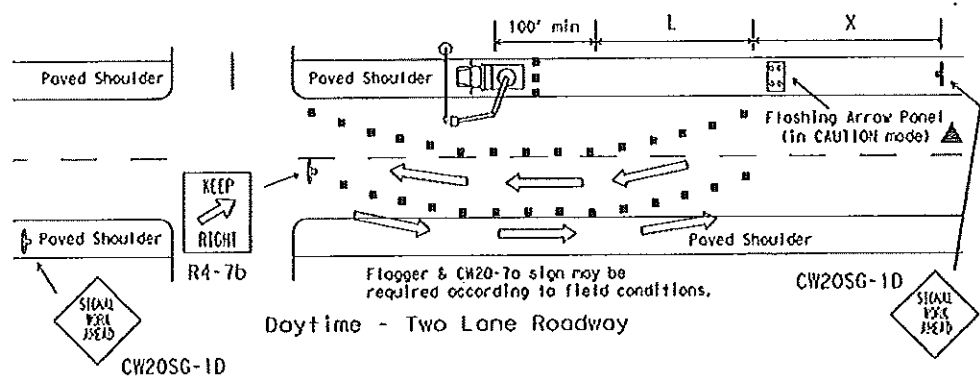
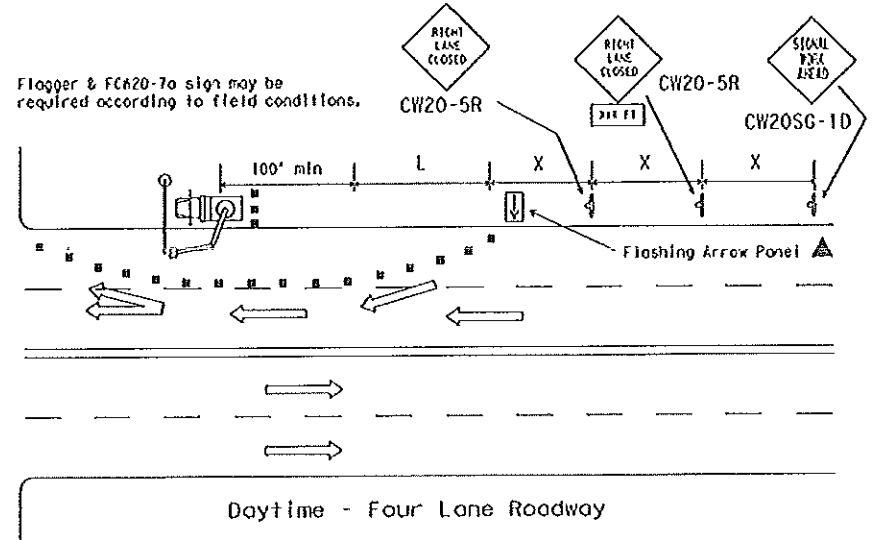
## TRAFFIC SIGNAL INSTALLATION TYPICAL DETAILS

SHEET 1 OF 2 WZ(BTS-1)-03

| REVISION | DATE  | BY   | CHKD | APP'D | REASON |
|----------|-------|------|------|-------|--------|
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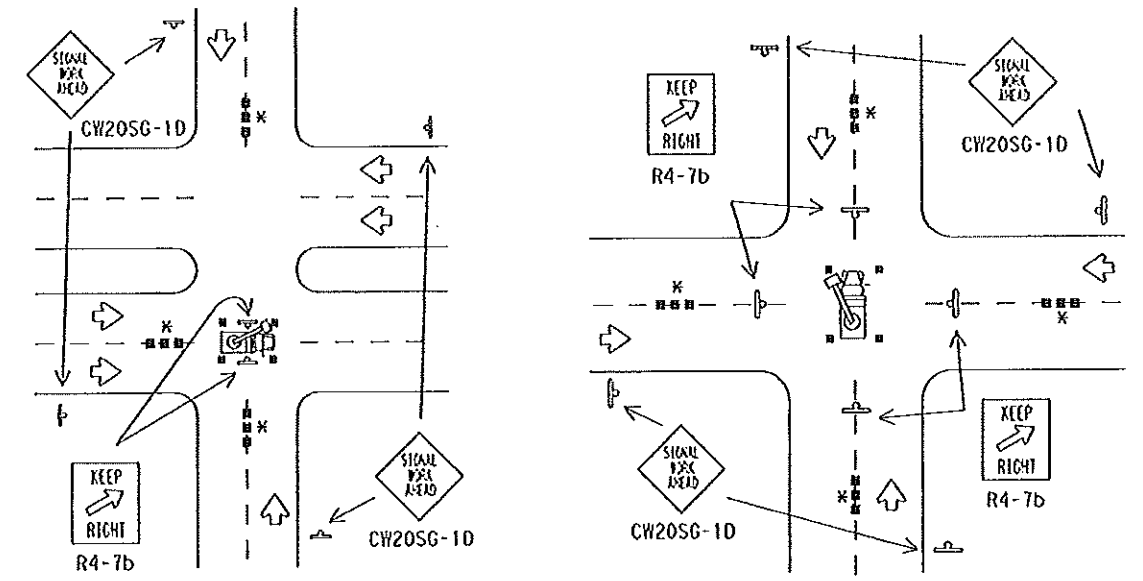
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# "ABOVE LANE" WORK PERFORMED BY BUCKET TRUCK



▲ The arrow panel may be omitted when stated elsewhere in the plans.

# "ABOVE TRUCK" WORK PERFORMED BY BUCKET TRUCK



## 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 pointed 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 "Texas Manual on Uniform Traffic Control Devices" (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. The additional signs requested by the Engineer/Inspector shall not be subsidiary.
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 that the Engineer can verify the correct procedures are being followed.
8. The contractor is responsible for sign installations 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".
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 TMUTCD Part 6)

The types of sign supports, 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 that the sign support and substrate meets crashworthiness and length of work requirements.

- a. Long-term stationary is work that occupies a location more than 3 days.
- b. Intermediate-term stationary is work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.
- c. Short-term stationary is daytime work that occupies a location for more than 1 hour, but less than 12 hours.
- d. Short duration is work that occupies a location up to 1 hour.
- e. Mobile is work that moves intermittently or continuously.

