

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 1

1. CONTRACTOR: Austin Underground, Inc.

2. Change Order Work Limits: Sta. 10+00 to Sta. 136+51

3. Type of Change (on federal-aid non-exempt projects): Minor (Major/Minor)

4. Reasons: 3F, 3L (3 Max. - In order of importance - Primary first)

Project: T5045

Roadway: CR 404

CSJ
Number: _____

5. Describe the work being revised:

3F. County Convenience. Additional work desired by the County. This Change Order revises the original water line pipe design from 18 inch ductile iron to 24 inch HDPE pipe. Due to the Contract value of this requested change, the 24 inch HDPE pipe material and the fusion of that pipe is also being removed from this Contract and will be bid under a separate Contract. Portable concrete traffic barrier (CTB) is also being added to the Contract, to improve the work zone safety.

6. Work to be performed in accordance with Items: See attached.

7. New or revised plan sheet(s) are attached and numbered: C-002, 003, 100, 301 to 338, 401 and 501 to 503

8. New Special Provisions/Specifications to the contract are attached: ☐ Yes ☒ No

9. New Special Provisions to Item N/A No. N/A, Special Specification Item N/A are attached.

Each signatory hereby warrants that each has the authority to execute this Change Order (CO).

The contractor must sign the Change Order and, by doing so, agrees to waive any and all claims for additional compensation due to any and all other expenses; additional changes for time, overhead and profit; or loss of compensation as a result of this change.

The following information must be provided

Time Ext. #: N/A Days added on this CO: 0

Amount added by this change order: (\$232,550.27)

THE CONTRACTOR

Date 5-18-22

By

Typed/Printed Name

Typed/Printed Title

Valentin J Gomez, Jr
Sr. PM

RECOMMENDED FOR EXECUTION:



Project Manager Date 5/31/2022

N/A

Design Engineer Date



Program Manager Date 5/31/2022

Design Engineer's Seal:

County Commissioner Precinct 1 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 2 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 3 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 4 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Judge Date
☐ APPROVED

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 1

Project # T5045

TABLE A: Force Account Work and Materials Placed into Stock

	LABOR	HOURLY RATE			HOURLY RATE

TABLE B: Contract Items:

				ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
502-6001	BARRICADES, SIGNS, AND TRAFFIC HANDLING	MO	\$1,900.00	2.00	\$3,800.00	1.00	3.00	\$5,700.00	\$1,900.00
512-6001	PORT CTB (FURN & INSTL)(SGL SLOPE)(TY 1	LF	\$27.50	0.00	\$0.00	120.00	120.00	\$3,300.00	\$3,300.00
512-6009	PORT CTB (FURN & INST)(LOW PROF)(TY 1)	LF	\$54.00	200.00	\$10,800.00	160.00	360.00	\$19,440.00	\$8,640.00
512-6010	PORT CTB (FURN & INST)(LOW PROF)(TY 2)	LF	\$54.00	120.00	\$6,480.00	40.00	160.00	\$8,640.00	\$2,160.00
512-6049	PORT CTB (REMOV)(SGL SLOPE)(TY 1)	LF	\$17.25	0.00	\$0.00	120.00	120.00	\$2,070.00	\$2,070.00
512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	\$12.00	200.00	\$2,400.00	160.00	360.00	\$4,320.00	\$1,920.00
512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	\$12.00	120.00	\$1,440.00	40.00	160.00	\$1,920.00	\$480.00
545-6005	CRASH CUSHION ATTEN. (REMOV)	EA	\$1,225.00	0.00	\$0.00	4.00	4.00	\$4,900.00	\$4,900.00
545-6019	CRASH CUSHION ATTEN. (INSTL)(S)(N)(TL3)	EA	\$8,800.00	0.00	\$0.00	4.00	4.00	\$35,200.00	\$35,200.00
501S-30	Jacking or Boring, 30" Steel Pipe, ASTM A134	LF	\$770.00	579.00	\$445,830.00	(579.00)	0.00	\$0.00	(\$445,830.00)
CIP11.06.B	Trench Excavation Safety Protection Systems (All Depths)	LF	\$1.00	12,072.00	\$12,072.00	2,246.00	14,318.00	\$14,318.00	\$2,246.00
G2.07	SITE PREPARATION	STA	\$500.00	136.50	\$68,250.00	13.50	150.00	\$75,000.00	\$6,750.00
G6.09.A-RB	ROCK BERM	LF	\$42.00	253.00	\$10,626.00	189.00	442.00	\$18,564.00	\$7,938.00
G6.09.A-SF	SILT FENCE	LF	\$3.00	12,581.00	\$37,743.00	3,211.00	15,792.00	\$47,376.00	\$9,633.00
G7.09	BROADCAST SEEDING	SY	\$1.00	35,938.00	\$35,938.00	25,893.00	61,831.00	\$61,831.00	\$25,893.00
W1.17.A	Ductile Iron Fittings (C-153 Weight Schedule)	TON	\$5,000.00	5.00	\$25,000.00	(4.00)	1.00	\$5,000.00	(\$20,000.00)
W1.17.A.18/ W2.10.A.18	Pipe, 18" Dia. DI CL-250 or PVC C-900, pressure-rated for 250 psi, Complete in Place, Including Excaation and Backfill	LF	\$115.00	7,342.00	\$844,330.00	(7,342.00)	0.00	\$0.00	(\$844,330.00)
W1.17.AR.18/ W2.10.AR.18	Restrained Pipe, 18" Dia. DI CL-250 or PVC C-900, pressure-rated for 250 psi, Complete in Place, Including Excavation andn Backfill	LF	\$150.00	5,309.00	\$796,350.00	(5,309.00)	0.00	\$0.00	(\$796,350.00)
W3.21.A18	VALVES, GATE 18" DIA.	EA	\$17,000.00	9.00	\$153,000.00	(9.00)	0.00	\$0.00	(\$153,000.00)
W3.21.ARV2	AIR RELEASE VALVES, 2"	EA	\$6,500.00	8.00	\$52,000.00	1.00	9.00	\$58,500.00	\$6,500.00
W4.04.24	Encasement Pipe, 30" Dia., Steel (7/16" Thickness)	LF	\$280.00	91.00	\$25,480.00	(91.00)	0.00	\$0.00	(\$25,480.00)
TOTALS					\$2,531,539.00			\$366,079.00	(\$2,165,460.00)

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 1

Project # **T5045**

TABLE B: Contract Items (Continued)

				ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
SP.W1.17.D	Waterline Marker	EA	\$230.00	30.00	\$6,900.00	10.00	40.00	\$9,200.00	\$2,300.00
SP.W3.21.F	Drain Valve Assembly including valve and pipe	EA	\$6,600.00	8.00	\$52,800.00	1.00	9.00	\$59,400.00	\$6,600.00
501S-36	Jacking or Boring, 36" Steel Pipe, ASTM A134	LF	\$775.00	0.00	\$0.00	789.00	789.00	\$611,475.00	\$611,475.00
G4.05	Concrete Trench Cap (6" Thick, 2000 PSI)	CY	\$550.00	0.00	\$0.00	5.00	5.00	\$2,750.00	\$2,750.00
SP.W3.21.G	Valves, Butterfly 24" Dia.	EA	\$8,250.00	0.00	\$0.00	11.00	11.00	\$90,750.00	\$90,750.00
SP.W3.21.F	Drain Valve Assembly, including valve and pipe	EA	\$4,500.00	0.00	\$0.00	10.00	10.00	\$45,000.00	\$45,000.00
SS.W5.9.B24	24" HDPE Fittings	EA	\$2,200.00	0.00	\$0.00	10.00	10.00	\$22,000.00	\$22,000.00
SS.W5.9.C24	24" HDPE MJ Adapter	EA	\$2,200.00	0.00	\$0.00	24.00	24.00	\$52,800.00	\$52,800.00
SS.W5.9.C6	6" HDPE MJ Adapter	EA	\$380.00	0.00	\$0.00	10.00	10.00	\$3,800.00	\$3,800.00
SS.W5.9.A24-IO	Pipe, 24" Dia. HDPE (DIPS Size), DR11 (200psi), Complete in Place, excavation and backfill (Materials and Fusion not included)	LF	\$73.19	0.00	\$0.00	14,967.00	14,967.00	\$1,095,434.73	\$1,095,434.73
The "Totals" from Table B of the previous work sheet:					\$2,531,539.00			\$366,079.00	(\$2,165,460.00)
TOTALS					\$2,591,239.00			\$2,358,688.73	(\$232,550.27)

CHANGE ORDER REASON(S) CODE CHART

1. Design Error or Omission	1A. Incorrect PS&E 1B. Other
2. Differing Site Conditions (unforeseeable)	2A. Dispute resolution (expense caused by conditions and/or resulting delay) 2B. Unavailable material 2C. New development (conditions changing after PS&E completed) 2D. Environmental remediation 2E. Miscellaneous difference in site conditions (unforeseeable)(Item 9) 2F. Site conditions altered by an act of nature 2G. Unadjusted utility (unforeseeable) 2H. Unacquired Right-of-Way (unforeseeable) 2I. Additional safety needs (unforeseeable) 2J. Other
3. County Convenience	3A. Dispute resolution (not resulting from error in plans or differing site conditions) 3B. Public relations improvement 3C. Implementation of a Value Engineering finding 3D. Achievement of an early project completion 3E. Reduction of future maintenance 3F. Additional work desired by the County 3G. Compliance requirements of new laws and/or policies 3H. Cost savings opportunity discovered during construction 3I. Implementation of improved technology or better process 3J. Price adjustment on finished work (price reduced in exchange for acceptance) 3K. Addition of stock account or material supplied by state provision 3L. Revising safety work/measures desired by the County 3M. Other
4. Third Party Accommodation	4A. Failure of a third party to meet commitment 4B. Third party requested work 4C. Compliance requirements of new laws and/or policies (impacting third party) 4D. Other
5. Contractor Convenience	5A. Contractor exercises option to change the traffic control plan 5B. Contractor requested change in the sequence and/or method of work 5C. Payment for Partnering workshop 5D. Additional safety work/measures desired by the contractor 5E. Other
6. Untimely ROW/Utilities	6A. Right-of-Way not clear (third party responsibility for ROW) 6B. Right-of-Way not clear (County responsibility for ROW) 6C. Utilities not clear 6D. Other

Williamson County Road Bond Program

CR 404 Hutto Water Line Williamson County Project No. T5045

Change Order No. 1 Reason for Change

This Change Order revises the original water line pipe design from 18 inch ductile iron to 24 inch HDPE pipe. The change in pipe size and material was necessary to meet the increased demand in water and to alleviate the availability issues of ductile iron pipe. Due to the Contract value of this requested change, the 24 inch HDPE pipe material and the fusion of that pipe is also being removed from this Contract (T5045) and will be bid under a separate Contract (22IFB96). Portable concrete traffic barrier (CTB) is also being added to the Contract, to improve the work zone safety.

The following new item will be added by this Change Order.

ITEM	DESCRIPTION	QTY	UNIT
512-6001	PORT CTB (FURN & INSTL)(SGL SLOPE)(TY 1)	120.00	LF
512-6049	PORT CTB (REMOV)(SGL SLOPE)(TY 1)	120.00	LF
545-6005	CRASH CUSHION ATTEN. (REMOV)	4.00	EA
545-6019	CRASH CUSHION ATTEN. (INSTL)(S)(N)(TL3)	4.00	EA
501S-36	Jacking or Boring, 36" Steel Pipe, ASTM A134	789.00	LF
G4.05	Concrete Trench Cap (6" Thick, 2000 PSI)	5.00	CY
SP.W3.21.G	Valves, Butterfly 24" Dia.	11.00	EA
SP.W3.21.F	Drain Valve Assembly, including valve and pipe	10.00	EA
SS.W5.9.B24	24" HDPE Fittings	10.00	EA
SS.W5.9.C24	24" HDPE MJ Adapter	24.00	EA
SS.W5.9.C6	6" HDPE MJ Adapter	10.00	EA
SS.W5.9.A24- IO	Pipe, 24" Dia. HDPE (DIPS Size), DR11 (200psi), Complete in Place, excavation and backfill (Materials and Fusion not included)	14,967.00	LF

This Change Order results in a net decrease of \$232,550.27 to the Contract amount, for an adjusted Contract total of \$2,665,088.73. The original Contract amount was \$2,897,639.00. As a result of this and all Change Orders to-date, \$232,550.27 has been deducted from the Contract, resulting in an 8.03% net decrease in the overall Contract cost. As a result of this Change Order, (0) days will be added to the contract.

HNTB Corporation
Oscar Salazar-Bueno, P.E.

WILLIAMSON COUNTY

CR 404 HUTTO 24 INCH WATER LINE REALIGNMENT
PRECINCT NUMBER 4
WILLIAMSON COUNTY PROJECT NO. IFB T5045

CLASSIFICATION & POSTED SPEED:
CR 404 RURAL MAJOR COLLECTOR 40 MPH
FM 973 RURAL MINOR ARTERIAL 65 MPH

AVERAGE DAILY TRAFFIC (ADT):
CR 404 252 (2021) 348 (2041)
FM 973 5758 (2021) 7975 (2041)

INDEX OF SHEETS

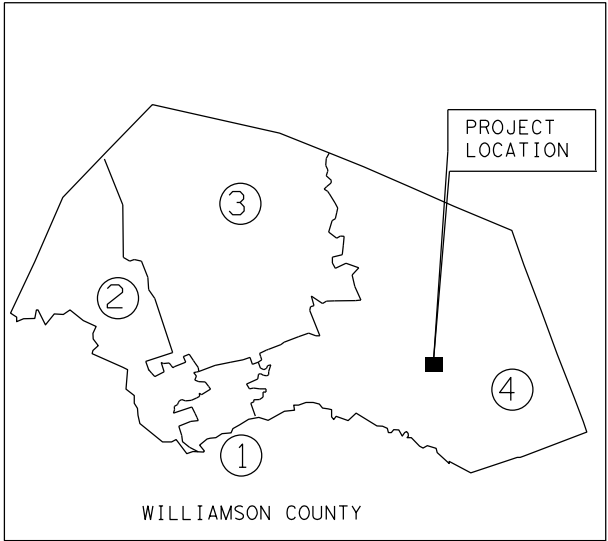
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	GENERAL NOTES
3	SURVEY NOTES
4	KEY MAP
5 - 42	WATER LINE P&P SHEETS
43	EROSION CONTROL STANDARD DETAILS
44 - 45	STANDARD WATER DETAILS
46	HDPE WATER DETAILS
47 - 63	TXDOT TRAFFIC CONTROL STANDARDS

PROJECT LIMITS: ALONG FUTURE COUNTY ROAD FROM CR 404 TO CR 404 AT FM 973

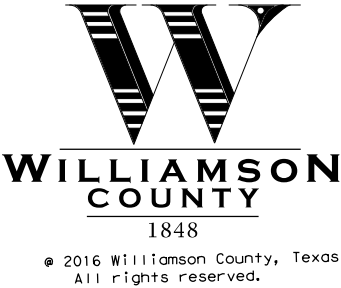
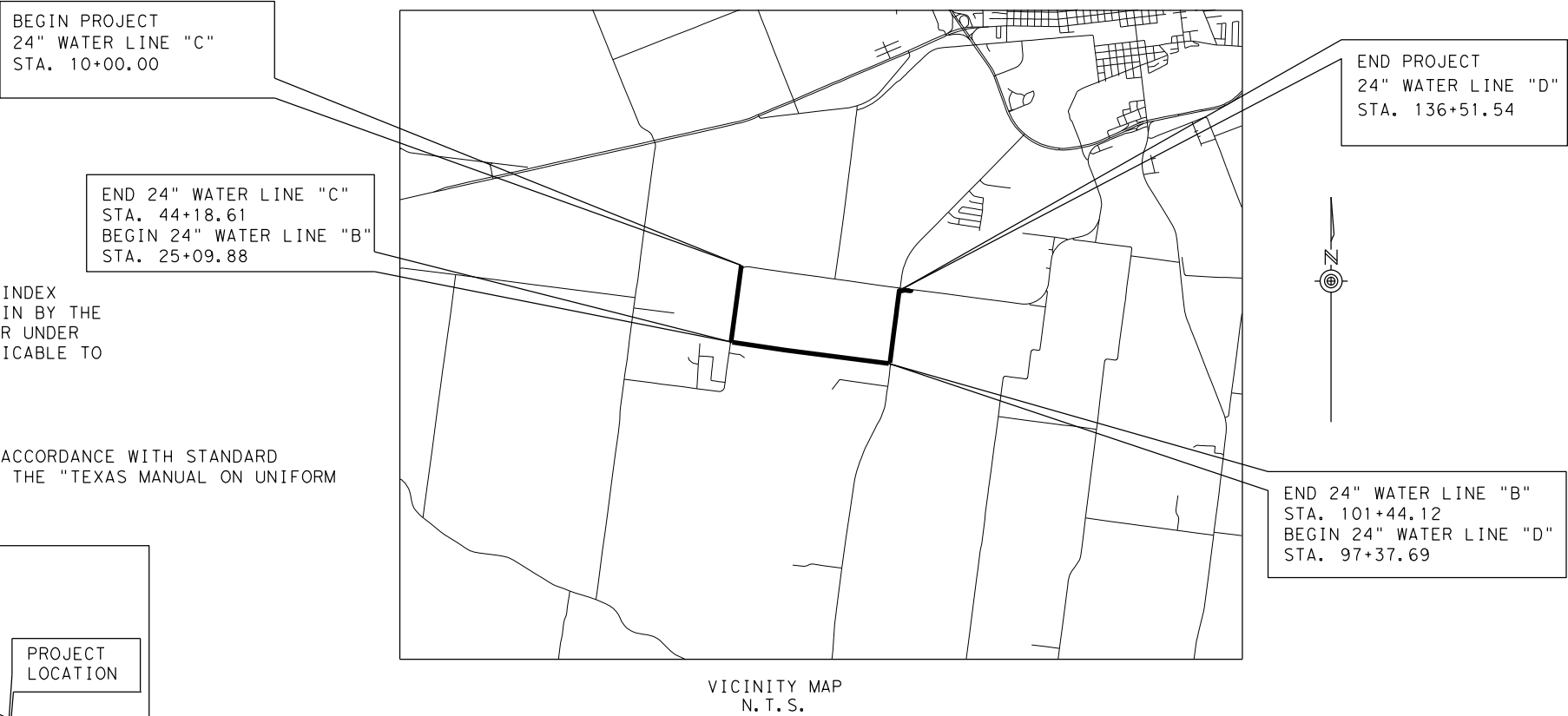
FOR THE RELOCATION OF AN EXISTING CITY OF HUTTO TRANSMISSION MAIN WITH VALVES,
APPURTENANCES, ENCASEMENT PIPE, JACK AND BORE, AND PRESSURE TAPS ONTO THE EXISTING MAIN

THE STANDARD DRAWINGS SHOWN IN THE INDEX
OF SHEETS ABOVE AND IDENTIFIED HEREIN BY THE
SYMBOL * HAVE BEEN SELECTED BY ME OR UNDER
MY DIRECT SUPERVISION AS BEING APPLICABLE TO
THIS PROJECT.

REQUIRED SIGNS SHALL BE PLACED IN ACCORDANCE WITH STANDARD
SHEETS BC(1)-14 THRU BC(12)-14 AND THE "TEXAS MANUAL ON UNIFORM
TRAFFIC CONTROL DEVICES.:



TxDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION
OF HIGHWAYS, STREETS AND BRIDGES ADOPTED ON
NOVEMBER 1, 2014 AND ALL APPLICABLE SPECIAL PROVISIONS
AND SPECIAL SPECIFICATIONS AS INDICATED IN THE BID
DOCUMENTS SHALL GOVERN ON THIS PROJECT.



APPROVED BY:
WILLIAMSON COUNTY

HONORABLE BILL GRAVELL, JR. DATE
WILLIAMSON COUNTY JUDGE

APPROVED BY:
WILLIAMSON COUNTY

COMMISSIONER RUSS BOLES DATE
WILLIAMSON COUNTY PRECINCT 4

APPROVED BY:
HNTB CORPORATION

RICHARD L RIDINGS, PE DATE
ROAD BOND MANAGEMENT TEAM



PREPARED BY:
COBBFENDLEY (DESIGN CONSULTANT)


KRISTEN VAN HOOSIER, P.E.
PROJECT MANAGER

3/30/2022
DATE

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-002-GNOT.dwg -- Tab: GNOT-01 -- Plotted: 3/28/2022 3:44 PM By: KRISTEN VAN HOOSIER

City Of Hutto - General Construction Notes
Updated March 2019

1. The contractor is to contact one of the following:
Texas811 811
Lone star 1-800-669-8344
For location of existing facilities at least 48 hours prior to commencement of any construction activities.
2. Prior to any construction, the design engineer shall convene a preconstruction conference between the City of Hutto, himself, the contractor, other utility companies, any affected parties and any other entity the City or engineer may require. If construction is not started on the site within 30 calendar days after the pre-construction conference, the engineer shall convene a new preconstruction conference between the City of Hutto, himself, and all the above mentioned entities.
3. Prior to any changes to the construction site, video of the site must be taken and provided to the City before construction commences.
4. All construction operations shall be performed in accordance with City of Hutto Engineering Manual and standard construction specifications and details. If City of Hutto Engineering Manual unavailable, or not applicable, refer to TxDOT and/or City of Georgetown Manual, standards and/or specifications.
5. All storm sewer bends and wyes shall be prefabricated.
6. All storm sewer mains to be field-tested for water tightness no sooner than 30 days after total completion of the storm sewer lines.
7. All storm sewer mains to be video taped by camera no sooner than 30 days after total completion of the storm sewer lines. Two digital copies shall be supplied to the City before closeout. All storm sewer conduits will be inspected by the city before city acceptance, video must show details of all irregularities or offsets (minimum 10 seconds of video time).
8. All construction operations shall be accomplished in accordance with applicable regulations of the U.S. Occupational Safety and Health Administration. OSHA standards may be purchased from the government printing office; information and related reference materials may be purchased from OSHA, 611 e. 6th Street, Austin, Texas.
9. Contractor shall take all due precautions to protect existing facilities from damage. Any damage incurred to existing facilities as a result of construction operations to be repaired immediately by the contractor, at no additional cost to owner.
10. Contractor to give notice to all authorized inspectors, superintendents or persons in charge of public and private utilities affected by his operations at least 48 hours prior to commencement of work.

