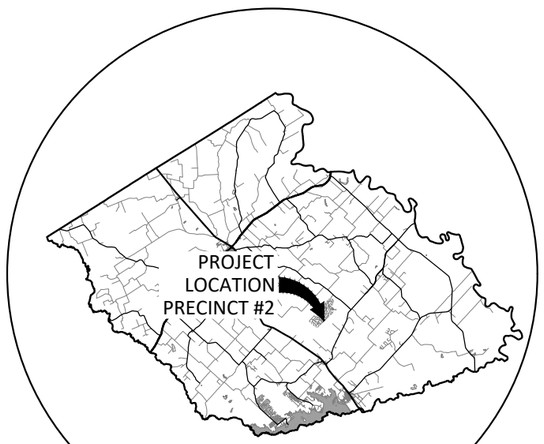
COUNTY PROJECT NO.: BURLESON CO – 24–065–057–E567–STREET–DRAINAGE
LOCAL IDENTIFIER: B–18–DP–48–0002

CONSTRUCTION DRAWINGS FOR

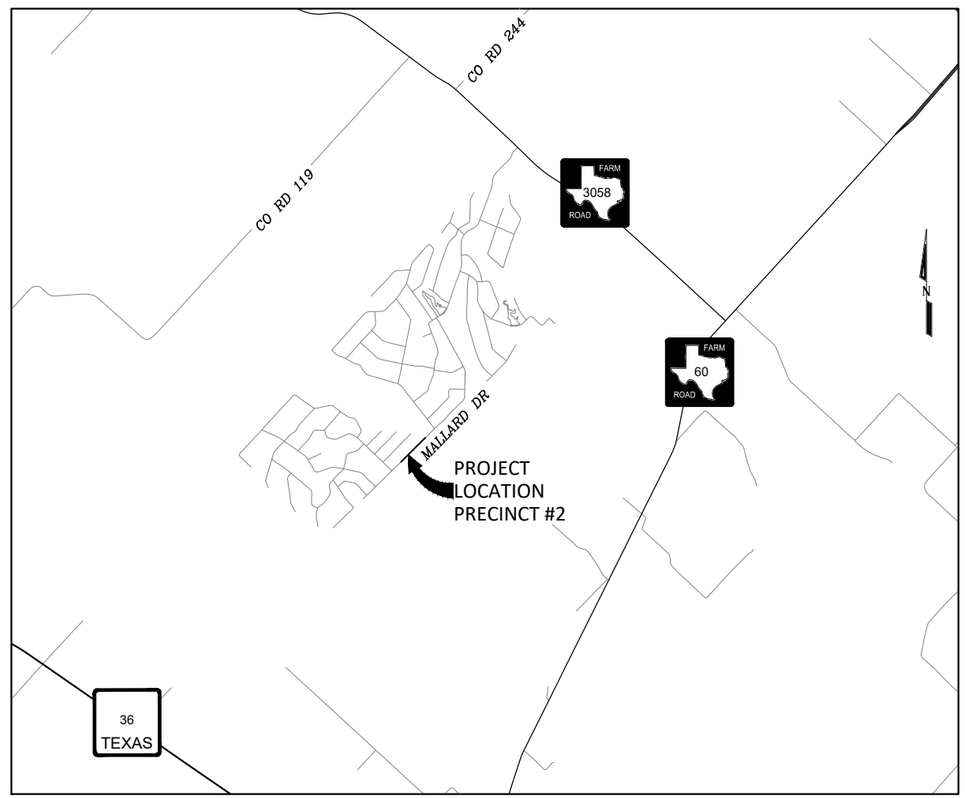
BURLESON CO - 24-065-057-E567-STREET-DRAINAGE MALLARD DRIVE

JUNE 2025



VICINITY MAP

SCALE : NONE
BURLESON COUNTY



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COMMISSIONERS COURT

COUNTY JUDGE:	KEITH SCHROEDER
PRECINCT 1 COMMISSIONER:	DWAYNE FAUST
PRECINCT 2 COMMISSIONER:	VINCENT SVEC, JR.
PRECINCT 3 COMMISSIONER:	DAVID HILDEBRAND
PRECINCT 4 COMMISSIONER:	ROBERT URBANOSKY

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PLANS & SPECIFICATIONS FOR THIS PROJECT. ANY ITEMS THAT ARE NOT DETAILED OR SPECIFICALLY ADDRESSED SHALL BE PER BURLESON COUNTY STANDARD SPECIFICATIONS AND UNIFIED DESIGN GUIDELINES.

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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AUSTIN BRYAN CONROE HOUSTON

COVER

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 1	OF: 30

ORIGINAL LAYOUT SIZE – 22X34

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Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\1 -COVER & NOTES.DWG

ORIGINAL LAYOUT SIZE – 22X34

STANDARD NOTES

1. TOPOGRAPHIC SURVEY WAS PERFORMED BY HODDE & HODDE LAND SURVEYING, INC ON AUGUST 21, 2024. ELEVATIONS FOR TEMPORARY BENCHMARKS (TBMS) SHOWN ON THESE PLANS SHALL BE VERIFIED FOR CONSISTENCY AND PRECISION BETWEEN TBMS FOR EACH SITE.
2. SOME WORK MAY BE LOCATED WITHIN A FEMA–DESIGNATED FLOODWAY AND/OR 100–YEAR FLOODPLAIN. ANY REQUIRED FLOODPLAIN DEVELOPMENT PERMITS, NO–RISE CERTIFICATIONS OR LETTERS OF MAP CHANGE SHALL BE PROVIDED BY OTHERS.
3. THE CONTRACTOR SHALL ADHERE TO ALL APPLICABLE STANDARD DETAILS AND SPECIFICATIONS FOR PROPOSED IMPROVEMENTS.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BIDSET PLANS AND SPECS.
5. REVISIONS TO THESE ENGINEERING PLANS MUST BE AUTHORIZED BY BLEYL ENGINEERING PRIOR TO CONSTRUCTION. BLEYL ENGINEERING – (979) 268–1125
6. THE CONTRACTOR SHALL:
   a. NOTIFY BLEYL ENGINEERING (979)–268–1125 AND ALL OTHER PERTINENT AGENCIES 48 HRS BEFORE STARTING WORK.
   b. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 72 HOURS PRIOR TO COMMENCING WORK.
   c. NOTIFY ALL APPROPRIATE UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION.
   d. NOTIFY THE ENGINEER AND ALL PERTINENT AGENCIES OF ALL DESIRED FIELD CHANGES. THE ENGINEER'S APPROVAL MAY BE REQUIRED.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY AND SAFETY PROVISIONS REQUIRED TO PROTECT INDIVIDUALS, EQUIPMENT, MATERIALS AND WORKMANSHIP NECESSARY FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STORAGE OF MATERIALS IN SAFE AND WORKMANLIKE MANNER TO PREVENT INJURIES DURING AND AFTER WORKING HOURS UNTIL PROJECT COMPLETION.
8. THE CONTRACTOR SHALL ADVISE THE ENGINEER OF ANY APPARENT OR SPECIAL NEEDS TO COMPLETE THE SCOPE OF WORK INCLUDED IN THIS PROJECT. THESE MAY INCLUDE THE NEED FOR OWNER PROVIDED SERVICES SUCH AS WATER, STAFF AVAILABILITY, ETC.
9. ACCURATE RECORDS SHOWING THE INSTALLED LOCATIONS OF ALL IMPROVEMENTS SHALL BE MAINTAINED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO MAINTAIN ACCESS DURING THE CONSTRUCTION PERIOD. SCHEDULING OF ACTIVITIES SHOULD EMPHASIZE ACCESSIBILITY TO THE PROJECT SITE. EXTENDED PERIODS OF RESTRICTED ACCESS MUST BE LIMITED.
11. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND ALL UTILITY COMPANY REGULATIONS CONCERNING SAFETY AND HEALTH PRACTICES.
12. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OSHA RULES AND REGULATIONS.
13. THE CONTRACTOR SHALL PROTECT EXISTING MONUMENTS, YARDS, PRIVATE UTILITIES, DRIVES, CURBS, MAIL BOXES, SIGNS, IMPROVEMENTS, CULVERTS, AND OWNER'S FACILITIES FROM DAMAGE DURING CONSTRUCTION. DAMAGE DONE TO THESE ITEMS SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL MOVE AND REPLACE SUCH MOVABLE ITEMS AS MAIL BOXES, TRAFFIC CONTROL, BUSINESS SIGNS, AND STREET SIGNS AS NECESSARY FOR CONSTRUCTION. FENCES OR STRUCTURES WHICH REQUIRE DISMANTLING OR REMOVAL SHALL BE RECONSTRUCTED OR REPLACED TO EQUAL OR BETTER THAN ORIGINAL CONDITION.
14. AT THE END OF ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL RESTORE EXISTING FACILITY (I.E. PROPERTY) EQUAL TO OR BETTER THAN EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. CLEAN–UP ACTIVITIES SHALL BE MAINTAINED THROUGHOUT THE CONTRACT PERIOD.
15. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO ENSURE THAT SURFACE DRAINAGE IS NOT IMPEDED BY CONSTRUCTION WORK.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF CONSTRUCTION ACTIVITIES DURING THE CONTRACT PERIOD. THIS SHALL INCLUDE ANY EROSION CONTROL MEASURES AND RE–GRADING NECESSARY TO ACHIEVE THE LINES AND GRADES SET FORTH BY THESE PLANS.
17. THE CONTRACTOR SHALL PROVIDE AND INSTALL CONSTRUCTION FENCING AROUND SITE TO PREVENT NON–WORKERS FROM ACCESSING THE CONSTRUCTION AREA. EXISTING WOODEN FENCES MAY BE USED IN LIEU OF CONSTRUCTION FENCING WHERE THEY EXIST AND CAN PREVENT ACCESS TO THE CONSTRUCTION AREA.
18. THE CONTRACTOR SHALL COMPLY WITH STATE AND LOCAL REGULATIONS REGARDING STORM WATER POLLUTION PREVENTION. IT IS THE CONTRACTORS RESPONSIBILITY TO DEVELOP AND ENSURE THAT AN ADEQUATE STORM WATER POLLUTION PREVENTION PLAN IS IMPLEMENTED AND MAINTAINED. ALL SILT FROM THE CONSTRUCTION OF THE PROPOSED UTILITIES IS TO BE RETAINED ON SITE AND PREVENTED FROM BEING TRANSPORTED TO THE NATURAL DRAINAGE PATHWAYS. ALL SWPP DEVICES WILL BE PAID FOR BY THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED UTILITY WORK. CONFORMANCE TO THESE REGULATORY REQUIREMENTS IS MANDATORY.
19. ALL TESTING PROCEDURES USED ON THIS PROJECT SHALL CONFORM TO THE TCEQ, AWWA, NSF OR APPLICABLE STANDARDS. THE TESTING EXPENSE SHALL BE BORNE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
20. THE CONTRACTOR SHOULD BE AWARE THAT THERE ARE OVERHEAD AND UNDERGROUND ELECTRICAL, TELEPHONE, ETC. LINES WITHIN THE PROJECT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL EXERCISE CARE AROUND THESE LINES TO PREVENT DAMAGE TO LINES AND INJURY TO THE PERSONNEL. ANY DAMAGE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
21. ALL UNDERGROUND UTILITY LINES, SIZES, AND MATERIAL TYPES SHOWN ON THE PLANS ARE FOR THE PURPOSE OF MAKING THE CONTRACTOR AWARE THAT THEY EXIST. NEITHER THE OWNER, NOR THE ENGINEER GUARANTEES THE ACCURACY THEREOF. ALSO, THE LOCATIONS OF SOME EXISTING UTILITY LINES ARE NOT KNOWN AND THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE AND MATERIAL TYPES OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE FINAL ALIGNMENT OF THE PROPOSED MAIN LINES ARE SUBJECT TO MODIFICATION PENDING THE ESTABLISHMENT OF EXISTING UTILITY LOCATIONS.
22. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT ALL 'POINTS OF CROSSING' TO DETERMINE IF CONFLICTS EXIST BEFORE COMMENCING ANY CONSTRUCTION. NOTIFY THE ENGINEER AT ONCE OF ANY CONFLICTS.
23. THE LATEST TCEQ REGULATIONS MUST BE FOLLOWED FOR CROSSINGS OF SANITARY SEWER MAINS AND WATER MAINS. IT IS THE INTENT THAT THE MOST ECONOMICALLY ACCEPTABLE ALTERNATIVE BE ELECTED. ACCORDINGLY, FIELD VERIFICATION OF EXISTING UTILITY GRADES IS IMPERATIVE.
24. FINAL COVER OF INSTALLED LINES SHALL NOT BEGIN PRIOR TO OBSERVATION AND ACCEPTANCE BY THE OWNER OR ENGINEER. THE CONTRACTOR SHALL CONTACT THE OWNER BY 4:00 P.M. REGARDING THE SCHEDULING OF THESE MONITORING VISITS.
25. CONNECTIONS TO EXISTING LINES SHALL INCLUDE ALL REQUIRED FITTINGS, MATERIALS REQUIRED TO MAKE A SUCCESSFUL TIE IN MEETING ALL APPLICABLE STANDARDS.
26. THE LOADING AND UNLOADING OF ALL MATERIALS AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PRACTICES AND SHALL AT ALL TIMES BE PERFORMED WITH CARE TO AVOID ANY DAMAGE TO THE MATERIAL. THE CONTRACTOR SHALL LOCATE AND PROVIDE THE NECESSARY STORAGE 'AREAS' FOR MATERIALS AND EQUIPMENT.
27. ALL MATERIALS AND EQUIPMENT SHALL BE BOTH FURNISHED AND INSTALLED UNLESS OTHERWISE NOTED.
28. THE CONTRACTOR SHALL PROVIDE SHEETING, SHORING AND BRACING AS NECESSARY TO PROTECT WORKMEN AND EXISTING UTILITIES DURING ALL PHASES OF CONSTRUCTION AS PER OSHA REQUIREMENTS.
29. TRENCH SAFETY REQUIREMENTS SHALL BE IN ACCORDANCE WITH OSHA STANDARD 29 CFR PART 1926 P. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING TRENCH SAFETY. COST FOR ANY TRENCH SAFETY SYSTEMS THAT REQUIRE AN ENGINEER'S SEAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE PROJECT.
30. IF AND WHERE DEWATERING IS NECESSARY, THR CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION.
31. THE CONTRACTOR SHALL INSTALL ALL EROSION/SEDIMENT CONTROL FEATURES SHOWN ON THE EROSION CONTROL WORKMAP PRIOR TO GRADING OR OTHER CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL ADHERE TO ALL TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM REQUIREMENTS FOR CONSTRUCTION SITES, INCLUDING INSTALLATION, MAINTENANCE, AND REMOVAL OF ALL NECESSARY STORMWATER POLLUTION PROTECTION MEASURES AND NOTICES. CONTRACTOR SHALL NOTIFY THE TCEQ, MS4, AND PUBLIC AS REQUIRED AND CREATE, UPDATE, AND MAINTAIN A STORMWATER POLLUTION PREVENTION PLAN AS REQUIRED, INCLUDING REQUIRED INSPECTION.
32. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN A MANNER SUCH THAT TRUCKS AND OTHER VEHICLES DO NOT CREATE A DIRT NUISANCE OR SAFETY HAZARD IN ANY STREETS, PUBLIC OR PRIVATE. CLEAN UP OF STREETS SHALL BE DONE DAILY AT NO ADDITIONAL COST TO THE PROJECT.
33. ALL PIPES AND STRUCTURES SHALL BE INSTALLED TO MANUFACTURER SPECIFICATIONS, INCLUDING MAXIMUM BENDING RADIUS, JOINT DEFLECTION, FITTINGS, SEALANTS, ETC.
34. NO EXCAVATIONS SHALL BE LEFT OPEN OVERNIGHT. ALL EXCAVATIONS WHICH CANNOT BE BACKFILLED OVERNIGHT SHALL BE COVERED WITH STEEL SHEETING WHEN IN PAVED AREAS. FOR NON–PAVED AREAS STEEL SHEETING, WOOD PLANKING OR OTHER MATERIAL WHICH IS APPROVED BY THE COUNTY MAY BE USED. COMPLETELY CORDON OFF THE EXCAVATION AREA WITH PLASTIC CONSTRUCTION FENCING APPROVED BY THE COUNTY. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND SAFETY OF EXCAVATION AREAS.
35. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND DETERMINE THE DEPTH, LOCATION, ELEVATION, ALIGNMENT AND EXISTENCE OF ALL SURFACE OR UNDERGROUND UTILITIES AND STRUCTURES IN AND AROUND THE VICINITY OF THE WORK TO BE PERFORMED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF ANY CONFLICTS FOUND PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL ALLOW AMPLE TIME TO THE OWNER TO DETERMINE A RESOLUTION TO THE CONFLICT. NO ADDITIONAL PAYMENT SHALL BE MADE FOR DELAYS DUE TO SUCH CONFLICTS OR WORK DONE WITHOUT DETERMINING THE ACTUAL LOCATION OF UTILITIES OR OBJECTS.
36. EXISTING PAVEMENT, CURB, SIDEWALK, DRIVEWAY, AND LANDSCAPED AREAS DAMAGED DURING CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR TO ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. ALL AREAS WHERE EXISTING VEGETATION AND GRASS HAS BEEN REMOVED OR SIGNIFICANTLY REDUCED BY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL ADEQUATELY APPLY REVEGETATIVE COVERINGS OVER THE AREA WITHIN 14 CALENDAR DAYS AFTER LAST DISTURBANCE AND THEN WATER THE AREAS UNTIL GROWTH IS WELL ESTABLISHED AND THE SITE IS PROVISIONALLY ACCEPTED BY THE CITY'S PROJECT MANAGER. REVEGETATIVE COVERINGS FOR DISTURBED AREAS SHALL BE:
   a. FOR LANDSCAPED YARDS, APPLY BLOCK SOD;
   b. FOR NATURAL VEGETATION AND OTHER GRASSY AREAS APPLY HYDROMULCH.
37. ALL CONSTRUCTION STAKING FOR THE IMPROVEMENTS REQUIRED ON THIS PROJECT WILL BE PROVIDED BY THE CONTRACTOR. THE CONTRACTOR SHALL USE A TEXAS REGISTERED PROFESSIONAL LAND SURVEYOR TO PERFORM THE CONSTRUCTION STAKING AND TO VERIFY THE LOCATIONS OF ALL POTENTIAL ALIGNMENT CONFLICTS SPECIFICALLY CALLED FOR ON THE PLANS. CONSTRUCTION STAKING SHALL BE CONSIDERED INCIDENTAL AND THE CONTRACTOR SHALL INCLUDE COSTS IN RELATED ITEMS OF WORK. THE CONTRACTOR SHALL USE GRADE CONTROL TO ENSURE FLOW LINES AND INVERTS ARE INSTALLED AT GRADES AND ELEVATIONS SHOWN.
38. ALL TRENCHING AND BACKFILLING SHALL BE PERFORMED PER THE SPECIFICATIONS. TESTING WILL BE PERFORMED BY A CERTIFIED LABORATORY AT THE OWNER'S EXPENSE, TO VERIFY PROPER BEDDING AND BACKFILL. ANY WORK THAT DOES NOT PASS TESTING SHALL BE REPLACED AND RETESTED AT THE CONTRACTOR'S EXPENSE. STRUCTURAL AREAS SHALL INCLUDE ALL SIDEWALKS AND SHALL EXTEND 5' BEYOND THE CURB LINES OF ALL STREETS, ALLEYS AND PARKING AREAS.
39. UNLESS OTHERWISE NOTED, ALL WATER, GAS AND SEWER LINE TIE–INS AND CONNECTIONS SHALL BE CONSIDERED SUBSIDIARY TO THEIR REQUIRED COMPONENTS AS LISTED IN THE BID TABS. NO SEPARATE PAYMENT WILL BE MADE FOR APPURTENANCES NECESSARY TO INSTALL SEWER LINE ITEMS ACCORDING TO SPECIFICATIONS.
40. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL ONLY BE COMPENSATED FOR THE PIPE, FITTINGS, CLEANOUTS, MANHOLES, AND OTHER APPURTENANCES THAT ARE ACTUALLY INSTALLED FOR THE UTILITY LINES AND OTHER IMPROVEMENTS REQUIRED FOR THIS PROJECT. REFER TO APPLICABLE TECHNICAL SPECIFICATION SECTIONS FOR SPECIFIC INFORMATION ON MEASUREMENT AND PAYMENT, ELIMINATION/ADDITION OF FITTINGS AND RELATED RESTRAINED JOINT PIPE LENGTHS, LAYING SCHEDULES, AND OTHER IMPORTANT REQUIREMENTS ON THE SEWER LINES AND OTHER IMPROVEMENTS ON THIS PROJECT.
41. UNLESS SPECIFICALLY STATED, AND OTHERWISE PROVIDED FOR ON THE BID FORM, ALL WORK DESCRIBED IN THESE STANDARD NOTES SHALL BE CONSIDERED INCIDENTAL TO THE ITEMS OF WORK LISTED ON THE BID PROPOSAL FORM AND NO SEPARATE PAYMENT WILL BE MADE TO THE CONTRACTOR FOR SUCH WORK.
42. ANY REQUIRED CHANGES TO THE DRAWINGS RESULTING FROM THE ACCEPTANCE OF ALTERNATES AND/OR SUBSTITUTIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
43. THE UTILITY LOCATIONS SHOWN ON THESE PLANS ARE PRIMARILY TAKEN FROM ABOVEGROUND MARKINGS LOCATED DURING A TOPOGRAPHIC SURVEY. SANITARY SEWER, STORM SEWER INLETS, JUNCTION BOXES, ELECTRIC AND GAS MARKINGS (PAINT AND PIN FLAGS) AND VISIBLE PIPE ENDS WERE SURVEYED. VERTICAL INFORMATION ON THESE PIPES IS BASED UPON INTERPOLATION OF MEASURED FLOWLINES. VERTICAL INFORMATION ON OTHER UTILITIES IS ONLY SCHEMATIC.
44. BLEYL ENGINEERING AND THE OWNER ARE AWARE OF THE FOLLOWING UTILITIES WITHIN THE AREA OF WORK:
   a. WATER
   b. TELEPHONE/COMMUNICATIONS
   c. ELECTRIC LINES AND POWER POLES
   d. ELECTRIC SERVICES

   THIS LIST IS PRESENTED ONLY AS INFORMATION TO THE CONTRACTOR AND SHOULD NOT BE CONSTRUED AS A COMPLETE LIST OF FACILITIES. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE PRECAUTIONS TO MAINTAIN THE INTEGRITY OF THE EXISTING UTILITIES LISTED (A. THROUGH D.) OR THOSE DISCOVERED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE PROJECT.
45. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE ELECTRIC UTILITY COMPANY FOR HOLDING OR STABILIZING POWER POLES, GUY WIRES, ETC. WHERE NECESSARY.
46. THE CONTRACTOR SHALL CONTACT ALL PERTINENT UTILITY AND PIPELINE COMPANIES 48 HOURS (MINIMUM) PRIOR TO EXCAVATION IN A PROJECT AREA. THE CONTRACTOR SHALL CONTACT 811 CALL, DIG TESS NOTIFICATION CENTER AT 1–800–DIG(344)–TESS(8377) AND TEXAS ONE CALL NOTIFICATION CENTER AT 1–800–245–4545 TO PROVIDE UTILITY LOCATIONS. ALL UTILITIES (INCLUDING BUT NOT LIMITED TO PIPELINES, NATURAL GAS LINES, FIBER OPTIC CABLE, BURIED ELECTRIC, TELEPHONE, TELEVISION, WATER, SANITARY SEWER, STORM SEWER, ETC.) SHALL BE IDENTIFIED PRIOR TO EXCAVATION.
47. THE CONTRACTOR SHALL NOT USE RESIDENTS' WATER.
48. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL MATERIALS WHICH ARE NOT TO BE REINSTALLED OR SALVAGED ON THE PROJECT IN A MANNER THAT COMPLIES WITH ALL APPLICABLE LAWS AND REGULATIONS. PAY SHALL BE CONSIDERED INCIDENTAL TO THE NEAREST–RELATED WORK ITEM.
49. REMOVAL AND REPLACEMENT OF EXISTING STRUCTURES AND FACILITIES, SUCH AS STREET SIGNS, TRAFFIC SIGNS AND MAIL BOXES, SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE PROJECT EXCEPT WHERE SPECIFICALLY NOTED ON THE PLANS AND LISTED IN THE BID FORM.
50. UNLESS OTHERWISE NOTED, ALL WATER, GAS AND SEWER LINE TIE–INS AND CONNECTIONS SHALL BE CONSIDERED SUBSIDIARY TO THEIR REQUIRED COMPONENTS AS LISTED IN THE BID TABS. NO SEPARATE PAYMENT WILL BE MADE FOR APPURTENANCES NECESSARY TO INSTALL SEWER LINE ITEMS ACCORDING TO SPECIFICATIONS.
51. THE CONTRACTOR SHALL ACCESS WORK SITE FROM 7:00 A.M. TO 6:00 P.M. MONDAY THROUGH FRIDAY ONLY. ANY LANE CLOSURE SHALL ONLY BE BETWEEN THE HOURS OF 8:30 AM AND 4:00 PM OR AS APPROVED IN ADVANCED, IN WRITING, BY THE OWNER.

STREET NOTES

1. FILL AREAS ON PLANS SHALL BE FILLED IN LAYERS NOT EXCEEDING 8' IN DEPTH AND EACH COMPACTED TO NOT LESS THAN 95% STANDARD PROCTOR DENSITY PRIOR TO INSTALLATION OF WATER LINE AND FILL AREA SHALL BE SEEDED AND FERTILIZED WITHIN 10 WORKING DAYS.
2. EXISTING PAVEMENTS, CURBS, DRIVEWAYS, AND SIDEWALKS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO BURLESON COUNTY STANDARDS, WITH LATEST ADDENDA AND AMENDMENTS THERETO.
3. CONDITION OF THE ROAD AND/OR RIGHT–OF–WAY UPON COMPLETION OF JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.
4. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO SATISFACTION OF THE OWNING AUTHORITY.
5. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAWS CONCERNING EXCAVATION, TRENCHING AND SHORING.
6. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES TO EXISTING WATER, WASTEWATER, STORM SEWER AND TRAFFIC SIGNAL CONDUITS, ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE BURLESON COUNTY STANDARDS, AT NO COST TO BURLESON COUNTY.
7. SIGNING, BARRICADING AND LIGHTING FOR CONSTRUCTION WITHIN HIGHWAY RIGHT–OF–WAY SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND OTHER APPLICABLE STATE OR LOCAL STANDARDS. SIGNS, BARRICADES AND LIGHTS SHALL BE KEPT CLEAN, OPERATIONAL AND PROPERLY POSITIONED TO ASSURE PROPER SAFETY PRECAUTIONS.
8. THE CONSTRUCTION TRAFFIC CONTROL SIGNS, DEVICES AND BARRICADES ON THESE DRAWINGS CONSTITUTE MINIMUM REQUIREMENTS AND ARE NOT INTENDED TO COVER SPECIAL CIRCUMSTANCES OR OTHER CONDITIONS THAT MAY ARISE DUE TO UNFORESEEN FIELD CONDITIONS. THE CONTRACTOR SHALL PLACE AND MAINTAIN SUFFICIENT ADDITIONAL SIGNS, BARRICADES, AND WARNING DEVICES TO WARN THE PUBLIC AND PROVIDE FOR THE SAFE MOVEMENT OF TRAFFIC AND THE CONSTRUCTION ZONE SAFETY. WHERE PROJECT REQUIREMENTS ARE NOT FULLY SATISFIED BY THE STANDARDS SHOWN HEREON, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL GOVERN. ALL TEMPORARY AND PERMANENT TRAFFIC CONTROL DEVICES MARKINGS, STRIPING AND SIGNAGE REQUIRED FOR THIS PROJECT SHALL BE INCLUDED IN THE APPROPRIATE LUMP SUM BID ITEM. ANY CHANGES TO TRAFFIC CONTROL DEEMED NECESSARY DUE TO FIELD CONDITIONS SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE PROJECT.

