



Standard Utility Agreement

Form WILCO-U-SUA

(Rev. 3/25)
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Project Name: Bud Stockton Loop Ext.
Project Letting Date: February 2023
Utility ID (TxDOT LUP): **NA**

Roadway: Bud Stockton Loop and CR 305
From: Bud Stockton
To: CR 305/CR 344

This Standard Utility Agreement ("Agreement") by and between Williamson County, Texas ("County"), and Jarrell-Schwertner Water Supply Corp, ("Utility"), acting by and through its duly authorized representative, shall be effective on the date of approval and execution by and on behalf of the County.

WHEREAS, the County has deemed it necessary to make certain infrastructure improvements as designated by the County and, if applicable, approved by the Federal Roadway Administration and/or the State of Texas, within the limits of the project as indicated above;

WHEREAS, the proposed Project will necessitate the adjustment, removal, and/or relocation of certain facilities of the Utility as indicated in the following statement of work: Relocation of approximately 1,000 linear feet of existing 6-inch waterline to a new 12-inch waterline, including associated valve installations, service line replacements, and surface restoration to accommodate the existing waterline conflicts with the Bud Stockton Loop Project.; and more specifically as shown in the Utility's plans, specifications and estimated costs, which are attached hereto as Attachment "A".

WHEREAS, the County will participate in the costs of the adjustment, removal, and relocation of certain facilities to the extent as may be eligible for the County participation.

WHEREAS, the County, upon receipt of evidence it deems sufficient, acknowledges the Utility's interest in certain lands and facilities that entitle it to reimbursement for the adjustment, removal, and relocation of certain of its facilities located upon the lands as indicated in the statement of work above.

NOW, THEREFORE, BE IT AGREED:


The County will pay to the Utility the costs incurred in adjustment, removal, and relocation of the Utility's facilities up to the amount said costs may be eligible for County participation.

All conduct under this Agreement, including but not limited to the adjustment, removal, and relocation of the facility, the development and reimbursement of costs, any environmental requirements, and retention of records will be in accordance with all applicable federal, state, and county laws, rules and regulations, including, without limitation, the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act, 42 U.S.C. §§ 4601, et seq., the National Environmental Policy Act, 42 U.S.C. §§ 4321, et seq., the Buy America provisions of 23 U.S.C. § 313 and 23 CFR 635.410, as amended, Texas Transportation Code § 223.045, the Utility Relocations, Adjustments, and Reimbursements provisions of 23 CFR 645, Subpart A, and the Utility Accommodation provisions of 23 CFR 645, Subpart B.

The Utility shall supply, upon request by the County, proof of compliance with the aforementioned laws, rules, regulations, and guidelines prior to the commencement of the adjustment, removal, and relocation of the facility.

The Utility shall not commence any physical work, including without limitation site preparation, on the County's right of way or future right of way, until the County provides the Utility with written authorization to proceed with the physical work upon the County's completion and clearance of its environmental review of the Project. Any such work by the Utility prior to the County's written authorization to proceed will not be eligible for reimbursement and the Utility is responsible for entering any property within the proposed limits of the Project that has not yet been acquired by the County. This written authorization to proceed with the physical work is in addition to the authorization to commence work outlined below. Notwithstanding the foregoing, the provisions of this paragraph are required only when the County has not obtained completion and clearance of its environmental review of the Project prior to the execution of this Agreement by the County and the Utility.

Initial Date
County

 _____
Initial Date
Utility

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If State and/or Federal funding applies to the Project, the Utility shall comply with the Buy America provisions of 23 U.S.C. § 313, 23 CFR 635.410, as amended, and the Steel and Iron Preference provisions of Texas Transportation Code § 223.045 and, when products that are composed predominately of steel and/or iron are incorporated into the permanent installation of the utility facility, use domestically manufactured products. If State and/or Federal funding applies to the Project, TxDOT Form 1818 (Material statement), along with all required attachments, must be submitted, prior to the commencement of the adjustment, removal, and relocation of the facility, as evidence of compliance with the aforementioned provisions. Failure to submit the required documentation or to comply with the Buy America, and Steel and Iron Preference requirements shall result in: (1) the Utility becoming ineligible to receive any contract or subcontract made with funds authorized under the Intermodal Surface Transportation Efficiency Act of 1991; (2) the County withholding reimbursement for the costs incurred by the Utility in the adjustment, removal, and relocation of the Utility's facilities; and (3) removal and replacement of the non-compliant products.

The Utility agrees to develop relocation or adjustment costs by accumulating actual direct and related indirect costs in accordance with a work order accounting procedure prescribed by the County, or may, with the County's approval, accumulate actual direct and related indirect costs in accordance with an established accounting procedure developed by the Utility. Bills for work hereunder are to be submitted to the County not later than six (6) months after completion of the field work. Failure to submit the request for final payment, in addition to all supporting documentation, within six (6) months after completion of the field work may result in forfeiture of payment for said work.

When requested, the County will make intermediate payments at not less than monthly intervals to the Utility when properly billed. Such payments will not exceed 90 percent (90%) of the eligible cost as shown in each such billing. Intermediate payments shall not be construed as final payment for any items included in the intermediate payment.

Alternatively, if the approved accounting method is a lump sum, the County agrees to pay the Utility an agreed lump sum of \$NA as supported by the attached estimated costs. The County will, upon satisfactory completion of the adjustments, removals, and relocations and upon receipt of a final billing, make payment to the Utility in the agreed amount.

Upon execution of this Agreement by both parties hereto, the County will, by written notice, authorize the Utility to perform such work diligently and to conclude said adjustment, removal, and relocation by the stated completion date which is attached hereto in Attachment "C". The completion date shall be extended for delays caused by events outside the Utility's control, including an event of Force Majeure, which shall include a strike, war or act of war (whether an actual declaration of war is made or not), insurrection, riot, act of public enemy, accident, fire, flood or other act of God, sabotage, or other events, interference by the County or any other party with the Utility's ability to proceed with the work, or any other event in which the Utility has exercised all due care in the prevention thereof so that the causes of other events are beyond the control and without the fault or negligence of the Utility.

This Agreement in its entirety consists of the following elements:

Standard Utility Agreement – WILCO-U-SUA;

- Plans, Specifications, and Estimated Costs (Attachment "A");
- Accounting Method (Attachment "B");
- Schedule of Work (Attachment "C");
- Statement Covering Contract Work – WILCO-U-JB (Attachment "D");
- Utility Joint Use Agreement – WILCO-U-JUA (Attachment "E");
- Eligibility Ratio Calculation (Attachment "F");
- Comparative Betterment Calculation and Estimate (Attachment "G"); and
- Proof of Property Interest – WILCO-U-Affidavit (Attachment "H").

All attachments are included herein as if fully set forth. In the event it is determined that a substantial change from the statement of work contained in this Agreement is required, reimbursement therefore shall be limited to costs covered by a modification or amendment of this Agreement or a written change or extra work order approved by the County and the Utility.

 Initial Date
 County

JS *10-23-2015*
 Initial Date
 Utility

Form WILCO-U-SUA

(Rev. 3/25)

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This Agreement is subject to termination, without cause and for convenience, by the County at any time up to the date that work under this Agreement has been authorized, and such cancellation will not create any liability on the part of the County. However, the County will review and reimburse the Utility for eligible costs incurred by the Utility in preparation of this Agreement.

The County Auditor may conduct an audit or investigation of any entity receiving funds from the County directly under this Agreement or indirectly through a subcontract under this Agreement. Acceptance of funds directly under this Agreement or indirectly through a subcontract under this Agreement acts as acceptance of the authority of the County Auditor, under the direction of the Legislative Audit Committee, to conduct an audit or investigation in connection with those funds. An entity that is the subject of an audit or investigation must provide the County Auditor with access to any information the County Auditor considers relevant to the investigation or audit.

The Utility by execution of this Agreement does not waive any of the rights that the Utility may have within the limits of the law.

It is expressly understood that the Utility conducts the adjustment, removal, and relocation at its own risk, and that the County makes no warranties or representations regarding the existence or location of utilities currently within its right of way.

The signatories to this Agreement warrant that each has the authority to enter into this Agreement on behalf of the party represented.

UTILITY

Utility: Jarrell-Schwertner Water Supply

By: 

Print Name: Joe Simmons

Title: General Manager

Date: 10-23-2025

THE COUNTY OF WILLIAMSON

Executed and approved for the County of Williamson Texas for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by Williamson County, Texas.

By: _____
Presiding Officer of the
Williamson County Commissioners Court

Date: _____

REVIEWED

By Harsha Shetty on 11/13/2025

APPROVED

By Christen Eschberger at 3:59 pm, Dec 01, 2025

REVIEWED

By Eddie Church, P.E. at 10:11 am, Nov 24, 2025

Initial Date
County

JS 10-23-2025
Initial Date
Utility

Attachment "A"

Plans, Specifications, and Estimated Costs

Funding Sources

Select all that apply

- City of _____
- Williamson County, Texas
- State of Texas *
- Federal *

*Buy America Compliance only applies when State or Federal funding is present.

All material items within the cost estimate that must meet Buy America or Steel and Iron Preference Provision requirements must be indicated with an asterisk (*) on the attached estimate.

- Currently, **this Project does not plan to use** iron and steel subject to Buy America requirements. In the event that Buy America regulated materials are used during the construction of this Project, compliance documentation will be provided.
- There are non-domestic iron and steel materials in this Project that fall under the De Minimis equation. Calculations showing the total cost does not exceed one-tenth of one percent (0.1%) of the individual utility agreement amount or \$2,500.00, whichever is greater is required.
- We understand the Buy America Compliance Requirements for iron and steel and will supply the required documentation to the County indicating compliance with this provision. The following documents will be supplied prior to the installation of the materials:

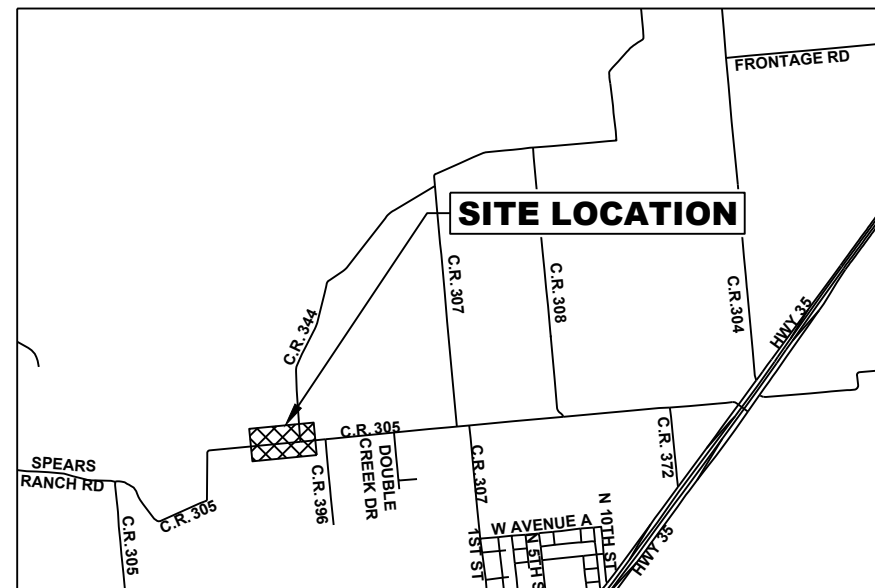
- 1) Form 1818 - Material Statement
- 2) Material Test Reports or Certifications

Initial Date
County

JS 10-23-2024
Initial Date
Utility

JARRELL SCHWERTNER WATER SUPPLY CORPORATION C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

JARRELL SCHWERTNER WATER SUPPLY CORPORATION, TEXAS
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT



RECORD DRAWING

These record documents are provided based on information furnished by the Contractor upon which Kasberg, Patrick & Associates, LP has the right to rely and without any warranty as to their fitness for any purpose. The owner agrees that any use of these documents is at its sole risk and further, to the fullest extent permitted by law, releases Kasberg, Patrick & Associates, LP from any liabilities arising out of any use or modification of the documents.

**KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS F-510**

Date: 10/09/2023 By: *Alvin R. Sutton, III*

Board Members

Board President

Mark Harbin

Vice President

John Valenta

Secretary/Treasurer

Pam Oakes

Directors

Donnie Tschoerner

Ed Krause

John Valenta

Louis Danek

Mike Dunnam

Tom Maddden

General Manager

Joe Simmons

JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT



KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626
FIRM REGISTRATION NO. F-510



Alvin R. Sutton, III

February 21, 2023

FILE: P:\USWSCI\2022\2022-102 Northwest WL Imp\CAD\ CR 307 PHASE 1\Plans\GENERAL\22-102 - GENERAL.dwg LAST SAVED: 4/19/2023 7:33:54 AM LAYOUT: SHEET INDEX AND LEGEND

Sheet List Table

GENERAL SHEETS

- G-01 COVER
- G-02 SHEET INDEX AND LEGEND
- G-03 GENERAL NOTES
- G-04 EROSION CONTROL NOTES AND DETAILS
- G-05 EROSION & SEDIMENTATION CONTROL PLAN SHEET
- C-06 WATERLINE ABANDONMENT SHEET

WATERLINE PLAN & PROFILE SHEETS

- P-01 WL 'A' - STA. 1+00 TO 6+00
- P-02 WL 'A' - STA. 6+00 TO 11+50
- P-03 WL 'B' - STA. 1+00 TO END

DETAIL SHEETS

- D-01 WATERLINE DETAILS
- D-02 PIPE EMBEDMENT (1 OF 2)
- D-03 PIPE EMBEDMENT (2 OF 2) & WATER METER DETAIL
- D-04 TRAFFIC CONTROL PLAN - CONVENTIONAL SHOULDER WORK
- D-05 TRAFFIC CONTROL PLAN - ONE LANE TWO WAY TRAFFIC CONTROL
- D-06 BARRICADE DETAILS (SHEET 1 OF 12)
- D-07 BARRICADE DETAILS (SHEET 2 OF 12)
- D-08 BARRICADE DETAILS (SHEET 3 OF 12)
- D-09 BARRICADE DETAILS (SHEET 4 OF 12)
- D-10 BARRICADE DETAILS (SHEET 5 OF 12)
- D-11 BARRICADE DETAILS (SHEET 6 OF 12)
- D-12 BARRICADE DETAILS (SHEET 8 OF 12)
- D-13 BARRICADE DETAILS (SHEET 10 OF 12)

ADDENDUM

- AD-01 ADDENDUM 01

LEGEND

	12" W	PROPOSED WATERLINE
	8" WW	PROPOSED WASTEWATER LINE
	12" W	EXISTING WATER LINE (TO REMAIN)
	12" W	EXISTING WATER LINE (TO BE ABANDONED)
	12" WW	EXISTING WASTEWATER LINE (TO REMAIN)
	12" WW	EXISTING WASTEWATER LINE (TO BE ABANDONED)
	GAS	EXISTING GAS LINE
		PROPOSED RIGHT-OF-WAY / PROPERTY LINE
		BARBED WIRE FENCE
		CHAIN LINK FENCE
		WOODEN PRIVACY FENCE
		OVERHEAD ELECTRIC LINE
		UNDERGROUND TELEPHONE CABLE
		TOP OF SLOPE
		TOE OF SLOPE / FLOWLINE
		EXISTING EDGE OF ASPHALT
		PERMANENT UTILITY EASEMENT (P.U.E.)
		TEMPORARY CONSTRUCTION EASEMENT (T.C.E.)
		EXISTING PROPERTY LINE
		CHAIN LINK FENCE
		METAL FENCE
		WIRE FENCE

GENERAL

	MONUMENT
	FLAG POLE
	IRON PIN SET
	IRON PIN FOUND
	SIGN
	BENCHMARK
	TREE SYMBOL
	NAIL SET/FOUND
	"X" IN CONCRETE FOUND/SET (LABEL)
	BORE HOLE
	BOLLARD POST
	FENCE POST
	GROUND LIGHT
	GROUNDING ROD
	RAILROAD CONTROL BOX
	MARKER SIGN
	MAIL BOX

ELECTRIC

	ELECTRIC BOX
	LIGHT POLE
	POWER POLE
	GUY
	MANHOLE
	JUNCTION BOX
	TRAFFIC SIGNAL POLE/BOX /CONTROL PANEL

TELECOMM/CABLE

	TELEPHONE RISER BOX
	MANHOLE
	CABLE BOX
	CABLE PEDESTAL
	JUNCTION BOX
	TELEPHONE POLE
	PULL BOX

WATER

	FIRE HYDRANT
	WATER VALVE 1
	WATER VALVE 2
	WATER METER
	MANHOLE
	PIPE FITTING
	REDUCER
	HOSE BIB
	SPRINKLER CONTROL BOX
	SPRINKLER CONTROL VALVE
	AIR RELEASE VALVE

WASTEWATER

	MANHOLE
	PIPE FITTING
	CLEANOUT

STORM SEWER

	MANHOLE
	AREA DRAIN

GAS

	GAS METER
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ABBREVIATION KEY

F.L. ELEV.	FLOW LINE ELEVATION
TOC ELEV.	TOP OF CURB ELEVATION
TOA ELEV.	TOP OF ASPHALT ELEVATION
L.F.	LINEAR FEET
STA.	STATION
P.I.	POINT OF INTERSECTION
HPI	HORIZONTAL POINT OF INTERSECTION
VPI	VERTICAL POINT OF INTERSECTION
TOC	TOP OF CURB
EOC	EDGE OF CONCRETE
EOP	EDGE OF PAVEMENT

RECORD DRAWING
These record documents are provided based on information furnished by the contractor upon which Kasberg, Patrick & Associates, LP ("KPA") has the right to rely. Use and/or modification of these documents by a third party, other than Owner, is at its sole risk and KPA shall have no liability for damages arising out of such use and/or modification by a third party, other than Owner.

NO.	DATE	REVISION	BY

Plot Date: 10/10/2023 9:50:47 AM
Plotted By: EHARRIS

© 2022 Kasberg, Patrick & Associates, LP
KPA Firm Registration Number F-510

PROJECT NO. 22-102
DRAWN BY Eric Harris
DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY
DATE 10/09/2023



KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626

JARRELL SCHWERTNER WATER SUPPLY CORPORATION C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT
GENERAL SHEETS SHEET INDEX AND LEGEND

SHEET NO.
G-02 OF
06 SHEETS

FILE: P:\USWSC\2022\2022-102 - GENERAL.dwg CR 307 PHASE 1\Plans\GENERAL\22-102 - GENERAL.dwg LAST SAVED: 4/19/2023 7:33:54 AM LAYOUT: GENERAL NOTES

**Texas Commission on Environmental Quality
Water Pollution Abatement Plan General Construction Notes**

- Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.
- All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.
- If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.
- No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
- Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.
- If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
- Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.
- Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).
- All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
- Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.
- The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.
- The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:
 - any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
 - any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
 - any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office 2800 S. IH 35, Suite 100 Austin, Texas 78704-5712 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone(210) 490-3096 Fax (210) 545-4329
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THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.
TCEQ-0592 (Rev. 3/15/07)

General Notes

- All barricades, signs, and traffic control for this project shall conform to the latest edition of the Texas Manual on Uniform Traffic Control Devices for Streets and Highways.
- The bidders for this project shall familiarize themselves with all requirements of working in state and county rights-of-way and Jarrell Schwertner WSC easements. The bidders shall familiarize themselves with all insurance requirements for said work and shall include in their bids, insurance costs and insurance premiums that provide for the state of Texas, the city of Georgetown and the engineer as additional insured's under the contractor's policies.
- Blasting is not permitted on this project.
- All construction operations shall be accomplished in accordance with applicable regulations of the U.S. Occupational Safety and Health Administration. Copies of the OSHA standards may be purchased from the U.S. government printing office: information and related reference materials may be obtained from OSHA; 903 San Jacinto, Austin, Texas.
- These plans prepared by Kasberg, Patrick & Associates, LP, do not extend to or include designs or systems pertaining to the safety of the contractor or its employees, agents or representatives in the performance of the work. The seal of Kasberg, Patrick & Associates, LP registered professional engineer(s) hereon does not extend to any such safety systems that may now or hereafter be incorporated in the work. The contractor shall prepare or obtain the appropriate safety systems, including the plans and specifications.
- Contractor shall comply with all applicable local, state and federal requirements regarding excess and waste material, including methods of handling and disposal.
- Contractor shall maintain access to public and private facilities during construction.
- Contractor shall notify Jarrell Schwertner WSC a minimum of 3 working days. (Monday-Friday) in advance of construction startup, followed by a letter of confirmation. Contractor shall also give a minimum of 3 working days. (Monday-Friday), notice to all authorized inspectors, superintendents or persons in charge of private and public utilities affected by his operations prior to commencement of work.
- Location of existing utilities shown on the plans was compiled from record information. No warranty is implied as to the actual location of existing utilities. Contractor shall field verify locations of existing utilities prior to the commencement of construction. Contractor should call the Jarrell Schwertner WSC at (512) 746-2114 for visual aide in identifying the approximate location of the existing utilities. If there are any conflicts between proposed and existing utilities, or if the existing utilities are in any way different from what is shown on the drawings, then it shall be the contractor's responsibility to notify the city or other affected utility before proceeding with any construction. The contractor shall be responsible for resolving all conflicts at his expense. Jarrell Schwertner WSC will consider any conflicts at said locations on a case-by-case basis in order to determine if the contractor should be reimbursed for his expense in solving said conflict.
- Contractor shall make all due precautions to protect existing facilities from damage. Any damage to existing facilities incurred as a result of these construction operations are to be repaired immediately by the contractor to at least the preexisting condition at no additional cost to Jarrell Schwertner WSC.
- Contractor shall coordinate interruptions of all utilities and services with all applicable utility company or companies. All work shall be in accordance with the requirements of the applicable utility company or agency involved.
- When un-located or incorrectly located underground piping or a break in a line or other utilities and services are encountered during site work operations, the contractor shall notify the applicable utility company immediately to obtain procedure directions. Contractor shall cooperate with the applicable utility company in maintaining active services in operation.
- Contractor shall locate material storage areas away from storm water conveyance systems. Contractor shall provide protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials off site.
- Burning is allowed in Williamson County by air curtain destructors method and prior written approval from applicable government agencies at the contractor's expense. The contractor can haul cleared vegetation to an acceptable off-site location with written approval by the owner's representative. Prior to construction the contractor shall designate to Jarrell Schwertner WSC 's representative, which method will be used for disposal of cleared vegetation.
- Fuel storage is not allowed on this project.
- Contractor shall advise owner immediately, verbally and in writing, of any fuel or toxic material spills onto the project construction area and the actions to be taken to remedy the problem.
- Contractor is responsible for disposing of his fuels, materials, and contaminated excavations in a legally approved manner.
- Contractor is responsible for complying with all applicable environmental laws.
- Contractor is responsible for providing and maintaining sanitary facilities on this project for employees.
- Contractor shall coordinate all materials testing, including soil density tests and related soils

- analysis. Tests shall be accomplished by an independent laboratory, at the frequency, time and location as specified in the technical specifications. A copy of the test results shall be forwarded to Jarrell Schwertner WSC's representative, and the contractor. Tests, which show unsatisfactory results, shall be repeated at the expense of the contractor subsequent to the contractor's remedial activities.
- The trench excavation and shoring safety plan system as required by the laws of the state of Texas and as outlined in the technical specifications will be required as a minimum trench safety measure and shall be submitted to Jarrell Schwertner WSC prior to the beginning of construction. Implementation of the submitted trench safety plan shall be the sole responsibility of the contractor.
 - Existing paving, buildings and other items shown on the plans is not specifically related to the work of the contractor and is shown for information only.
 - Any water hauled to the site during the installation shall be paid by the contractor.
 - TxDOT requires 48-hour notification prior to any proposed work in state right of way.
 - This project is a calendar day project and therefore shall be void of rain days as credit to construction time. Jarrell Schwertner WSC will not accept rain days unless a month within the project time has had rain days in excess of the average rain days for that month. Days of drying for the project site will not be considered.

Month	Rain Days
January	7 days
February	7 days
March	7 days
April	7 days
May	8 days
June	6 days
July	6 days
August	5 days
September	7 days
October	7 days
November	7 days
December	7 days

Construction Layout/Project Coordination

- Jarrell Schwertner WSC will provide the daily on-site construction representation for this project.
- Pre-construction conference.
 - Prior to beginning work on the project and soon after the award of the contract, a conference will be held among the representatives of Jarrell Schwertner WSC, the engineer, the contractor, and any subcontractor that will be involved in the work. At that time, the contractor shall submit charts or briefs, outlining the manner of execution of the work that is intended in order to complete the specified work within the allotted time. This conference will more completely establish the sequence of work to be followed and establish the estimated progress schedule for completion of the various tasks. When applicable, the pre-construction conference will be held only after installation of the erosion and sedimentation controls. This conference may take place on the site to demonstrate competence with the erosion and sedimentation control plan and water pollution abatement plan.
 - In addition, at this conference, the contractor shall be responsible for furnishing the engineer with all of the following, as specified herein or as directed by the engineer:
 - Samples of all materials to be used on the project with identification as to product name; name, location, phone number (including area code) and mailing address of product source and manufacturer, if different from source; content of product; amount of each ingredient in the product, and manufacturer's directions as to use and application of the product, if applicable.
 - Manufacturer's literature of all materials and equipment installed on the project.
- Protection of vehicular and pedestrian traffic is of the utmost importance for the project. The traffic control and sequence of construction plan shall address all anticipated situations in this regard with sufficient detail.
- The plans for this project show proposed elevations, slopes and dimensions that are intended for actual placement. However, there may be some instances where existing conditions make it impractical to achieve the ideal. In those instances, the Jarrell Schwertner WSC will assist the contractor in making proper field changes to better account for field conditions.
- Jarrell Schwertner WSC's representative shall identify the limits of construction prior to commencement of the project.

Site Grading Notes

- Contractor shall control dust caused by the work and comply with pollution control regulations of governing authorities.
- Contractor shall remove built up material on adjacent public roadways resulting from his work. Cleaning shall be at least once a day.
- Contractor shall protect stockpiled material such that storm water will not adversely affect erosion control, sidewalks, traffic, private property, or the San Gabriel River.

- Required fill embankment shall be placed and compacted per technical specifications in maximum 6-inch loose lifts and compacted as stated in the specifications.

Paving And Concrete Notes

- Any existing pavement, curbs and/or sidewalk damaged or removed by the contractor that are not a part of this contract shall be repaired by the contractor to at least the preexisting condition at his expense before acceptance of the work.
- The contractor shall provide Jarrell Schwertner WSC with a barricade and signing plan, which will include how traffic will be handled during construction. The barricades, signs and lights shall conform to the latest edition of the Texas Manual On Uniform Traffic Control Devices For Streets And Highways. The contractor can utilize the typical TxDOT Traffic Control Sheets for this project.
- All concrete to be class "a" for site work per technical specifications and all reinforcing steel to be ASTM A-615 grade 60, unless otherwise noted.
- Natural subgrade - loose, disturbed or undisturbed natural subgrade beneath pavement should be scarified and rolled. Subgrade compactions shall not exceed 100%. Proof-rolling and preparation of subgrade shall be in accordance with TxDOT item 216 "proof rolling" and item 132 embankment.
- Concrete rip rap shall be 4-inch thickness, class "b" concrete with 6" x 6" x #6 welded wire flat-sheet mesh. Finished concrete shall receive a broom finish and sprayed with type 2 membrane curing compound. The rip rap shall be placed with a 24-inch depth by 6-inch wide toe ditch at the bottom of slope edge and with an 18-inch depth by 6-inch wide toe ditch at the top of slope edge.