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11. Contractor to comply with all applicable local, state, and federal requirements regarding excess and waste material, including methods of handling and disposal.
12. Contractor to coordinate interruptions of all utilities and services. All work to be in accordance with the requirements of the applicable utility company or agency involved.
13. When un-located or incorrectly located, a break in utility lines, or other utilities and services are encountered during site work operations, 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.
14. Contractor to locate, protect, and maintain benchmarks, monuments, control points and project engineering reference points. Re-establish disturbed or destroyed items by registered professional land surveyor in the State of Texas, at no additional cost to owner.
15. When construction is being carried out within easements, the contractor shall confine his work to within the permanent and temporary easements. Prior to final acceptance, the contractor shall be responsible for removing all trash and debris within the permanent and temporary easements. Clean-up shall be to the satisfaction of the engineer.
16. The contractor and the engineer shall keep accurate records of all construction that deviates from the plans. Accurate "record" drawings will be provided to the City of Hutto, along with a letter certification from a registered professional engineer licensed in the State of Texas, stating that said project has been constructed in accordance with these plans, prior to the owner being issued a certification of completion and final acceptance. These "record" drawings shall meet with the satisfaction of the Engineering and Development Services Departments prior to final acceptance.
17. Contractor shall strip six (6) inches of topsoil from all areas subject to grade modification. Remove all areas of weak soil.
18. The contractor shall protect all existing fences. In the event that a fence must 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.
19. Upon completion of the project, the site(s) as defined herein shall be cleaned of all debris and left in a neat and presentable condition.
20. All adjoining pavement sections shall be protected during all phases of construction and any damages incurred due to contractor's operation shall be repaired and/or replaced at the contractor's expense.
21. Contractor to control dust caused by the work and comply with pollution control regulations of governing authorities (no separate pay).
22. Traffic controls to be installed in accordance with the current TxDOT manual on uniform traffic control devices and TxDOT barricade and construction standards.
23. Revegetate all disturbed areas upon completion of the work per City of Georgetown construction standards.

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24. Contractor to exercise caution during construction near and around gas lines and power lines.
25. No work is to be performed between the hours of 6:00 p.m. and 7:00 a.m. all work requiring City inspection shall be performed Monday thru Friday. The City reserves the right to require the contractor to uncover all work performed without inspection.
26. The Contractor shall determine the exact location vertically and horizontally of all existing utilities prior to commencing work, and shall notify the engineer and the City if the existing utility location and depths are different from what is shown on the plans. The contractor agrees to be fully responsible for any and all damages which might be associated by the contractor's failure to exactly locate and preserve any and all underground utilities.
27. All Fire Lines shall be ductile iron.
28. Detectable tape shall be used for all underground utilities. Tape must be 12" wide 5 mil with applicable color and label.
29. Contractor will be responsible for keeping roads and drives adjacent to and near the site free from soil, sediment and debris. Contractor will not remove soil, sediment or debris from any area or vehicle by means of water, only shoveling and sweeping will be allowed. Contractor will be responsible for dust control from the site.
30. The Contractor shall be responsible for all damage to private property which occurs as a result of any portion of this project. Any damage to private property shall be repaired to equal or better condition. The Contractor shall pay and/or settle with private property owner(s) for all cost related to damage. The City will not provide separate pay for repair of damages, reimbursements or settlements.

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City of Hutto - Erosion, Sedimentation and Tree Protection Notes
Updated August 2018

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 the 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 must be submitted to and approved by the owner's representative.
3. All planting shall be done between May 1st and September 15th except as specifically authorized in writing. If planting is authorized to be done outside the date specified, the seed shall be planted with the addition of winter fescue (Kentucky 31) at a rate of 100 lbs/acre. Grass shall be common Bermuda Grass, hulled, minimum 82% pure live seed. All grass seed shall be free from noxious weed, grade "A" recent crop, cleaned and treated with appropriate fungicide at time of mixing. Seed shall be furnished in sealed, standard containers with dealer's guaranteed analysis.
4. All disturbed areas to be restored as noted in the water pollution abatement plan.
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 inches (4"). The irrigation to occur at 10-day intervals during the first two months to insure germination and establishment of the grass. Rainfall occurrences of one half and inch (1/2") or greater to postpone the water schedule one week.
6. Restoration to be acceptable when the grass has grown at least one and one half inches (1.5") high with 95% coverage, provided no bare spots larger than twenty-five square feet exist.
7. A minimum of four inches (4") of topsoil to be place in all area disturbed by construction.
8. The contractor to hydro mulch or sod (as shown on plans) all exposed cuts and fills upon completion of construction.
9. Erosion and sedimentation controls to be installed or maintained in a manner which does not result in soil buildup within tree drip line.
10. To avoid soil compaction, contractor shall not allow vehicular traffic, parking, or storage of equipment or materials in the tree drip line area.
11. Where a fence is closer than four feet (4') to a tree trunk, protect the trunk with strapped-on planking to a height of eight feet (8'), or 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 the construction activity to be pruned flush with the soil. Backfill root area with good quality topsoil as soon as possible. If exposed root areas are not

Page 1 of 2

backfilled within two days, cover them with organic matter in a manner which reduces soil temperature and minimizes water loss due to evaporation.

14. Contractor to prune vegetation to provide clearance for structure, 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 one-quarter inch (1/4") 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 owner's 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.

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City of Hutto - Water Notes
Updated March 2019

1. Water systems shall be constructed in accordance with City of Hutto Engineering Manual, standard specifications and standard details.
2. Fire hydrants on mains under construction shall be securely wrapped with a poly wrap bag and taped into place. The poly wrap shall be removed when the mains are accepted and brought into service. All fire lines shall be ductile. iron
3. All water service, wastewater service, and valve locations shall be appropriately marked as follows:
A. Water Service "W" on top of curb
B. Valve "V" on top of curb or valve sign as instructed by City Engineer
4. Tools for marking curbs shall be provided by the Contractor. Other appropriate means of marking service and valve locations shall be provided in areas without curbs. Such means of marking shall be specified by the engineer and approved by the City of Hutto.
5. Thrust blocking and restraints shall be in accordance with City of Hutto standard specifications.
6. Hydrostatic pressure and leakage tests shall be performed on all pressure pipelines carrying water.
7. All newly installed pipes and related products must conform to American National Standards Institute must be certified by an organization accredited by ANSI.
8. Pipe material for water mains shall be PVC (AWWA C900/C905, MIN. DR 14), or Ductile Iron (AWWA C151, MIN. CLASS 350). Water services (2" OR SMALLER) shall be polyethylene tubing (BLACK, 200 PSI, DR 9).
9. All ductile iron pipe (D.I.P) shall be wrapped with eight (8) MIL, black virgin polyethylene wrap as specified in ANSI/AWWA C105/A21.5.
10. All D.I.P. shall be lined with virgin polyethylene conforming to ASTM D-1248; 40 MIL thickness (nominal), 35 MILS (minimum). Liner to be Polybond or equal. At any point where D.I.P. cannot be wrapped in polyethylene, coat the exterior with Polybond or approved equal.
11. All PVC pipe (all types and SDR/DR wall thickness to be used) shall have rubber gasket equipped bell and spigot joints conforming to ASTM D-3212. The gasket material shall conform to ASTM F-477. Solvent welded joints will not be approved for this project.
12. All potable waterlines and sanitary sewer facilities must be installed so as to provide a minimum of nine feet of clearance in any direction between them. Where the nine foot separation distance cannot be achieved, follow these special procedures.
A. If a collection system pipe parallels a public water supply pipe the following requirements apply:
I. A collection system pipe must be constructed of cast iron, ductile iron, or PVC meeting ASTM specifications with at least 150 pounds per square inch (PSI) pressure rating for both the pipe and joints.

Page 1 of 3

- II. Vertical separation must be at least two feet between the outside diameters of the pipes.
- III. Horizontal separation must be at least four feet between outside diameters of the pipes.
- IV. Collection system pipe must be below water supply pipe.
B. If a collection system pipe crosses a public water supply pipe, the following requirements apply:
I. If a collection system is constructed of cast iron, ductile iron, or PVC with a minimum pressure rating of 150 PSI, the following requirements apply:
a. A minimum distance of six (6) inches between outside diameters of the pipes.
b. A collection system pipe must be below a public water supply pipe.
c. Collection system pipe joints must be located as far as possible from an intersection with a public water supply line.
II. If a collection system crosses over a public water supply pipe, each portion of a collection system pipe within nine feet of a public water supply pipe must be constructed of cast iron, ductile iron, or PVC pipe with a pressure rating of at least 150 PSI using appropriate adapters.

13. The Contractor must obtain a temporary water meter from the City of Hutto Utility Billing Department for all water used during construction.
14. Contractor to schedule water valve closure through City of Hutto: Department of Public Works – Utility Division with advance notice of 7 days. Contractor to contact public works at phone # 512-759-4016 and notify construction inspector. Water valve closure will only be scheduled for Tuesday through Thursday. Contractor to notify all businesses and residents affected by valve closures. Closures must be coordinated to minimize effects on existing customers with considerations given to businesses that require water to maintain operations.
15. Line flushing or any activity using a large quantity of water must be scheduled with the City of Hutto. Contractor will be responsible for tracking the amount of water used during flushing and be required to reimburse the city for water use, if not already metered.
16. The Contractor, at his expense, shall perform sterilization of all potable water lines and shall provide all equipment necessary (including test gages), supplies (including concentrated chlorine disinfection material) and necessary labor required for the sterilization procedure. The sterilization procedure shall be monitored by the Engineer and a City of Hutto Construction Inspector. Water samples will be collected to verify each treated line has attained an initial chlorine concentration of 50 ppm.
17. An independent qualified lab, at the Contractor's expense, shall perform quality testing for all wastewater pipe installed and pressure hydrostatic testing of all water lines constructed. The contractor shall provide all equipment (including pumps and gages), supplies, and labor necessary to perform the tests. A City of Hutto Construction Inspector must be present for all testing.

Page 2 of 3

18. The Contractor shall provide the engineer and the city not less than 24 hours notice prior to performing sterilization, quality testing, or pressure testing.
19. The Contractor shall not open or close any valves unless authorized by the City of Hutto.
20. All valve boxes and covers shall be cast iron per City of Hutto standard details.
21. All manholes shall be concrete with cast iron ring and cover. All manholes located outside of pavement shall have bolted and gasketed covers. Concrete manholes to be coated per standard detail and construction specifications. Tapping of fiberglass manholes shall not be permitted.
22. All fire lines shall be ductile iron pipe (AWWA C-100, Class 200).
23. All fire hydrants shall be silver in color including bonnet and installed per City of Hutto Standard detail.
24. All water piping and fittings shall be virgin stock.
25. All mechanical restraints shall be installed per manufacturer's specifications.
26. Along State Highways, water lines are required on both sides of the roadway. New water lines crossing existing streets shall be placed by boring. A steel casing shall be required under major and minor collector roadways, arterial roadways and State Highway. Open cut excavation will not be allowed to cross existing streets, unless approved by the City Engineer.
27. All new water pipes must have detectable tape per City of Hutto Standard Detail.
28. All automatic flush valves must use a meter to measure water loss.
29. Tracer wire will be tested and must work correctly before City acceptance of infrastructure. Tracer wiper must be encased in pipe.
30. All reduced size taps shall be made using an epoxy coated fabricated steel tapping sleeve with stainless steel bolts, or a stainless steel full circle tapping sleeve with ductile iron flange.

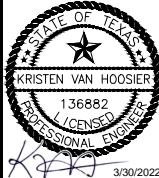
Page 3 of 3



GENERAL NOTES
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS



PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



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SHEET
C-002
2 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-002-GNOT.dwg -- Tab: SURV-NOTES -- Plotted: 3/30/2022 4:03 PM By: KRISTEN VAN HOOSIER

NOTES:

1. ALL PROJECT COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, TEXAS CENTRAL ZONE (4203), NAD 83/93/NAVD 88 (GEI0D12B). ALL COORDINATES SHOWN HEREIN ARE ADJUSTED TO SURFACE BY MULTIPLYING BY A SURFACE ADJUSTMENT FACTOR OF 1.00012352.

2. UNITS: U.S. SURVEY FEET

Horizontal Alignment Report

Report Date: 3/30/2022 3:28:01 PM
Alignment Name: WL-C
Station Range: Start: 10+00.00, End: 44+18.61
Description: ALONG CR 404

Begin WL-C
N 10,172,005.06 E 3,198,158.67 10+00.00

Line (1)
S7° 33' 01"W 358.84'
N 10,171,649.34 E 3,198,111.52 13+58.84
Line (1)

Line (2)
S7° 34' 16"W 1,440.38'
N 10,170,221.51 E 3,197,921.74 27+99.22
Line (2)

Line (3)
S7° 28' 51"W 500.54'
N 10,169,725.23 E 3,197,856.58 32+99.75
Line (3)

Line (4)
S7° 34' 33"W 1,109.17'
N 10,168,625.75 E 3,197,710.34 44+08.92
Line (4)

Line (5)
S37° 28' 20"E 9.69'
N 10,168,618.06 E 3,197,716.24 44+18.61
Line (5)

N 10,168,618.06 E 3,197,716.24 44+18.61
End WL-C

Alignment Length: 3,418.61'

Horizontal Alignment Report

Report Date: 3/30/2022 3:28:01 PM
Alignment Name: WL-B
Station Range: Start: 25+09.88, End: 101+44.12
Description: ALONG FCR, REDESIGNED

Begin WL-B
N 10,168,618.06 E 3,197,716.24 25+09.88

Line (1)
S82° 12' 22"E 7,634.24'
N 10,167,582.77 E 3,205,279.95 101+44.12
Line (1)

N 10,167,582.77 E 3,205,279.95 101+44.12
End WL-B

Alignment Length: 7,634.24'

Horizontal Alignment Report

Report Date: 3/30/2022 3:30:00 PM
Alignment Name: WL-D
Station Range: Start: 97+37.69, End: 136+60.00
Description: ALONG FM 973

Begin WL-D
N 10,167,582.77 E 3,205,279.95 97+37.69

Line (1)
N54° 08' 04"E 6.41'
N 10,167,586.52 E 3,205,285.14 97+44.09
Line (1)

Line (2)
N7° 26' 52"E 642.51'
N 10,168,223.61 E 3,205,368.43 103+86.60
Line (2)

Line (3)
N7° 26' 52"E 273.40'
N 10,168,494.70 E 3,205,403.87 106+60.00
Line (3)

Line (4)
N37° 33' 08"W 28.28'
N 10,168,517.13 E 3,205,386.63 106+88.28
Line (4)

Line (5)
N7° 26' 52"E 324.92'
N 10,168,839.30 E 3,205,428.75 110+13.20
Line (5)

Line (6)
N7° 26' 52"E 1,978.17'
N 10,170,800.79 E 3,205,685.16 129+91.37
Line (6)

Line (7)
N52° 28' 36"E 5.01'
N 10,170,803.84 E 3,205,689.14 129+96.38
Line (7)

Line (8)
S82° 31' 12"E 102.66'
N 10,170,790.47 E 3,205,790.92 130+99.04
Line (8)

Curve (9)
BC N 10,170,790.47 E 3,205,790.92 130+99.04
CTR N 10,170,988.77 E 3,205,816.94
PI N 10,170,785.30 E 3,205,830.36

Direction Back S82° 31' 24"E
Radius 200.00'
Delta 22°30'00"(LT)
Length 78.54'
Tangent 39.78'
Chord Direction N86° 13' 36"E Distance 78.04'
Direction Ahead N74° 58' 36"E

EC N 10,170,795.61 E 3,205,868.78 131+77.58
Curve (9)

Line (10)
N74° 58' 36"E 74.55'
N 10,170,814.93 E 3,205,940.78 132+52.12
Line (10)

Curve (11)
BC N 10,170,814.93 E 3,205,940.78 132+52.12
CTR N 10,170,621.77 E 3,205,992.62
PI N 10,170,825.16 E 3,205,978.91

Direction Back N74° 58' 36"E
Radius 200.00'
Delta 22°19'53"(RT)
Length 77.95'
Tangent 39.48'
Chord Direction N86° 08' 33"E Distance 77.46'
Direction Ahead S82° 41' 31"E

EC N 10,170,820.14 E 3,206,018.07 133+30.07
Curve (11)

Line (12)
S82° 41' 31"E 254.05'
N 10,170,787.83 E 3,206,270.06 135+84.13
Line (12)

Line (13)
Non-Tangent Radial Bearing N7° 18' 29"E
N52° 28' 36"E 23.44'
N 10,170,802.10 E 3,206,288.65 136+07.57
Line (13)

Line (14)
Non-Tangent Radial Bearing N7° 18' 29"E
N7° 28' 36"E 62.43'
N 10,170,854.09 E 3,206,295.47 136+60.00
Line (14)

N 10,170,854.09 E 3,206,295.47 136+60.00
End WL-D

Alignment Length: 3,922.31'

CobbFendley

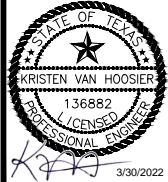
300 EAST HUNTLAND SPRING SUITE 100
AUSTIN, TEXAS 78752
512.834.9788 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

SURVEY NOTES

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

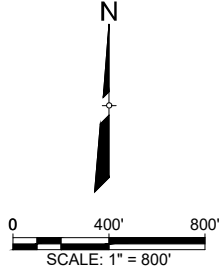
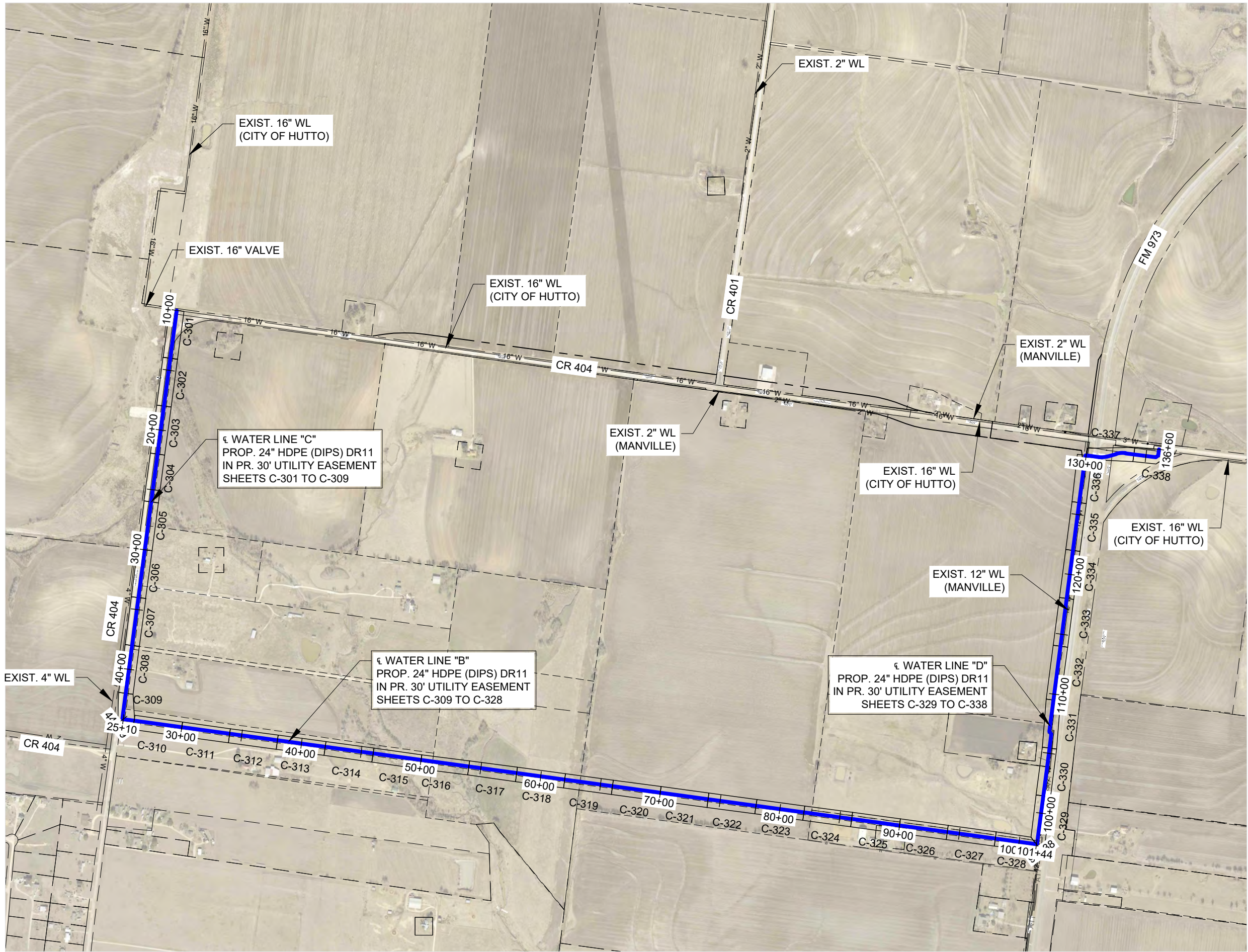


PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



THESE DESIGN DOCUMENTS ARE NOT TO BE USED FOR CONSTRUCTION PRIOR TO REGULATORY SIGNATURE AND PERMIT.

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-100-KEYMAP.dwg -- Tab: LAYOUT1 -- Plotted: 3/28/2022 3:45 PM By: KRISTEN VAN HOOSIER



- SEQUENCE OF WATERLINE CONSTRUCTION:
1. CONTRACTOR TO LAY PROP. WL PIPE UP TO CONNECTION POINTS.
 2. COORDINATE WITH MATT EDWARDS (512-845-5203) AT LEAST 48 HOURS PRIOR TO ANTICIPATED WATER SHUTOFF. SHUTOFF LIMITED TO 4 HOURS.
 3. INSTALL PRESSURE TAP ONTO EXISTING 16" PVC WATERLINE.
 4. OPEN FLOW INTO NEWLY INSTALLED 24" WATERLINE.
 5. INSTALL 16" INSERTION VALVE ON SIDE OF EX. 16" WATERLINE TO BE ABANDONED.
 6. SHUT OFF WATER.
 7. RESTRAIN 160 LF OF PIPE ALONG EXISTING WATERLINE TO REMAIN ACTIVE. USE MEGALUGS.
 8. CLOSE INSERTION VALVE, CUT, AND PLUG EXISTING 16" WATERLINE TO BE ABANDONED.

