

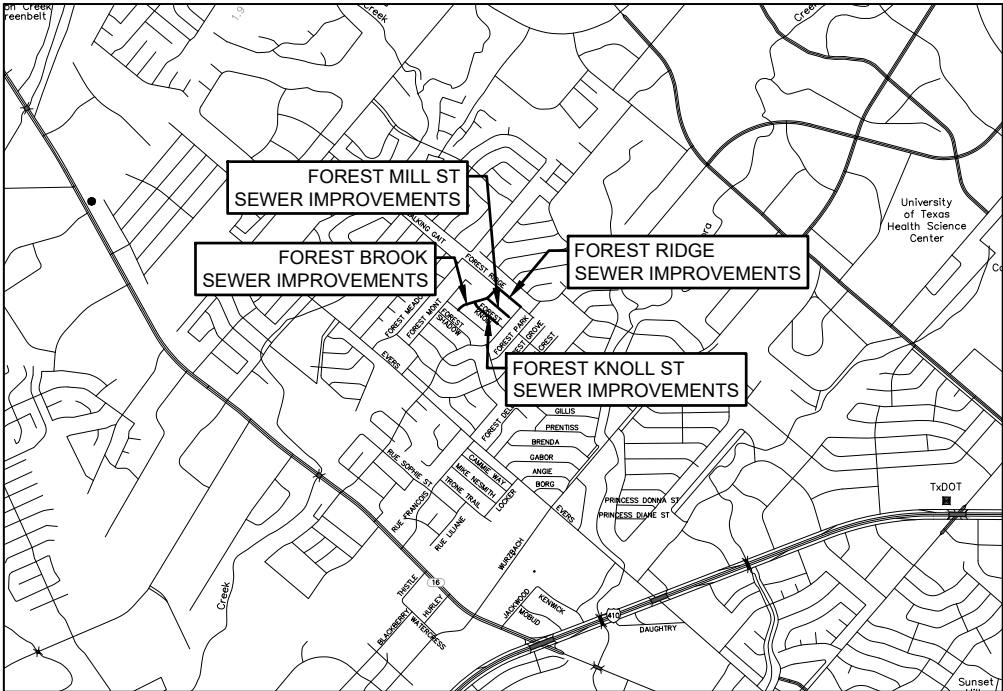
LEON VALLEY PUBLIC WORKS DEPARTMENT

BID NO. 2025-05

2025 FOREST OAKS SEWER IMPROVEMENTS



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NTS

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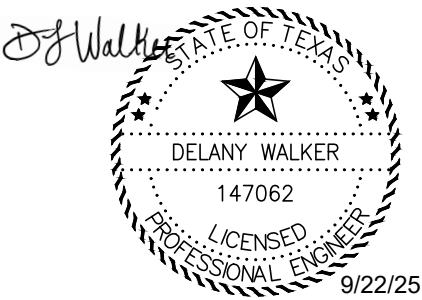
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GENERAL NOTES:

- ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE CITY OF LEON VALLEY AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
- A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
- A. CURRENT TxDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
- B. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
- C. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR CONSTRUCTION".
- D. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL OBTAIN SAWS STANDARD DETAILS FROM SAWS WEBSITE, http://apps.saws.org/business_center/specs/consts_specs/ UNLESS OTHERWISE NOTED WITHIN DESIGN PLANS.
3. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE CITY'S INSPECTION DIVISION, AND PROVIDE NOTIFICATION PROCEDURES THE CONTRACTOR WILL USE TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS TWO (2) WEEKS PRIOR TO EXCAVATION.
4. IF NECESSARY, CONTRACTOR WILL COORDINATE USE OF CITY PREMISES AT NO ADDITIONAL COST TO THE CITY.
5. LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO THE CITY OF LEON VALLEY.
6. THE EXISTING CONDITIONS WERE DETERMINED AT THE TIME OF PLAN PREPARATION JULY 2025. THE LOCATIONS SHOWN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DAMAGES TO THE EXISTING UTILITIES DUE TO NEGLIGENCE OF THE CONTRACTOR OR DUE TO EXCAVATION OUTSIDE OF THE DEFINED CONSTRUCTION LIMITS OF THIS PROJECT. CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY OF FIELD VERIFYING EACH UTILITY LOCATION AND COORDINATING AND NOTIFYING OWNERS AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO EXCAVATION. CALL 811 OR 1-800-545-6005 FOR UTILITY LOCATES. TELEPHONE NUMBERS OF UTILITY OWNERS ARE LISTED BELOW FOR THE CONTRACTOR'S CONVENIENCE.
- | COMPANY NAME | TELEPHONE NUMBER |
|---------------------------|---------------------------------|
| C.P.S ENERGY | 1-800-545-6005 |
| SAWS | 1-800-545-6005 |
| SW BELL | 1-800-545-6005 |
| SPECTRUM | 1-800-545-6005 |
| LEON VALLEY WATER & SEWER | 210-336-0858
(RANDY HOCKETT) |
| AT&T | 1-800-252-1133 |
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGES DONE BY THE PROJECT'S CONSTRUCTION (NSPI).
8. CONTRACTOR SHALL NOT MAKE USE OF DUMPSTERS OR WASTE BINS THAT ARE INTENDED TO SERVE RESIDENTS AND/OR BUSINESSES.
9. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION AND BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.
10. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
11. ALL WORK DONE WITHIN THE 100-YEAR FLOODPLAIN SHALL BE DONE IN ACCORDANCE WITH FLOODPLAIN DEVELOPMENT PERMIT.
12. ANY WORK COMPLETED WITHOUT PRIOR WRITTEN AUTHORIZATION WHICH IS NOT INCLUDED IN THESE PLANS AND SPECIFICATIONS WILL NOT BE COMPENSATED BY THE CITY OF LEON VALLEY.
13. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM WORK ON CITY OF LEON VALLEY RECOGNIZED HOLIDAYS.

WEEKEND WORK: CONTRACTORS ARE REQUIRED TO SUBMIT REQUEST TO THE CITY OF LEON VALLEY INSPECTION CONSTRUCTION DEPARTMENT BY 12:00PM ON THE WEDNESDAY PRIOR TO THE WEEKEND BEING REQUESTED. REQUEST SHOULD BE SENT TO THE OWNER.

ANY AND ALL UTILITY WORK INSTALLED WITHOUT WEEKEND APPROVAL WILL
BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.

- PRE CON SITE VIDEO: BEFORE THE START OF ANY CONSTRUCTION, THE CONTRACTOR MUST BE VIDEO RECORDED BY THE CONTRACTOR WITH ONE COPY SUBMITTED TO THE CITY OF LEON VALLEY. A PRE-SITE VIDEO WILL PROVIDE ACCURATE DOCUMENTATION OF THE EXISTING CONDITIONS (NSPI).
15. POWER POLE BRACING: CONTRACTORS SHOULD BE ADVISED THAT THERE ARE EXISTING OVERHEAD UTILITY POLES ALONG THE PROJECT CORRIDOR. CONTRACTORS SHOULD FURTHER BE ADVISED THAT IF THE DISTANCE FROM THE OUTSIDE FACE OF A UTILITY TRENCH TO THE FACE OF A UTILITY POLE IS LESS THAN 5 FEET, SAID UTILITY POLE IS SUBJECT TO BRACING, BASED ON A DETERMINATION MADE BY UTILITY POLE OWNER. COSTS INCURRED BY CONTRACTOR FOR BRACING OF THESE UTILITY POLES IS SUBSIDIARY TO THAT RESPECTIVE UTILITY COMPANY'S WORK. IT IS ADVISABLE FOR THE CONTRACTOR TO REVIEW THE CONSTRUCTION DOCUMENTS, AND VISIT THE CONSTRUCTION SITE TO DETERMINE POTENTIAL IMPACTS.
16. CONSTRUCTION SEQUENCING: IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO SCHEDULE SEQUENCING FOR REMOVAL AND INSTALLATION OF EXISTING AND PROPOSED CITY OF LEON VALLEY UTILITIES IN CONJUNCTION WITH GENERAL PROJECT CONSTRUCTION. SEQUENCE OF CONSTRUCTION ACTIVITIES SHALL BE CONSIDERED IN ORDER TO MINIMIZE THE EXTENT AND DURATION OF DISTURBANCES.
17. CONTRACTOR SHALL COMPLY WITH APPLICABLE REGULATIONS INCLUDING, BUT NOT LIMITED TO, THOSE OVERSEEN BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA). OSHA INFORMATION AND RELATED MATERIALS MAY BE OBTAINED AT <https://www.osha.gov/> OR AT THE OSHA SAN ANTONIO OFFICE LOCATED AT FOUNTAINHEAD TOWER, SUITE 605 8200 W. INTERSTATE 10 SAN ANTONIO, TX 78230 WHICH IS ALSO REACHABLE BY PHONE AT (210)472-5040.
18. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS, BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED IN THE PAY ITEM TO WHICH IT RELATES.
19. CONFLICTS IN THE PLANS AND/OR SPECIFICATIONS FOUND BY THE CONTRACTOR SHALL BE PROMPTLY REPORTED TO THE INSPECTOR BEFORE PROCEEDING WITH CONSTRUCTION.
20. BIDDERS ARE HEREBY NOTIFIED TO MAKE SUCH SUBSURFACE INVESTIGATIONS AS THEY DEEM NECESSARY. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ROCK, SAND, GRAVEL OR OTHER UNSTABLE CONDITIONS ENCOUNTERED IN STREET EXCAVATION, BOX CULVERT EXCAVATION, STRUCTURAL EXCAVATION, PIPE EXCAVATION OR CHANNEL EXCAVATION.
21. THE CONTRACTOR SHALL LIMIT WORK ACTIVITIES TO THE STREET RIGHTS-OF-WAY AND EASEMENTS. NO PROVISIONS HAVE BEEN MADE FOR WORK ACTIVITIES OR STORAGE OF MATERIALS AND/OR EQUIPMENT ON PRIVATE PROPERTY.
22. THE CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKERS, ETC. ANY CONSTRUCTION STAKES, MARKERS, ETC., DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
23. CONTRACTOR SHALL PROTECT FROM DAMAGE ALL TREES WITHIN THE PROJECT'S RIGHT-OF-WAY AND VARIOUS CONSTRUCTION AND FILL EASEMENTS EXCEPT FOR THOSE TREES SPECIFICALLY DESIGNATED BY THE "CONSTRUCTION INSPECTOR" TO BE REMOVED FOR CONSTRUCTION PURPOSES. ALL TREES WHICH ARE NOT DESIGNATED FOR REMOVAL AND ARE DAMAGED BY CONTRACTOR SHALL BE COMPENSATED FOR OR REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF LEON VALLEY OR THE PROPERTY OWNER.
24. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO DEVELOP THE CONTRACTOR'S PLANS TO IMPLEMENT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS.
25. THE CONTRACTOR SHALL MAINTAIN ALL ADJOINING STREETS AND TRAVELED ROUTES FREE FROM SPILLED AND/OR TRACKED CONSTRUCTION MATERIALS.
26. ANY CAVERN OR SOLUTION CHANNELS ENCOUNTERED DURING CONSTRUCTION SHALL BE REPORTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY OFFICE WITH A REQUEST FOR APPROVAL OF CONSTRUCTION.
27. ALL WASTE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND IT SHALL BE HIS SOLE RESPONSIBILITY TO DISPOSE OF THIS MATERIAL OFF THE LIMITS OF THE RIGHT-OF-WAY AND TO PRIVATE OWNERS. NO WASTE MATERIALS SHALL BE PLACED IN EXISTING LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS OF EXISTING NATURAL DRAINAGE. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING A FLOOD PLAIN DEVELOPMENT FROM THE APPROPRIATE ENTITY.
28. CONTRACTOR IS TO MAINTAIN UNRESTRICTED DRAINAGE OF THE PROJECT SITE AND ADJACENT AREAS DURING CONSTRUCTION.
29. AFTER COMPLETION OF ALL WORK, THE CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE RIGHT-OF-WAY AND LEAVE THE WORK AREA NEAT AND CLEAN. ANY TEMPORARY FILL TO FACILITATE CONSTRUCTION SHALL BE REMOVED AND DISPOSED OF IN A MANNER APPROVED BY THE CITY INSPECTOR.

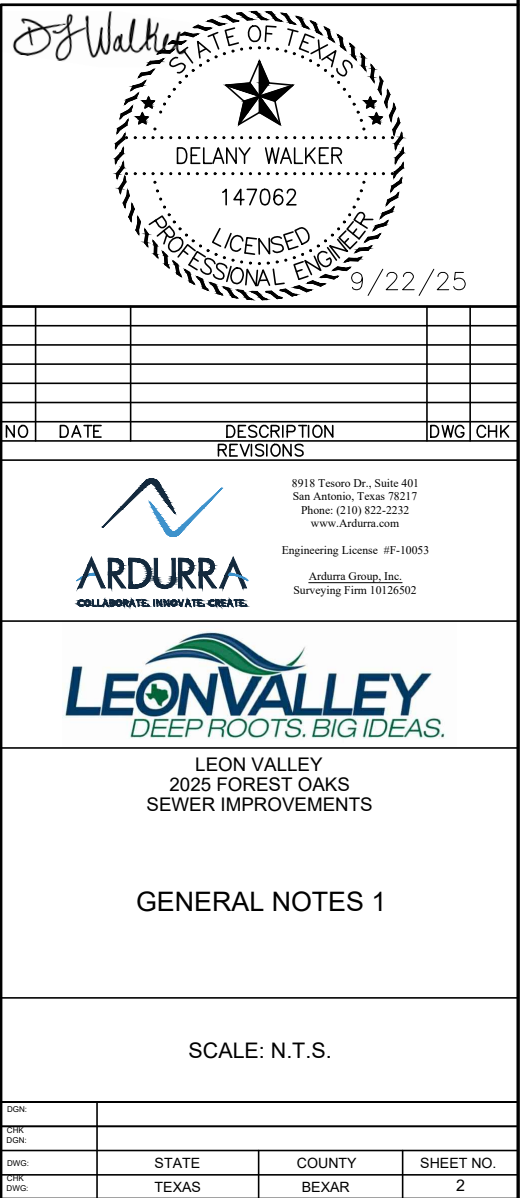
30. OVERHEAD UTILITIES MAY EXIST ON THE PROPERTY. TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS AND OWNERS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY, TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CONTACT CPS AT 210-978-3500.
31. CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS, TESTS, APPROVALS AND ACCEPTANCES REQUIRED COMPLETING CONSTRUCTION OF THIS PROJECT.
32. ALL SPOILS FROM EXCAVATION SHALL BE PLACED IN A TRUCK OR TRAILER TO BE REMOVED DAILY AND SHALL NOT BE PLACED ON THE GROUND OR ROADWAY.
33. REMOVE EXISTING RAISED PAVEMENT MARKERS AND EXISTING PAVEMENT MARKINGS AS THE WORK PROGRESSES OR AS APPROVED. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.
34. ANY MATERIALS REMOVED AND NOT REUSED AND DETERMINED TO BE SALVAGEABLE SHALL BE STORED WITHIN THE PROJECT LIMITS AT AN APPROVED LOCATION OR DELIVERED UNDAMAGED TO THE STORAGE YARD AS DIRECTED. PROPERLY DISPOSE UNSALVAGEABLE MATERIALS IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
35. ANY SIGN PANELS THAT ARE ADJUSTED OR REMOVED AND REPLACED SHALL BE DONE THE SAME WORKDAY UNLESS OTHERWISE APPROVED. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL CONFORM TO APPLICABLE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST ADDITION), TxDOT STANDARD SPECIFICATIONS AS WELL AS PROVISIONS APPLICABLE TO THE PROJECT AND AS OTHER SAFETY CODES AND INSPECTION REQUIREMENTS OF THE FIRE DEPARTMENT.
36. MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW, UN-DEPRECIATED STOCK. ALL EQUIPMENT SHALL BE NEW, UNLESS NOTED OTHERWISE ON THE PLANS.

ADDITIONAL GENERAL NOTES:

1. THE CONTRACTOR'S PLAN SHALL PROVIDE THE ADEQUATE TRENCH SAFETY SYSTEMS THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL DEVELOP STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
2. NSPI STANDS FOR NO SEPARATE PAY ITEM. TOM STANDS FOR TOP OF MANHOLE.
3. CONTRACTOR WILL BE REQUIRED TO PRE-TELEVIEW ALL SEWER MAINS WITHIN THE PROJECT LIMITS BEFORE BEGINNING CONSTRUCTION AND POST TELEVIEW ALL PROPOSED SEWER MAIN AFTER INSTALLATION.
4. CONTRACTOR MUST VERIFY INVERTS AT TIE-IN LOCATIONS AND NOTIFY THE CITY OF LEON VALLEY IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION OF PROPOSED MAINS.
5. IF EXISTING CLEANOUT IS IN THE SIDEWALK OR DRIVEWAY A TRAFFIC RATED SEWER CLEANOUT IS TO BE INSTALLED AS PART OF THIS PROJECT DURING LATERAL AND CLEANOUT REPLACEMENT.
6. TRAFFIC RATED SEWER CLEANOUTS WILL NOT BE PAID FOR SEPARATELY BUT WILL BE SUBSIDIARY TO APPLICABLE BID ITEMS.
7. IF DUE TO STREET EXCAVATION DEPTHS, A SEWER LATERAL MUST BE CONSTRUCTED BEYOND THE PROPERTY LINE AND THE CONTRACTOR SHALL OBTAIN RIGHT OF ENTRY LETTER AND TIE INTO THE EXISTING LATERAL AT A LOCATION DETERMINED IN THE FIELD. THE RIGHT OF ENTRY AND ADDITIONAL LATERAL INSTALLATION BEYOND THE PROPERTY LINE WILL NOT BE PAID FOR SEPARATELY BUT WILL BE SUBSIDIARY TO APPLICABLE BID ITEMS.
8. CONTRACTOR MUST KEEP MANHOLES ACCESSIBLE AT ALL TIMES.
9. INSTALL CIPP AND PERFORM PIPE BURSTING IN SECTIONS OF THE SEWER MAINS THAT ARE IDENTIFIED ON THE ENGINEERING PLANS FOR REHABILITATION IN ACCORDANCE WITH THE CONSTRUCTION PHASING AND TRAFFIC CONTROL PLANS DEVELOPED FOR THE PROJECT.
10. PROVIDE ANY ADDITIONAL LOCAL BYPASS PUMPING AS REQUIRED TO COMPLETE ALL CIPP AND PIPE BURSTING WORK. NO SEPARATE PAYMENT WILL BE MADE FOR LOCAL BYPASS PUMPING.
11. THE CONTRACTOR IS ADVISED TO TAKE APPROPRIATE CAUTIONARY STEPS DURING ALL CLEANING, VIDEO INSPECTION, CIPP INSTALLATION, PIPE BURSTING, AND SEWER LINE POINT REPAIR.
12. AFTER CLEANING SECTIONS OF SEWER MAIN ACCORDING TO SPECIFICATION NO. 868, THE CONTRACTOR SHALL TELEVIEW AND VIDEOTAPE ALL SECTIONS OF SEWER MAIN DESIGNATED FOR CIPP OR PIPE BURSTING TO IDENTIFY LOCATION OF SERVICE CONNECTIONS, PIPE CONDITION AND LOCATIONS REQUIRING POINT REPAIRS.
13. AFTER CIPP INSTALLATION OR PIPE BURSTING IS COMPLETED, THE CONTRACTOR SHALL TELEVIEW AND VIDEOTAPE THE REHABILITATED SEWER MAINS IN ACCORDANCE WITH SPECIFICATION NO. 866 TO DOCUMENT SATISFACTORY COMPLETION OF WORK TO THE ENGINEER AND OWNER.
14. CONTRACTOR IS RESPONSIBLE FOR TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) PERMITTING AND DEVELOPMENT OF A STORMWATER POLLUTION PREVENTION PLAN (SWSP) FOR THE PROJECT. THE SWSP PLAN AND PROCEDURES SHALL BE IMPLEMENTED ACCORDING TO THE

TCEQ AND EPA REGULATIONS FOR STORMWATER DISCHARGE FROM CONSTRUCTION ACTIVITIES. FINAL PROJECT ACCEPTANCE SHALL NOT BE GRANTED UNTIL ALL PERMANENT STABILIZATION MEASURES HAVE BEEN ESTABLISHED.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY MEANS AND METHODS OF CONSTRUCTION SHOULD GROUNDWATER BE ENCOUNTERED. (NO SEPARATE PAY ITEM.)
16. THE CONTRACTOR SHALL COORDINATE SMOKE TESTING OF SERVICE CONNECTIONS WITH THE CITY OF LEON VALLEY OPERATIONS STAFF. IF LEAKS ARE FOUND IN TESTING, THE SERVICE RECONNECTION WILL BE DONE WITH OPEN CUT CONSTRUCTION METHODS.
17. CONTRACTOR SHALL INSPECT ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS WEEKLY AND AFTER EACH RAIN EVENT. CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY DAMAGED CONTROLS IMMEDIATELY UPON DISCOVERY. CONTRACTOR SHALL REMOVE SEDIMENT FROM TEMPORARY SEDIMENT CONTROL FENCING WHEN SEDIMENT BUILDUP REACHES OR EXCEEDS 6 INCHES. CONTRACTOR SHALL REMOVE SEDIMENT FROM CURB INLET GRAVEL FILTERS WHEN SEDIMENT BUILDUP REACHES OR EXCEEDS 3 INCHES. THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS AND WILL NOT BE PAID FOR SEPARATELY.
18. MANHOLE COORDINATES FOR CIPP REHABILITATION LOCATIONS ARE GRID COORDINATES ESTABLISHED USING GPS INSTRUMENTATION WITH DATUM BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983 (CORS 1996). VERTICAL DATUM OF MANHOLE RIM ELEVATION IS BASED ON NAVD 88. MANHOLE FLOWLINE ELEVATIONS WERE ESTABLISHED BY FIELD MEASURE DOWNS FROM THE GPS RIM ELEVATION. GRID TO SURFACE CONVERSION FACTOR IS 1.00017.
19. CONTRACTOR SHALL BE REQUIRED TO REMOVE EXISTING SANITARY SEWER, LATERALS AND MANHOLES AS A NON-SEPARATE PAY ITEM (NSPI).



SEWER GENERAL NOTES:

- A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY THE CITY OF LEON VALLEY IMMEDIATELY. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW.
- B. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
- C. CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.
- D. CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.
- E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
- F. MEET ALL POST SSO REQUIREMENTS AS PER EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISIONING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.

SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND NOTIFY THE CITY OF LEON VALLEY'S INSPECTOR, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED, INCLUDING ANY FINES FROM EPA.

NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ, AND THE CITY OF LEON VALLEY.

- THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED, IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 865, "BYPASS PUMPING SMALL DIAMETER SANITARY SEWER MAINS" AND STANDARD SPECIFICATION ITEM NO. 864 "BYPASS PUMPING LARGE DIAMETER SANITARY SEWER MAINS" AS APPLICABLE. PAYMENT FOR SUCH WORK WILL BE MADE UNDER THE APPLICABLE BID ITEM.
- PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE CITY OF LEON VALLEY CONSTRUCTION INSPECTION DIVISION AND/OR PRODUCTION GROUPS AT LEAST TWO WEEKS OR MORE IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO TIE-INS; THIS IS AT NO ADDITIONAL COST TO THE CITY OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.
- ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS (NSPI).
- FLOW METERS IN MANHOLES: THE CONTRACTOR SHALL NOTIFY CITY OF LEON VALLEY A MINIMUM OF 72 HOURS, NOT COUNTING WEEKENDS OR CITY HOLIDAYS, BEFORE WORKING ON THE PIPE OR MANHOLE, IN ORDER TO HAVE THE CITY REMOVE THE FLOW METER IN THE MANHOLE. ANY DAMAGE DONE TO THE FLOW METER WILL BE CHARGED TO THE CONTRACTOR THROUGH A CHANGE ORDER.

TRENCH EXCAVATION SAFETY PROTECTION:

- CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAIN EMPLOYEE OR STRUCTURAL/DESIGN/GEOTECHNICAL/SAFETY/ EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND APPROVE THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES, THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS.
- SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAIN EMPLOYEE OF SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CPS ENERGY NOTES:

- CALL THE TEXAS STATE WIDE ONE CALL LOCATOR NUMBER 1-800-344-8377, 8 HOURS BEFORE BEGINNING ANY EXCAVATION.
- DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CPS ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
- THE PROJECT MUST BE GAS LEAK SURVEYED PRIOR TO THE FINAL OVERLAY. ALLOW 10 WORKING DAYS FOR THE LEAK SURVEY AND ALLOW AN ADDITIONAL 10 WORKING DAYS FOR VALVE ADJUSTMENTS. THE CONTRACTOR MUST COORDINATE THE SURVEY AND THE ADJUSTMENTS THROUGH THE PROJECT INSPECTOR.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING CPS ENERGY OVERHEAD AND UNDERGROUND ELECTRIC FACILITIES IF ADJACENT TO WORK AREAS.

AT&T NOTE:

THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT THE TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-828-5127. CONTRACTOR IS TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION.

FLOODPLAIN NOTES:

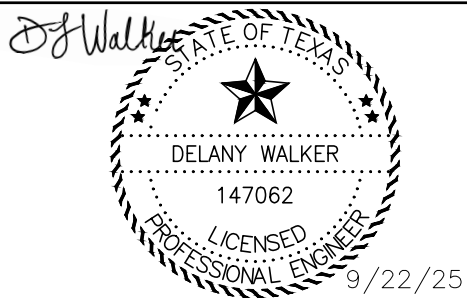
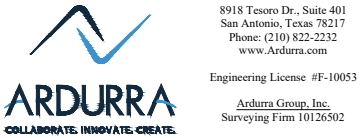
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN ALL REQUIRED STORM WATER PERMITS, FEES, AND APPROVALS. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PERMITS REQUIRED FOR CONSTRUCTION IN DRAINAGE EASEMENTS, RIGHT-OF-WAYS, AND FLOODPLAINS.
- THE CONTRACTOR SHALL NOTIFY STORM WATER ENGINEERING AT LEAST 24 HOURS PRIOR TO THE INSTALLATION OF ANY DRAINAGE FACILITY WITHIN A DRAINAGE EASEMENT OR STREET RIGHT-OF-WAY NOT INDICATED ON THE CONSTRUCTION PLANS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING DRAINAGE FACILITIES FROM DAMAGE. ANY DAMAGE TO EXISTING DRAINAGE SYSTEMS, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AT HIS EXPENSE. THE CONTRACTOR SHALL NOTIFY STORM WATER ENGINEERING AT 210-207-8052 AS SOON AS CONFLICTS WITH UTILITIES ARE ENCOUNTERED OR ANY DRAINAGE SYSTEM IS DAMAGED DURING CONSTRUCTION.
- CONSTRUCTION SPOILS WILL NOT BE ALLOWED TO BE DEPOSITED ANYWHERE WITHIN A DRAINAGE EASEMENT, RIGHT-OF-WAY OR FLOODPLAIN WITHIN THE LIMITS OF THE PROJECT AND SHALL BE DISPOSED OFFSITE IN COMPLIANCE WITH CURRENT APPLICABLE REGULATIONS.
- NO STRUCTURE, FENCES, WALLS, LANDSCAPING, OR OTHER OBSTRUCTIONS THAT IMPEDE DRAINAGE SHALL BE PLACED WITHIN THE LIMITS OF THE DRAINAGE EASEMENTS SHOWN ON THE CONSTRUCTION DOCUMENTS.
- UPON COMPLETION OF TRENCHING, THE AREA WILL BE BACKFILLED AND COMPACTED TO ITS ORIGINAL CONDITION. TRENCHES/BORE PITS TO BE OPEN AND UNATTENDED LONGER THAN 24 HOURS SHALL BE PROTECTED TO WITHSTAND ALL HYDRODYNAMIC AND HYDROSTATIC FORCES AND PREVENT DOWNSTREAM IMPACTS. TRENCHES/BORE PITS TO BE OPEN LONGER THAN 30 DAYS AFTER STARTING EXCAVATION SHALL BE BACKFILLED WITH A SEMI-PERMANENT REPAIR BACKFILL.

TRAFFIC CONTROL NOTES:

- IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO SEE THAT ALL TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED AT THE JOB SITE IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND RELATED INDUSTRY STANDARDS AND REGULATIONS. THESE NOTES, DO NOT, IN OF THEMSELVES, CONSTITUTE A TRAFFIC CONTROL PLAN. IN THE EVENT THAT THESE PLANS DO NOT INCLUDE TRAFFIC CONTROL, OR THAT THE CONTRACTOR WISHES TO VARY FROM TRAFFIC CONTROL INCLUDED WITH THESE PLANS, HE SHALL SUBMIT FOR REVIEW A TRAFFIC CONTROL PLAN SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS, INCLUDING A SIGN AND BARRICADE PLAN CONFORMING TO THE REQUIREMENTS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE CITY'S CONSTRUCTION OBSERVER /INSPECTOR WILL ONLY BE RESPONSIBLE TO INSPECT THE TRAFFIC CONTROL DEVICES BEING DEPLOYED. IF, IN THE OPINION OF THE COI, THE TRAFFIC CONTROL DEVICES DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC, THE COI SHALL HAVE THE OPTION TO STOP CONSTRUCTION OPERATIONS AT NO EXPENSE TO THE CITY UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED BY THE CONTRACTOR.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND MAINTAIN TEMPORARY STOP SIGNS AND ALL OTHER TRAFFIC CONTROL DEVICES REQUIRED TO PROTECT THE GENERAL PUBLIC. IF THE CITY OF LEON VALLEY HAS REMOVED PERMANENT STOP SIGNS, THE CONTRACTOR SHALL REQUEST THAT THE SIGNS BE RETURNED TO THE CONSTRUCTION SITE TO BE REINSTALLED BY THE CONTRACTOR. ALL PERMANENT SIGNS OR TRAFFIC CONTROL DEVICES MISSING OR DAMAGED UPON COMPLETION OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR MUST CONTACT THE CITY'S COI 48 HOURS IN ADVANCE (INCLUDING WEEKENDS) OF ANY MINOR STREET CLOSURE.
- AS WORK PROGRESSES, LOCATION OF TEMPORARY TRAFFIC CONTROL DEVICES WILL BE ADJUSTED AND MODIFIED, AS NECESSARY BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.
- IF THE NEED ARISES, ADDITIONAL TEMPORARY TRAFFIC CONTROL DEVICES, SPECIAL DIRECTIONAL DEVICES, AND/OR BUSINESS NAME SIGNS MAY BE ORDERED BY THE TRAFFIC ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
- TEMPORARY TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE TxDOT BARRICADE AND CONSTRUCTION STANDARDS AND TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- THE CONTRACTOR MUST MAINTAIN ALL STREETS WITHIN PROJECT LIMITS OPEN TO THROUGH TRAFFIC BY REPAIRING TRENCHES, POTHOLES, LEVELING UP WITH ASPHALT, ETC. AT NO DIRECT PAYMENT, WITH THE COST TO BE INCLUDED IN OTHER ITEMS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUITABLE ACCESS

ACCOMMODATIONS FOR SCHOOL CHILDREN AND PEDESTRIANS.

- THE CONTRACTOR SHALL PROVIDE ACCESS TO RESIDENCES AND ALL BUSINESSES AT ALL TIMES WITHIN ALL THE PHASES OF THE WORK.
- CONSTRUCTION WORK NECESSITATES THE UTILIZATION OF VEHICLE PATHS OTHER THAN THE LANES NORMALLY USED, TRAFFIC CONTROL MARKINGS NO LONGER APPLICABLE SHALL BE REMOVED AND APPROVED TEMPORARY PAVEMENT MARKINGS AND SIGNS INSTALLED IN ACCORDANCE WITH PART VI-D OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. AFTER CONSTRUCTION IS COMPLETED AND TRAFFIC IS REROUTED BACK TO THE ORIGINAL LANES, THE TRAFFIC CONTROL MARKINGS AND/OR RAISED BUTTONS THAT WERE ORIGINALLY REMOVED FROM THE EXISTING PAVEMENT MUST BE REPLACED. IN ADDITION, TEMPORARY MARKINGS MUST BE REMOVED. ALL OF THIS IS TO BE DONE AT NO DIRECT PAYMENT; COST SHOULD BE INCLUDED IN OTHER ITEMS.
- ALL TEMPORARY TRAFFIC CONTROL DEVICES, ETC. SHALL BE PROVIDED BY THE CONTRACTOR WITHOUT DIRECT PAYMENT, UNLESS OTHERWISE NOTED OR STATED.
- THE COI WILL MONITOR THE CONTRACTOR'S TRAFFIC CONTROL DEVICES AND WILL BE RESPONSIBLE TO FURNISH ALL RESIDENTS AND BUSINESSES WITH AN INFORMATION FLYER ON ALL JOBS DURING CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL STREETS OUTSIDE OF THE PROJECT LIMITS WHICH ARE DAMAGED DUE TO CONSTRUCTION ACTIVITIES. THE REPLACED SECTION MUST BE APPROVED BY THE CITY'S STREET ENGINEER. THERE WILL BE NO DIRECT PAYMENT FOR THIS PUBLIC THE COST IS TO BE INCLUDED IN OTHER ITEMS.
- THE CONTRACTOR SHALL PROVIDE THE CITY AN EMERGENCY TELEPHONE NUMBER FOR EVENINGS, WEEKENDS, AND HOLIDAYS BY THE FIRST WORKING DAY OF THE PROJECT. THIS TELEPHONE NUMBER MUST BE A COMMERCIAL ANSWERING SERVICE. THE ANSWERING SERVICE MUST BE ABLE TO CONTACT THE CONTRACTOR AND HAVE THE CONTRACTOR RESPOND TO THE CITY STAFF WITHIN TWO HOURS OF THE INITIAL CONTACT.
- CONTRACTOR SHALL MAINTAIN CONTINUOUS ACCESS TO ALL INTERSECTING STREETS UNLESS OTHERWISE SHOWN ON THESE PUBLIC WHEN CONTINUOUS ACCESS SCHEDULED TO BE BLOCKED, THE CONTRACTOR SHALL CONTACT THE DISPATCHER FOR THE FIRE DEPARTMENT AND EMS AT (210) 684-8897 AND THE POLICE DEPARTMENT AT (210) 684-3215, TO APPRISE THEM OF THE PENDING STREET CLOSURE AT LEAST FORTY-EIGHT HOURS IN ADVANCE. IF THE CLOSURE FALLS LONG A BUS ROUTE, THE CONTRACTOR SHALL ALSO CONTACT VIA AT (210) 362-2896.
- CONTRACTOR SHALL MAINTAIN EITHER THE EXISTING OR TEMPORARY STREET NAME SIGNS AT EACH INTERSECTION ONSITE THROUGHOUT CONSTRUCTION. IF THE EXISTING STREET NAME SIGNS ARE USED, THEY MUST BE MAINTAINED IN THE CONDITION ENCOUNTERED PRIOR TO THE BEGINNING OF CONSTRUCTION, AND THEN BE TURNED IN TO THE CITY INSPECTOR AT THE END OF THE PROJECT. IF TEMPORARY SIGNS ARE USED DURING CONSTRUCTION, THEY SHALL HAVE A MINIMUM OF 4-INCH LETTERS, AND MAY BE FABRICATED WITH CONSTRUCTION ZONE MATERIAL (BLACK LEGEND ON ORANGE BACKGROUND, USING PLYWOOD SUBSTRATE, ETC.)
- NO MORE THAN 300 FEET OF UNBACKFILLED TRENCH CAN BE OPEN WITHOUT REPLACEMENT OF PAVEMENT OR BACKFILLED AND PLATED.
- ALL OPEN TRENCHES AND PITS SHALL BE BACKFILLED AND PLATED BEFORE THE CONTRACTOR CAN LEAVE AN AREA. NO TRENCHES AND/OR PITS SHALL BE LEFT UNBACKFILLED AND PLATED OVERNIGHT AND/OR DURING NON-WORKING HOURS.
- THE CONTRACTOR SHALL OPEN ROADWAY TO NORMAL TWO-LANE, TWO-WAY TRAFFIC OPERATIONS DURING NON-WORKING HOURS.
- THE CONTRACTOR SHALL MAINTAIN A MINIMUM 10-FOOT LANE FOR ONE-LANE, TWO-WAY TRAFFIC OPERATIONS WHEN FLAGGING.
- CONTRACTOR SHALL CLOSE DOWN NECESSARY STREETS TO THROUGH TRAFFIC USING TxDOT'S BARRICADE AND CONSTRUCTION STANDARDS AND/OR THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

[illegible]

LEON VALLEY
2025 FOREST OAKS
SEWER IMPROVEMENTS

GENERAL NOTES 2

SCALE: N.T.S.

DGN:			
CHK DGN:			
DWG:	STATE	COUNTY	SHEET NO.
CHK DWG:	TEXAS	BEXAR	3

S:\Projects\Leon Valley\2025-0959-00 Leon Valley Forest Oaks Sewer Improve\000\20-Drawings\Plans\Civil\2025-0959-ALIGNMENT_DTLS.dwg
Monday September 22, 2025, 3:11pm

SEWER MAIN IMPROVEMENTS HORIZONTAL ALIGNMENT DATA

Beginning chain SEWER description Forest Brook				
Point 600	N 8,845,003.34	E 10,708,075.28	Sta. 10+00.00	
Course from 600 to 601A Dist 121.94'				
Point 601A	N 8,845,014.82	E 10.708.196.67	Sta. 11+21.94	
Course from 601A to 601 Dist 147.18'				
Point 601	N 8,844,965.05	E 10,708,335.19	Sta. 12+69.12	
Course from 601 to 602 Dist 116.36'				
Point 602	N 8,844,914.76	E 10,708,440.12	Sta 13+85.48	
Course from 602 to 603 Dist 266.98'				
Point 603	N 8,844,806.32	E 10.708684.08	Sta 16+52.46	
Course from 603 to 604 Dist 292.31'				
Point 604	N 8,844,821.67	E 10,708,974.56	Sta 19+44.77	
Ending chain SEWER description				

SEWER MAIN IMPROVEMENTS HORIZONTAL ALIGNMENT DATA

Beginning chain 8 in SEWER description Forest knoll St.				
Point 602	N 8,844,914.76	E 10,708,440.12	Sta. 10+00.00	
Course from 602to 602A Dist 51.90' = Sta. 13+85.48				
Point 602A	N 8,844,803.41	E 10,708,402.01	Sta. 10+51.90	
Course from 602A to 608 Dist 164.61'				
Point 608	N 8,844,574.19	E 10,708,423.38	Sta. 12+16.51	
Course from 608 to 607 Dist 291.58'				
Point 4	N 8,844,428.06	E 10,708,461.08	Sta. 15+08.09	
Ending chain 8 in SEWER description				

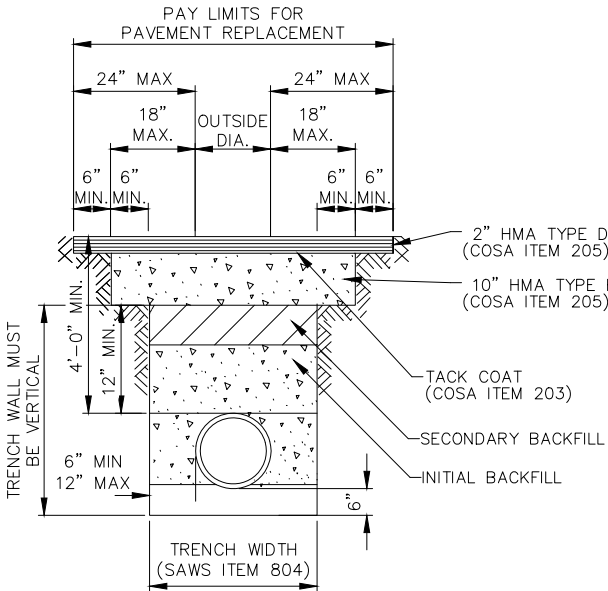
SEWER MAIN IMPROVEMENTS HORIZONTAL ALIGNMENT DATA

Beginning chain 8 in SEWER description Forest Mill St.				
Point 603	N 8,844,806.32	E 10,708,684.08	Sta. 10+00.00	
Course from 603 to 609 Dist 51.90' = Sta. 16+52.46				
Point 609	N 8,844,509.34	E 10,708,723.62	Sta. 10+51.90	
Course from 609 to 610 Dist 164.61'				
Point 610	N 8,844,246.31	E 10,708,758.80	Sta. 12+16.51	
Ending chain 8 in SEWER description				

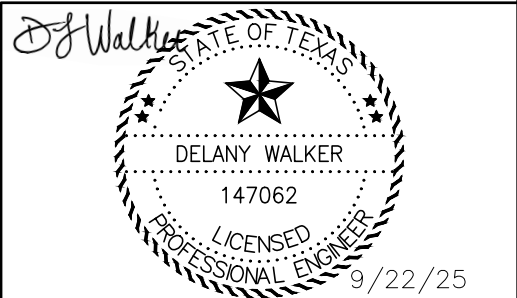
SEWER MAIN IMPROVEMENTS HORIZONTAL ALIGNMENT DATA

Beginning chain 8 in SEWER description Forest Ridge				
Point 604	N 8,844,821.67	E 10,708,974.56	Sta. 10+00.00	
Course from 604 to 615 Dist 200.78' = Sta. 19+44.77				
Point 615	N 8,844,803.41	E 10,708,402.01	Sta. 12+00.78	
Course from 615 to 614 Dist 343.69'				
Point 614	N 8,844,281.99	E 10,709,046.62	Sta. 15+44.47	
Course from 614 to 613 Dist 85.90'				
Point 613	N 8,844,196.84	E 10,709,058.12	Sta. 16+30.37	
Ending chain 8 in SEWER description				


OVERALL QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
100	MOBILIZATION	LS	1
101	PREPARATION OF RIGHT-OF-WAY	LS	1
103	REMOVE CONCRETE CURB	LF	100
103	REMOVE CONCRETE SIDEWALK & DRIVEWAY	SF	368
203	TACK COAT	GAL	66
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (10" TYPE B)	SY	476
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D)	SY	641
500	CONCRETE CURB	LF	100
502	CONCRETE SIDEWALK	SY	41
503	CONCRETE DRIVEWAY	SY	0.3
530	BARRICADES, SIGNS & TRAFFIC HANDLING	LS	1
550	TRENCH EXCAVATION SAFETY PROTECTION	LF	1495
848	8" SANITARY SEWER PIPE, ALL DEPTHS	LF	1495
852.1	SANITARY SEWER MANHOLE (0'-6')	EA	10
852.3	EXTRA DEPTH MANHOLE (>6')	VF	22
854	6" SANITARY SEWER LATERALS	LF	1291
854	TWO-WAY CLEANOUT	EA	26
865	BYPASS PUMPING, SMALL DIAMETER SANITARY SEWER	LS	1
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	2695
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	2695
901	8" CIPP SANITARY SEWER PIPE, ALL DEPTHS	LF	1200
910	MANHOLE REHABILITATION (INCLUDES REPLACEMENT OF RING & COVER)	VF	34
1109	SERVICE RECONNECTION, ALL DEPTHS (W/ REMOTE CONTROL CUT DEVICE)	EA	30



TYPICAL TRENCH DETAIL
N.T.S



NO	DATE	DESCRIPTION	DWG	CHK
REVISIONS				



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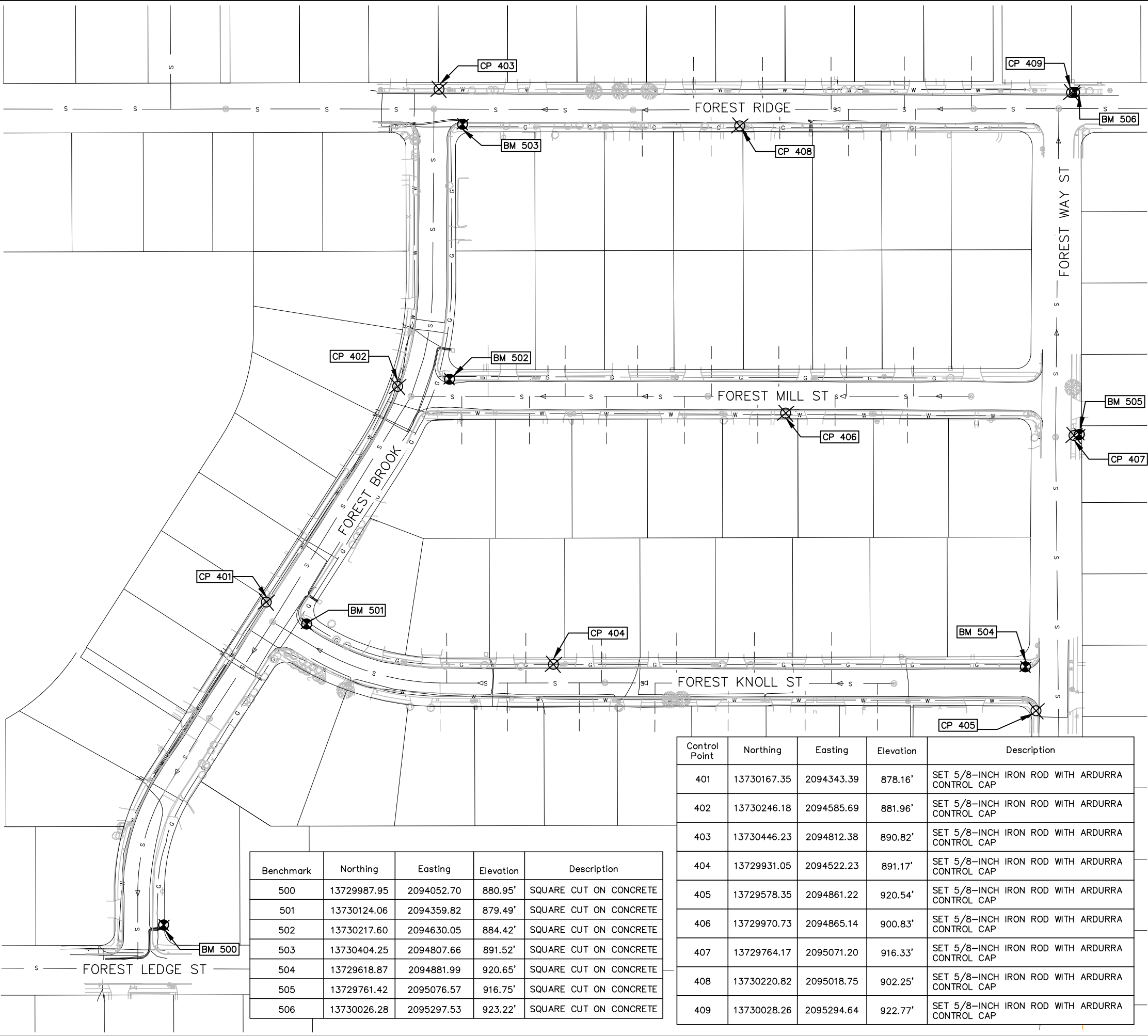


LEON VALLEY
2025 FOREST OAKS
SEWER IMPROVEMENTS

OVERALL QUANTITIES
HORIZONTAL ALIGNMENT
DATA AND TYP. DETAILS

SCALE: N.T.S.			
DGN			
CHK			
DWG	STATE	COUNTY	SHEET NO.
CHK	TEXAS	BEXAR	4

S:\Projects\Leon Valley\2025-0959-00 Leon Valley Forest Oaks Sewer Improve\000\20-Drawings\Plans\Civil\2025-0959-00_PCL.dwg
Monday September 22, 2025, 3:13pm



LEGEND

BENCHMARK (BM)

CONTROL POINT (CP)

STATE OF TEXAS
REGISTERED
PATRICIA M. MORALES
7150
PROFESSIONAL SURVEYOR

Patricia Morales

9/22/25

NO	DATE	DESCRIPTION	DWG	CHK
REVISIONS				

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LEON VALLEY
DEEP ROOTS. BIG IDEAS.