Project Notes

- The contractor to contact Jarrell Schwertner WSC at (512) 746-2114 for existing utility locations prior to any excavation. In advance of construction, the contractor shall verify the locations of all utilities to be extended, tied to or altered, or subject to damage/inconvenience by the construction operations.
- Contractor shall strip 6 inches of topsoil from all areas subject to grade modifications. Contractor shall remove any area of weak soil.
- The contractor shall be responsible and liable for all job site safety, management of job site personnel, supervision of the use of job site equipment and direction of all construction procedures, methods and elements required to complete the construction of the proposed improvements.
- The contractor shall protect all existing fences. In the event that a fence shall be removed, the contractor shall replace said fence or portion thereof with the same type of fencing to a quality of equal or better than the original fence. This work shall be considered subsidiary to the project, unless specifically identified in the bid form.

Testing And Submittals

- The contractor shall be responsible for providing material samples as well as any manufacturers literature of materials used on this project as required by the engineer. Any costs associated with any sampling and testing shall be the responsibility of the contractor. These costs shall be considered as incidental and the contractor will not be entitled to any additional compensation.
- The contractor shall be responsible for and pay for all charges of testing laboratories for services in connection with initial tests made on all imported materials to the project sites including but not limited to embedment materials, fill material, backfill material, select material, crushed limestone base, subbase, concrete, steel, wood forms, liquid asphalt, aggregate, water, cement, curing compound, guard rail, etc. The tests for which the contractor will typically be responsible are Atterberg limits, sieve analysis, plasticity indices, mix design, California bearing ratios, proctors (moisture density curves) and all tests required by the specifications that prove the material brought to the project sites meets or exceeds the specifications and contract documents. The owner, the city of Georgetown, will pay all the charges of testing laboratories for services in connection with in place field densities, concrete cylinders testing, HMAC density tests and any in place test required for quality assurance. Retesting after failure of in place tests shall be at the expense of the contractor.

Americans with disabilities act

- This project is intended to conform to the Americans With Disabilities Act.
- The contractor shall be aware of construction procedures, finished product requirements of this act, and coordinate all activities to satisfy this act.

RECORD DRAWING
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NO.	DATE	REVISION	BY
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KPA Firm Registration Number F-510			

PROJECT NO. 22-102
DRAWN BY Eric Harris
DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY *[Signature]*
DATE 10/09/2023



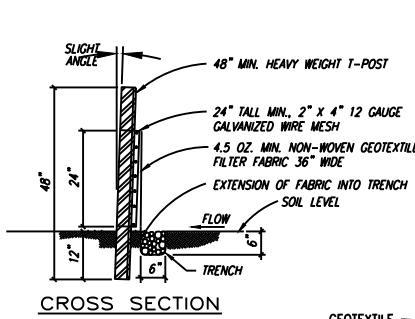
KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626

JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

GENERAL SHEETS
GENERAL NOTES

SHEET NO.
G-03 OF
06 SHEETS

FILE: P:\USW\SC2022\2022-102 - GENERAL.dwg LAST SAVED: 4/19/2023 7:33:54 AM LAYOUT: EROSION CONTROL NOTES AND DETAILS



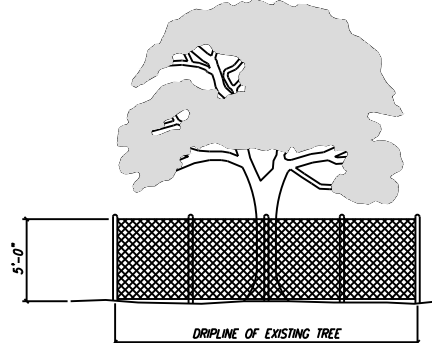
Inspection and maintenance guidelines:

- Inspect all fencing weekly, and after any rainfall event.
- Remove sediment when buildup reaches 6 inches.
- Replace any torn fabric.
- Replace or repair any sections crushed or collapsed in the course of construction activity.

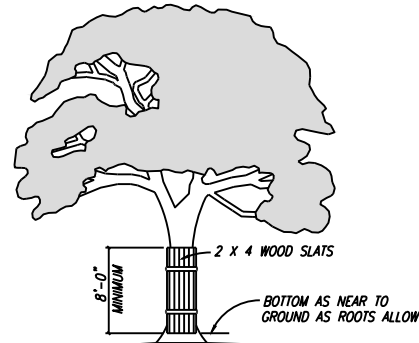
Installation:

- Layout the silt fence following as closely as possible to the contour.
- Clear the ground of debris, rocks, plants (including grasses taller than 2") to provide a smooth flow approach surface. Excavate 4" deep x 4" wide trench on upstream side of face per plans.
- Drive the heavy duty t-post at least 12 inches into the ground and at a slight angle towards the flow.
- Attach the 2" x 4" 12 gauge welded wire mesh to the t-post with 11 1/2 gauge galvanized t-post clips. The top of the wire to be 24" above ground level. The welded wire mesh to be overlapped 6" and tied at least 6 times with hog rings.
- The silt fence to be installed with a skirt a minimum of 11" wide placed on the uphill side of the fence inside excavated trench. The fabric to overlap the top of the wire by 1".
- Anchor the silt fence by backfilling with excavated dirt and rocks.
- Geotextile splices should be a minimum of 18" wide attached in at least 6 places. Splices in concentrated flow areas will not be accepted.

SILT FENCE DETAIL
NOT TO SCALE



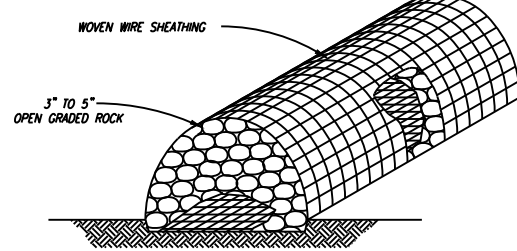
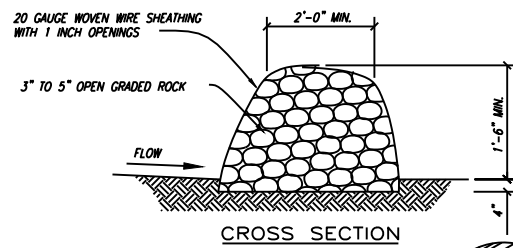
TREE PROTECTION - CHAIN LINK FENCE
NOT TO SCALE



TREE PROTECTION - WOOD SLATS
NOT TO SCALE

Notes:

1. Where any exceptions result in a fence being closer than four feet (4'-0") to a tree trunk protect the trunk with strapped-on-planking to a height of eight feet (8'-0"), or to the limits of lower branching in addition to the reduced fencing provided.
2. Any roots exposed by construction activity shall be pruned flush with the soil. Backfill root areas with good quality top soil as soon as possible. If exposed root areas are not backfilled within two (2) days, cover them with organic material in a manner which reduces soil temperature, and minimizes water loss due to evaporation.
3. Prior excavation or grade cutting within tree dripline. Make a clean cut between the disturbed and undisturbed root zones with a rock saw or similar equipment, to minimize damage to remaining roots.
4. Trees most heavily impacted by construction activities should be watered deeply once a week during periods of hot, dry weather. Tree crowns should be sprayed with water periodically to reduce dust accumulation on the leaves.
5. Any trenching required for the installation of landscape irrigation shall be placed as far from existing tree trunks as possible.
6. No landscape topsoil dressing greater than four inches (4") shall be permitted within the dripline of a tree. No soil is permitted on the root flare of any tree.
7. Pruning to provide clearance for structures, vehicular traffic and equipment shall take place before construction begins.



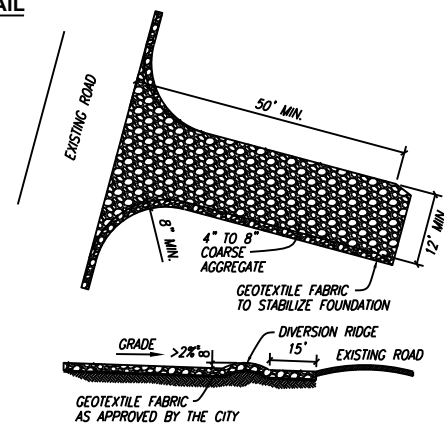
Installation:

- Layout the rock berm following as closely as possible to the contour.
- Clear the ground of debris, rocks or plants that will interfere with installation.
- Place woven wire fabric on the ground along the proposed installation with enough overlap to completely encircle the finished size of the berm.
- Place the rock along the center of the wire to the designated height.
- Wrap the structure with the previously placed wire mesh secure enough so that when walked across the structure retains its shape.
- Secure with tie wire.
- The ends of the berm should be tied into existing upslope grade and the berm should be buried in a trench approx. 4 inches deep to prevent failure of the control.
- The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Inspection and Maintenance Guidelines:

- Inspection should be made weekly and after each rainfall event by the responsible party. For installations in streambeds, additional daily inspections should be made.
- Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner.
- Repair any loose wire sheathing.
- The berm should be reshaped as needed during inspection.
- The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.

ROCK BERM DETAIL
NOT TO SCALE



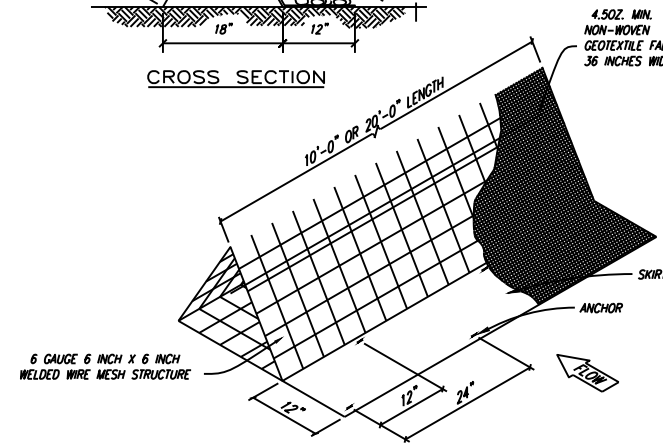
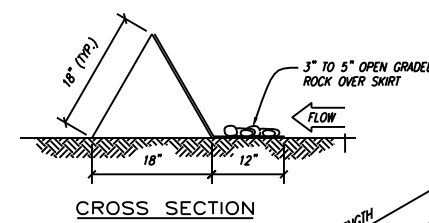
Installation:

- Clear the area of debris, rocks or plants that will interfere with installation.
- Grade the area for the entrance to flow back on to the construction site. Runoff from the stabilized construction entrance onto a public street will not be accepted.
- Place geotextile fabric if required.
- Place rock as required.

Inspections and maintenance guidelines:

- The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
- All sediment spilled, dropped, washed or tracked on to public rights-of-way should be removed immediately by contractor.
- When necessary, wheels should be cleaned to remove sediment prior to entrance onto public rights-of-way.
- When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
- All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



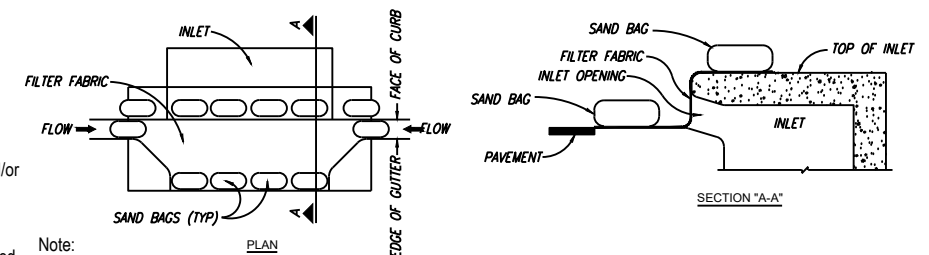
Installation:

- Layout the filter dike following as closely as possible to the contour.
- Clear the ground of debris, rocks or plants that will interfere with installation.
- Place the filter dike sections one at a time, with the skirt on the uphill side towards the direction of flow anchoring each section to the ground before the next section is placed.
- Anchors should be placed on 2'-0" centers alternating from front to back so that there is actually only 1'-0" in between anchors.
- Securely fasten the skirt from one section of filter dike to the next.
- Filter dikes shall maintain continuous contact with the ground.
- After the site is completely stabilized, the dikes and any remaining silt should be removed. Silt should be disposed of in a manner that will not contribute to additional siltation.

Inspection and Maintenance Guidelines:

- Inspection should be made weekly or after each rainfall event and repair or replacement should be made promptly as needed by the contractor.
- Inspect and realign berms as needed to prevent gaps between the sections.
- Accumulated silt should be removed after each rainfall event, and disposed of in a manner which shall not cause additional siltation.

TRIANGULAR FILTER DIKE
NOT TO SCALE



Note:

Filter fabric to extend 5'-0" beyond inlet opening, upstream of inlet. Terminate fabric in street gutter with sand bags placed in gutter flowline.

CURB INLET PROTECTION DETAIL
NOT TO SCALE

EROSION/SEDIMENTATION AND TREE PROTECTION NOTES

1. The contractor to install and maintain erosion/sedimentation controls and tree/natural area protective fencing prior to any site preparation work (clearing, grubbing, grading, or excavation). Contractor to remove erosion/sedimentation controls at the completion of project and grass restoration.
2. The placement of erosion/sedimentation controls to be in accordance with the approved erosion and sedimentation control plan and water pollution abatement plan. Deviations from the approved plan shall be submitted to and approved by the owner's representative.
3. All disturbed areas to be restored as noted in the water pollution abatement plan.
4. The seeding for erosion control to be applied over areas disturbed by construction as follows:
From September 15 to March 1, seeding to be with a combination of 2 pounds per 1,000 square feet of unhulled bermuda and 2 pounds per 1,000 square feet of winter rye with a purity of 95% with 90% germination.
From March 2, to September 14, seeding to be with hulled bermuda grass (cynodon dactolyn) at a rate of 2 pounds per 1,000 square feet with a purity of 95% with 85% germination.
5. The planted area to be irrigated or sprinkled in a manner that will not erode the topsoil, but will sufficiently soak the soil to a depth of four (4) inches. The irrigation to occur at 10-day intervals during the first two months. Rainfall occurrences of 1/2 inch or greater to postpone the watering schedule one week.
6. Restoration to be acceptable when the grass has grown at least 1-1/2 inches high with 95% coverage, provided no bare spots larger than 25 square feet exist.
7. A minimum of four (4) inches of topsoil to be placed in all areas disturbed by construction.
8. The contractor to hydromulch or sod (as shown on plans) all exposed cuts and fills upon completion of construction, except where cuts are made in solid rock.
9. Erosion and sedimentation controls to be installed or maintained in a manner which does not result in soil buildup within tree dripline.
10. To avoid soil compaction, contractor shall not allow vehicular traffic, parking, or storage of equipment or materials in the tree dripline areas.
11. Where a fence is closer than four (4) feet to a tree trunk, protect the trunk with strapped-on planking to a height of eight (8) feet (or to the limits of lower branching) in addition to the fencing.
12. Trees to be removed in a manner which does not impact trees to be preserved.
13. Any root exposed by construction activity to be pruned flush with the soil. Backfill root areas with good quality topsoil as soon as possible. If exposed root areas are not backfilled within two days, cover them with organic material in a manner which reduces soil temperature and minimizes water loss due to evaporation.
14. Contractor to prune vegetation to provide clearance for structures, vehicular traffic, and equipment before damage occurs (ripping of branches, etc.). All finished pruning to be done according to recognized, approved standards of the industry (reference the "National Arborist Association pruning standards for shade trees").
15. The contractor is to inspect the controls at weekly intervals and after every rainfall exceeding 1/4 inch to verify that they have not been significantly disturbed. Any accumulated sediment after a significant rainfall to be removed and placed in the owner designated spoil disposal site. The contractor to conduct periodic inspections of all erosion/sedimentation controls and to make any repairs or modifications necessary to assure continued effective operation of each device.
16. Where there is to be an approved grade change, impermeable paving surface, tree well, or other such site development immediately adjacent to a protected tree, erect the fence approximately two to four feet (2'-4') behind the area in question.
17. No above and/or below ground temporary fuel storage facilities to be stored on the project site.
18. If erosion and sedimentation control systems are existing from prior contracts, owner's representative and the contractor to examine the existing erosion and sedimentation control systems for damage prior to construction. Any damage to preexisting erosion and sedimentation controls noted to be repaired at owners expense.
19. Intentional release of vehicle or equipment fluids onto the ground is not allowed. Contaminated soil resulting from accidental spill to be removed and disposed of properly.

RECORD DRAWING

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PROJECT NO.	22-102
DRAWN BY	Eric Harris
DESIGNED BY	Alvin R. Sutton III, P.E.
APPROVED BY	<i>Alvin R. Sutton III</i>
DATE	10/09/2023



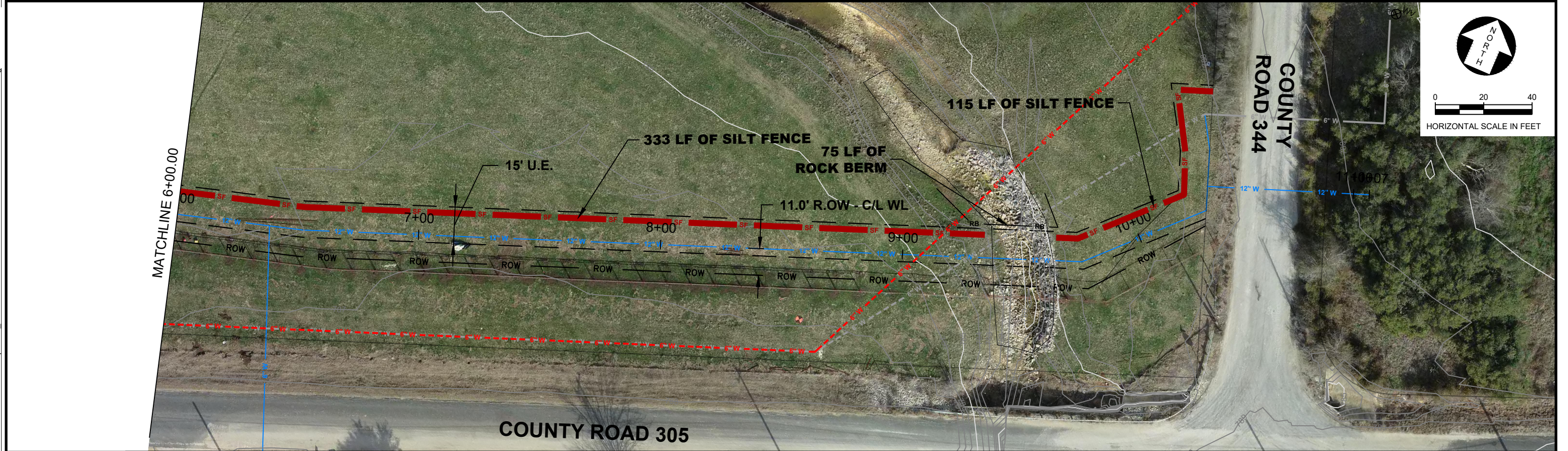
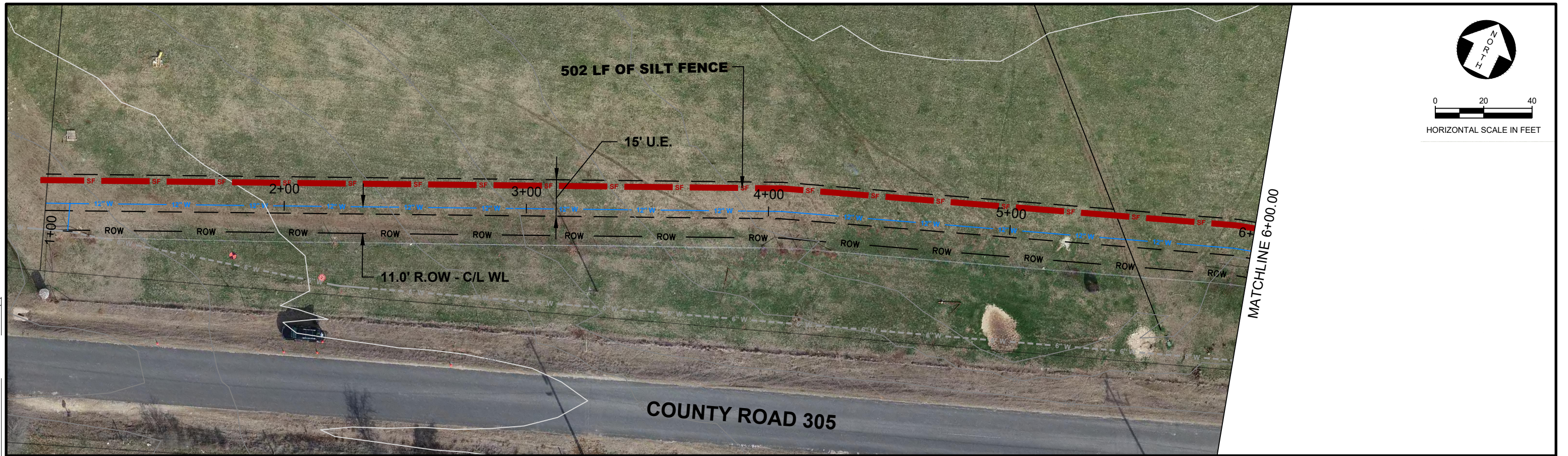
KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626

JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

GENERAL SHEETS
EROSION CONTROL NOTES AND DETAILS

SHEET NO.
G-04 OF
06 SHEETS

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PROJECT NO. 22-102
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DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY *Alvin R. Sutton III*
DATE 10/09/2023



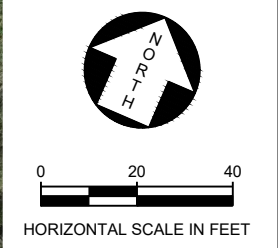
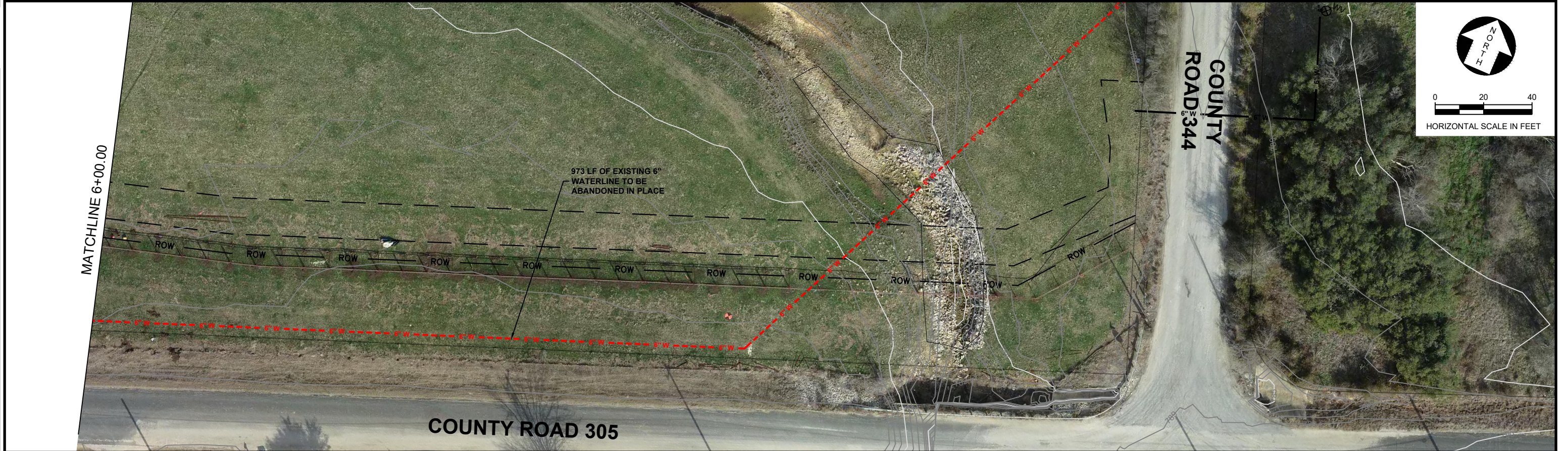
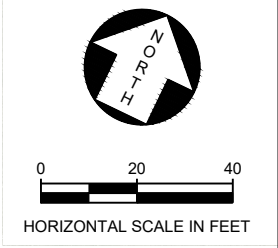
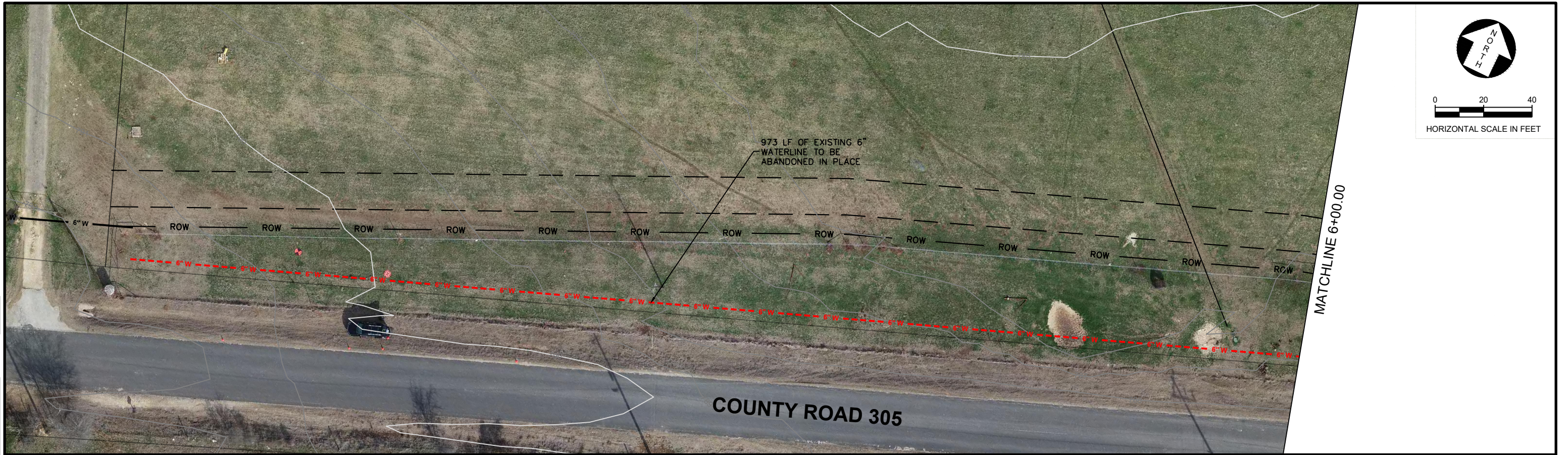
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GEORGETOWN, TEXAS 78626

JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

EROSION & SEDIMENTATION CONTROL PLAN SHEET
STA 1+00 TO 11+26

SHEET NO. **G-05** OF **06** SHEETS

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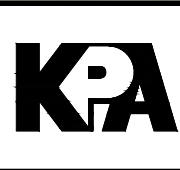
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DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY *Alvin R. Sutton III*
DATE 10/09/2023