GRADING NOTES

1. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE STARTING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
2. BEFORE STARTING CONSTRUCTION, CONTRACTOR SHALL VERIFY BENCHMARK ELEVATION AND NOTIFY ENGINEER IF ANY DISCREPANCY AND/OR CONFLICT IS FOUND.
3. THE CONTRACTOR SHALL PROTECT ALL MANHOLE COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES THAT ARE TO REMAIN IN PLACE AND UNDISTURBED DURING CONSTRUCTION.
4. ALL EXISTING CONCRETE PAVING, SIDEWALK, AND CURB DEMOLITION SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. DISPOSAL SHALL BE AT AN APPROVED OFF–SITE, LAWFUL LOCATION, UNLESS DIRECTED OTHERWISE BY THE OWNER.

REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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AUSTIN BRYAN CONROE HOUSTON

NOTES

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 2	OF: 30

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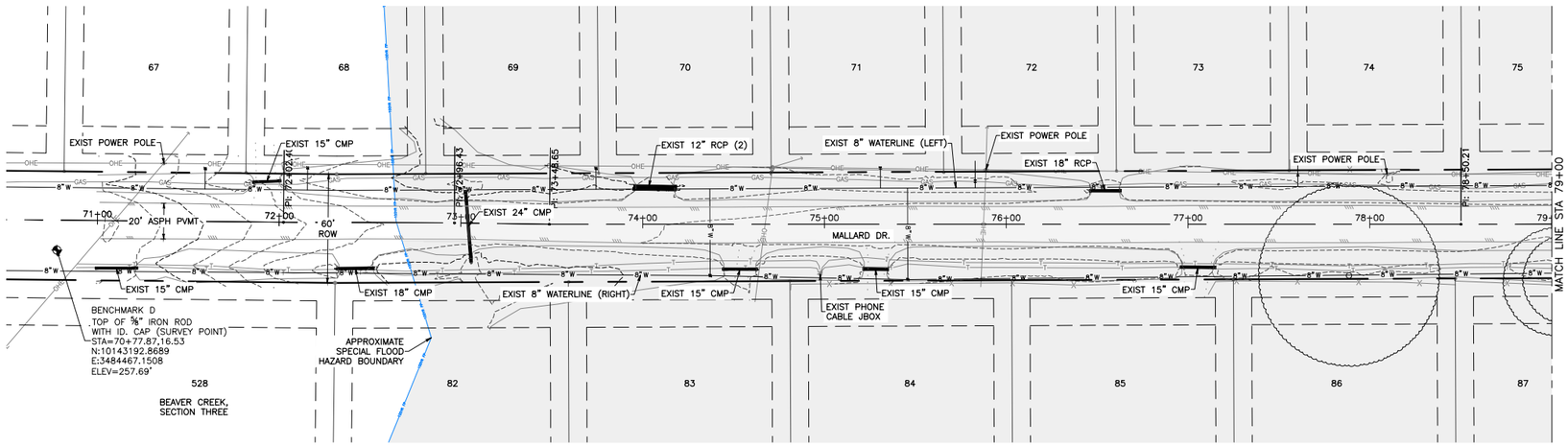
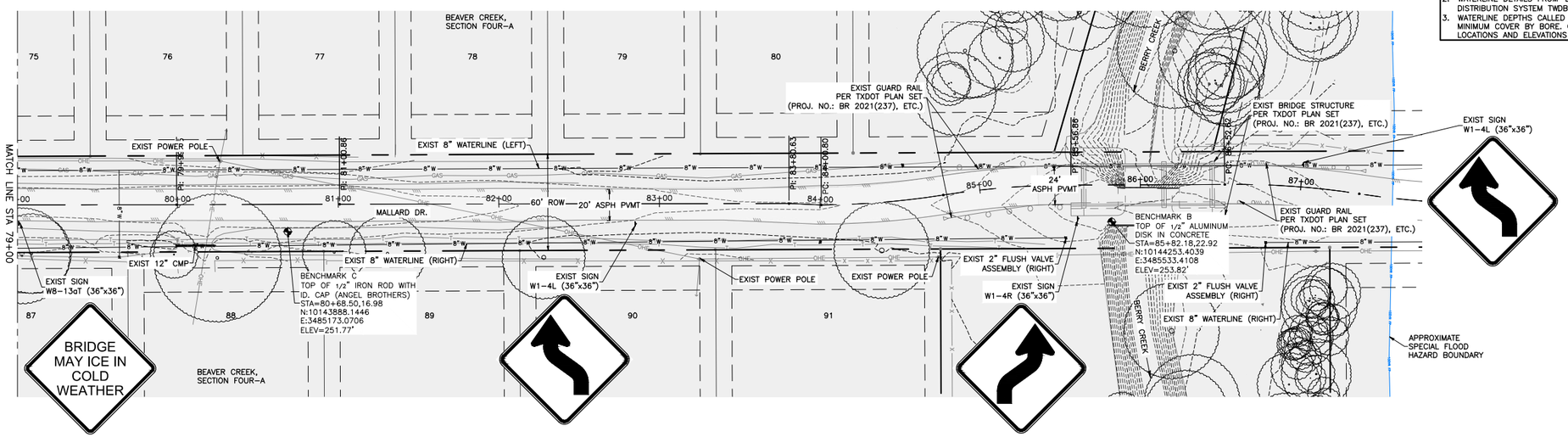
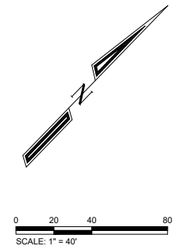
ORIGINAL LAYOUT SIZE – 22X34







LEGEND

- EXIST STORM
- EXIST WATER LINE
- EXIST GAS LINE
- EXIST UNDERGROUND TELEPHONE CABLES
- EXIST OVERHEAD ELECTRIC
- EXIST FENCE
- EXIST ASPHALT PAVEMENT
- EXIST EASEMENT LINES
- EXIST RIGHT OF WAY (ROW)
- EXIST DITCH TOP OF BANK
- EXIST 100-YR FLOODPLAIN
- EXIST TREE
- SURVEY BENCHMARK

NOTES:
1. BRIDGE STRUCTURE DETAILS FROM TXDOT'S MALLARD RD AT BERRY CREEK / CR244 AT SESSUMS CREEK PLAN SET. PROJECT NUMBER BR 2021(237), ETC.
2. WATERLINE DETAILS FROM "BEAVER CREEK WCID NO.1 WATER DISTRIBUTION SYSTEM TWDB PROJECT NO. 10418 CONTRACT NO.3"
3. WATERLINE DEPTHS CALLED 48" MINIMUM COVER BY OPEN CUT AND 42" MINIMUM COVER BY BORE. CONTRACTOR TO VERIFY WATERLINE LOCATIONS AND ELEVATIONS BEFORE CONSTRUCTION.

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
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1722 Broadmoor, Suite 210, Bryan Tx. 77802
Texas Firm Registration No. F-678
Tel. 979-268-1125 Fax 979-260-3849
www.bleylengineering.com
AUSTIN BRYAN CONROE HOUSTON

EXISTING CONDITIONS

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 3	OF: 30

JGORDON 6/25/2025 9:04:40 AM
Z:\13300\13357_BURLESON-GLO_CDBG_MIT_MOD\04_CAD\CD-13357\MALLARD_DR\2 – EXISTING CONDITIONS.DWG

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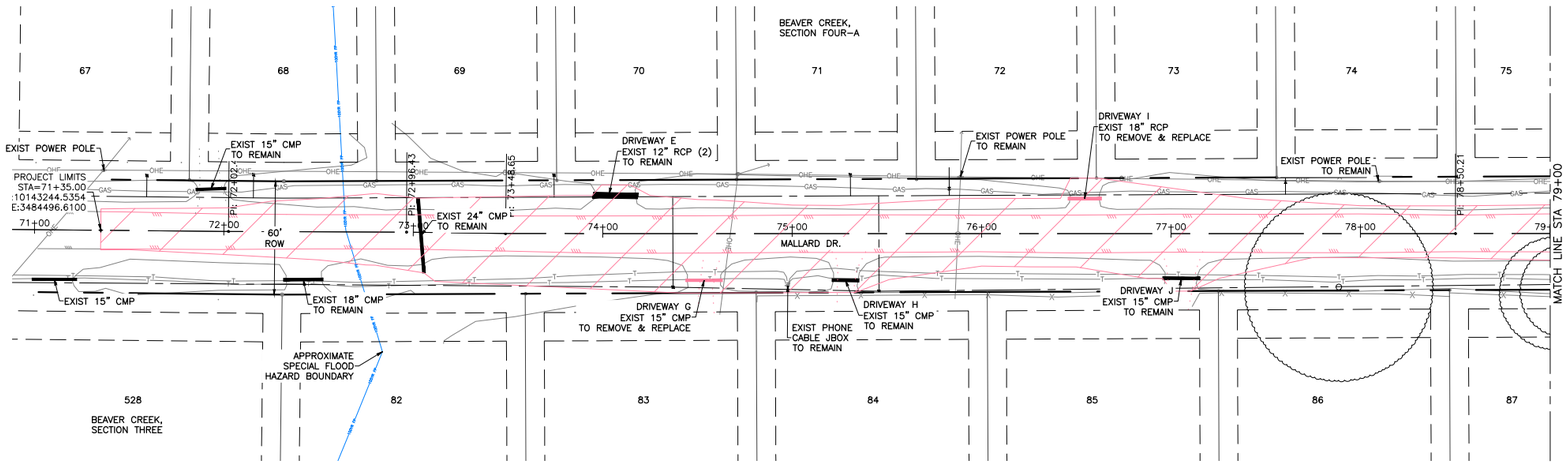
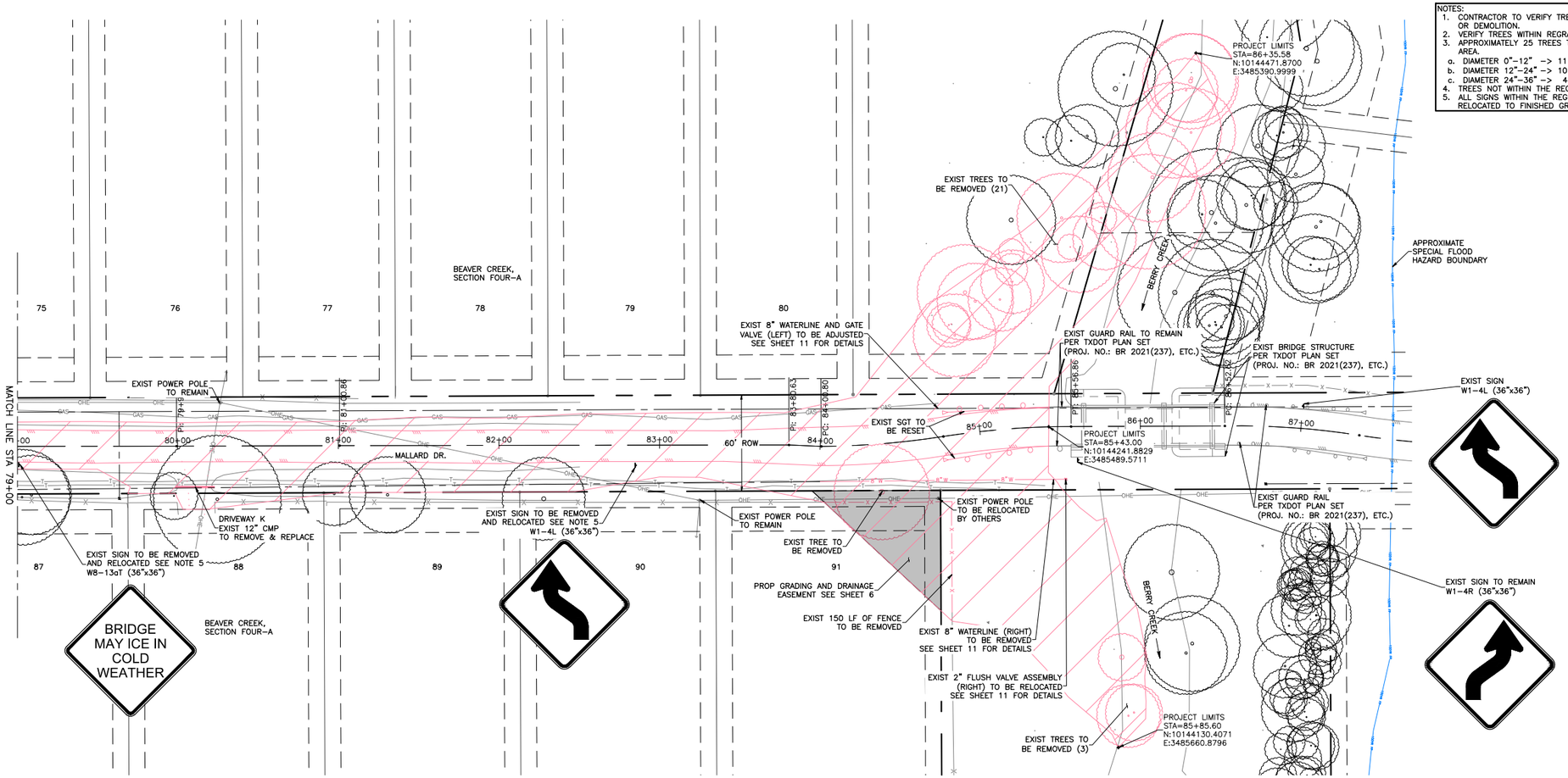


0 20 40 80
SCALE: 1" = 40'

LEGEND

- REGRADE AREA
- DEMOLITION ITEM
- TREE REMOVAL
- TREE TO REMAIN

NOTES:
1. CONTRACTOR TO VERIFY TREE REMOVALS IN FIELD BEFORE REGRADING OR DEMOLITION.
2. VERIFY TREES WITHIN REGRADING AREA BEFORE CONSTRUCTION.
3. APPROXIMATELY 25 TREES TO BE REMOVED WITHIN THE REGRADING AREA.
   a. DIAMETER 0"–12" –> 11 TREES
   b. DIAMETER 12"–24" –> 10 TREES
   c. DIAMETER 24"–36" –> 4 TREES
4. TREES NOT WITHIN THE REGRADING AREA SHALL BE PROTECTED.
5. ALL SIGNS WITHIN THE REGRADING AREA SHALL BE REMOVED AND RELOCATED TO FINISHED GRADE IN PLACE.



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DEMOLITION PLAN

BURLESON CO -
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MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 4	OF: 30

JGORDON
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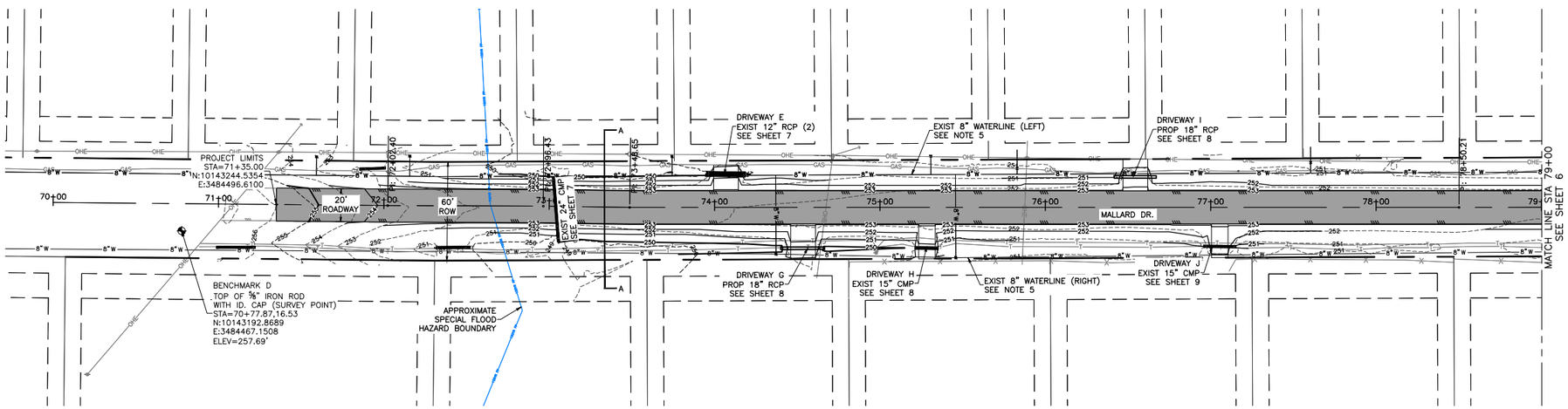

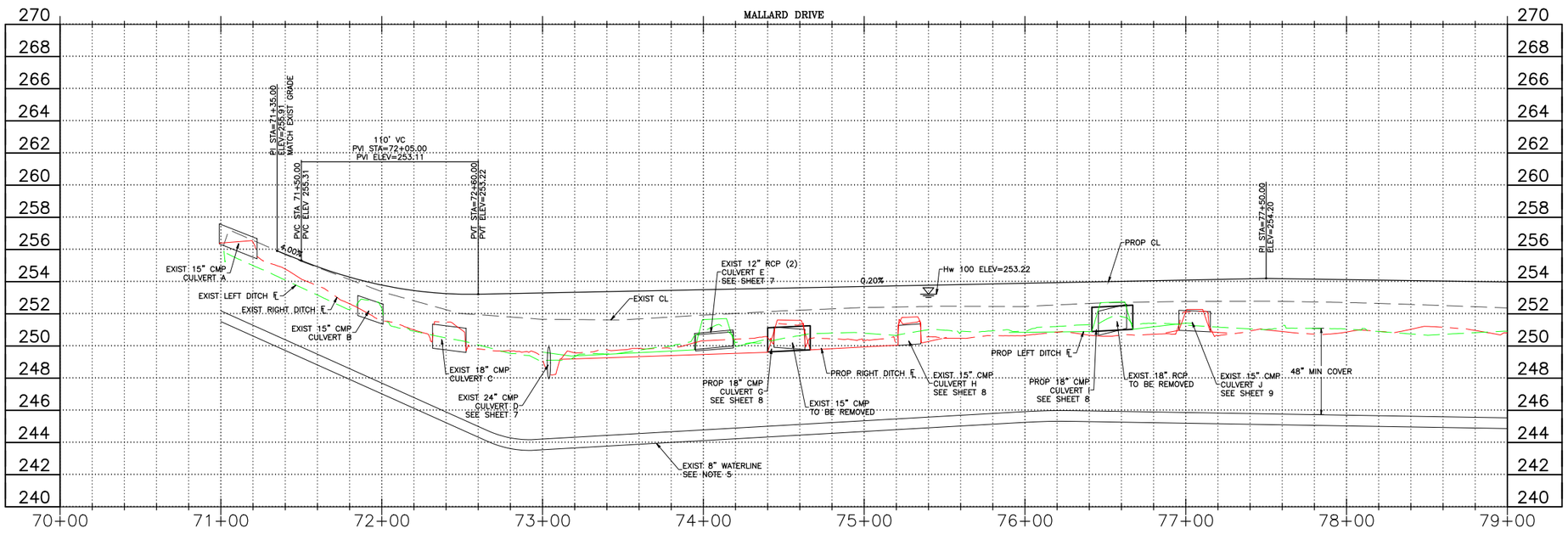

0 20 40 80
SCALE: 1" = 40'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT
	SURVEY BENCHMARK
	PROPOSED ROADWAY
110	EXISTING CONTOUR
111	PROPOSED CONTOUR
	EXISTING RIGHT DITCH ℄
	EXISTING LEFT DITCH ℄
	PROPOSED RIGHT DITCH ℄
	PROPOSED LEFT DITCH ℄

NOTES:
1. GRADE SITE FOR POSITIVE DRAINAGE.
2. FINISHED GRADES SHALL NOT IMPACT OFFSITE DRAINAGE AND SHALL NOT EXCEED 3:1.
3. CONTRACTOR TO DISPOSE OF EXCESS SPOIL.
4. VERIFY EXISTING PAVEMENT ELEVATIONS PRIOR TO CONSTRUCTION.
5. FIELD VERIFY WATERLINE BEFORE CONSTRUCTION. WATERLINE LOCATION BASED ON "BEAVER CREEK WCID NO.1 WATER DISTRIBUTION SYSTEM TWDB PROJECT NO. 10418 CONTRACT NO.3"

THE DESIGN OF THE PROJECT WILL HAVE NO NEGATIVE EFFECT ON THIS DEVELOPMENT OR ON THE SURFACE WATER ELEVATION AND/OR THE ADJACENT PROPERTIES.

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
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PLAN AND PROFILE 1 OF 2

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
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LICENSED
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6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 5	OF: 30

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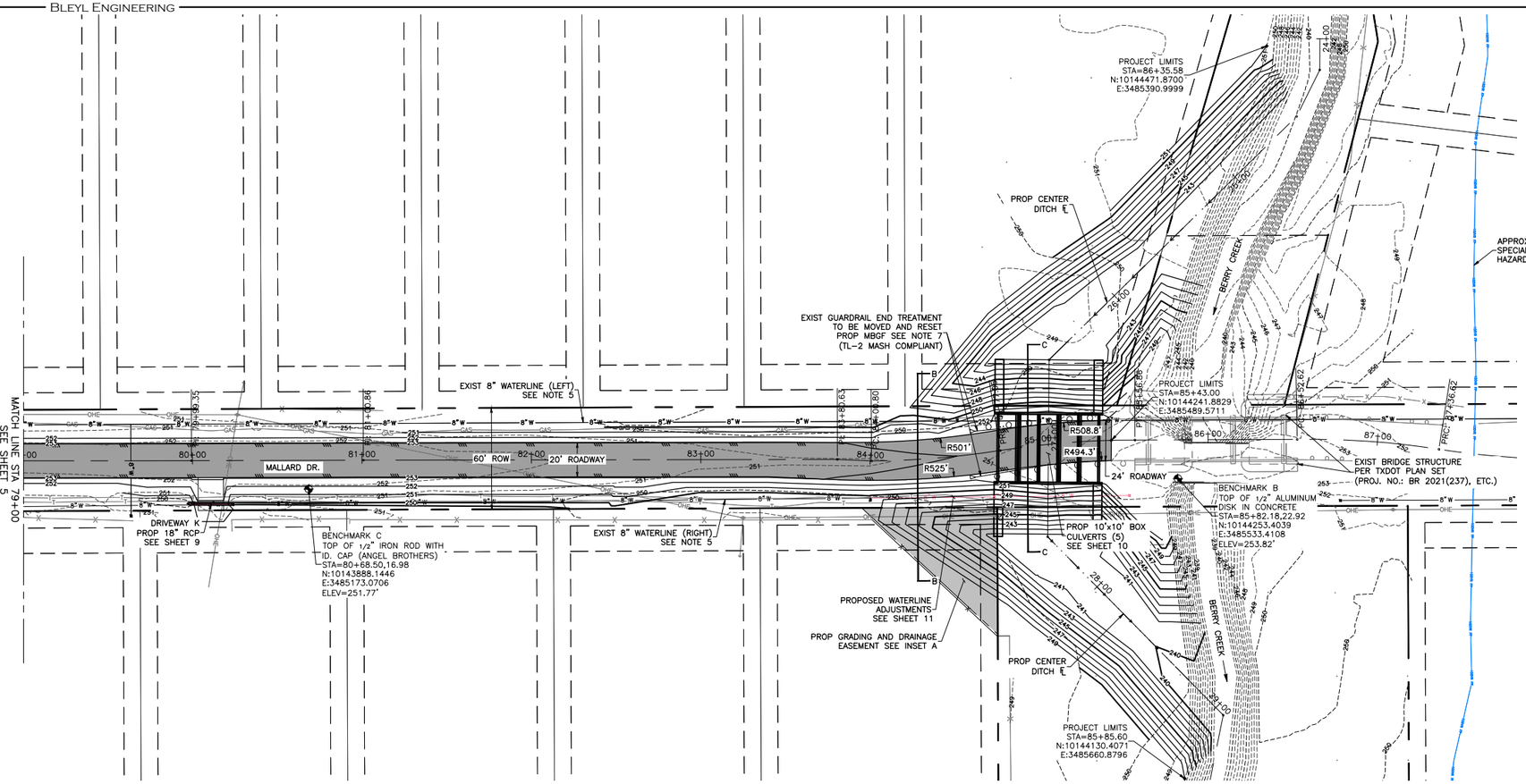
ORIGINAL LAYOUT SIZE – 22X34



LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT
	SURVEY BENCHMARK
	PROPOSED ROADWAY
110	EXISTING CONTOUR
111	PROPOSED CONTOUR
	EXISTING RIGHT DITCH ℄
	EXISTING LEFT DITCH ℄
	PROPOSED RIGHT DITCH ℄
	PROPOSED LEFT DITCH ℄
	PROPOSED CENTER DITCH ℄

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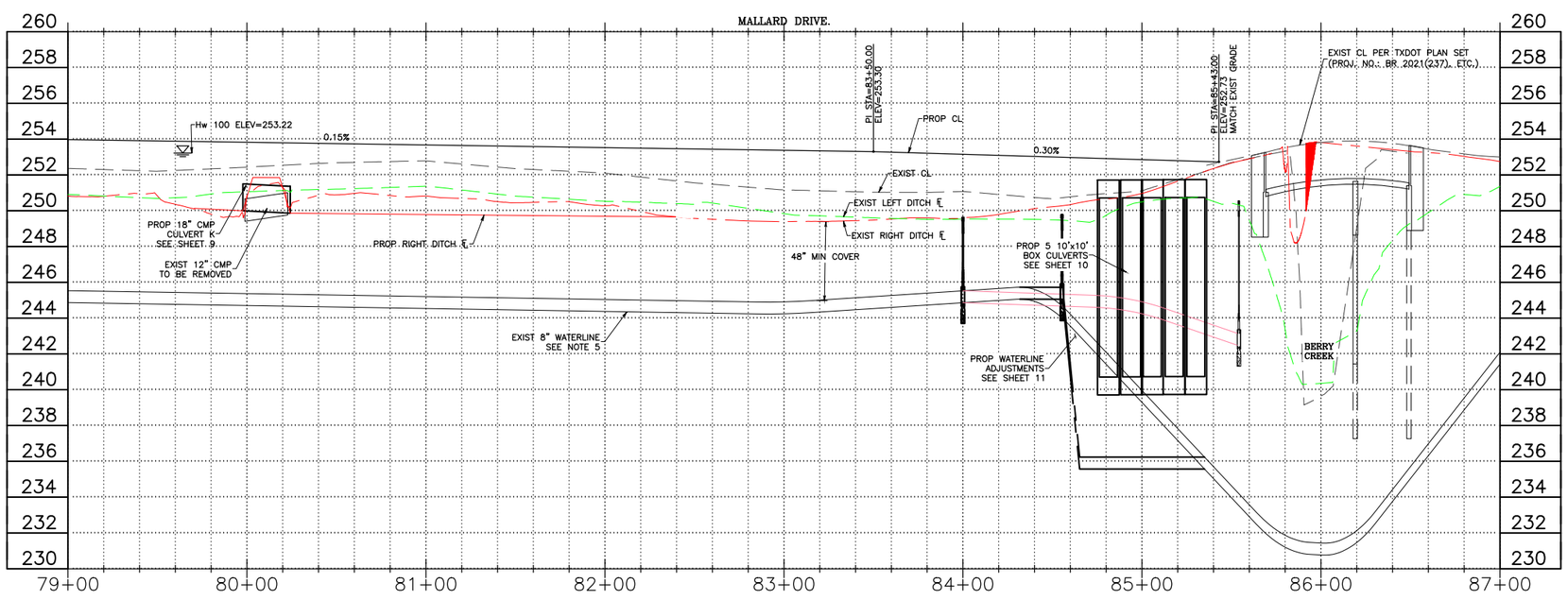
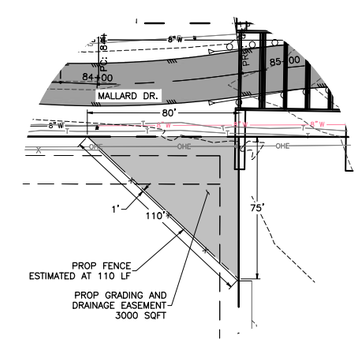
6. SEE SHEET 11 FOR WATERLINE ADJUSTMENT DETAILS.
7. PROPOSED MBGF (TL-2 MASH COMPLIANT) SHALL BE 25 LF ON BOTH SIDES OF MALLARD DR. (TOTAL 50 LF).