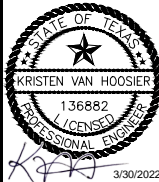


KEYMAP

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS



PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



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SHEET
C-100
4 of 66

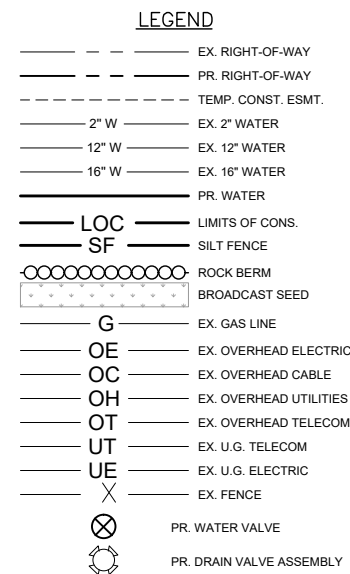


GENERAL NOTES

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
2. EXISTING 16" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN IS CONSTRUCTED, TESTED, APPROVED AND THE NEW MAIN IS PLACED IN SERVICE.
3. EXISTING WATER MAINS THAT ARE TO BE ABANDONED IN PLACE AND ARE UNDER THE PROPOSED ROADWAY ARE TO BE CUT, CAPPED, AND FILLED WITH FLOWABLE FILL. SUBSIDIARY TO COST OF PIPE, NO SEPARATE PAY. EXISTING WATER LINES THAT ARE TO BE ABANDONED IN PLACE AND ARE NOT UNDER THE PROPOSED ROADWAY WILL BE CAPPED.
4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. ALL EXISTING FENCES SHALL BE PROTECTED. IF DAMAGE TO AN EXISTING FENCE OCCURS, THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
6. WATER LINE SHALL BE 24" DIPS HDPE, DR 11 (200 PSI), WITH I.D. = 20.829". CONCRETE THRUST BLOCKS SHALL BE USED AT ALL FITTINGS, VALVES, AND OTHER APPURTENANCES.
7. DEMANDS DAMAGE DURING WATER LINE INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
8. HDPE FITTINGS SHALL BE SHOP-FABRICATED HDPE IN ACCORDANCE WITH AWWA STANDARD C906. FIELD FABRICATION OF FITTINGS IS PROHIBITED. ALL FITTINGS MUST BE PRESSURE-RATED FOR 200 PSI.
9. THE MINIMUM COIL BENDING RADIUS OF DR11 HDPE 24" PIPE IS 54 FEET. THESE PLANS SHOW A MINIMUM BENDING RADIUS OF 200 FEET. THE CONTRACTOR SHALL BRING TO THE IMMEDIATE ATTENTION OF THE ENGINEER ANY LOCATION WHERE FIELD BENDING CANNOT BE ACCOMPLISHED.

EXISTING GRADE	607.7
FLOW LINE OF PIPE	602.79

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.



WATER LINE C PLAN AND PROFILE

LINE C FLAIN AND
14+00 TO 18+00

HUTTO 24" WATE
TAYLOR, TEXAS



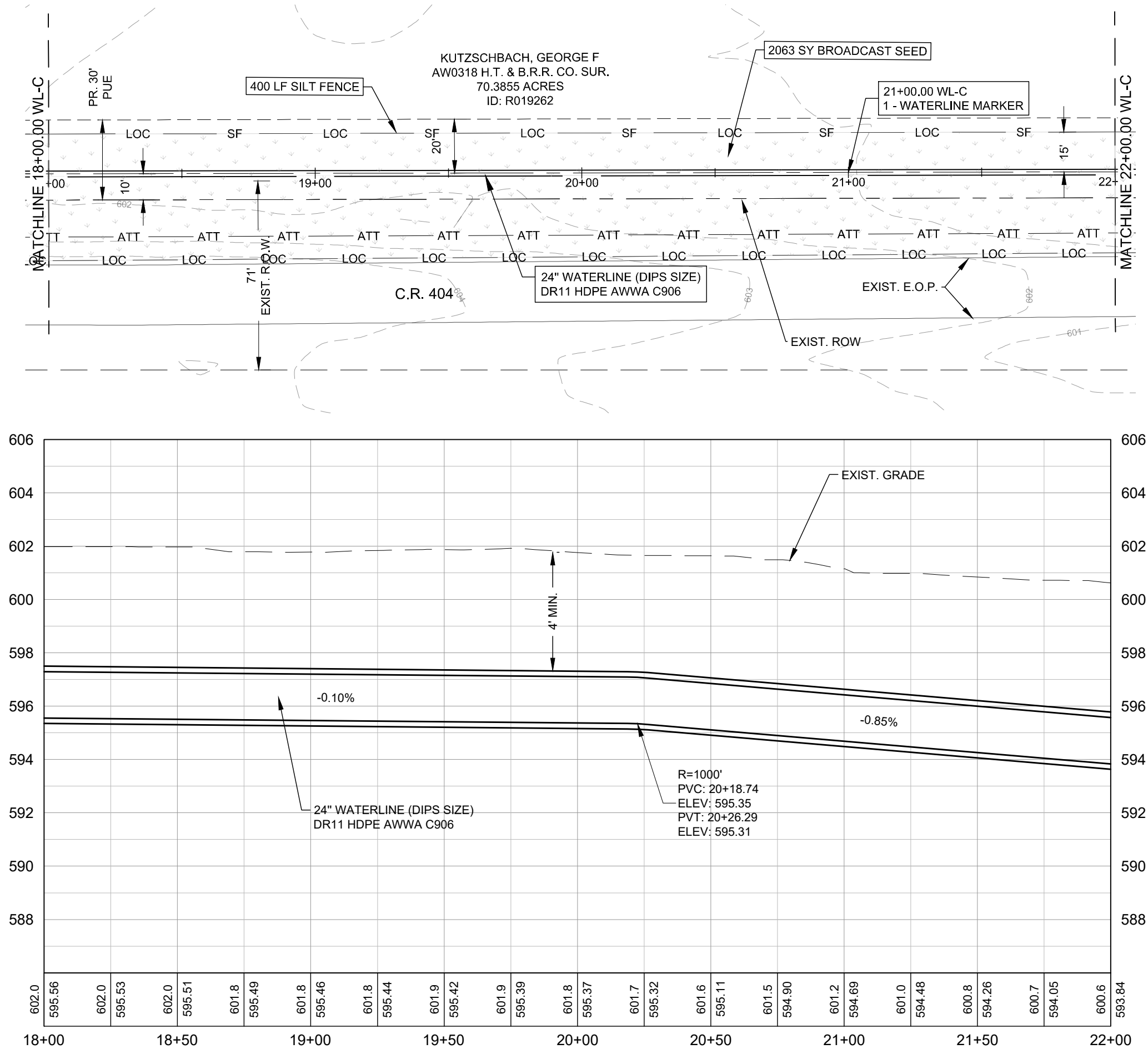
PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: G. LITTLEFIELD
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



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SHEET
C-302
6 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-03 - Plotted: 3/28/2022 3:47 PM By: KRISTEN VAN HOOSIER



LEGEND

---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC LIMITS OF CONS.
---	SF SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
G	EX. GAS LINE
OE	EX. OVERHEAD ELECTRIC
OC	EX. OVERHEAD CABLE
OH	EX. OVERHEAD UTILITIES
OT	EX. OVERHEAD TELECOM
UT	EX. U.G. TELECOM
UE	EX. U.G. ELECTRIC
X	EX. FENCE
⊗	PR. WATER VALVE
⊕	PR. DRAIN VALVE ASSEMBLY

GENERAL NOTES:

- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
- EXISTING 16" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN IS CONSTRUCTED, TESTED, APPROVED AND THE NEW MAIN IS PLACED IN SERVICE.
- EXISTING WATER MAINS THAT ARE TO BE ABANDONED IN PLACE AND ARE UNDER THE PROPOSED ROADWAY ARE TO BE CUT, CAPPED, AND FILLED WITH FLOWABLE FILL. SUBSIDIARY TO COST OF PIPE, NO SEPARATE PAY. EXISTING WATER LINES THAT ARE TO BE ABANDONED IN PLACE AND ARE NOT UNDER THE PROPOSED ROADWAY WILL BE CAPPED.
- ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
- ALL EXISTING FENCES SHALL BE PROTECTED. IF DAMAGE TO AN EXISTING FENCE OCCURS, THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
- WATER LINE SHALL BE 24" DIPS HDPE, DR 11 (200 PSI), WITH I.D. = 20.829". CONCRETE THRUST BLOCKS SHALL BE USED AT ALL FITTINGS, VALVES, AND OTHER APPURTENANCES.
- DRIVEWAYS DAMAGED DURING WATER LINE INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
- HDPE FITTINGS SHALL BE SHOP-FABRICATED HDPE IN ACCORDANCE WITH AWWA STANDARD C906. FIELD FABRICATION OF FITTINGS IS PROHIBITED. ALL FITTINGS MUST BE PRESSURE-RATED FOR 200 PSI.
- THE MINIMUM COLD BENDING RADIUS OF DR11 HDPE 24" PIPE IS 54 FEET. THESE PLANS SHOW A MINIMUM BENDING RADIUS OF 200 FEET. THE CONTRACTOR SHALL BRING TO THE IMMEDIATE ATTENTION OF THE ENGINEER ANY LOCATION WHERE FIELD BENDING CANNOT BE ACCOMPLISHED.

EXISTING GRADE
607.7

FLOW LINE OF PIPE
602.79

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

CobbFendley
1000 E. 27th Street, Suite 100
Austin, Texas 78752
512.834.9788 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

WATER LINE C PLAN AND PROFILE
18+00 TO 22+00

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

WILLIAMSON COUNTY
1848

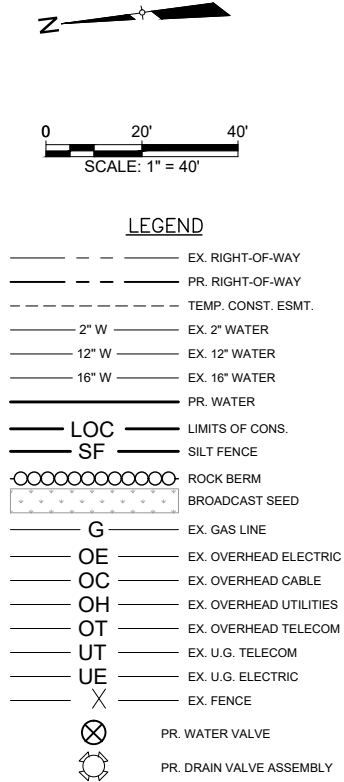
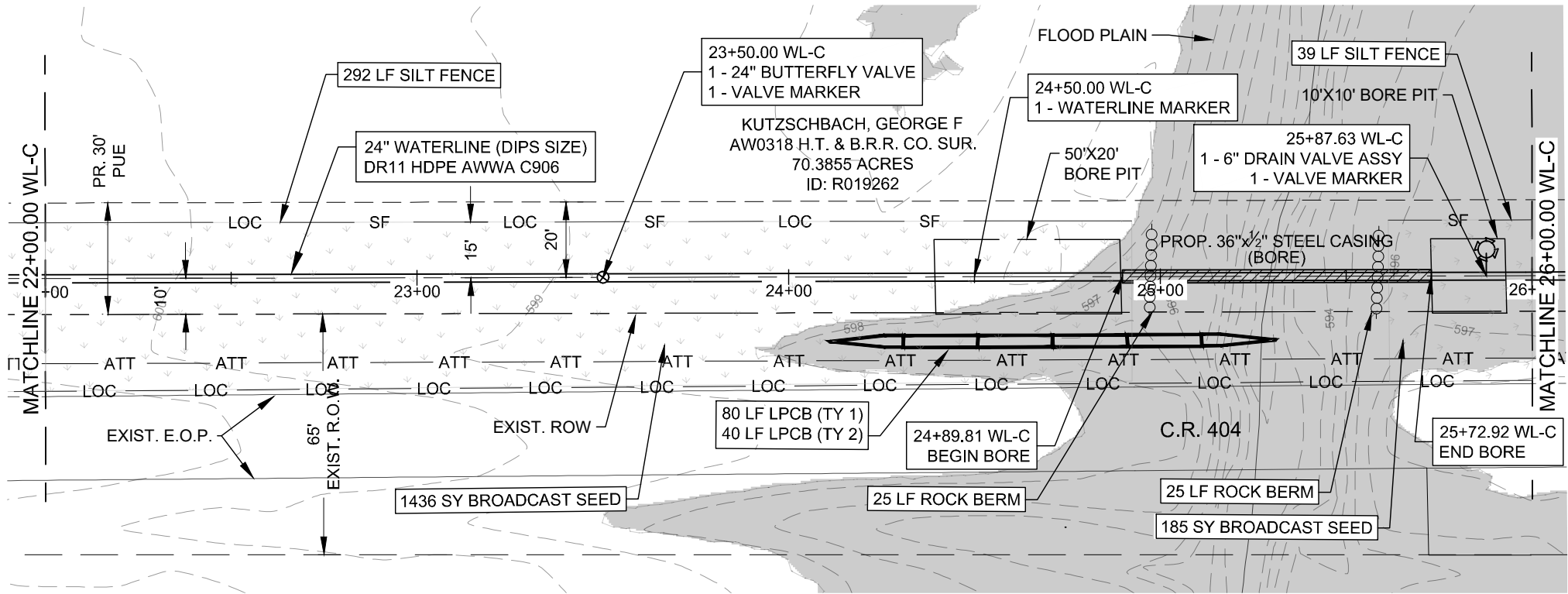
PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: G. LITTLEFIELD
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

STATE OF TEXAS
136882
K. VAN HOOSIER
3/30/2022

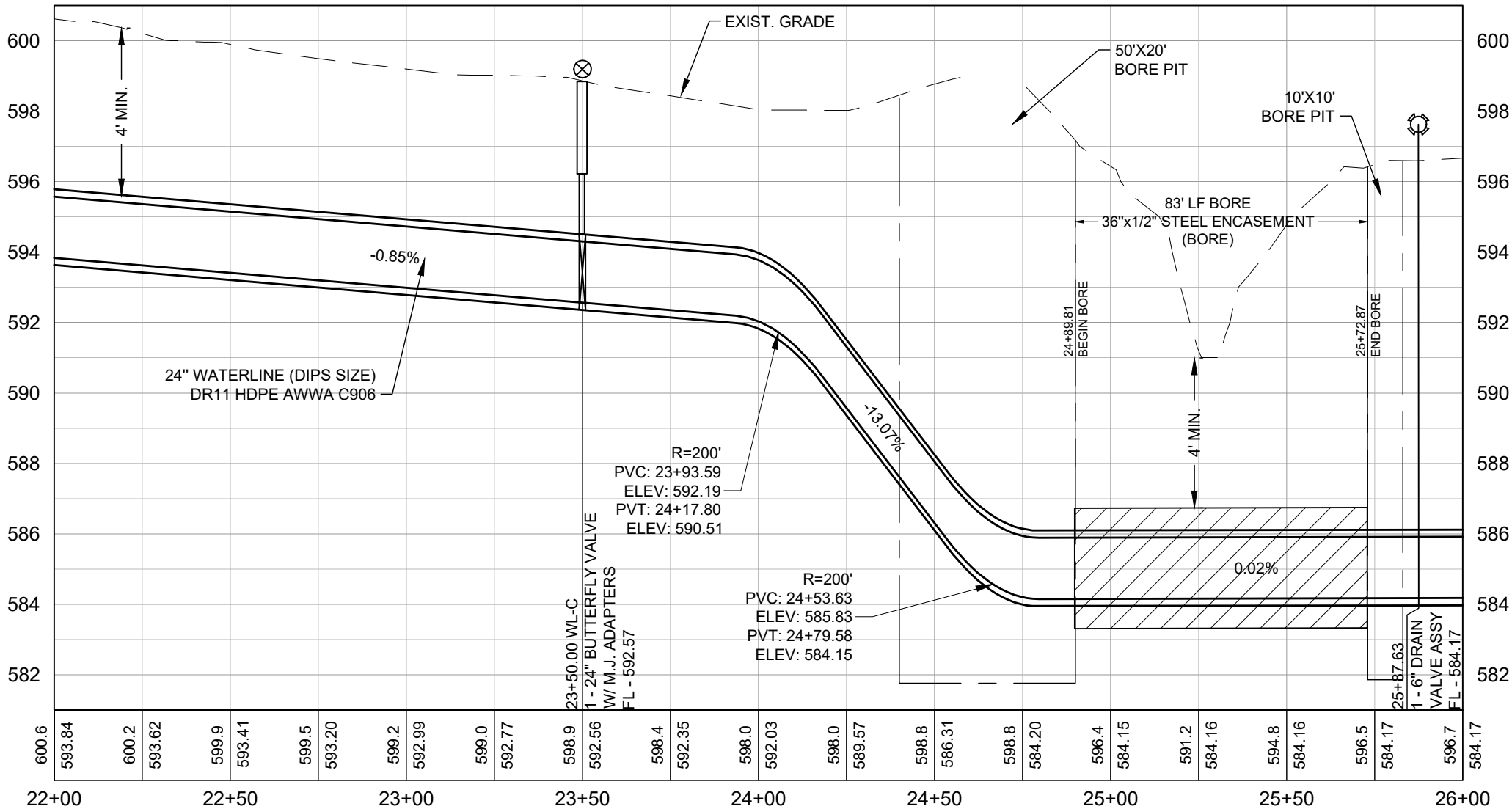
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SHEET
C-303
7 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-01.dwg - Tab: WATR-04 - Plotted: 3/28/2022 3:49 PM By: KRISTEN VAN HOOSIER



- GENERAL NOTES:
1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
 2. EXISTING 16\"/>
 3. EXISTING WATER MAINS THAT ARE TO BE ABANDONED IN PLACE AND ARE UNDER THE PROPOSED ROADWAY ARE TO BE CUT, CAPPED, AND FILLED WITH FLOWABLE FILL. SUBSIDIARY TO COST OF PIPE, NO SEPARATE PAY. EXISTING WATER LINES THAT ARE TO BE ABANDONED IN PLACE AND ARE NOT UNDER THE PROPOSED ROADWAY WILL BE CAPPED.
 4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
 5. ALL EXISTING FENCES SHALL BE PROTECTED. IF DAMAGE TO AN EXISTING FENCE OCCURS, THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
 6. WATER LINE SHALL BE 24\"/>
 7. DRIVEWAYS DAMAGED DURING WATER LINE INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
 8. HDPE FITTINGS SHALL BE SHOP-FABRICATED HDPE IN ACCORDANCE WITH AWWA STANDARD C906. FIELD FABRICATION OF FITTINGS IS PROHIBITED. ALL FITTINGS MUST BE PRESSURE-RATED FOR 200 PSI.
 9. THE MINIMUM COLD BENDING RADIUS OF DR11 HDPE 24\"/>



REV. NO.	DESCRIPTION	APPROVED BY:	DATE

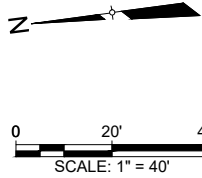
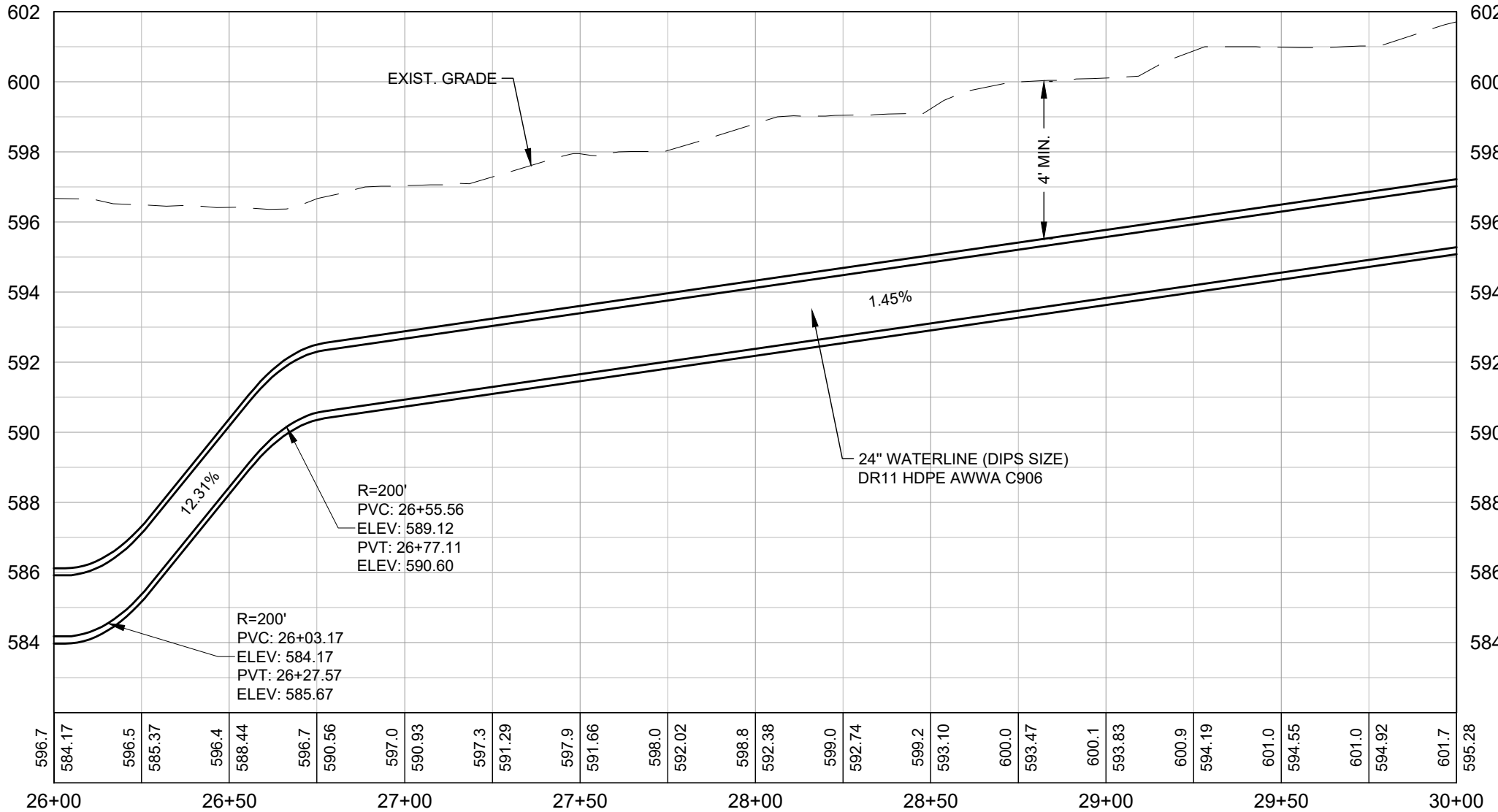
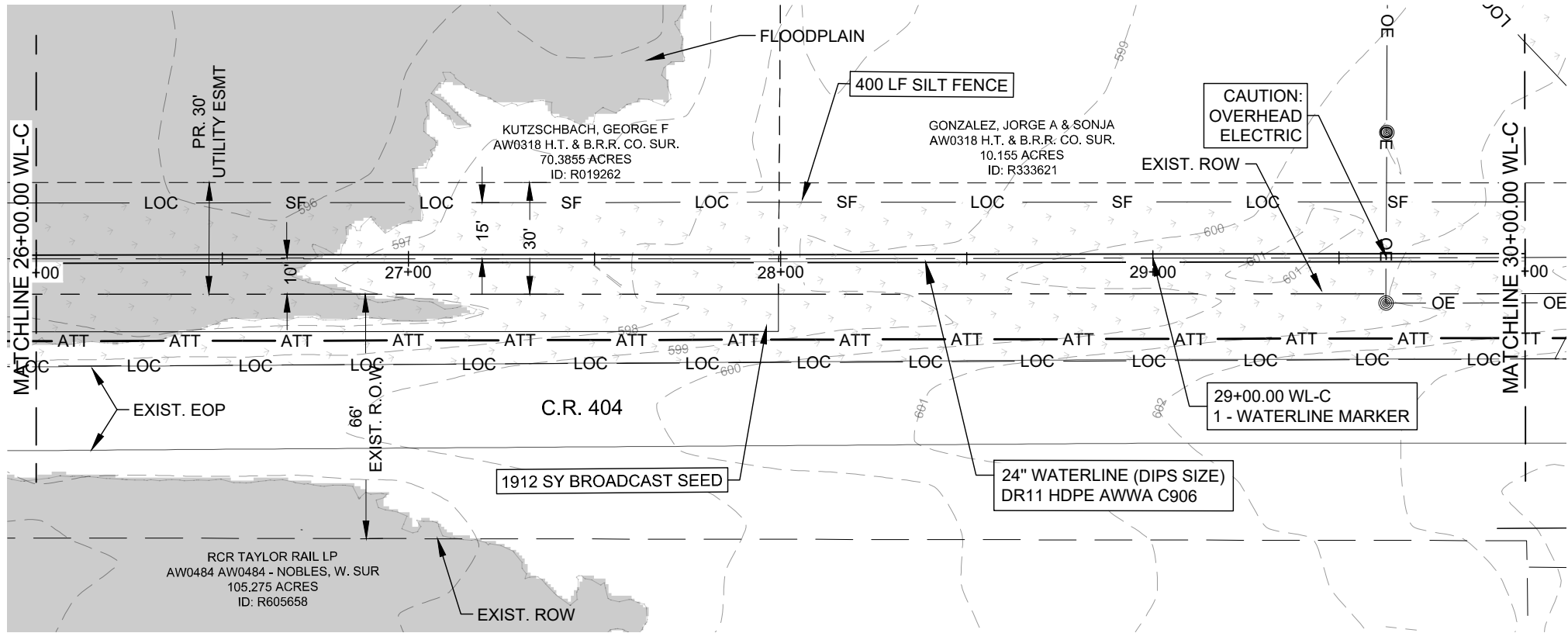
CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS

WILLIAMSON COUNTY
1848

PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: G. LITTLEFIELD
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET
C-304
8 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-02.dwg - Tab: 5 - Plotted: 3/28/2022 3:51 PM By: KRISTEN VAN HOOSIER



LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	ROCK BERM
---	BROADCAST SEED
G	EX. GAS LINE
OE	EX. OVERHEAD ELECTRIC
OC	EX. OVERHEAD CABLE
OH	EX. OVERHEAD UTILITIES
OT	EX. OVERHEAD TELECOM
UT	EX. U.G. TELECOM
UE	EX. U.G. ELECTRIC
X	EX. FENCE
⊗	PR. WATER VALVE
⊕	PR. DRAIN VALVE ASSEMBLY

GENERAL NOTES:

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EXISTING
GRADE
FLOW LINE
OF PIPE

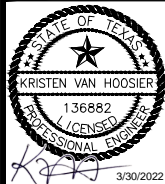
PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.



WATER LINE C PLAN AND PROFILE
26+00 TO 30+00
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

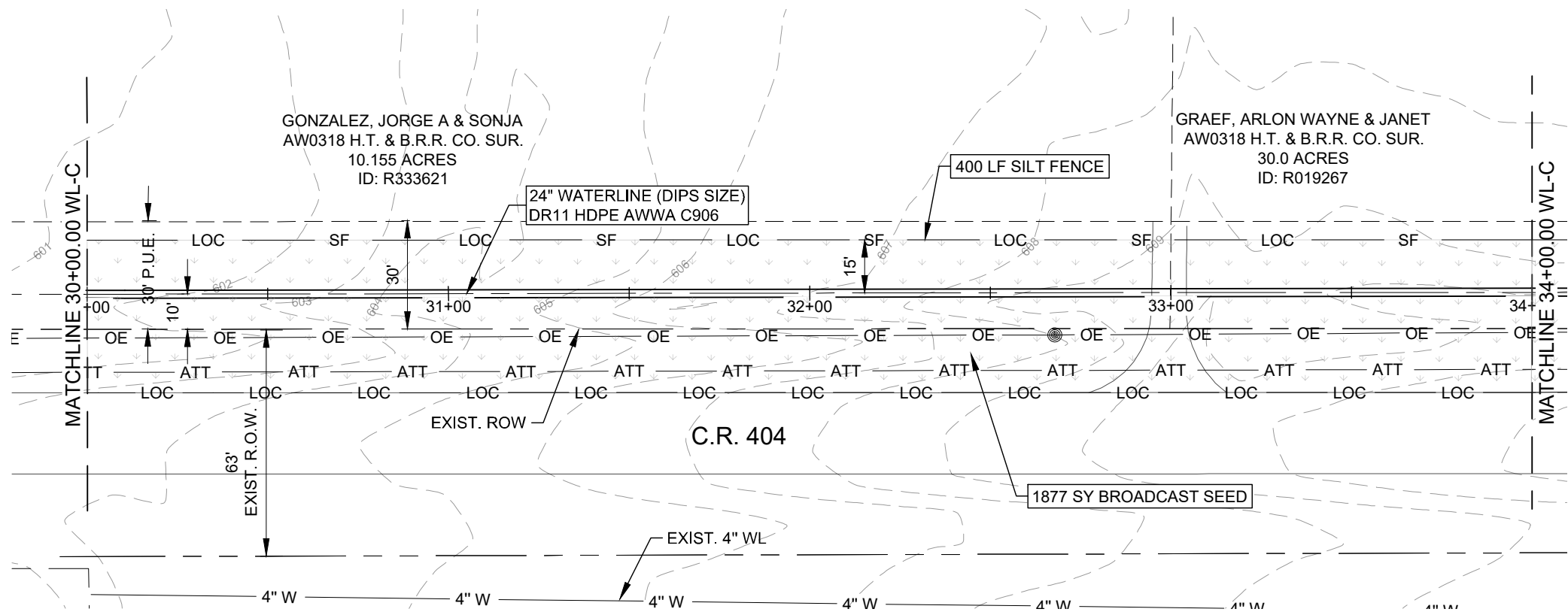


PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
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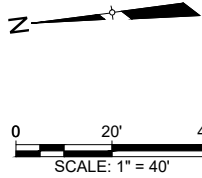
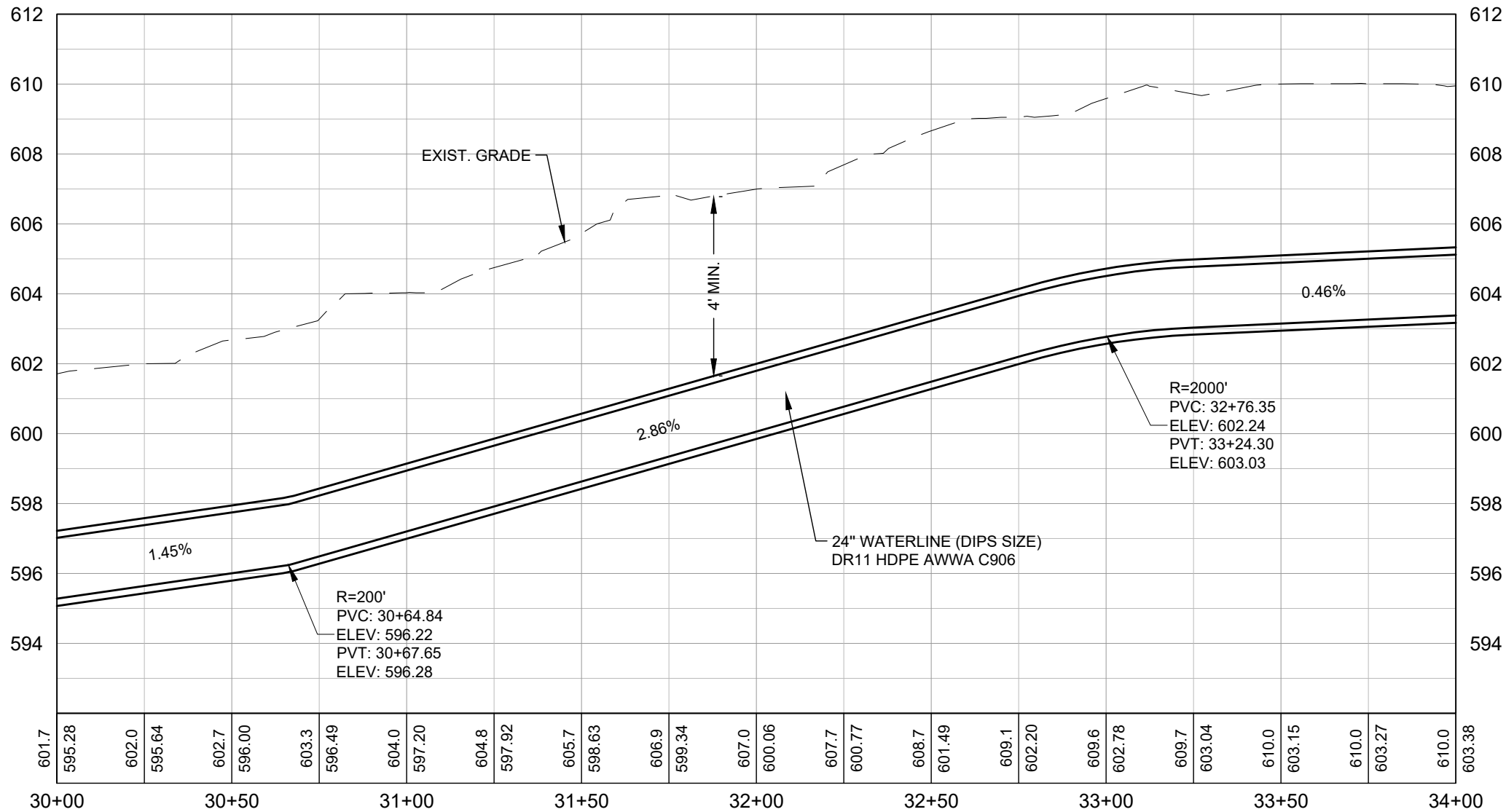


SHEET
C-305
9 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-03.dwg - Tab: 6 - Plotted: 3/28/2022 3:52 PM By: KRISTEN VAN HOOSIER



NOTE:
CONTRACTOR SHALL
PROVIDE ACCESS TO
PRIVATE PROPERTIES
DURING CONSTRUCTION
AND RESTORE TO EQUAL
OR BETTER CONDITIONS
(AS APPLICABLE)



LEGEND	
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---	PR. RIGHT-OF-WAY
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---	LOC LIMITS OF CONS.
---	SF SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
G	EX. GAS LINE
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OC	EX. OVERHEAD CABLE
OH	EX. OVERHEAD UTILITIES
OT	EX. OVERHEAD TELECOM
UT	EX. U.G. TELECOM
UE	EX. U.G. ELECTRIC
X	EX. FENCE
⊗	PR. WATER VALVE
⊕	PR. DRAIN VALVE ASSEMBLY

GENERAL NOTES:

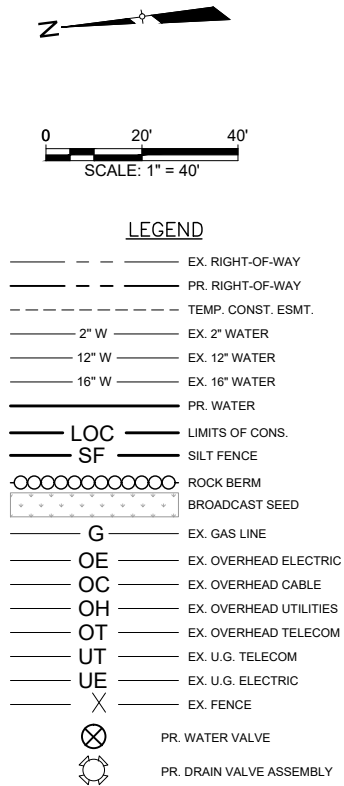
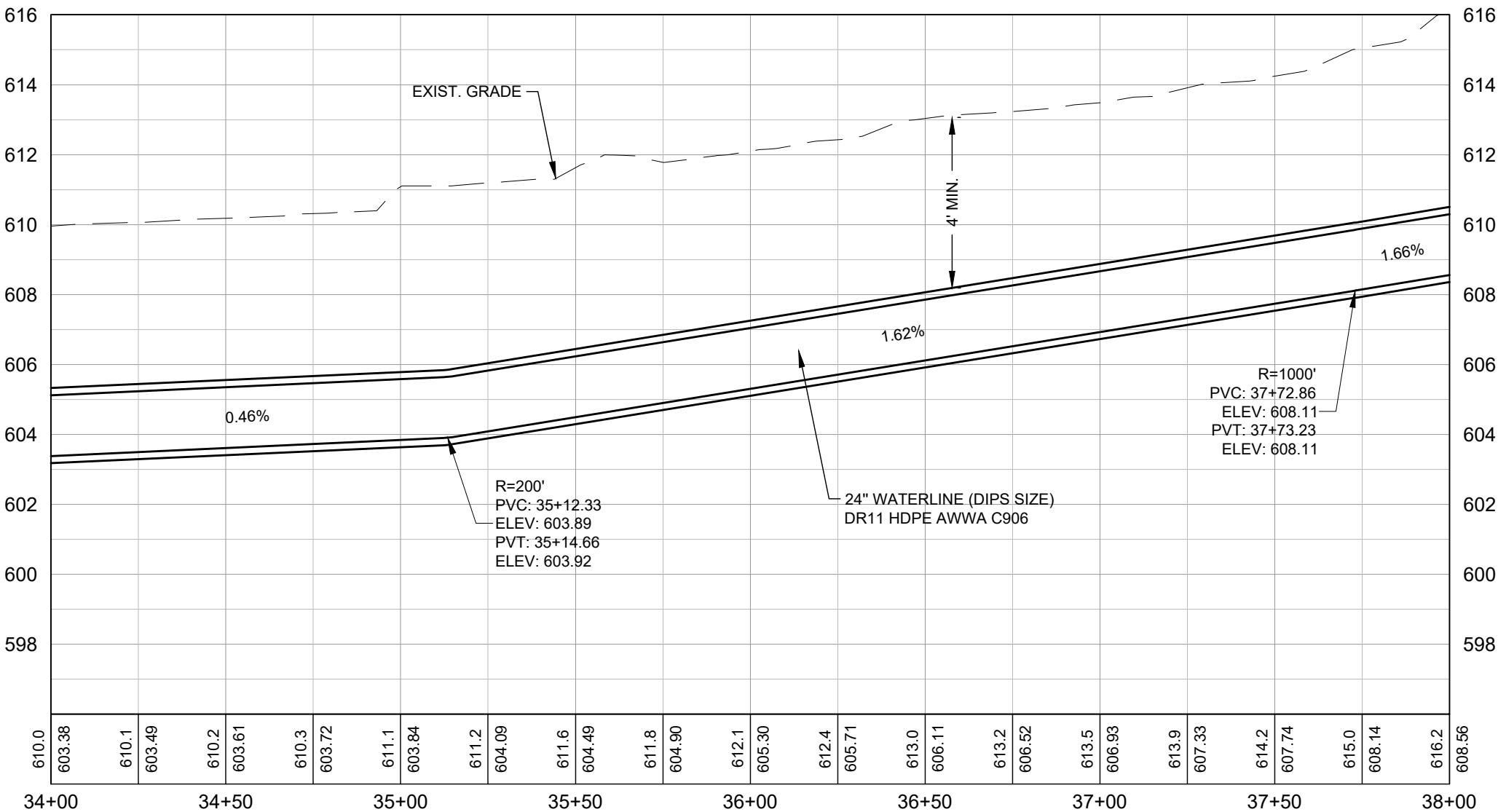
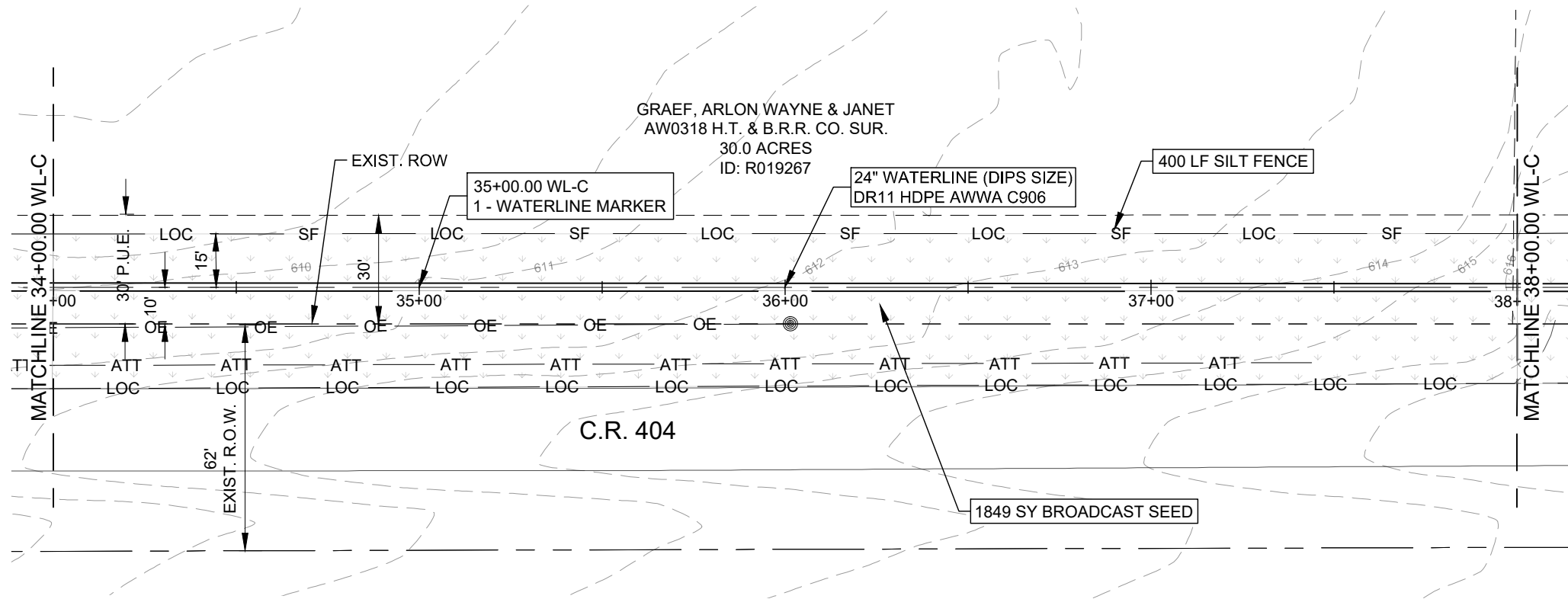
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EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	
CobbFendley ENGINEERS, ARCHITECTS, SURVEYORS 500 EAST HUNTLAND DRIVE, SUITE 100 AUSTIN, TEXAS 78752 512.834.9788 FAX 512.834.7227 WWW.COBBFENDLEY.COM	
WATER LINE C PLAN AND PROFILE 30+00 TO 34+00 CR 404 HUTTO 24" WATER LINE TAYLOR, TEXAS	
WILLIAMSON COUNTY 1848	
PROJ. NO. 1903-099-05-57 DESIGN: H. NEWTON DRAWN: J. HASTINGS CHECK: K. VAN HOOSIER APPR: K. VAN HOOSIER DATE: 3/29/2022	
STATE OF TEXAS KRISTEN VAN HOOSIER 136882 LICENSED PROFESSIONAL ENGINEER 3/30/2022	
SHEET C-306 10 of 66	

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-03.dwg - Tab: 7 - Plotted: 3/28/2022 3:53 PM By: KRISTEN VAN HOOSIER



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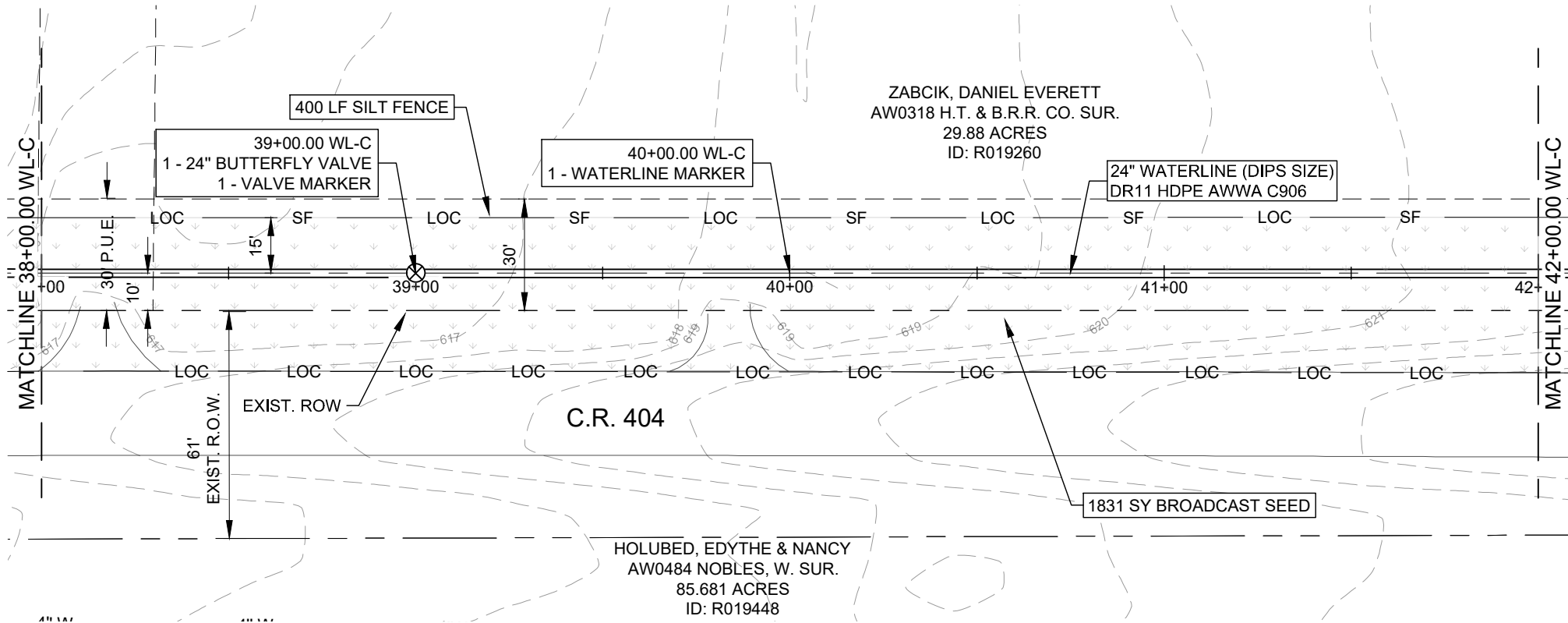
REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE

CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS

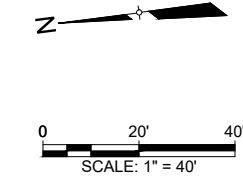
PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET
C-307
11 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-03.dwg - Tab: 8 - Plotted: 3/28/2022 3:53 PM By: KRISTEN VAN HOOSIER

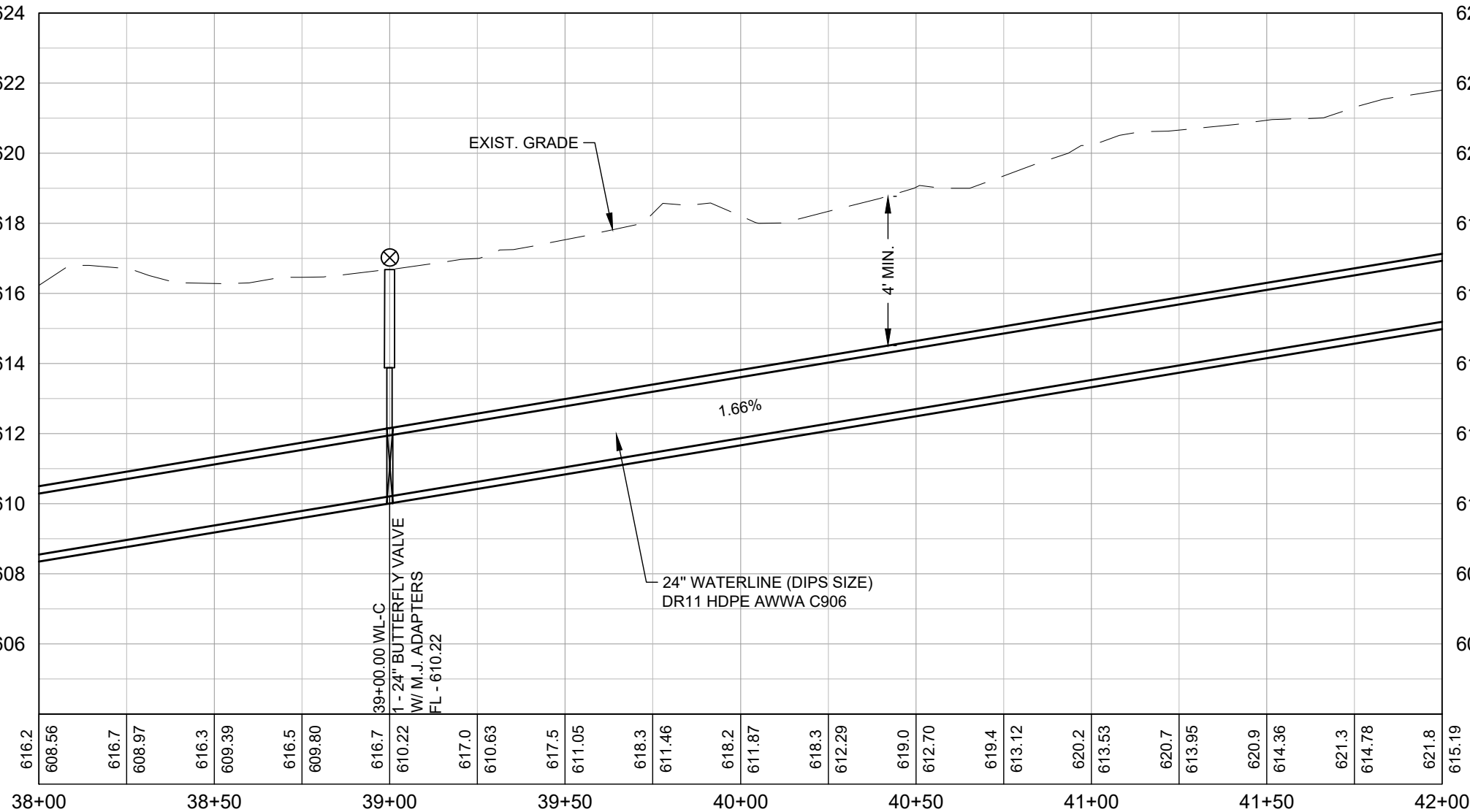


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LEGEND	
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---	PR. RIGHT-OF-WAY
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FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
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WATER LINE C PLAN AND PROFILE
38+00 TO 42+00
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

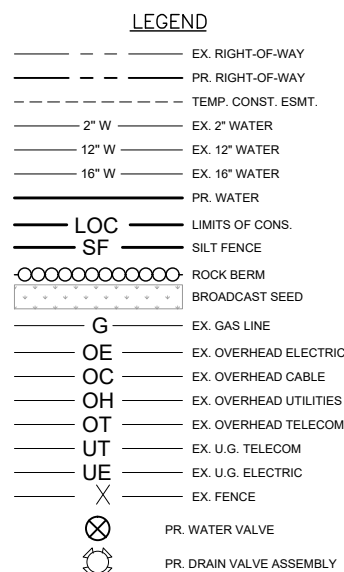
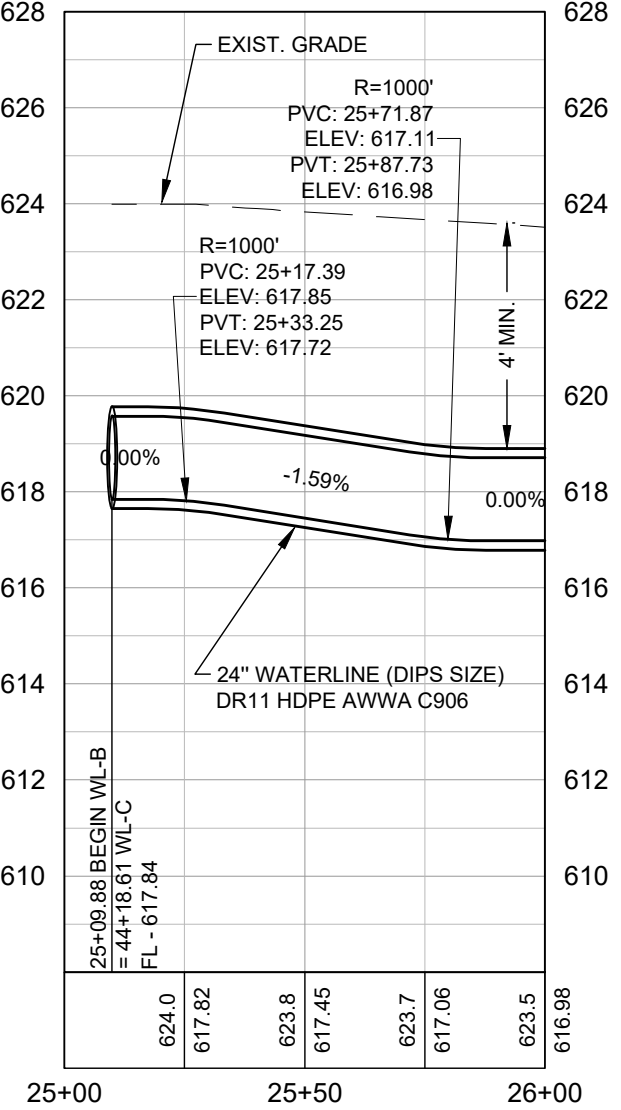
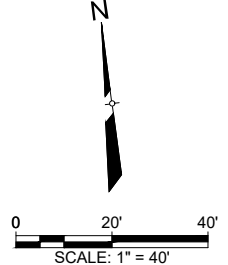
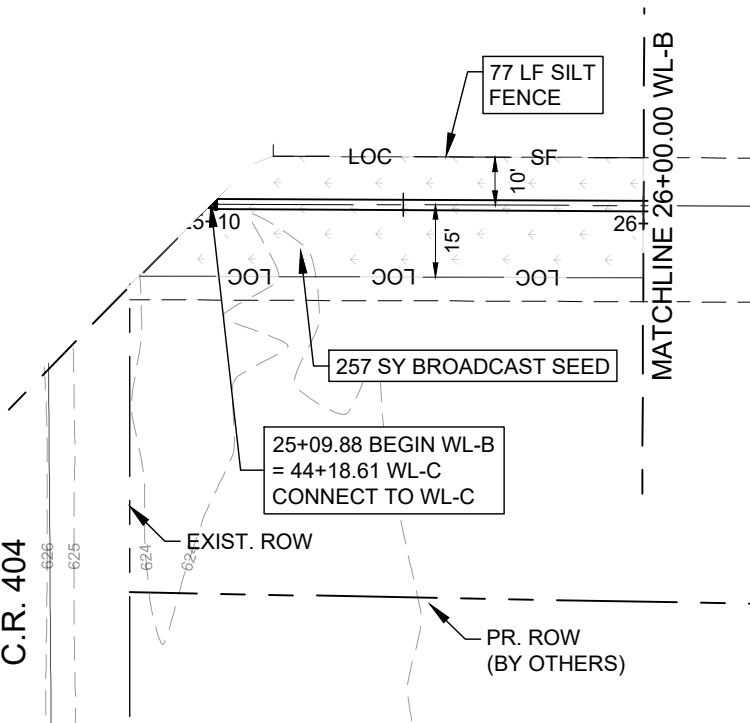
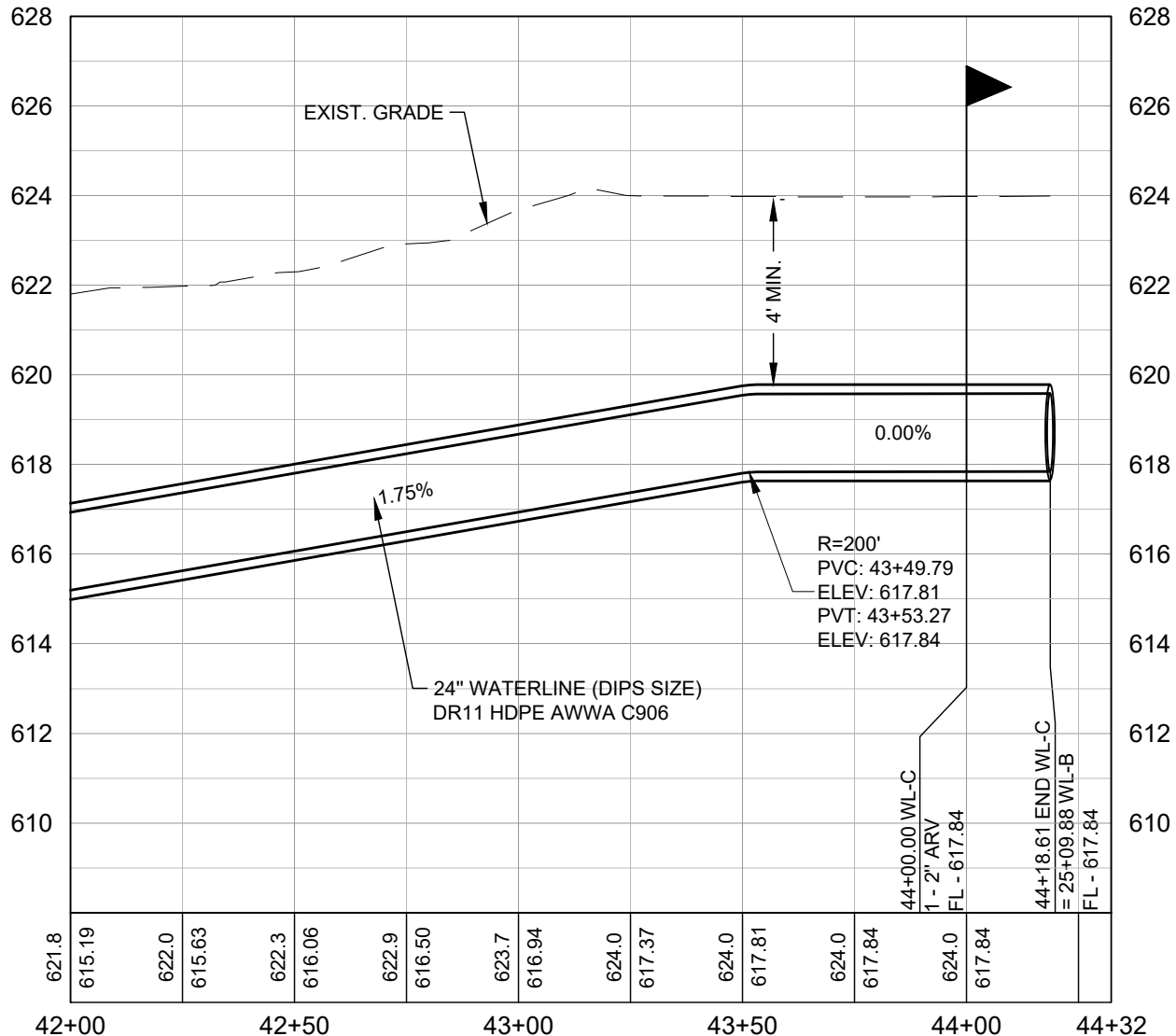
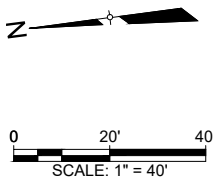
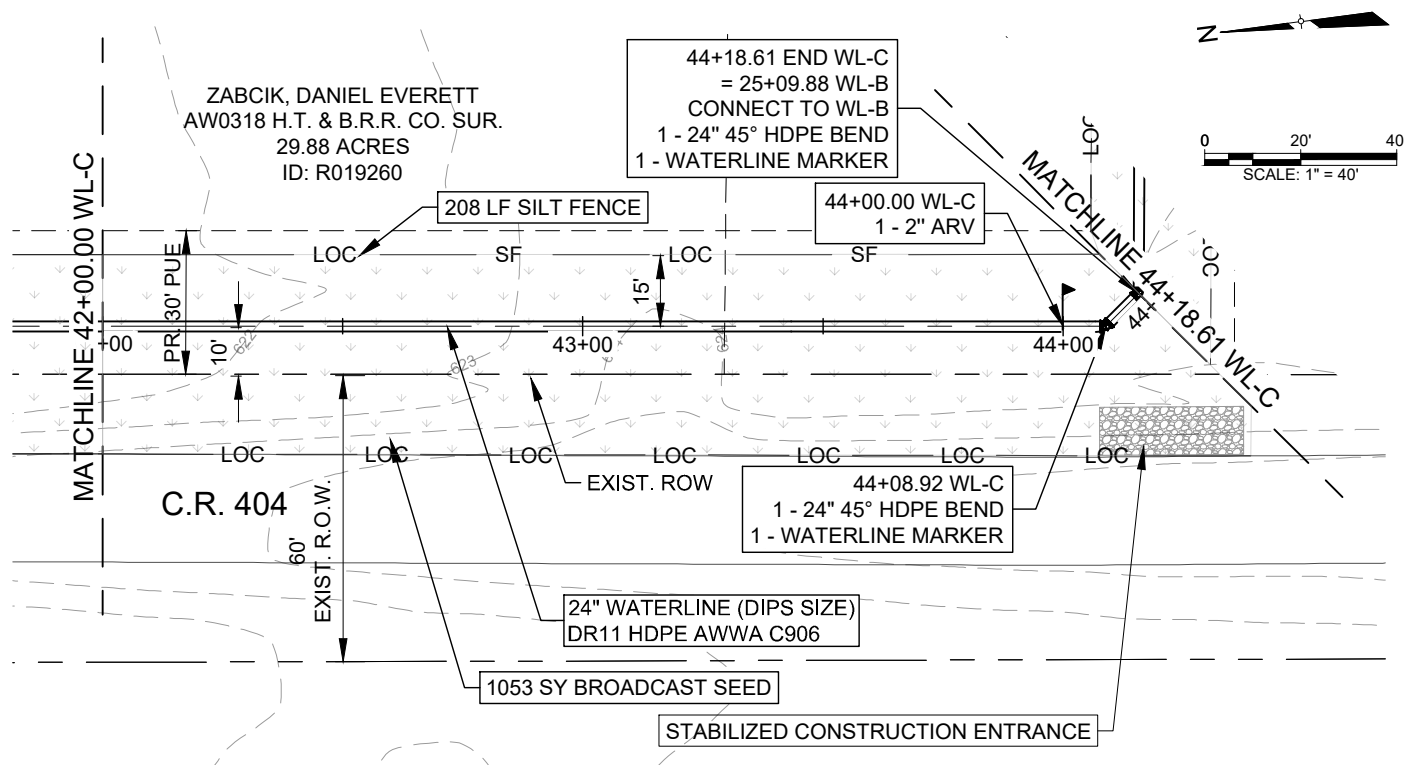


PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
APPR: 3/29/2022

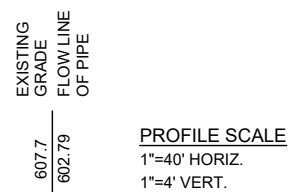


SHEET
C-308
12 of 66

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APPROVED BY: DATE

REVISION DESCRIPTION

REV. NO.

512.834.9788 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

WL C P&P 42+00 TO 44+32.32 - WL B
P&P 25+09.88 TO 26+00
CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS

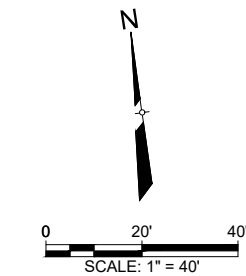
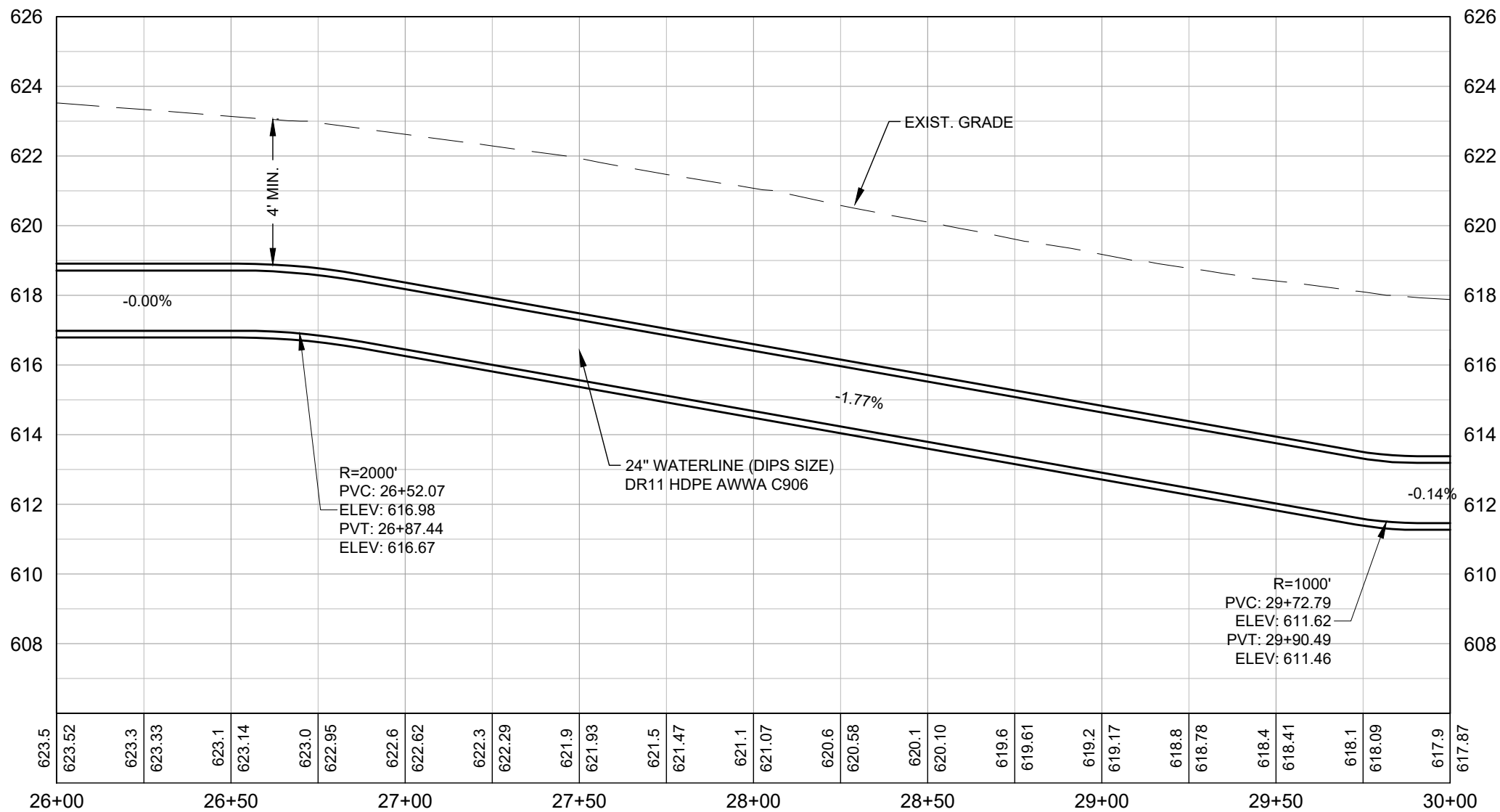
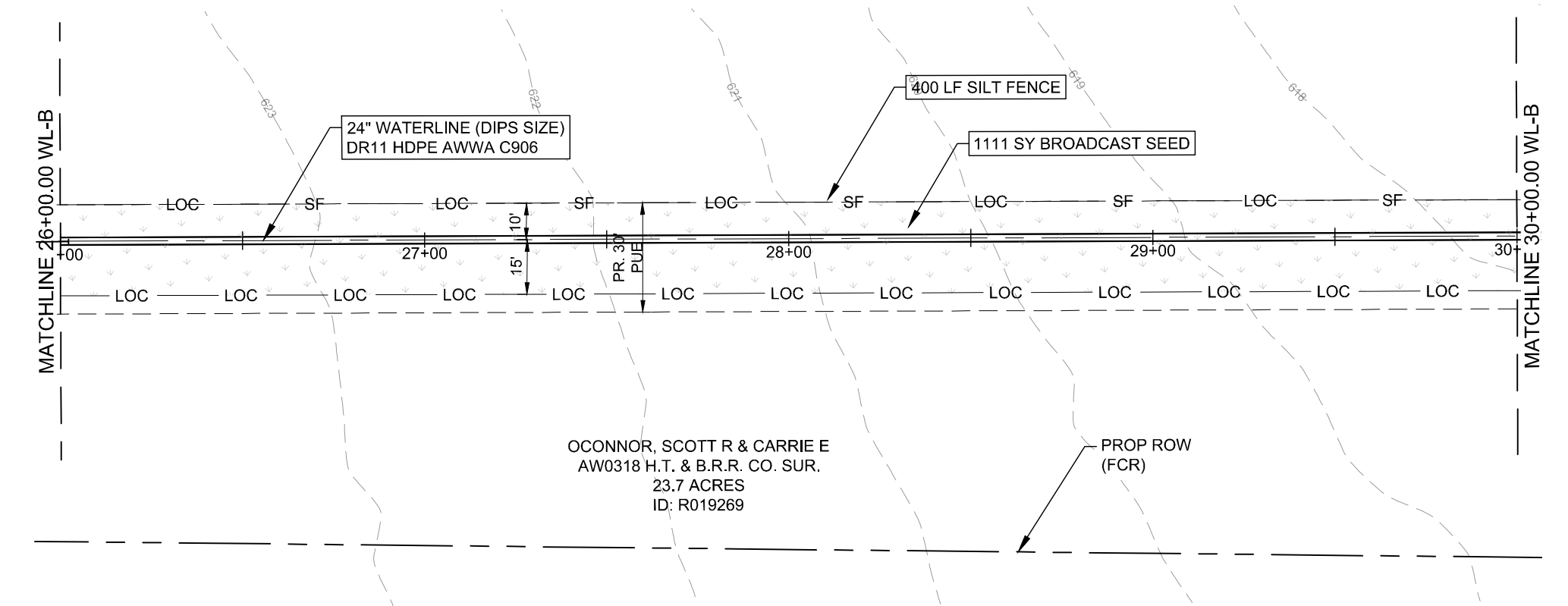
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PROJ. NO: 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
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136882
K. VAN HOOSIER
3/30/2022