## 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.
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.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

## 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 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.
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 sign sheeting.
7. Signs shall be removed upon completion of the 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 will 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 (such as those used with cones or edgeline channelizers) shall NOT be used as sign support weights.
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.

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be obtained by contacting:

Standards Engineer  
Traffic Operations Division - 1E  
Texas Department of Transportation  
125 East 11th Street  
Austin, Texas 78701-2483  
Phone (512) 416-3120  
Fax (512) 416-3299

Instructions to locate the "CWZTCD" on TxDOT website are:

Start at website - [www.dot.state.tx.us](http://www.dot.state.tx.us)  
Click on "About TxDOT",  
Click on "Organizational Chart",  
Click on Traffic Operations Box,  
Click on "Compliant Work Zone Traffic Control Devices",  
Click on "View PDF".  
This site is printable.

## DEPARTMENTAL MATERIAL SPECIFICATIONS

|                                   |          |
|-----------------------------------|----------|
| PLYWOOD SIGN BLANKS               | DVS-7100 |
| ALUMINUM SIGN BLANKS              | DVS-7110 |
| FLAT SURFACE REFLECTIVE SHEETING  | DVS-8300 |
| FLEXIBLE ROLL-UP REFLECTIVE SIGNS | DVS-8310 |
| VINYL NON-REFLECTIVE SHEETING     | DVS-8320 |

| COLOR  | USAGE            | SHEETING MATERIAL                |
|--------|------------------|----------------------------------|
| ORANGE | BACKGROUND       | TYPE E (FLUORESCENT PRISMATIC)   |
| WHITE  | BACKGROUND       | TYPE C (HIGH SPECIFIC INTENSITY) |
| WHITE  | LEGEND & BORDERS | TYPE C (HIGH SPECIFIC INTENSITY) |
| BLACK  | LEGEND & BORDERS | VINYL NON-REFLECTIVE SHEETING    |

| LEVELS DISPLAYED                                                                                                                                                                                                                                                                                    | ACC:                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 |

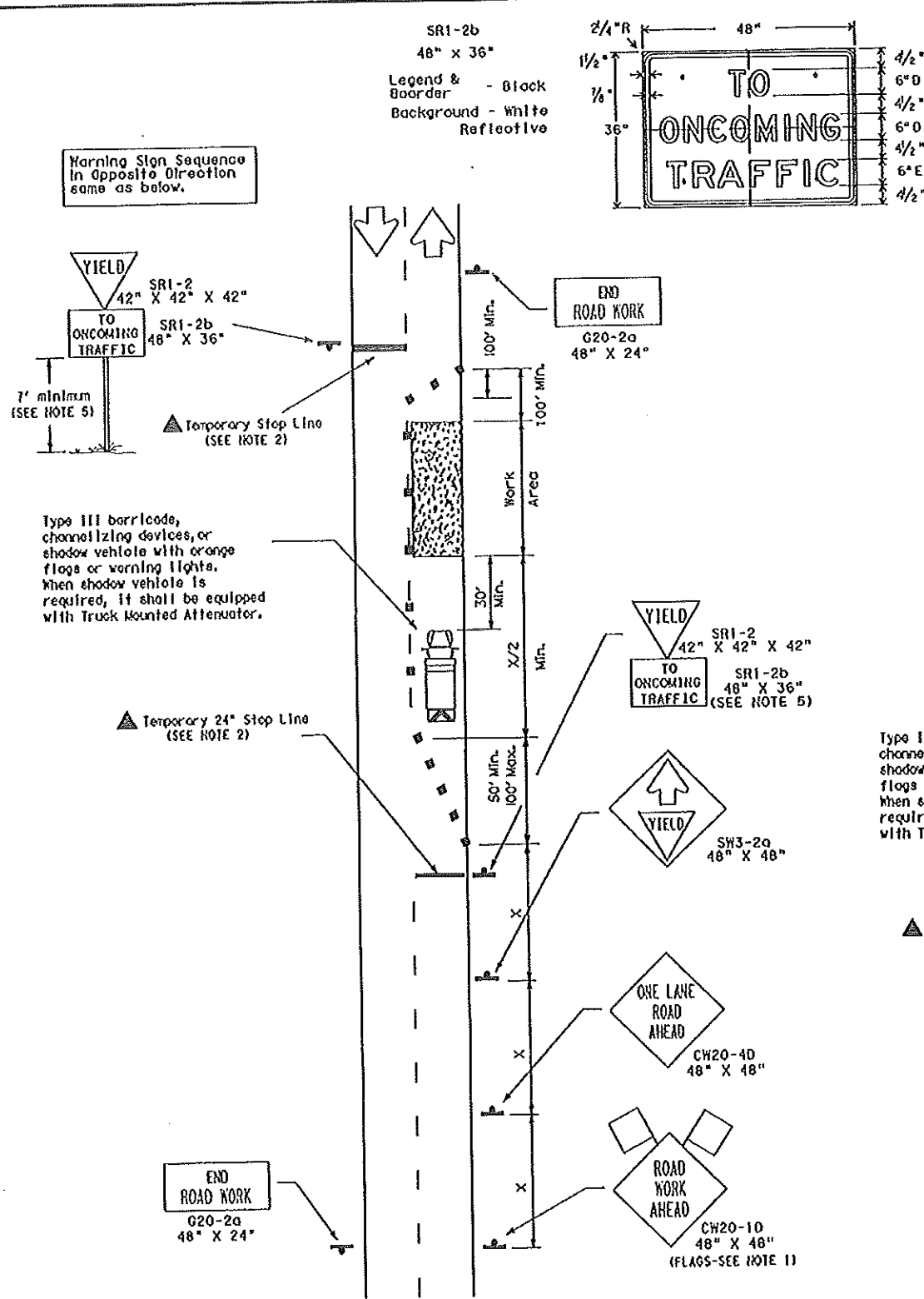
STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION  
Traffic Operations Division