THE DESIGN OF THE PROJECT WILL HAVE NO NEGATIVE EFFECT ON THIS DEVELOPMENT OR ON THE SURFACE WATER ELEVATION AND/OR THE ADJACENT PROPERTIES.





INSET A

PROPOSED GRADING AND DRAINAGE EASEMENT
NTS

REV	DATE	BY	APP	COMMENT

PREPARED FOR:

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100 WEST BUCK
CALDWELL, TX, 77836

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PLAN AND PROFILE 2 OF 2

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 6	OF: 30

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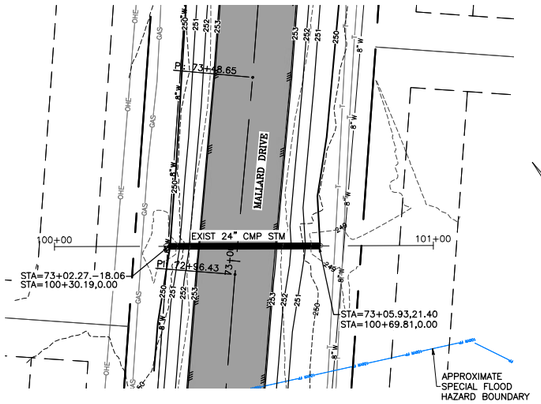
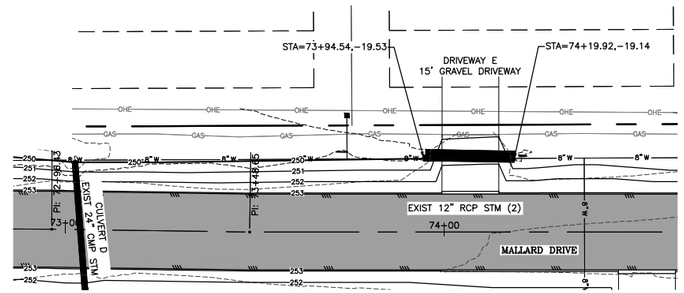
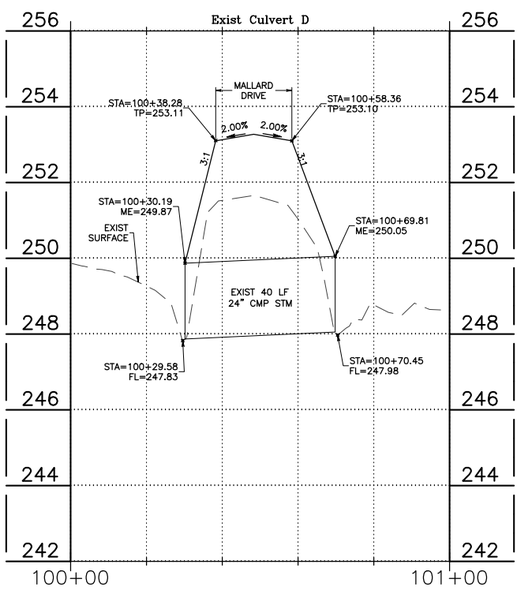
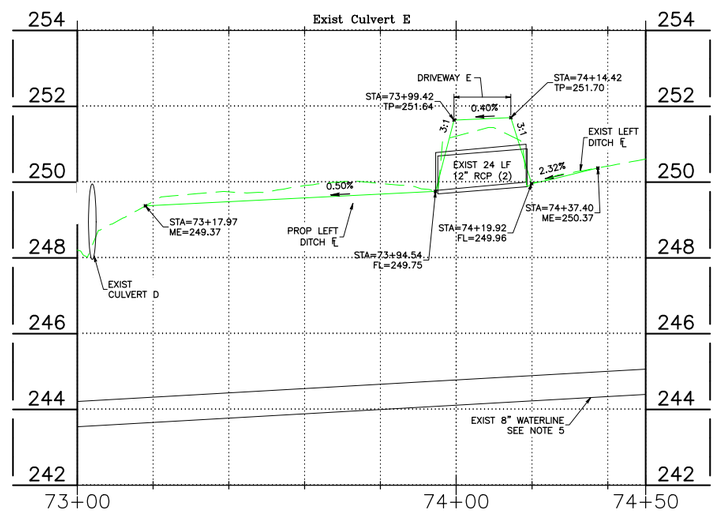
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\4 - PLAN & PROFILE.DWG

ORIGINAL LAYOUT SIZE - 22X34









0 20 40 80
SCALE: 1" = 40'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT
	SURVEY BENCHMARK
	PROPOSED ROADWAY
110	EXISTING CONTOUR
111	PROPOSED CONTOUR
	EXISTING RIGHT DITCH ℄
	EXISTING LEFT DITCH ℄
	PROPOSED RIGHT DITCH ℄
	PROPOSED LEFT DITCH ℄

NOTES:
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3. CONTRACTOR TO DISPOSE OF EXCESS SPOIL.
4. VERIFY EXISTING PAVEMENT ELEVATIONS PRIOR TO CONSTRUCTION.
5. FIELD VERIFY WATERLINE BEFORE CONSTRUCTION. WATERLINE LOCATION BASED ON "BEAVER CREEK WCID NO.1 WATER DISTRIBUTION SYSTEM TWDB PROJECT NO. 10418 CONTRACT NO.3"

THE DESIGN OF THE PROJECT WILL HAVE NO NEGATIVE EFFECT ON THIS DEVELOPMENT OR ON THE SURFACE WATER ELEVATION AND/OR THE ADJACENT PROPERTIES.

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
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CALDWELL, TX, 77836

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CULVERTS PLAN AND PROFILE
1 OF 4

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 7	OF: 30

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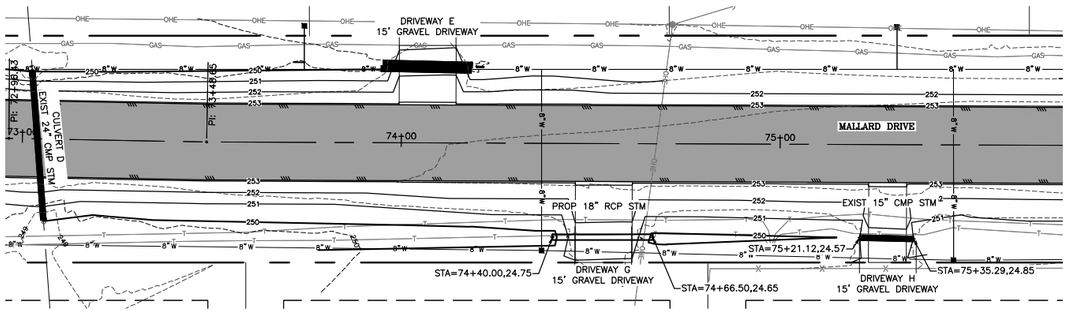
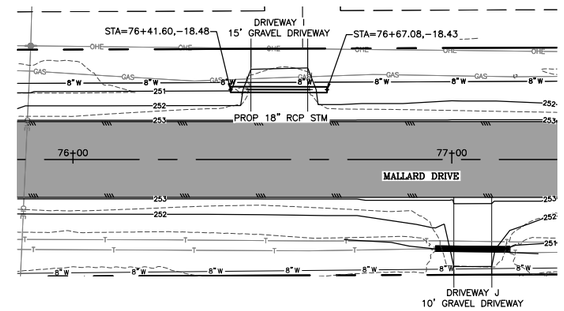
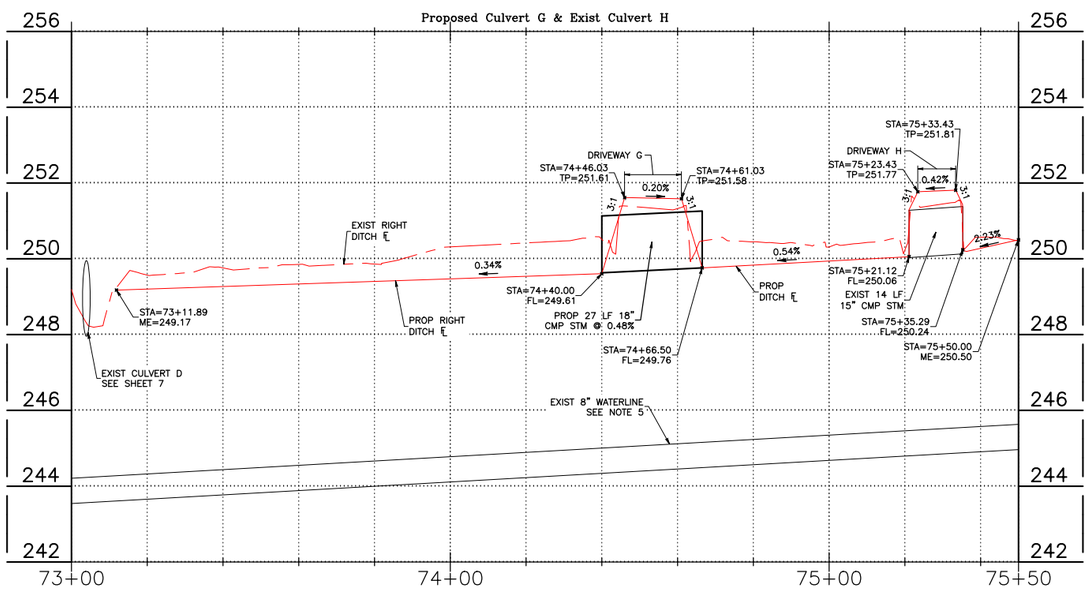
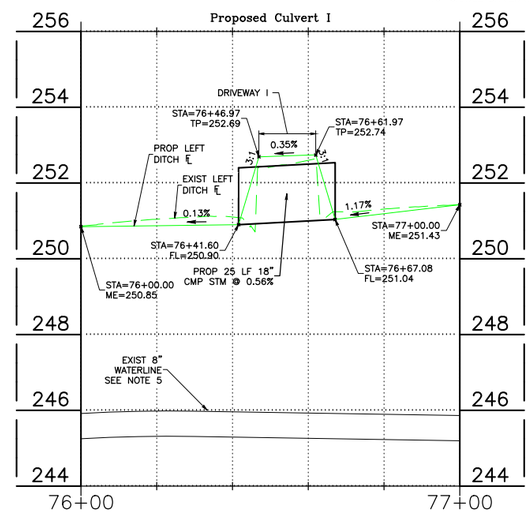
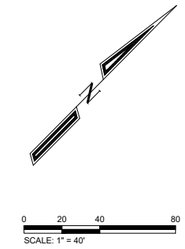
ORIGINAL LAYOUT SIZE – 22X34











LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT
	SURVEY BENCHMARK
	PROPOSED ROADWAY
110	EXISTING CONTOUR
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PREPARED FOR:
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CULVERTS PLAN AND PROFILE
2 OF 4

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 8	OF: 30

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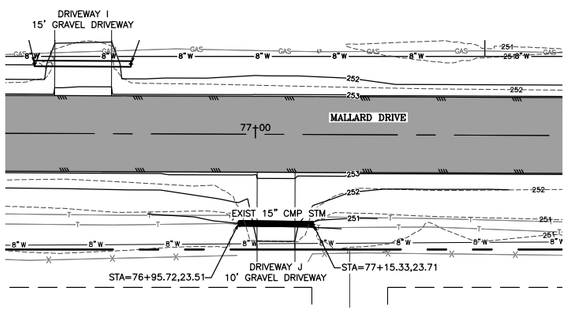
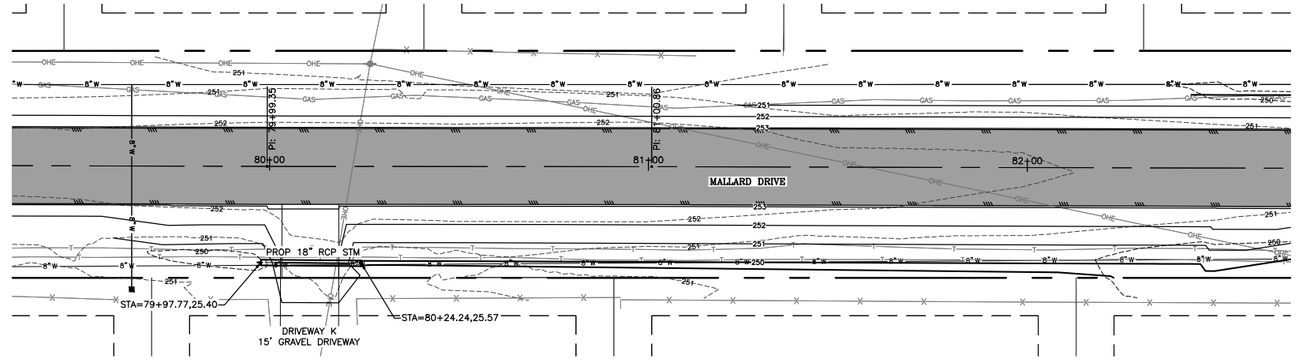
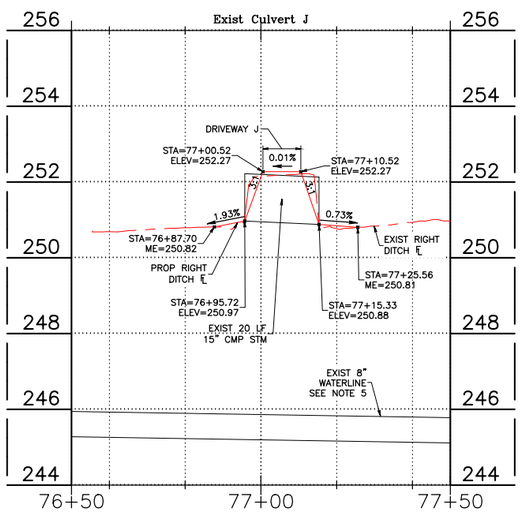
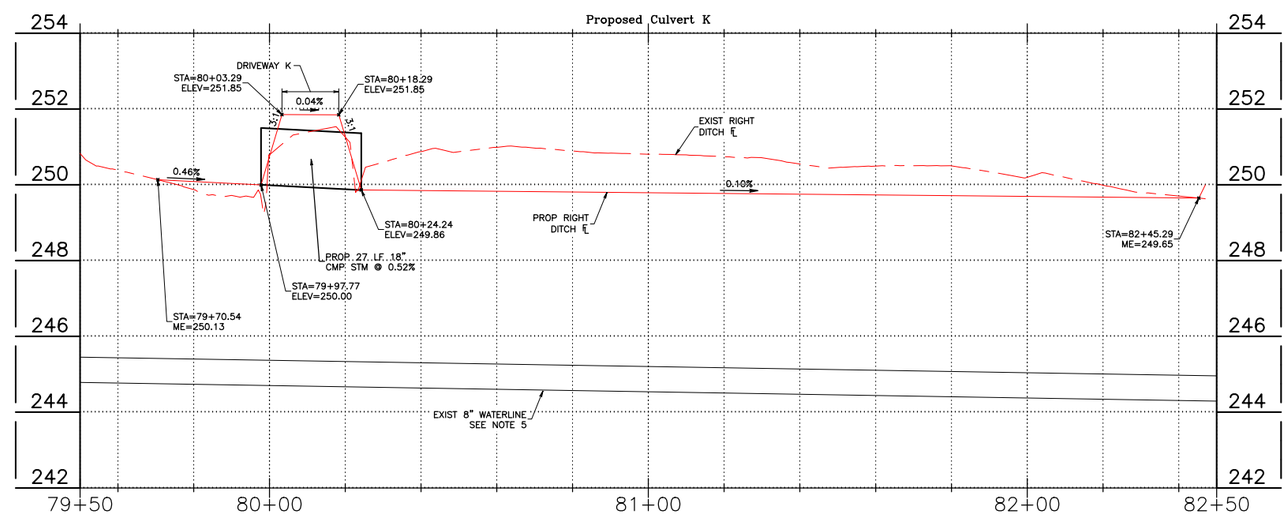
ORIGINAL LAYOUT SIZE – 22X34









LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
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CULVERTS PLAN AND PROFILE
3 OF 4

BURLESON CO -
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6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 9	OF: 30

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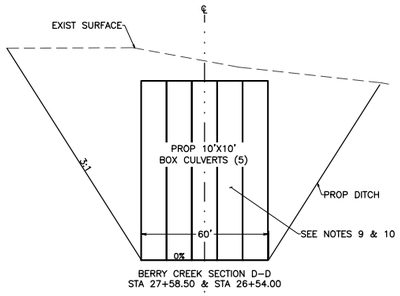
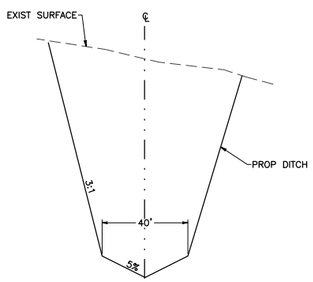
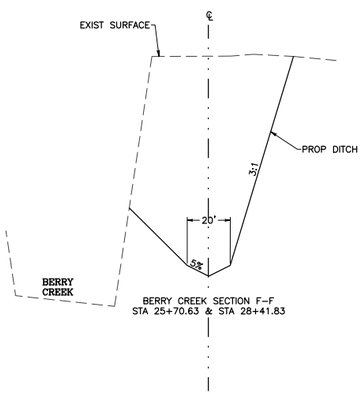


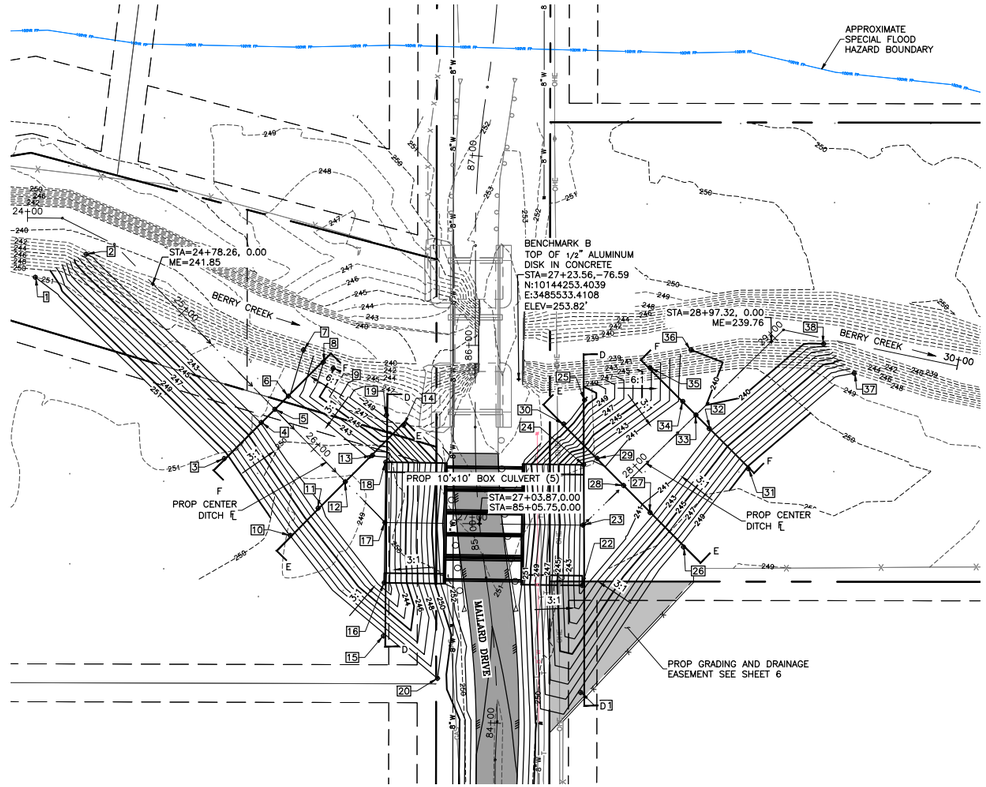
BERRY CREEK SECTION D–D
STA 27+58.50 & STA 26+54.00

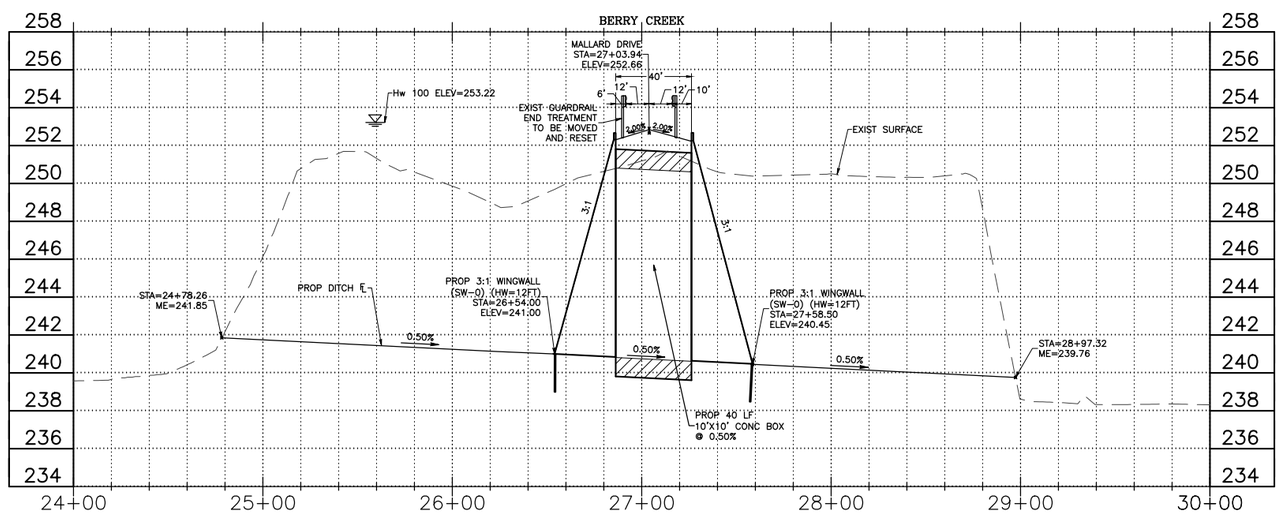


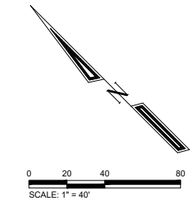
BERRY CREEK SECTION E–E
STA 26+24.00 & STA 27+88.50



BERRY CREEK SECTION F–F
STA 25+70.63 & STA 28+41.83







LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT
	SURVEY BENCHMARK
	PROPOSED ROADWAY
110	EXISTING CONTOUR
111	PROPOSED CONTOUR
	PROPOSED CENTER DITCH ℄

NOTES:
1. GRADE SITE FOR POSITIVE DRAINAGE.
2. FINISHED GRADES SHALL NOT IMPACT OFFSITE DRAINAGE AND SHALL NOT EXCEED 3:1.
3. CONTRACTOR TO DISPOSE OF EXCESS SPOIL.
4. VERIFY EXISTING PAVEMENT ELEVATIONS PRIOR TO CONSTRUCTION.
5. FIELD VERIFY WATERLINE BEFORE CONSTRUCTION. WATERLINE LOCATION BASED ON "BEAVER CREEK WCID NO.1 WATER DISTRIBUTION SYSTEM TWDB PROJECT NO. 104180 CONTRACT NO.3"
6. 6:1 FOR SLOPES PERPENDICULAR TO BERRY CREEK FLOW.
7. STA 27+03.87 BERRY CREEK = STA 85+05.75 MALLARD DR.
8. HW = H+T+C-3" -> 120"+10"+9"-3" = 136"-> 11.33' -> HW=12'
9. SEE SHEET 24 FOR BOX CULVERT DETAILS.
10. CEMENT STABILIZED SAND (CSS) SHALL BE PLACED BETWEEN EACH BOX CULVERT IN ACCORDANCE WITH TXDOT DETAIL SCP-MD. ESTIMATED AT 30 CY.