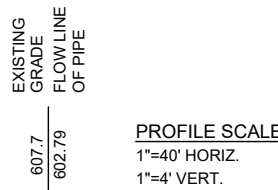
SHEET
C-309
13 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-04.dwg - Tab: 10 - Plotted: 3/28/2022 3:57 PM By: KRISTEN VAN HOOSIER



LEGEND	
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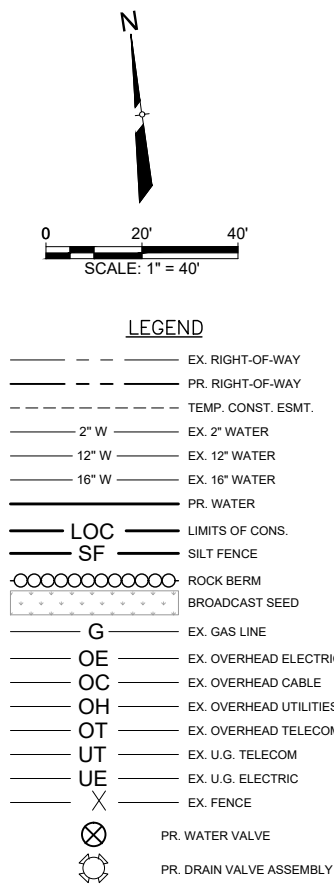
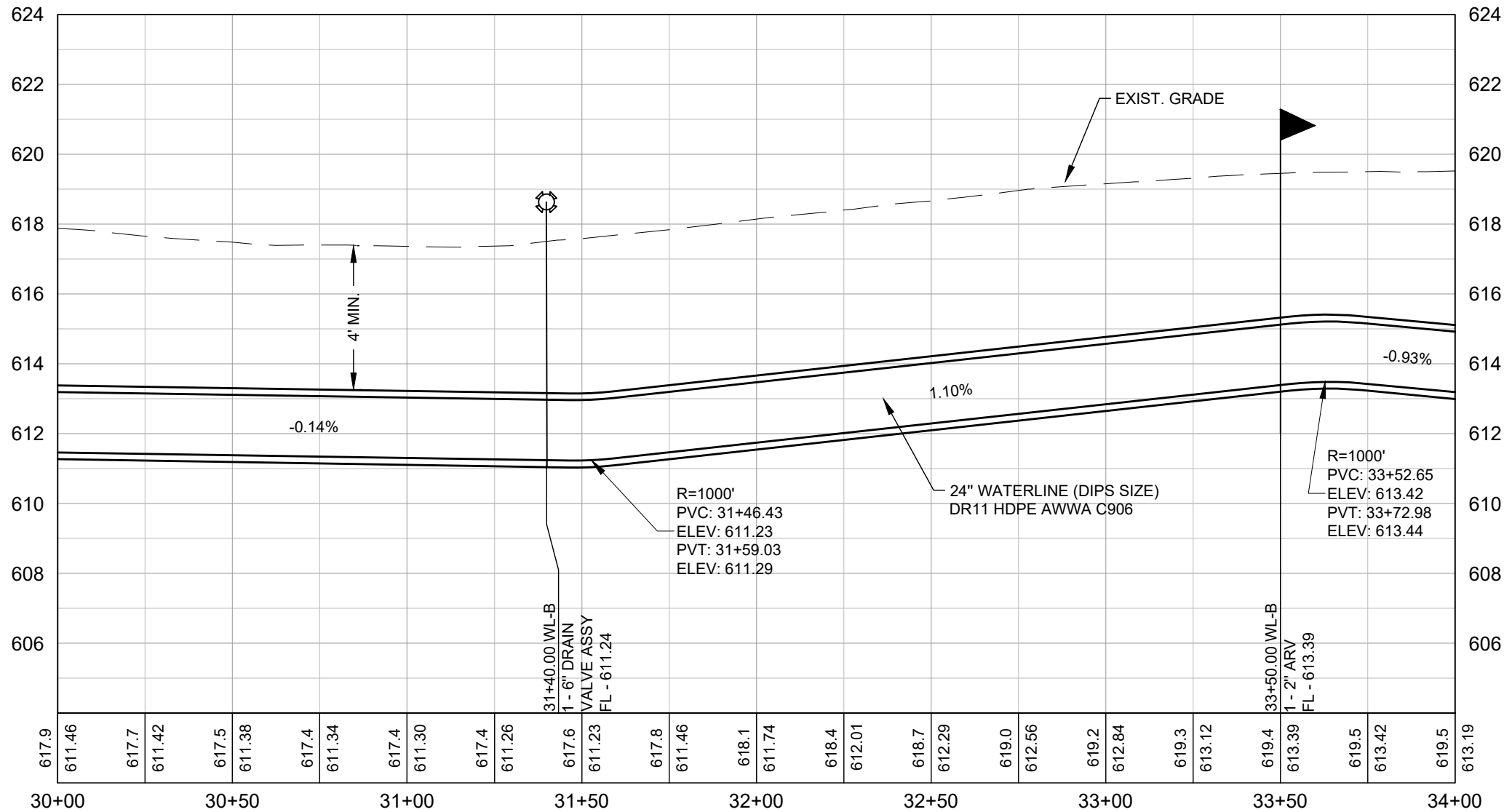
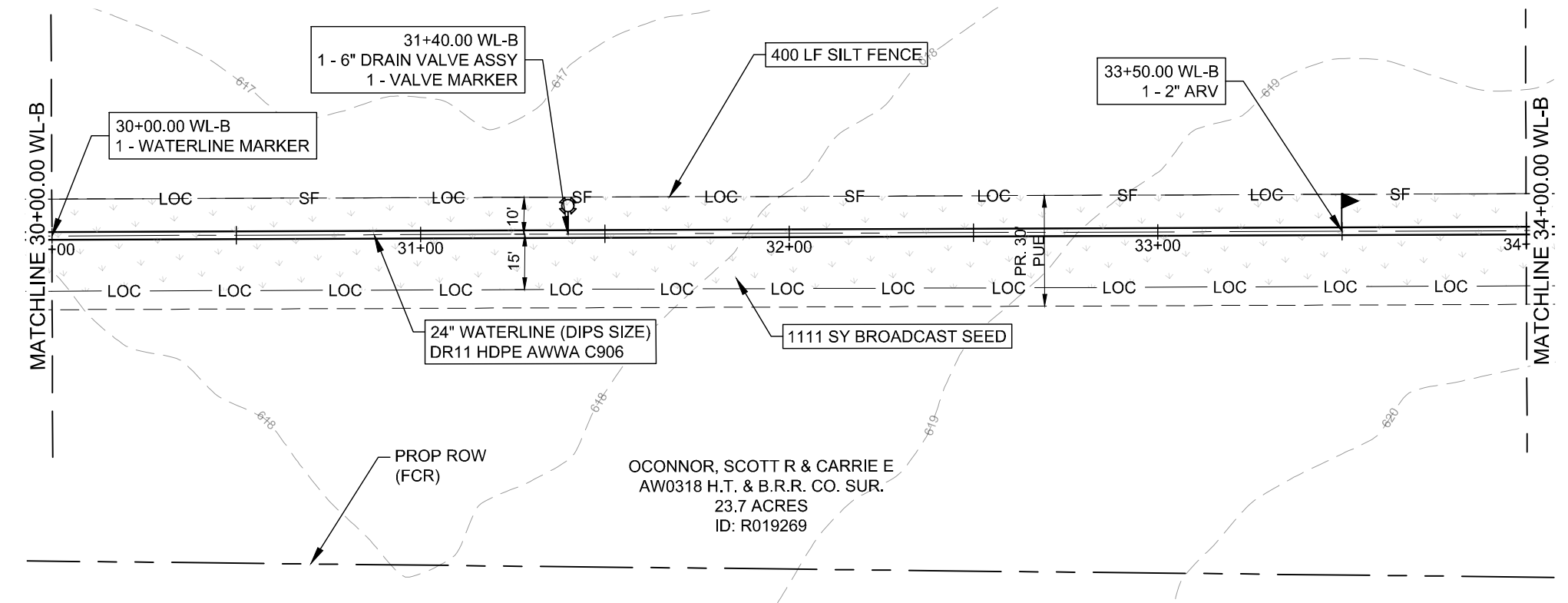
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REVISION DESCRIPTION	
REV. NO.	

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO. 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
APPR: 3/29/2022

SHEET
C-310
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Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-04.dwg - Tab: 11 - Plotted: 3/28/2022 3:57 PM By: KRISTEN VAN HOOSIER



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REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE

CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS

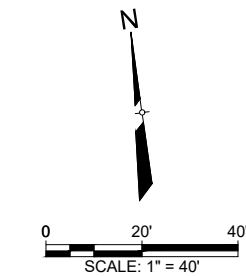
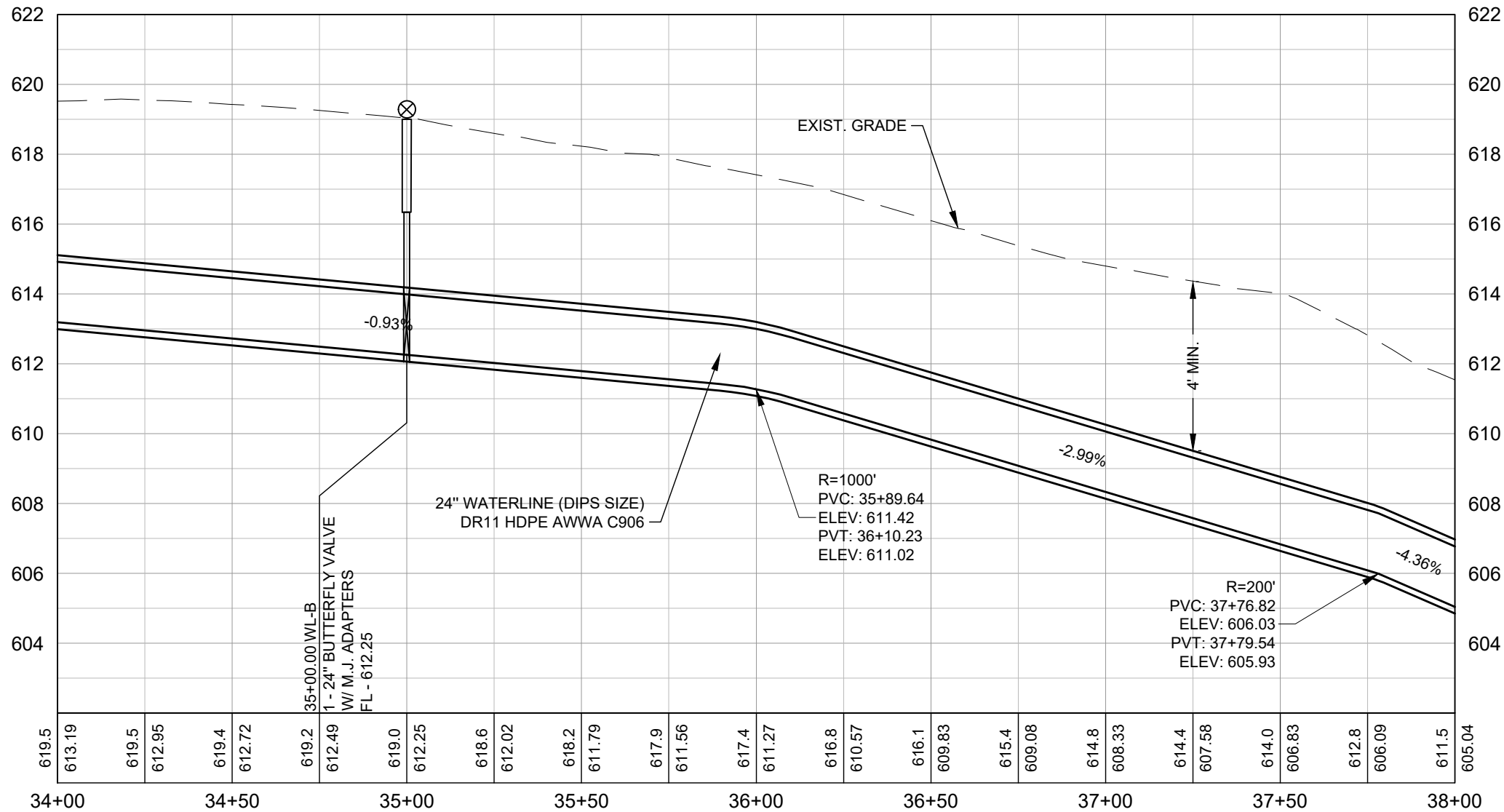
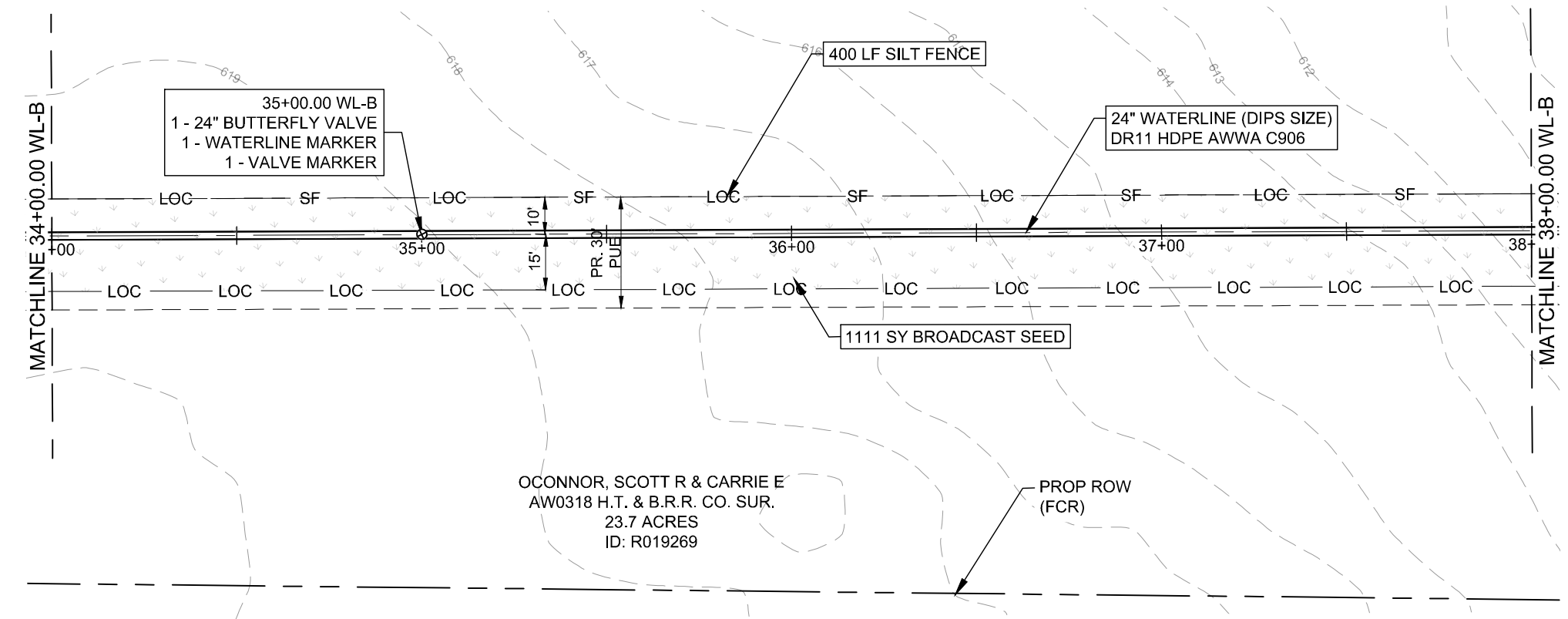
WILLIAMSON COUNTY
1848

PROJ. NO. 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
APPR: K. VAN HOOSIER
DATE: 3/29/2022

STATE OF TEXAS
K. VAN HOOSIER
136882
LICENSED PROFESSIONAL ENGINEER
3/30/2022

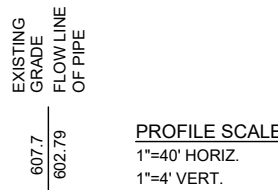
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C-311
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Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-04.dwg - Tab: 12 - Plotted: 3/28/2022 3:58 PM By: KRISTEN VAN HOOSIER



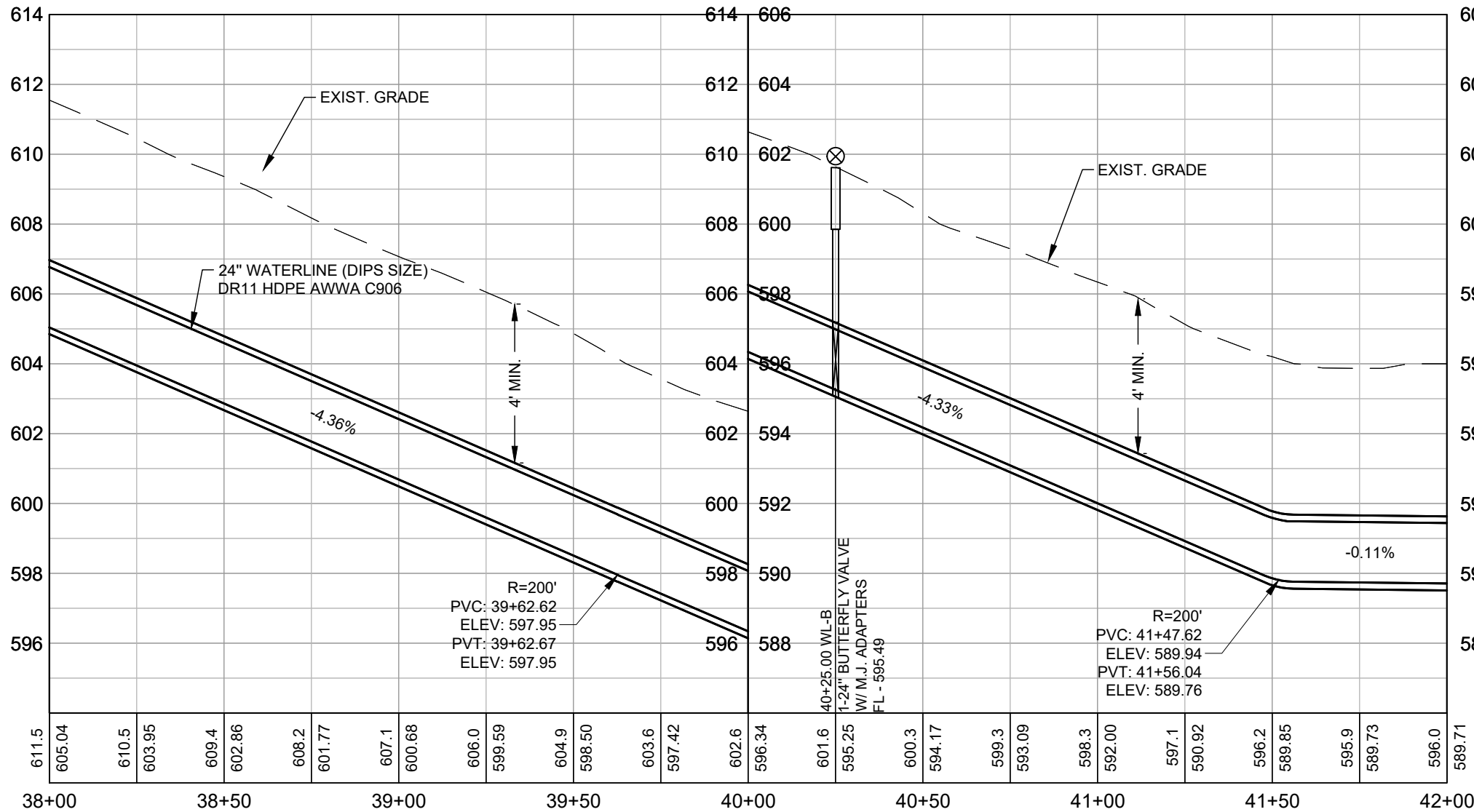
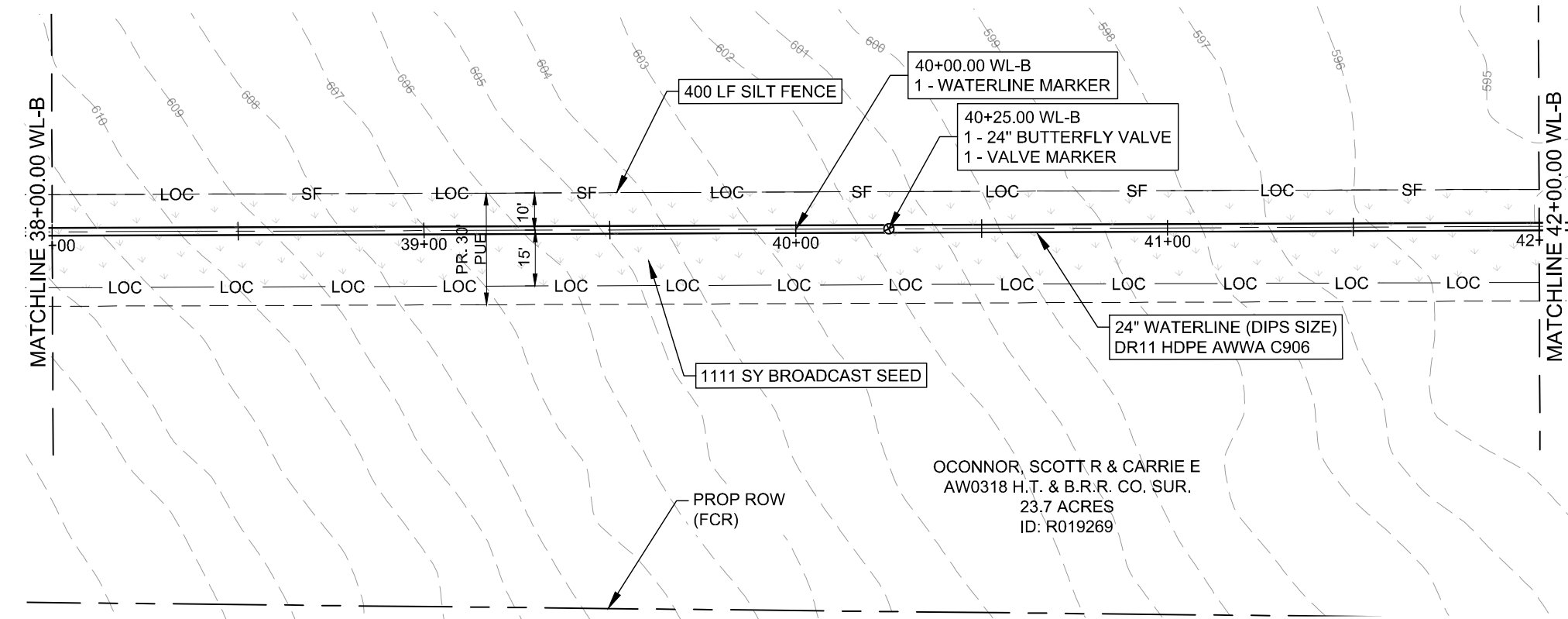
LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	ROCK BERM
---	BROADCAST SEED
---	G
---	OE
---	OC
---	OH
---	OT
---	UT
---	UE
---	EX. FENCE
---	PR. WATER VALVE
---	PR. DRAIN VALVE ASSEMBLY