LEON VALLEY
2025 FOREST OAKS
SEWER IMPROVEMENTS

PROJECT CONTROL PLAN

HORIZ. SCALE: 1"=40'
0 20 40
SCALE IN FEET

VERT. SCALE: 1"=10'
0 5 10
SCALE IN FEET

DGN:			
CHK:			
DWG:	STATE	COUNTY	SHEET NO.
CHK:	TEXAS	BEXAR	5

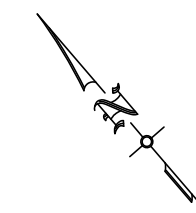
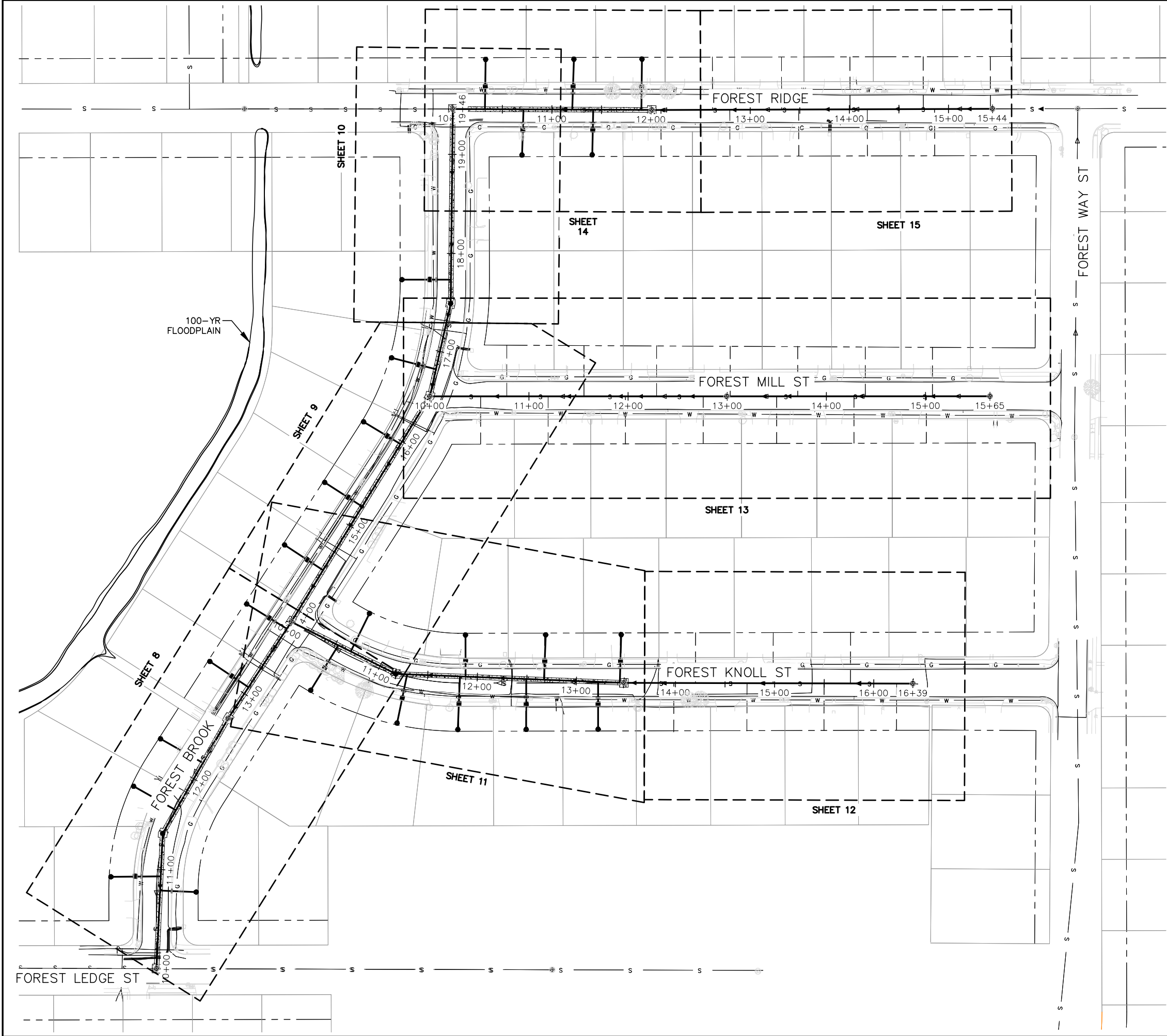
Control Point	Northing	Easting	Elevation	Description
401	13730167.35	2094343.39	878.16'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
402	13730246.18	2094585.69	881.96'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
403	13730446.23	2094812.38	890.82'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
404	13729931.05	2094522.23	891.17'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
405	13729578.35	2094861.22	920.54'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
406	13729970.73	2094865.14	900.83'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
407	13729764.17	2095071.20	916.33'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
408	13730220.82	2095018.75	902.25'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP
409	13730028.26	2095294.64	922.77'	SET 5/8-INCH IRON ROD WITH ARDURRA CONTROL CAP

Benchmark	Northing	Easting	Elevation	Description
500	13729987.95	2094052.70	880.95'	SQUARE CUT ON CONCRETE
501	13730124.06	2094359.82	879.49'	SQUARE CUT ON CONCRETE
502	13730217.60	2094630.05	884.42'	SQUARE CUT ON CONCRETE
503	13730404.25	2094807.66	891.52'	SQUARE CUT ON CONCRETE
504	13729618.87	2094881.99	920.65'	SQUARE CUT ON CONCRETE
505	13729761.42	2095076.57	916.75'	SQUARE CUT ON CONCRETE
506	13730026.28	2095297.53	923.22'	SQUARE CUT ON CONCRETE

LEGEND

S — WASTE WATER
W — WATER
G — BURIED GAS
OT — OH TEL
UGT — BURIED TEL
OE — OH ELEC
UGP — BURIED ELEC
— FENCE
— RIGHT-OF-WAY
— PROPERTY LINE
○ CLEAN OUT
○ FIRE HYDRANT
○ WATER METER
○ WATER VALVE
□ TELE PEDESTAL
○ LIGHT POLE
● POWER POLE
● GUY WIRE
○ SIGN
○ EXIST MANHOLE
● REHAB MANHOLE
● REPLACE MANHOLE
◄ S — PROP SS
— PROP SS LATERAL
— EXIST SS LATERAL
○ CLEAN OUT
★ GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
▨ TRENCH REPAIR
▨ FLOWABLE FILL
□ CONC ENCASEMENT
—X— GROUT & ABANDON

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Monday September 22, 2025, 3:15pm



- LEGEND**
- S — WASTE WATER
 - W — WATER
 - G — BURIED GAS
 - OT — OH TEL
 - UGT — BURIED TEL
 - OE — OH ELEC
 - UGP — BURIED ELEC
 - FENCE
 - RIGHT-OF-WAY
 - PROPERTY LINE
 - CLEAN OUT
 - ⊙ FIRE HYDRANT
 - ⊙ WATER METER
 - ⊙ WATER VALVE
 - ⊙ TELE PEDESTAL
 - LIGHT POLE
 - POWER POLE
 - ⊙ GUY WIRE
 - ⊙ SIGN
 - ⊙ EXIST MANHOLE
 - ⊙ REHAB MANHOLE
 - ⊙ REPLACE MANHOLE
 - ◄ S — PROP SS
 - PROP SS LATERAL
 - EXIST SS LATERAL
 - ⬡ CLEAN OUT
 - ★ GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
 - ▨ TRENCH REPAIR
 - ▨ FLOWABLE FILL
 - CONC ENCASEMENT
 - X- GROUT & ABANDON

Delany Walker
STATE OF TEXAS
★
DELANY WALKER
147062
LICENSED PROFESSIONAL ENGINEER
9/22/25

NO	DATE	DESCRIPTION	DWG	CHK
REVISIONS				

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LEON VALLEY
DEEP ROOTS. BIG IDEAS.

LEON VALLEY
2025 FOREST OAKS
SEWER IMPROVEMENTS

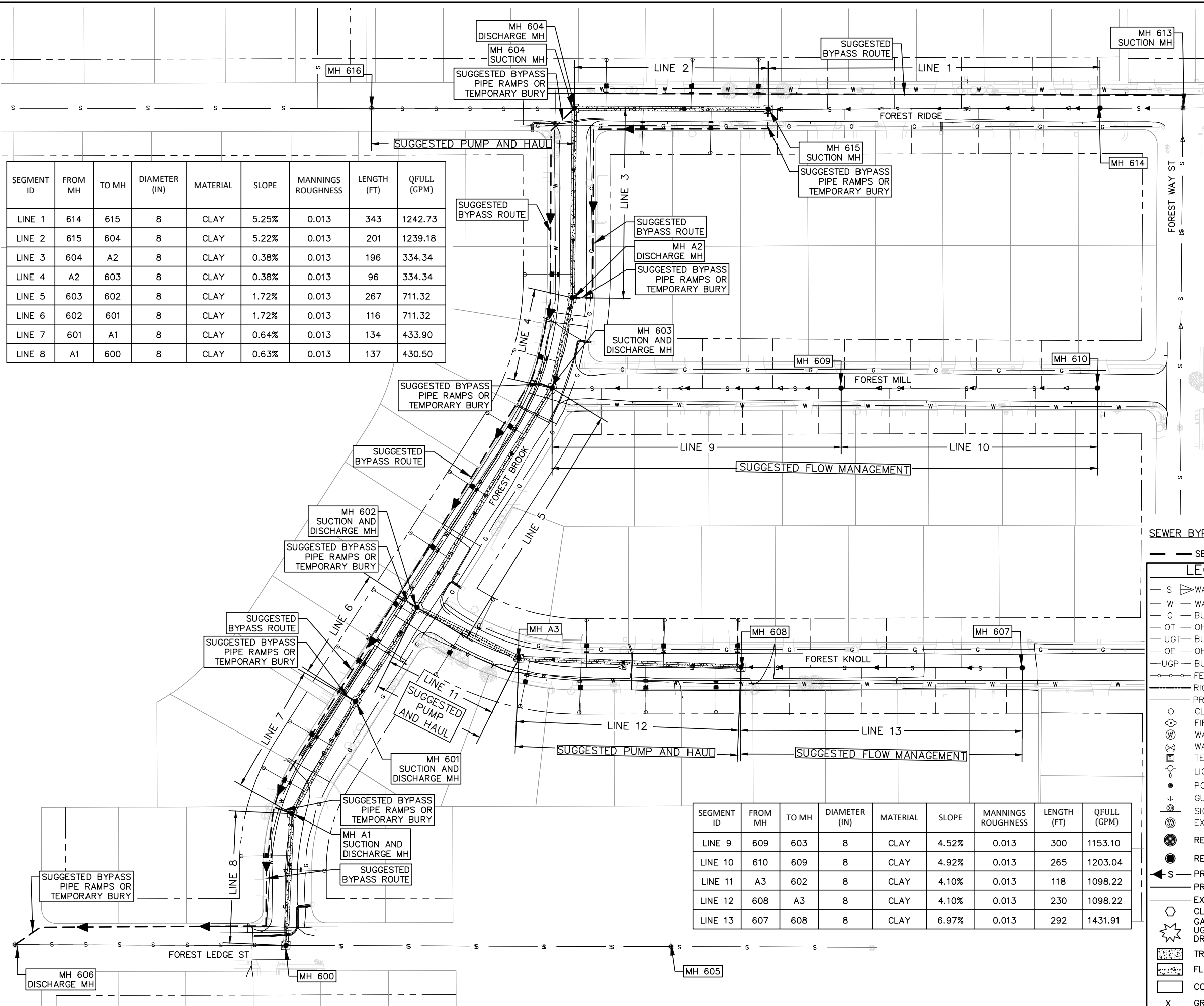
OVERALL SEWER PLAN

HORIZ. SCALE: 1"=40'
0 20 40
SCALE IN FEET

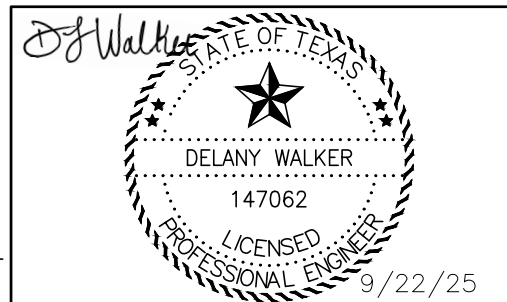
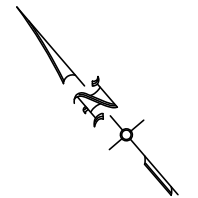
VERT. SCALE: 1"=10'
0 5 10
SCALE IN FEET

DGN:			
CHK DGN:			
DWG:	STATE	COUNTY	SHEET NO.
CHK DWG:	TEXAS	BEXAR	6

S:\Projects\Leon Valley\2025-0959-00 Leon Valley Forest Oaks Sewer Improve\000\20-Drawings\Plans\Civil\2025-0959-01_BY PASS PLAN_SHT.dwg
Monday September 22, 2025, 3:19pm



- NOTES:
1. ALL WORK FOR BYPASS PUMPING SHALL BE DONE IN ACCORDANCE TO SAWS SPECIFICATION NO. 865 "BYPASS PUMPING SMALL DIAMETER SANITARY SEWER MAINS"
 2. FIELD VERIFY MANHOLE INTERS AND SANITARY SEWER MAIN SLOPES PRIOR TO COMMENDING BYPASS WORK.
 3. DRIVEWAYS SHALL REMAIN ACCESSIBLE AT ALL TIMES.
 4. FLOW DATA PROVIDED IS FOR CONTRACTORS INFORMATION ONLY. FLOWS PROVIDED DO NOT INCLUDE INFLOW/INFILTRATION.
 5. BYPASS PUMPING SHALL ONLY OCCUR WHEN THE WEATHER FORECAST SHOWS NO RAINFALL FOR A FIVE (5) DAY "DURATION". IF RAINFALL IS PREDICTED DURING OPERATIONS CONTRACTOR SHALL MAKE ANY NECESSARY TEMPORARY CONNECTIONS TO ALLOW FLOW THROUGH THE SYSTEM.
 6. THE CONTRACTOR MAY BYPASS SEGMENT BY SEGMENT INSTEAD OF FULL LENGTH OF PROJECT (NSPI).

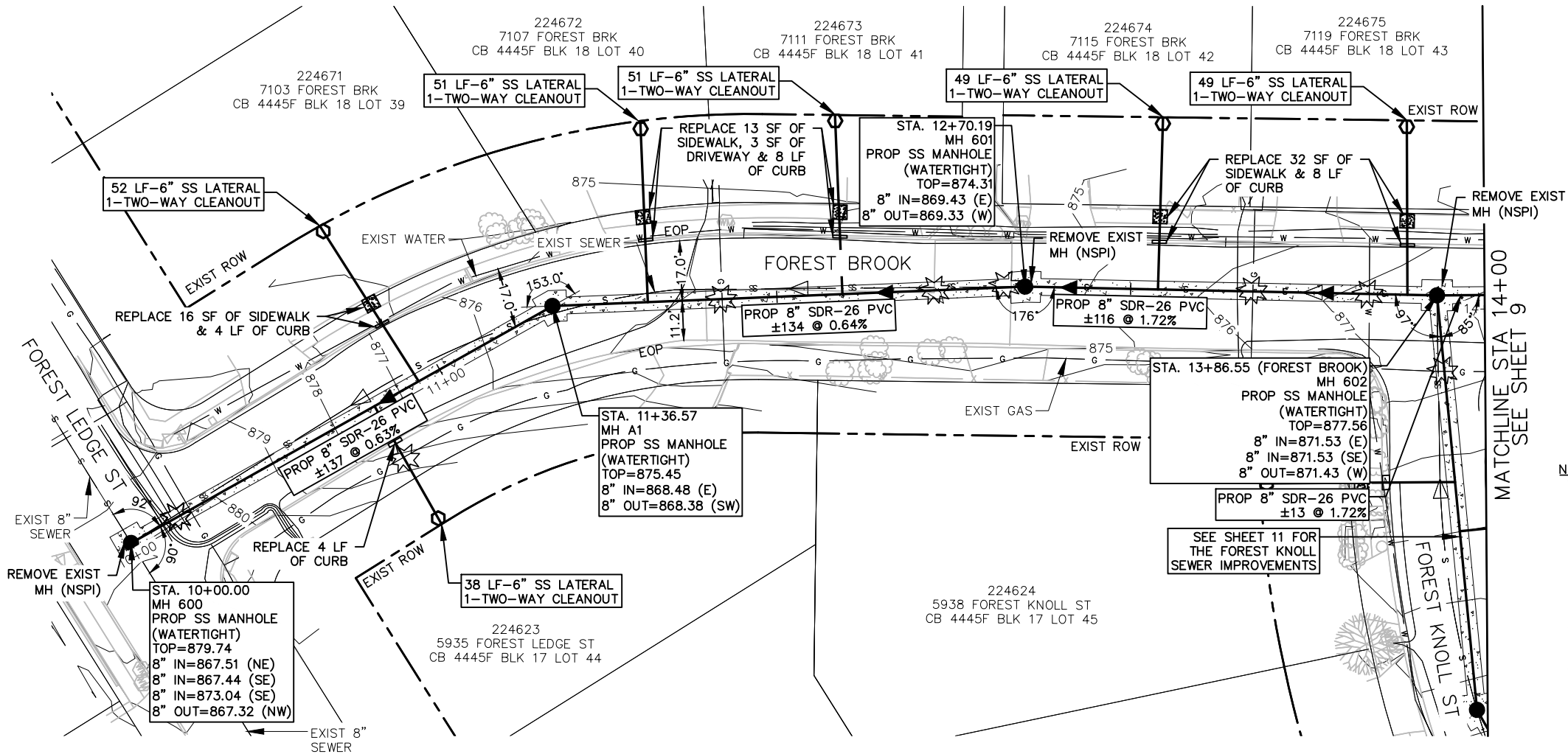


SEWER BYPASS LEGEND:

- — SEWER BYPASS
- LEGEND
- S — WASTE WATER
 - W — WATER
 - G — BURIED GAS
 - OT — OH TEL
 - UGT — BURIED TEL
 - OE — OH ELEC
 - UGP — BURIED ELEC
 - FENCE
 - RIGHT-OF-WAY
 - PROPERTY LINE
 - CLEAN OUT
 - ⊙ FIRE HYDRANT
 - ⊙ WATER METER
 - ⊙ WATER VALVE
 - ⊙ TELE PEDESTAL
 - ⊙ LIGHT POLE
 - ⊙ POWER POLE
 - ⊙ GUY WIRE
 - ⊙ SIGN
 - ⊙ EXIST MANHOLE
 - ⊙ REHAB MANHOLE
 - ⊙ REPLACE MANHOLE
 - S — PROP SS
 - — PROP SS LATERAL
 - — EXIST SS LATERAL
 - CLEAN OUT
 - ☆ GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
 - ▨ TRENCH REPAIR
 - ▨ FLOWABLE FILL
 - ▨ CONC ENCASEMENT
 - X — GROUT & ABANDON

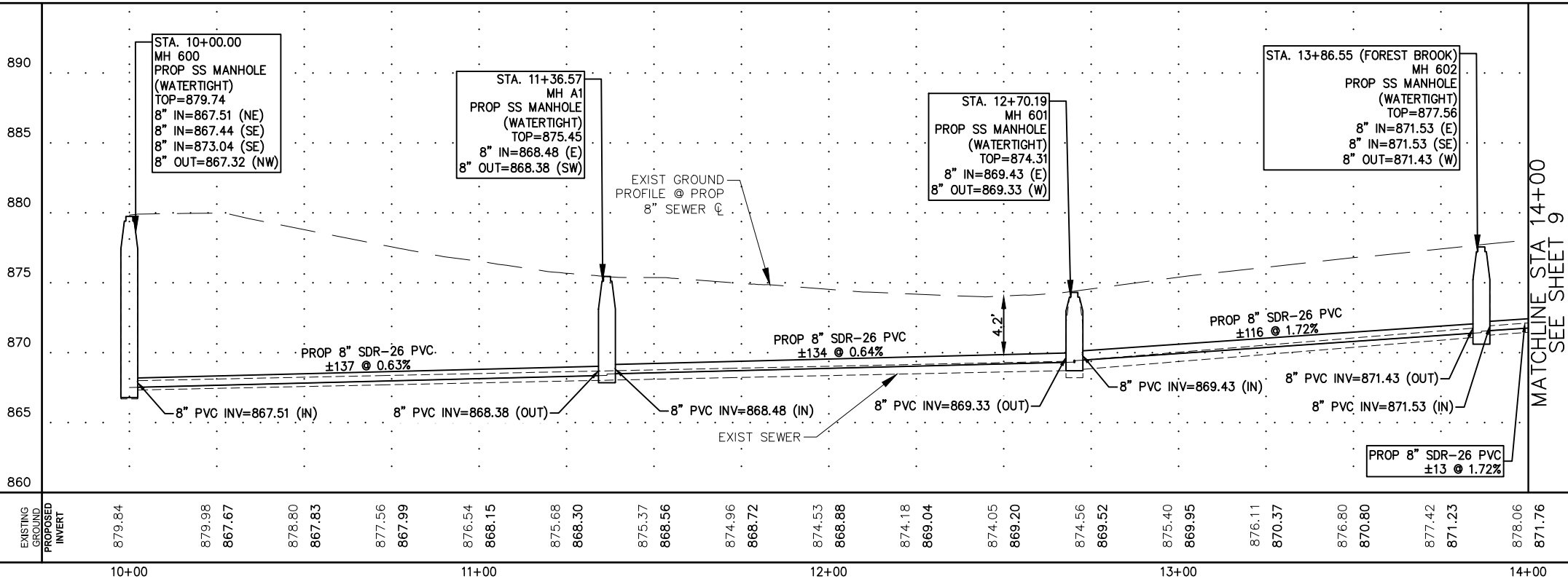
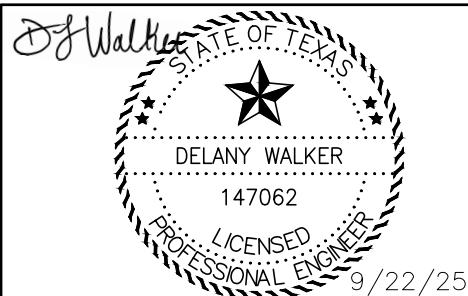
NO	DATE	DESCRIPTION	DWG	CHK
REVISIONS				
<div>8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com Engineering License #F-10053 Ardurra Group, Inc. Surveying Firm 10126502</div> <div>ARDURRA COLLABORATE. INNOVATE. CREATE.</div> <div>LEON VALLEY DEEP ROOTS. BIG IDEAS.</div> <div>LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS</div> <div>SUGGESTED BYPASS SEWER PLAN</div> <div>HORIZ. SCALE: 1"=40' 0 20 40 SCALE IN FEET</div> <div>VERT. SCALE: 1"=10' 0 5 10 SCALE IN FEET</div> <div>DGN: [] CHK: [] DWG: [] CHK: []</div> <div>STATE: TEXAS COUNTY: BEXAR SHEET NO.: 7</div>				

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Monday September 22, 2025, 3:24pm



- NOTE:
1. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF THE EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
 2. CONTRACTOR SHALL CONFIRM THE LOCATION OF THE CUSTOMERS EXISTING CLEAN-OUT AND LATERALS PRIOR TO BEGINNING WORK. EVERY CUSTOMER WITH AN EXISTING LATERAL AND CLEAN-OUT SHALL HAVE THEM REPLACED AS PART OF THIS PROJECT.
 3. CONTRACTOR SHALL VERIFY THE INVERTS OF THE EXISTING SEWER MAINS PRIOR TO BEGINNING CONSTRUCTION.
 4. CONTRACTOR SHALL REPLACE ALL CURBS, SIDEWALKS AND ASPHALT REMOVED FOR THE INSTALLATION OF THE SEWER LATERALS TO RESTORE SITES TO THE PRE-CONSTRUCTION CONDITIONS. THIS WORK IS SUBSIDIARY TO SAW ITEM 854.