THE DESIGN OF THE PROJECT WILL HAVE NO NEGATIVE EFFECT ON THIS DEVELOPMENT OR ON THE SURFACE WATER ELEVATION AND/OR THE ADJACENT PROPERTIES.

POINT TABLE

POINT NO.	DESC.	STA (OFF) (ELEV)
1	TB	24+04.41 (31.33R) (251.00)
2	TOE	24+38.18 (11.32R) (242.00)
3	TB	25+70.63 (37.23R) (250.83)
4	TOE	25+70.63 (10.00R) (241.89)
5	FL	25+70.63 (0.00) (241.39)
6	TOE	25+70.63 (10.00L) (241.89)
7	TOE	25+58.70 (32.60L) (242.00)
8	TB	25+70.63 (35.70L) (243.99)
9	TB	25+76.61 (37.19L) (244.99)
10	TB	26+24.00 (40.59R) (248.96)
11	TOE	26+24.00 (20.00R) (242.13)
12	FL	26+24.00 (0.00) (241.13)
13	TOE	26+24.00 (20.00L) (242.13)
14	TB	26+24.00 (42.78L) (250.06)
15	TB	26+54.00 (59.89R) (249.45)
16	TOE (WINGWALL)	26+54.00 (31.83R) (241.00)
17	FL	26+54.00 (0.00) (241.00)
18	TOE (WINGWALL)	26+54.00 (31.83L) (241.00)
19	TB	26+54.00 (56.67L) (249.42)
20	TB	26+82.82 (81.92R) (249.00)

POINT TABLE

POINT NO.	DESC.	STA (OFF) (ELEV)
21	TB	27+58.50 (88.35R) (249.35)
22	TOE (WINGWALL)	27+58.50 (31.83R) (240.45)
23	FL	27+58.50 (0.00) (240.45)
24	TOE (WINGWALL)	27+58.50 (31.83L) (240.45)
25	TB	27+58.50 (66.69L) (251.08)
26	TB	27+88.50 (45.31R) (249.71)
27	TOE	27+88.50 (20.00R) (241.30)
28	FL	27+88.50 (0.00) (240.30)
29	TOE	27+88.50 (20.00L) (241.30)
30	TB	27+88.50 (45.28L) (251.33)
31	TB	28+41.83 (39.55R) (250.29)
32	TOE	28+41.83 (10.00R) (240.54)
33	FL	28+41.83 (0.00) (240.04)
34	TOE	28+41.83 (10.00L) (240.54)
35	TB	28+41.83 (34.87L) (244.17)
36	TB	28+63.89 (26.45L) (240.00)
37	TB	29+47.43 (14.79R) (248.00)
38	TOE	29+28.52 (2.94R) (240.01)

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
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AUSTIN BRYAN CONROE HOUSTON

CULVERTS PLAN AND PROFILE
4 OF 4

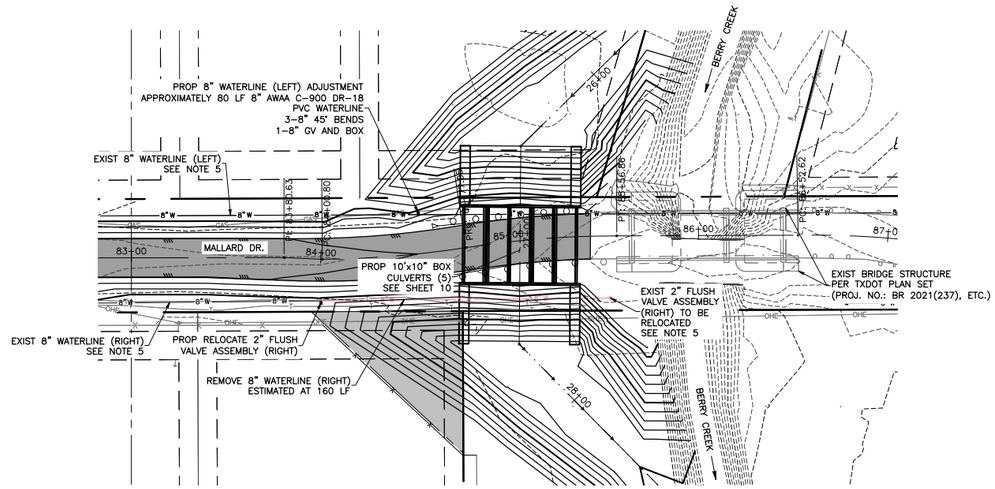
BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 10	OF: 30

JGORDON 6/25/2025 9:03:54 AM
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\4 - PLAN & PROFILE.DWG

ORIGINAL LAYOUT SIZE – 22X34



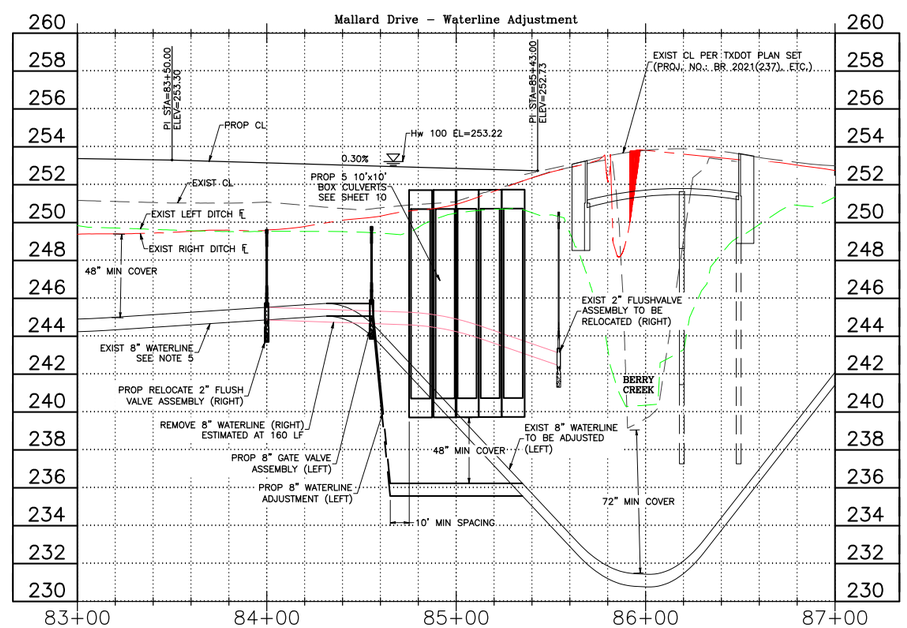
0 20 40 80
SCALE: 1" = 40'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT
	SURVEY BENCHMARK
	PROPOSED ROADWAY
110	EXISTING CONTOUR
111	PROPOSED CONTOUR
	EXISTING RIGHT DITCH ℄
	EXISTING LEFT DITCH ℄
	PROPOSED RIGHT DITCH ℄
	PROPOSED LEFT DITCH ℄
	PROPOSED CENTER DITCH ℄

NOTES:
1. GRADE SITE FOR POSITIVE DRAINAGE.
2. FINISHED GRADES SHALL NOT IMPACT OFFSITE DRAINAGE AND SHALL NOT EXCEED 3:1.
3. CONTRACTOR TO DISPOSE OF EXCESS SPOIL.
4. VERIFY EXISTING PAVEMENT ELEVATIONS PRIOR TO CONSTRUCTION.
5. FIELD VERIFY WATERLINE BEFORE CONSTRUCTION. WATERLINE LOCATION BASED ON "BEAVER CREEK WCID NO.1 WATER DISTRIBUTION SYSTEM TWDB PROJECT NO. 10418 CONTRACT NO.3"
6. COORDINATE WATERLINE CONSTRUCTION WITH "BEAVER CREEK WCID NO.1 WATER DISTRIBUTION SYSTEM TWDB PROJECT NO. 10418 CONTRACT NO.3"

THE DESIGN OF THE PROJECT WILL HAVE NO NEGATIVE EFFECT ON THIS DEVELOPMENT OR ON THE SURFACE WATER ELEVATION AND/OR THE ADJACENT PROPERTIES.



REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
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WATERLINE ADJUSTMENT
BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

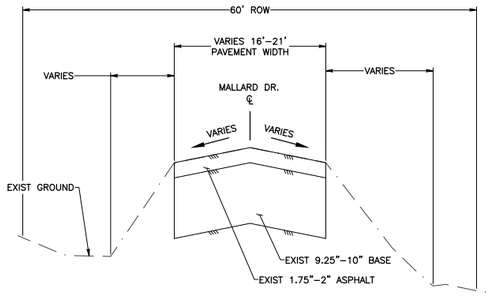
DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 11	OF: 30

JGORDON 6/25/2025 9:05:30 AM
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\4 - PLAN & PROFILE.DWG

ORIGINAL LAYOUT SIZE – 22X34

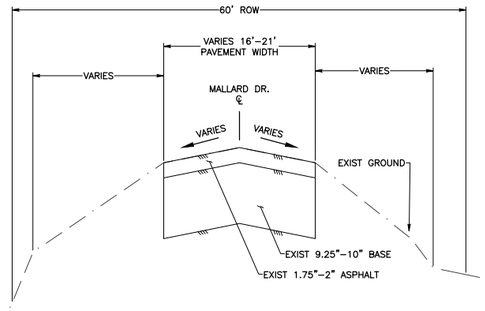
EXISTING TYPICAL SECTION A-A

STA 71+35 TO STA 84+26
N.T.S.



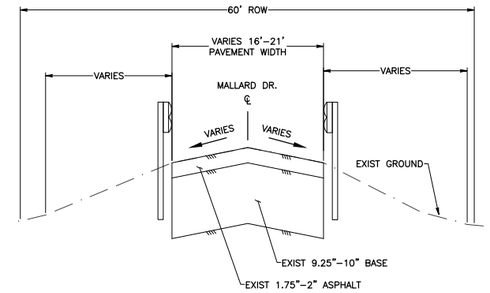
EXISTING TYPICAL SECTION B-B

STA 84+26 TO STA 84+76
N.T.S.



EXISTING TYPICAL SECTION C-C

STA 84+76 TO STA 85+43
N.T.S.



PROPOSED TYPICAL SECTION A-A

STA 71+35 TO STA 84+26
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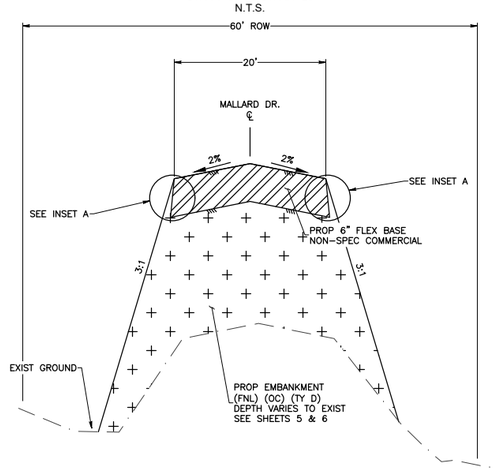
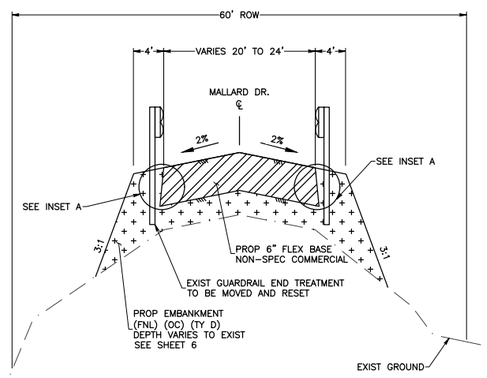
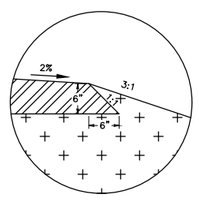


PROPOSED TYPICAL SECTION B-B

STA 84+26 TO STA 84+76
N.T.S.



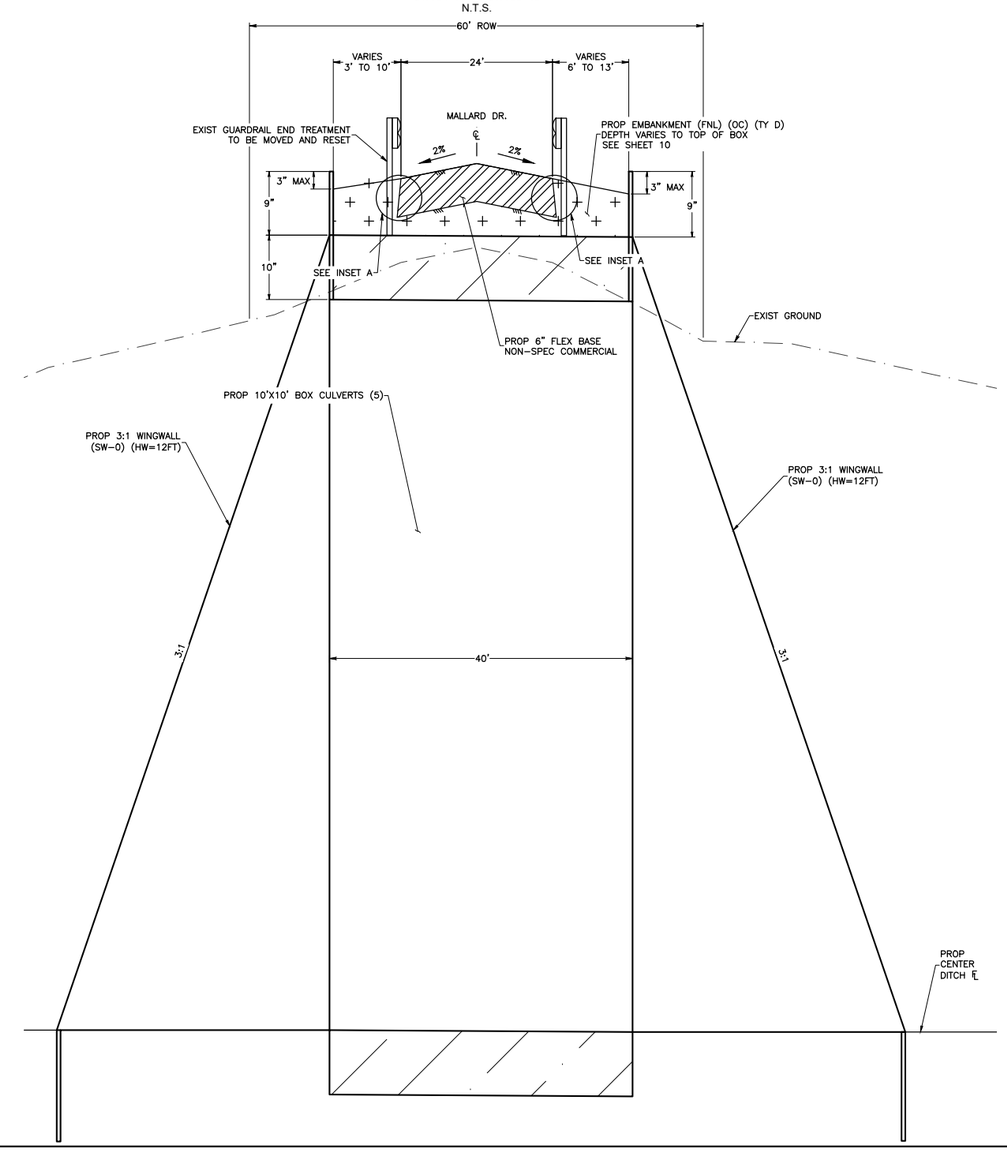


INSET A

SCALE: NTS

PROPOSED TYPICAL SECTION C-C

STA 84+76 TO STA 85+43
N.T.S.



REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
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1722 Broadmoor, Suite 210, Bryan Tx 77802
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TYPICAL SECTIONS

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 12	OF: 30

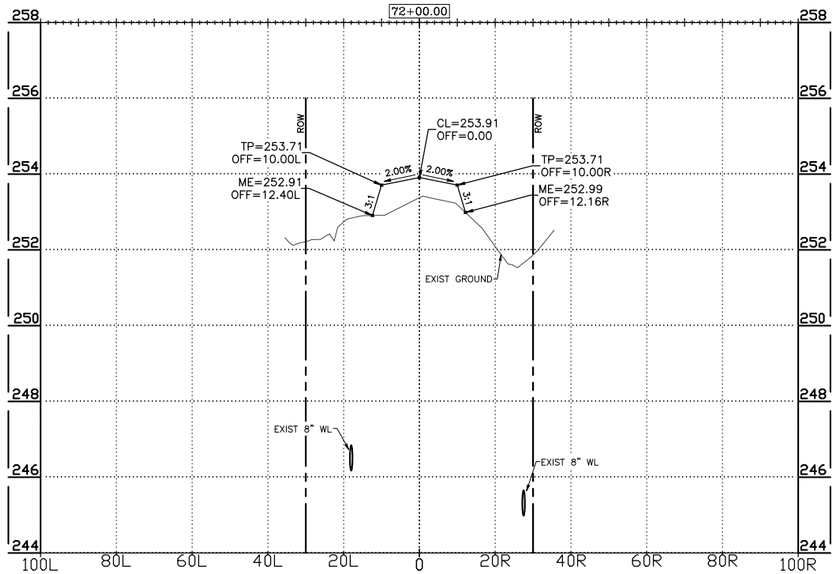
JGORDON 6/25/2025 9:04:13 AM
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD DR\4 - PLAN & PROFILE.DWG

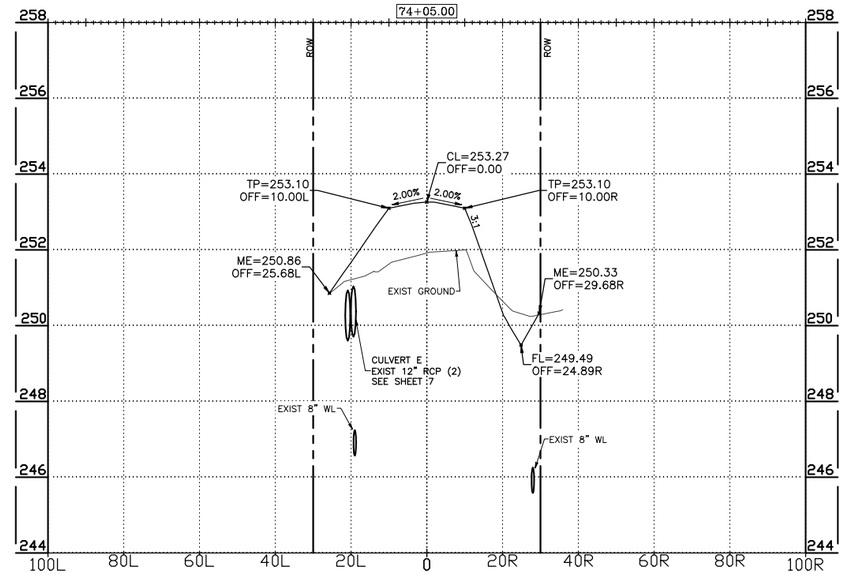
ORIGINAL LAYOUT SIZE – 22X34

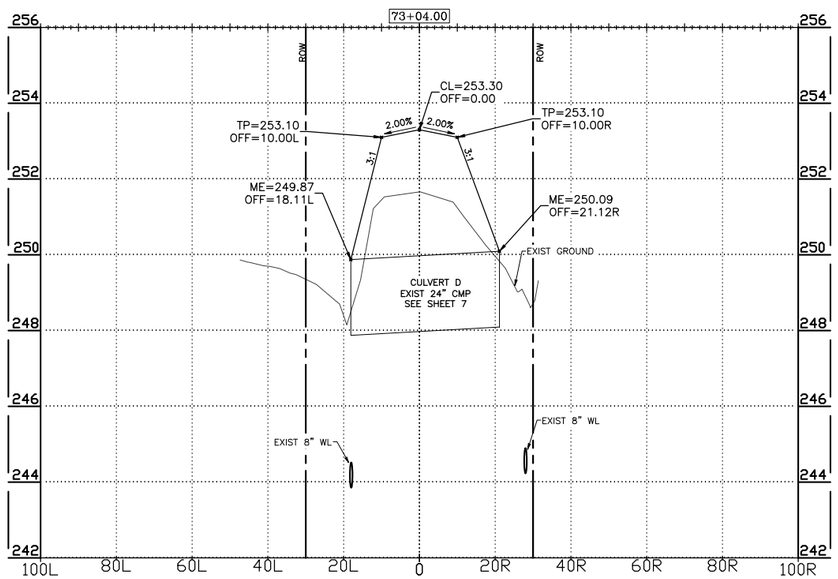
SCALE: 1" = 20'

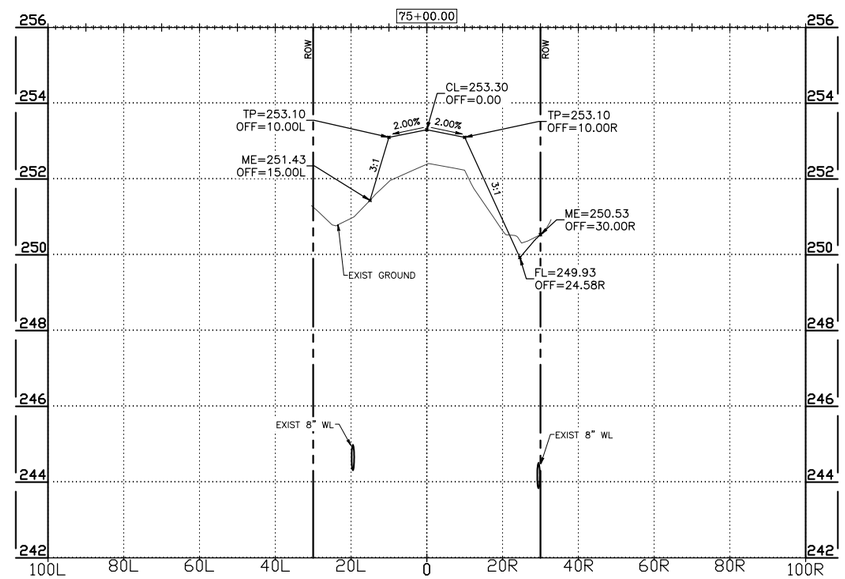
LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT









REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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MALLARD DRIVE SECTIONS 1 OF 4

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 13	OF: 30

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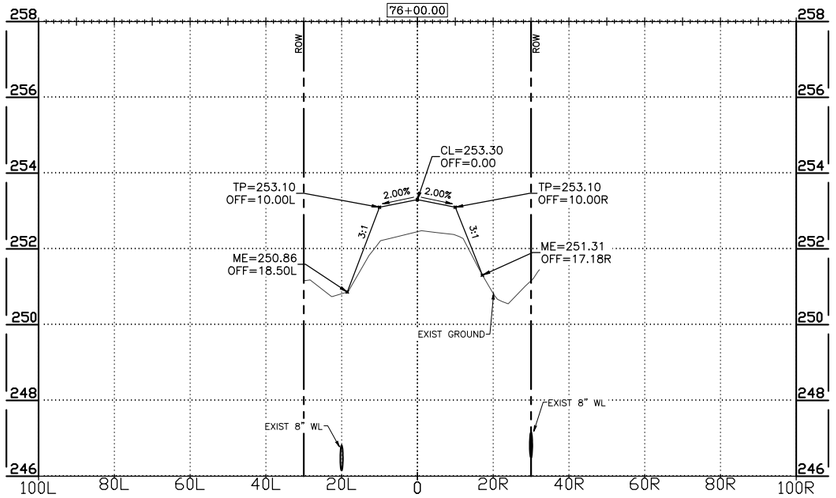
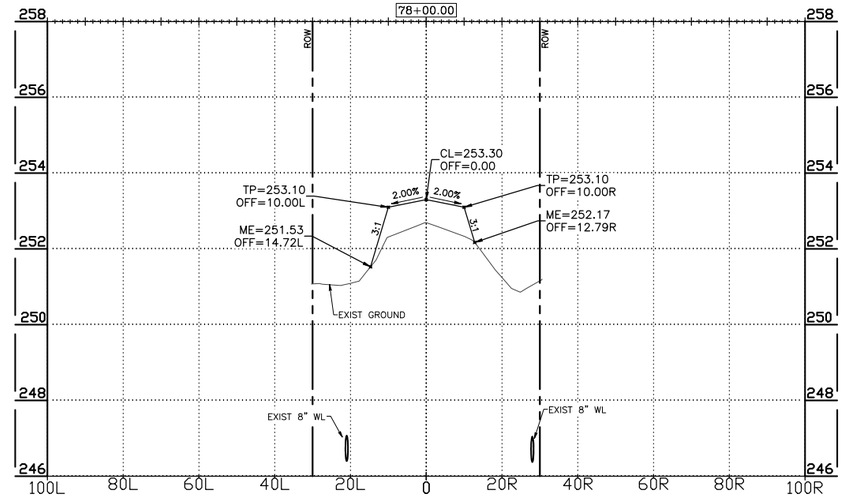
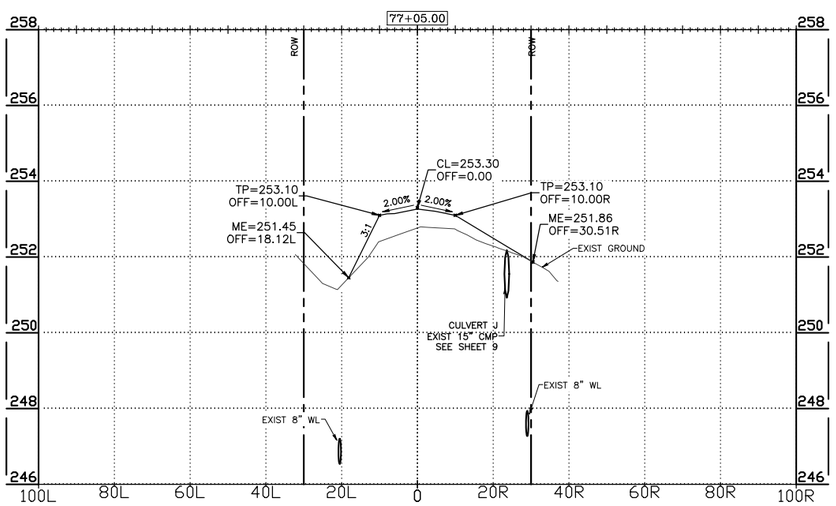
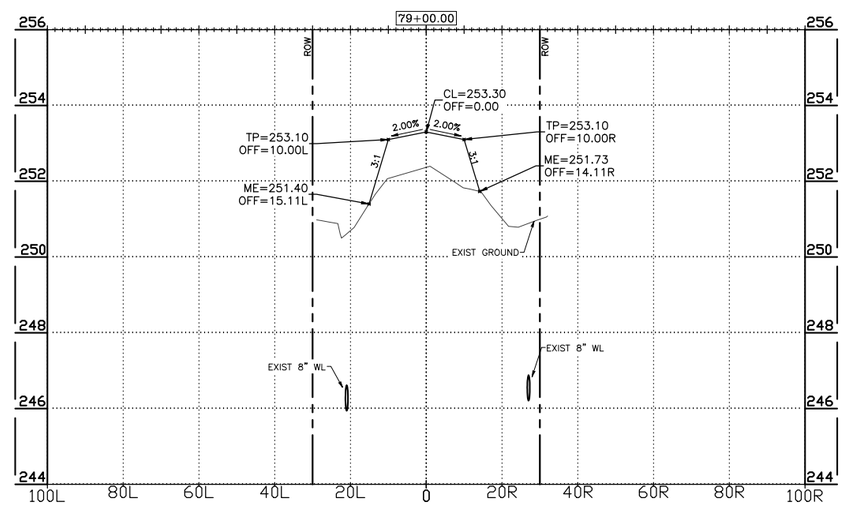
ORIGINAL LAYOUT SIZE – 22X34