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APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	
CobbPendley 1000 E. 27th Ave., Suite 100 500 East Huntland Drive, Suite 100 Austin, Texas 78752 512.834.9798 FAX 512.834.7727 WWW.COBBPENDLEY.COM	
WATER LINE B PLAN AND PROFILE 34+00 TO 38+00 CR 404 Hutto 24" WATER LINE TAYLOR, TEXAS	
WILLIAMSON COUNTY 1848	
PROJ. NO: 1903-099-05-57 DESIGN: H. BYRNE DRAWN: J. HASTINGS CHECK: K. VAN HOOSIER APPR: 3/29/2022	
STATE OF TEXAS KRISTEN VAN HOOSIER 136882 LICENSED PROFESSIONAL ENGINEER 3/30/2022	
SHEET C-312 16 of 66	

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-04.dwg - Tab: 13 - Plotted: 3/28/2022 3:58 PM By: KRISTEN VAN HOOSIER



LEGEND

---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	ROCK BERM
---	BROADCAST SEED
---	G
---	OE
---	OC
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EXISTING GRADE

FLOW LINE

OF PIPE

PROFILE SCALE

1"=40' HORIZ.

1"=4' VERT.

APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

WATER LINE B PLAN AND PROFILE

38+00 TO 42+00

CR 404 Hutto TO 24" WATER LINE TAYLOR, TEXAS

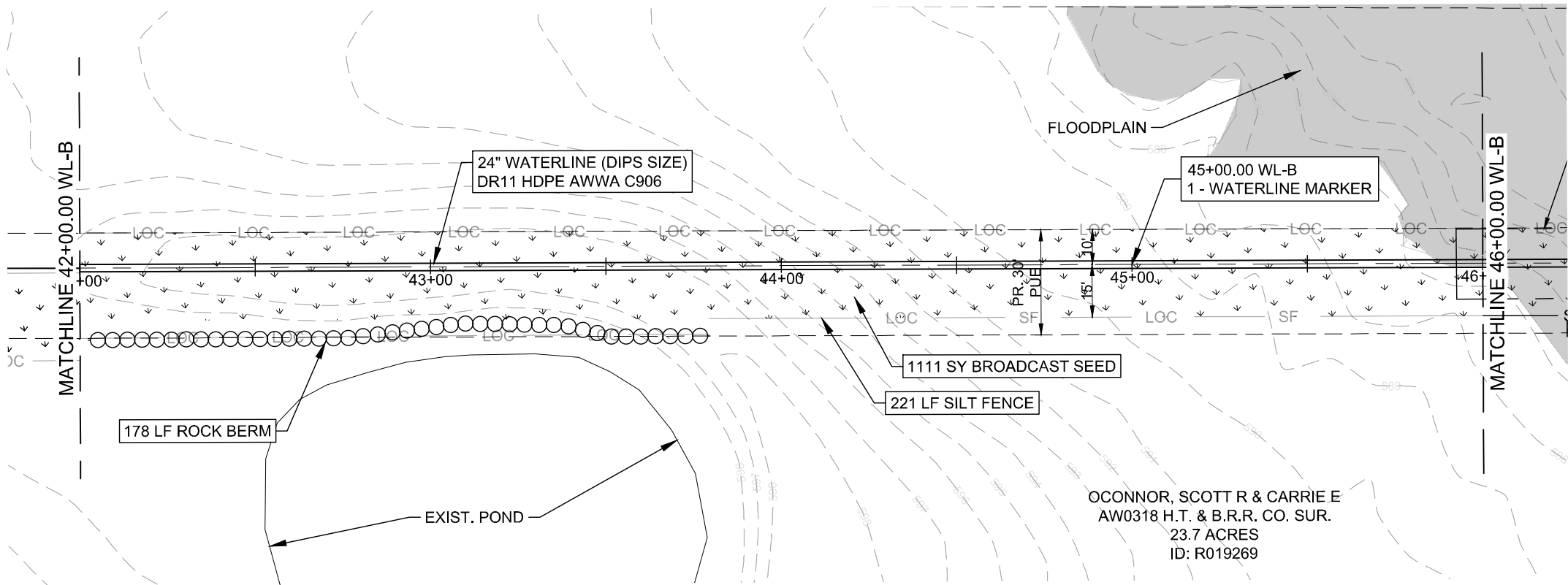
PROJ. NO: 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: H. BYRNE
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET

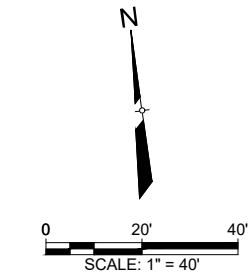
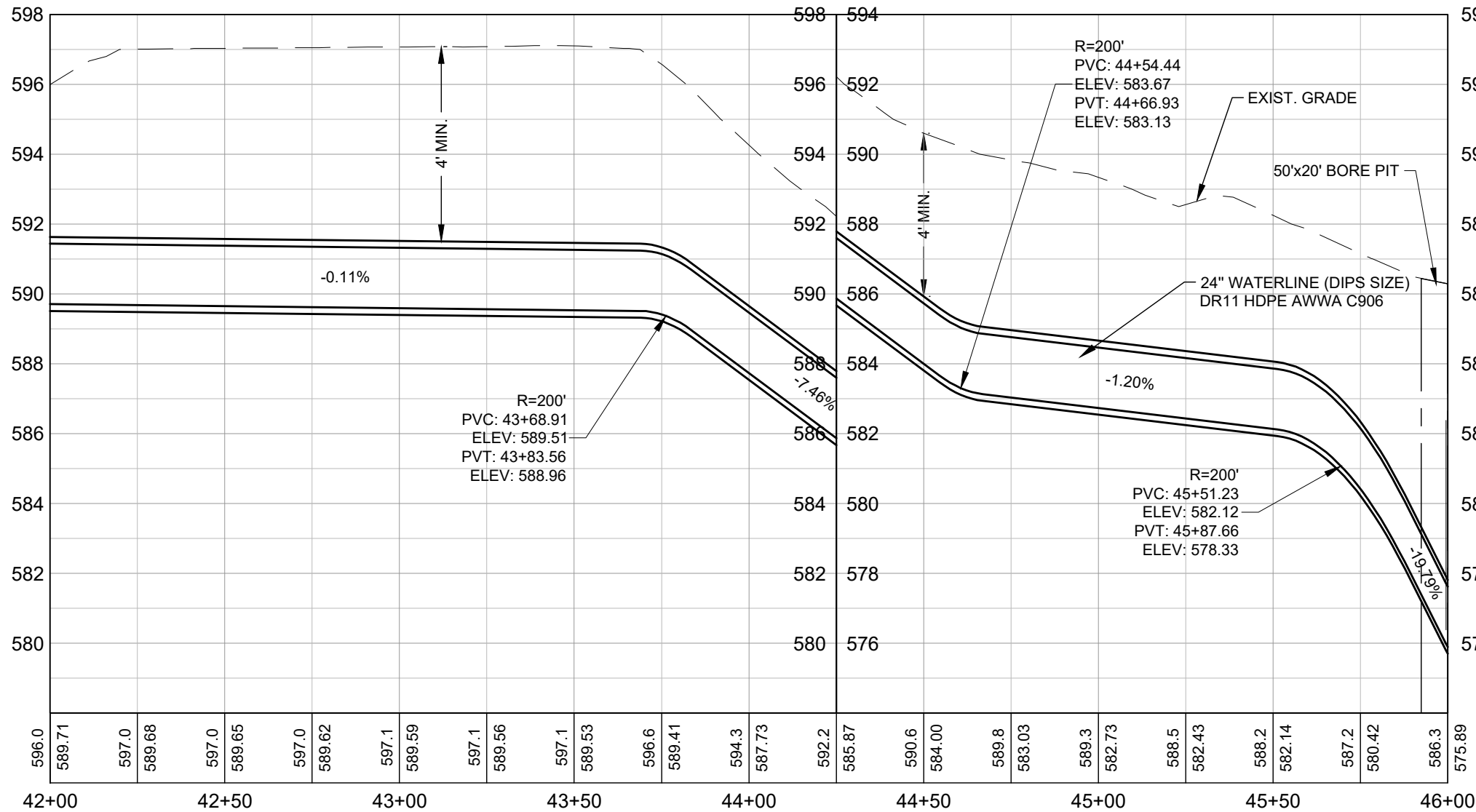
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Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-05.dwg - Tab: 14 - Plotted: 3/28/2022 4:00 PM By: KRISTEN VAN HOOSIER



O'CONNOR, SCOTT R & CARRIE E
AW0318 H.T. & B.R.R. CO. SUR.
23.7 ACRES
ID: R019269



LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	2" W EX. 2" WATER
---	12" W EX. 12" WATER
---	16" W EX. 16" WATER
---	PR. WATER
---	LOC LIMITS OF CONS.
---	SF SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
G	EX. GAS LINE
OE	EX. OVERHEAD ELECTRIC
OC	EX. OVERHEAD CABLE
OH	EX. OVERHEAD UTILITIES
OT	EX. OVERHEAD TELECOM
UT	EX. U.G. TELECOM
UE	EX. U.G. ELECTRIC
X	EX. FENCE
⊗	PR. WATER VALVE
⊕	PR. DRAIN VALVE ASSEMBLY

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EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.



WATER LINE B PLAN AND PROFILE
42+00 TO 46+00
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

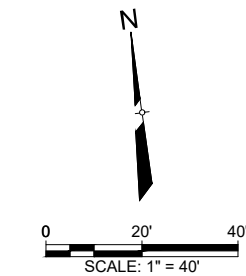
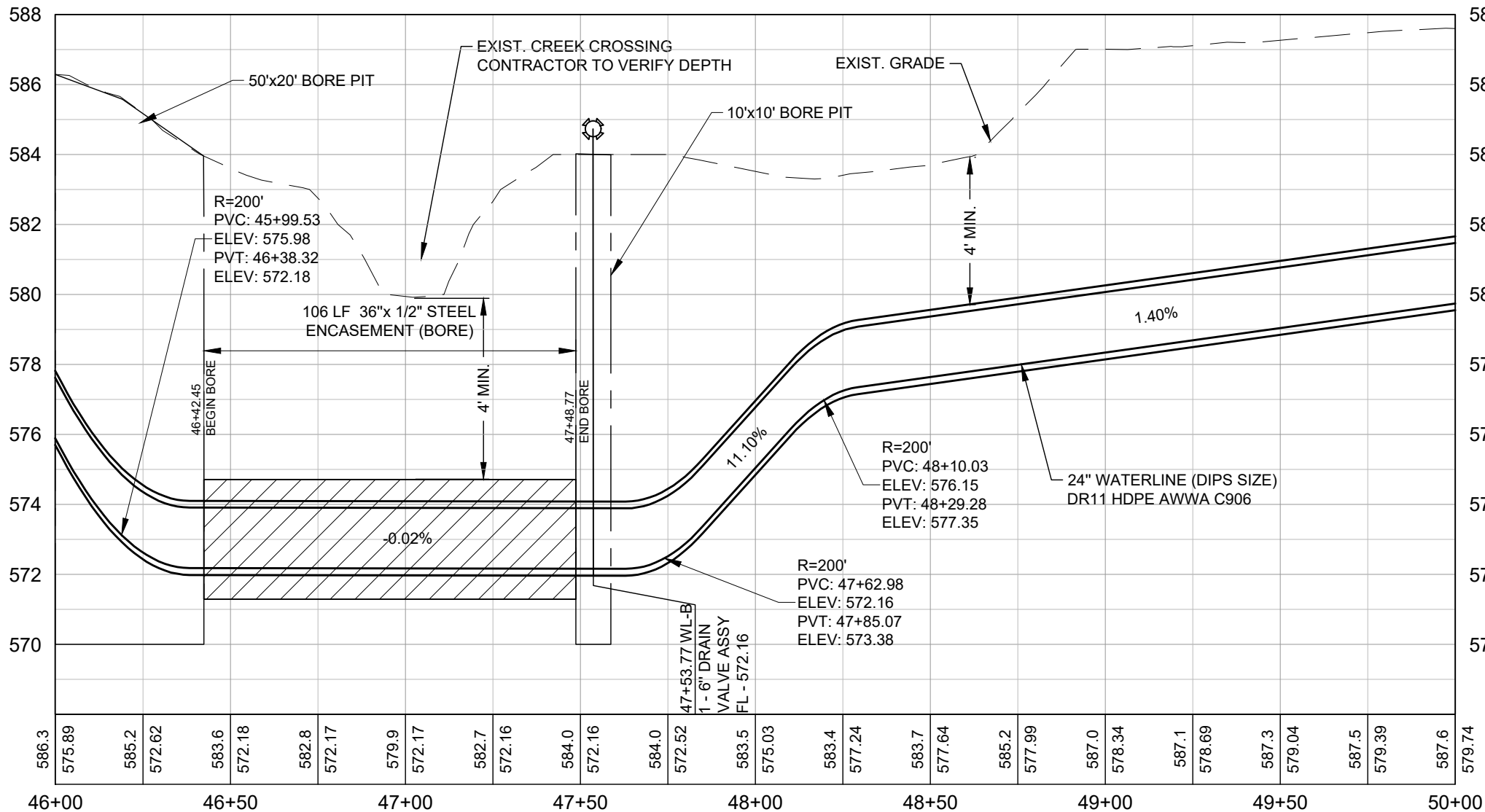
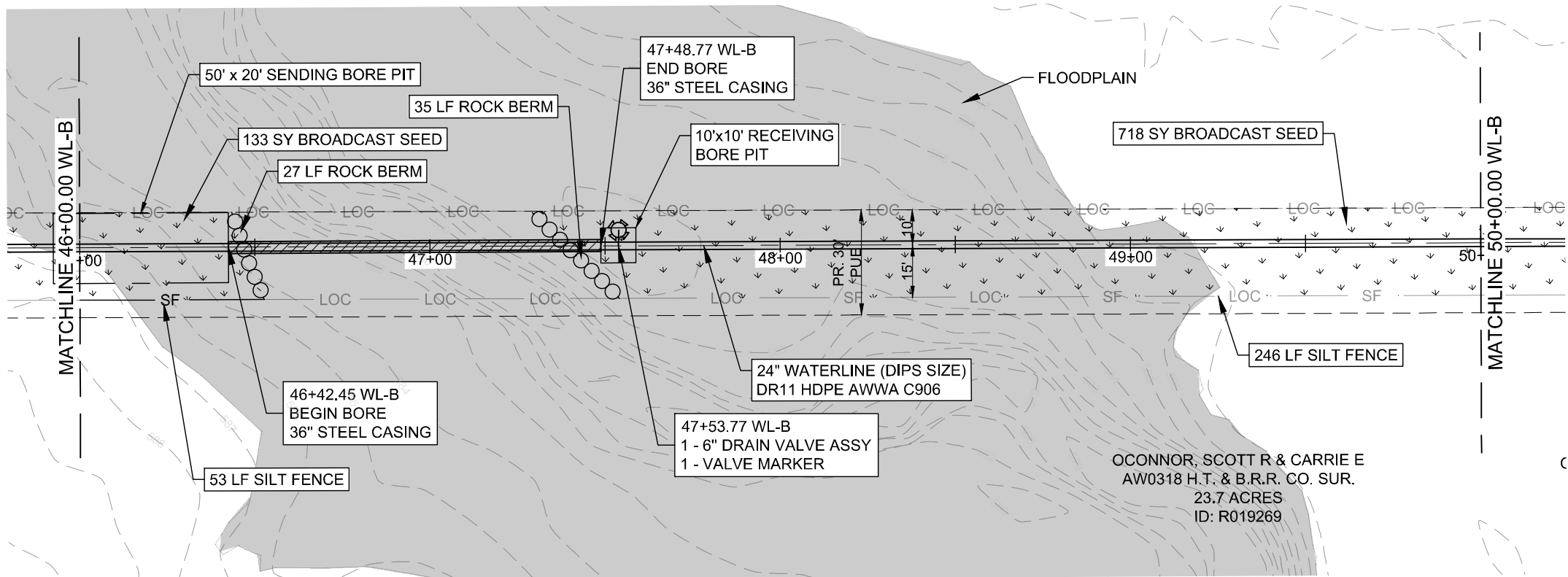


PROJ. NO. 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
APPR: 3/29/2022



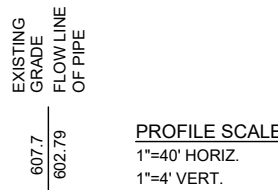
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LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LIMITS OF CONS.
---	SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
---	EX. GAS LINE
---	EX. OVERHEAD ELECTRIC
---	EX. OVERHEAD CABLE
---	EX. OVERHEAD UTILITIES
---	EX. OVERHEAD TELECOM
---	EX. U.G. TELECOM
---	EX. U.G. ELECTRIC
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REVISION DESCRIPTION

REV. NO.