## TRAFFIC SIGNAL INSTALLATION BARRICADES AND SIGNS

SHEET 2 OF 2 WZ(BTS-2)-03

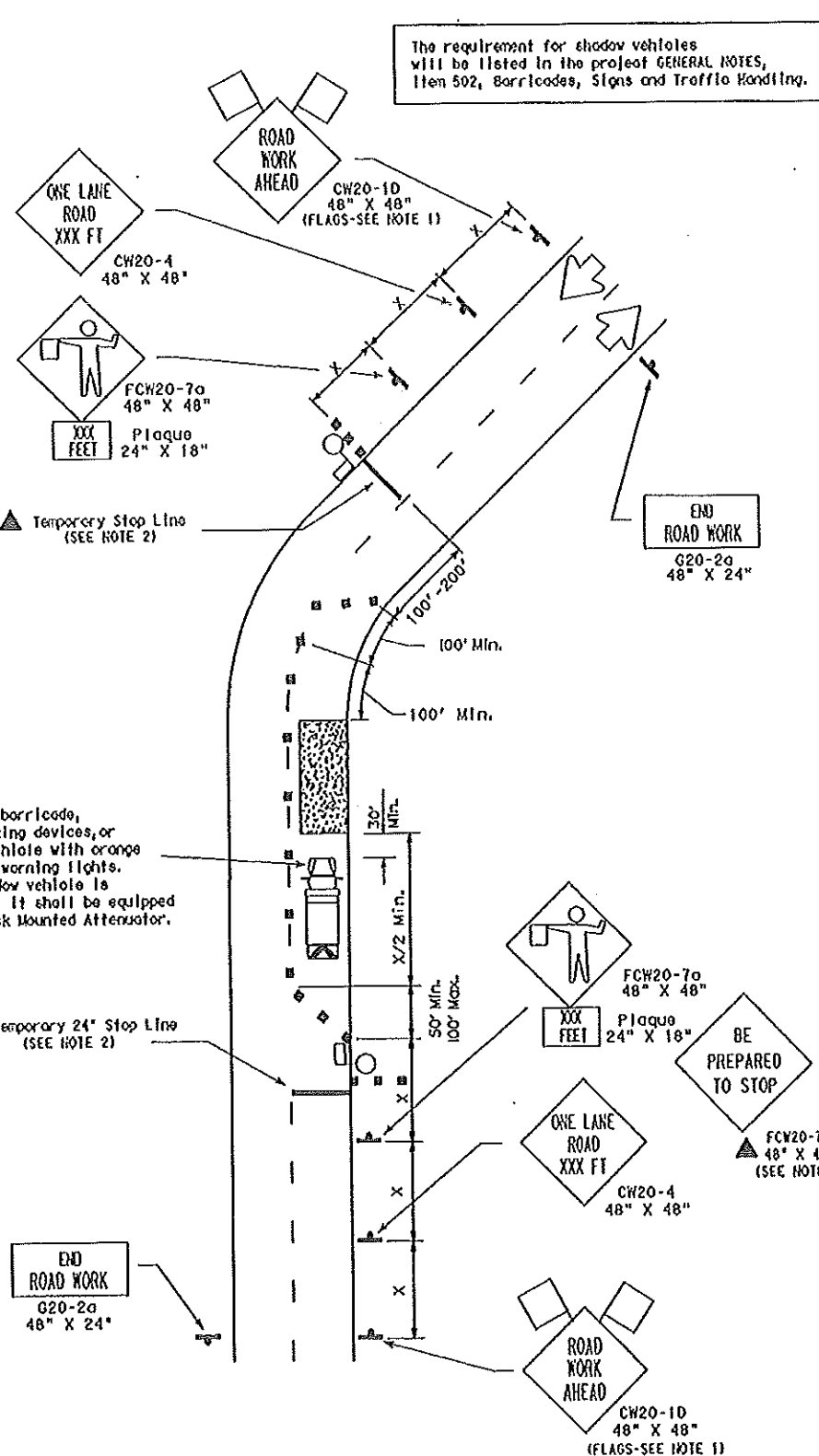
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|---------------------|-----|---------|----|------|------|------|
| © TxDOT Apr 11 1992 | REV | DATE    | BY | CHKD | APPD | FILE |
| 2-98                | 1   | 10/1/98 | WZ | WZ   | WZ   | WZ   |
| 4-98                | 2   | 10/1/98 | WZ | WZ   | WZ   | WZ   |
| 10-99               | 3   | 10/1/99 | WZ | WZ   | WZ   | WZ   |
| 3-03                | 4   | 10/1/03 | WZ | WZ   | WZ   | WZ   |

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TCP (2-2a)

2-Lane Roadway Without Paved Shoulders  
One Lane Closed  
Adequate Field of View



TCP (2-2b)

2-Lane Roadway Without Paved Shoulders  
One Lane Closed  
Inadequate Field of View

The requirement for shadow vehicles will be listed in the project GENERAL NOTES, Item 502, Barricades, Signs and Traffic Handling.

#### LEGEND

- Type III Barricade    Channelizing Devices    Flag  
Heavy Work Vehicle    Truck Mounted Attenuator  
Trailer Mounted Flashing Arrow Panel    Portable Changeable Message Sign  
Flogger    Sign Post

| Posted Speed % | Formula               | Minimum Distances<br>Taper Lengths X X |            |            | Suggested Maximum<br>Spacing of Device |              | Minimum<br>Sign Spacing<br>X Distance |
|----------------|-----------------------|----------------------------------------|------------|------------|----------------------------------------|--------------|---------------------------------------|
|                |                       | 10' Offset                             | 11' Offset | 12' Offset | On a Taper                             | On a Tangent |                                       |
| 30             | $L = \frac{WS^2}{60}$ | 150'                                   | 165'       | 180'       | 30'                                    | 60' - 75'    | 120'                                  |
| 35             |                       | 205'                                   | 225'       | 245'       | 35'                                    | 70' - 90'    | 160'                                  |
| 40             |                       | 265'                                   | 295'       | 320'       | 40'                                    | 80' - 100'   | 240'                                  |
| 45             | L = WS                | 450'                                   | 495'       | 540'       | 45'                                    | 90' - 110'   | 320'                                  |
| 50             |                       | 500'                                   | 550'       | 600'       | 50'                                    | 100' - 125'  | 400'                                  |
| 55             |                       | 550'                                   | 605'       | 660'       | 55'                                    | 110' - 140'  | 500'                                  |
| 60             |                       | 600'                                   | 660'       | 720'       | 60'                                    | 120' - 150'  | * 600'                                |
| 65             |                       | 650'                                   | 715'       | 780'       | 65'                                    | 130' - 165'  | * 700'                                |
| 70             |                       | 700'                                   | 770'       | 840'       | 70'                                    | 140' - 175'  | * 800'                                |

X Conventional Roads Only

XX Taper lengths have been rounded off.