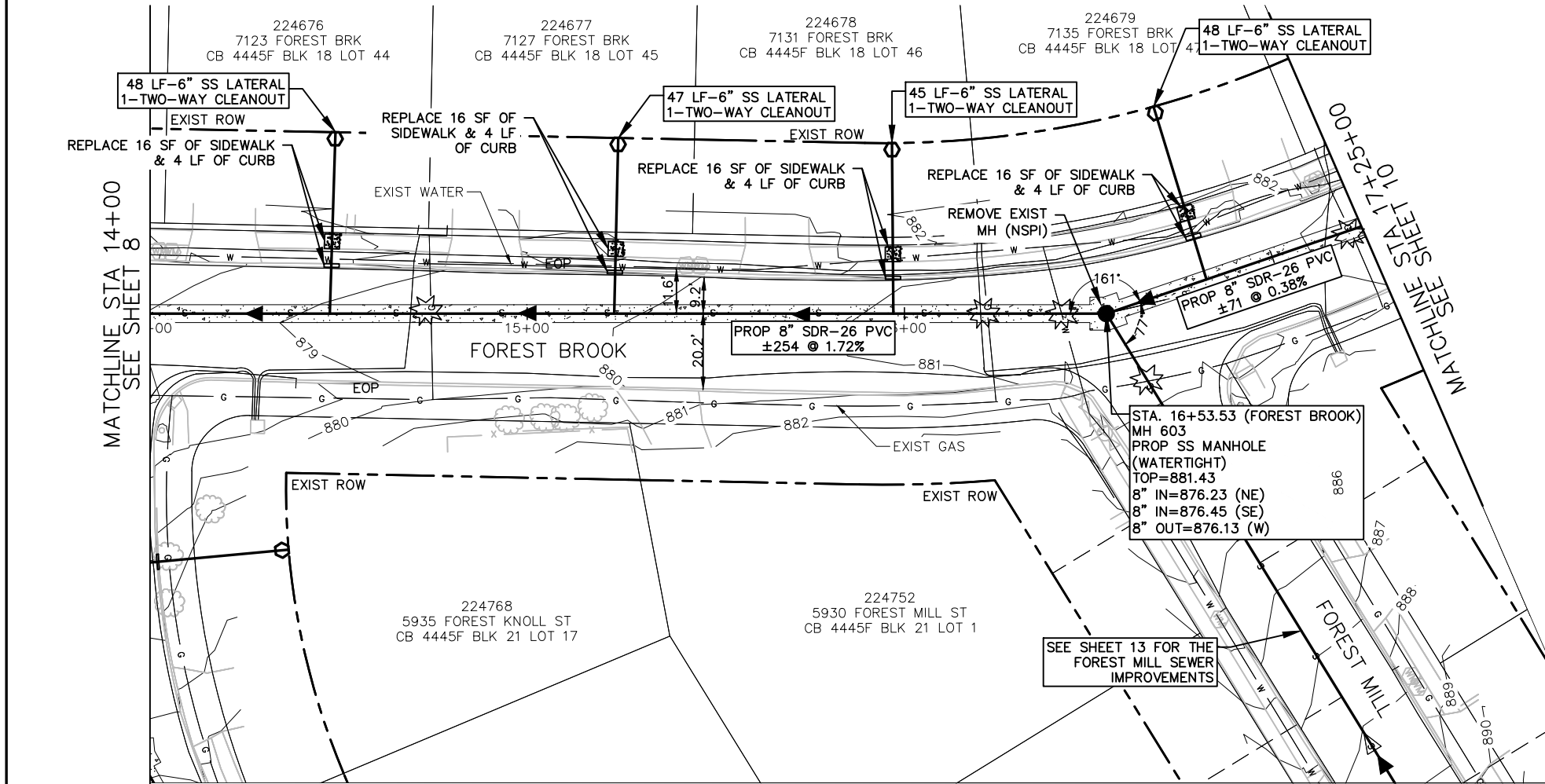
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103	REMOVE CONCRETE CURB	LF	24
103	REMOVE CONCRETE SIDEWALK & DRIVEWAY	SF	80
203	TACK COAT	GAL	18
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (10" TYPE B)	SY	131
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D)	SY	176
500	CONCRETE CURB	LF	24
502	CONCRETE SIDEWALK	SY	9
503	CONCRETE DRIVEWAY	SY	0.3
550	TRENCH EXCAVATION SAFETY PROTECTION	LF	400
848	8" SANITARY SEWER PIPE, ALL DEPTHS	LF	400
852.1	SANITARY SEWER MANHOLE (0'-6")	EA	4
852.3	EXTRA DEPTH MANHOLE (>6")	VF	8
854	6" SANITARY SEWER LATERALS	LF	290
854	TWO-WAY CLEANOUT	EA	6
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	400
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	400



LEGEND	
— S	WASTE WATER
— W	WATER
— G	BURIED GAS
— OT	OH TEL
— UGT	BURIED TEL
— OE	OH ELEC
— UGP	BURIED ELEC
—	FENCE
—	RIGHT-OF-WAY
—	PROPERTY LINE
○	CLEAN OUT
⊙	FIRE HYDRANT
⊗	WATER METER
⊕	WATER VALVE
⊖	TELE PEDESTAL
⊙	LIGHT POLE
⊕	POWER POLE
⊖	GUY WIRE
⊙	SIGN
⊕	EXIST MANHOLE
⊖	REHAB MANHOLE
⊙	REPLACE MANHOLE
⊕	PROP SS
⊖	PROP SS LATERAL
⊙	EXIST SS LATERAL
⊕	CLEAN OUT
⊖	GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
⊙	TRENCH REPAIR
⊕	FLOWABLE FILL
⊖	CONC ENCASEMENT
⊙	GROUT & ABANDON

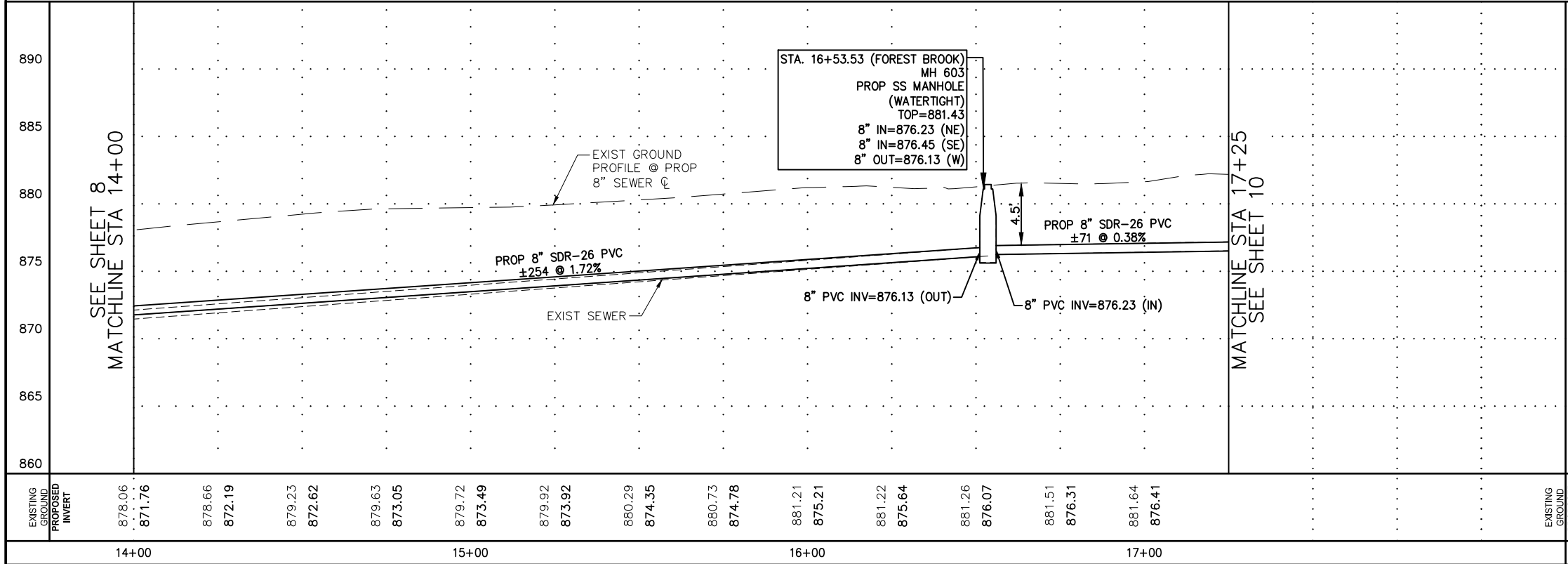
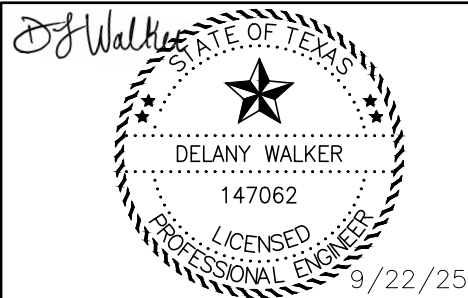
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REVISIONS				
 8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.ardurra.com Engineering License #F-10053 Ardurra Group, Inc. Surveying Firm 10126502				
 LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS				
FOREST BROOK STA. 10+00 TO STA. 14+00				
HORIZ. SCALE: 1"=40'		VERT. SCALE: 1"=10'		
0 20 40 SCALE IN FEET		0 5 10 SCALE IN FEET		
DGN				
CHK				
DWG		STATE	COUNTY	SHEET NO.
CHK		TEXAS	BEXAR	8

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Monday September 22, 2025, 3:25pm



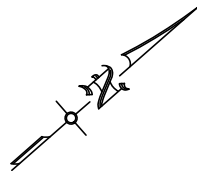
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103	REMOVE CONCRETE CURB	LF	16
103	REMOVE CONCRETE SIDEWALK & DRIVEWAY	SF	64
203	TACK COAT	GAL	14
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (10" TYPE B)	SY	100
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D)	SY	136
500	CONCRETE CURB	LF	16
502	CONCRETE SIDEWALK	SY	7
550	TRENCH EXCAVATION SAFETY PROTECTION	LF	325
848	8" SANITARY SEWER PIPE, ALL DEPTHS	LF	325
852.1	SANITARY SEWER MANHOLE (0'-6")	EA	1
854	6" SANITARY SEWER LATERALS	LF	188
854	TWO-WAY CLEANOUT	EA	4
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	325
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	325

- NOTE:
- CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF THE EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
 - CONTRACTOR SHALL CONFIRM THE LOCATION OF THE CUSTOMERS EXISTING CLEAN-OUT AND LATERALS PRIOR TO BEGINNING WORK. EVERY CUSTOMER WITH AN EXISTING LATERAL AND CLEAN-OUT SHALL HAVE THEM REPLACED AS PART OF THIS PROJECT.
 - CONTRACTOR SHALL VERIFY THE INVERTS OF THE EXISTING SEWER MAINS PRIOR TO BEGINNING CONSTRUCTION.
 - CONTRACTOR SHALL REPLACE ALL CURBS, SIDEWALKS AND ASPHALT REMOVED FOR THE INSTALLATION OF THE SEWER LATERALS TO RESTORE SITES TO THE PRE-CONSTRUCTION CONDITIONS. THIS WORK IS SUBSIDIARY TO SAW ITEM 854.



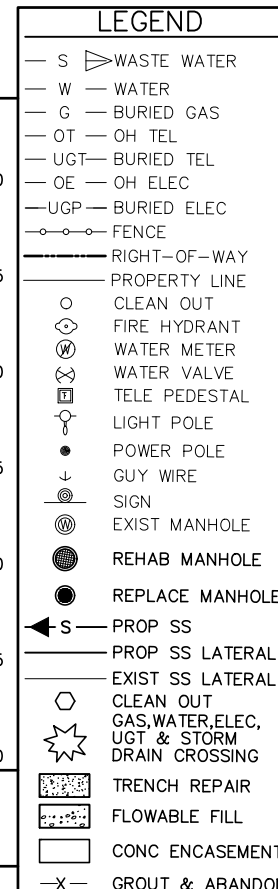
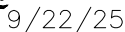
LEGEND	
— S	WASTE WATER
— W	WATER
— G	BURIED GAS
— OT	OH TEL
— UGT	BURIED TEL
— OE	OH ELEC
— UGP	BURIED ELEC
—	FENCE
—	RIGHT-OF-WAY
—	PROPERTY LINE
○	CLEAN OUT
⊙	FIRE HYDRANT
⊗	WATER METER
⊕	WATER VALVE
⊞	TELE PEDESTAL
⊟	LIGHT POLE
⊠	POWER POLE
⊡	GUY WIRE
⊢	SIGN
⊣	EXIST MANHOLE
⊤	REHAB MANHOLE
⊥	REPLACE MANHOLE
◀ S	PROP SS
—	PROP SS LATERAL
—	EXIST SS LATERAL
⬠	CLEAN OUT
⬡	GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
▨	TRENCH REPAIR
▩	FLOWABLE FILL
▭	CONC ENCASEMENT
— X —	GROUT & ABANDON



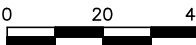
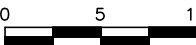
NO	DATE	DESCRIPTION					DWG	CHK	
REVISIONS									
			<div>8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com</div> <div>Engineering License #F-10053</div> <div>Ardurra Group, Inc. Surveying Firm 10126502</div>						
									
<div>LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS</div>									
<div>FOREST BROOK STA. 14+00 TO STA. 17+25</div>									
<div>HORIZ. SCALE: 1"=40'</div> <div><div>02040</div><div></div><div>SCALE IN FEET</div></div>					<div>VERT. SCALE: 1"=10'</div> <div><div>0510</div><div></div><div>SCALE IN FEET</div></div>				
DGN:									
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CHK:		TEXAS	BEXAR			9			
DWG:									



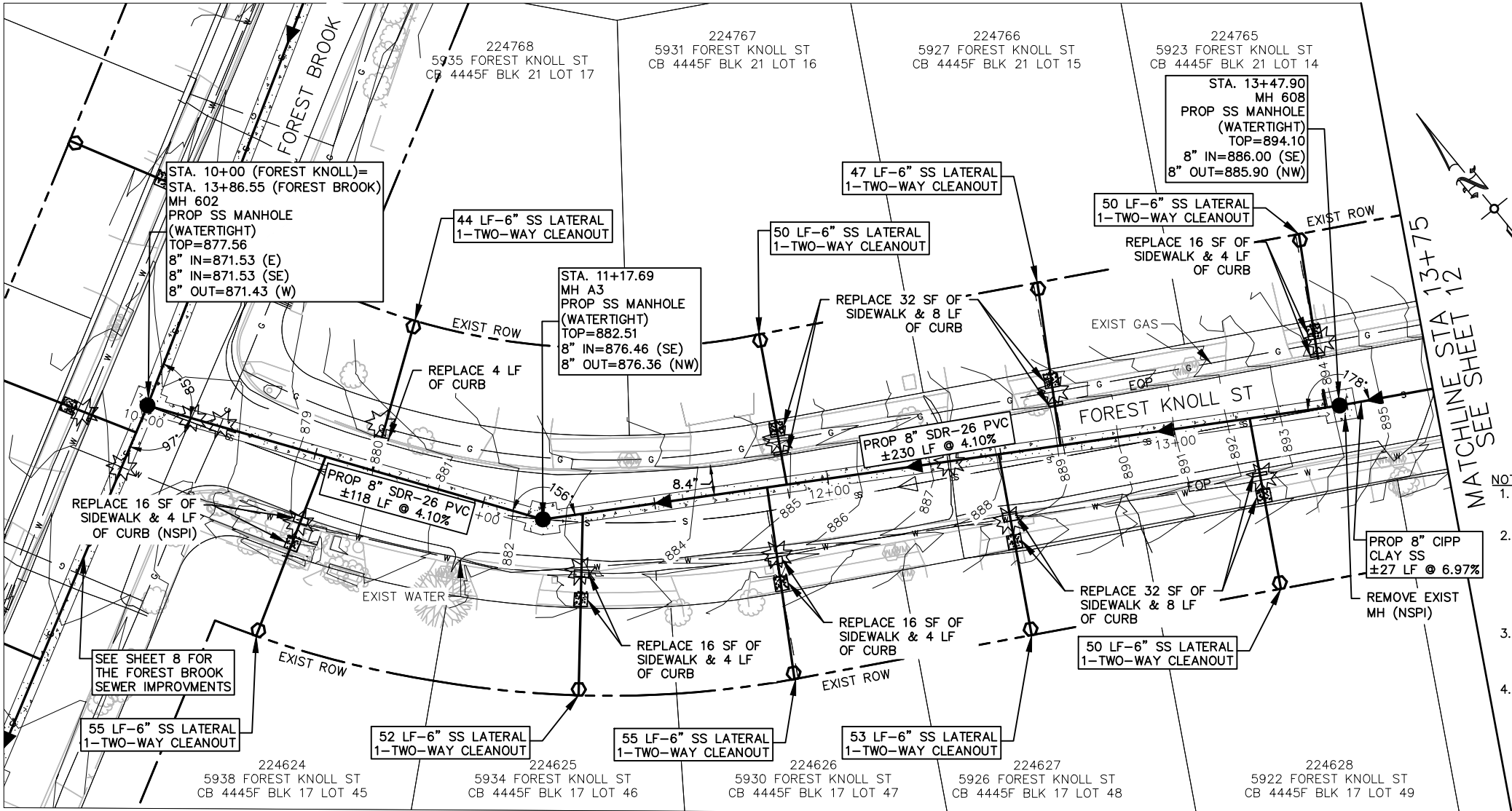
NOTE:

1. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF THE EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
2. CONTRACTOR SHALL CONFIRM THE LOCATION OF THE CUSTOMERS EXISTING CLEAN-OUT AND LATERALS PRIOR TO BEGINNING WORK. EVERY CUSTOMER WITH AN EXISTING LATERAL AND CLEAN-OUT SHALL HAVE THEM REPLACED AS PART OF THIS PROJECT.
3. CONTRACTOR SHALL VERIFY THE INVERTS OF THE EXISTING SEWER MAINS PRIOR TO BEGINNING CONSTRUCTION.
4. CONTRACTOR SHALL REPLACE ALL CURBS, SIDEWALKS AND ASPHALT REMOVED FOR THE INSTALLATION OF THE SEWER LATERALS TO RESTORE SITES TO THEIR PRE-CONSTRUCTION CONDITIONS. THIS WORK IS SUBSIDIARY TO SAW ITEM 854.