0 10 20 40
SCALE: 1" = 20'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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MALLARD DRIVE SECTIONS 2 OF 4

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS
CAD: JG RVW: DLB
PROJECT NO: 13357
SHEET: 14 OF: 30

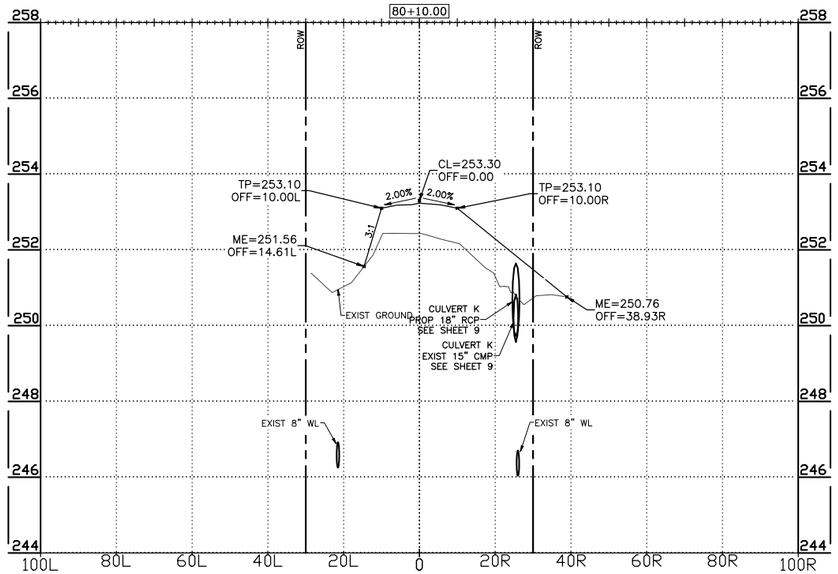
JGORDON
6/25/2025 9:05:38 AM
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\8 - SECTIONS.DWG

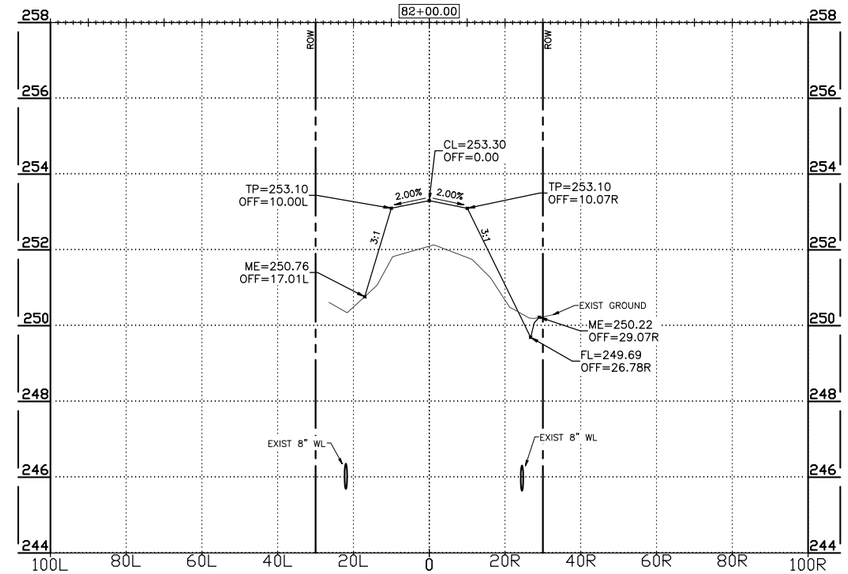
ORIGINAL LAYOUT SIZE - 22X34

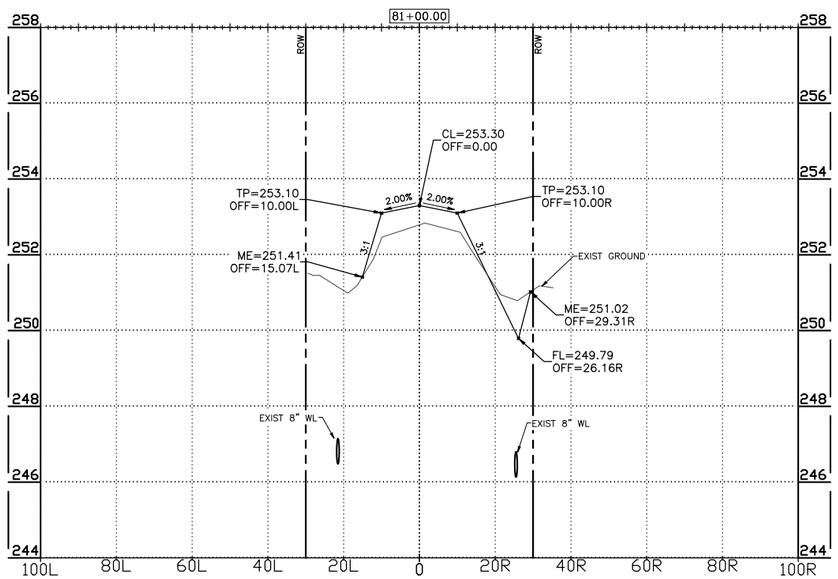
SCALE: 1" = 20'

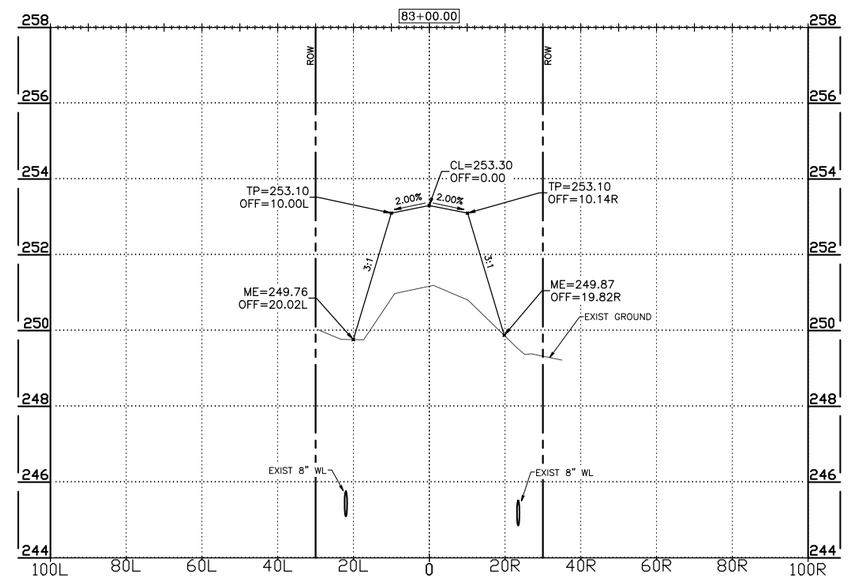
LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT









REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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MALLARD DRIVE SECTIONS 3 OF 4

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 15	OF: 30

JGORDON 6/25/2025 9:03:23 AM
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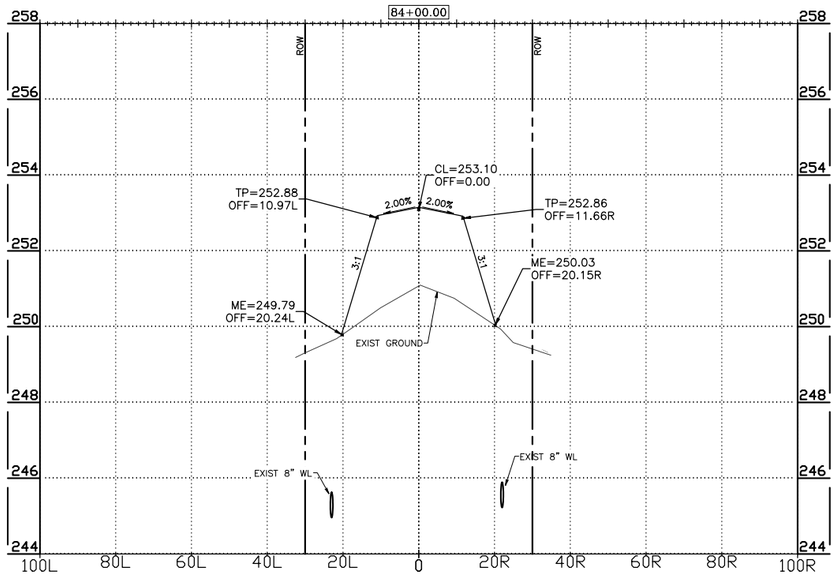
ORIGINAL LAYOUT SIZE – 22X34



0 10 20 40
SCALE: 1" = 20'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT

REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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MALLARD DRIVE SECTIONS 4 OF 4

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 16	OF: 30

JGORDON 6/25/2025 9:04:57 AM
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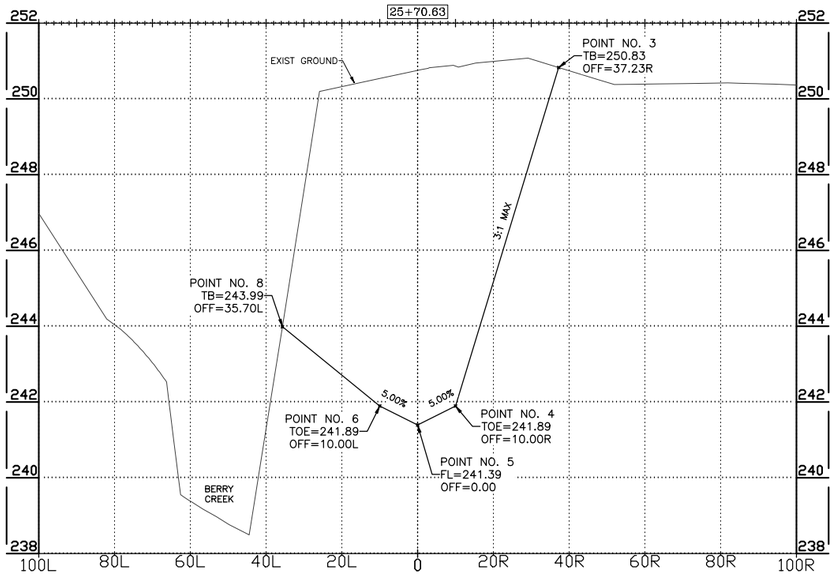
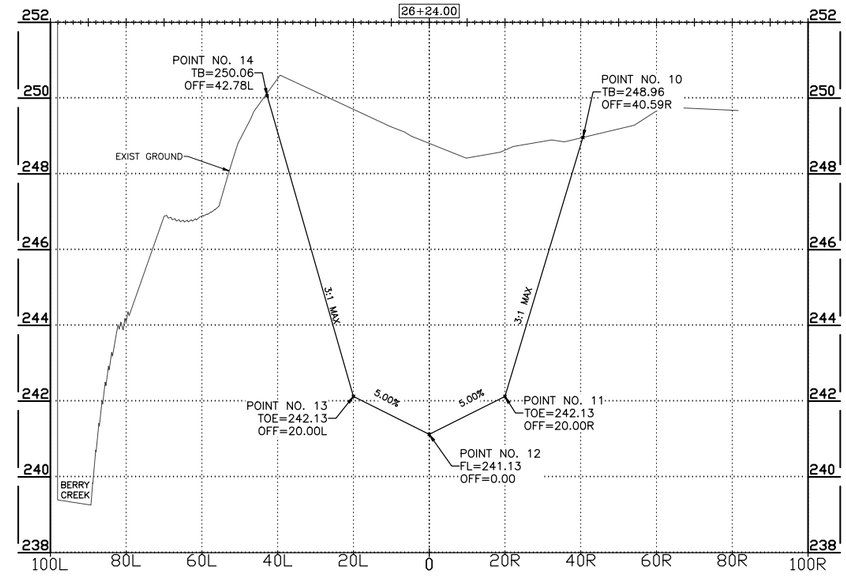
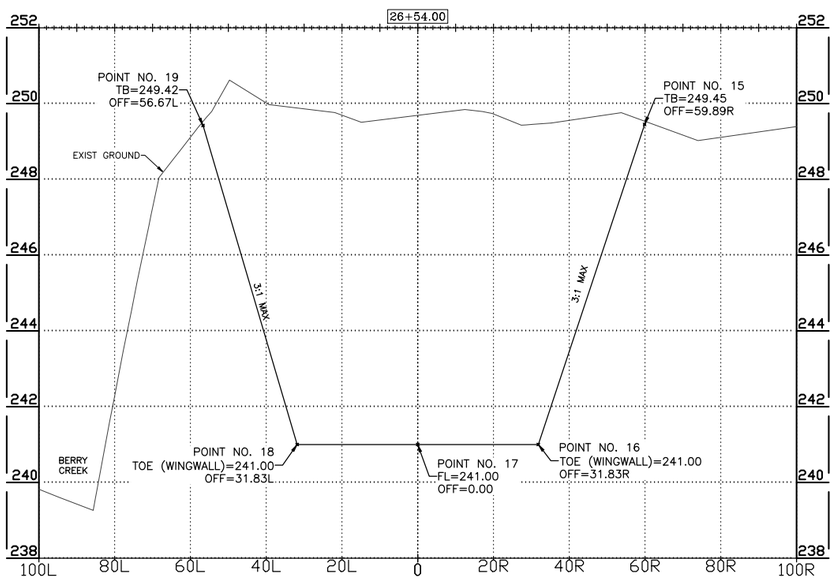
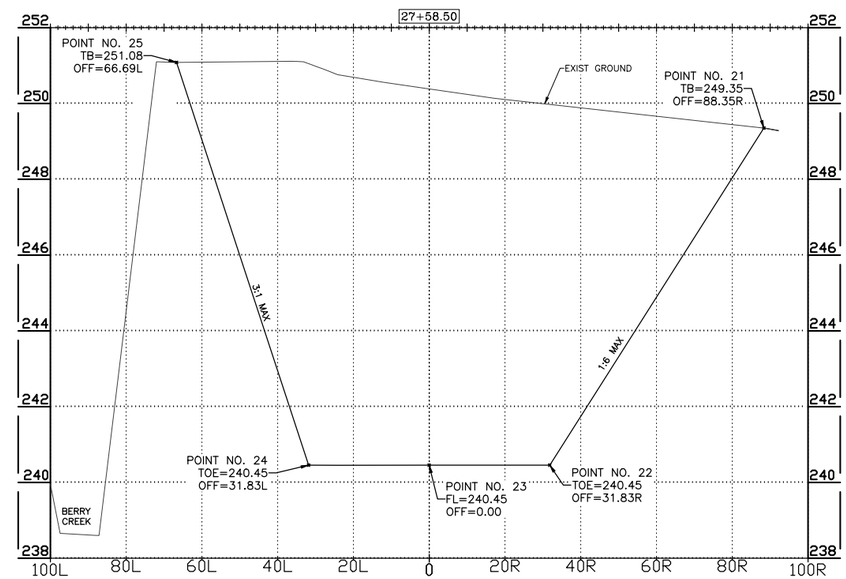
ORIGINAL LAYOUT SIZE – 22X34









0 10 20 40
SCALE: 1" = 20'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
PLANNING • DESIGN • MANAGEMENT
1722 Broadmoor, Suite 210, Bryan Tx 77802
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BERRY CREEK SECTIONS 1 OF 2

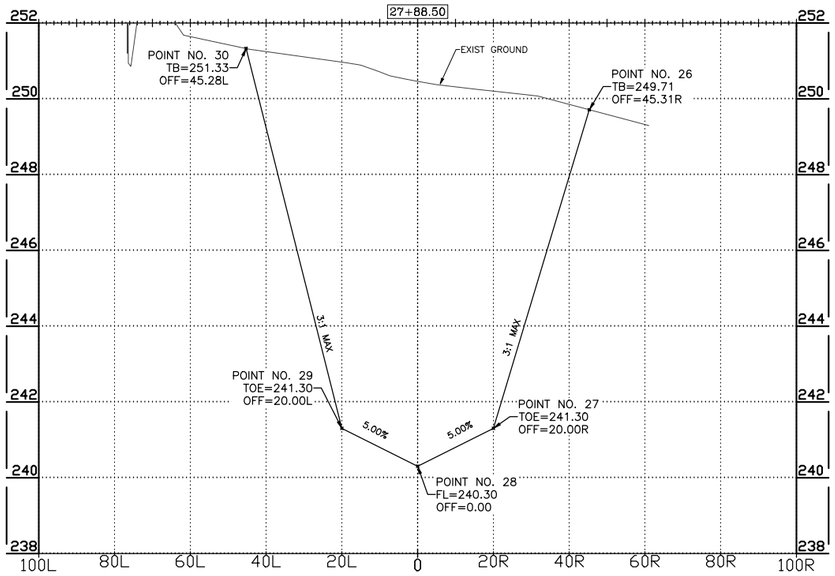
BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

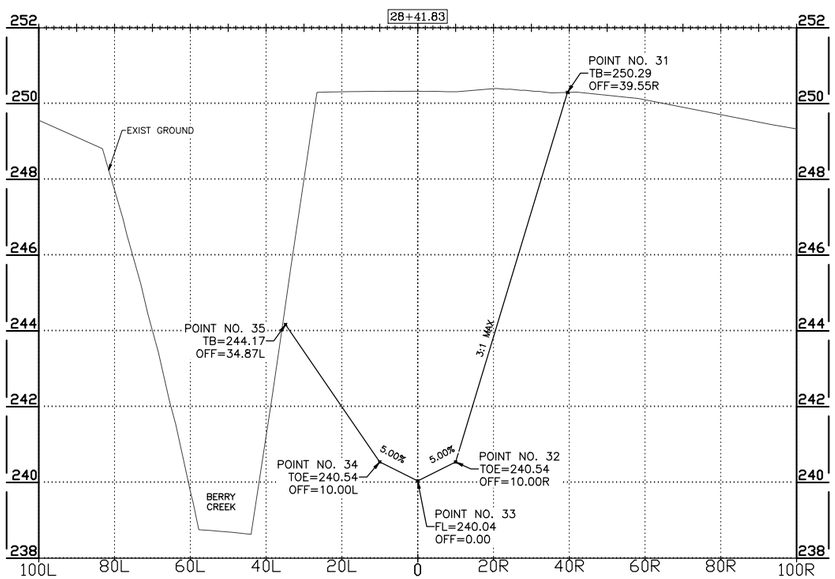
STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 17	OF: 30

JGORDON 6/25/2025 9:05:19 AM
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\8 – SECTIONS.DWG

ORIGINAL LAYOUT SIZE - 22X34





0 10 20 40
SCALE: 1" = 20'

LEGEND

CL	CENTERLINE
FL	FLOWLINE
ME	MATCH EXIST
TB	TOP OF BANK
TOE	TOE OF SLOPE
TP	TOP OF PAVEMENT

REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
PLANNING • DESIGN • MANAGEMENT
1722 Broadmoor, Suite 210, Bryan Tx 77802
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BERRY CREEK SECTIONS 2 OF 2

BURLESON CO -
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DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 18	OF: 30

JGORDON
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ORIGINAL LAYOUT SIZE – 22X34

NOTES:
1. TRAFFIC CONTROL PLAN IS PROVIDED FOR CONTRACTOR'S CONVENIENCE. CONTRACTOR MAY SUBMIT AN ALTERNATE TRAFFIC CONTROL PLAN SIGNED BY A LICENSED TRAFFIC PROFESSIONAL ENGINEER FOR REVIEW BY BURLESON COUNTY.
2. LOCAL ACCESS SHALL BE MAINTAINED FOR THE EXISTING COUNTY ROADS, CROSS STREETS, AND DRIVEWAYS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY DRAINAGE AT ALL TIMES, TO BE SUBSIDIARY TO OTHER BID ITEMS.
4. NOTIFY COUNTY PROJECT MANAGER AND INSPECTOR AT LEAST 2 WEEKS PRIOR TO CLOSING LANES.
5. SEE TEMPORARY SHORING SHEET 21 FOR ADDITIONAL INFORMATION.

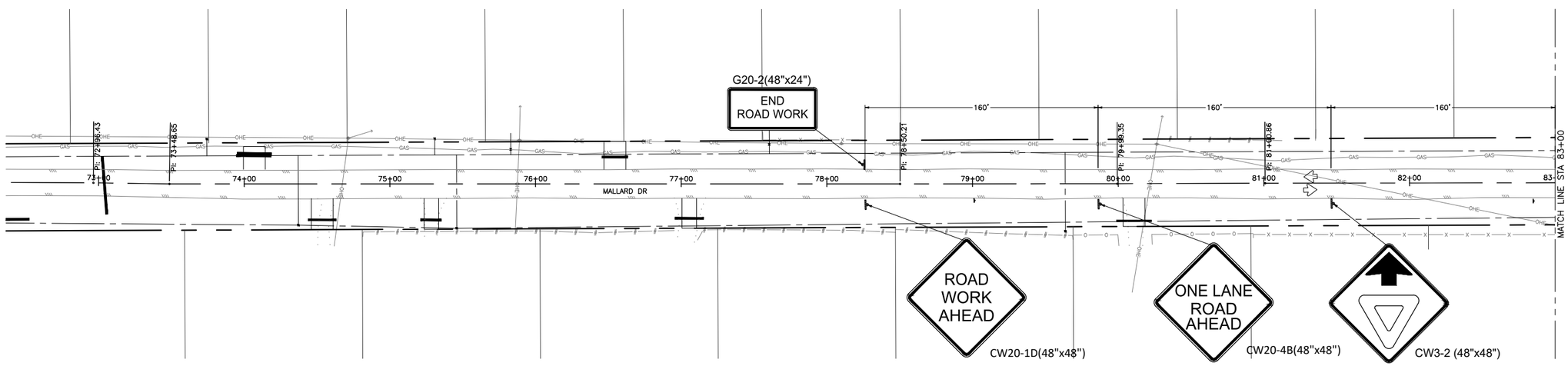
MALLARD DRIVE SPEED LIMIT: 35MPH
BERRY CREEK DRIVE SPEED LIMIT: 30MPH

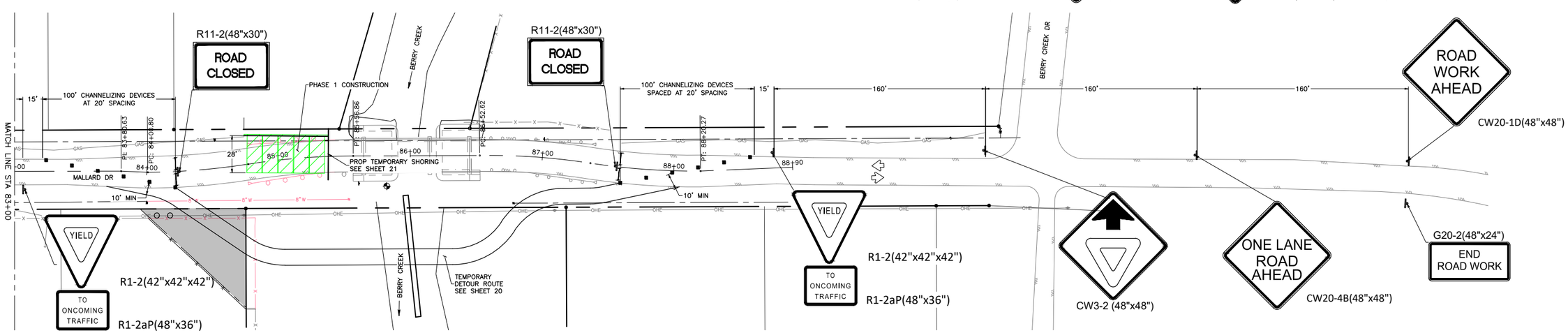
PHASE & STAGE SEQUENCE:
A. GENERALLY CONFORM TO THE FOLLOWING SEQUENCE.
B. INSTALL ALL ADVANCED WARNING SIGNS AS SHOWN IN ACCORDANCE WITH STANDARD SHEETS BC(1)–21 THRU BC(12)–21 AND AS DIRECTED BY THE ENGINEER.

PHASE ONE:
a. CONSTRUCT TEMPORARY DETOUR ROUTE.
b. PLACE TEMPORARY CHANNELIZING DEVICES AS SHOWN IN THE PLANS.
c. CONSTRUCT THE 28LF OF PROPOSED UPSTREAM DRAINAGE MODIFICATIONS.
d. CONSTRUCT THE PROPOSED WATERLINE (LEFT) ADJUSTMENTS.