L = Length of Taper (ft.)    X = Width of Offset (ft.)    S = Posted Speed (mph)

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

#### GENERAL NOTES:

- Flags attached to signs are **REQUIRED**.
- All traffic control devices illustrated are **REQUIRED**, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
- The **BE PREPARED TO STOP** sign may be installed after the **ONE LANE ROAD XXX FT** sign, but proper sign spacing shall be maintained.
- YIELD** sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work zones should be no longer than one half city block. In rural areas on roadways with less than 4000 ADT and work areas should be no longer than 400'.
- YIELD TO ONCOMING TRAFFIC** sign shall be placed on a support of a 7' minimum mounting height.
- Flaggers should use two-way radios or other methods of communication to control traffic.
- Length of work area should be based on the ability of flaggers to communicate.
- For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 10 feet is recommended. The 10 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

Texas Department of Transportation  
Traffic Operations Division

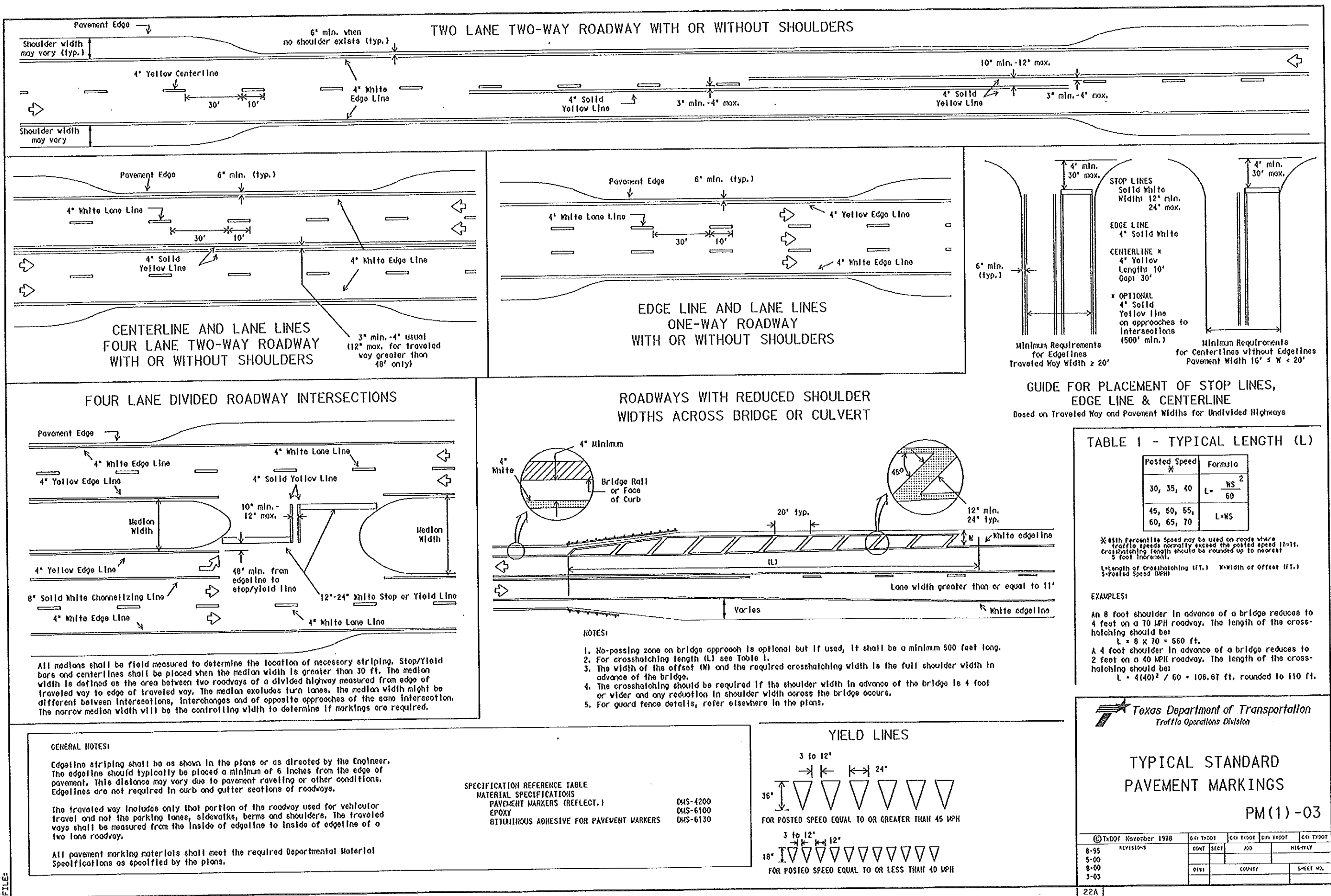
## TRAFFIC CONTROL PLAN

TCP (2-2) - 03

| © TxDOT December 1985 |           | REV. NO. | REV. DATE | REV. BY | REV. DATE | REV. BY |
|-----------------------|-----------|----------|-----------|---------|-----------|---------|
| 8-95                  | REVISIONS | REV. NO. | REV. DATE | REV. BY | REV. DATE | REV. BY |
| 1-97                  |           |          |           |         |           |         |
| 4-98                  |           |          |           |         |           |         |
| 3-03                  |           |          |           |         |           |         |

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DATE:  
FILE:



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ACC:  
LEVELS DISPLAYED  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

### SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type \_\_\_\_\_

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))  
TWT = Thin-Walled Tubing (see SMD(TWT))  
10BK0 = 10 BK0 Tubing (see SMD(SLIP-1) to (SLIP-3))  
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2) \_\_\_\_\_

Anchor Type \_\_\_\_\_

UA = Universal Anchor - Concrete (see SMD(FRP) and (TWT))  
UB = Universal Anchor - Bolted Down (see SMD(FRP) and (TWT))  
WS = Wedge Anchor Steel - (see SMD(TWT))  
WP = Wedge Anchor Plastic (see SMD(TWT))  
SA = Slipbase - Concrete (see SMD(SLIP-1) to (SLIP-3))  
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation \_\_\_\_\_

P = Prefab, "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))  
T = Prefab, "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))  
U = Prefab, "U" (see SMD(SLIP-1) to (SLIP-3))  
IF REQUIRED  
TEXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))  
BW = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))  
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))  
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

### REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT

Non-breakaway portion of support (i.e., stub). 4" max. 60"

Ground Surface

To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

### SIGN LOCATION

#### PAVED SHOULDERS

Travel Lane 12 ft min. 0 to 6 ft 7.5 ft max 7.0 ft min

Paved Shoulder

LESS THAN 6 FT. WIDE

When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.