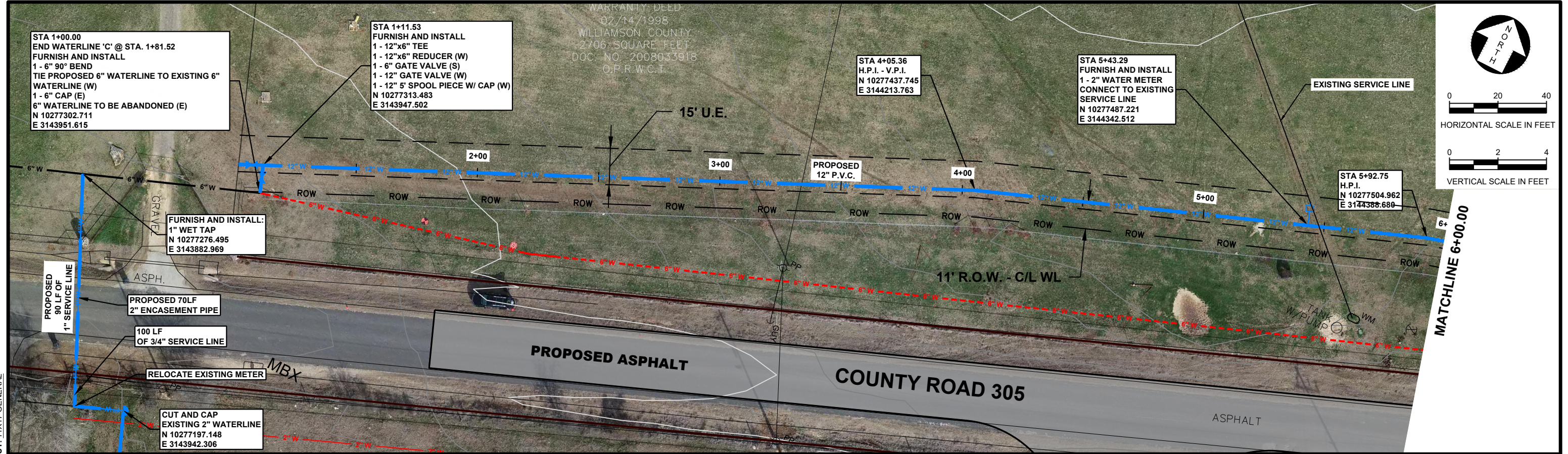


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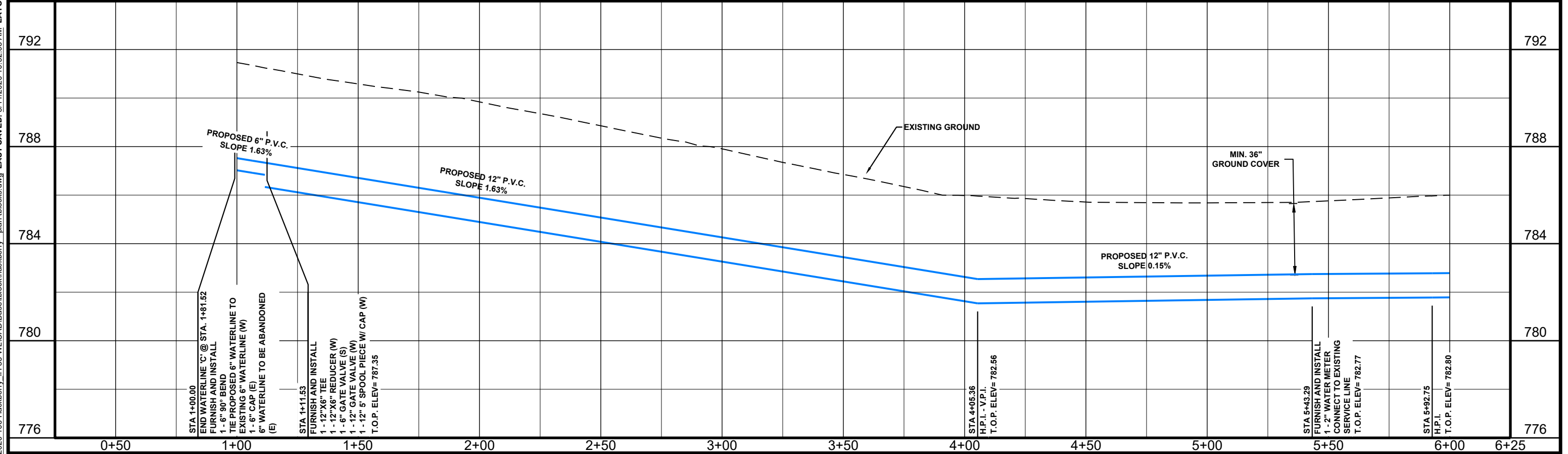
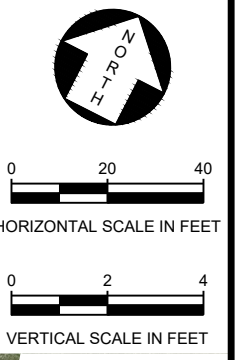
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C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT
WATERLINE ABANDONMENT SHEET
BEG. TO END

SHEET NO. **C-06** OF **06** SHEETS

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WARRANTY DEED
02/14/1998
WILLIAMSON COUNTY
2706 SQUARE FEET
DOC. NO. 2008033918
O.P.R.W.C.T.



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Plot Date: ---
Plotted By: SILIFF

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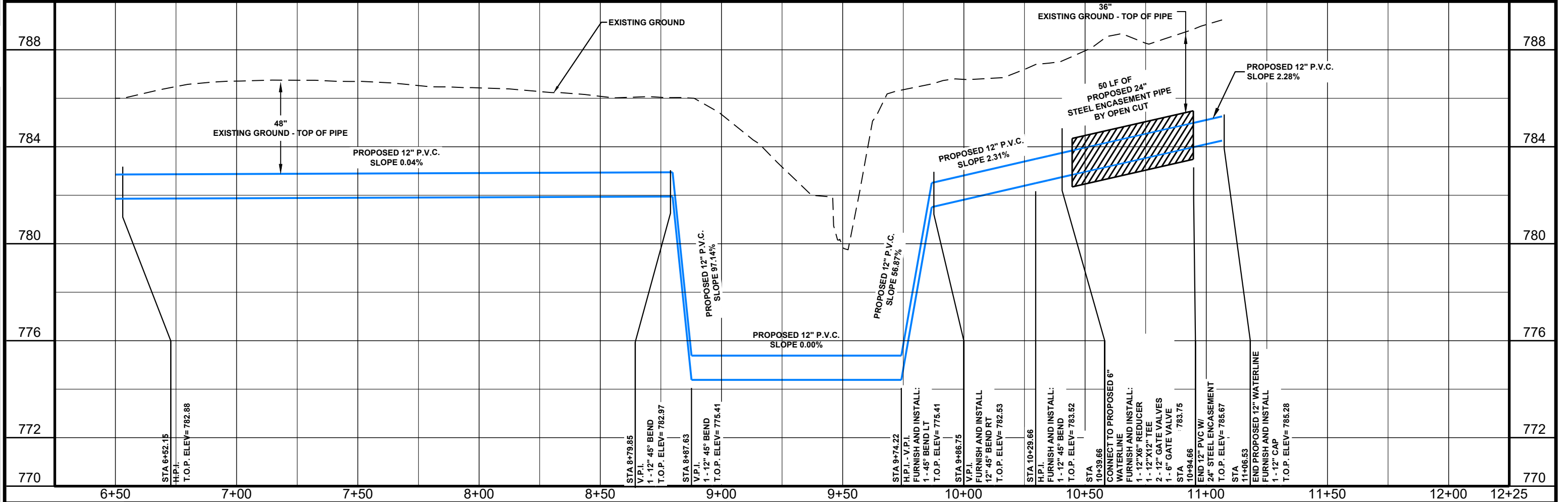
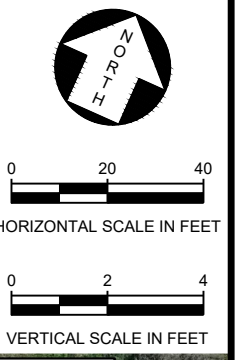
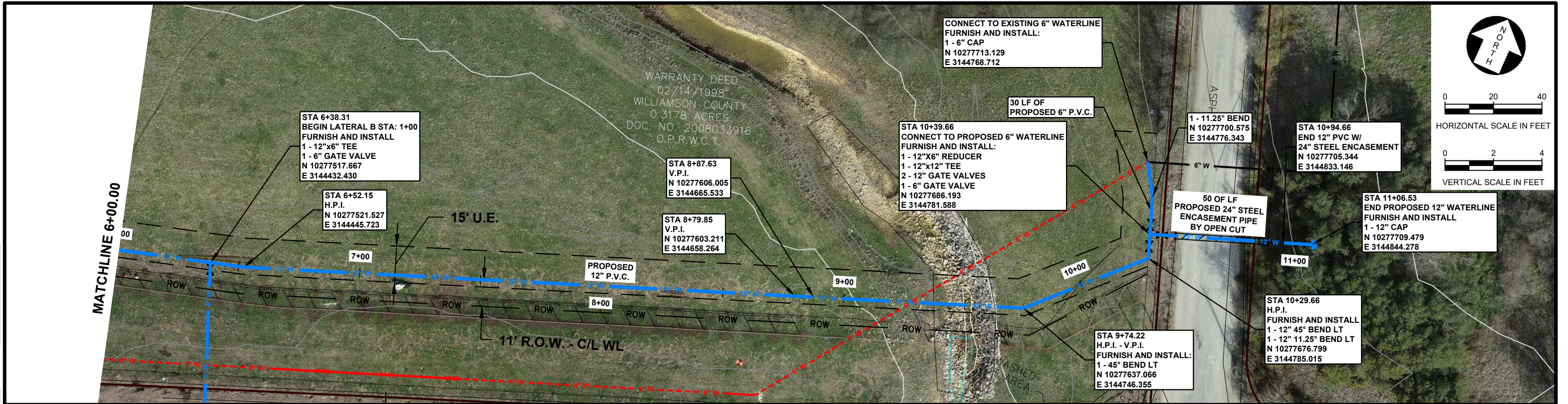
PROJECT NO. 22-102
DRAWN BY Eric Harris
DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY *[Signature]*
DATE 10/09/2023



KPA KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626

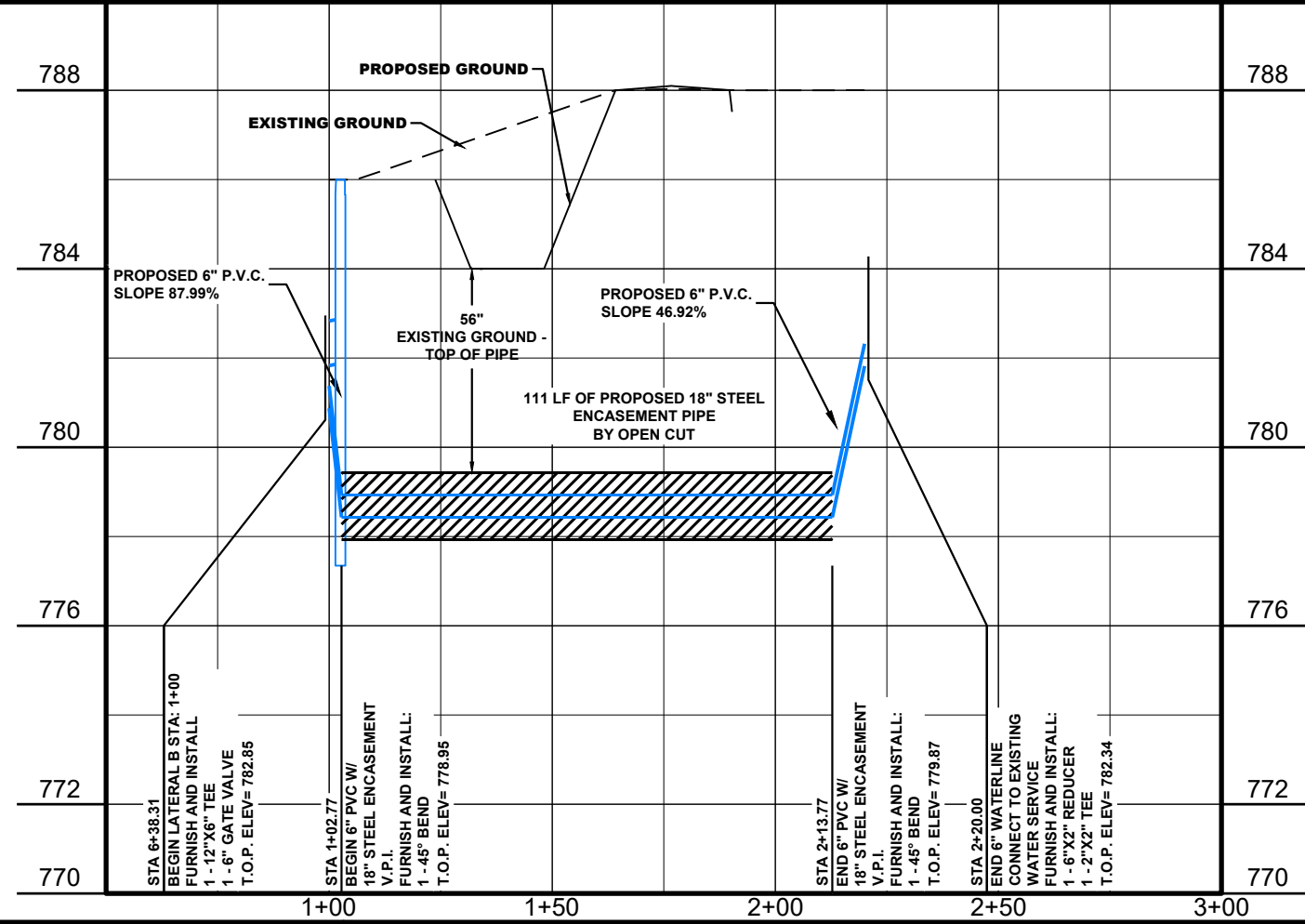
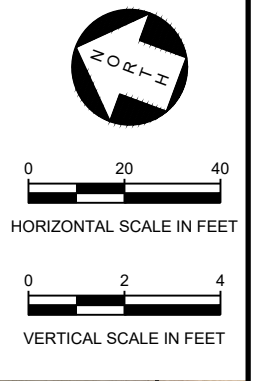
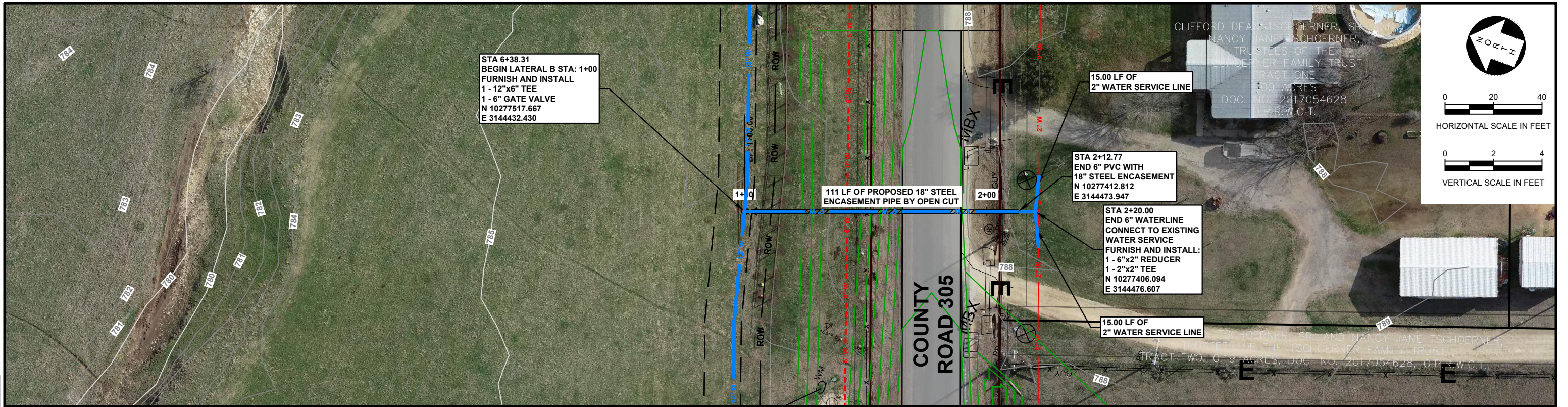
JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT
WATERLINE PLAN & PROFILE SHEETS
WL 'A' - STA. 1+00 TO 6+00

SHEET NO. **P-01** OF **03** SHEETS



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NO. DATE REVISION BY		© 2022 Kasberg, Patrick & Associates, LP KPA Firm Registration Number F-510		Plot Date: 10/10/2023 Plotted By: EHARRIS									

FILE: P:\USWCS\2020-106 Hackberry_IH_35 WL\CAD\Basetblock\hackberry - plan tblocks.dwg LAST SAVED: 5/11/2020 10:52:03 AM LAYOUT: 11X17 GENERAL



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 APPROVED BY *Alvin R. Sutton III*
 DATE 10/09/2023



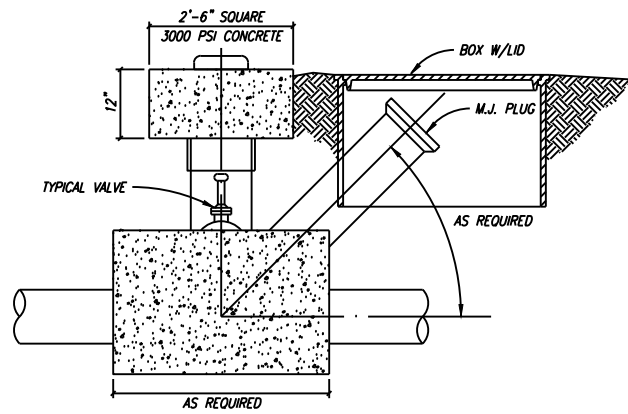
KPA KASBERG, PATRICK & ASSOCIATES, LP
 CONSULTING ENGINEERS
 GEORGETOWN, TEXAS 78626

JARRELL SCHWERTNER WATER SUPPLY CORPORATION
 C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

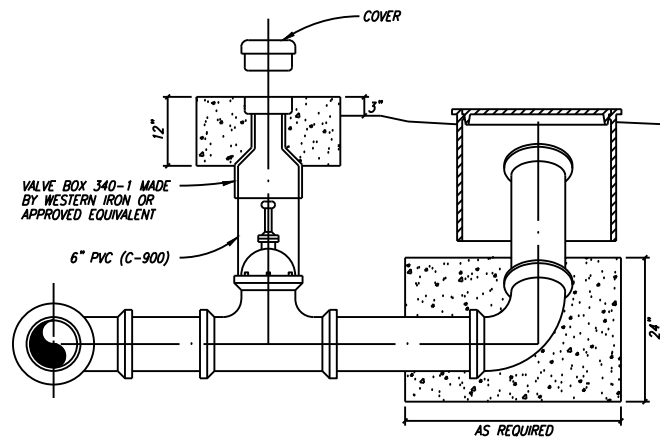
WATERLINE PLAN & PROFILE SHEETS
 WL 'B' - STA. 1+00 TO END

SHEET NO. **P-03** OF **03** SHEETS

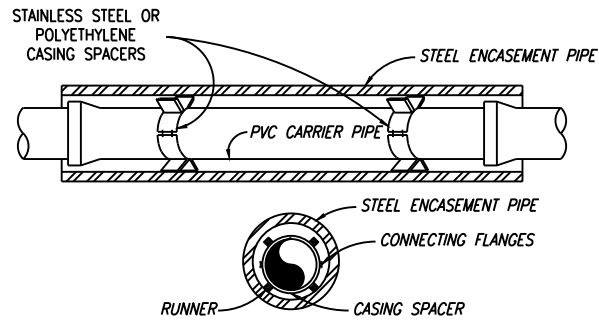
FILE: P:\USW\SC2022\2022-102 - Northwest WL Imp\CAD\ CR 307 PHASE 1\Plans\DETAILS - MISC\22-102 - WATERLINE DETAILS.dwg LAST SAVED: 2/17/2023 1:56:27 PM LAYOUT: WATERLINE DETAILS



TYPICAL FLUSH VALVE INSTALLATION
NOT TO SCALE



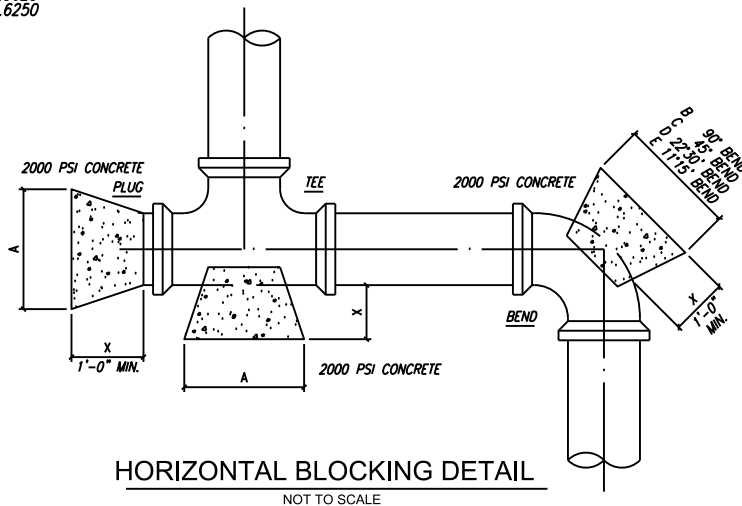
TYPICAL VALVE SETTING AND BOX (BEHIND CURB LINE)
NOT TO SCALE



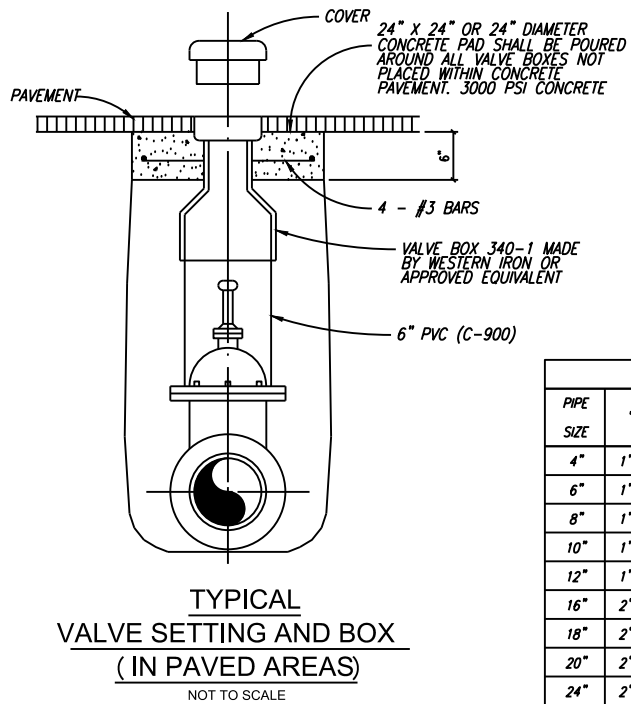
- NOTES:**
- CASING SPACERS SHALL BE POLYETHYLENE CASING SPACERS (RACI OR APPROVED EQUIVALENT). CONNECTING FLANGES SHALL BE RIBBED FOR EXTRA STRENGTH.
 - CASING SPACERS SHALL HAVE RUNNERS MADE OF ULTRA HIGH MOLECULAR WEIGHT POLYMER, WITH A MINIMUM HEIGHT OF 2 INCHES.
 - DO NOT USE WEDGES BETWEEN TOP OF PVC CARRIER PIPE AND INSIDE OF CASING TO KEEP PVC FROM MOVING.
 - PRIOR TO INSERTING PVC CARRIER PIPE, ANY WATER SHOULD BE PUMPED OUT OF THE CASING PIPE.
 - SPACERS WILL BE REQUIRED WITHIN AT LEAST 3 FEET FROM BOTH OPENINGS OF THE ENCASEMENT PIPE AND SPACED NO GREATER THAN 6 FEET THROUGHOUT THE ENCASEMENT PIPE.
 - CASING SPACERS WILL NOT BE PAID DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM FOR INSTALLING PVC PIPE.
 - ENCASEMENT PIPE SHALL BE SMOOTH STEEL 35,000 PSI YIELD STRENGTH WITH THICKNESS ACCORDING TO THE FOLLOWING TABLE:
 - PRESSURE PIPE (WATER LINE & FORCE MAIN) WITHIN STEEL ENCASEMENT PIPE SHALL BE RESTRAINED WITH BELL JOINT RESTRAINTS. GASKET LOCKS ARE AN ACCEPTABLE MEANS OF RESTRAINT FOR WATERLINE. WITHIN STEEL ENCASEMENT PIPE THIS WILL BE CONSIDERED SUBSIDIARY TO THE BID ITEM FOR THE PIPE AND ENCASEMENT.
 - ENDS OF THE ENCASEMENT PIPE WILL BE SEALED WITH AN END SEAL. END SEALS SHALL BE 1/8" THICK NEOPRENE RUBBER. ADVANCE PRODUCTS AND SYSTEMS, INC. MODEL AWW OR EQUAL.