LEGEND
- WORK ZONE
- SIGN
- CHANNELIZING DEVICE
- TY III BARRICADE
- EXISTING TRAFFIC FLOW
- BENCHMARK

0 20 40 80
SCALE: 1" = 40'





REV	DATE	BY	APP	COMMENT

PREPARED FOR:
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CALDWELL, TX, 77836

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TRAFFIC CONTROL PLAN – PHASE 1

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MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 19	OF: 30

JGORDON
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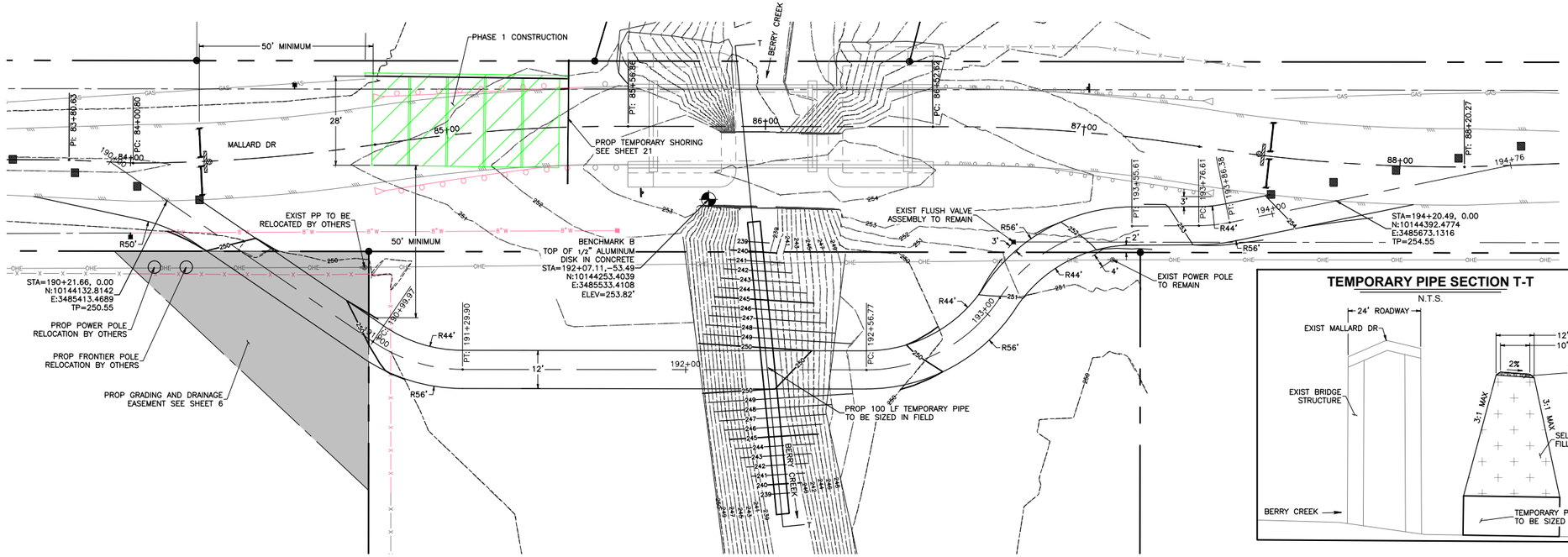
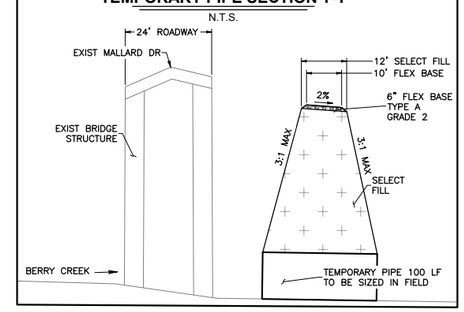
ORIGINAL LAYOUT SIZE – 22X34



TEMPORARY PIPE SECTION T-T

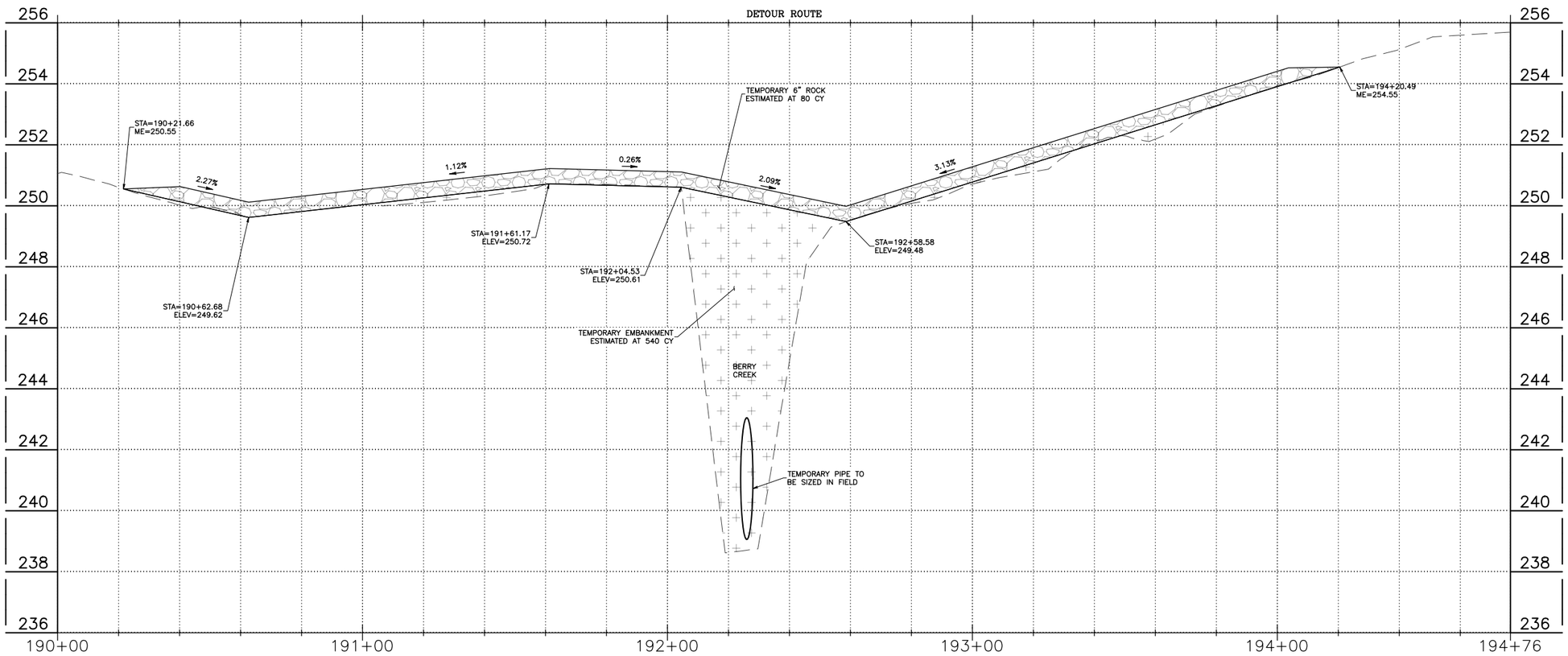
N.T.S.



0 10 20 40
SCALE: 1" = 20'

LEGEND

- WORK ZONE
- SIGN
- CHANNELIZING DEVICE
- TY III BARRICADE
- EXISTING TRAFFIC FLOW
- BENCHMARK
- 110 EXISTING CONTOUR
- 111 PROPOSED CONTOUR



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4. NOTIFY COUNTY PROJECT MANAGER AND INSPECTOR AT LEAST 2 WEEKS PRIOR TO CLOSING LANES.
5. SEE TEMPORARY SHORING SHEET 21 FOR ADDITIONAL INFORMATION.

MALLARD DRIVE SPEED LIMIT: 35MPH
BERRY CREEK DRIVE SPEED LIMIT: 30MPH

REV	DATE	BY	APP	COMMENT

PREPARED FOR:
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100 WEST BUCK
CALDWELL, TX, 77836

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TEMPORARY DETOUR ROUTE

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MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 20	OF: 30

JGORDON
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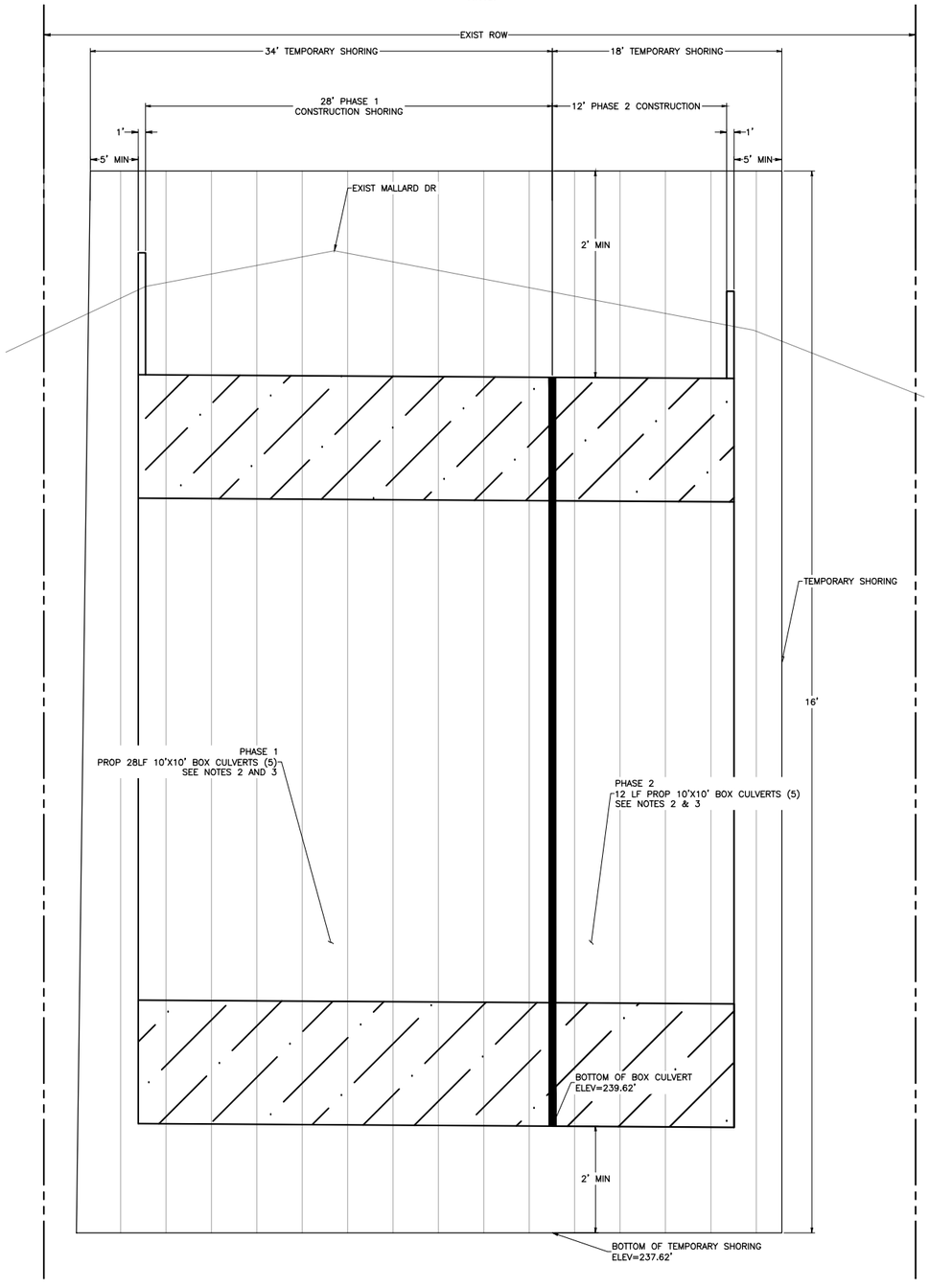
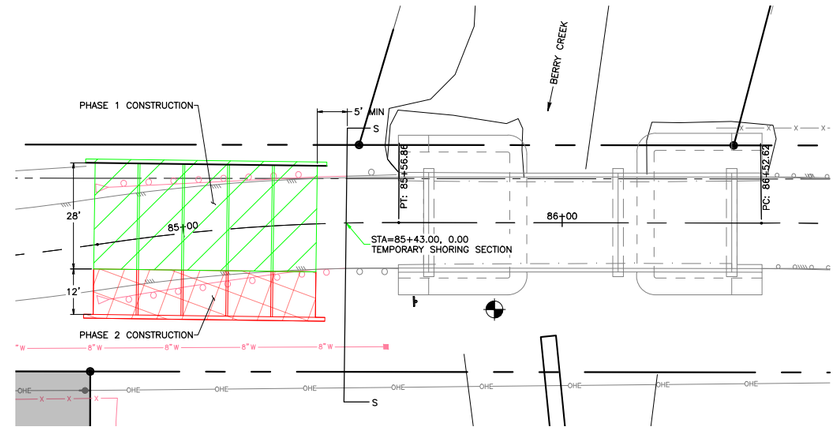
BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DR\6 – TCP.DWG

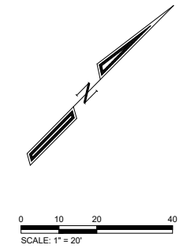
ORIGINAL LAYOUT SIZE – 22X34

TEMPORARY SHORING
SECTION S-S

STA 85+43
N.T.S.







LEGEND

- PHASE ONE
- PHASE TWO
- SIGN
- CHANNELIZING DEVICE
- TY III BARRICADE
- EXISTING TRAFFIC FLOW
- BENCHMARK

NOTES:
1. CONTRACTOR TO ENSURE STRUCTURAL STABILITY OF TEMPORARY SHORING AND CONSTRUCTION ELEMENTS PRIOR TO EXCAVATION AND CONSTRUCTION.
2. SHORING EXTEND:
   a. 2' MIN BELOW BOTTOM OF BOX CULVERT.
   b. 2' MIN ABOVE TOP OF BOX CULVERT.
   c. 5' MIN ON BOTH SIDES BOX CULVERT.
3. SHORING IN PHASE 1 & 2 MAY BE DONE SEPARATE OR TOGETHER.
   a. IF TOGETHER: TOTAL ESTIMATED 840 SF OF SHORING
   b. IF SEPARATE: PHASE 1 ESTIMATED 630 SF OF SHORING
   c. IF SEPARATE: PHASE 2 ESTIMATED 370 SF OF SHORING

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AUSTIN BRYAN CONROE HOUSTON

TEMPORARY SHORING

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MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 21	OF: 30

JGORDON
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ORIGINAL LAYOUT SIZE – 22X34

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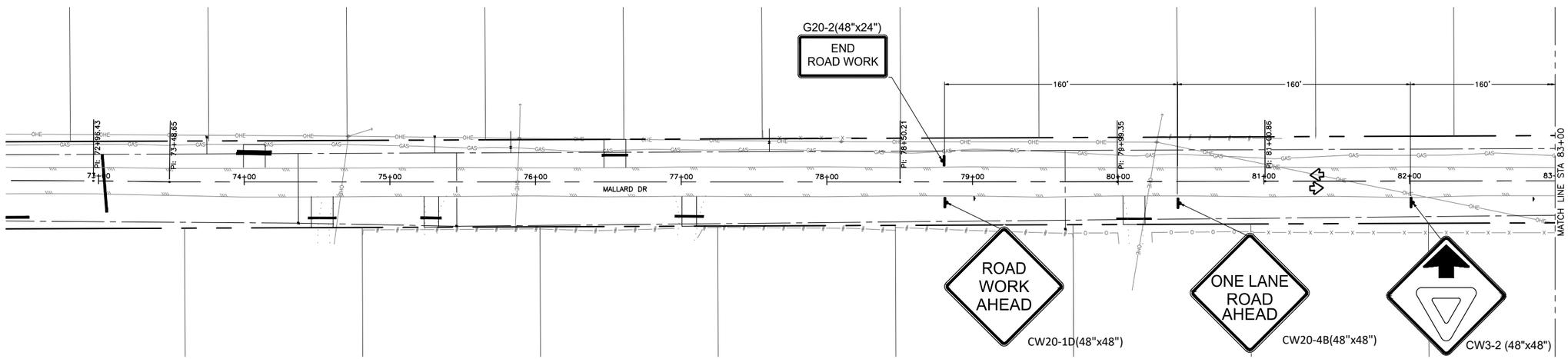
MALLARD DRIVE SPEED LIMIT: 35MPH
BERRY CREEK DRIVE SPEED LIMIT: 30MPH

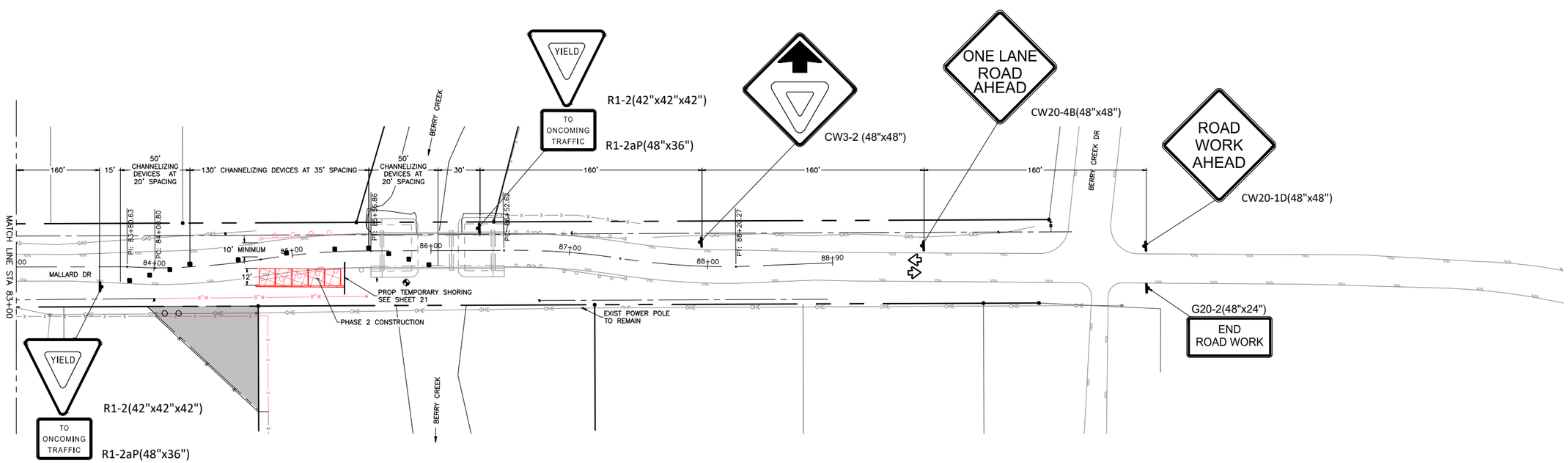
PHASE & STAGE SEQUENCE:
A. GENERALLY CONFORM TO THE FOLLOWING SEQUENCE.
B. INSTALL ALL ADVANCED WARNING SIGNS AS SHOWN IN ACCORDANCE WITH STANDARD SHEETS BC(1)–21 THRU BC(12)–21 AND AS DIRECTED BY THE ENGINEER.

PHASE TWO:
a. PLACE TEMPORARY CHANNELIZING DEVICES AS SHOWN IN THE PLANS.
b. CONSTRUCT THE 12LF OF PROPOSED DOWNSTREAM DRAINAGE MODIFICATIONS.
c. CONSTRUCT THE PROPOSED WATERLINE (RIGHT) ADJUSTMENTS.

LEGEND
- WORK ZONE
- SIGN
- CHANNELIZING DEVICE
- TY III BARRICADE
- EXISTING TRAFFIC FLOW
- BENCHMARK

0 20 40 80
SCALE: 1" = 40'





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TRAFFIC CONTROL PLAN – PHASE 2

BURLESON CO -
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MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 22	OF: 30

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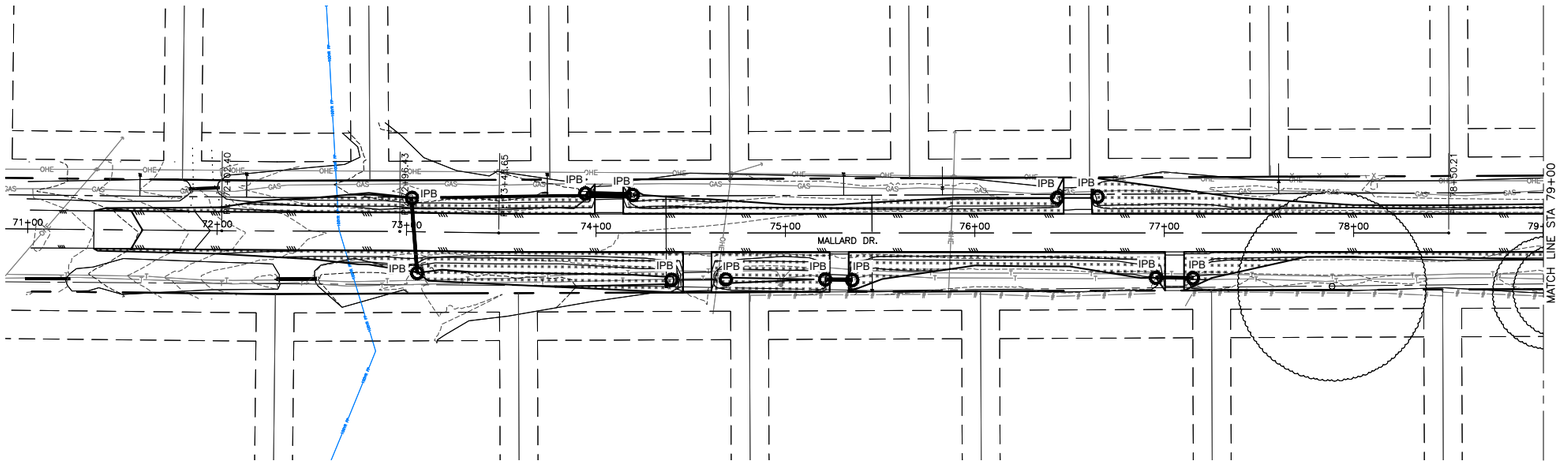
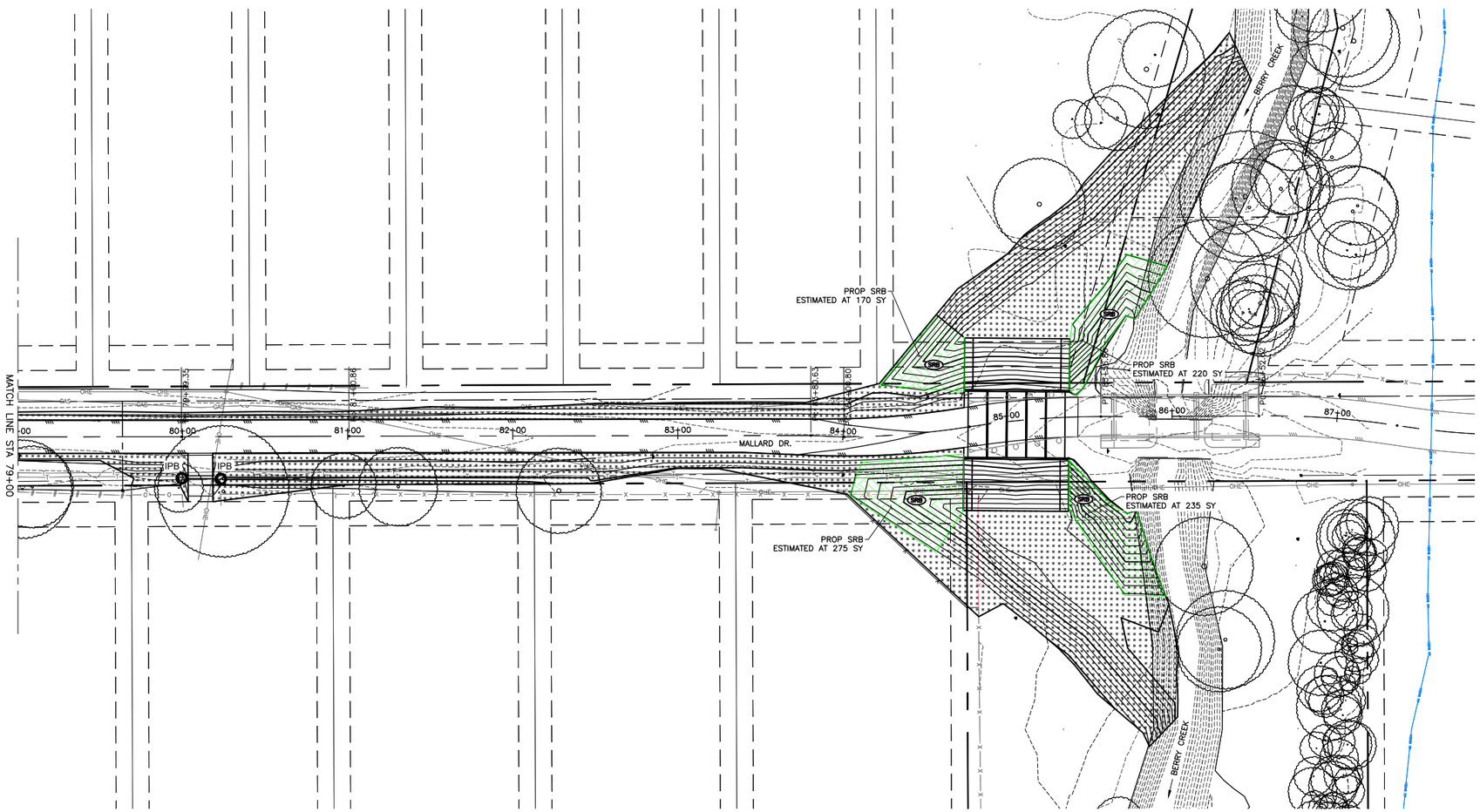
ORIGINAL LAYOUT SIZE – 22X34





0 20 40 80
SCALE: 1" = 40'

LEGEND

	BROADCAST SEED
SRB	SOIL RETENTION BLANKET
IPB	INLET PROTECTION BARRIER

NOTES:
1. CONTRACTOR SHALL RESTORE ANY DISTURBED PAVING OR FACILITIES TO PRE-CONSTRUCTION CONDITIONS OR BETTER AT NO COST TO OWNER.
2. CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS REQUIRED.
3. STORM SEWER (EXCLUDING CULVERTS) PIPE SHALL BE SMOOTH INTERIOR WALL HP STORM (ADS, OR EQUAL) PIPE WITH WATER TIGHT JOINTS, UNLESS OTHERWISE NOTED.
4. GRADE SITE FOR POSITIVE DRAINAGE.
5. SLOPES OF FINISHED GRADE SHALL NOT EXCEED 3:1.
6. THE FLOWLINE AND GRADE ON ALL PROPOSED CULVERTS TO BE VERIFIED AND SET BY THE REGULATING ENTITY PRIOR TO INSTALLATION.
7. SEED ALL DISTURBED AREAS.
8. IPB PAID FOR AS 6" EROSION CONTROL LOGS
9. CONTRACTOR TO ENSURE SCF DOES NOT OBSTRUCT WATERS FLOW ALONG BERRY CREEK.

THE DESIGN OF THE PROJECT WILL HAVE NO NEGATIVE EFFECT ON THIS DEVELOPMENT OR ON THE SURFACE WATER ELEVATION AND/OR THE ADJACENT PROPERTIES.

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EROSION CONTROL PLAN

BURLESON CO -
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MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 23	OF: 30

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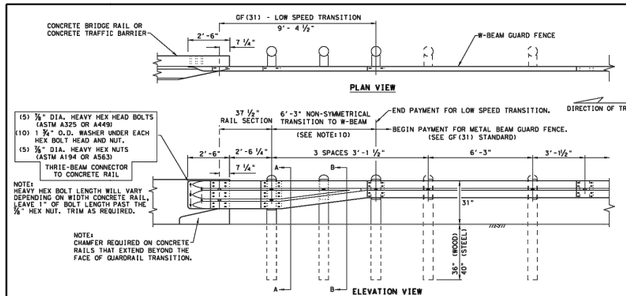
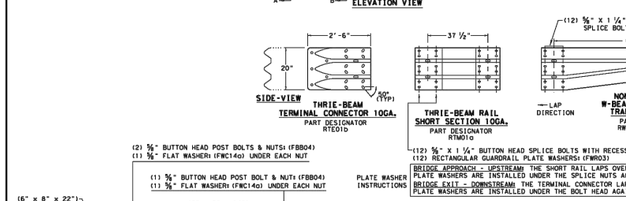
ORIGINAL LAYOUT SIZE – 22X34



GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31)STANDARD SHEET.
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16G)AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
5. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
6. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
7. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
8. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT, MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
9. REFER TO GF(31)STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
10. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE TRANSITION.