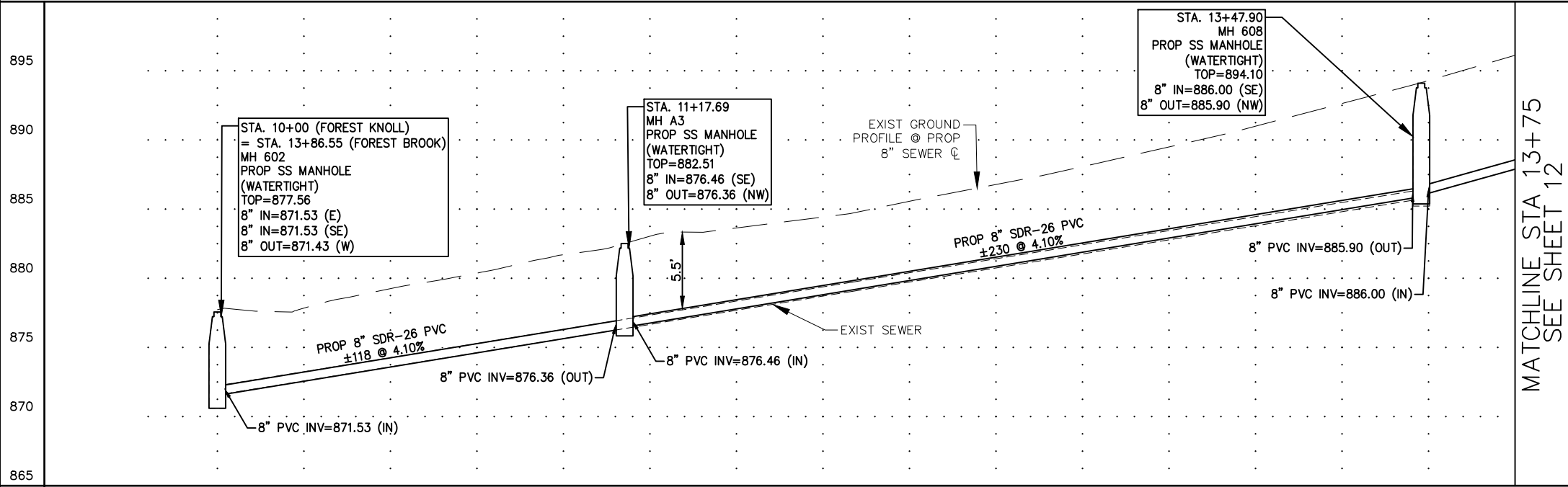
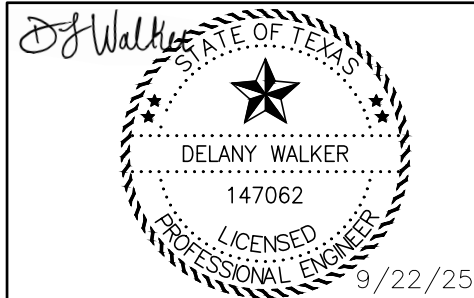
NO	DATE	DESCRIPTION REVISIONS						DWG	CH
							8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com Engineering License #F-10053 <u>Ardurra Group, Inc.</u> Surveying Firm 10126502		
 LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS									
FOREST BROOK STA. 17+25 TO END									
HORIZ. SCALE: 1"=40'					VERT. SCALE: 1"=10'				
									
SCALE IN FEET					SCALE IN FEET				
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DWG:		STATE		COUNTY		SHEET NO.			
CHK:		TEXAS		BEXAR		10			

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Monday September 22, 2025, 3:30pm



ITEM	DESCRIPTION	UNIT	QTY
103	REMOVE CONCRETE CURB	LF	36
103	REMOVE CONCRETE SIDEWALK & DRIVEWAY	SF	128
203	TACK COAT	GAL	15
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (10" TYPE B)	SY	110
205	HOT MIX ASPHALTIC CONCRETE PAVEMENT (2" TYPE D)	SY	148
500	CONCRETE CURB	LF	36
502	CONCRETE SIDEWALK	SY	14
550	TRENCH EXCAVATION SAFETY PROTECTION	LF	348
848	8" SANITARY SEWER PIPE, ALL DEPTHS	LF	348
852.1	SANITARY SEWER MANHOLE (0'-6")	EA	2
852.3	EXTRA DEPTH MANHOLE (>6")	VF	3.0
854	6" SANITARY SEWER LATERALS	LF	456
854	TWO-WAY CLEANOUT	EA	9
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	375
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	375
901	8" CIPP SANITARY SEWER PIPE, ALL DEPTHS	LF	27

- NOTE:
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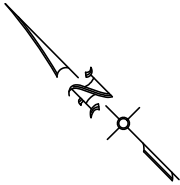
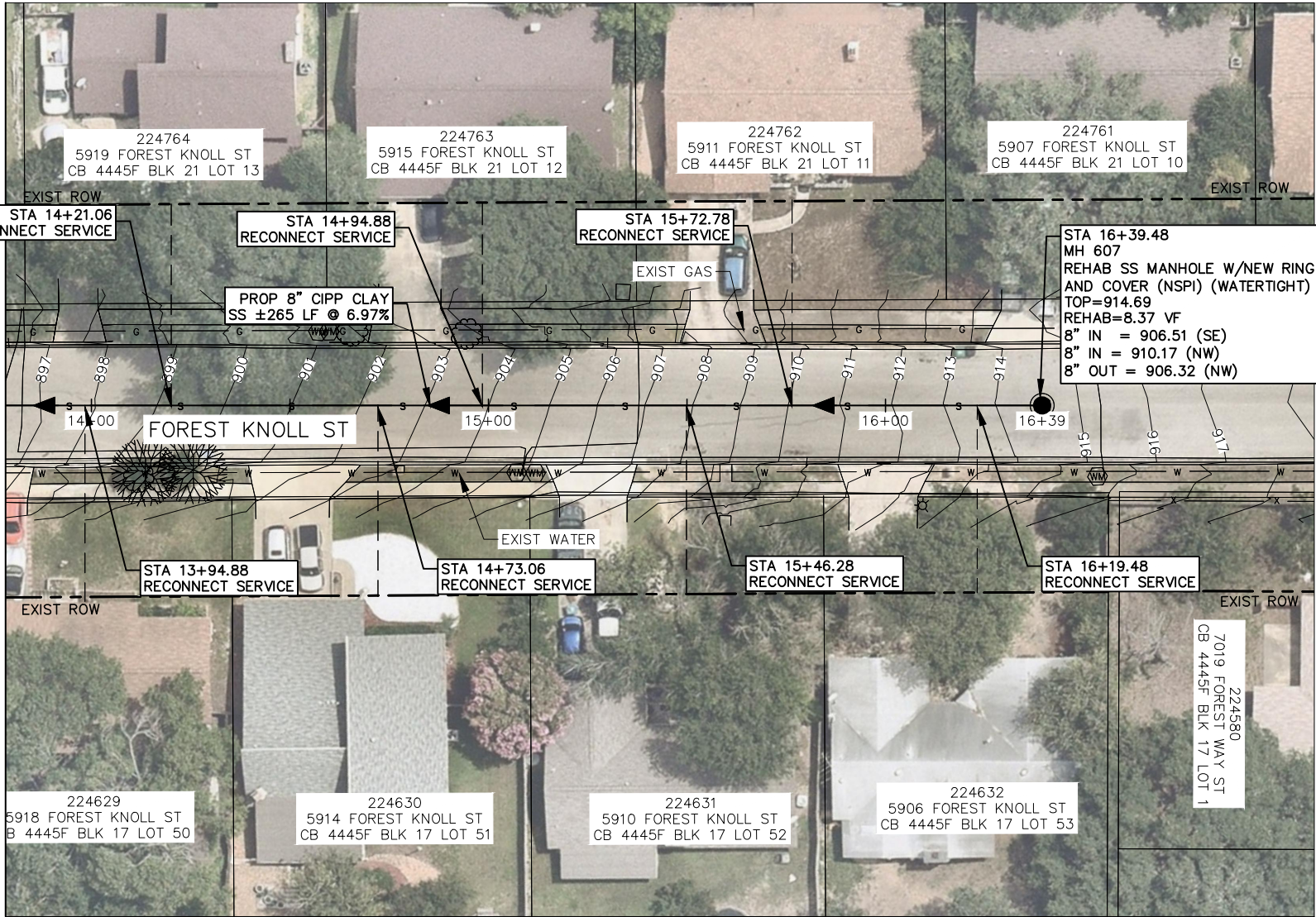


LEGEND	
— S	WASTE WATER
— W	WATER
— G	BURIED GAS
— OT	OH TEL
— UGT	BURIED TEL
— OE	OH ELEC
— UGP	BURIED ELEC
— FENCE	FENCE
—	RIGHT-OF-WAY
—	PROPERTY LINE
○	CLEAN OUT
⊙	FIRE HYDRANT
⊗	WATER METER
⊕	WATER VALVE
⊞	TELE PEDESTAL
⊟	LIGHT POLE
⊠	POWER POLE
⊡	GUY WIRE
⊢	SIGN
⊣	EXIST MANHOLE
⊤	REHAB MANHOLE
⊥	REPLACE MANHOLE
⊦	PROP SS
⊧	PROP SS LATERAL
⊨	EXIST SS LATERAL
⊩	CLEAN OUT
⊪	GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
⊫	TRENCH REPAIR
⊬	FLOWABLE FILL
⊭	CONC ENCASEMENT
⊮	GROUT & ABANDON

NO	DATE	DESCRIPTION	DWG	CHK
REVISIONS				
<div> 8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com Engineering License #F-10053 Ardurra Group, Inc. Surveying Firm 10126502</div>				
<div> LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS</div>				
FOREST KNOLL STA. 10+00 TO STA. 13+75				
<div>HORIZ. SCALE: 1"=40' 0 20 40 SCALE IN FEET</div> <div>VERT. SCALE: 1"=10' 0 5 10 SCALE IN FEET</div>				
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CHK:				
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CHK:	TEXAS	BEXAR	11	

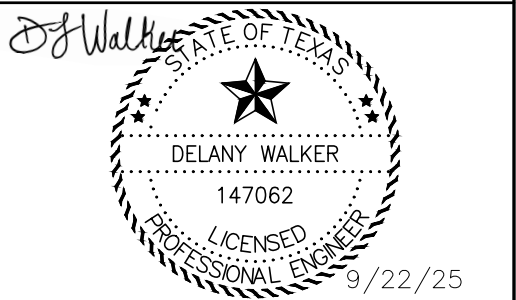
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Monday September 22, 2025, 3:34pm

MATCHLINE STA 13+75
SEE SHEET 11



ITEM	DESCRIPTION	UNIT	QTY
854	6" SANITARY SEWER LATERALS	LF	50
854	TWO-WAY CLEANOUT	EA	1
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	265
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	265
901	8" CIPP SANITARY SEWER PIPE, ALL DEPTHS	LF	265
910	MANHOLE REHABILITATION (INCLUDES REPLACEMENT OF RING & COVER)	VF	9
1109	SERVICE RECONNECTION, ALL DEPTHS (W/ REMOTE CONTROL CUT DEVICE)	EA	7

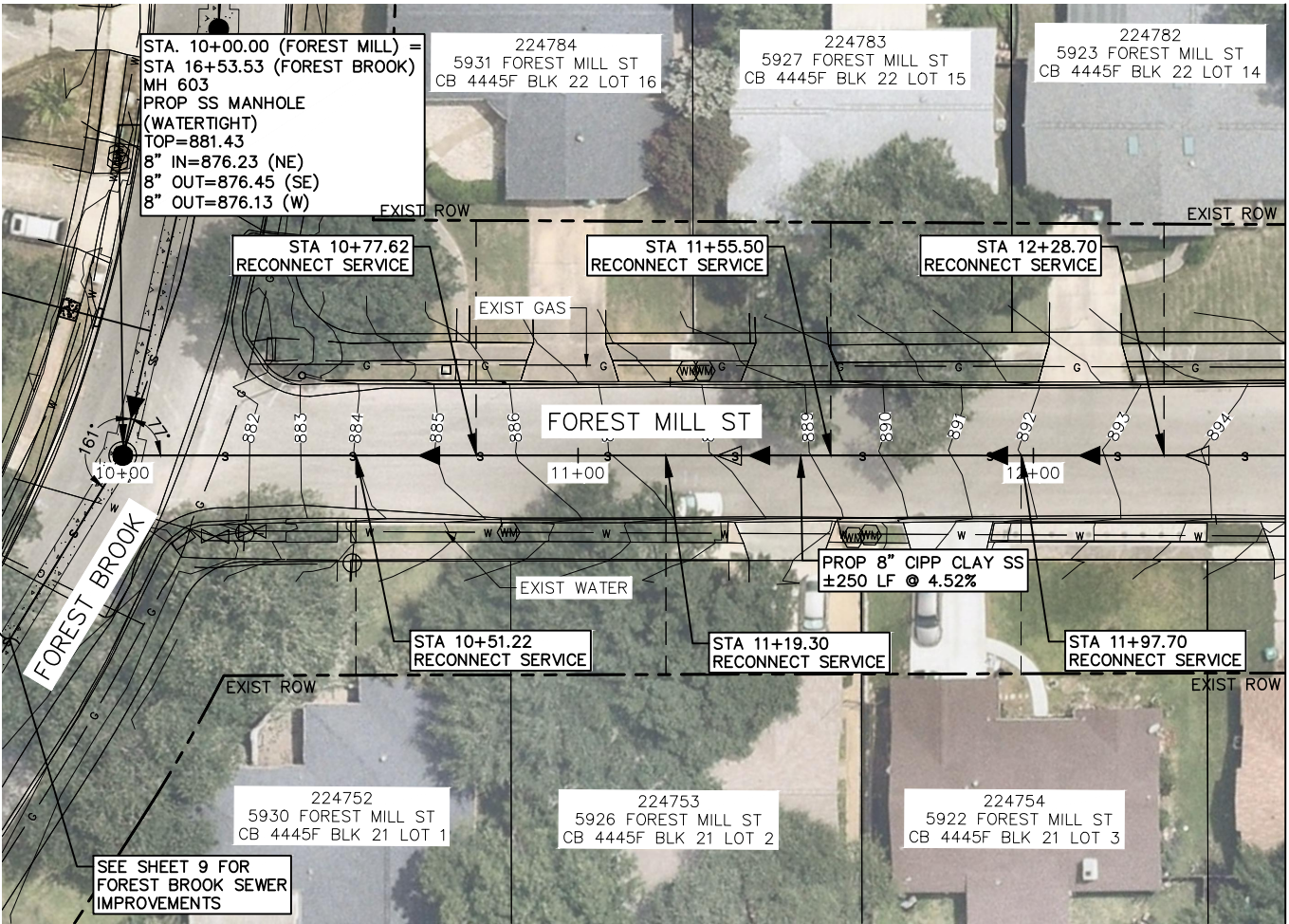
- NOTE:
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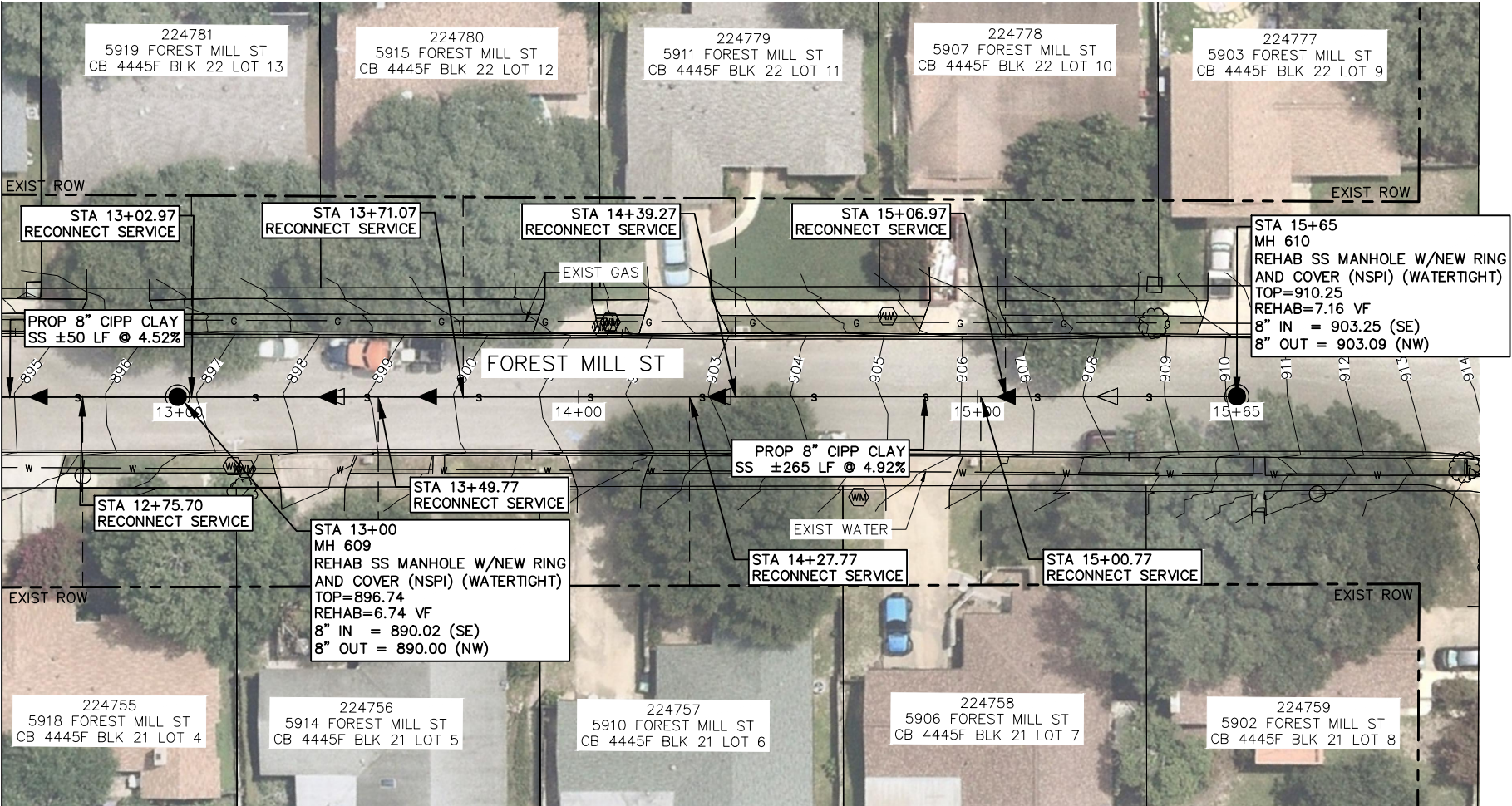
LEGEND			
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— UGT	BURIED TEL		
— OE	OH ELEC		
— UGP	BURIED ELEC		
—	FENCE		
—	RIGHT-OF-WAY		
—	PROPERTY LINE		
○	CLEAN OUT		
⊙	FIRE HYDRANT		
⊗	WATER METER		
⊕	WATER VALVE		
⊞	TELE PEDESTAL		
⊙	LIGHT POLE		
●	POWER POLE		
⊙	GUY WIRE		
⊙	SIGN		
⊙	EXIST MANHOLE		
⊙	REHAB MANHOLE		
⊙	REPLACE MANHOLE		
◄ S	PROP SS		
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—	EXIST SS LATERAL		
⬠	CLEAN OUT GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING		
▨	TRENCH REPAIR		
▨	FLOWABLE FILL		
□	CONC ENCASEMENT		
— X —	GROUT & ABANDON		

NO	DATE	DESCRIPTION	DWG	CHK	
REVISIONS					
			8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com Engineering License #F-10053		
			Ardurra Group, Inc. Surveying Firm 10126502		
					
LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS					
FOREST KNOLL STA. 13+75 TO END					
HORIZ. SCALE: 1"=40'			VERT. SCALE: 1"=10'		
					
SCALE IN FEET			SCALE IN FEET		
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DWG:	STATE	COUNTY	SHEET NO.		
DWG:	TEXAS	BEXAR	12		

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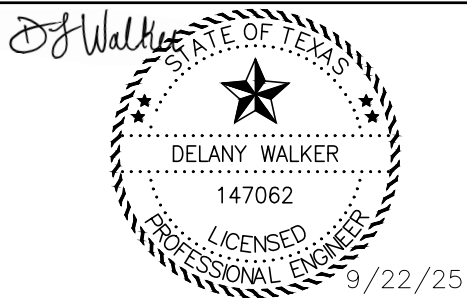
MATCHLINE STA 12+50



MATCHLINE STA 12+50

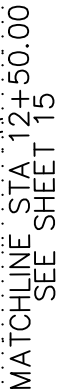
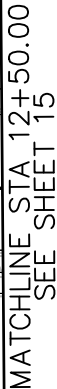
ITEM	DESCRIPTION	UNIT	QTY
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	565
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	565
901	8" CIPP SANITARY SEWER PIPE, ALL DEPTHS	LF	565
910	MANHOLE REHABILITATION (INCLUDES REPLACEMENT OF RING & COVER)	VF	14
1109	SERVICE RECONNECTION, ALL DEPTHS (W/ REMOTE CONTROL CUT DEVICE)	EA	14

- NOTE:
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LEGEND			
— S	WASTE WATER		
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—	FENCE		
—	RIGHT-OF-WAY		
—	PROPERTY LINE		
○	CLEAN OUT		
⊕	FIRE HYDRANT		
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⊕	TRENCH REPAIR		
⊕	FLOWABLE FILL		
⊕	CONC ENCASEMENT		
— X —	GROUT & ABANDON		

NO	DATE	DESCRIPTION					DWG	CHK	
REVISIONS									
			8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com						
			Engineering License #F-10053						
COLLABORATE. INNOVATE. CREATE.			Ardurra Group, Inc. Surveying Firm 10126502						
									
LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS									
FOREST MILL STA. 10+00 TO END									
HORIZ. SCALE: 1"=40'					VERT. SCALE: 1"=10'				
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		TEXAS		BEXAR		13			



FIELD VERIFY THE
EXISTING UTILITIES
CONSTRUCTION.
CONFIRM THE
CUSTOMERS EXISTING
TERMS PRIOR TO
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AND CLEAN-OUT
REPLACED AS PART

VERIFY THE INVERTS
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ION.
REPLACE ALL CURBS,
WALTS REMOVED FOR
OF THE SEWER
RE SITES TO THE
CONDITIONS. THIS
O SAW ITEM 854.

DJ Walker

STATE OF TEXAS

★ ★ ★

DELANY WALKER

147062

PROFESSIONAL ENGINEER

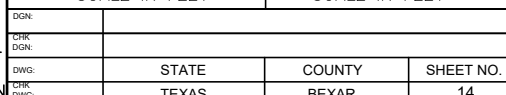
9/22/25

-
- The seal is circular with a decorative border. Inside the border, the text "STATE OF TEXAS" is at the top and "LICENSED PROFESSIONAL ENGINEER" is at the bottom. In the center is a five-pointed star. Below the star, the name "DELANY WALKER" and the license number "147062" are printed. The expiration date "9/22/25" is at the bottom right. A handwritten signature "D Walker" is written across the top left of the seal.


 8918 Tesoro Dr., Suite 401
 San Antonio, Texas 78217
 Phone: (210) 822-2232
 www.Ardurra.com
 Engineering License #F-10053
 Ardurra Group, Inc.
 Surveying Firm 10126502
ARDURRA
COLLABORATE. INNOVATE. CREATE.