PIPE SIZE - CARRIER PIPE SIZE - CASING (DIAMETER) (DIAMETER) (MIN.)	PIPE SIZE (DIAMETER)	MINIMUM PIPE THICKNESS (INCHES)
8" - 10"	LESS THAN 12"	1/4"
12" - 14"	12" TO LESS THAN 18"	5/16"
16" - 18"	18" TO LESS THAN 22"	3/8"
20"	22" TO LESS THAN 28"	7/16"
24"	28" TO LESS THAN 34"	1/2"
30"	34" TO LESS THAN 42"	9/16"
36"	42" TO LESS THAN 48"	5/8"

INSTALLATION OF PVC PIPE THROUGH CASINGS
NOT TO SCALE



HORIZONTAL BLOCKING DETAIL
NOT TO SCALE



TYPICAL VALVE SETTING AND BOX (IN PAVED AREAS)
NOT TO SCALE

PIPE SIZE	X"	PLUGS AND TEES		90° BENDS		45° BENDS		22° 30' BENDS		11° 15' BENDS			
		A"	AREA ¹	VOL ²	B"	AREA ¹	VOL ²	C"	AREA ¹	VOL ²	D"	AREA ¹	VOL ²
4"	1'-0"	1'-0"	.83	.05	1'-0"	.83	.05	1'-0"	.83	.05	1'-0"	.83	.05
6"	1'-6"	1'-0"	1.06	.06	1'-2"	1.50	.09	1'-0"	.83	.05	1'-0"	.83	.05
8"	1'-6"	1'-3"	1.89	.11	1'-6"	2.66	.15	1'-3"	1.44	.08	1'-0"	.83	.05
10"	1'-6"	1'-9"	2.95	.17	2'-0"	4.17	.24	1'-6"	2.26	.13	1'-3"	1.15	.07
12"	1'-6"	2'-0"	4.25	.24	2'-3"	6.00	.34	1'-9"	3.25	.18	1'-3"	1.65	.10
16"	2'-0"	2'-7"	7.54	.56	3'-0"	10.65	.79	2'-3"	5.76	.43	1'-8"	2.94	.22
18"	2'-0"	2'-11"	7.70	.57	3'-5"	10.89	.82	2'-6"	5.89	.44	1'-10"	3.01	.22
20"	2'-0"	3'-3"	7.86	.59	3'-9"	11.12	.89	2'-9"	6.01	.45	2'-0"	3.07	.23
24"	2'-0"	3'-8"	11.33	.84	4'-3"	16.00	1.20	3'-2"	8.65	.65	2'-6"	4.42	.23

¹ SQUARE FEET (MINIMUM) ² CUBIC YARDS (MAXIMUM)

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NO.	DATE	REVISION	BY

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KPA Firm Registration Number F-510

Plot Date: 10/10/2023 9:51:26 AM
Plotted By: EHARRIS

PROJECT NO. 22-102
DRAWN BY Eric Harris
DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY *Alvin R. Sutton III*
DATE 10/09/2023



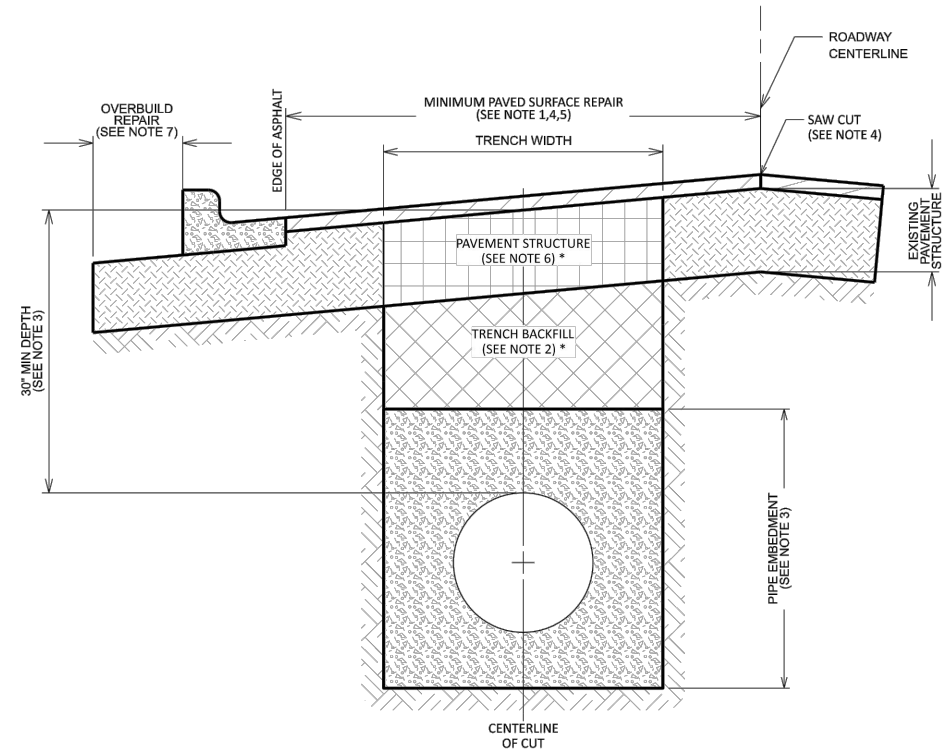
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C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

DETAIL SHEETS
WATERLINE DETAILS

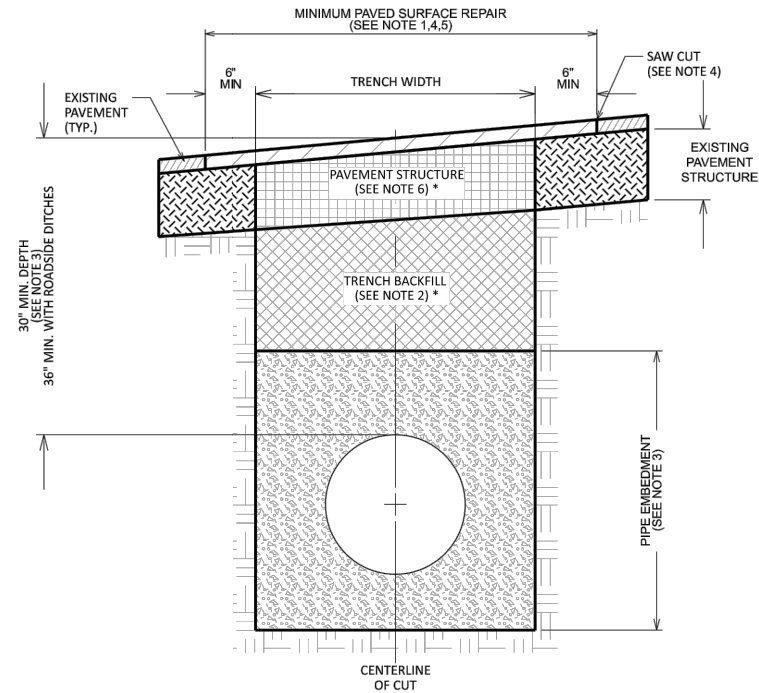
SHEET NO. **D-01** OF **13** SHEETS

**PARALLEL UTILITY CUT PAVEMENT REPAIR DETAIL
REQUIREMENT IN WILLIAMSON COUNTY R.O.W**



- PAVEMENT SHALL BE HOT MIX ASPHALT (SPECIFICATIONS; TXDOT ITEM 340 AND 341, TYPE D). EXISTING HMAC THICKNESS OR 2" MINIMUM, WHICHEVER IS GREATER. ROLL IN PLACE TO MATCH EXISTING SURFACE, $\frac{1}{8}$ " TOLERANCE.
 - TRENCH BACKFILL SHALL BE FLEXIBLE BASE, COMPACTED TO 95% OPTIMUM IN 8" LIFTS UNLESS OTHERWISE APPROVED (SPECIFICATIONS; TXDOT ITEM 247, TYPE A, GRADE 2).
 - PIPE EMBEDMENT (PIPE ENVELOPE) SIZE AND MATERIALS SHALL BE AS SPECIFIED ELSEWHERE BY UTILITY COMPANY AND/OR ITS ENGINEERS. PIPE DEPTH SHALL BE AS SPECIFIED ELSEWHERE PROVIDED THAT MINIMUM DEPTHS ARE MET.
 - SAW CUT SHALL BE MADE PRIOR TO TRENCH CUT. IF PAVEMENT IS DAMAGED DURING CUT, A NEW SAW CUT SHALL BE MADE BEYOND THE DAMAGED AREA AND NEW PAVEMENT PLACED.
 - DAMAGE BEYOND THE CENTERLINE OF ROADWAY REQUIRES REPAIR OVER ENTIRE ROADWAY WIDTH.
 - PAVEMENT STRUCTURE SHALL BE FLEXIBLE BASE, COMPACTED TO 98% OPTIMUM TO MATCH DEPTH OF EXISTING STRUCTURE INCLUDING THE DEPTH OF STABILIZED SUBGRADE.
 - TRENCHING IN THE FLEXIBLE BASE OVERBUILD IS DISCOURAGED, BUT IF DONE MUST BE FLOWABLE FILLED TO THE BOTTOM OF GUTTER AND TOPSOILED TO THE TOP OF CURB.
- * PAVEMENT STRUCTURE AND TRENCH BACKFILL ARE PERMITTED TO USE FLOWABLE BACKFILL (CONTROLLED LOW-STRENGTH MATERIAL) WITH COMPRESSIVE STRENGTH NOT LESS THAN 200 PSI AND NOT TO EXCEED 400 PSI.

**PERPENDICULAR UTILITY CUT PAVEMENT REPAIR DETAIL
REQUIREMENT IN WILLIAMSON COUNTY R.O.W**



- PAVEMENT SHALL BE HOT MIX ASPHALT (SPECIFICATIONS; TXDOT ITEM 340 AND 341, TYPE D). MATCH EXISTING HMAC THICKNESS, OR 2" MINIMUM, WHICHEVER IS GREATER. ROLL IN PLACE TO MATCH EXISTING SURFACE, $\frac{1}{8}$ " TOLERANCE.
 - TRENCH BACKFILL SHALL BE FLEXIBLE BASE, COMPACTED TO 95% OPTIMUM IN 8" LIFTS UNLESS OTHERWISE APPROVED. (SPECIFICATIONS; TXDOT ITEM 247, TYPE A, GRADE 2).
 - PIPE EMBEDMENT (PIPE ENVELOPE) SIZE AND MATERIALS SHALL BE AS SPECIFIED ELSEWHERE BY UTILITY COMPANY AND/OR ITS ENGINEERS. PIPE DEPTH SHALL BE AS SPECIFIED ELSEWHERE PROVIDED THAT MINIMUM DEPTHS ARE MET.
 - SAW CUT SHALL BE MADE PRIOR TO TRENCH CUT. IF PAVEMENT IS DAMAGED DURING CUT, A NEW SAW CUT SHALL BE MADE BEYOND THE DAMAGED AREA AND NEW PAVEMENT PLACED.
 - WHERE ROADSIDE DITCHES (BAR DITCHES) ARE CROSSED BY THE UTILITY PIPE, MINIMUM DEPTH TO THE TOP OF THE PIPE FROM THE CENTERLINE ROAD ELEVATION WILL BE 36".
 - PAVEMENT STRUCTURE SHALL BE FLEXIBLE BASE, COMPACTED TO 98% OPTIMUM TO MATCH DEPTH OF EXISTING STRUCTURE INCLUDING THE DEPTH OF STABILIZED SUBGRADE.
- * PAVEMENT STRUCTURE AND TRENCH BACKFILL ARE PERMITTED TO USE FLOWABLE BACKFILL (CONTROLLED LOW-STRENGTH MATERIAL) WITH COMPRESSIVE STRENGTH NOT LESS THAN 200 PSI AND NOT TO EXCEED 400 PSI.

A. EMBEDMENT DETAILS

- WASHED OR SCREENED GRAVEL SHALL CONFORM TO THE FOLLOWING GRADATION:

SIZE	% PASS
1/2"	100
3/8"	80-100
No. 4	15-70
No. 10	0-10
- SELECT MATERIAL (AS APPROVED BY THE OWNER) - MATERIAL WHICH IS FREE OF ROCKS, LUMPS, CLODS, ORGANIC MATTER OR DEBRIS. SELECT MATERIAL BENEATH ASPHALT SHALL HAVE A P.I. OF 12 TO 22 AND SHALL BE COMPACTED TO 95% DENSITY ASTM-D-698 AT OPTIMUM MOISTURE. ALL OTHER SELECT MATERIAL SHALL BE COMPACTED TO 85% DENSITY ASTM D-698.
- CONCRETE (FOR ENCASEMENT, FILL OR BLOCKING) - SHALL CONFORM TO ASTM C94. THE COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE AT LEAST 3000 PSL.
- BEGINNING AND ENDING OF ENCASEMENTS SHALL NOT BE MORE THAN 6 INCHES FROM A PIPE JOINT.
- WHERE WATER AND SEWER LINES PARALLEL WITH LESS THAN 10 FEET HORIZONTAL CLEAR DISTANCE, NO ENCASEMENT IS REQUIRED IF BOTH LINES ARE 150 PSI PRESSURE RATED.
- WHERE MINIMUM COVER, 30" IS NOT AVAILABLE, ENCASEMENT WILL BE REQUIRED.
- ALL CONCRETE ENCASEMENTS MUST BE FORMED AND INSPECTED BY THE ENGINEER PRIOR TO PLACING CONCRETE AND BACKFILLING.

B. WATER LINE NOTES

- WATER LINES SHALL BE MINIMUM DEPTHS OF 42 INCHES BELOW FINISHED GRADE. TOP OF VALVE STEMS TO BE 18 INCHES TO 36 INCHES BELOW FINISHED GRADE.
- PRESSURE TAPS SHALL BE IN ACCORDANCE WITH THE APPLICABLE TECHNICAL SPECIFICATIONS. TAPPING SLEEVES AND VALVES INSTALLED BY PRIVATE CONTRACTOR SHALL BE INSPECTED BY THE CITY. CONCRETE BLOCKING SHALL BE PLACED BEHIND AND UNDER ALL TAP SLEEVES A MINIMUM OF 24 HOURS AFTER MAKING THE TAP.
- CONTRACTOR SHALL COORDINATE THE CONNECTION OF PROPOSED WATER LINES TO EXISTING WATER LINES WITH THE CITY OF BELTON.
- WATER LINE TESTING AND STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE TECHNICAL SPECIFICATIONS.
- PRESSURE RATINGS OF VALVES, FITTINGS AND APPURTENANCES SHALL EQUAL OR EXCEED THE PRESSURE RATING OF ADJACENT WATER PIPELINE.
- ABOVE GROUND PORTION OF FIRE HYDRANTS ON MAINS UNDER CONSTRUCTION SHALL BE SECURELY WRAPPED WITH A POLYETHYLENE BAG OR ENVELOPE TAPED INTO PLACE, WHICH IS TO BE REMOVED BY THE CONTRACTOR WHEN THE MAINS ARE ACCEPTED AND PLACED IN SERVICE.
- ALL WATER LINE FITTINGS AND BENDS SHALL BE DUCTILE IRON UNLESS NOTED OTHERWISE.
- ALL UNDERGROUND DUCTILE IRON PIPE AND FITTINGS SHALL BE WRAPPED WITH MINIMUM OF MILLIMETER THICKNESS POLYETHYLENE WRAP IN ACCORDANCE WITH AWWA C105.
- CONTRACTOR SHALL PROVIDE ADEQUATE THRUST BLOCKING TO WITHSTAND TEST PRESSURES.
- CONTRACTOR SHALL COMPLY WITH MANUFACTURER'S RECOMMENDATION FOR CURVATURE OF LINES AND / OR DEFLECTION OF PIPE JOINTS.
- CONTRACTOR SHALL PROVIDE PIPE MANUFACTURER'S PLUGS OR CAPS AT ALL PIPE STUB-OUTS ON WATER LINES NOT CONNECTING TO OTHER LINES. CONTRACTOR SHALL REMOVE PLUGS OR CAPS AND CONNECT TO EXISTING LINES WHERE SHOWN ON PLANS.
- WHERE A NEW WATER LINE CROSSES WITHIN 18 INCHES UNDER A STORM WATER PIPE OR DITCH, THE WATER LINE SHALL BE CONCRETE ENCASED A MINIMUM OF 12 INCHES OUTSIDE EACH SIDE OF THE STORM WATER PIPE TRENCH OR DITCH.
- CORPORATION STOPS SHALL BE LOCATED TO AVOID FUTURE DRIVEWAYS. CORPORATION STOPS SHALL BE LOCATED WITHIN 5 FEET OF THE FRONT LOT CORNER OR IN THE MIDDLE OF THE LOT.
- ALL FIRE HYDRANTS SHALL BE M&H, OR MUELLER AND SHALL BE DOMESTIC.
- ALL GATE VALVES SHALL BE M&H, MUELLER, OR CLOW AND SHALL BE DOMESTIC.
- ALL FITTINGS SHALL BE MECHANICALLY RESTRAINED. ALL RESTRAINTS SHALL BE SWIVEL, FLANGE OR MEGA-LUG.
- ALL PIPE AND FITTINGS SHALL BE DOMESTIC.

NOTES:

- SAW CUT TO REPAIR ASPHALT OR CONCRETE PAVEMENT AND PRIOR TO OPENING THE DITCH THE EMBEDMENT CONSISTS OF 1" CRUSHED STONE
- TRENCH WIDTHS SHOWN ARE MINIMUM FOR PROPER PLACEMENT AND COMPACTION OF EMBEDMENT
- THE MINIMUM CLEAR WIDTH OF TRENCH (SHEETED OR UNSHEETED) MEASURED AT SPRINGLINE OF PIPE SHALL BE 12" GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE.
- WHERE PIPE INSTALLATION IS IN ROCK (OR OTHER INCOMPRESSIBLE FOUNDATION), THE CONTRACTOR SHALL EXCAVATE SO AS TO PROVIDE A MINIMUM OF 8" GRANULAR CUSHION BENEATH THE PIPE. INSTALLATION OF ANY PIPE WITHIN 4' OF THE BACK OF CURB OR EDGE OF STREET, SHALL REQUIRE THE SAME EMBEDMENT AS FOR INSTALLATION IN STREETS.
- CONTRACTOR SHALL SHAPE EMBEDMENT MATERIAL TO ACCOMMODATE THE BELLED JOINTS OF PIPES TO INSURE SUPPORT THROUGHOUT THEIR LENGTH. BELLED JOINTS SHALL HAVE A MINIMUM OF 2" OF FILL BENEATH THEM.
- IF EXCAVATED MATERIAL IS NOT ACCEPTABLE TO THE ENGINEER FOR BACKFILL, CONTRACTOR WILL PROVIDE SELECT IMPORT MATERIAL AS REQUIRED.
- FOR TRENCHING, BEDDING, AND BACKFILL, SEE TCEC CHAPTER 317.2 "BEDDING".
- FOR ROCK AND OTHER CONDITIONS NOT SPECIFIED HERE, REFER TO ENGINEER FOR BACKFILL DESIGN.
- GREEN TAPE TO BE USED FOR WASTEWATER GRAVITY AND FORCE MAINS, BLUE TAPE TO BE USED FOR WATER MAINS. TAPE SHALL BE 12-INCHES WIDE.
- NO CRUSHER FINES ARE ALLOWED AT ALL.

RECORD DRAWING

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NO.	DATE	REVISION	BY

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Plot Date: 10/10/2023 9:51:30 AM
Plotted By: EHARRIS

PROJECT NO. 22-102
DRAWN BY Eric Harris
DESIGNED BY Alvin R. Sutton III, P.E.
APPROVED BY *[Signature]*
DATE 10/09/2023

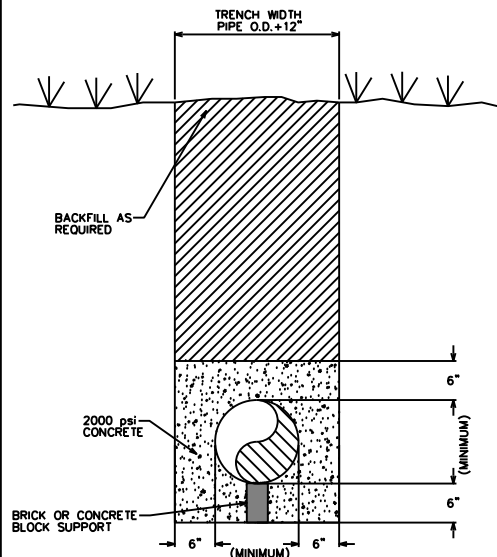


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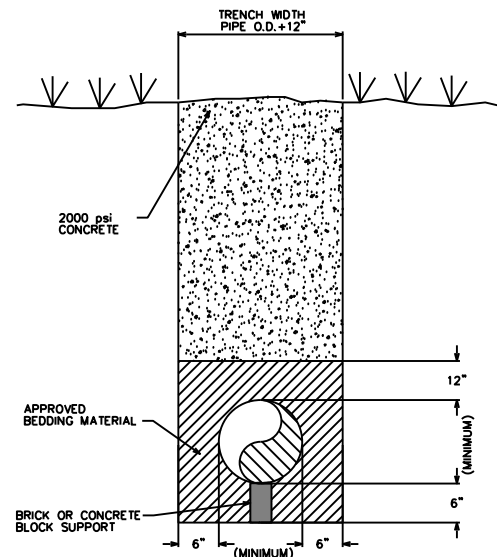
JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

DETAIL SHEETS
PIPE EMBEDMENT (1 OF 2)

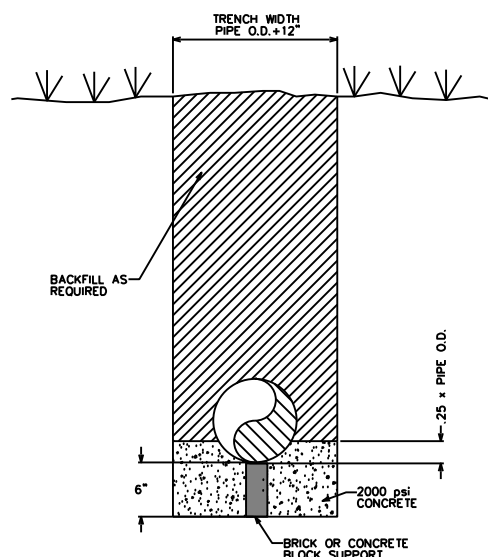
SHEET NO.
D-02 OF
13 SHEETS



**CONCRETE ENCASEMENT
TYPE I**

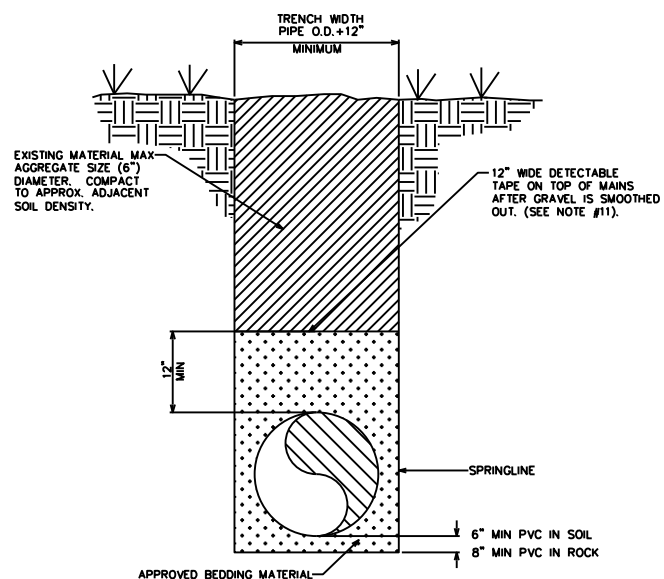


**CONCRETE ENCASEMENT
TYPE II**



CONCRETE CRADLE

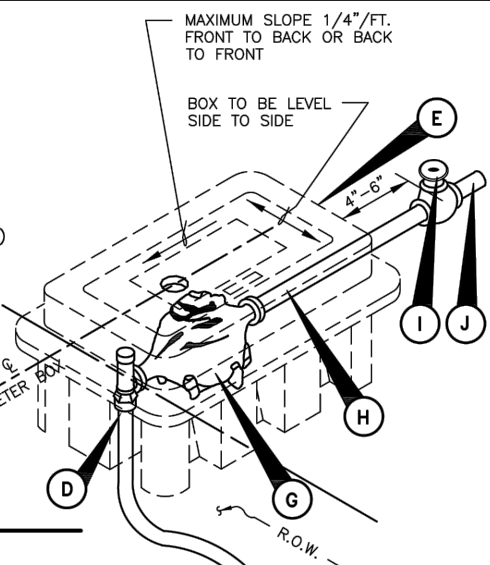
ROADWAY = ROAD B/C TO B/C +4"
IN EACH DIRECTION



**OUT OF ROAD INSTALLATION
CLASS 3**

MATERIAL LIST:

- A. SERVICE SADDLE REQUIRED. SERVICE SADDLE TO BE EPOXY COATED WITH DUAL STAINLESS STEEL BANDS.
- B. 1" CORPORATION STOP - SERVICE PIPE OUTLET. (SEE NOTE #2)
- C. 1" SERVICE PIPE.
- D. LOCKING ANGLE METER STOP; SERVICE PIPE INLET X SWIVEL COUPLING NUT OUTLET.
- E. PLASTIC RECTANGULAR METER BOX. (SEE TABLE BELOW)
- F. PIPE CASING WHERE APPLICABLE. (AS PER DETAIL WT-01)
- G. WATER METER, CENTERED IN BOX. (SEE TABLE BELOW)
- H. WATER METER COUPLING; MALE I.P.T. X SWIVEL COUPLING NUT.
- I. BRONZE GATE VALVE: NON-RISING STEM (3/4" OR 1") FEMALE I.P.T. (PROPERTY OWNERS CUT-OFF OUTSIDE METER BOX IN SEPARATE VALVE CAN WITH LID AS PER CITY OF ROUND ROCK STANDARDS).
- J. 3/4" OR 1" PIPE MEETING CITY OF ROUND ROCK PLUMBING CODE REQUIREMENTS.

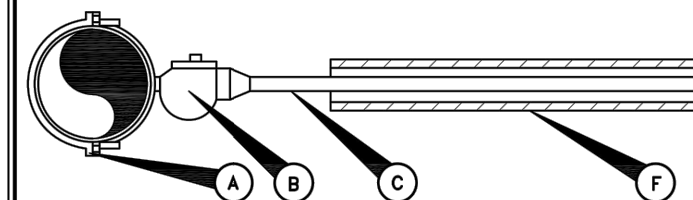


NOTES:

1. SERVICE PIPE SHALL BE COPPER TUBE SIZE. IT MAY BE 150 P.S.I. ANNEALED SEAMLESS TYPE "K" COPPER TUBING OR 200 P.S.I. BLACK COLORED POLYETHYLENE HAVING A DIMENSION RATIO OF 9 (DR9).
2. ALL STAINLESS STEEL INSERTS THAT COME WITH COMPRESSION FITTINGS SHALL NOT BE USED ON ANY CONNECTIONS.
3. SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM.
4. TOP OF BOXES SHALL BE 1" ABOVE FINISHED GRADE.
5. PIPING AND TUBING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 510.3 OF THE STANDARD SPECIFICATIONS. SPECIAL ATTENTION IS CALLED TO "PIPE BEDDING ENVELOPE" AND "BACKFILLING", SECTIONS 510.3 (14) AND 510.3 (25), RESPECTIVELY.
6. AXIS OF METER ASSEMBLY (LINE THROUGH METER STOP, METER, PIPING AND OWNERS CUTOFF) SHALL BE 10" BELOW TOP OF BOX.
7. SLOTS PROVIDED IN METER BOX TO ACCOMMODATE PIPING INTO AND OUT OF BOX, SHALL NOT BE MODIFIED.
8. LOCATION OF METER BOXES SHALL BE SUBJECT TO THE APPROVAL OF THE C.O.R.R.

PART NUMBER	SERIES	COLOR	HEIGHT	WIDTH	LENGTH
DFW36C-12-BODY*	36C	BLACK	12"	TOP = 13-3/4"	TOP = 18-7/8"
DFW36C-AF1EQA-LID*	36C	BLACK	1-7/8"	LID = 10-3/16"	LID = 15-9/16"
DFW36C-12-AF1EQA*	36C	BLACK	12"	BASE = 10-1/2"	BASE = 18-7/8"

* MANUFACTURED BY DFW PLASTICS INCORPORATED OR APPROVED EQUAL.