Travel Lane 6 ft min. Greater than 6 ft 7.5 ft max 7.0 ft min

Paved Shoulder

GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

### T-INTERSECTION

Travel Lane 12 ft min. 6 ft min. 7.5 ft max 7.0 ft min

Paved Shoulder

When this sign is needed at the end of a two-lane, two-way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

### TYPICAL SIGN ATTACHMENT DETAIL

No more than 2 sign posts should be located within a 7 ft. circle.

7 ft. diameter circle Acceptable

7 ft. diameter circle Not Acceptable

7 ft. diameter circle Not Acceptable

7 ft. diameter circle Not Acceptable

### BEHIND BARRIER

Travel Lane 5 ft min. 7.5 ft max 7.0 ft min

Paved Shoulder

BEHIND GUARDRAIL

Travel Lane 2 ft min. 7.5 ft max 7.0 ft min

Paved Shoulder

BEHIND CONCRETE BARRIER

\*\*Sign clearance based on distance required for proper guard rail or concrete barrier performance.

### RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)

Travel Lane 7.5 ft max 7.0 ft min

Paved Shoulder

Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

\*\*\* Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

### TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

U-bolt Sign Clamp Sign Post Sign Panel Nut, look washer Nylon washer, flat washer, look washer, nut

Back-to-Back Signs

Sign Panel Sign Post Sign Panel Sign Clamp Nut, look washer Nylon washer, flat washer, look washer, nut

Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

| Pipe Diameter  | Approximate Bolt Length |                 |
|----------------|-------------------------|-----------------|
|                | Specific Clamp          | Universal Clamp |
| 2" nominal     | 3"                      | 3 or 3 1/2"     |
| 2 1/2" nominal | 3 or 3 1/2"             | 3 1/2 or 4"     |
| 3" nominal     | 3 1/2 or 4"             | 4 1/2"          |

### SIGNS WITH PLAQUES

Travel Lane 7.5 ft max 7.0 ft min

Paved Shoulder

When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

### CURB & GUTTER OR RAISED ISLAND

Face of Curb 2 ft min. 7.5 ft max 7.0 ft min

Face of Curb

### RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)

Travel Lane 7.5 ft max 7.0 ft min

Paved Shoulder

Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

\*\*\* Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

\* Signs shall be mounted using the following condition that results in the greatest sign elevation:

- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade of the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:  
<http://www.txdot.gov/publications/traffic.htm>

### STANDARD PLANS

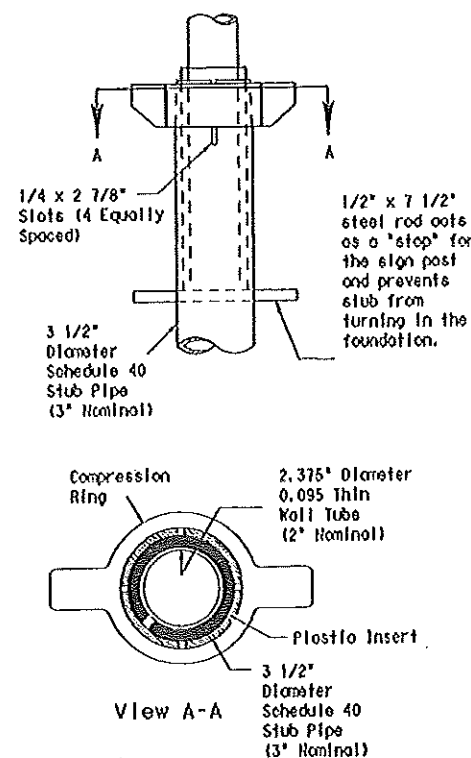
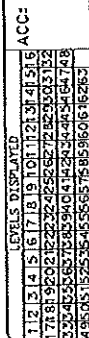
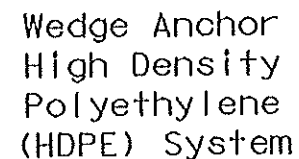
TEXAS DEPARTMENT OF TRANSPORTATION  
Traffic Operations Division

### SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD (GEN) -08

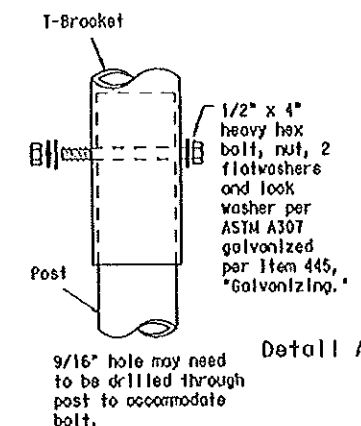
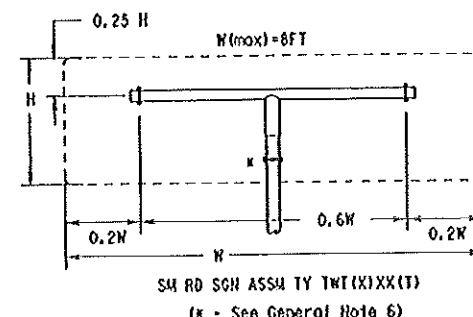
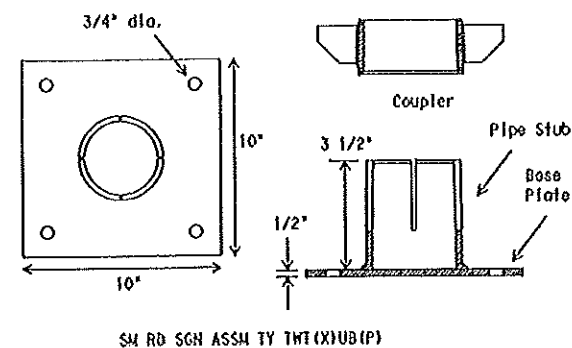
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| 4        | 01/01/03 | JAN 01 2003  |      |       |       |
| 5        | 03/01/03 | MAR 01 2003  |      |       |       |
| 6        | 05/01/03 | MAY 01 2003  |      |       |       |
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| 18       | 05/01/05 | MAY 01 2005  |      |       |       |
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| 20       | 09/01/05 | SEP 01 2005  |      |       |       |
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| 97       | 07/01/18 | JULY 01 2018 |      |       |       |
| 98       | 09/01/18 | SEP 01 2018  |      |       |       |
| 99       | 11/01/18 | NOV 01 2018  |      |       |       |
| 100      | 01/01/19 | JAN 01 2019  |      |       |       |