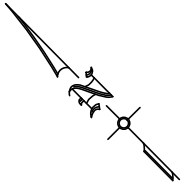
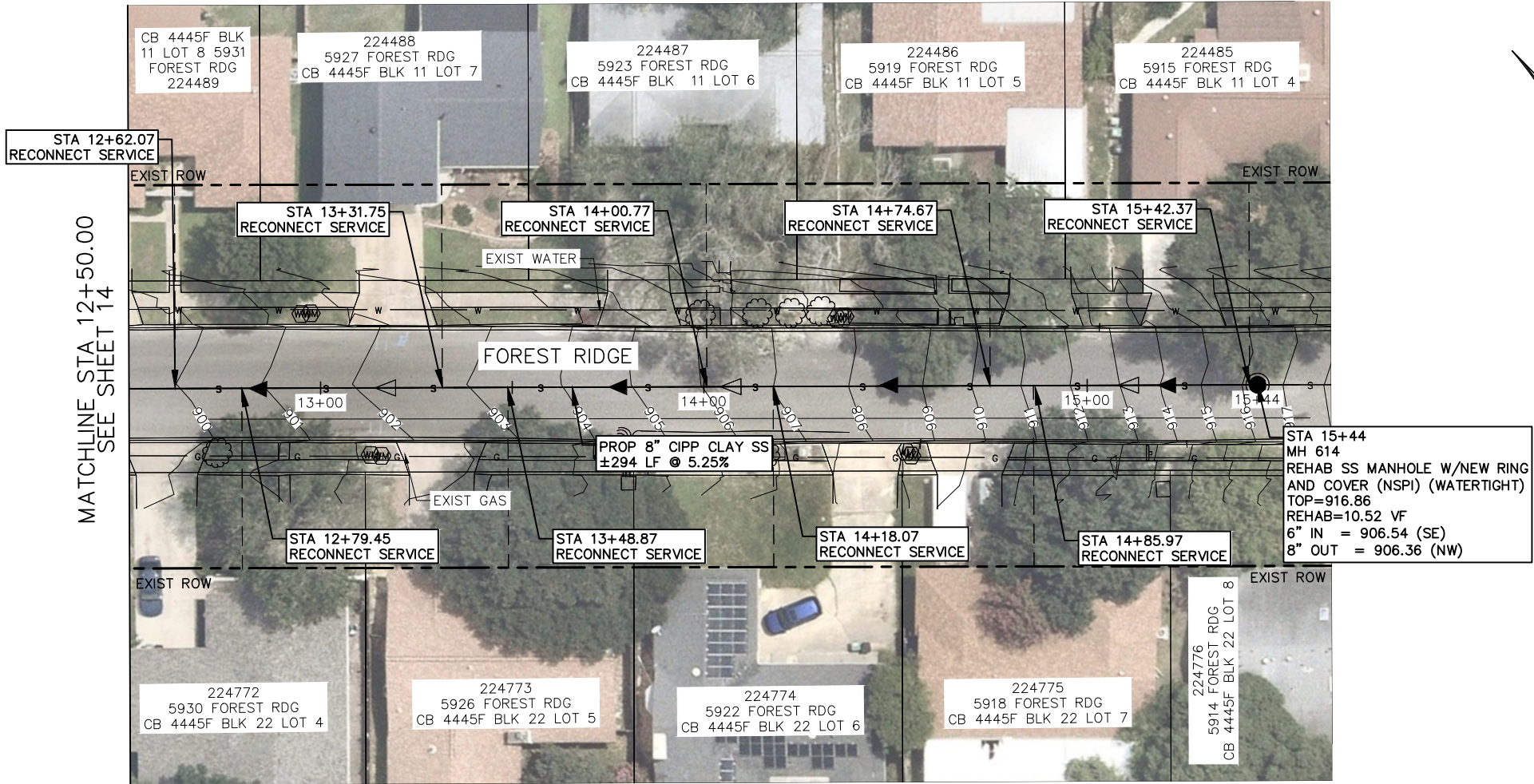


FOREST RIDGE STA 10+00
TO STA. 12+50



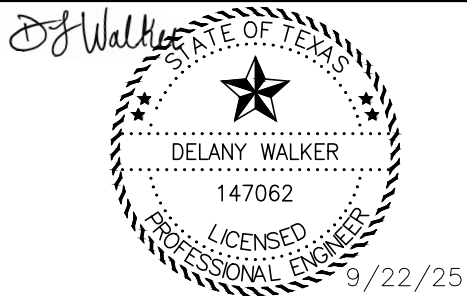
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CHK	TEXAS	DEYAR	14

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Monday September 22, 2025, 3:44pm



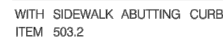
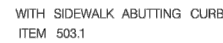
ITEM	DESCRIPTION	UNIT	QTY
866	PRE-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	294
866	POST-CONSTRUCTION SANITARY SEWER MAIN TELEVISION INSPECTION (8"-15" MAIN)	LF	294
901	8" CIPP SANITARY SEWER PIPE, ALL DEPTHS	LF	294
910	MANHOLE REHABILITATION (INCLUDES REPLACEMENT OF RING & COVER)	VF	10.5
1109	SERVICE RECONNECTION, ALL DEPTHS (W/ REMOTE CONTROL CUT DEVICE)	EA	9

- NOTE:
- CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF THE EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
 - CONTRACTOR SHALL CONFIRM THE LOCATION OF THE CUSTOMERS EXISTING CLEAN-OUT AND LATERALS PRIOR TO BEGINNING WORK. EVERY CUSTOMER WITH AN EXISTING LATERAL AND CLEAN-OUT SHALL HAVE THEM REPLACED AS PART OF THIS PROJECT.
 - CONTRACTOR SHALL VERIFY THE INVERTS OF THE EXISTING SEWER MAINS PRIOR TO BEGINNING CONSTRUCTION.
 - CONTRACTOR SHALL REPLACE ALL CURBS, SIDEWALKS AND ASPHALT REMOVED FOR THE INSTALLATION OF THE SEWER LATERALS TO RESTORE SITES TO THE PRE-CONSTRUCTION CONDITIONS. THIS WORK IS SUBSIDIARY TO SAW ITEM 854.



LEGEND			
— S	WASTE WATER		
— W	WATER		
— G	BURIED GAS		
— OT	OH TEL		
— UGT	BURIED TEL		
— OE	OH ELEC		
— UGP	BURIED ELEC		
—	FENCE		
—	RIGHT-OF-WAY		
—	PROPERTY LINE		
○	CLEAN OUT		
⊙	FIRE HYDRANT		
⊗	WATER METER		
⊗	WATER VALVE		
⊗	TELE PEDESTAL		
⊙	LIGHT POLE		
●	POWER POLE		
+	GUY WIRE		
⊙	SIGN		
⊙	EXIST MANHOLE		
⊙	REHAB MANHOLE		
⊙	REPLACE MANHOLE		
◄ S	PROP SS		
—	PROP SS LATERAL		
—	EXIST SS LATERAL		
⬠	CLEAN OUT GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING		
▨	TRENCH REPAIR		
▨	FLOWABLE FILL		
□	CONC ENCASEMENT		
— X —	GROUT & ABANDON		

NO	DATE	DESCRIPTION	DWG	CHK	
REVISIONS					
			<div>8918 Tesoro Dr., Suite 401 San Antonio, Texas 78217 Phone: (210) 822-2232 www.Ardurra.com Engineering License #F-10053 Ardurra Group, Inc. Surveying Firm 10126502</div>		
					
LEON VALLEY 2025 FOREST OAKS SEWER IMPROVEMENTS					
FOREST RIDGE STA. 12+50 TO END					
HORIZ. SCALE: 1"=40'			VERT. SCALE: 1"=10'		
<div>02040</div> 			<div>0510</div> 		
SCALE IN FEET			SCALE IN FEET		
DGN:					
CHK:					
DGN:					
DWG:					
DWG:	STATE	COUNTY	SHEET NO.		
DWG:	TEXAS	BEXAR	15		



1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY THAT MAY BE NECESSARY TO RECONSTRUCT WITHIN PRIVATE PROPERTY TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE. THIS PORTION OF THE DRIVEWAY SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS AS MAY APPLY:

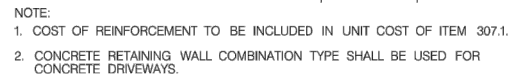
- CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.1 OR 503.2.
- ASPHALTIC CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.4 AND SHALL INCLUDE A MINIMUM OF 1" ASPHALT TYPE 'D' & 6" FLEXIBLE BASE
- GRAVEL DRIVEWAY PAID FOR UNDER ITEM NO. 503.5 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE

2. 7" MINIMUM HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.
3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:
- | TYPE | MINIMUM | MAXIMUM |
|----------------------|---------|---------|
| RESIDENTIAL | 10' | 20' |
| COMMERCIAL – ONE WAY | 12' | 20' |
| COMMERCIAL – TWO WAY | 24' | 30' |
4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB.
5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR, AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
6. DUMMY JOINTS PARALLEL TO THE CURB SHALL BE PLACED WHERE THE SIDEWALK MEETS THE DRIVEWAY. DUMMY JOINTS PERPENDICULAR TO THE CURB, AND WITHIN THE BOUNDARIES OF THE PARALLEL DUMMY JOINTS, SHALL BE PLACED AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK.
7. A MINIMUM OF TWO ROUND AND SMOOTH DOWEL BARS 3/8" IN DIAMETER AND 18" IN LENGTH SHALL BE SPACED 18" APART AT EACH EXPANSION JOINT.
8. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE. WHERE SIDEWALKS CROSS DRIVEWAYS, SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2%.
9. SIDEWALK RAMP SURFACE SHALL BE BRUSH FINISHED.

TYPE	MINIMUM	MAXIMUM
RESIDENTIAL	10'	20'
COMMERCIAL – ONE WAY	12'	20'
COMMERCIAL – TWO WAY	24'	30'



WITH SIDEWALK SEPARATED FROM CURE
ITEM 503.2



ON COMPACTED SUBGRADE
ITEM 307.1



WITH SIDEWALK SEPARATED FROM CURB



_____ % SUBMITTAL	PROJECT NO.: _____	DATE: _____
DRWN. BY: V. VASQUEZ	DSGN. BY: _____	CHKD. BY: R.S. HOSSEINI, P.E. SHEET NO.: 16

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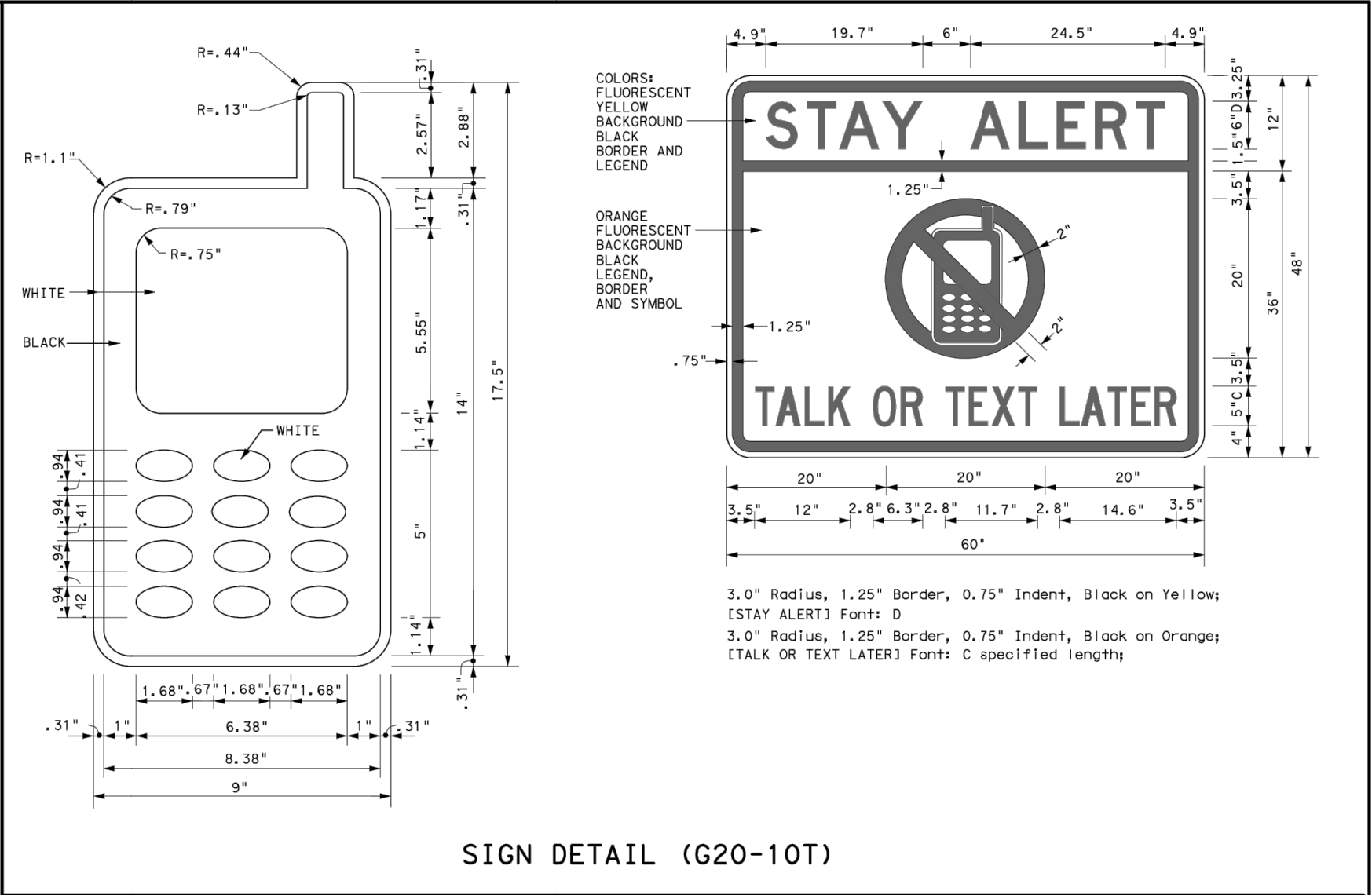
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- 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.
- 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.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The 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.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY APPAREL NOTES:


- 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.



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

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

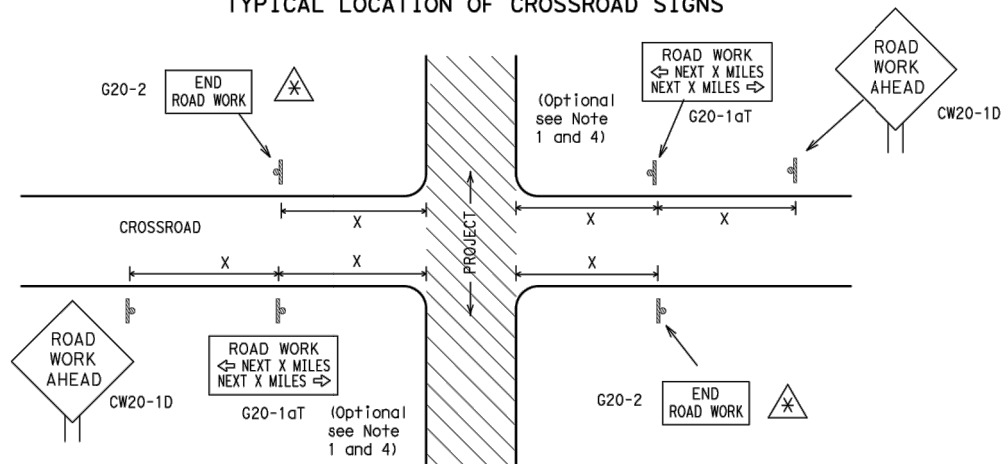
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov	
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)	
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)	
MATERIAL PRODUCER LIST (MPL)	
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"	
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)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

SHEET 1 OF 12					
 Texas Department of Transportation		Traffic Operations Division Standard			
<div>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS BC (1) - 14</div>					
FILE#	bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CS: TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS					
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9-07	7-13				
		DIST	COUNTY		SHEET NO.
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3/23/2022
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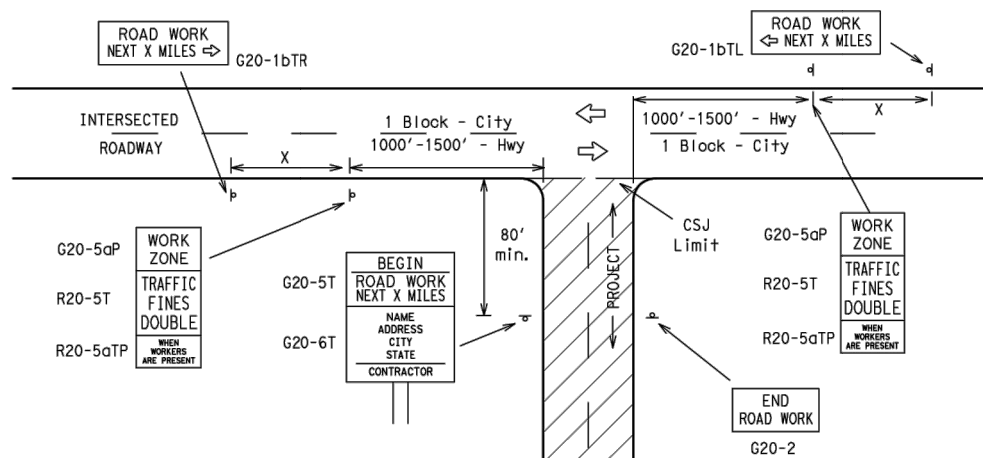
TYPICAL LOCATION OF CROSSROAD SIGNS



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

- 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.
- 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. This information shall be shown in the plans.
- Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
- 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.
- Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
- 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

- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- 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^{1,5,6}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 ²
			60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	80	1000 ²
			*	* ³

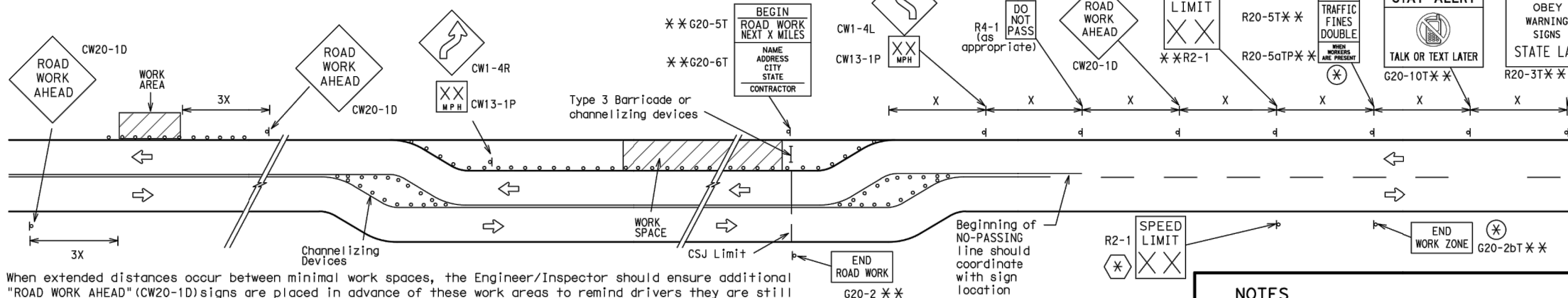
x For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

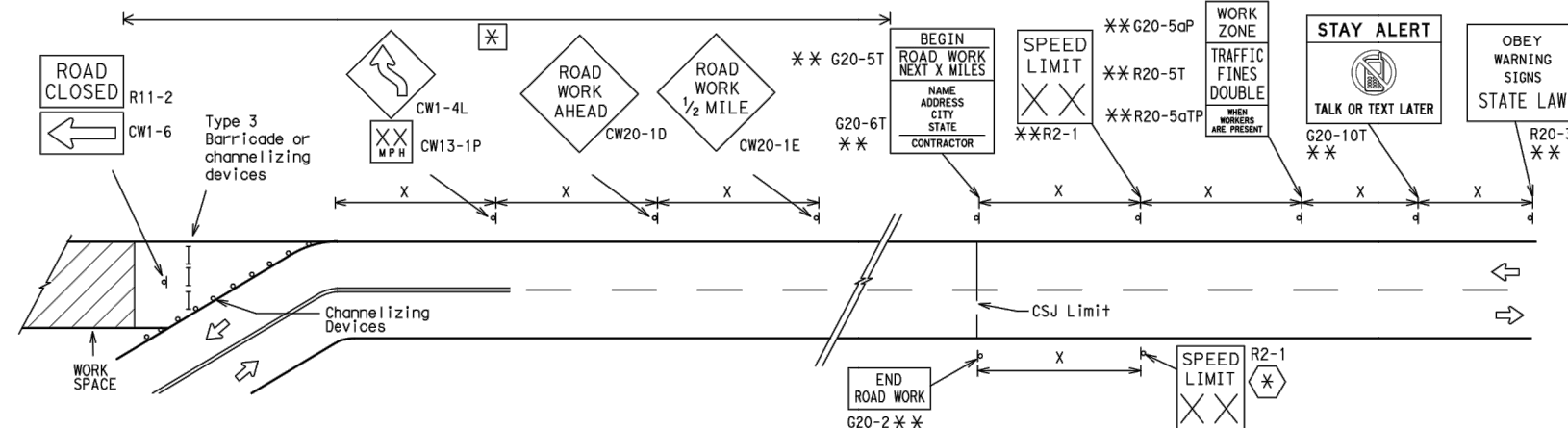
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- 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



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" (G20-2bT) 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.

** Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

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



BARRICADE AND CONSTRUCTION PROJECT LIMIT

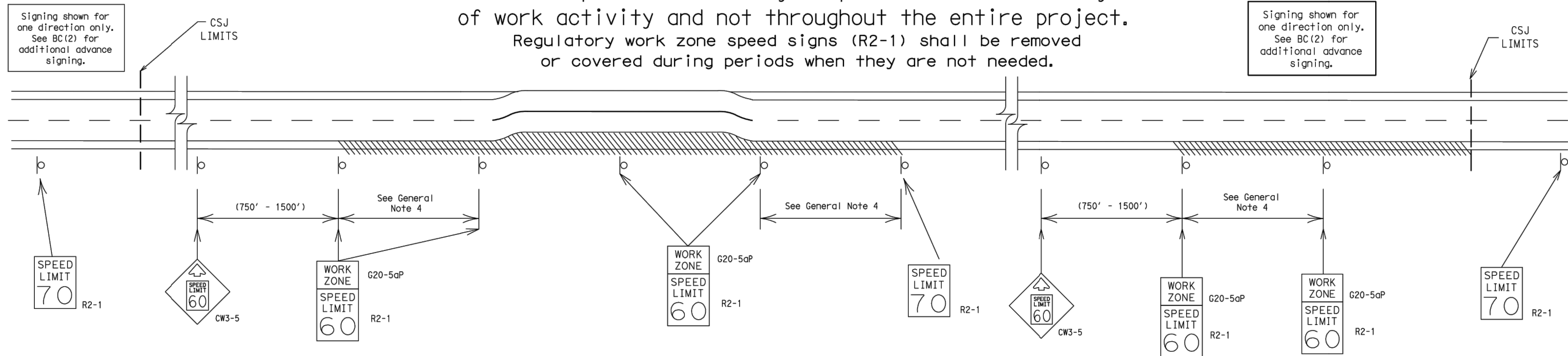
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7-13				
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

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

GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:
 - 40 mph and greater 0.2 to 2 miles
 - 35 mph and less 0.2 to 1 mile
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (CW3-5) sign, "WORK ZONE" (G20-5aP) plaque and the "SPEED LIMIT" (R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

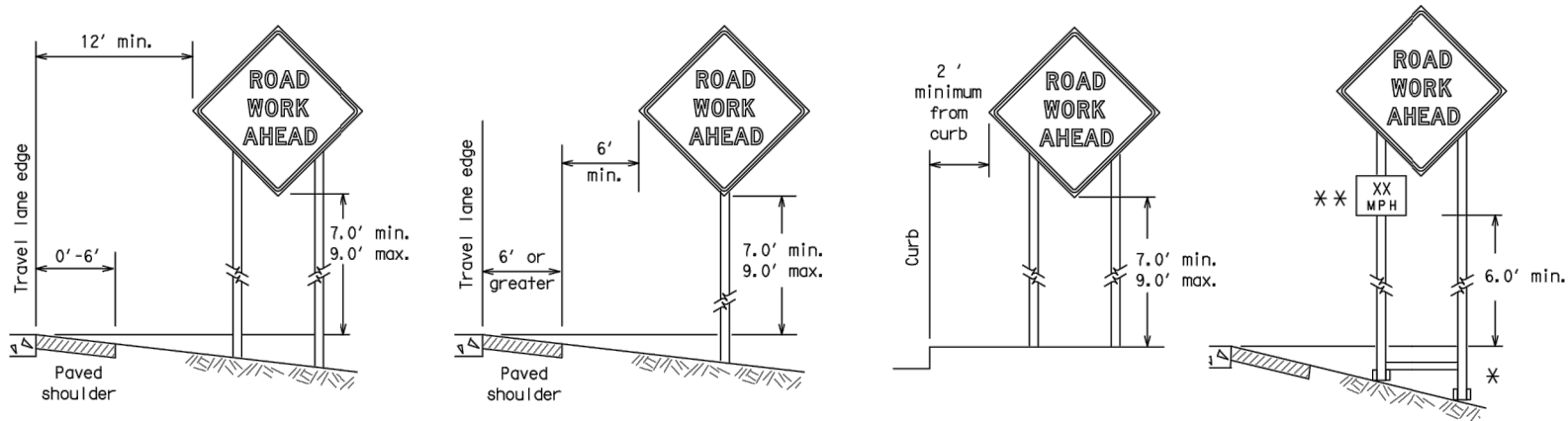
SHEET 3 OF 12

		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
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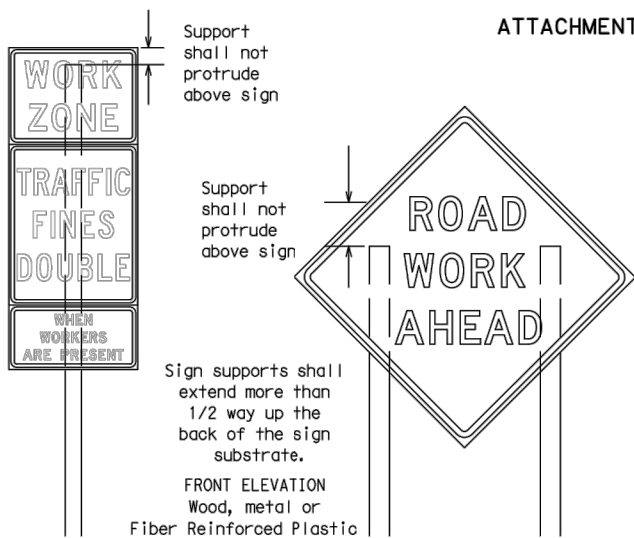
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

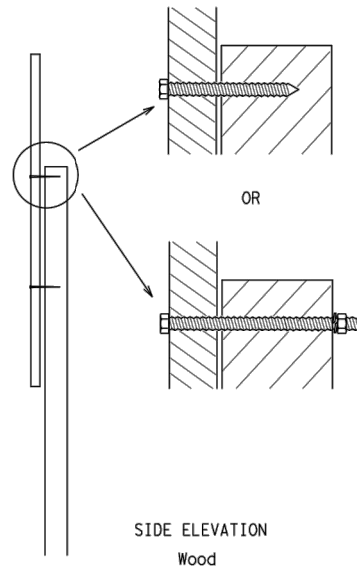
✱✱ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



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

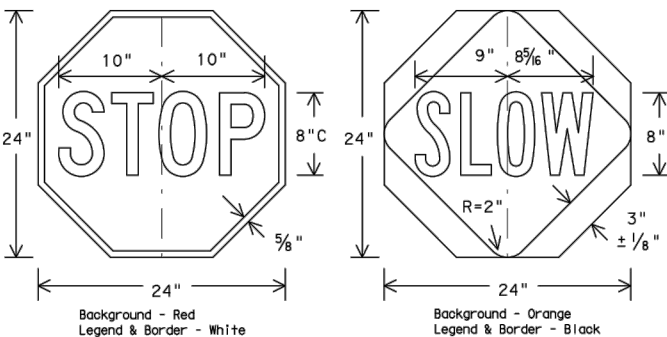
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports



Nails 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.

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- 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.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- 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)

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

SIGN MOUNTING HEIGHT

- 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.
- The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
- 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

- 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

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

REFLECTIVE SHEETING

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

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

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
- 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.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

- 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.

SHEET 4 OF 12



Traffic Operations Division Standard

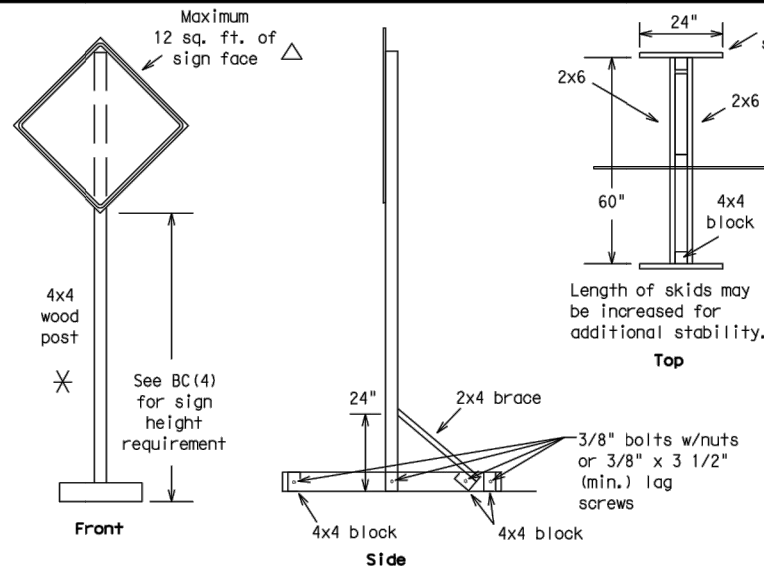
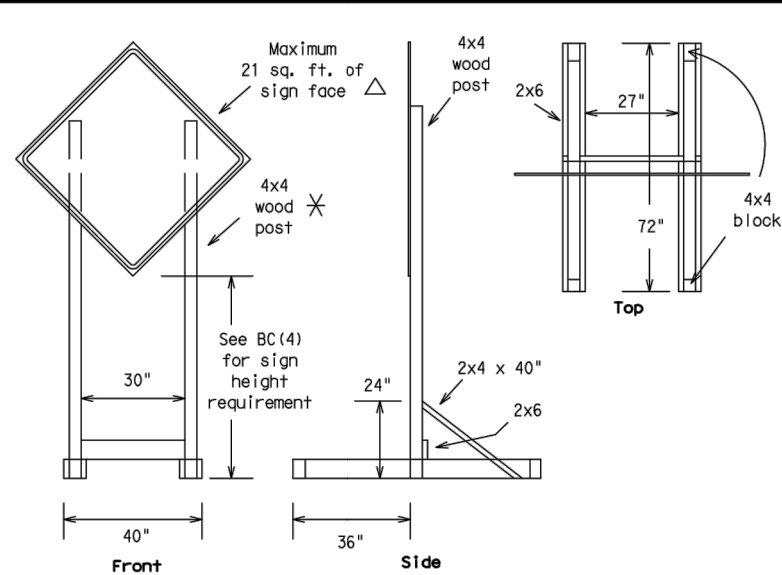
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14				
7-13				
	DIST	COUNTY		SHEET NO.
				21

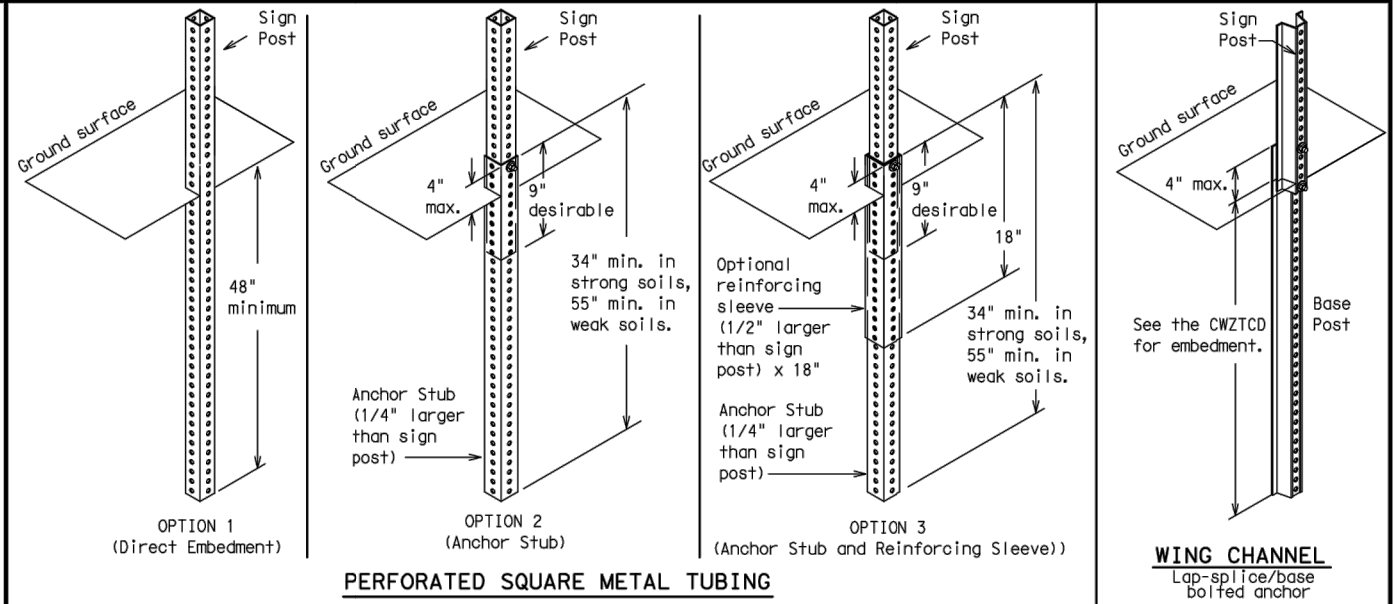
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3/23/2022
S:\Projects\Leon Valley\170165 Professional Eng Svc\540 Blacksmith Lane Water and Sewer Imp\20-Drawings\Plans\Civil\170165-540-TXD01-BD-01 (5).dgn



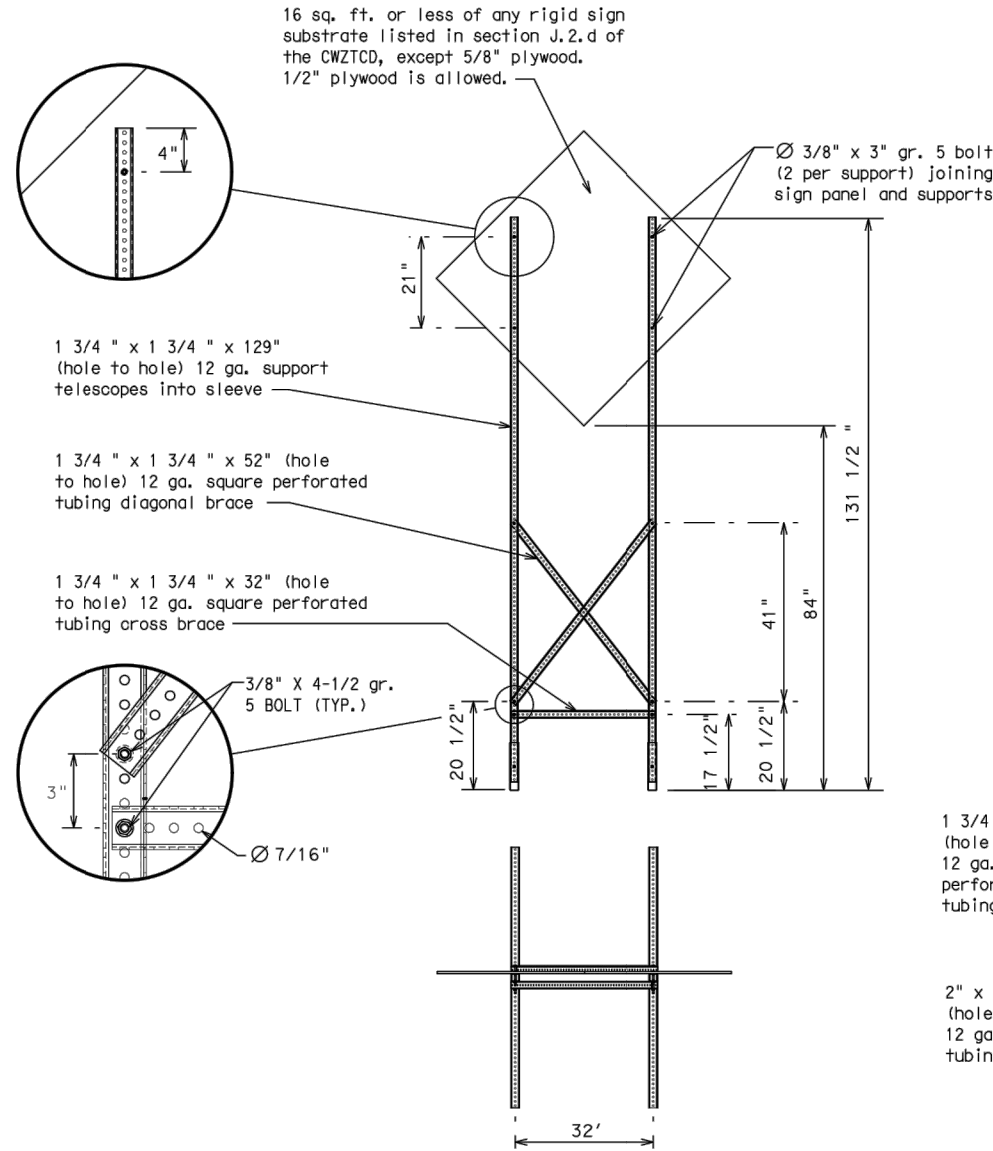
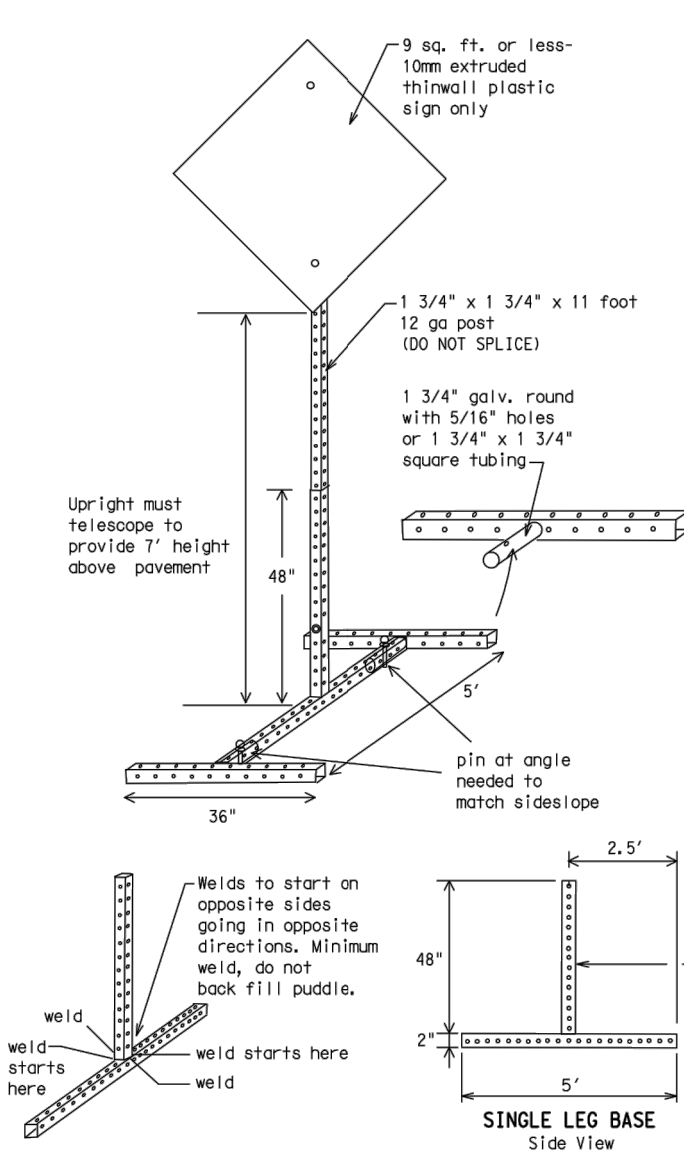
SKID MOUNTED WOOD SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



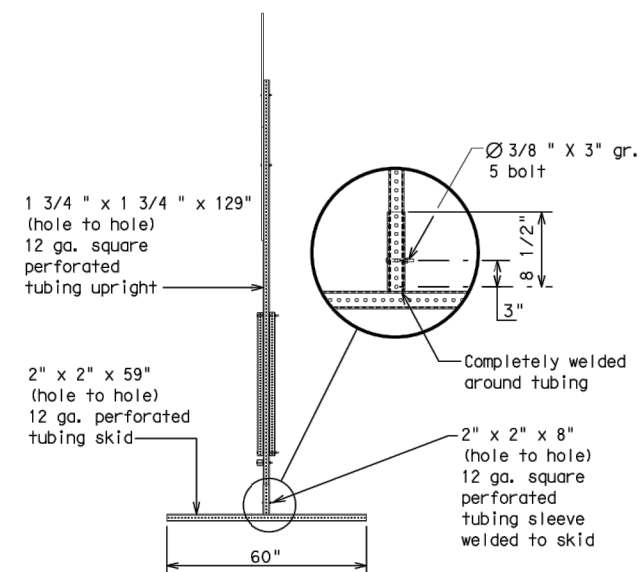
GROUND MOUNTED SIGN SUPPORTS

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



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

WOOD POST SYSTEM FOR GROUND 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(1)).

OTHER DESIGNS

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

GENERAL NOTES

- 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.
- No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

- ☐ See BC(4) for definition of "Work Duration."
- ✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
- Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
- The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
- PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
- Each line of text should be centered on the message board rather than left or right justified.
- If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY
CLOSED
X MILE

FRONTAGE
ROAD
CLOSED

ROAD
CLOSED
AT SH XXX

SHOULDER
CLOSED
XXX FT

ROAD
CLSD AT
FM XXXX

RIGHT LN
CLOSED
XXX FT

RIGHT X
LANES
CLOSED

RIGHT X
LANES
OPEN

CENTER
LANE
CLOSED

DAYTIME
LANE
CLOSURES

NIGHT
LANE
CLOSURES

I-XX SOUTH
EXIT
CLOSED

VARIOUS
LANES
CLOSED

EXIT XXX
CLOSED
X MILE

EXIT
CLOSED

RIGHT LN
TO BE
CLOSED

MALL
DRIVEWAY
CLOSED

X LANES
CLOSED
TUE - FRI

XXXXXXXX
BLVD
CLOSED

Other Condition List

ROADWORK
XXX FT

ROAD
REPAIRS
XXXX FT

FLAGGER
XXXX FT

LANE
NARROWS
XXXX FT

RIGHT LN
NARROWS
XXXX FT

TWO-WAY
TRAFFIC
XX MILE

MERGING
TRAFFIC
XXXX FT

CONST
TRAFFIC
XXX FT

LOOSE
GRAVEL
XXXX FT

UNEVEN
LANES
XXXX FT

DETOUR
X MILE

ROUGH
ROAD
XXXX FT

ROADWORK
PAST
SH XXXX

ROADWORK
NEXT
FRI-SUN

BUMP
XXXX FT

US XXX
EXIT
X MILES

TRAFFIC
SIGNAL
XXXX FT

LANES
SHIFT

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE
RIGHT

FORM
X LINES
RIGHT

DETOUR
NEXT
X EXITS

USE
XXXXX
RD EXIT

USE
EXIT XXX

USE EXIT
I-XX
NORTH

STAY ON
US XXX
SOUTH

USE
I-XX E
TO I-XX N

TRUCKS
USE
US XXX N

WATCH
FOR
TRUCKS

WATCH
FOR
TRUCKS

EXPECT
DELAYS

EXPECT
DELAYS

PREPARE
TO
STOP

REDUCE
SPEED
XXX FT

END
SHOULDER
USE

USE
OTHER
ROUTES

WATCH
FOR
WORKERS

STAY
IN
LANE

Location List

AT
FM XXXX

BEFORE
RAILROAD
CROSSING

NEXT
X
MILES

PAST
US XXX
EXIT

XXXXXXX
TO
XXXXXXX

US XXX
TO
FM XXXX

Warning List

SPEED
LIMIT
XX MPH

MAXIMUM
SPEED
XX MPH

MINIMUM
SPEED
XX MPH

ADVISORY
SPEED
XX MPH

RIGHT
LANE
EXIT

USE
CAUTION

DRIVE
SAFELY

DRIVE
WITH
CARE

** Advance Notice List

TUE-FRI
XX AM-
X PM

APR XX-
XX
X PM-X AM

BEGINS
MONDAY

BEGINS
MAY XX

MAY X-X
XX PM -
XX AM

NEXT
FRI-SUN

XX AM
TO
XX PM

NEXT
TUE
AUG XX

TONIGHT
XX PM-
XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.


FULL MATRIX PCMS SIGNS

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

WORDING ALTERNATIVES

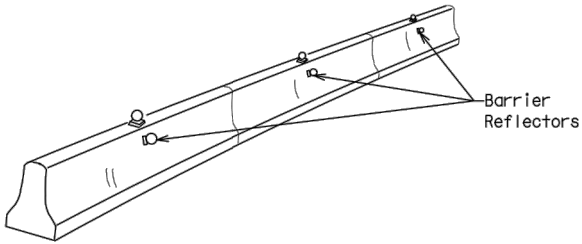
- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.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

SHEET 6 OF 12

 Texas Department of Transportation				Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)					
BC (6) - 14					
FILE:	bc-14.dgn	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS					
9-07	8-14	DIST	COUNTY		SHEET NO.
7-13					23

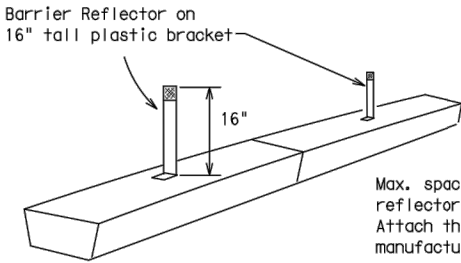
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



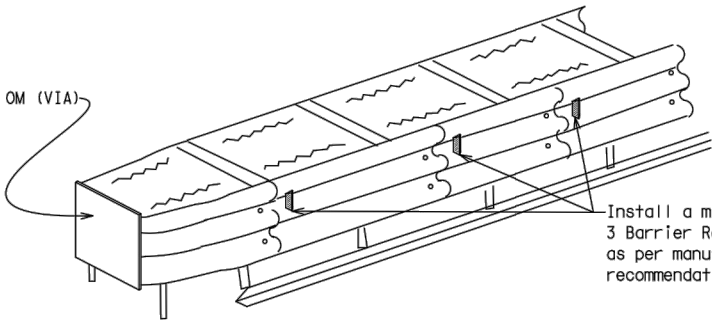
CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

See D & OM (VIA)



Install a minimum of 3 Barrier Reflectors as per manufacturer's recommendations.

DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

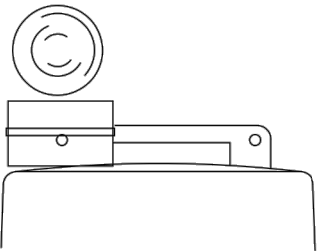
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

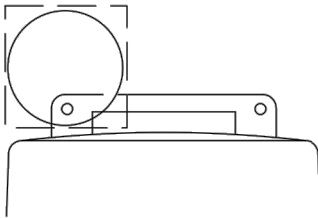
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



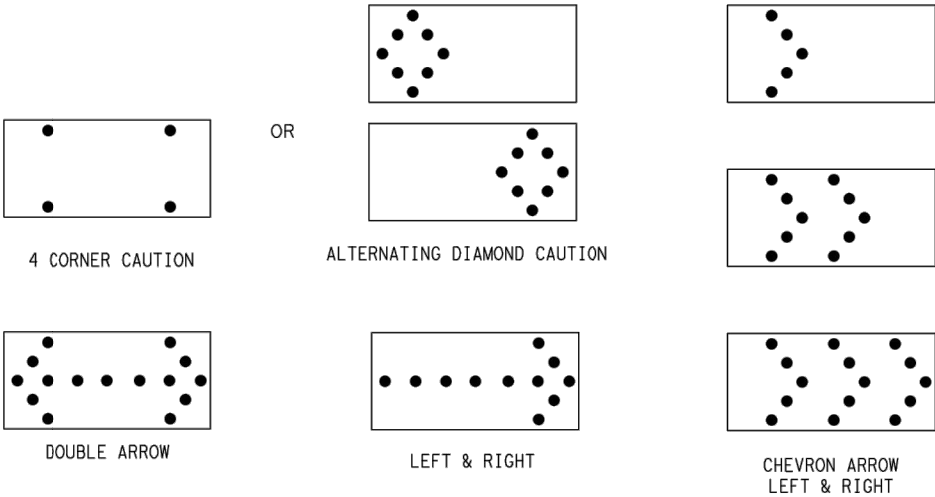
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage.
- The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
- Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- 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

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



Traffic Operations Division Standard

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

BC(7)-14

FILE:	bc-14.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB			HIGHWAY		
REVISIONS									
9-07	8-14	DIST	COUNTY					SHEET NO.	
7-13							24		

Plotted by: sgallaspay
3/23/2022

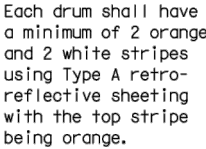
1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece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

Pre-qualified plastic drums shall meet the following requirements:

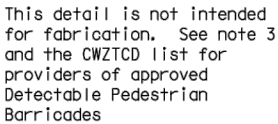
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

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 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.

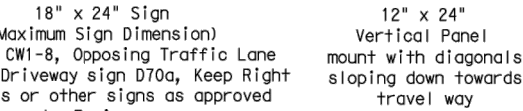
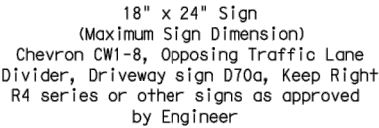
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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



1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



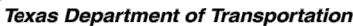
1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to 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 for Buildings and Facilities (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 may use 8" nominal barricade rails 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.



SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED
ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} 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 Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, 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 or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

SHEET 8 OF 12



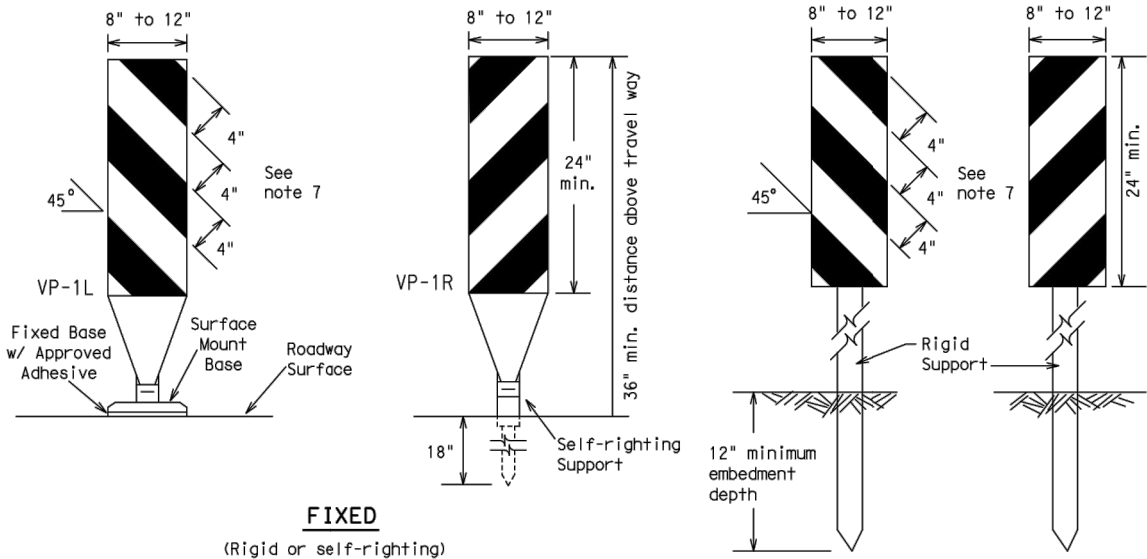
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 14

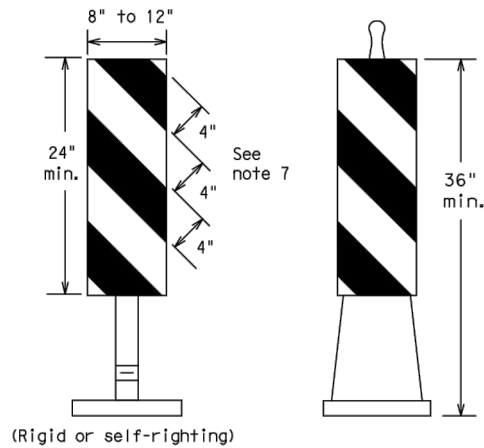
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© TxDOT November 2002		CONT	SECT	JOB			HIGHWAY		
REVISIONS									
4-03	7-13	DIST	COUNTY					SHEET NO.	
9-07	8-14							25	

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Plotted by: sgal laspy
3/23/2022
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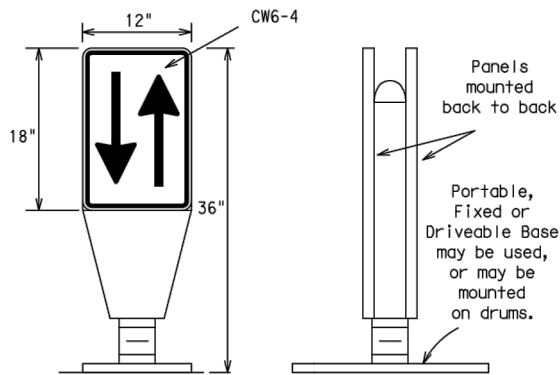
FIXED
(Rigid or self-righting)



PORTABLE

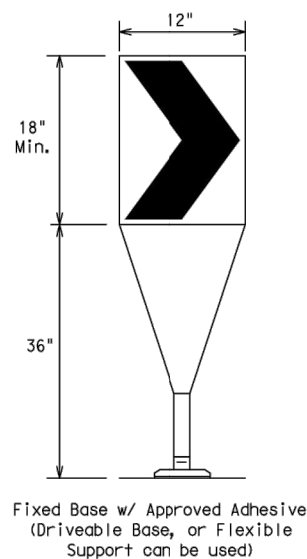
VERTICAL PANELS (VPs)

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



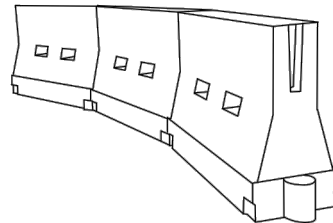
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- 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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- 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.
- Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- 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.
- 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

GENERAL NOTES

- 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).
- 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.
- Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- 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.

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' 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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

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7-13				26

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- DISCLAIMER:
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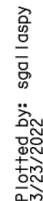
6"

6"

Minimum Width of Reflective Sheetting 7 inches.

The diagram illustrates a cross-section of a three-rail track. It consists of three horizontal rails: a top rail, a middle rail, and a bottom rail. Each rail is represented by a rectangle with diagonal hatching. The rails are supported by vertical stiffeners, which are shown as thin vertical lines. The top rail is labeled "Flat rail" with an arrow pointing to it. The middle and bottom rails are labeled "Stiffener" with an arrow pointing to the stiffener between them. The horizontal distance between the stiffeners is labeled "4' min., 8' max.". The vertical distance between the stiffeners is labeled "20\"".

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES



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PERSPECTIVE VIEW

Detour Roadway

30 feet

ROAD CLOSED

DETOUR

NAME
ADDRESS
CITY
STATE
CONTRACTOR

R11-2

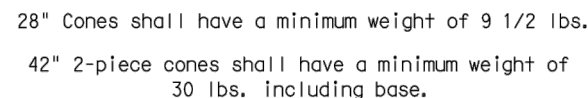
M4-10L

G20-6T

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.




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

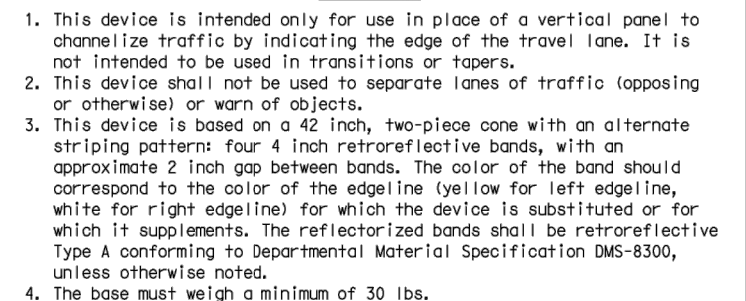



-
- PERSPECTIVE VIEW**
- Typical Plastic Drum
- PLAN VIEW**
- A minimum of two drums shall be used across the work area.
- 10' max. 10' max. 10' max.
- These drums are not required on one-way roadway
- Increase number of plastic drums on side of approaching traffic if road width makes it necessary. (minimum of 2 and maximum of 4 drums)

1. Where positive redirection 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
	Steady burn warning light or yellow warning reflector

THIS DEVICE SHALL NOT BE USED ON
PROJECTS LET AFTER MARCH 2014.



 Texas Department of Transportation		Traffic Operations Division Standard							
<h1>BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES</h1>									
<h2>BC (10) - 14</h2>									
FILE#	bc-14.dgn	DN#	TxDOT	CK#	TxDOT	DW#	TxDOT	CK#	TxDOT
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							27		

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3/23/2022
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WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

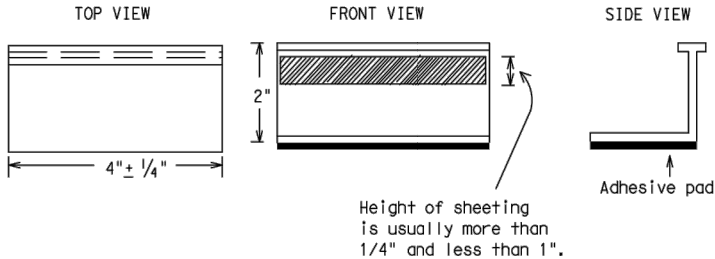
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



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

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS


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

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

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
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(1).

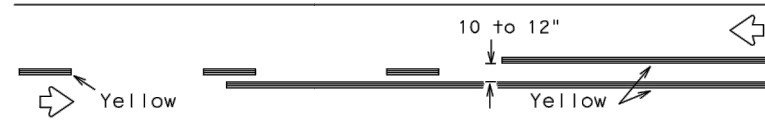
SHEET 11 OF 12

 Texas Department of Transportation		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS			
BC (11) - 14			
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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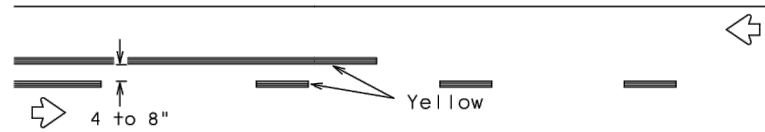
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PAVEMENT MARKING PATTERNS

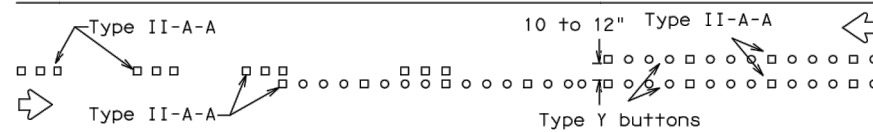


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

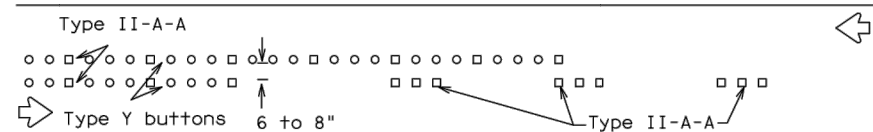


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

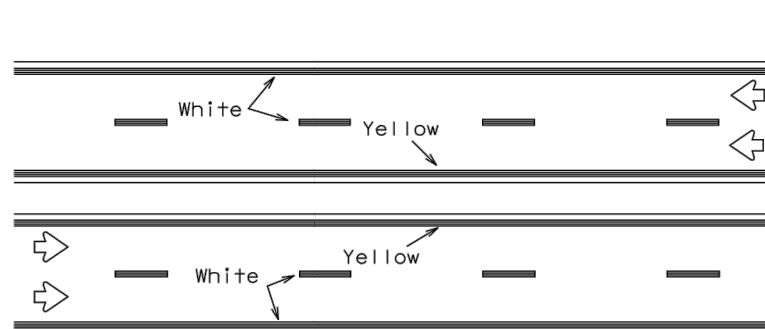


RAISED PAVEMENT MARKERS - PATTERN A



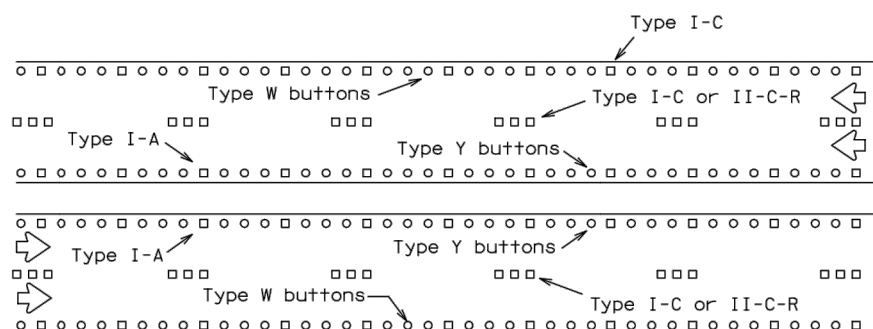
RAISED PAVEMENT MARKERS - PATTERN B

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



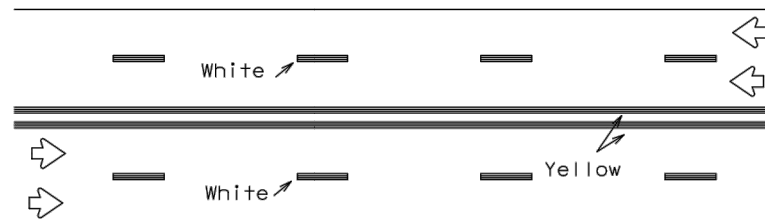
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



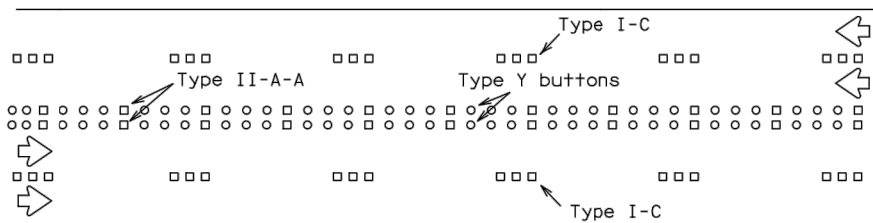
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



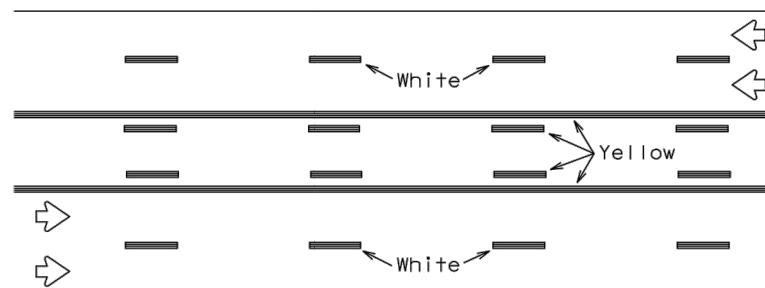
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



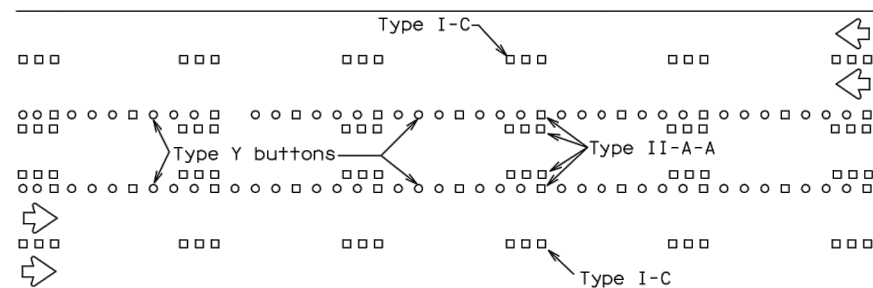
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

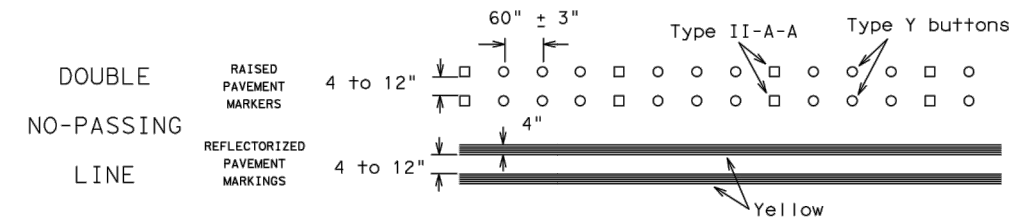
Prefabricated markings may be substituted for reflectORIZED pavement markings.



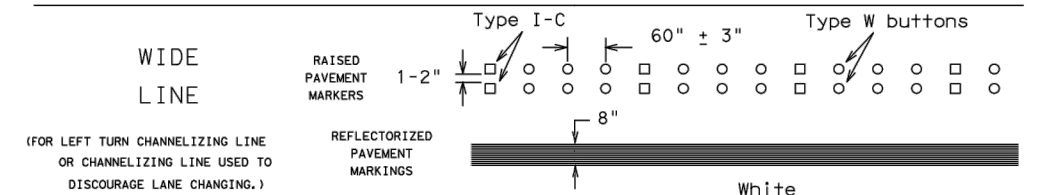
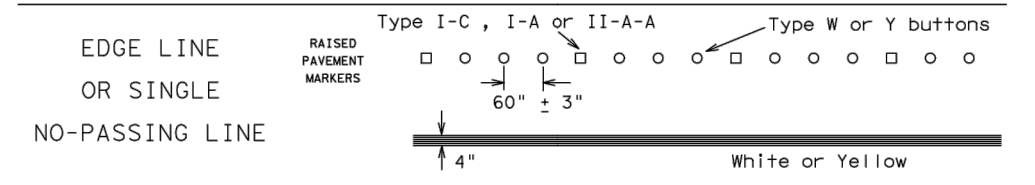
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

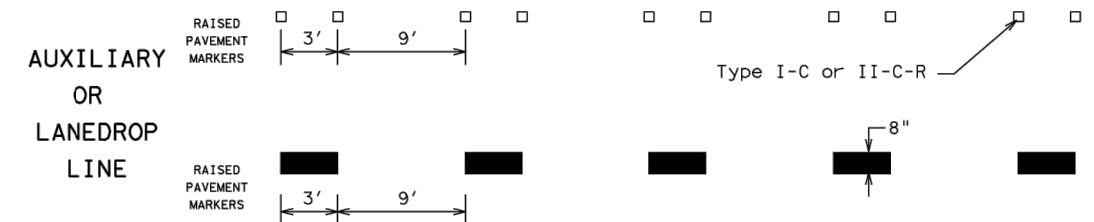
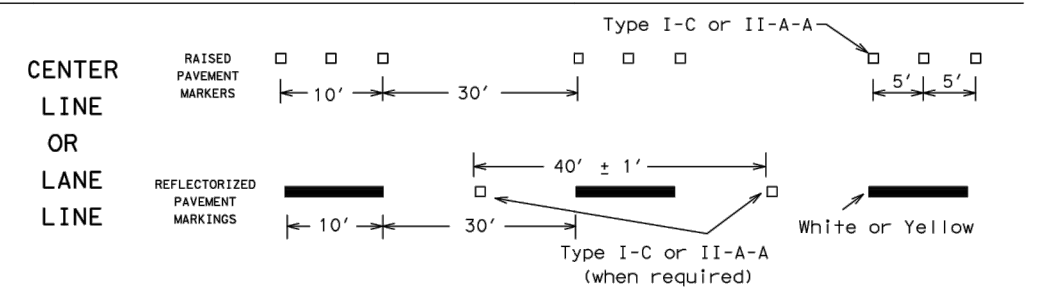
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

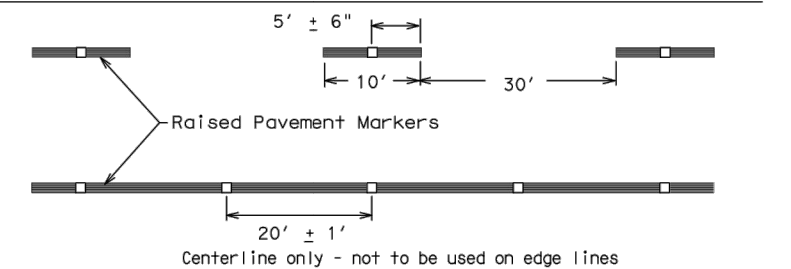


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



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BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

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11-02 8-14				