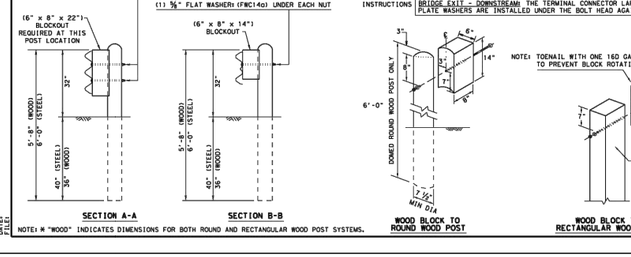


(2) ⅝" BUTTON HEAD POST BOLTS & NUTS# (FBB04)
(1) ⅝" FLAT WASHER# (FWC14G) UNDER EACH NUT

(1) ⅝" BUTTON HEAD POST BOLT & NUT# (FBB04)
(1) ⅝" FLAT WASHER# (FWC14G) UNDER EACH NUT

PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



LOW-SPEED TRANSITION

Texas Department of Transportation — Design Division Standard

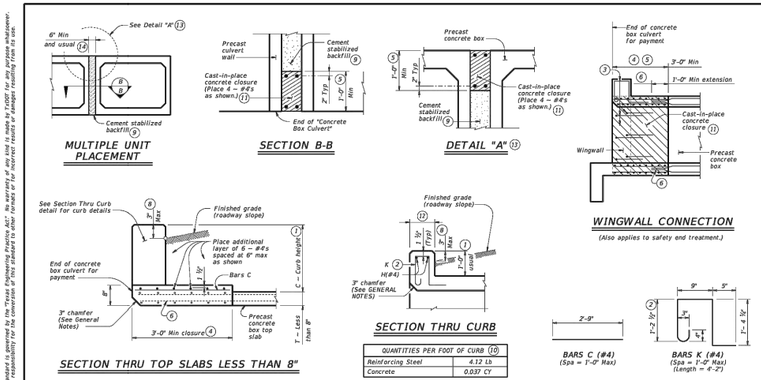
METAL BEAM GUARD FENCE
THRIE-BEAM TRANSITION
TL-2 MASH COMPLIANT

GF(31)TR TL2-19

FILE: gf31tr1-19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CCL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST		COUNTY	SHEET NO.

DISCLAIMER:
THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE:
FILE:



1. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
2. For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
3. Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
4. Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.
5. For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.
6. Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
7. Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
9. Cement stabilized backfill between boxes is considered part of the box culvert for payment.
10. All curb concrete and reinforcing is considered part of the box culvert for payment.
11. Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
12. 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
13. For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
14. This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

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

HL93 LOADING

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BOX CULVERTS
PRECAST
MISCELLANEOUS DETAILS

SCP-MD

FILE: CD-SCP-MD-20.dgn	DN: GAF	CK: LRB	DW: BRH/TJ/JDT	CK: GAF
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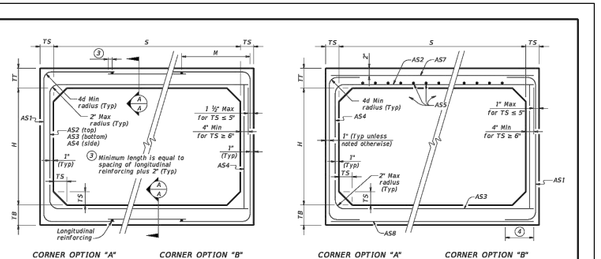
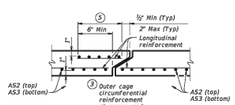
BOX DATA

SECTION DIMENSIONS S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	Fill Height (ft.)	H (Min) (in.)	REINFORCING (sq. in. / ft.) ② AS1	AS2	AS3	AS4	AS5	AS7	AS8	① Lift Weight (tons)
10	4	10	10	10	< 2	-	0.33	0.34	0.27	0.24	0.24	0.24	0.24	16.5
10	4	10	10	10	2 < 3	58	0.38	0.35	0.30	0.24	-	-	-	16.5
10	4	10	10	10	3 - 5	53	0.31	0.28	0.27	0.24	-	-	-	16.5
10	4	10	10	10	10	52	0.36	0.32	0.33	0.24	-	-	-	16.5
10	4	10	10	10	15	52	0.47	0.42	0.43	0.24	-	-	-	16.5
10	4	10	10	10	20	52	0.61	0.54	0.55	0.24	-	-	-	16.5
10	4	10	10	10	25	52	0.75	0.67	0.68	0.24	-	-	-	16.5
10	5	10	10	10	< 2	-	0.30	0.36	0.30	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2 < 3	58	0.35	0.39	0.34	0.24	-	-	-	17.5
10	5	10	10	10	3 - 5	52	0.28	0.31	0.30	0.24	-	-	-	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	-	-	-	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	-	-	-	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	-	-	-	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	-	-	-	17.5
10	6	10	10	10	< 2	-	0.28	0.38	0.33	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2 < 3	58	0.32	0.42	0.37	0.24	-	-	-	18.5
10	6	10	10	10	3 - 5	53	0.26	0.34	0.33	0.24	-	-	-	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	-	-	-	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	-	-	-	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	-	-	-	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	-	-	-	18.5
10	7	10	10	10	< 2	-	0.25	0.40	0.36	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2 < 3	58	0.30	0.45	0.40	0.24	-	-	-	19.5
10	7	10	10	10	3 - 5	53	0.24	0.36	0.35	0.24	-	-	-	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	-	-	-	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	-	-	-	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	-	-	-	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	-	-	-	19.5
10	8	10	10	10	< 2	-	0.24	0.41	0.38	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2 < 3	64	0.27	0.47	0.43	0.24	-	-	-	20.5
10	8	10	10	10	3 - 5	58	0.24	0.38	0.38	0.24	-	-	-	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	-	-	-	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	-	-	-	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	-	-	-	20.5
10	9	10	10	10	< 2	-	0.24	0.42	0.41	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2 < 3	70	0.26	0.50	0.46	0.24	-	-	-	21.5
10	9	10	10	10	3 - 5	64	0.24	0.40	0.40	0.24	-	-	-	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	-	-	-	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	-	-	-	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	-	-	-	21.5
10	10	10	10	10	< 2	-	0.24	0.44	0.44	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2 < 3	79	0.25	0.52	0.48	0.24	-	-	-	22.5
10	10	10	10	10	3 - 5	70	0.24	0.42	0.43	0.24	-	-	-	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	-	-	-	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	-	-	-	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	-	-	-	22.5

① For box length = 8'-0"
② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.





MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)."

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SINGLE BOX CULVERTS
PRECAST
10'-0" SPAN

SCP-10

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TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions: Maximum Wingwall Height Hw	W	X	Y	Z	Variable Reinforcing: Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	③ Estimated Quantities per ft of wing length (2-wings): Reinf (Lb/Ft)	Conc (CY/Ft)
2'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2-wings)

Bar	Size	No.	Spa
D	#3	–	1'-0"
E	#4	–	1'-0"
F	#4	–	1'-0"
G	#6	4	–
H	#4	4	–
P	#4	–	1'-0"
R	#5	6	–
V	#4	–	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	–	1'-0"
Q	#4	1	–
Reinf (lb/ft)			2.45
Conc (CY/ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$Hw = H + T + C - 0.250'$
$Lw = (Hw - 0.333') (SL)$

For cast-in-place culverts:
$Ltw = (N) (S) + (N - 1) (0.5')$

For precast culverts:
$Ltw = (N) (2D + S) + (N - 1) (0.5')$

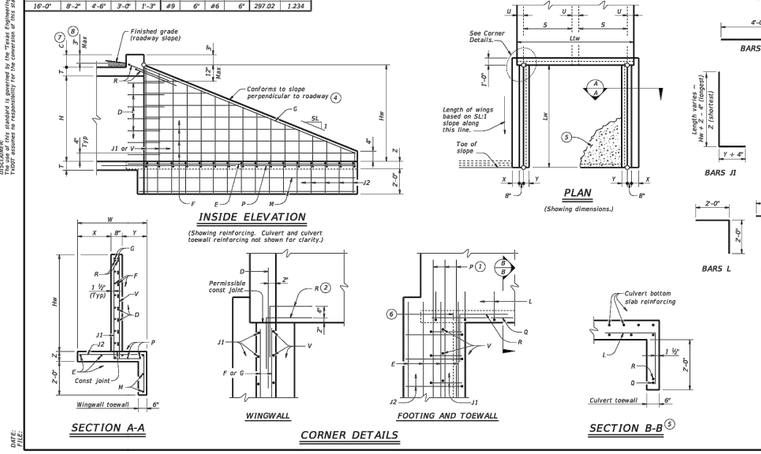
Total Wingwall Area (two wings – SF) = $(Hw + 0.333') (Lw)$

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.

① Extend Bars P 3'-0" minimum into bottom slab of box culvert.
② Adjust as necessary to maintain 1 1/2" clear cover and 4" minimum between bars.
③ Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
④ Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
⑤ When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-0" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
⑥ At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
⑦ Hw to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
⑧ For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.



MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS
WITH STRAIGHT WINGS FOR
0° SKEW BOX CULVERTS

SW-0

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STATE OF TEXAS
DAVID L. BESLY
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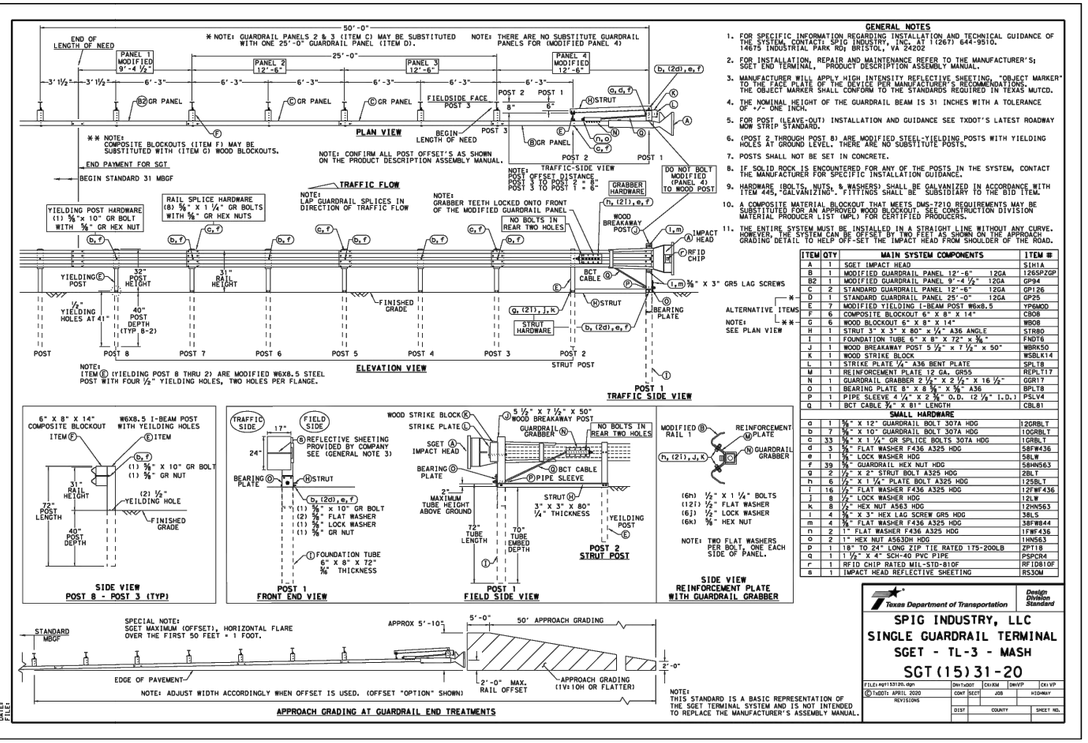
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 24	OF: 30

ORIGINAL LAYOUT SIZE – 22X34



GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT (126?) 644-9510, 14675 INDUSTRIAL PARK RD? BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING", FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE SPECIFIED UP TO 15 DEG. HORIZONTAL BEND. APPROPRIATE GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS		ITEM #
A	1	SGET IMPACT HEAD		SIM1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6"	12GA	12GSPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2"	12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6"	12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0"	12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6X8.5		YPBWOOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"		CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"		WBO8
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE		STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/16"		FND16
J	1	WOOD breakaway POST 5 1/2" X 7 1/2" X 50"		WBRK50
K	1	WOOD STRIKE BLOCK		WSBLK14
L	1	STRIKE PLATE 7/8" A36 BENT PLATE		SPL18
M	1	REINFORCEMENT PLATE 12 GA. GR55		REPL717
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"		GGR17
O	1	BEARING PLATE 8" X 8 3/8" X 3/8" A36		BPL18
P	1	PIPE SLEEVE 4" X 4" X 3/8" O.D. (2 1/2" I.D.)		PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH		CBL81
		SMALL HARDWARE		
a	1	3/4" X 12" GUARDRAIL BOLT 307A HDG		12GRBLT
b	7	3/4" X 10" GUARDRAIL BOLT 307A HDG		10GRBLT
c	33	3/4" X 1 1/4" GR SPLICE BOLTS 307A HDG		1GRBLT
d	3	3/4" FLAT WASHER F436 A325 HDG		SBF#436
e	1	3/4" LOCK WASHER HDG		SBLW
f	39	3/4" GUARDRAIL HEX NUT HDG		SBHN563
g	2	1/2" X 2" STRUT BOLT A325 HDG		2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG		125BLT
i	14	1/2" FLAT WASHER F436 A325 HDG		12FBF436
j	8	1/2" LOCK WASHER HDG		12LW
k	8	1/2" HEX NUT A563 HDG		12HN563
l	4	5/8" X 3" HEX LAG SCREW GR5 HDG		3BLS
m	4	5/8" FLAT WASHER F436 A325 HDG		3BFB#4
n	2	1" FLAT WASHER F436 A325 HDG		1FB#436
o	1	1" HEX NUT A563GH HDG		1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB		ZPT18
q	1	1/2" X 4" SCH-40 PVC PIPE		PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F		RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING		RS30M

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SPIG INDUSTRY, LLC SINGLE GUARDRAIL TERMINAL SGET - TL-3 - MASH

SGT(15)31-20

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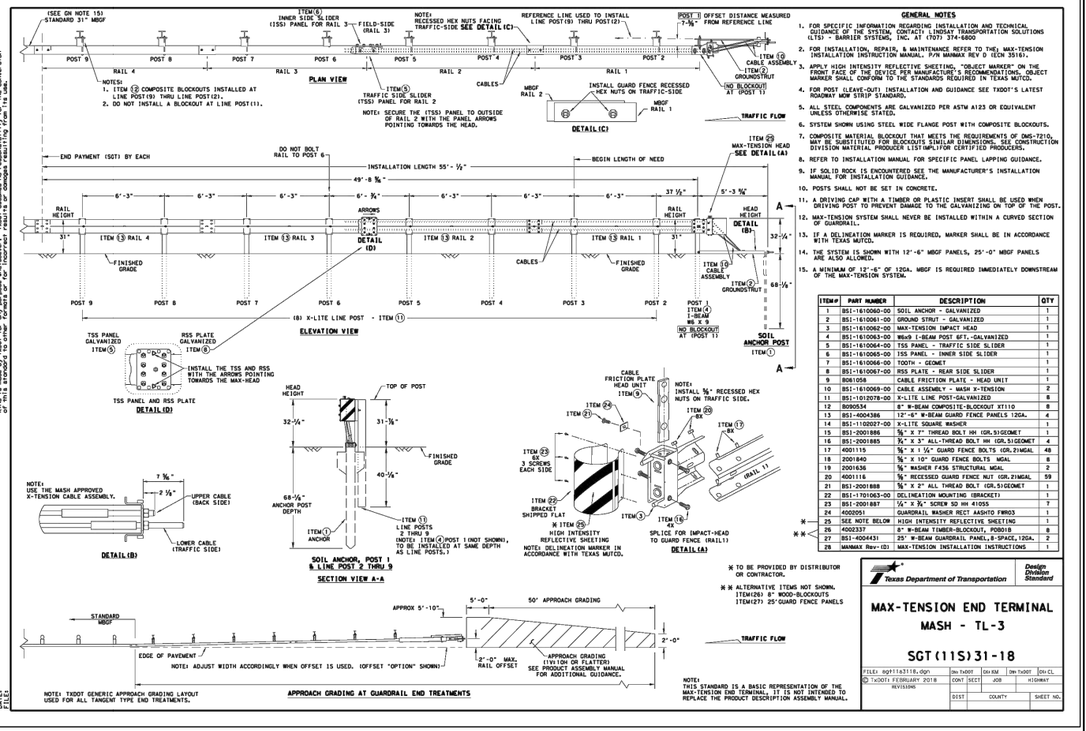

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT (1888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN# 62023TB
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING", FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS, REFER TO SoftStop's INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE# A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/8" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE# B	PART PN#5851B-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN#5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE# C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN#616 ANCHOR RAIL 25'-0" PN#15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
62023TB	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
616	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 3/8")
15203G	1	POST #1 - (STYP) (4'- 8 1/2")
15000G	1	POST #2 - (STYP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (3/8" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
390BG	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
370HG	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	3/4" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	3/4" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	3/4" x 10" HGR POST BOLT A307
3391G	1	3/4" x 1 3/4" HEX HD BOLT A325
448BG	1	3/4" x 9" HEX HD BOLT A325
4372G	4	3/4" WASHER F436
105285G	2	3/4" x 2 1/2" HEX HD BOLT GR-5
105286G	1	3/4" x 1 1/2" HEX HD BOLT GR-5
324GG	6	3/4" ROUND WASHER (WIDE)
324SG	3	3/4" HEX NUT A563 GR.DH
585ZG	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE#B

Texas Department of Transportation — Design Division Standard

MAX-TENSION END TERMINAL MASH - TL-3

SGT(11S)31-18

FILE: sgt11s31t8.dgn | DN: TxDOT | CK: KM | DW: VP | CK: CL
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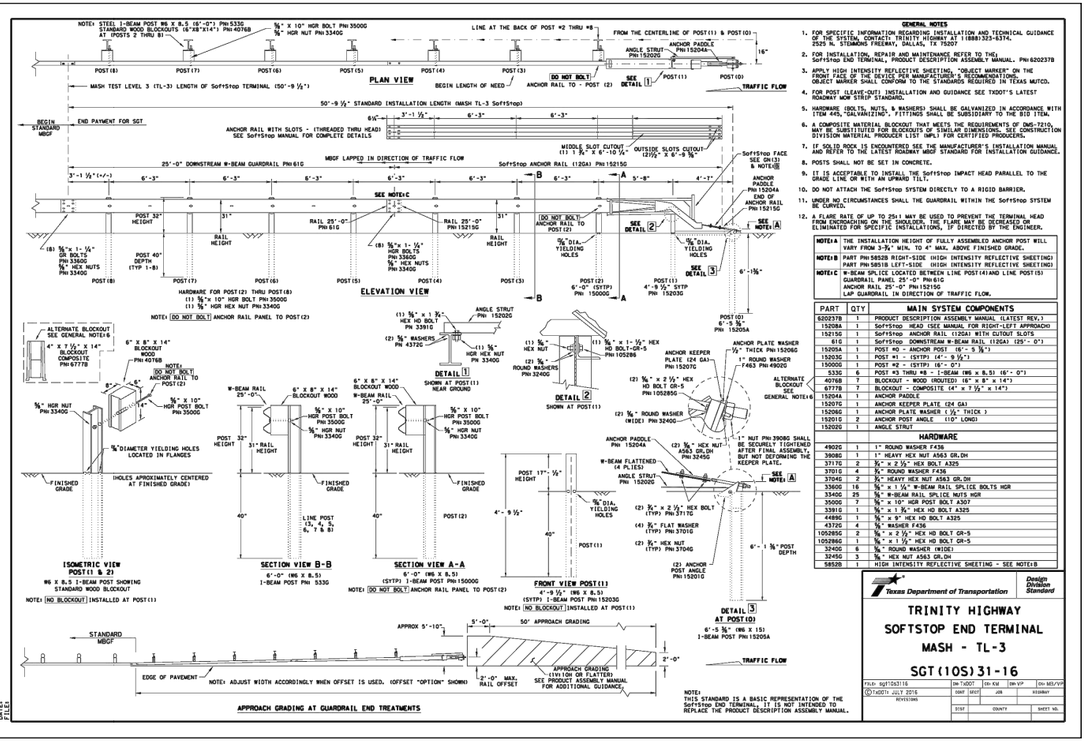

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435, 3610 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-0627).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM#	PART NUMBER	DESCRIPTION	QTY
1	BS1-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BS1-1610061-00	GROUND STRUT - GALVANIZED	1
3	BS1-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BS1-1610063-00	W6x8.5 I-BEAM POST 6FT.-GALVANIZED	1
5	BS1-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BS1-1610065-00	TSS PANEL - INNER SIDE SLIDER	1
7	BS1-1610066-00	TOOTH - GEOMET	1
8	BS1-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	R061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BS1-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BS1-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	R090034	8" W-BEAM COMPOSITE-BLOCKOUT RT110	8
13	BS1-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BS1-1110027-00	X-LITE SQUARE WASHER	1
15	BS1-2001886	5/8" X 7" THREAD BOLT HH (GR.5)(GEOMET	4
16	BS1-2001885	5/8" X 3" ALL-THREAD BOLT HH (GR.5)(GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BS1-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)(GEOMET	1
22	BS1-1701063-00	DEL(INEATION MOUNTING (BRACKET)	1
23	BS1-2001887	1/4" X 3/4" SCREW SD HH 410SS	1
24	4002051	GUARDRAIL WASHER RECT ASHSTD FW803	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PD8018	8
27	BS1-4004451	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	WHMAX Rev-(B)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

Texas Department of Transportation — Design Division Standard

SINGLE GUARDRAIL TERMINAL MSKT-MASH-TL-3

SGT(12S)31-18

FILE: sgt12s31t8.dgn | DN: TxDOT | CK: KM | DW: VP | CK: CL
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REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

BLEYL ENGINEERING
PLANNING • DESIGN • MANAGEMENT
1722 Broadmoor Street, Suite 210, Bryan Tx. 77802
Texas Firm Registration No. F-678
Tel. 979-268-1125 Fax 979-260-3849
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DETAILS 2 OF 7
BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS — DAVID L. BESLY — 81873 — LICENSED — PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 25	OF: 30

ORIGINAL LAYOUT SIZE - 22X34

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))
- 10GMG = 10 GMG Tubing (see SMD(SLIP-1) to (SLIP-3))
- SB0 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

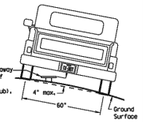
Number of Posts (1 or 2)

Anchor Type
- UA = Universal Anchor - Concreted (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 - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab. "Plate" (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
- 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- WC = 1.12 K/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
- EAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

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.

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

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.

BEHIND BARRIER

BEHIND GUARDRAIL **BEHIND CONCRETE BARRIER**

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

* 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

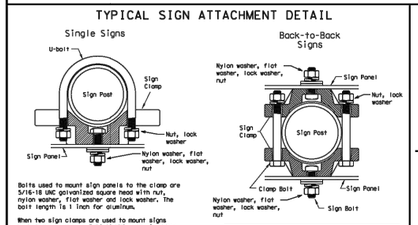
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

TYPICAL SIGN ATTACHMENT DETAIL



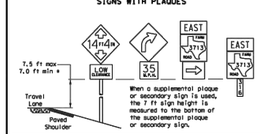
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

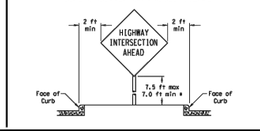
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



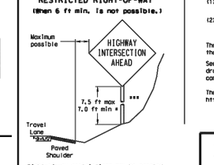
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
GENERAL NOTES & DETAILS

SMD(GEN)-08

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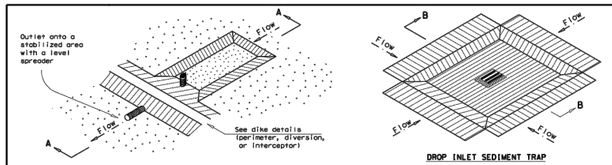
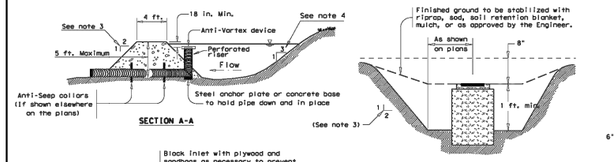
SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

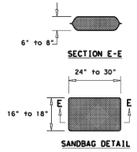
(ST/PO)

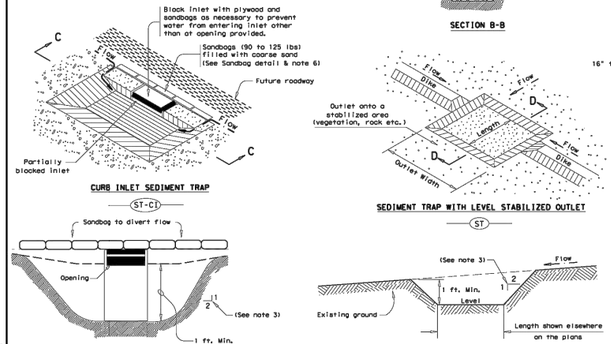


DROP INLET SEDIMENT TRAP

(ST-DI)







GENERAL NOTES

1. Pipe outlet material shall conform to the item "Pipe Underdrains" or as accepted by the Engineer.
2. All pipe connections shall be watertight.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter. Protect the traveling public from inlet stacks within the clear zone.
4. Sediment basins shall have side slopes of 3:1 or flatter.
5. The dimensions and limits of excavation for sediment basins and traps will be as shown elsewhere on the plans.
6. The sandbag material shall be made of polypropylene, polyethylene or polyamide woven fabric, min. unit weight 4 ounces /SY, Mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70%.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment basin and/or trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Basins: The drainage area for a sediment basin should not exceed 100 acres. The basin capacity shall be at least 1800 CF/Acre of drainage area (0.5" over the drainage area). If the disturbed area draining to the basin is larger than 10 acres, the basin capacity should be 3600 CF/Acre (1.0" over the drainage area).