METER SIZE	LENGTH
5/8"	7 1/2"
3/4"	7 1/2"
1"	11"

RECORD SIGNED COPY
ON FILE AT U&ES DEPARTMENT
APPROVED
03-01-18
DATE
THE ARCHITECT/ENGINEER ASSUMES
RESPONSIBILITY FOR THE APPROPRIATE
USE OF THIS DETAIL. (NOT TO SCALE)

CITY OF ROUND ROCK

DRAWING NO:
WT-02

**SINGLE 5/8", 3/4" OR 1"
WATER METER DETAIL**



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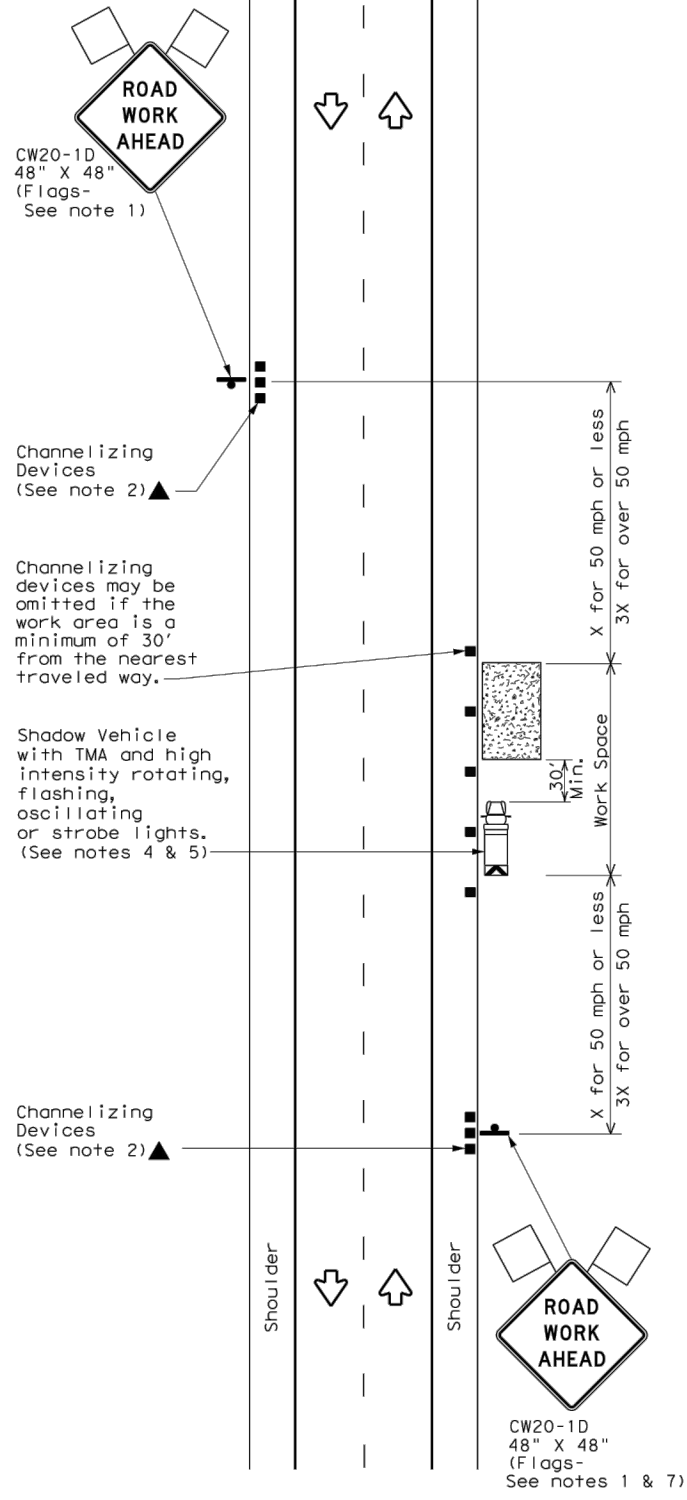
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JARRELL SCHWERTNER WATER SUPPLY CORPORATION
C.R. 305 @ C.R. 344 WATERLINE IMPROVEMENT

DETAIL SHEETS
PIPE EMBEDMENT (2 OF 2) & WATER METER DETAIL

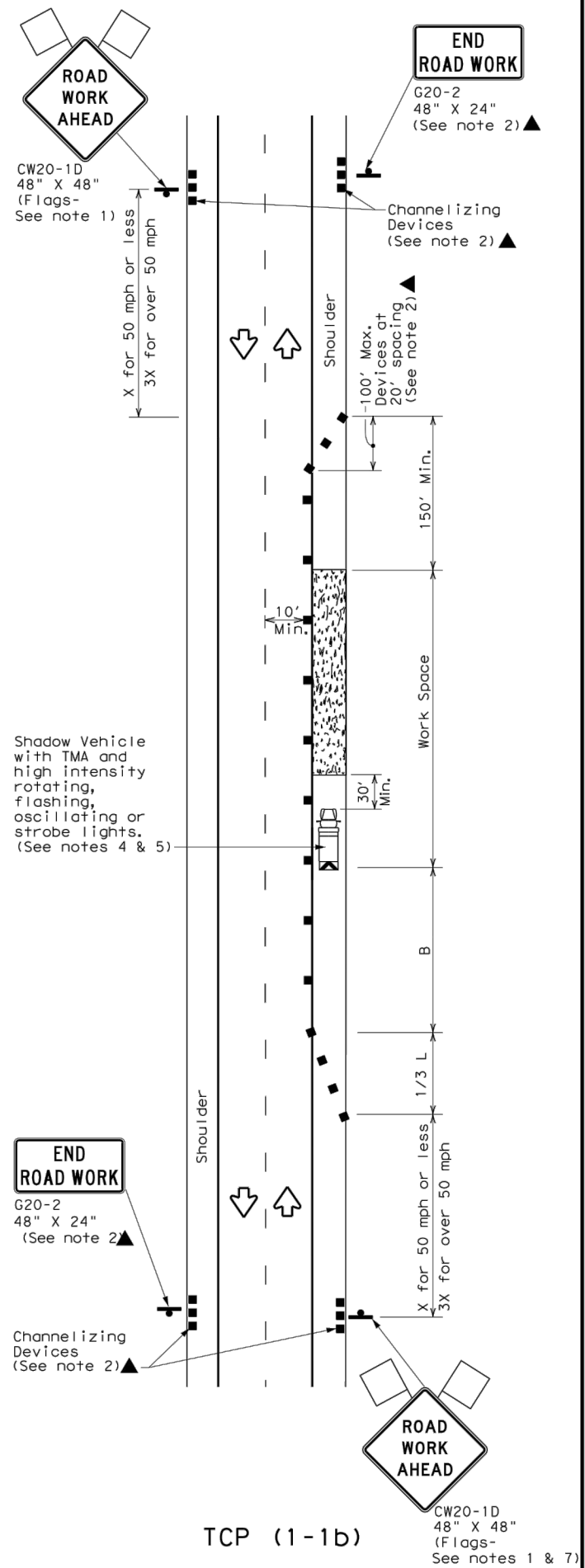
SHEET NO.
D-03 OF
13 SHEETS

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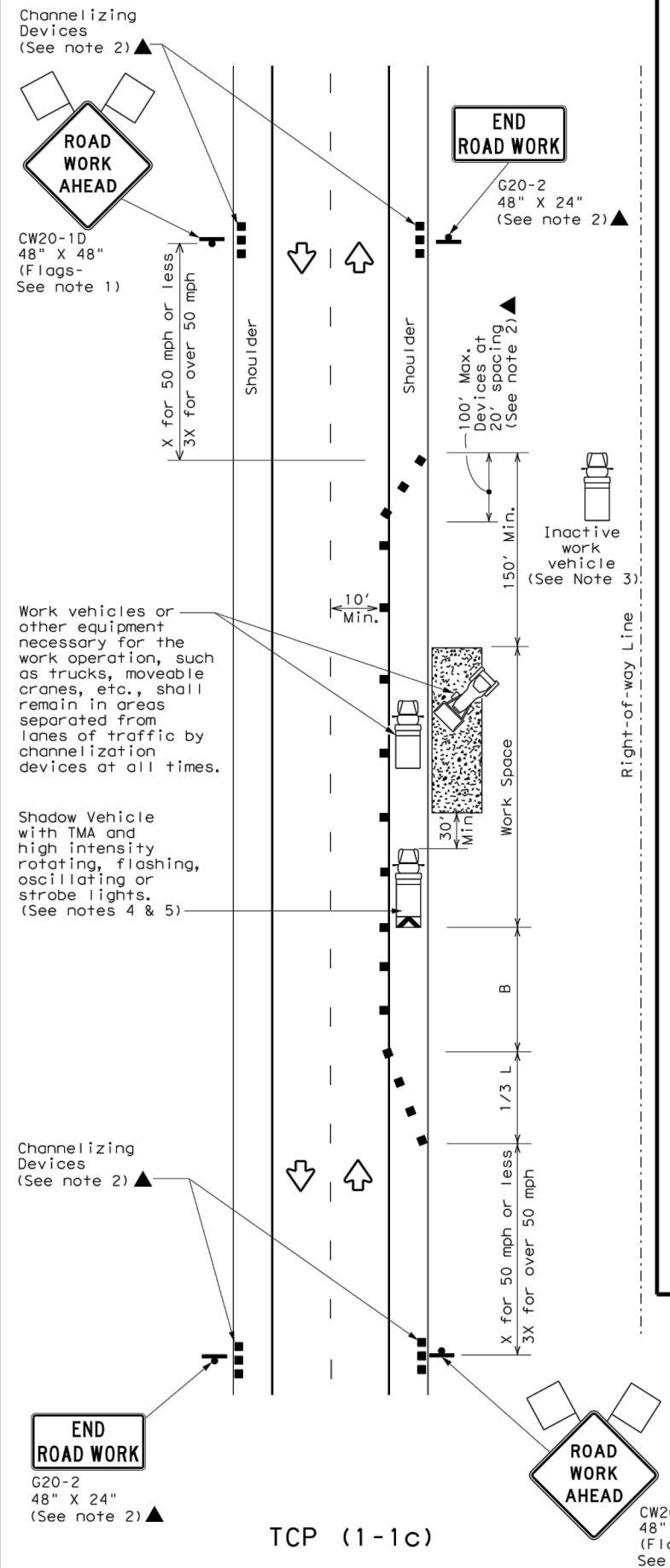
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

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

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

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



TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

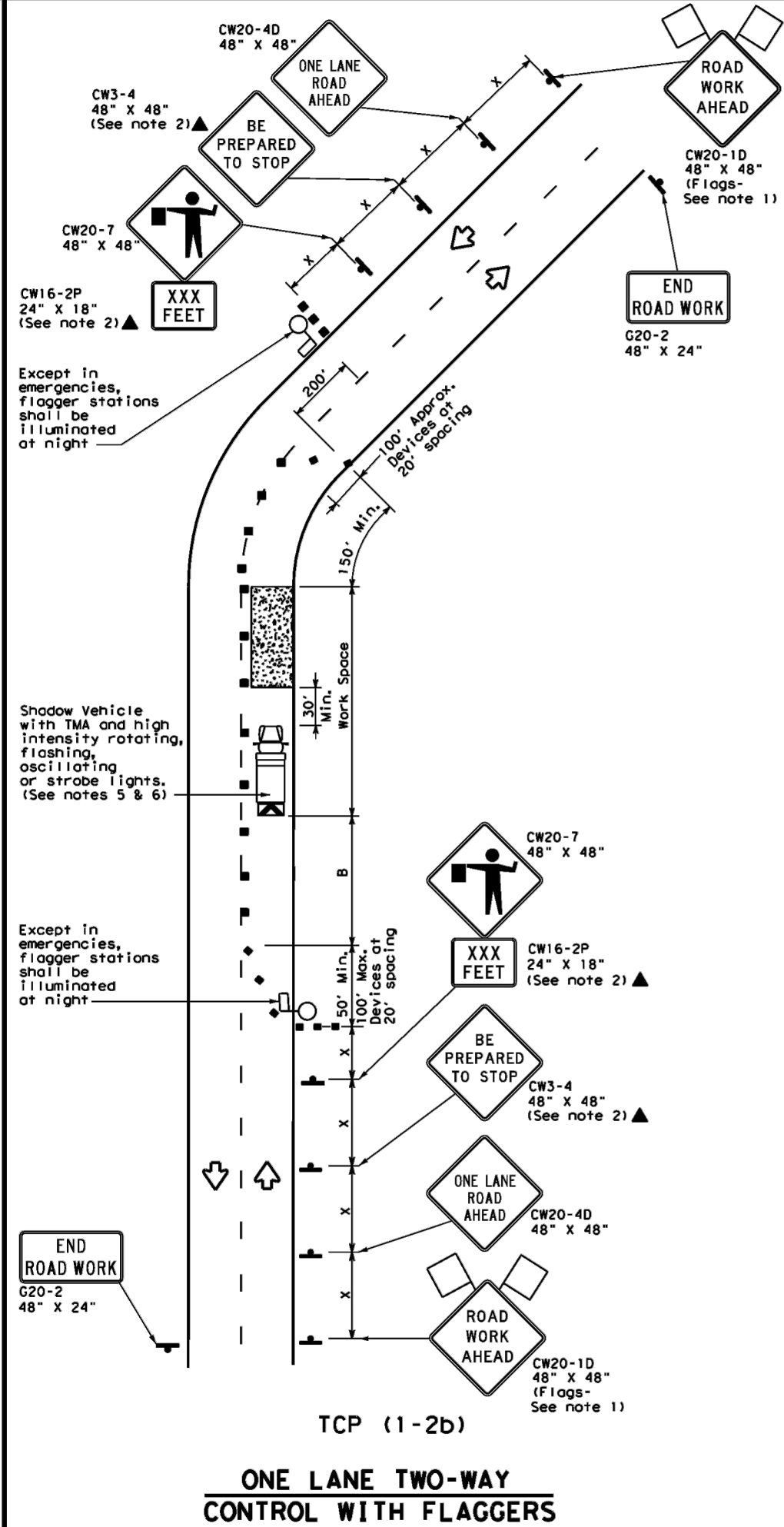
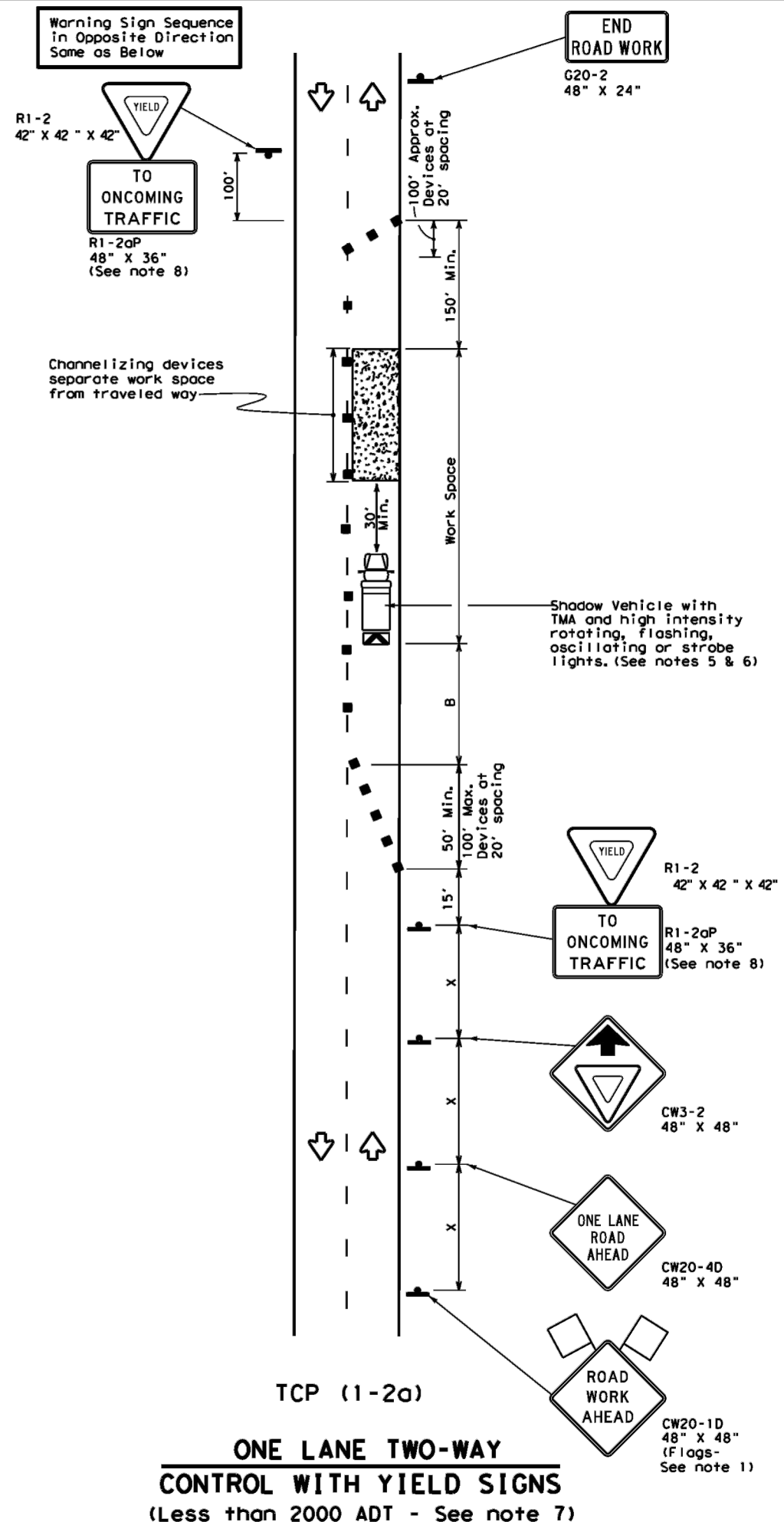
TCP (1-1) - 18

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

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

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

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

GENERAL NOTES

- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
- Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 150 feet.
- A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP (1-2) - 18

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:


1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.
2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

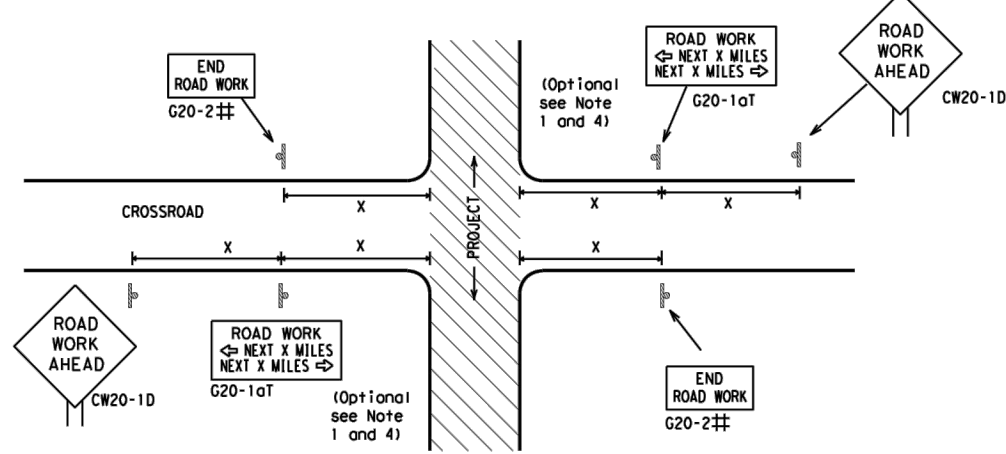
<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)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

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) -21</p>		
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5-10 5-21		

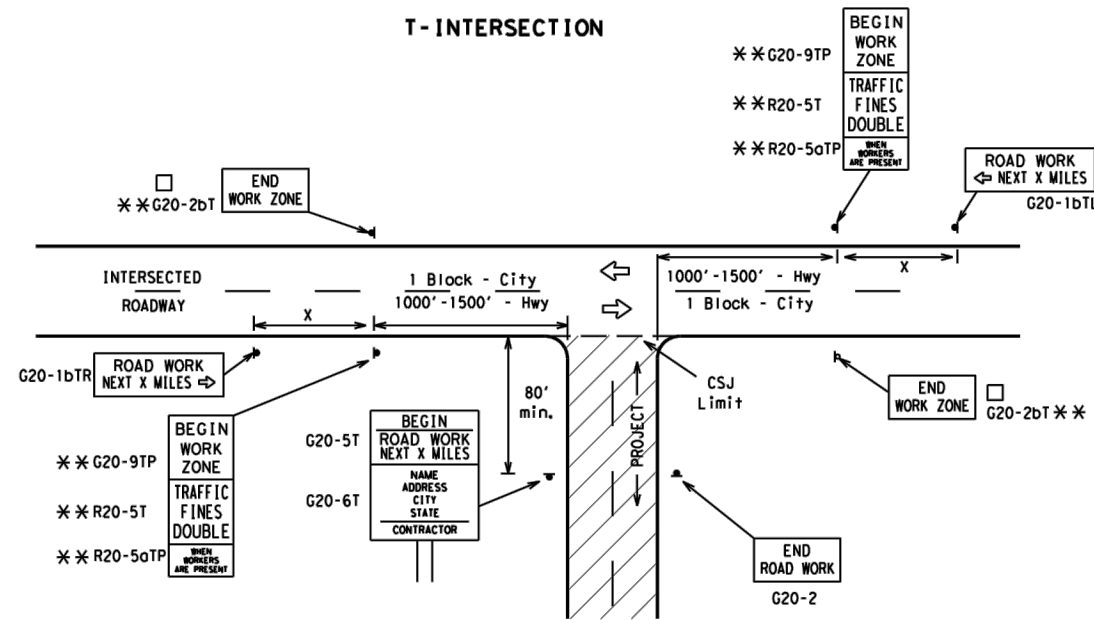
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## 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 as per TMUTCD Part 5. 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 Δ 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
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

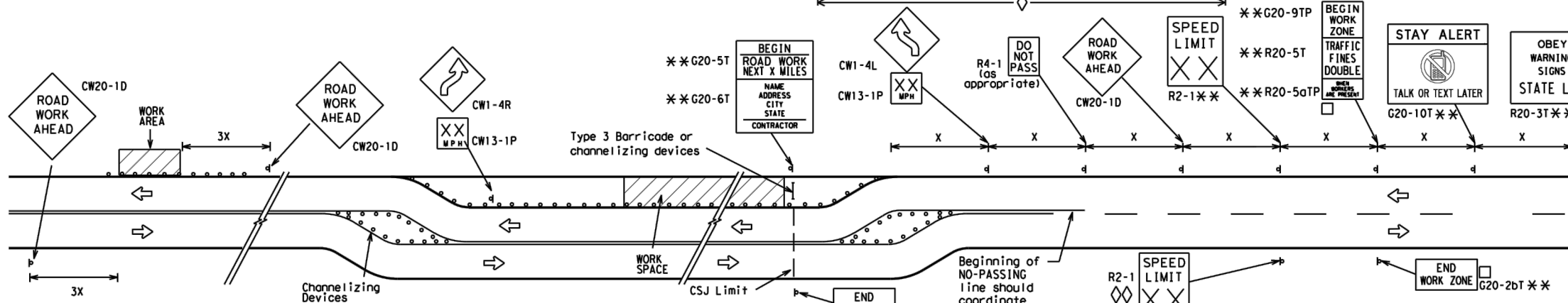
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

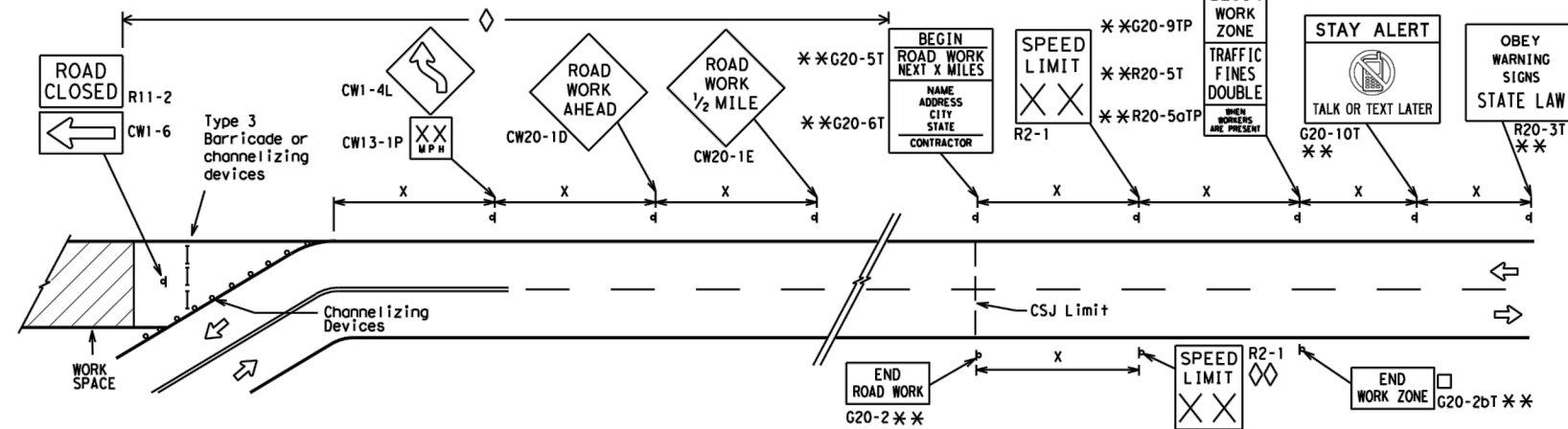
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. 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

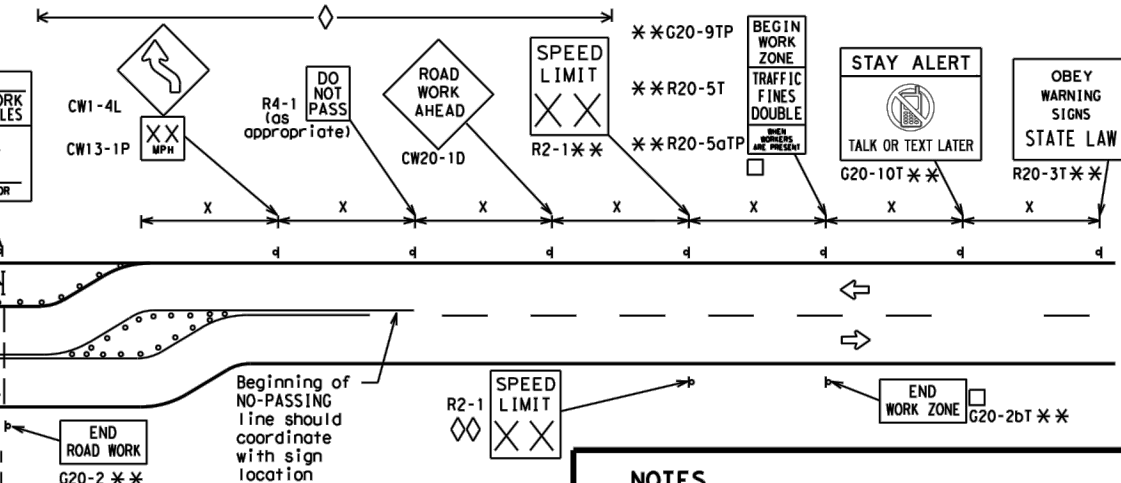


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) 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.
- CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC (2) - 21

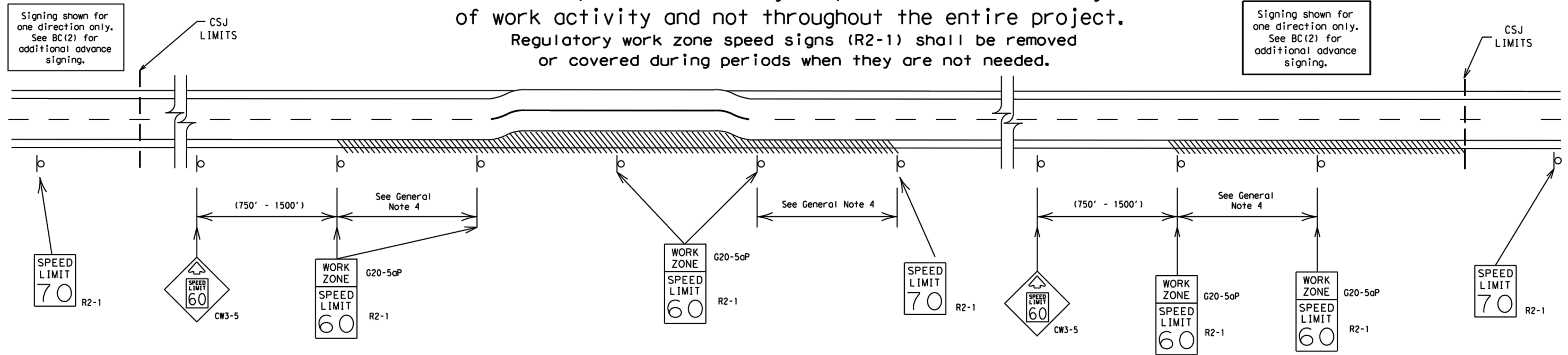
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 traveled 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.