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Plastic Insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The Insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The Insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 60 and 76 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



**NOTE**

The devices shall be installed per manufacturer's recommendations.  
Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

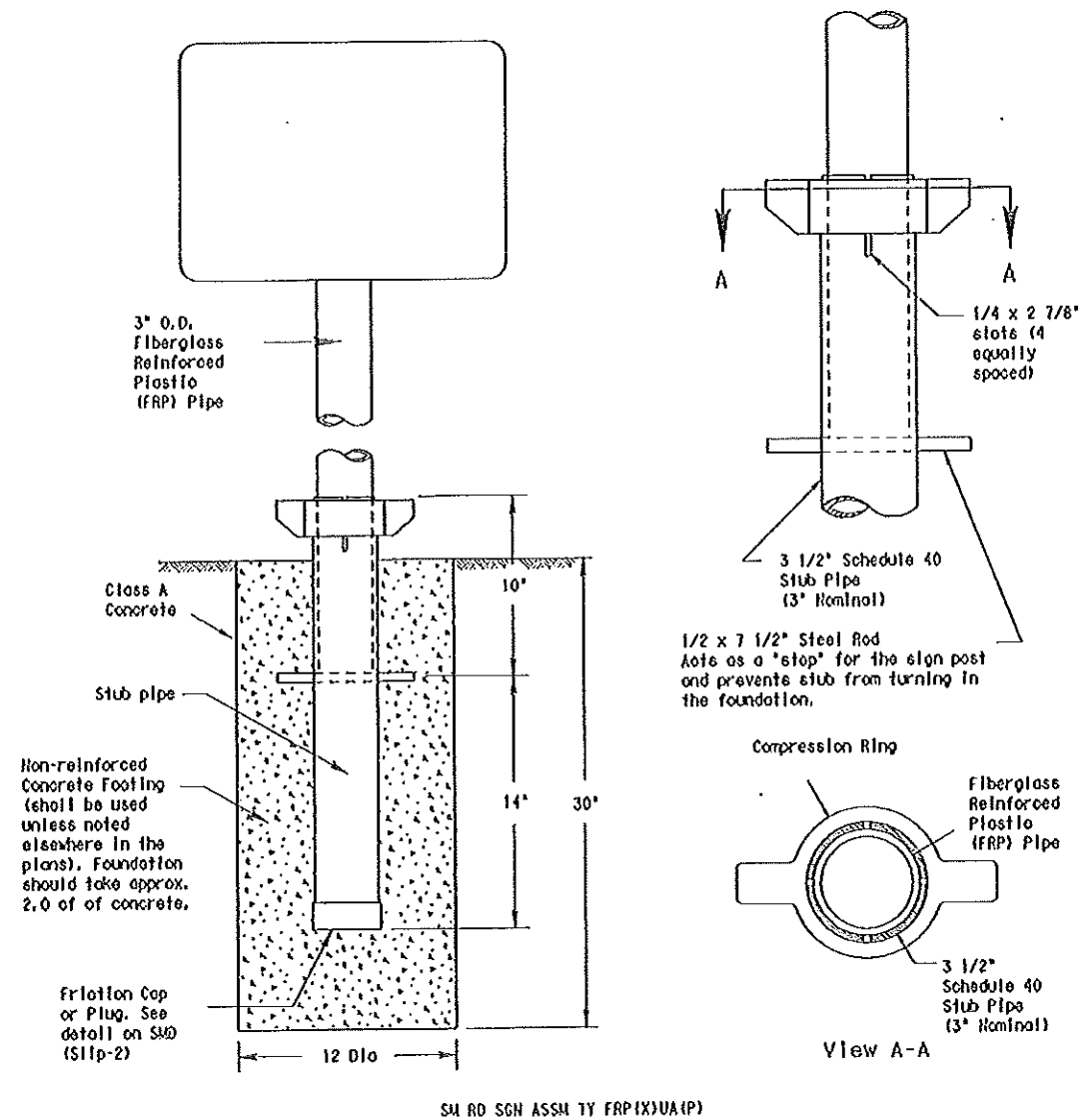
1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer, Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BXG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is:  
[http://www.txdot.gov/business/producer\\_list.htm](http://www.txdot.gov/business/producer_list.htm)
4. Material used as post with this system shall conform to the following specifications:  
13 BXG Tubing (2.375" outside diameter) (WTW)  
0.095" nominal wall thickness  
Seamless or electric-resistance welded steel tubing  
Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008  
Other steels may be used if they meet the following:  
55,000 PSI minimum yield strength  
70,000 PSI minimum tensile strength  
18% minimum elongation in 2"  
Wall thickness (uncoated) shall be within the range of .083" to .099"  
Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"  
Galvanization per ASTM 123 or ASTM A653 D210. For precoated steel tubing (ASTM A653), recast tube outside diameter weld seam by metalizing with zinc wire per ASTM 8833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is:  
<http://www.txdot.gov/publications/traffic.htm>

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SKD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
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. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

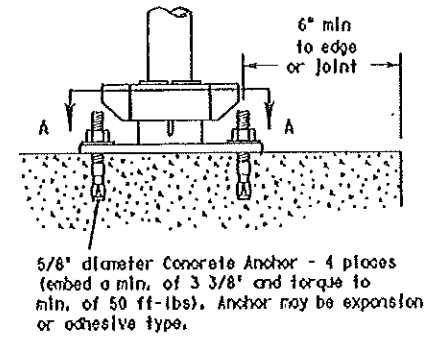
1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SUB(GEH) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

## Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post

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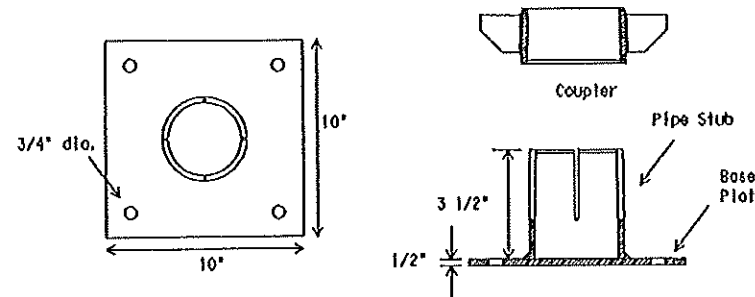


SM RD SGH ASSM TY FRP(X)UA(P)



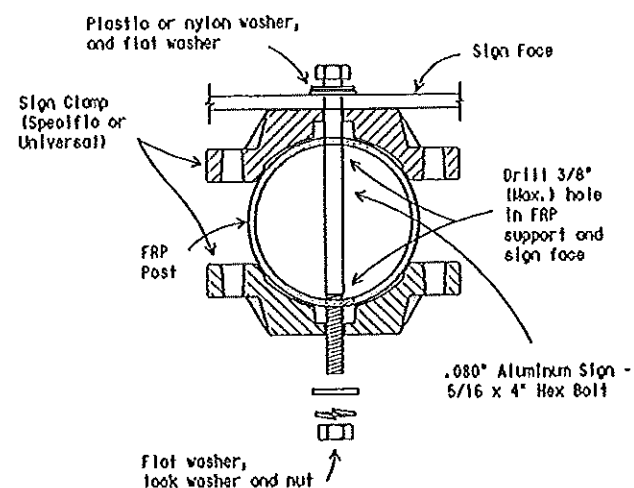
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DWS-6100, "Epoxy Resins and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

### BOLT-DOWN DETAILS

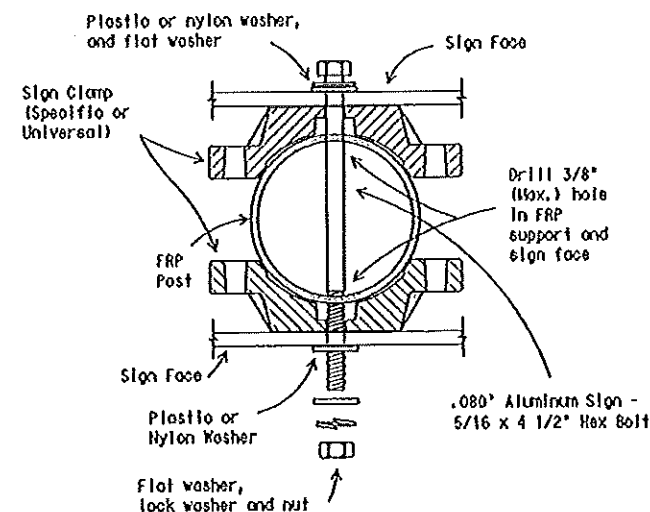


SM RD SGH ASSM TY FRP(X)UB(P)

### Typical Sign Mounting Detail for FRP Support with Single Sign



### Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



#### GENERAL NOTES:

- FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
- All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
- See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is:  
<http://www.txdot.gov/publications/traffic.htm>

#### FRP POST REQUIREMENTS

- Materials shall conform to the requirements of Departmental Material Specification DWS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
- Thickness of FRP sign support is 0.125" ± 0.031", - 0.0".
- FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:  
Texas Department of Transportation  
Traffic Operations Division  
125 East 11th Street  
Austin, Texas 78701-2483

#### UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- 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.
- Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
- Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
- Attach sign to FRP post.
- Insert sign post into base post. Lower until the post comes to rest on the steel rod.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

#### BOLT DOWN SIGN SUPPORT

- Position base plate with coupler on existing concrete.
- Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
- Attach sign to FRP post.
- Insert bottom of sign post into pipe stub.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

ACC: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**STANDARD PLANS**  
**TEXAS DEPARTMENT OF TRANSPORTATION**  
Traffic Operations Division  
**SIGN MOUNTING DETAILS**  
**SMALL ROADSIDE SIGNS**  
**UNIVERSAL ANCHOR SYSTEM**  
**WITH FRP POST**  
**SMD (FRP) -08**

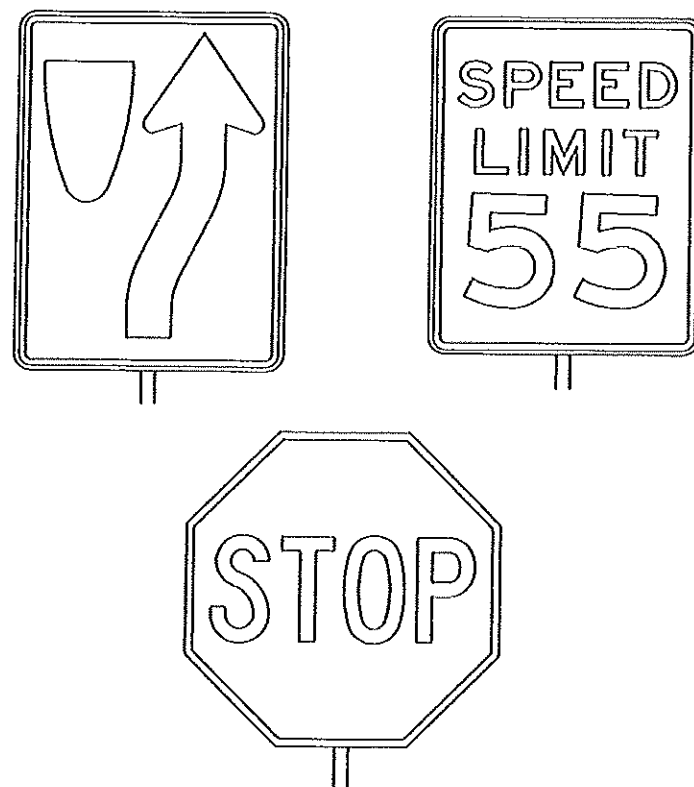
| © TxDOT July 2002 | Rev. TxDOT | Rev. TxDOT | Rev. TxDOT | Rev. TxDOT |
|-------------------|------------|------------|------------|------------|
| 9-08              | 1          | 2          | 3          | 4          |
| DATE              | DATE       | DATE       | DATE       | DATE       |
|                   |            |            |            |            |