The basin should have a 40 hour draw-down time with an emergency spillway. The spillway may be designed to pass the peak rate of runoff from a 25 year frequency storm. The 100 year storm should be investigated to consider possible flooding impacts.

The entrance into the basin should be protected from erosion. The basin should be cleaned when the capacity has been reduced by 1/3.

Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:
1. Within drainage ditches spaced # 500': on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

The trap outlet may either be through a perforated riser and pipe assembly designed to achieve a 40 hour draw-down time or over a level stabilized area (vegetation, rock, etc.).

The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1', whichever is less.

PLANS SHEET LEGEND

- (ST/PO) Sediment Basin and / or Trap with Pipe Outlet
- (ST-DI) Drop Inlet Sediment Trap
- (ST-CI) Curb Inlet Sediment Trap
- (ST) Sediment Trap with Level Stabilized Outlet

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
SEDIMENT BASINS AND TRAPS (EARTHWORK FOR EROSION CONTROL.)
EC(6)-16

FILE: ec616 | DN: TxDOT | CK: RM | DW: VP | CK: LS
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

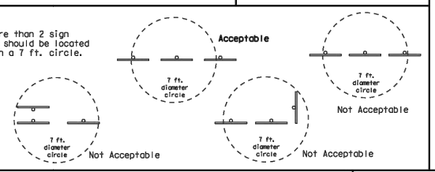
Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10GMG = 10 GMG Tubing (see SMD(SLIP-1) to (SLIP-3))
- SB0 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

Anchor Type
- UA = Universal Anchor - Concreted (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 - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab. "Plate" (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))

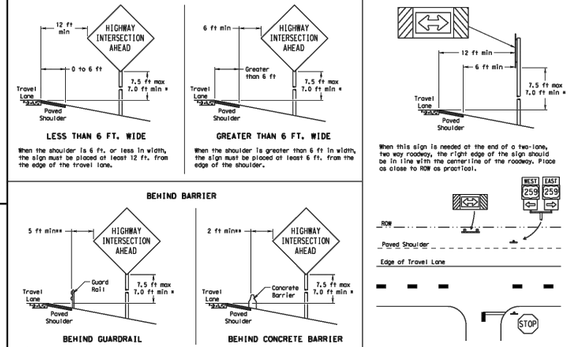
IF REQUIRED
- 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- WC = 1.12 K/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
- EAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))



REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT

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



TYPICAL SIGN ATTACHMENT DETAIL

SIGNS WITH PLAQUES

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

RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)

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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
GENERAL NOTES & DETAILS

SMD(GEN)-08

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

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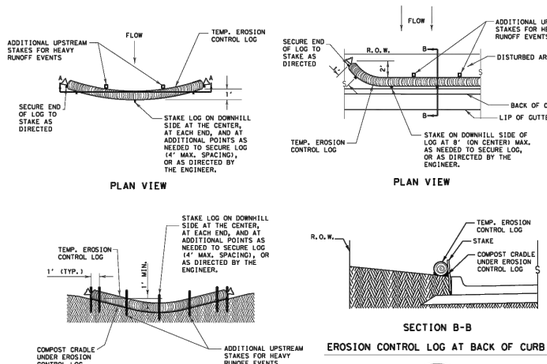
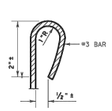


LEGEND

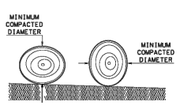
- (CL-D) EROSION CONTROL LOG DAM
- (CL-BOC) EROSION CONTROL LOG AT BACK OF CURB
- (CL-ROW) EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- (CL-SST) EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- (CL-SSL) EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- (CL-DI) EROSION CONTROL LOG AT DROP INLET
- (CL-CI) EROSION CONTROL LOG AT CURB INLET
- (CL-GI) EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:
1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

SHEET 1 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

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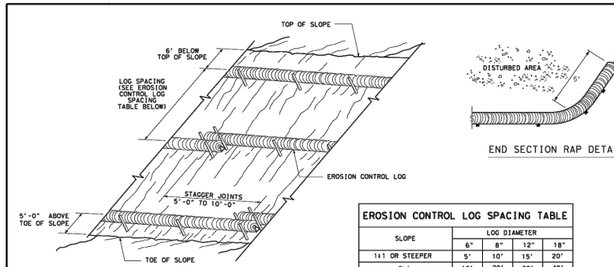
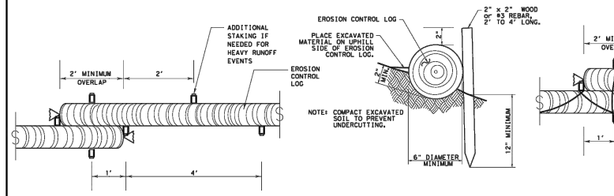


EROSION CONTROL LOG SPACING TABLE

SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



TRENCH DEPTH TABLE

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

SHEET 2 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

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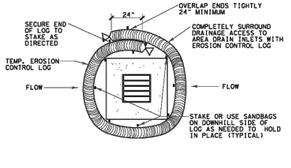
DETAILS 3 OF 7
BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 26	OF: 30

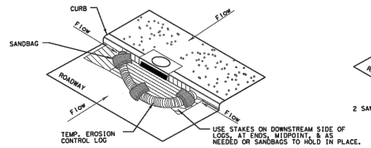
JGORDON
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DRV.7 - DETAILS.DWG
6/25/2025 9:03:32 AM

ORIGINAL LAYOUT SIZE – 22X34



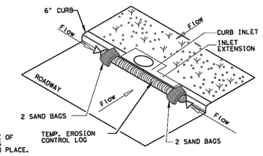
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

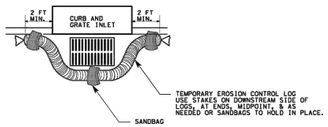
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

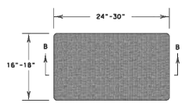
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

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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. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER 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. For mobile operations, CSJ limit signs are not required.
11. 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 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," or equivalent revisions, and 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.
2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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5-10 5-21				

PREPARED FOR:

BURLESON COUNTY
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CALDWELL, TX, 77836

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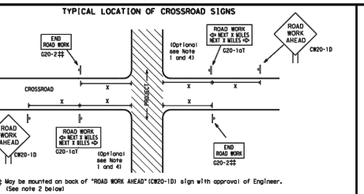
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS — DAVID L. BESLY — 81873 — LICENSED — PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 27	OF: 30

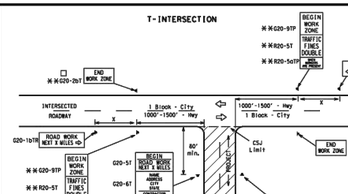
TYPICAL LOCATION OF CROSSROAD SIGNS



✠ May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer.
See note 2 below.

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) 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 as per TMUTCD Part 5. 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 considered as 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 "ROAD WORK NEXT X MILES"(G20-1aT)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 on or near an intersection.
2. If construction closes the road at a T-Intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING △◊

SIZE

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

SPACING

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

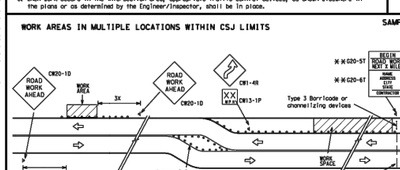
✠ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

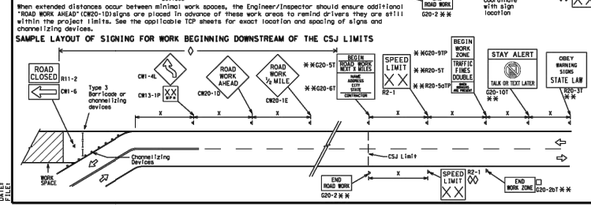
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

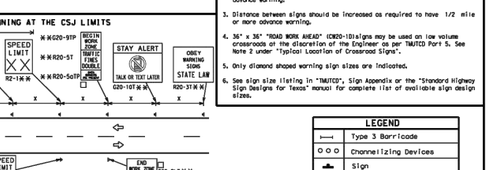


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

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

☐ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2b†) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

✠✠ CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign, and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
	Type 3 Barricade
○○○	Channelizing Devices
	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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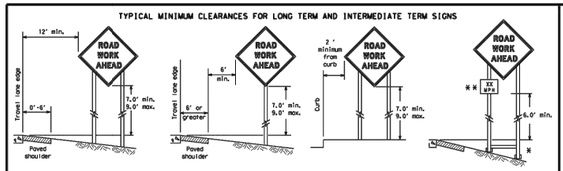
7-13 5-21	DIST		COUNTY	SHEET NO.

DATE/FILE

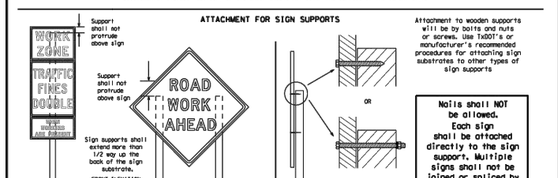
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



✠ When placing skid supports on uneven 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



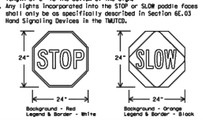
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall 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.

Splicing embedded perforated square metal tubing in order to extend post height is 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.

STOP/SLOW PADDLES

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



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_N, OR C_N SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

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, specific service (LOGO), or cultural information. Drivers processing 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. For details for covering large guide signs see the TS-CD standard.
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 crossbeams bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crossbeamty supports as shown on the BC standard sheets, TLS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets 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 or 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.

DATE/FILE

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. 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.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets.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.
7. 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.
8. Any identification markings may be placed only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. 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 heights, the size of signs, and the type of sign sheeting may 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 pavement.
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 relocated 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 Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans 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 CWTCD 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 cleats, 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 A_N shall be used for all signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_N or Type C_N, 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 Designs for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This 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 solids shall not be turned of 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.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be filled shut to keep the sand from spilling and to maintain a stable 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 25 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact, rather than as tire inner tubes will not.
6. 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 CWTCD list.
7. 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 from legs, sign, or other fasteners. Sandbags shall be placed along the legs, sign, or braces to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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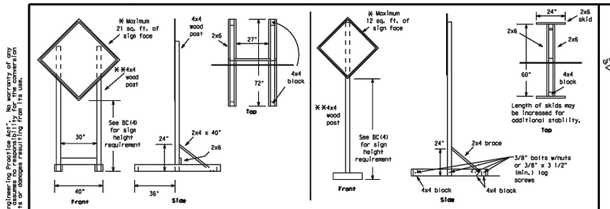
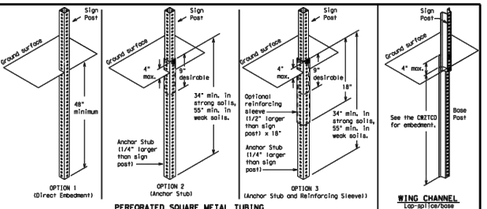
ORIGINAL LAYOUT SIZE — 22X34



SKID MOUNTED WOOD SIGN SUPPORTS

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

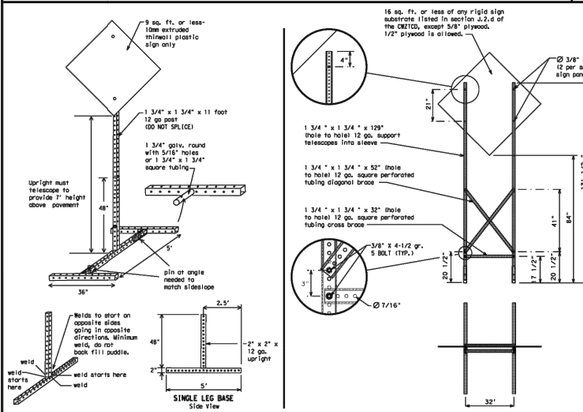


PERFORATED SQUARE METAL TUBING

WING CHANNEL
LOC-WC158/208 Bolted anchor

GROUND MOUNTED SIGN SUPPORTS

Refer to the CRZTCD 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.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(11)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CRZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

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. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CRZTCD List.
3. 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 CRZTCD for the type of sign substrate that can be used for each approved sign support.

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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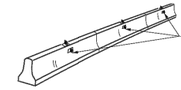
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found on the Material Producer List web address shown on BC(11).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. the cost of the reflectors shall be considered subsidiary to Item 512.



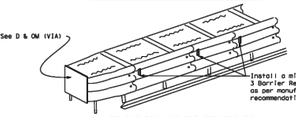
CONCRETE TRAFFIC BARRIER (CTB)

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

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

LOW PROFILE CONCRETE BARRIER (LPCB)



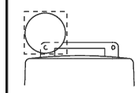
DELINEATION OF END TREATMENTS

END TREATMENTS OF CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CRZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

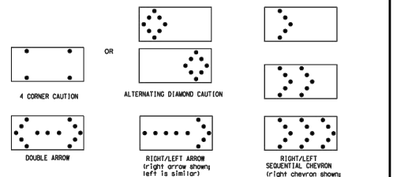
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A ranges flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 85 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a slip, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

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

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

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

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



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage.
8. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
9. 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.
10. The sequential arrow display is NOT ALLOWED.
11. The TxDOT standards; however, the sequential chevron display may be used during daylight operations.
12. A Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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 Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CRZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CRZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of area exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work area is an extended distance from the TMA.

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Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

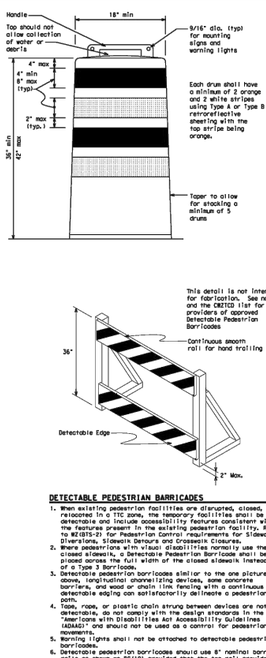
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit body (installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

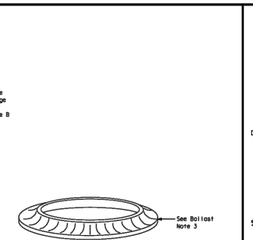
RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crush rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CRZTCD list.
4. 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.
5. 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.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.





18" x 24" Sign (Minimum Sign Dimension) Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70g, Keep Right R4 series or other signs as approved by Engineer

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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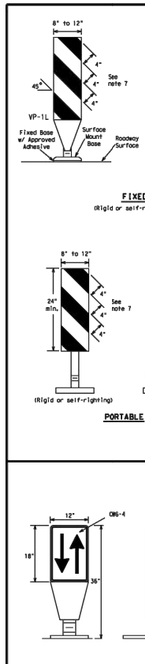
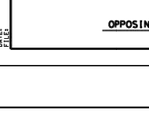
DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a temporary Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades shall include the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade posts as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



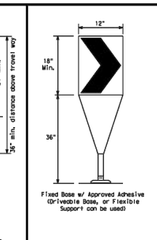
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use 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, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable bases. See "Compliant Work Zone Traffic Control Devices List" (CRZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of the sheeting material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



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 sight 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 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_W or Type C_W conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

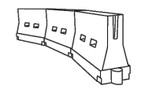


1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that one chevron always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_W or Type C_W conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet 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.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CRZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 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.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs 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. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CRZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers in BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

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 Manual for Assessing Safety Hardware (MASH) 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 CRZTCD 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 a 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 not be less than 32 inches in height.

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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REV	DATE	BY	APP	COMMENT

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

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BRYAN CONROE HOUSTON AUSTIN

DETAILS 5 OF 7

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS — DAVID L. BESLY — 81873 — LICENSED — PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 28	OF: 30

ORIGINAL LAYOUT SIZE — 22X34

TYPE 3 BARRICADES

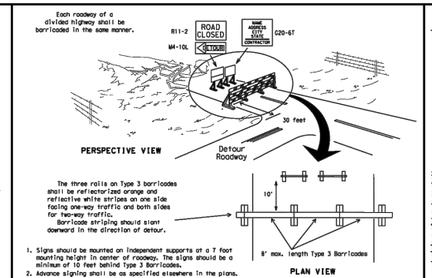
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending 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 towards the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, consistency sand is recommended. The sandbags will be filed shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that resists ultraviolet impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B 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

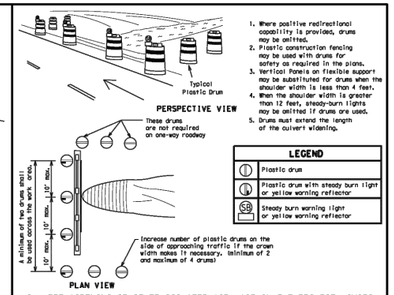
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



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 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

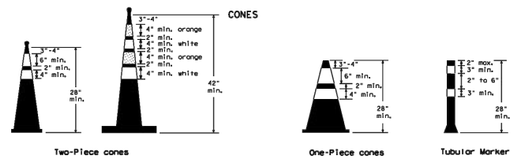
TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

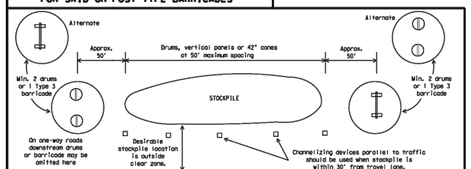


Two-Piece cones — One-Piece cones — Tubular Marker

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 predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface, and shall be retroreflective of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

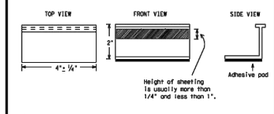
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 1995.
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 three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	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).

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

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE= bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	DIST		COUNTY	SHEET NO.

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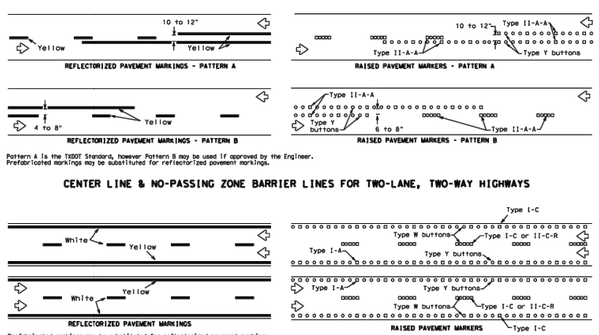
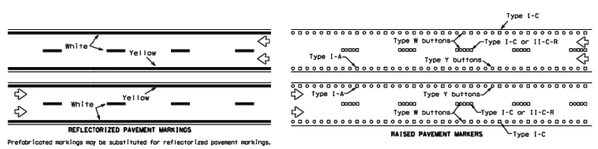
PAVEMENT MARKING PATTERNS



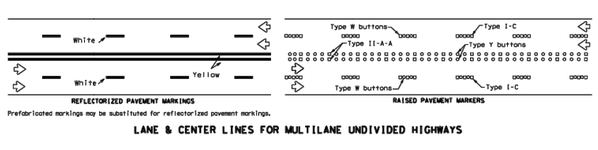
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

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



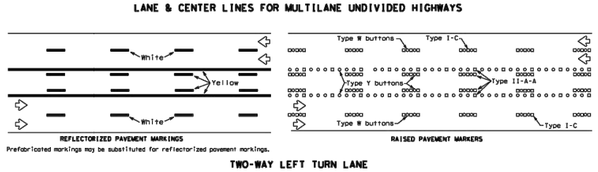
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

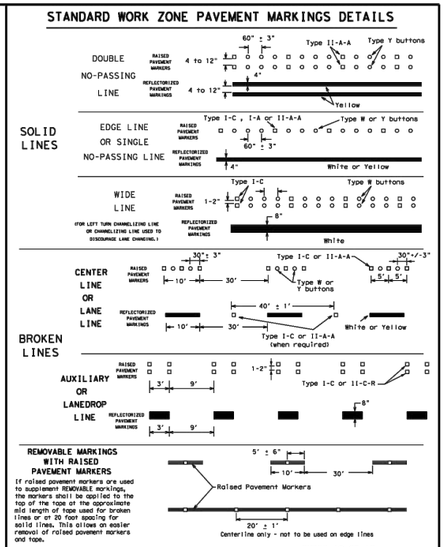
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



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 on 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."

SHEET 12 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE= bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	DIST		COUNTY	SHEET NO.

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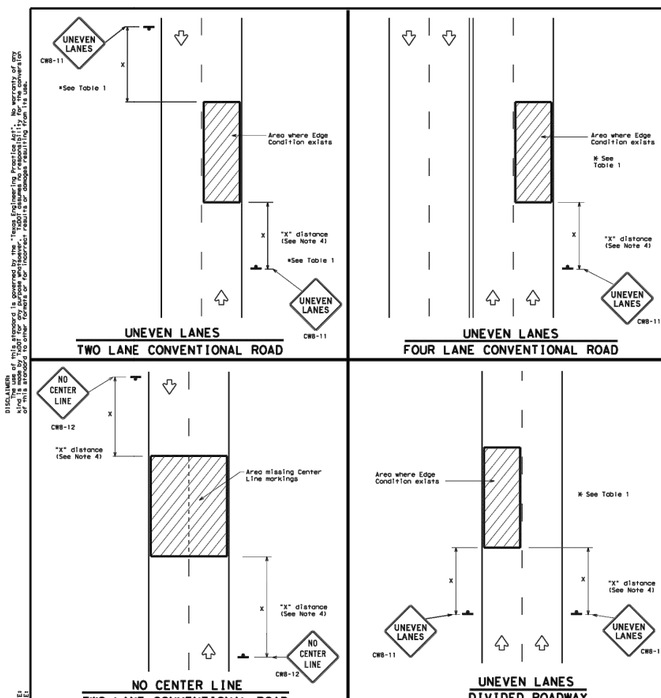

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CWB-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CWB-11) signs shall 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 (CWT-3UP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CWB-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
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.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
1	Less than or equal to 1½" (maximum-planing) 1½" (typical-overlay)	Signs CWB-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
2	Less than or equal to 3"	Signs CWB-11
3	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

Notched Wedge Joint

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

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation — Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE= wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 8-95 2-98 7-13 1-97 3-03	DIST		COUNTY	SHEET NO.

112.2

PREPARED FOR:

BURLESON COUNTY
100 WEST BUCK
CALDWELL, TX, 77836

REV	DATE	BY	APP	COMMENT

BLEYL ENGINEERING
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BRYAN — CONROE — HOUSTON — AUSTIN

DETAILS 6 OF 7

BURLESON CO -
24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

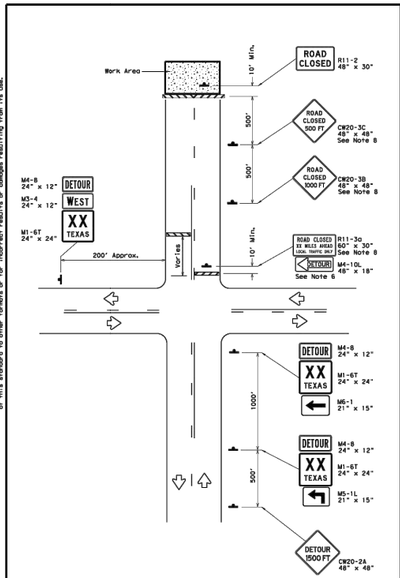
STATE OF TEXAS — DAVID L. BESLY — 81873 — LICENSED — PROFESSIONAL ENGINEER
6-25-2024

DESIGN: CS	
CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 29	OF: 30

DATE: FILE:

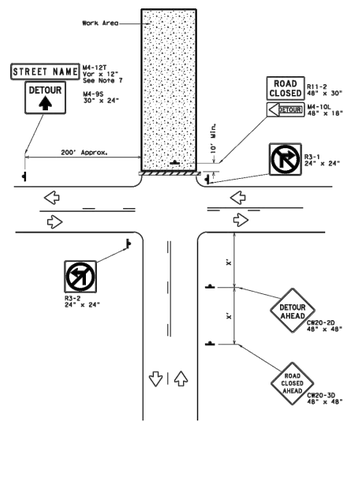
JGORDON
Z:\13300\13357 BURLESON-GLO CDBG MIT MOD\04 CAD\CD-13357\MALLARD_DRV.7 — DETAILS.DWG
6/25/2025 9:04:34 AM

ORIGINAL LAYOUT SIZE – 22X34



ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
Type 3 Barricade	
Sign	

Posted Speed M	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

M Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the DBGM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(1)01 and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

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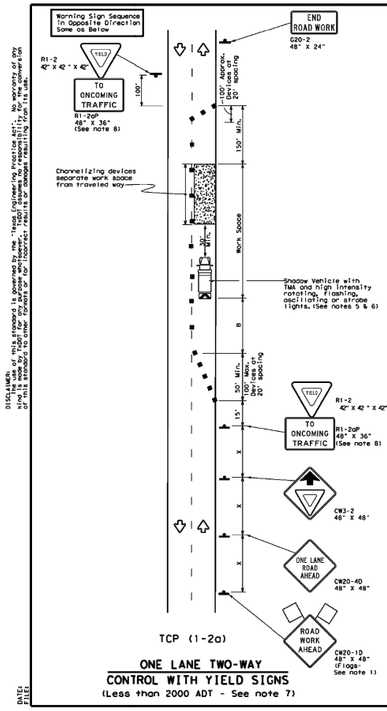
REVISIONS					
1-92 4-98 2-13		DIST		COUNTY	SHEET NO.
2-98 3-03					

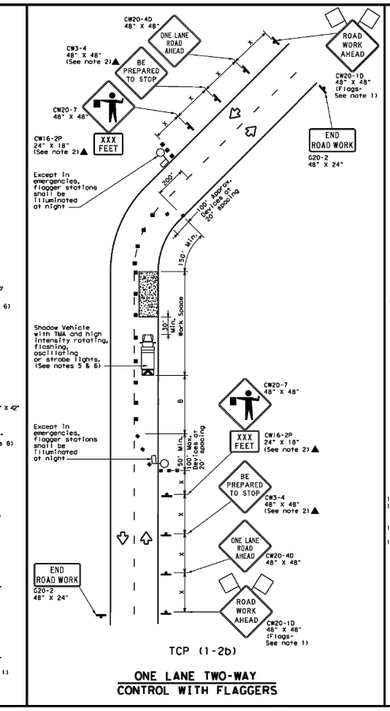
TRF-1



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

Posted Speed M	Formula	Minimum Desirable Taper Lengths M/M			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' offset	12' offset	14' offset	On a tangent	On a curve			
30	L = WS²/60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45		450'	495'	540'	45'	90'	320'	195'	360'
50	L = WS	500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW1-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

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

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TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

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4-90 4-98		DIST		COUNTY	SHEET NO.
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1-97 2-13					

TRF-2

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DETAILS 7 OF 7

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24-065-057-E567-STREET-DRAINAGE
MALLARD DRIVE
BURLESON COUNTY, TEXAS

STATE OF TEXAS
DAVID L. BESLY
81873
LICENSED
PROFESSIONAL ENGINEER
6-25-2024

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CAD: JG	RVW: DLB
PROJECT NO: 13357	
SHEET: 30	OF: 30