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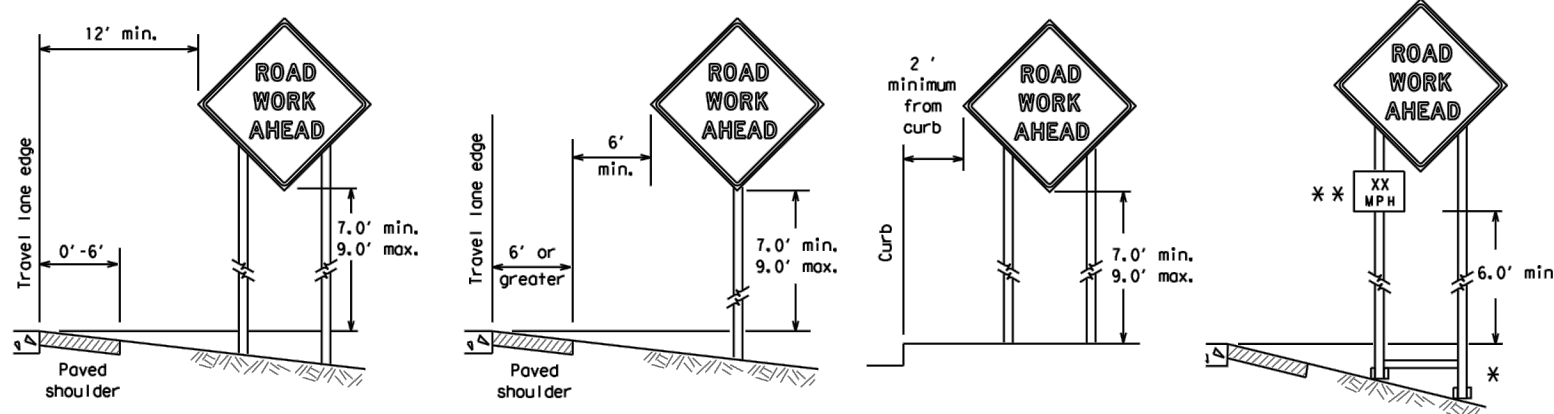
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

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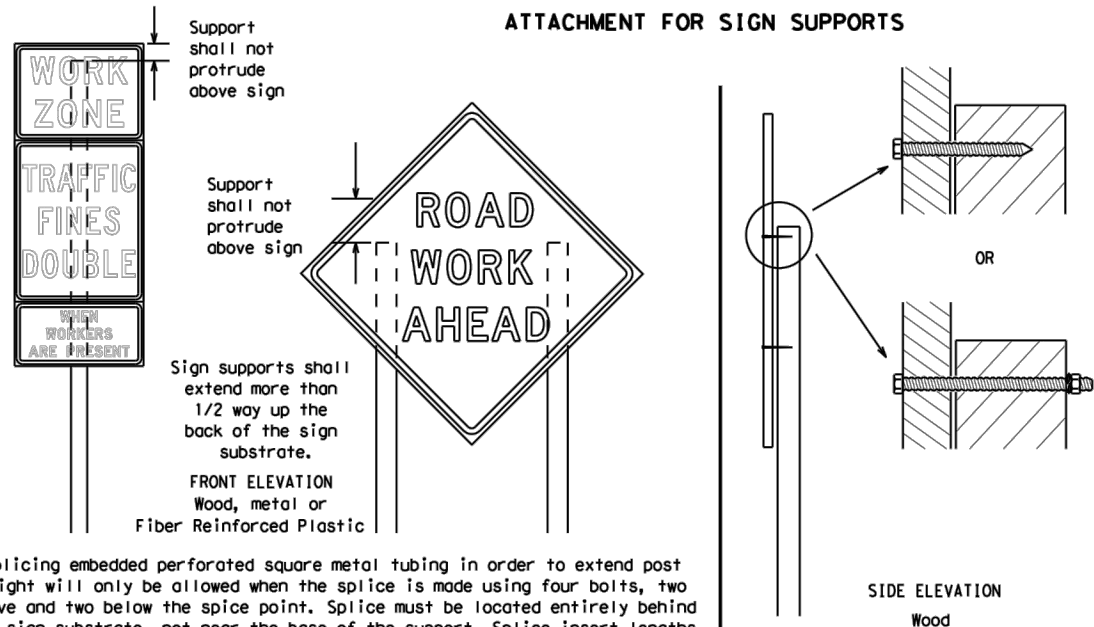
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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.

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) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- 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

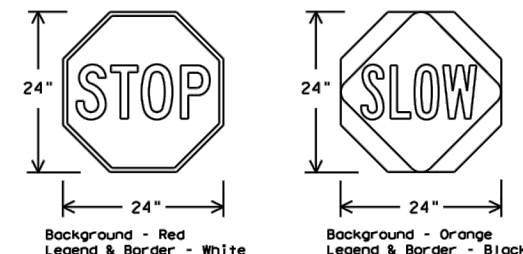
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not 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.

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".
- STOP/SLOW paddles shall be retroreflective when used at night.
- 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.



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers 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. For details for covering large guide signs see the TS-CD standard.
- 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 SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- 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.

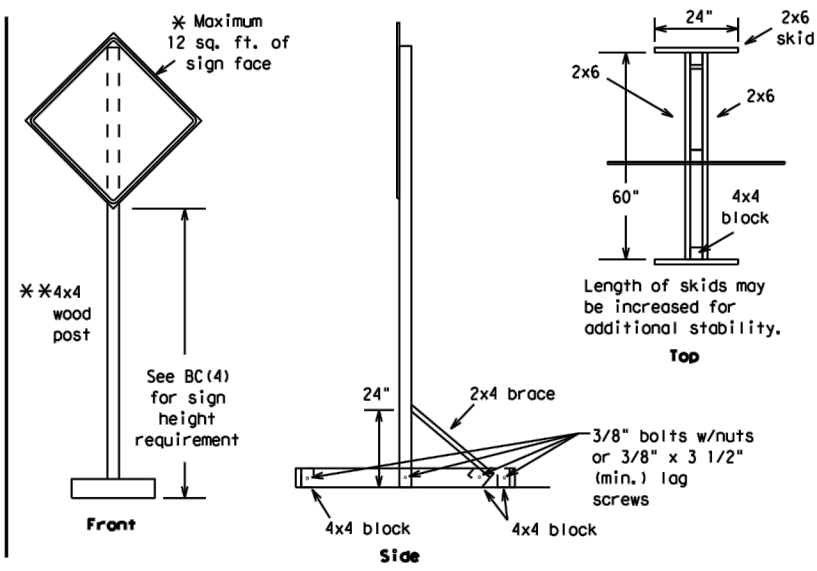
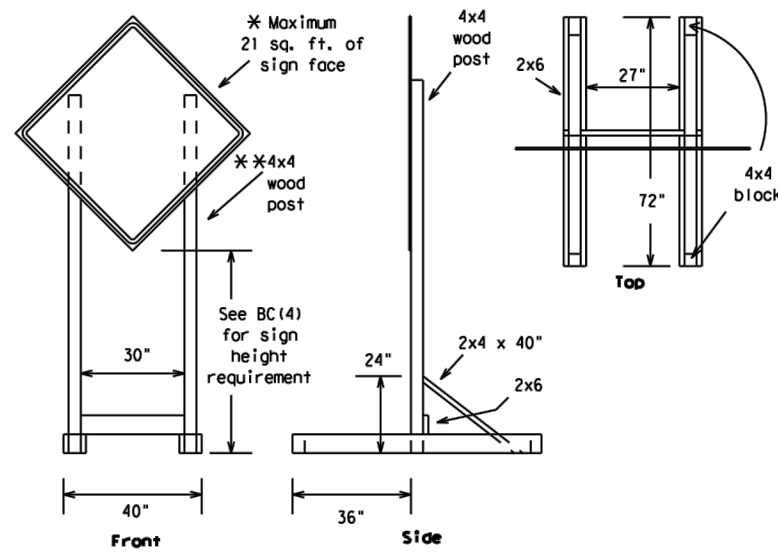


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

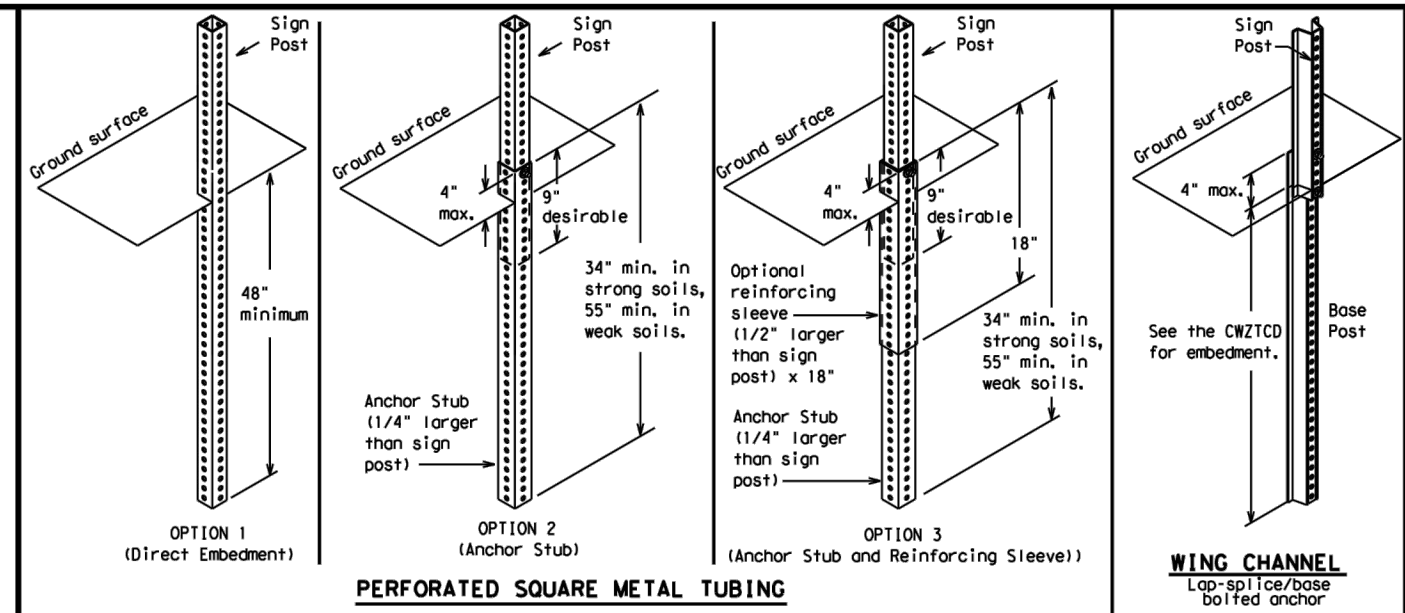
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07	8-14			
7-13	5-21			
	DIST	COUNTY	SHEET NO.	
			D-09	

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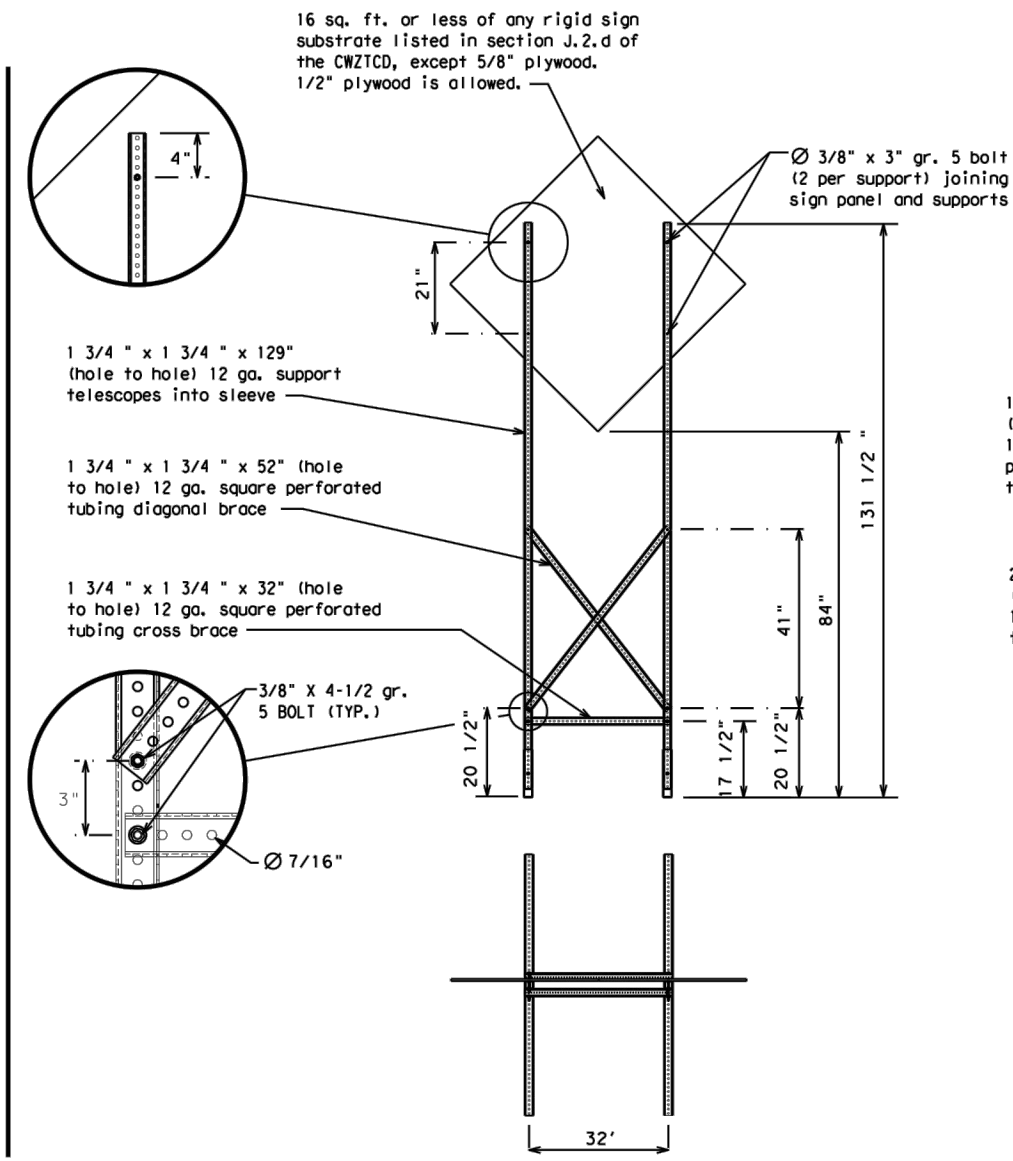
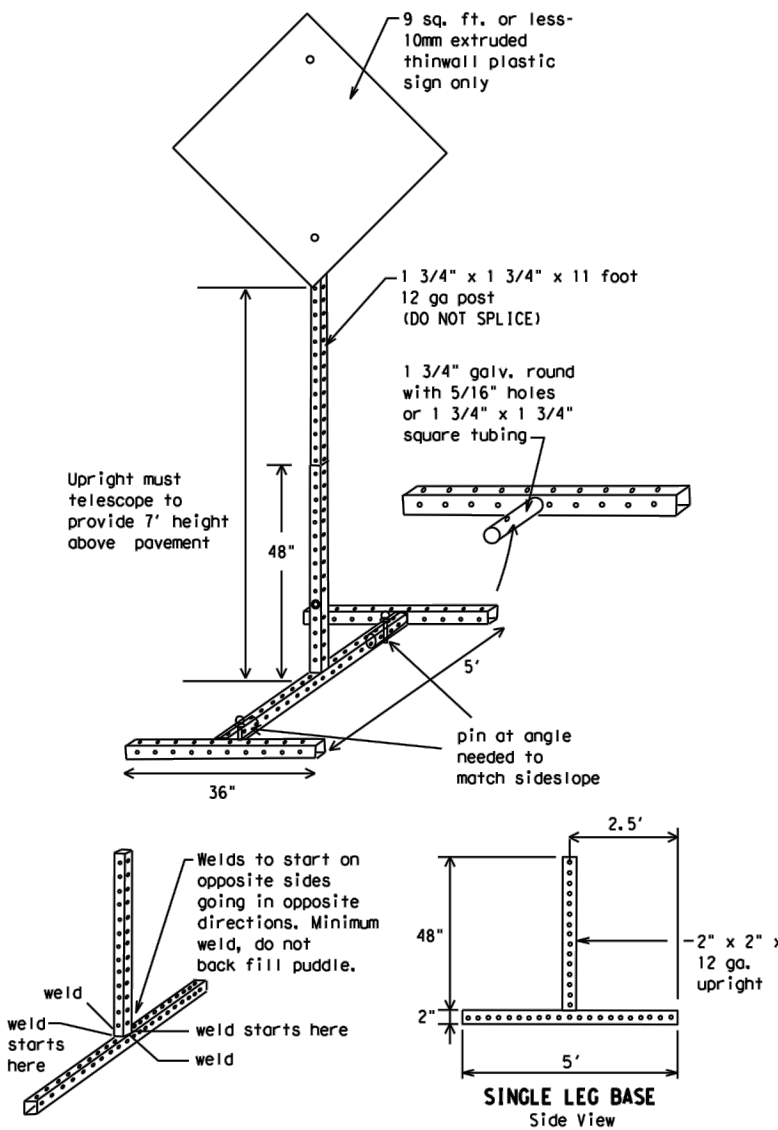
SKID MOUNTED WOOD SIGN SUPPORTS

* 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.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(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) - 21

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DATE: FILE:

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

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.

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
XXXXXXXX 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.

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.

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.

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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
Canal	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	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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

DATE: FILE:



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

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9-07 8-14				
7-13 5-21	DIST	COUNTY	SHEET NO.	D-11

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

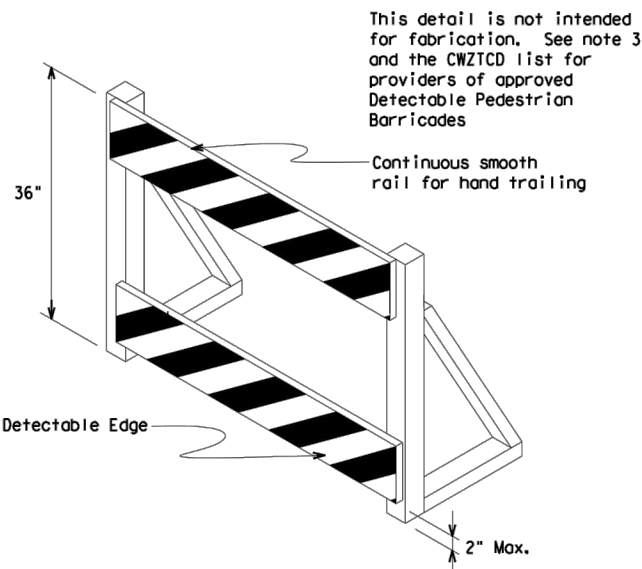
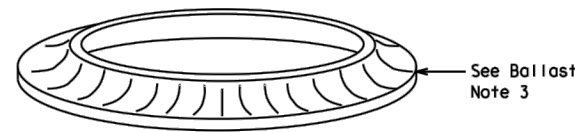
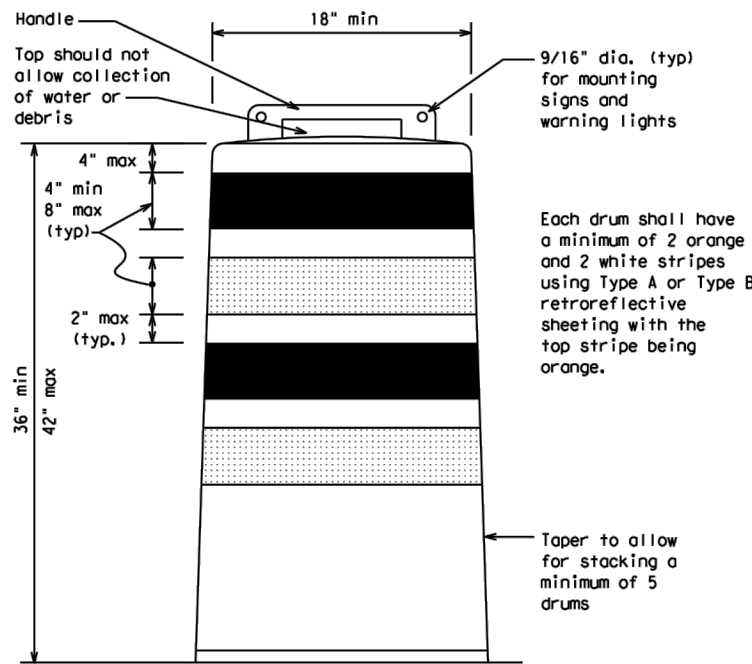
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

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

BALLAST

- Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
- Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

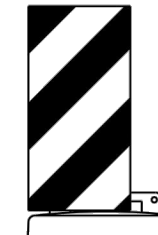


DETECTABLE PEDESTRIAN BARRICADES

- When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
- 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.
- Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian barricades.
- Detectable pedestrian barricades should 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.



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

FILE:	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS									
4-03	8-14								
9-07	5-21								
7-13									
		DIST	COUNTY			SHEET NO.			
					D-12				

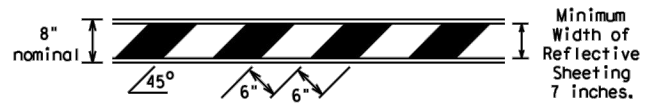
DATE:
FILE:

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

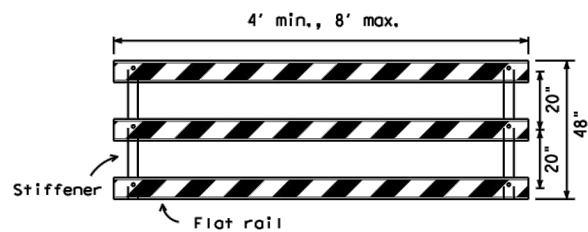
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



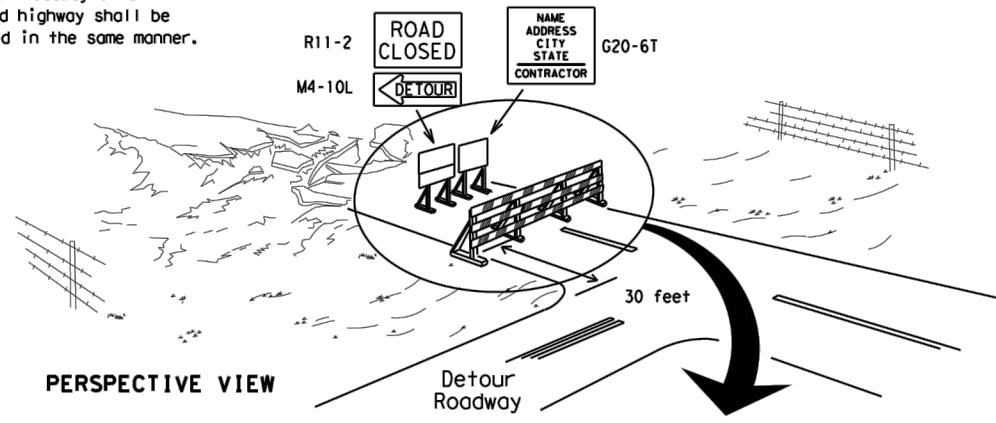
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

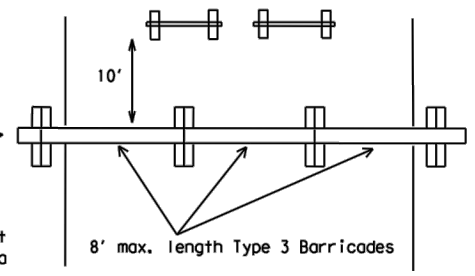
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

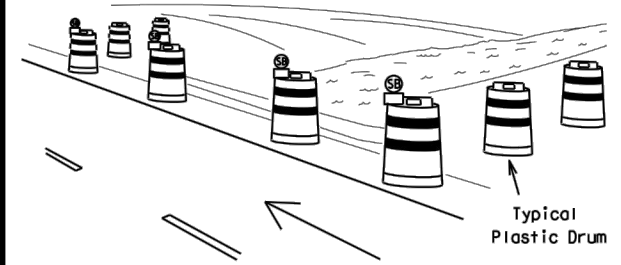
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