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DATE:  
FILE:

## REQUIREMENTS FOR REGULATORY SIGNS

### TYPICAL EXAMPLES



#### DEPARTMENTAL MATERIAL SPECIFICATIONS

##### ALUMINUM SIGN BLANKS DHS-7110

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

##### SIGN FACE MATERIALS DHS-8300

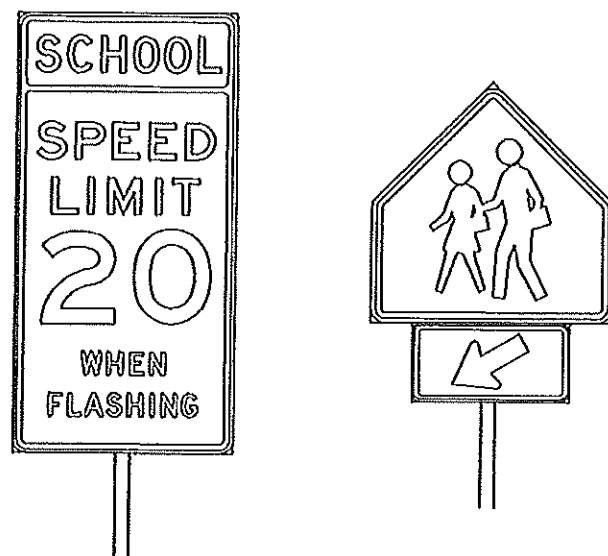
| USAGE            | COLOR | SIGN FACE MATERIAL          |
|------------------|-------|-----------------------------|
| BACKGROUND       | ALL   | TYPE C SHEETING             |
| LEGEND & BORDERS | WHITE | TYPE C SHEETING             |
| LEGEND & BORDERS | BLACK | ACRYLIC NON-REFLECTIVE FILM |

#### GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Regulatory sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Enod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Block legend and borders shall be applied by screening process or cut-out acrylic non-reflective block film to white background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DHS-7110.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

## REQUIREMENTS FOR SCHOOL SIGNS

### TYPICAL EXAMPLES



#### DEPARTMENTAL MATERIAL SPECIFICATIONS

##### ALUMINUM SIGN BLANKS DHS-7110

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

##### SIGN FACE MATERIALS DHS-8300

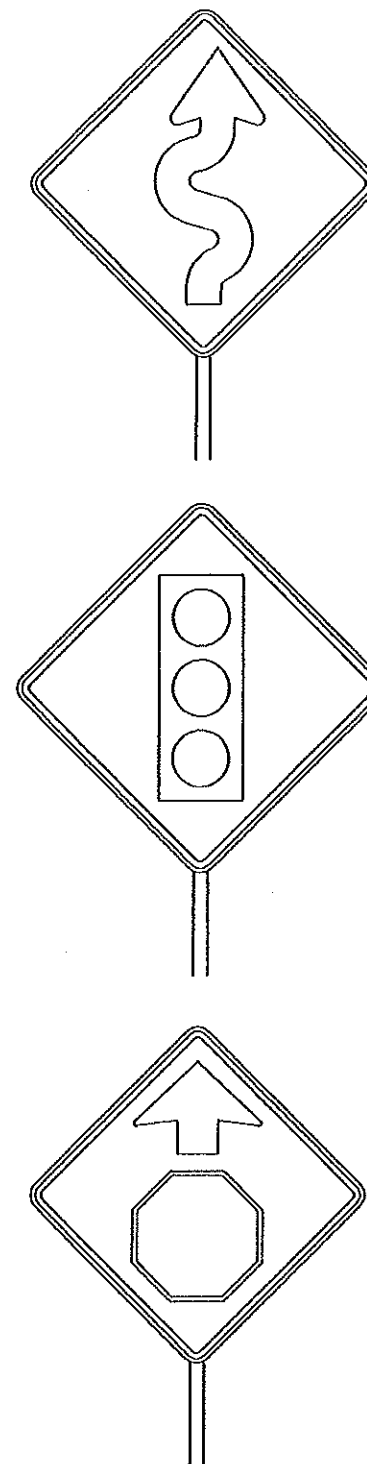
| USAGE            | COLOR           | SIGN FACE MATERIAL          |
|------------------|-----------------|-----------------------------|
| BACKGROUND       | WHITE           | TYPE C SHEETING             |
| BACKGROUND       | FLOR. YEL. GRN. | TYPE E SHEETING             |
| LEGEND & BORDERS | BLACK           | ACRYLIC NON-REFLECTIVE FILM |

#### GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. School sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Enod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Block legend and borders shall be applied by screening process or cut-out acrylic non-reflective block film to background sheeting, or combination thereof.
5. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DHS-7110.
6. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

## REQUIREMENTS FOR WARNING SIGNS

### TYPICAL EXAMPLES



#### DEPARTMENTAL MATERIAL SPECIFICATIONS

##### ALUMINUM SIGN BLANKS DHS-7110

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

##### SIGN FACE MATERIALS DHS-8300

| USAGE            | COLOR     | SIGN FACE MATERIAL          |
|------------------|-----------|-----------------------------|
| BACKGROUND       | YELLOW    | TYPE E SHEETING             |
| LEGEND & BORDERS | BLACK     | ACRYLIC NON-REFLECTIVE FILM |
| LEGEND & SYMBOLS | ALL OTHER | TYPE D SHEETING             |

#### GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Warning sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Enod, or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Block legend and borders shall be applied by screening process or cut-out acrylic non-reflective block film to yellow background sheeting, or combination thereof.
5. Colored legend and symbols shall be applied by screening process with transparent colored ink, transparent colored overlay film, or colored sheeting to white sheeting, or combination thereof. The colored legend or symbol is then applied to the yellow background sheeting.
6. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DHS-7110.
7. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website,

<http://www.txdot.gov/publications/traff1a.htm>

 Texas Department of Transportation  
Traffic Operations Division

## TYPICAL SIGN REQUIREMENTS

TSR(4)-08

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|----------------------|---------|------|----|--------|
| 12-03                |         |      |    |        |
| 9-08                 |         |      |    |        |