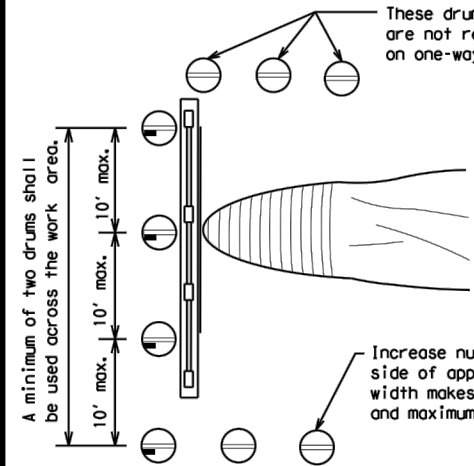
PLAN VIEW

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

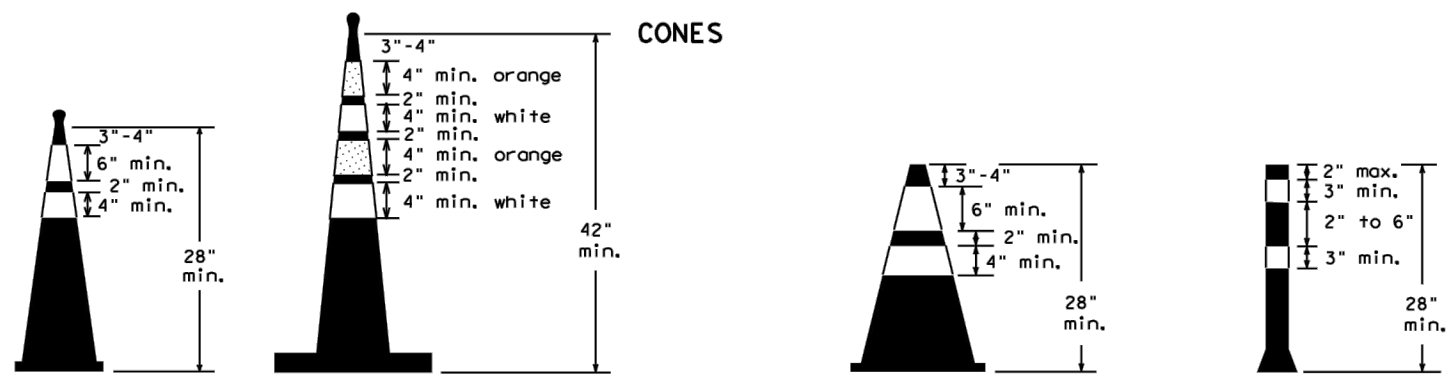


PLAN VIEW

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



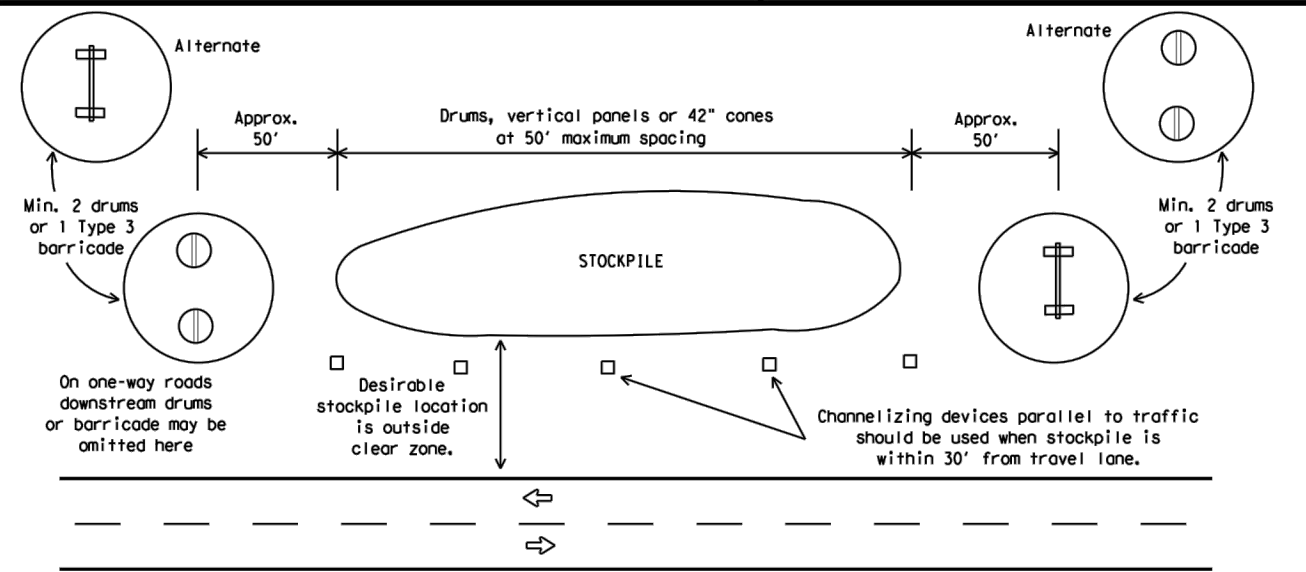
Two-Piece cones

One-Piece cones

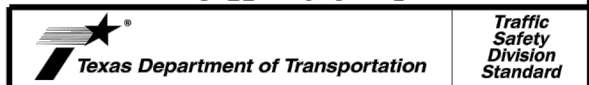
Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
9-07 8-14	REVISIONS			
7-13 5-21	DIST	COUNTY	SHEET NO.	
			D-13	

DATE: FILE:

**JARRELL SCHWERTNER WATER SUPPLY CORPORATION
CR 305 @ CR 344 WATER LINE IMPROVEMENTS**

**ADDENDUM NO. 1
March 17, 2023**

The construction plans and specifications for the JSWSC – CR 305 @ CR 344 Water Line Improvements project, on which bids are to be received until 2:00 PM on Thursday, March 23, 2023 are hereby modified as follows:

I. GENERAL/CONTRACT DOCUMENTS

1. RFI's and Responses:
 - a. Plan calls to abandon in place the existing 6" line, will bid items be added to cut and cap each end where necessary?
 - **Lines are to be abandoned in place. A bid item has been added to the Base Bid and Alternate Bid of the Revised Bid Form dated 3-17-23 for cutting and capping the existing 6" water line.**
 - b. Plan shows 160 lf of bore but only 150 lf in the base bid, will a quantity adjustment be made for the base bid?
 - **Quantities have been adjusted for the steel encasement pipe by open cut in the Revised Bid Form dated 3-17-23.**
 - c. Since JSWSC is providing the 12" pipe, I'm assuming the bidder will exclude the material price of 12" C900 in their bid item for the 12" waterline?
 - **That is correct. The bid item for the 12" water line in the alternate bid is for delivering and installing only. For all other bid items, base bid and alternate bid, material is to be included in the bid item.**
 - **The location of the pipe material is at the City of Jarrell Water Utility Yard located near the intersection of FM 487 and Town Center Boulevard. Contractor shall coordinate pick of materials with Joe Simmons, General Manager – JSWSC.**

2. Please find the attached Williamson County Roadway Crossing Permit. This permit will be required to be filled out by the contractor for submittal to Williamson County once the project has been awarded. All fees associated with this item shall be considered subsidiary to the steel encasement pipe bid items.

II. PLAN SHEETS


1. Refer to sheet P-01.
 - a. The location of the new water service connection is near Station 6+60. The attached meter service connection detail shall be utilized for this project.

2022-102-30

A1-1

III. BID SUBMITTAL

1. Bidders shall acknowledge receipt of this Addendum in the space provided in the proposal and on the outer envelope of their bid.
2. A revised Bid Schedule is attached to this Addendum. Bids shall be submitted on the revised Bid Schedule dated 3-17-23. The Owner and Engineer do not guarantee the accuracy of these electronic bid forms and shall have no responsibility for any errors or omissions in Bidders bid amounts arising from use of these electronic bid forms. Accuracy of all bids submitted shall be full responsibility of the Bidder.


 Alvin R. (Trae) Sutton III, P.E.
 Kasberg, Patrick & Associates, LP
 800 South Austin Avenue
 Georgetown, TX 78626

March 17, 2023
 Date



2022-102-30

A1-2

This document is released for the purpose of interim review under the authority of Alvin R. Sutton P.E. 96530 on October 10, 2023. It is not to be used for construction, bidding or permit purposes.

NO.	DATE	REVISION	BY

© 2022 Kasberg, Patrick & Associates, LP
 KPA Firm Registration Number F-510

Plot Date: 10/10/2023 9:51:42 AM
 Plotted By: EHARRIS

PROJECT NO. 2020-106
 DRAWN BY Eric Harris
 DESIGNED BY Alvin R. Sutton III, P.E.
 APPROVED BY _____
 DATE _____



KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626

JARRELL SCHWERTNER WATER SUPPLY CORPORATION
 C.R. 305 @ C.R. 307 WATERLINE IMPROVEMENT
 ADDENDUM 01

SHEET NO. **AD-01** OF **01** SHEETS

**Jarrell-Schwertner Water Supply Waterline Relocation
Bud Stockton Loop and CR 305
October 6, 2025**

12" Water Line Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price (\$)	Unit Cost (\$)
1	Mobilization, Bonds and Insurance, not-to-exceed 5% of the Alternate Bid Amount	LS	1	5,663.00	5,663.00
2	Provide Labor, Equipment, Tools and Supervision to Complete Preparation of Right-of-way	LF	1,150	2.00	2,300.00
3	Submit Trench Safety Plan prepared and signed by P.E., in Conformance with State Law and OSHA	LS	1	275.00	275.00
4	Implement and Follow Trench Safety Plan (Pipe)	LF	1,150	0.50	575.00
5	Prepare Stormwater Pollution Prevention Plan, Including Submission to and Receiving Permits from Texas Commission on Environmental Quality	LS	1	138.00	138.00
6	For Preparing and Submitting a Control Plan prepared and signed by a P.E. for Vehicular Traffic	LS	1	138.00	138.00
7	Implement and Administer Barricade, Signing and Traffic Safety Plan (Vehicular and Pedestrian)	LS	1	464.00	464.00
8	Provide Clean-up and Final Grading Along Final Pipeline Route	LF	1,150	2.50	2,875.00
9	Install 12-inch Diameter C900 DR-18 PVC Water Line	LF	1,000	23.10	23,100.00
10	For Furnishing and Installing 12-Inch Gate Valve with Valve Marker	EA	4	3,573.00	14,292.00
11	For Furnishing and Installing 12" x 2" Reducer	EA	2	580.00	1,160.00
12	Provide and Install 6-inch Diameter C900 DR-18 PVC Water Line	LF	150	36.40	5,460.00
13	For Furnishing and Installing 6-Inch Gate Valve with Valve Marker	EA	2	1,369.00	2,738.00
14	For Furnishing and Installing 6-Inch x 2" Reducer	EA	1	393.00	393.00
15	For Furnishing and Installing 12-Inch Cap	EA	1	486.00	486.00
16	For Furnishing and Installing 12-Inch 45° Bends	EA	6	827.00	4,962.00
17	For Furnishing and Installing 12-Inch 11-1/4° Bends	EA	2	772.00	1,544.00
18	For Furnishing and Installing 6-Inch 90° Bends	EA	1	449.00	449.00
19	For Furnishing and Installing 6-Inch 45° Bends	EA	4	427.00	1,708.00
20	For Furnishing and Installing 24 Steel Encasement Pipe by Open Cut	LF	50	303.40	15,170.00
21	For Furnishing and Installing 18 Steel Encasement Pipe by Open Cut	LF	111	277.70	30,824.70
22	Provide and Install 12"x12" Tee	EA	1	1,341.00	1,341.00
23	Provide and Install 12"x6" Tee	EA	2	1,010.00	2,020.00
24	Provide and Install 2" PVC Water Line Complete For	LF	30	20.90	627.00
25	For Connecting to Existing 6" Water Line	EA	1	2,940.00	2,940.00
26	For Cutting & Capping Existing 6" Water Line	EA	2	486.00	972.00
27	For 2" Tee	EA	1	476.00	476.00
28	For Connecting to Existing 2" Water Line	EA	3	1,215.00	3,645.00
29	Furnish and Install new Water Service Connection	EA	1	626.00	626.00
30	For Furnishing All Materials, Equipment, Tools and Labor Necessary for Pressure Testing Water Pipe, Including Any Necessary Repairs	LS	1	1,415.00	1,415.00
31	Furnish and Install Sampling Stations for Microbiological Testing in accordance with AWWA C-651	LS	1	1,525.00	1,525.00
32	Furnish, Install, Maintain and Remove Silt Fence	LF	950	2.50	2,375.00
33	Furnish, Install, Maintain and Remove Rock Berm	LF	75	25.40	1,905.00
34	Furnish and Install Hydro Mulch Seeding	SY	2,500	1.70	4,250.00
35	Engineering Design Fees	LS	1	21,270.00	21,270.00
TOTAL					\$ 160,101.70
JSW ELIGIBILITY RATIO (%)					97.99%
JSW ELECTIVE BETTERMENT (%)					3.52%
NET REIMBURSEMENT TO UTILITY					\$151,361.35

Attachment “B” Accounting Method

Actual Cost Method of Accounting

The Utility accumulates cost under a work order accounting procedure prescribed by the Federal or State regulatory body and proposes to request reimbursement for actual direct and related indirect costs.

Lump Sum Method of Accounting

Utility proposed to request reimbursement based on an agreed lump sum amount supported by a detailed cost analysis.

Initial Date
County

Initial Date
Utility

Attachment “C” Schedule of Work

Estimated Start Date (mm/dd/yyyy): 12/17/2023, subject to physical work restrictions prior to the issuance of environmental clearance as required by the provisions of this Agreement. (If construction will be joint bid and included in the highway contract, enter the Project let date.)

Estimated Duration (number of days): 102

Estimated Completion Date (mm/dd/yyyy): 03/28/2024

- Joint Bid Construction – Actual construction dates may vary as determined by the Project contractor or the County.

Initial Date
County

Initial Date
Utility

Attachment "D" Statement Covering Contract Work

Engineering Contract:

- Utility performing with their own forces. (Certified timesheets or ledgers are required at billing.)
- Utility will use consultant contract (Continuing contract rate sheets of fee schedule must be attached.)
- The County will procure a utility engineering consultant (Engineering rate sheet must be attached.)

Construction Contract:

- Utility performing with their own forces. (Certified timesheets or ledgers are required at billing.)
- Utility will use outside forces to perform the accommodation. (Complete the Procedure to be used in Contracting Work below.)
- The County will complete the accommodation joint-bid as indicated below. (Option D) (WILCO-U-JB also required)

Statement Covering Utility Construction Contract Work

I, Joe Simmons, a duly authorized and qualified representative of Jarrell-Schwertner Water Supply Corp., hereinafter referred to as Utility, am fully cognizant of the facts and make the following statements in respect to the work which will or may be done on a contract basis as it appears in the estimate (Attachment A), to which this statement is attached.

It is more economical and/or expedient for Utility to contract this accommodation, or Utility is not adequately stated or equipped to perform the necessary work on this Project with its own forces to the extent as indicated on the estimate.

Procedure to be used in Contracting Work:

- Option A:**
Solicitation of bids is to be accomplished through open advertising and contract is to be awarded to the lowest qualified bidder who submits a proposal in conformity with the requirements and specifications for the work to be performed. Associated bid tabulations must be provided to the County at billing.

Initial Date
County

Initial Date
Utility

Option B:

Solicitation of bids is to be accomplished by circulating to a list of pre-qualified contractors or known qualified contractors who submits a proposal in conformity with the requirements and specifications for the work to be performed. Associated bid tabulations will be provided to the County. Such presently known contractors are listed below: (a list may be attached)

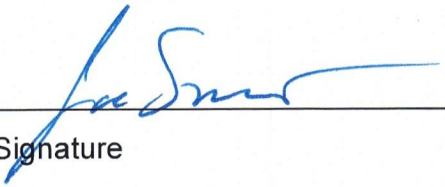
- 1. _____
- 2. _____
- 3. _____

Option C:

The work is to be performed under an existing continuing contract under which certain work is regularly performed for Utility and under which the lowest available costs are developed. The existing continuing contract will be made available for the County for review at a location mutually acceptable to the Utility and the County. If only part of the work is to be done under an existing contract, a Continuing Contract Rate sheet must be attached.

Option D:


The Utility plans and specifications, with the consent of County, will be included in the construction contract awarded by the County. In the best interest of both the County and Utility, the Utility request the County to include the plans and specifications for this work in the general contract for construction of the Project [Project Name], so that the work may be can be coordinated with the other construction operations; and the construction contract is to be awarded by the County to the lowest qualified bidder who submits a proposal in conformity with the requirements and specifications for the work to be performed. If this option is chosen, attach form WILCO-U-JB, the terms of which are incorporated herein by reference.


 Signature

11-4-2025
 Date

General Manager
 Title

 Initial Date
 County

 11-4-2025
 Initial Date
 Utility

Attachment “E” Utility Joint Use Agreement

- Utility Joint Use Agreement (WILCO-U-JUA)
 - Plans with highlighted areas to be joint used are included.

- Utility Installation Review/Permit Number:
The utility must obtain an approved permit before the start of construction inside the County right of way.

- Utility Prior Rights Agreement
 - Plans with prior rights area highlighted are included.

- Quit Claim will be submitted at the Final Billing
Area of existing easements to be quit claimed is noted in the plans.

Initial Date
County

Initial Date
Utility

Attachment "F" Eligibility Ratio

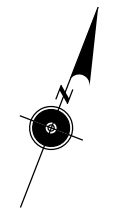
Eligibility Ratio established: 97.99 %

- Interstate roadway
- Non-interstate roadway / project

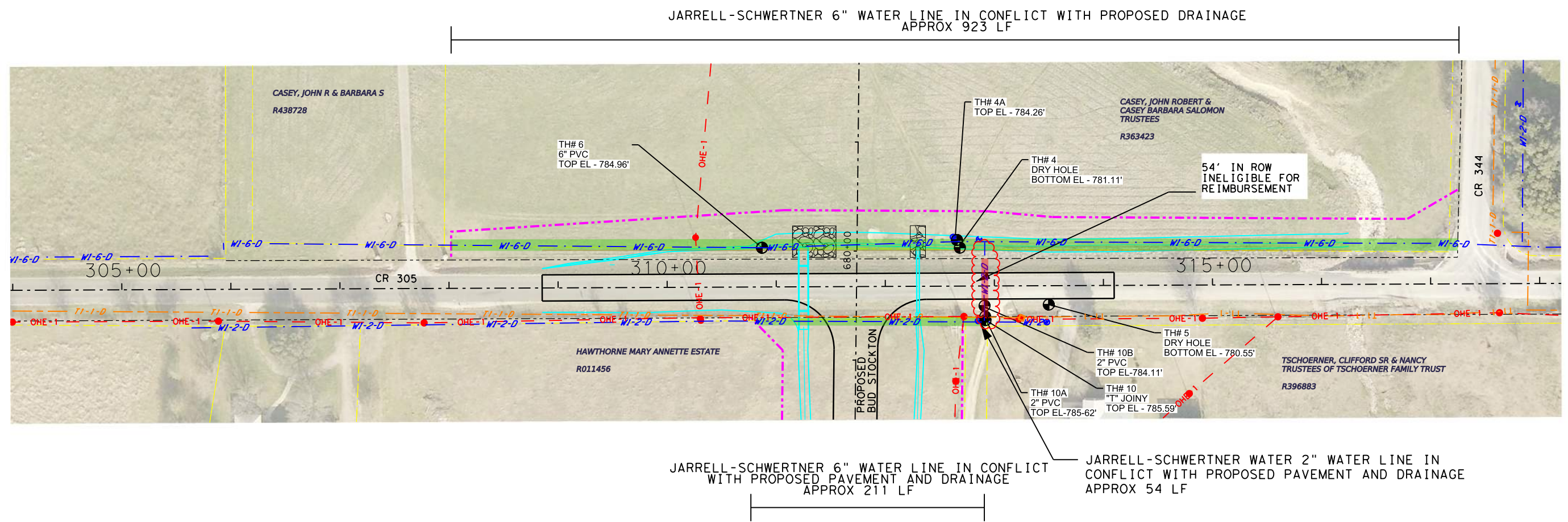
Initial Date
County

Initial Date
Utility

5/18/2023 12:44:51 PM \\caustinserv\server\Common\CFA\2014\0308801*Williamson*County*2013*Road*Bond\DESIGN\C_Bud Stockton_Extension\EXHIBITS\Eligibility\C-Bud-Stockton*UC*RP-3INT




- LEGEND**
- - - - - PROPOSED ROW
 - - - - - EXISTING ROW
 - PROPOSED ROADWAY
 - PROPOSED DRAINAGE
 - - - - - PROPERTY LINES
 - ELIGIBLE FOR REIMBURSEMENT
 - INELIGIBLE FOR REIMBURSEMENT
- EXISTING UTILITIES**
- | | | |
|--------------|----------------|-----------------------|
| LVL B | LVL C/D | WATER: |
| — WI-2 — | — WI-2-D — | JARRELL-SCHWERTNER 2" |
| — WI-6 — | — WI-6-D — | JARRELL-SCHWERTNER 6" |



UTILITY OWNER	DESCRIPTION OF UTILITY	LINEAR FOOTAGE IN CONFLICT IN EASEMENTS, LF (A)	TOTAL LINEAR FOOTAGE IN CONFLICT, LF (B)	* COST PER LINEAR FOOT, \$ (D)	ELIGIBILITY, % (C) = (B/A)	COST OF ADJUSTMENT, \$ (E) = (BxD)	ELIGIBLE COST FOR REIMBURSEMENT, \$
JARRELL-SCHWERTNER WATER SUPPLY CORP. (JSWSC)	6" WATER LINE WITHIN EASEMENT	923 LF	923 LF	\$ 210	100%	\$ 193,830.00	\$ 193,830.00
JARRELL-SCHWERTNER WATER SUPPLY CORP. (JSWSC)	2" WATER LINE WITHIN ROW	0 LF	54 LF	\$ 80	0%	\$ 4,320.00	\$ 0
JARRELL-SCHWERTNER WATER SUPPLY CORP. (JSWSC)	2" WATER LINE WITHIN EASEMENT	211 LF	211 LF	\$ 80	0%	\$ 16,880.00	\$ 16,880.00
JARRELL-SCHWERTNER WATER SUPPLY CORP. (JSWSC) ELIGIBILITY FOR BUDSTOCKTON RELOCATIONS, % TOTAL OF (F/E)						TOTAL COST OF ADJUSTMENT, \$ (E)	TOTAL ELIGIBLE COST FOR REIMBURSEMENT, \$ (F)
97.99%						\$ 215,030.00	\$ 210,710.00

* cost per linear foot based on 2023 prices from CobbFendley

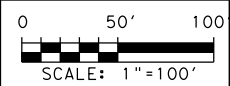


Texas Registration No. 274

505 East Huntland Drive, Suite 100
Austin, Texas 78752
512.834.9798 | fax 512.832.7727 | www.cobbfendley.com

**BUD STOCKTON EXTENTION
JARRELL-SCHWERTNER WATER
ELIGIBILITY RATIO**

DATE: 5/18/2023



SHEET: 1 OF 1

Attachment "G" Betterment Calculation and Estimate

- No Betterment
- Elective Betterment Ratio established: 3.52 %
 - Betterment % Calculation is attached
 - Comparative Estimate including betterment and in-kind is attached
- Forced Betterment
 - To comply with regulated industry standards, laws, and regulations. (Supporting documentation is attached)
 - To comply with published current design practice followed by the utility in its own work. (Supporting documentation is attached)
 - Due to proposed project design. (Provide explanation below)

Description of Elective Betterment included in this accommodation:

Water line has been up-sized from a 6 inch to a 12 inch pipe.

Statement justifying Forced Betterment included in this accommodation:

Initial Date
County

Initial Date
Utility

**Jarrell-Schwertner Water Supply Waterline Relocation
Bud Stockton Loop and CR 305
Comparative Estimate - 6" Water line vs 12" Waterline
March 23, 2023**

6" Water Line Installation "In-kind" Replacement Estimate						12" Water Line Elective Betterment Estimate (Upsized)							
Item No.	Description	Unit	Quantity	Unit Price (\$)	Unit Cost (\$)	Item No.	Description	Unit	Quantity	Unit Price (\$)	Unit Cost (\$)		
1	Mobilization, Bonds and Insurance, not-to-exceed 5% of the Base Bid Amount	LS	1	5,045.00	5,045.00	1	Mobilization, Bonds and Insurance, not-to-exceed 5% of the Amount	LS	1	5,663.00	5,663.00		
2	Provide Labor, Equipment, Tools and Supervision to Complete Preparation of Right-of-way	LF	1,150	2.00	2,300.00	2	Provide Labor, Equipment, Tools and Supervision to Complete Preparation of Right-of-way	LF	1,150	2.00	2,300.00		
3	Submit Trench Safety Plan prepared and signed by P.E., in Conformance with State Law and OSHA	LS	1	276.00	276.00	3	Submit Trench Safety Plan prepared and signed by P.E., in Conformance with State Law and OSHA	LS	1	275.00	275.00		
4	Implement and Follow Trench Safety Plan (Pipe)	LF	1,150	0.50	575.00	4	Implement and Follow Trench Safety Plan (Pipe)	LF	1,150	0.50	575.00		
5	Prepare Stormwater Pollution Prevention Plan, Including Submission to and receiving Permits from Texas Commission on Environmental Quality (TCEQ)	LS	1	138.00	138.00	5	Prepare Stormwater Pollution Prevention Plan, Including Submission to and Receiving Permits from Texas Commission on Environmental Quality	LS	1	138.00	138.00		
6	For Preparing and Submitting a Control Plan for Vehicular Traffic	LS	1	138.00	138.00	6	For Preparing and Submitting a Control Plan prepared and signed by a P.E. for Vehicular Traffic	LS	1	138.00	138.00		
7	Implement and Administer Barricade, Signing and Traffic Safety Plan (Vehicular)	LS	1	464.00	464.00	7	Implement and Administer Barricade, Signing and Traffic Safety Plan (Vehicular and Pedestrian)	LS	1	464.00	464.00		
8	Provide Clean-up and Final Grading Along Final Pipeline Route	LF	1,150	2.50	2,875.00	8	Provide Clean-up and Final Grading Along Final Pipeline Route	LF	1,150	2.50	2,875.00		
9	Provide and Install 6-inch Diameter C900 DR-18 PVC Water Line	LF	1,150	35.80	41,170.00	9	Install 12-inch Diameter C900 DR-18 PVC Water Line	LF	1,000	23.10	23,100.00		
10	For Furnishing and Installing 6-Inch Gate Valve with Valve Marker	EA	6	1,369.00	8,214.00	10	For Furnishing and Installing 12-Inch Gate Valve with Valve Marker	EA	4	3,573.00	14,292.00		
11	For Furnishing and Installing 6-Inch x 2" Reducer	EA	3	393.00	1,179.00	11	For Furnishing and Installing 12" x 2" Reducer	EA	2	580.00	1,160.00		
12	For Furnishing and Installing 6-Inch Cap	EA	1	266.00	266.00	12	Provide and Install 6-inch Diameter C900 DR-18 PVC Water Line	LF	150	36.40	5,460.00		
13	For Furnishing and Installing 6-Inch 90° Bends	EA	1	409.00	409.00	13	For Furnishing and Installing 6-Inch Gate Valve with Valve Marker	EA	2	1,369.00	2,738.00		
14	For Furnishing and Installing 6-Inch 45° Bends	EA	10	387.00	3,870.00	14	For Furnishing and Installing 6-Inch x 2" Reducer	EA	1	393.00	393.00		
15	For Furnishing and Installing 6-Inch 11-1/4° Bends	EA	2	376.00	752.00	15	For Furnishing and Installing 12-Inch Cap	EA	1	486.00	486.00		
16	For Furnishing and Installing 18 Steel Encasement Pipe by Open Cut	LF	161	270.90	43,614.90	16	For Furnishing and Installing 12-Inch 45° Bends	EA	6	827.00	4,962.00		
17	Provide and Install 6"x6" Tee	EA	2	575.00	1,150.00	17	For Furnishing and Installing 12-Inch 11-1/4° Bends	EA	2	772.00	1,544.00		
18	Provide and Install 2" PVC Water Line Complete	LF	30	22.50	675.00	18	For Furnishing and Installing 6-Inch 90° Bends	EA	1	449.00	449.00		
19	For Connecting to Existing 6" Water Line	EA	1	2,940.00	2,940.00	19	For Furnishing and Installing 6-Inch 45° Bends	EA	4	427.00	1,708.00		
20	For Cutting & Capping Existing 6" Water Line	EA	2	486.00	972.00	20	For Furnishing and Installing 24 Steel Encasement Pipe by Open Cut	LF	50	303.40	15,170.00		
21	For 2" Tee	EA	1	476.00	476.00	21	For Furnishing and Installing 18 Steel Encasement Pipe by Open Cut	LF	111	277.70	30,824.70		
22	For Connecting to Existing 2" Water Line	EA	3	1,215.00	3,645.00	22	Provide and Install 12"x12" Tee	EA	1	1,341.00	1,341.00		
23	Furnish and Install new Water Service Connection	EA	1	626.00	626.00	23	Provide and Install 12"x6" Tee	EA	2	1,010.00	2,020.00		
24	For Furnishing All Materials, Equipment, Tools and Labor Necessary for Pressure Testing Water Pipe, Including Any Necessary Repairs	LS	1	1,415.00	1,415.00	24	Provide and Install 2" PVC Water Line Complete F	LF	30	20.90	627.00		
25	Furnish and Install Sampling Stations for Microbiological Testing in accordance with AWWA C-651	LS	1	1,525.00	1,525.00	25	For Connecting to Existing 6" Water Line	EA	1	2,940.00	2,940.00		
26	Furnish, Install, Maintain and Remove Silt Fence	LF	950	2.50	2,375.00	26	For Cutting & Capping Existing 6" Water Line	EA	2	486.00	972.00		
27	Furnish, Install, Maintain and Remove Rock Berm	LF	75	27.40	2,055.00	27	For 2" Tee	EA	1	476.00	476.00		
28	Furnish and Install Hydro Mulch Seeding	SY	2,500	1.70	4,250.00	28	For Connecting to Existing 2" Water Line	EA	3	1,215.00	3,645.00		
29	Furnish and Install new Water Service Connection	EA	0	626.00	0.00	29	Furnish and Install new Water Service Connection	EA	1	626.00	626.00		
30	For Furnishing All Materials, Equipment, Tools and Labor Necessary for Pressure Testing Water Pipe, Including Any Necessary Repairs	LS	0	1,415.00	0.00	30	For Furnishing All Materials, Equipment, Tools and Labor Necessary for Pressure Testing Water Pipe, Including Any Necessary Repairs	LS	1	1,415.00	1,415.00		
31	Furnish and Install Sampling Stations for Microbiological Testing in accordance with AWWA C-651	LS	0	1,525.00	0.00	31	Furnish and Install Sampling Stations for Microbiological Testing in accordance with AWWA C-651	LS	1	1,525.00	1,525.00		
32	Furnish, Install, Maintain and Remove Silt Fence	LF	0	2.50	0.00	32	Furnish, Install, Maintain and Remove Silt Fence	LF	950	2.50	2,375.00		
33	Furnish, Install, Maintain and Remove Rock Berm	LF	0	25.40	0.00	33	Furnish, Install, Maintain and Remove Rock Berm	LF	75	25.40	1,905.00		
34	Furnish and Install Hydro Mulch Seeding	SY	0	1.70	0.00	34	Furnish and Install Hydro Mulch Seeding	SY	2,500	1.70	4,250.00		
35	Engineering Design Fees	LS	1	21,270.00	21,270.00	35	Engineering Design Fees	LS	1	21,270.00	21,270.00		
TOTAL IN-KIND ESTIMATE AMOUNT - (Items 1 - 28)					TOTAL	\$ 154,659.90	TOTAL ELECTIVE BETTERMENT ESTIMATE AMOUNT - (Items 1 - 34)					TOTAL	\$ 160,101.70

Betterment Ratio Calculation	
The total estimated cost of the project including Betterment (B)	\$ 160,101.70
The total estimate cost of the project to replace in-kind (A)	\$ 154,659.90
Amount of Betterment (B-A)=C	\$5,441.80
Betterment Ratio (C)/(A) (%)	3.52%

Attachment "H" Proof of Property Interest

- Supporting documentation of compensable property interest that establishes reimbursement eligibility.

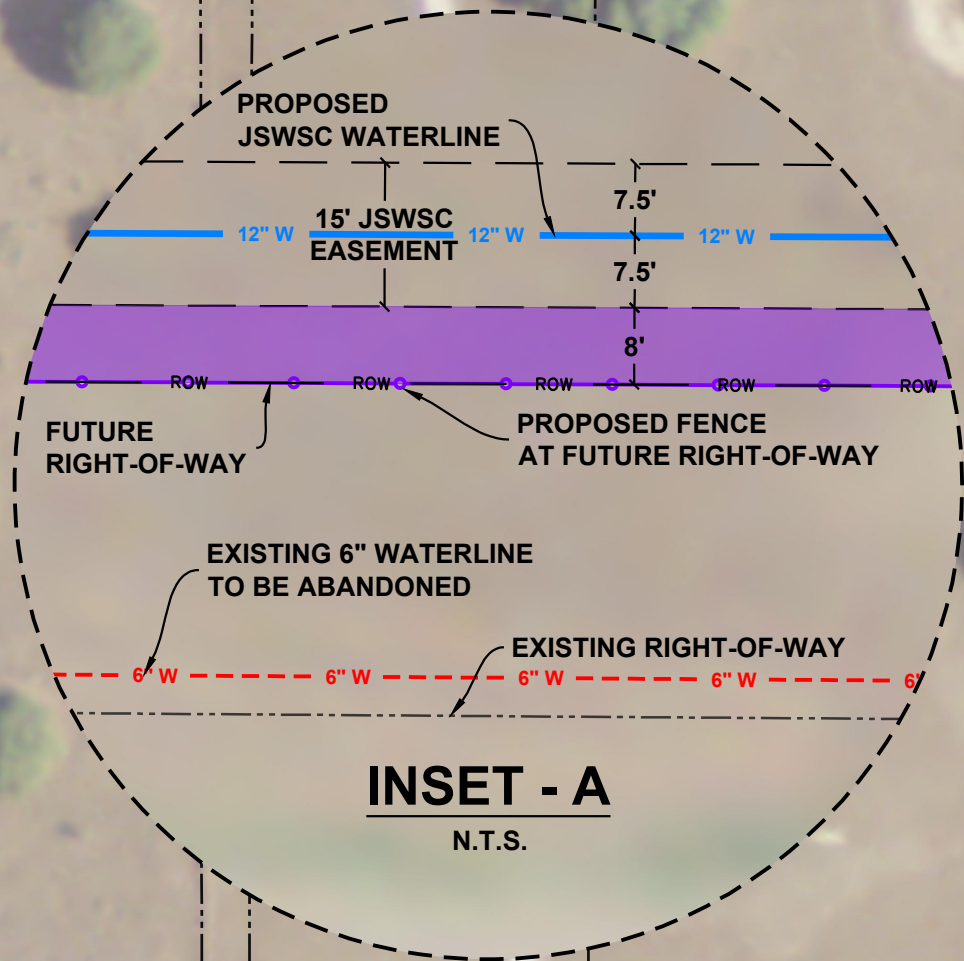
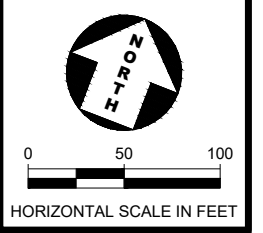
- Property interest documented through the following applicable affidavits and required attachments are attached.
 - WILCO-U-Affidavit
 - Utility Owner
AND
 - Disinterested Party or Landowner

 - Pole attachment with utility holding a compensable property interest.

Initial Date
County

Initial Date
Utility

FILE: P:\JWSWC\2022\2022-102 Northwest WL Imp\CAD\EXHIBITS\c bud stockton.dwg LAST SAVED: 10/25/2022 8:14:45 AM LAYOUT: CR 305 AT C BUD STOCKTON



INSET - A
N.T.S.

CASEY, JOHN ROBERT &
CASEY BARBARA SALOMON
TRUSTEES
R363423

CASEY, JOHN R & BARBARA S
R438728

SEE INSET - A

C.R. 344

C.R. 305

HAWTHORNE MARY ANNETTE ESTATE
R011456

TSCHOERNER, CLIFFORD SR & NANCY
TRUSTEES OF TSCHOERNER FAMILY TRUST
R396883



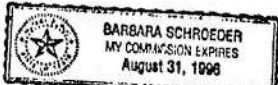
KPA KASBERG, PATRICK & ASSOCIATES, LP
CONSULTING ENGINEERS
GEORGETOWN, TEXAS 78626
Firm Registration No. F-510

NORTHWEST WATERLINE IMPROVEMENTS
CR 305 ATC. BUD STOCKTON
WATERLINE IMPROVEMENTS

CERTIFICATE OF ACKNOWLEDGEMENT FOR INDIVIDUALS

THE STATE OF TEXAS
COUNTY OF TRAVIS WILLIAMSON

This instrument was acknowledged before me on September 30, 1994, by
BILL R. CASEY and wife, DIXIE L. CASEY

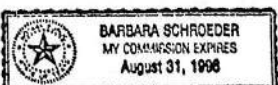


(Signature) Barbara Schroeder
(Print Name)
Notary Public, State of _____
My Commission Expires: _____

CERTIFICATE OF ACKNOWLEDGEMENT FOR INDIVIDUALS

THE STATE OF TEXAS
COUNTY OF TRAVIS WILLIAMSON

This instrument was acknowledged before me on September 30, 1994, by
JOHN R. CASEY



(Signature) Barbara Schroeder
(Print Name)
Notary Public, State of _____
My Commission Expires: _____

CERTIFICATE OF ACKNOWLEDGEMENT FOR INDIVIDUALS

THE STATE OF
COUNTY OF

This instrument was acknowledged before me on _____, 19____, by _____

(Signature) _____
(Print Name) _____
Notary Public, State of _____
My Commission Expires: _____

CORPORATE ACKNOWLEDGEMENT

THE STATE OF
COUNTY OF

This instrument was acknowledged before me on _____, 19____, by _____
_____ on behalf of said corporation.

(Signature) _____
(Print Name) _____
Notary Public, State of _____
My Commission Expires: _____

RECORDERS MEMORANDUM

All or parts of the text on this page was not clearly legible for satisfactory recordation.

Doc# : 9452493
Rec. \$ 11.00
Date : 10-26-1994
Time : 10:24:05 A.M.
Filed & Recorded in
Official Records
of WILLIAMSON County, TX.
ELAINE BIZZELL
COUNTY CLERK

THE STATE OF TEXAS
COUNTY OF WILLIAMSON
This is to certify that this document was FILED and RECORDED in the Official Public Records of Williamson County, Texas on the date and time stamped thereon.



Elaine Bizzell
COUNTY CLERK
WILLIAMSON COUNTY, TEXAS

RECORDED & INDEXED
2007 OCT 27 10:24 AM

UnOfficial Document



AFFIDAVIT

- For Utility Company
- For Landowner
- For Disinterested Party

THE STATE OF TEXAS
COUNTY OF WILLIAMSON

District: Jarrell
County: Williamson
Project No.: Bud Stockton Ext. (CR305-FM486)

BEFORE ME, THE UNDERSIGNED AUTHORITY, on this day personally appeared 2/16/2023, who after being by me duly sworn upon his/her oath deposes and says as follows:

"I, Joe Simmons am over the age of 18 years and am fully competent to testify to the matters set forth in this Affidavit. I have personal knowledge of all facts and swear that such facts are true and correct.

1. My current address is , 2393 CR 311, Jarrell Texas;
2. I am familiar with the land that is the subject of this Affidavit because General Manager (reason for knowledge, i.e., Landowner, County Commissioner, Agricultural Agent, Judge, Mayor, District/Area Engineer, or etc.)
3. I have personal knowledge that Water ("Utility") has occupied AW0172 DAVIS, E. SUR., ACRES 30.9622 [description of land] for a period of 21 years
4. The Utility has occupied the land by the placing of water lines [electric poles and lines, water lines, etc.], and said facilities have been present continuously during the period of the Utility's occupation.
5. The Utility is attesting to ownership, including claims through deeds, etc.Water; (For Utility Only)

Further affiant sayeth not."

Signature

General Manager
Title

Jarrell Schwertner WSC
Company/City/County

Individual

State of Texas
County of _____

Subscribed and Sworn To before me on this _____ day of _____ 20____,
by _____.

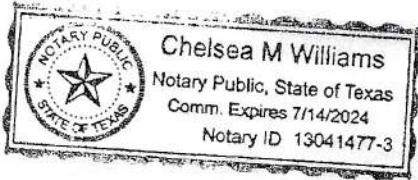
Notary Public's Signature
Notary's Name (Printed): _____
My commission expires: _____

OR

Business Entity

State of Texas
County of Williamson

Subscribed and Sworn To before me on this 11th day of February 2023
by Joe Simmons
of Jarrell-Schwertner WSC [name of utility company], a TEXAS [state]
WSC [type of company, e.g. LLC, Inc., L.P., etc.]



Chelsea Williams
Notary Public's Signature
Notary's Name (Printed): Chelsea Williams
My commission expires: 7/14/2024

**JARRELL-SCHWERTNER WATER SUPPLY CORPORATION
MEMBERSHIP TRANSFER**

Transferor hereby surrenders Membership in the Jarrell-Schwertner WSC by execution of the attached signature. Water service rights granted by Membership and other qualification hereby cease contingent upon further qualification of the Transferee in accordance with the policies of the Jarrell-Schwertner WSC.

By execution hereof, the undersigned hereby acknowledges that the Membership Transfer complies with the terms of one of the following items (1) through (4), thereby qualifying for transfer of Membership in accordance with the laws of the State of Texas.

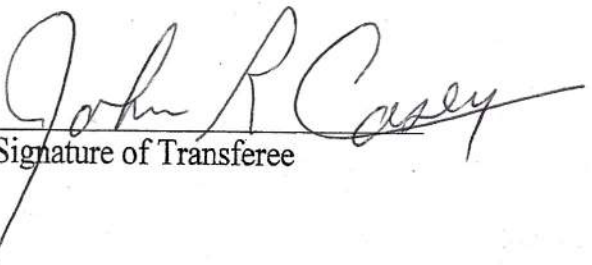
- (1) The Membership is transferred by will to a person related to the Transferor within the second degree by consanguinity; or
- (2) The Membership is transferred without compensation to a person related to the Transferor within the second degree by consanguinity; or
- (3) The Membership is transferred without compensation or by sale to the Corporation; or
- (4) The Membership is transferred as a part of the conveyance of real estate from which the Membership arose.

Transferee understands that qualification for Membership is not binding on the Corporation and does not qualify Member for continued water service unless the following terms and conditions are met.

- (1) This Membership Transfer Authorization Form is completed by the Transferor and Transferee;
- (2) The Transferee has completed the required Application Packet;
- (3) All indebtedness due the Corporation has been paid;
- (4) The Transferee demonstrates satisfactory evidence of ownership of the property designated to receive service and from which the Membership originally arose; and
- (5) Any other terms and conditions of the Corporation's Tariff are properly met.



Signature of Transferor



Signature of Transferee

#2304
~~2803~~

R 5 ✓
P 1
Seq 6938

Membership Transfer Authorization (Continued)

991 Dixie Casay
Transferor's Name

John Casay
Transferee's Name

5083526
4186523

1105 Church St
Forwarding Address

2400 CR 305
Current Address

WR 1026

Spangston, La 70567
City, State, Zip Code

Jarrell TX 76537
City, State, Zip Code

863-8251
Phone

512-746-2342
Phone

Account # 991

Final Reading _____

Reading Date 5-29-07

Location of Meter 101 CR 344

Note: A fee of \$35.00 is charged to the Transferee on all transfers.

Transferor may be due a refund of the Membership Fee, and Transferee understands that he/she must place on deposit a refundable Membership Fee with the Corporation.

Acknowledgement

The State of Texas
County of Williamson

In Witness whereof the said Transferor and Transferee have executed this instrument this 29 day of May, 2007

Before me, the undersigned, a Notary Public in and for said County and State, on this day personally appeared Dixie Casay & John Casay known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledge to me that they executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 29 day of May 2007

(Seal)

Jerry Beckman
Notary Public in and for

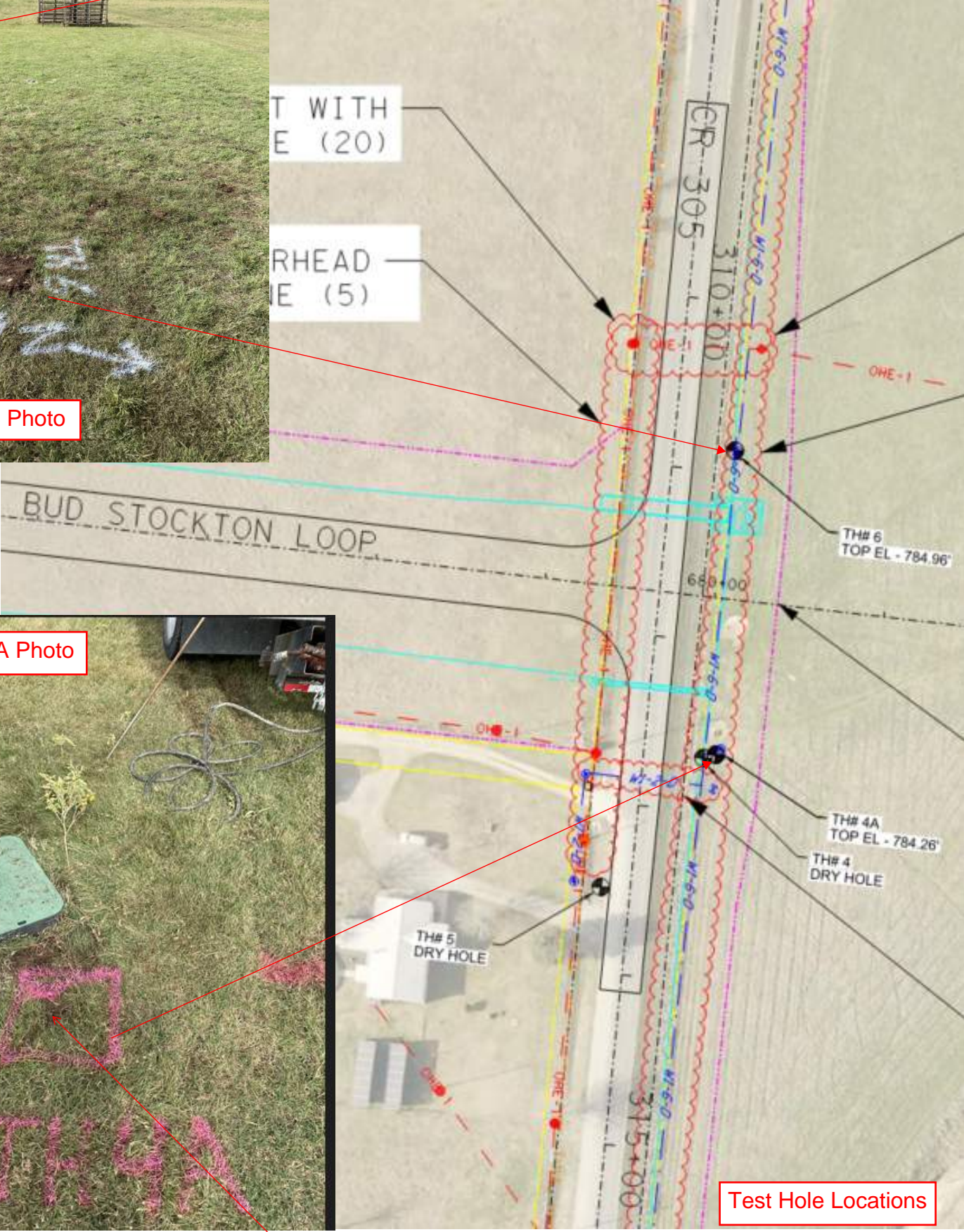
Williamson County, Texas

Commission expires _____

found behind fence inside property.



Test Hole 6 Photo



Test Hole Locations

Found behind fence inside property.



Test Hole 4A Photo



TEST HOLE DATA SHEET

TBPE NO. F-274 / TBPLS NO. 10046701

Project Name BAGDAD RD — LP 332 TO CR 281
 Project No. 1903-099-05, TASK 32
 Location CR 305

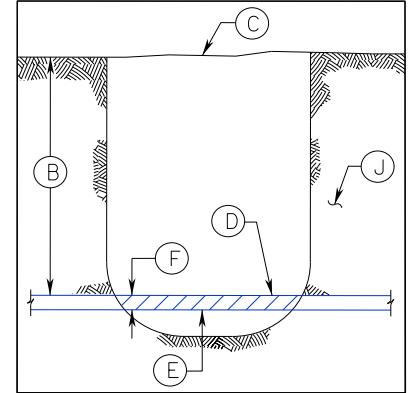
Test Hole No. 6
 Utility JARRELL-SCHERTNER WATER
 Date 11-10-2021

TEST HOLE DATA

- A. Northing 10277387.46
- Easting 3144220.25
- B. Depth to Top of Utility 2.00'
- C. Elevation Grade @ Top of Hole 786.96'
- D. Elev. @ Top of Utility 784.96'
- E. Elev. @ Bottom of Utility N/A
- F. Width or Dia. of Utility 0.50'
- G. Material of Utility PLASTIC
- H. Condition of Utility GOOD
- I. Thickness of Pvmnt. Base, etc. N/A
- J. Description of Soil CLAY

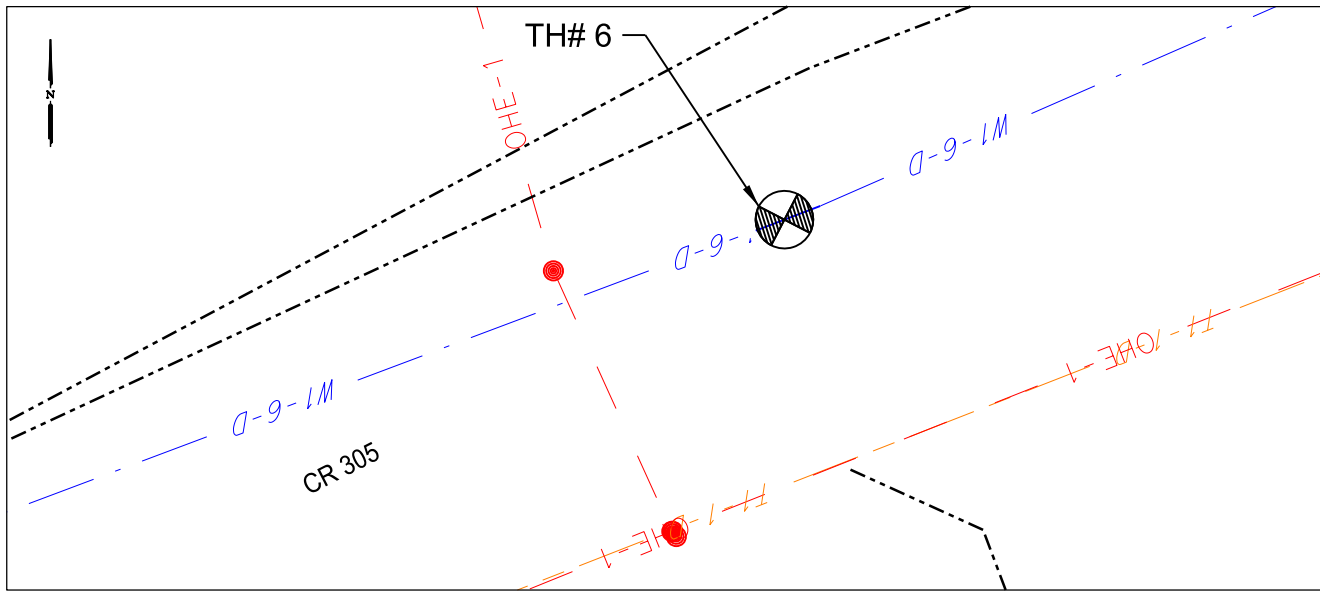


TOP



PROFILE

LEGEND
SEE PLAN SHEETS



PLAN

B.M. CP 105	Elev.= 829.57'	Description: NAIL
Northing:	10272755.45	Easting: 3146025.37
B.M. CP 109	Elev.= 834.59'	Description: NAIL
Northing:	10270728.52	Easting: 3146309.29

Remarks:

NOTE: ALL COORDINATES ARE USING TEXAS COORDINATE SYSTEM OF 1983 (NAD_83 (2011), CENTRAL ZONE, SURFACE. SAF FACTOR: 1.00012



TEST HOLE DATA SHEET

TBPE NO. F-274 / TBPLS NO. 10046701

Project Name BAGDAD RD — LP 332 TO CR 281
 Project No. 1903-099-05, TASK 32
 Location CR 305

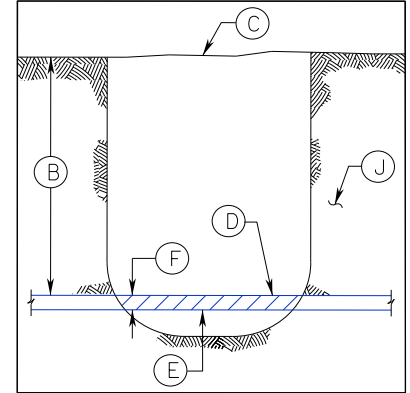
Test Hole No. 4A
 Utility JARRELL-SCHWERTNER WATER
 Date 11-09-2021

TEST HOLE DATA

A. Northing 10277458.71
 Easting 3144384.26
 B. Depth to Top of Utility 1.72'
 C. Elevation Grade @
 Top of Hole 785.98'
 D. Elev. @ Top of Utility 784.26'
 E. Elev. @ Bottom of Utility N/A
 F. Width or Dia. of Utility 0.50'
 G. Material of Utility PLASTIC
 H. Condition of Utility GOOD
 I. Thickness of Pvmnt.
 Base, etc. N/A
 J. Description of Soil CLAY



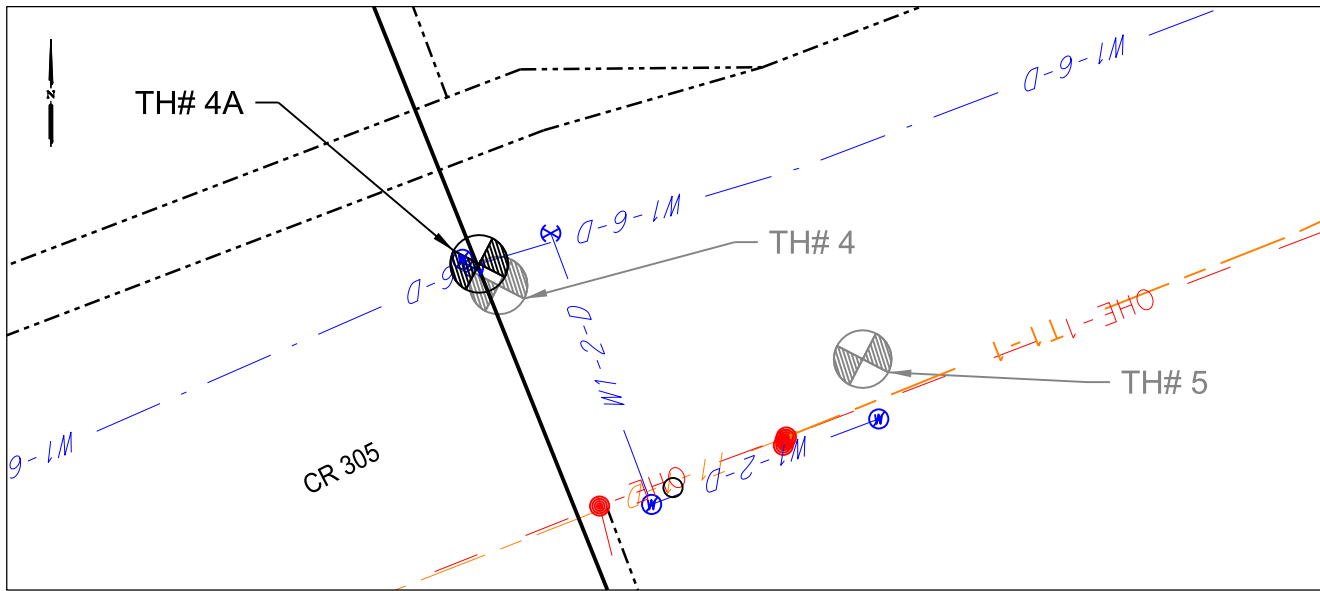
TOP



PROFILE

LEGEND

SEE PLAN SHEETS



PLAN

B.M. CP 105	Elev.= 829.57'	Description: NAIL
Northing:	10272755.45	Easting: 3146025.37
B.M. CP 109	Elev.= 834.59'	Description: NAIL
Northing:	10270728.52	Easting: 3146309.29

Remarks: TEST HOLE NEXT TO IRRIGATION BOX.