CobbFendley
500 EAST HUNTINGLAND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9788 FAX 512.834.7727
WWW.COBBFENDLEY.COM

WILLIAMSON COUNTY
1848

PROJ. NO. 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
APPR: K. VAN HOOSIER
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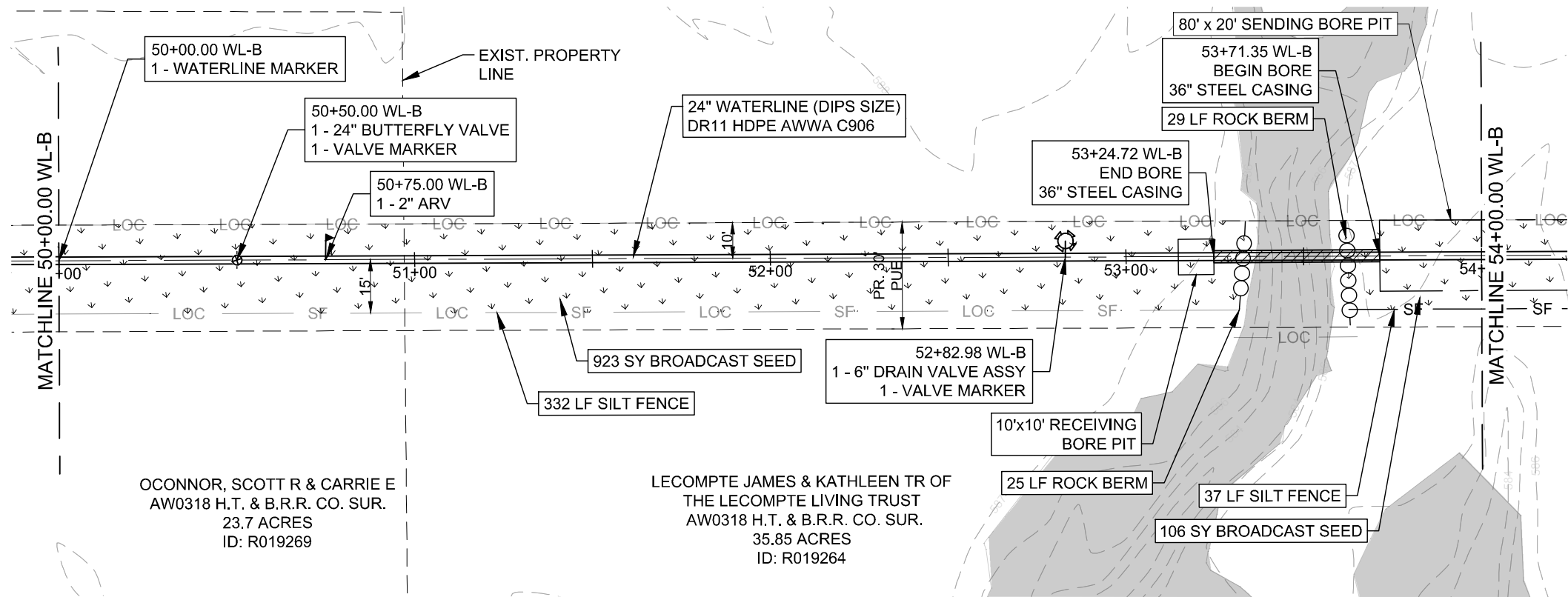
STATE OF TEXAS
KRISTEN VAN HOOSIER
136882
LICENSED PROFESSIONAL ENGINEER
3/30/2022

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C-315
19 of 66

WATER LINE B PLAN AND PROFILE
46+00 TO 50+00

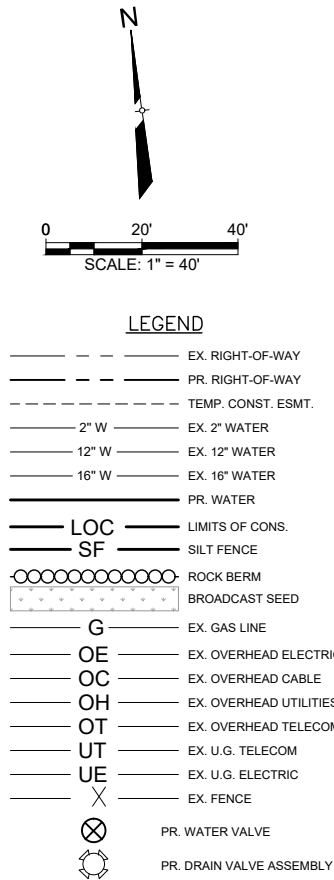
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-05.dwg - Tab: 16 - Plotted: 3/28/2022 4:01 PM By: KRISTEN VAN HOOSIER



OCONNOR, SCOTT R & CARRIE E
AW0318 H.T. & B.R.R. CO. SUR.
23.7 ACRES
ID: R019269

LECOMPTTE JAMES & KATHLEEN TR OF
THE LECOMPTTE LIVING TRUST
AW0318 H.T. & B.R.R. CO. SUR.
35.85 ACRES
ID: R019264



GENERAL NOTES:

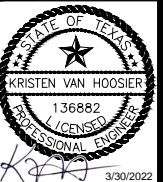
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WATER LINE B PLAN AND PROFILE
50+00 TO 54+00
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

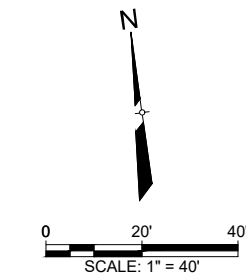
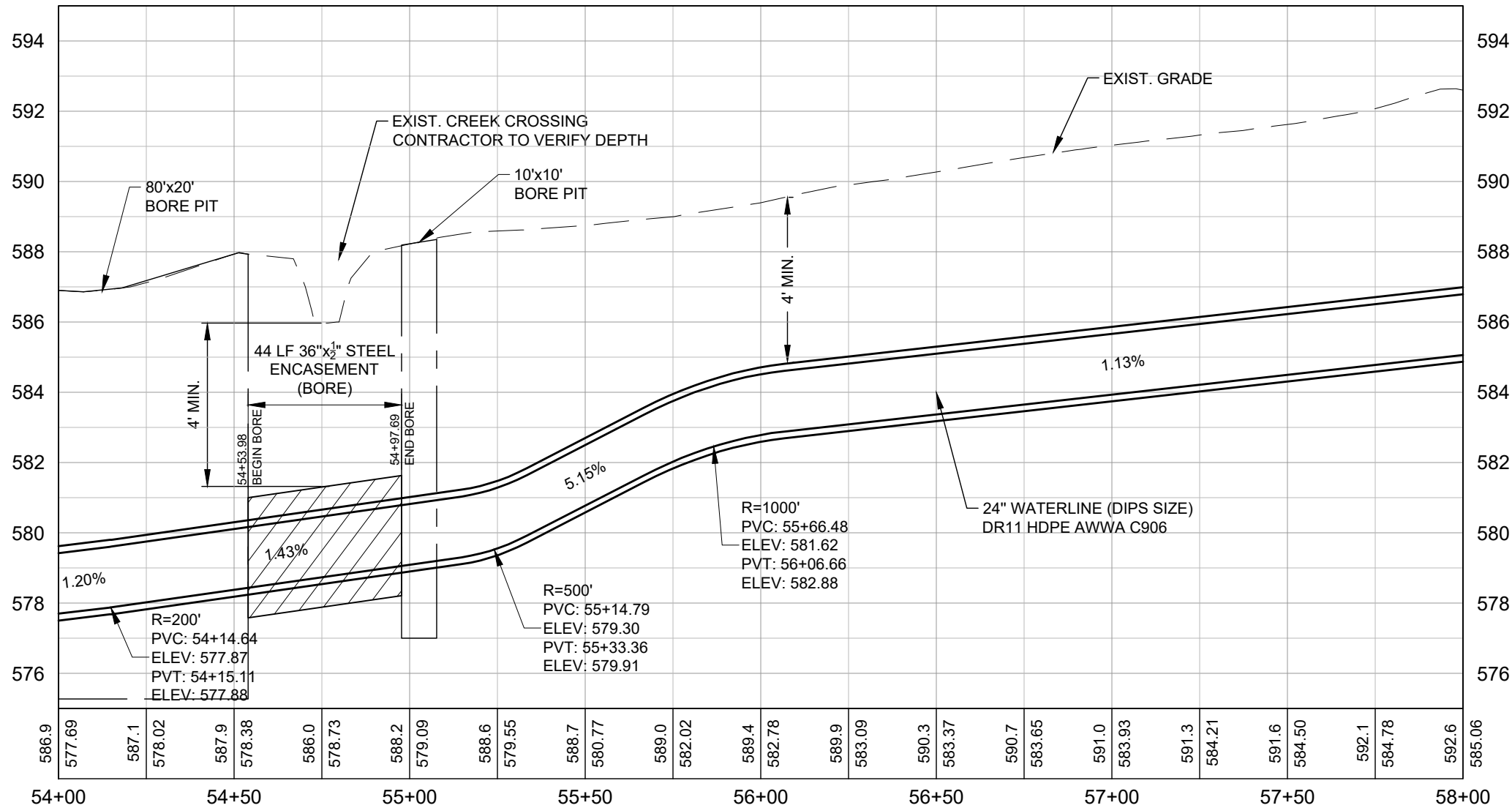
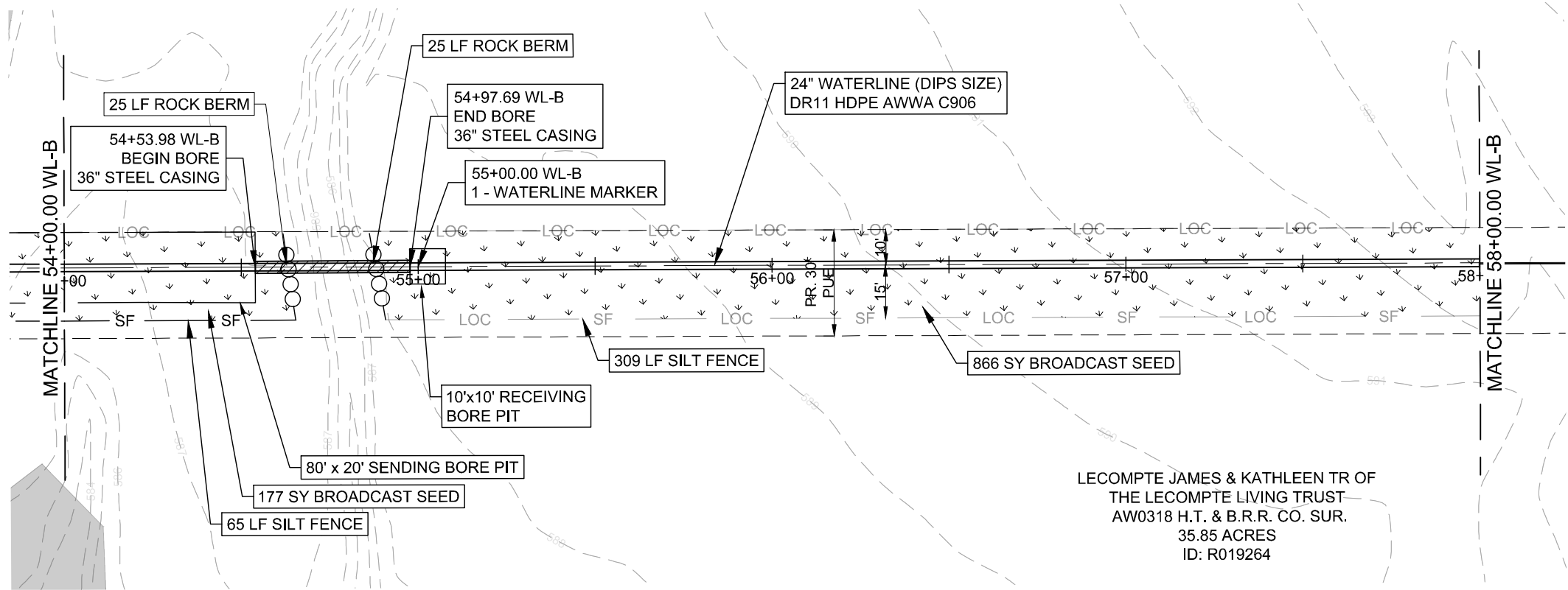


PROJ. NO: 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
DATE: 3/29/2022



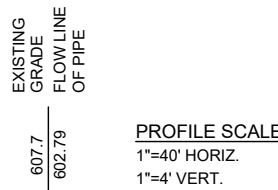
SHEET
C-316
20 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-05.dwg - Tab: 17 - Plotted: 3/28/2022 4:01 PM By: KRISTEN VAN HOOSIER



LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	LIMITS OF CONS.
---	SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
---	G
---	EX. GAS LINE
---	OE
---	EX. OVERHEAD ELECTRIC
---	OC
---	EX. OVERHEAD CABLE
---	OH
---	EX. OVERHEAD UTILITIES
---	OT
---	EX. OVERHEAD TELECOM
---	UT
---	EX. U.G. TELECOM
---	UE
---	EX. U.G. ELECTRIC
---	X
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---	PR. DRAIN VALVE ASSEMBLY

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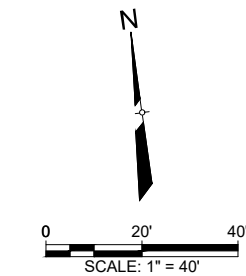
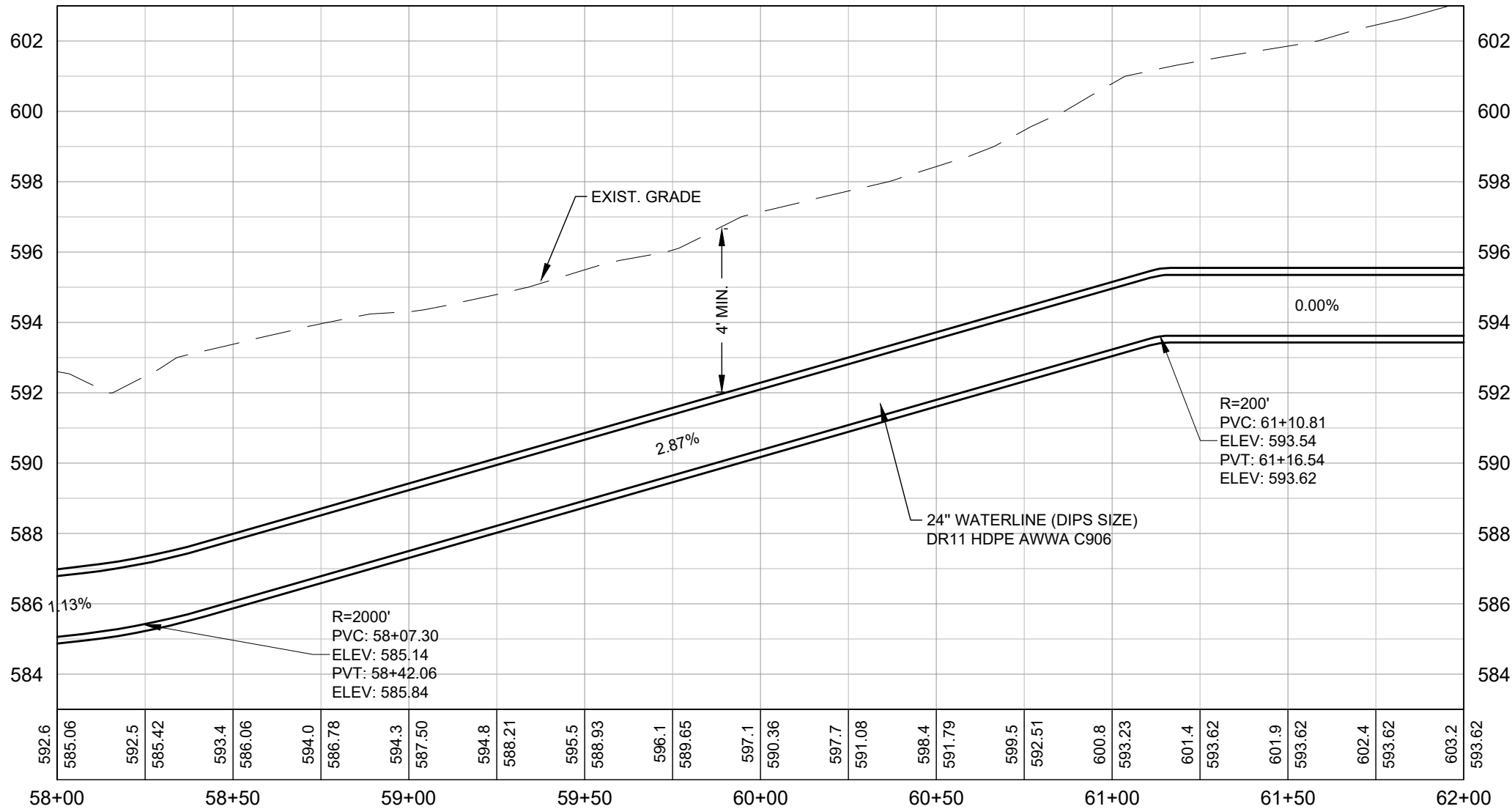
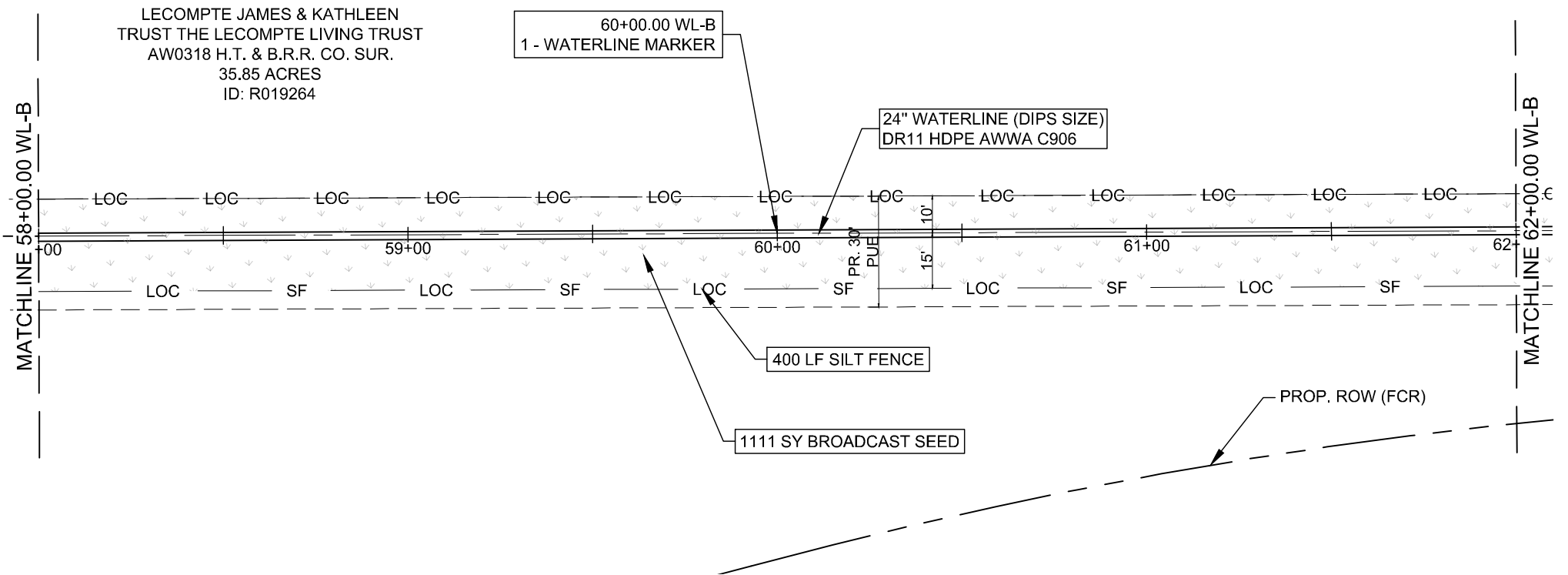
APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO: 1903-099-05-57
DESIGN: H. BYRNE
DRAWN: J. HASTINGS
CHECK: K. VAN HOOSIER
APPR: 3/29/2022

SHEET
C-317
21 of 66

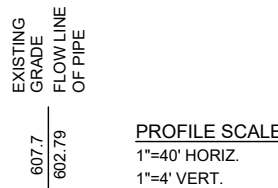
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LEGEND

---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	2" W EX. 2" WATER
---	12" W EX. 12" WATER
---	16" W EX. 16" WATER
---	PR. WATER
---	LOC LIMITS OF CONS.
---	SF SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
---	G EX. GAS LINE
---	OE EX. OVERHEAD ELECTRIC
---	OC EX. OVERHEAD CABLE
---	OH EX. OVERHEAD UTILITIES
---	OT EX. OVERHEAD TELECOM
---	UT EX. U.G. TELECOM
---	UE EX. U.G. ELECTRIC
---	X EX. FENCE
---	PR. WATER VALVE
---	PR. DRAIN VALVE ASSEMBLY

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APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

CobbFendley
ENGINEERS, ARCHITECTS, PLANNERS
500 EAST HUNTLAND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

WATER LINE B PLAN AND PROFILE
58+00 TO 62+00
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

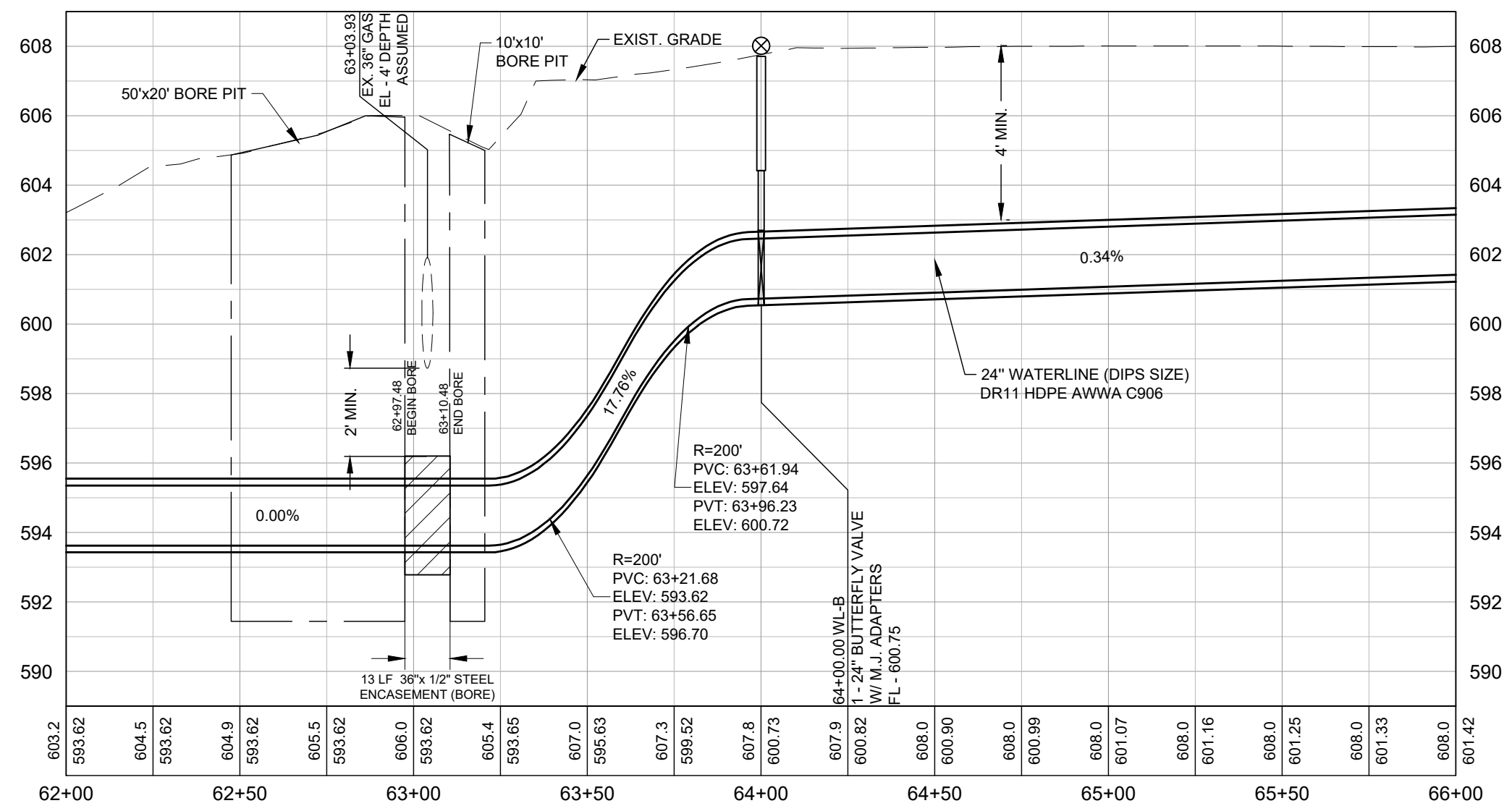
WILLIAMSON COUNTY
1848

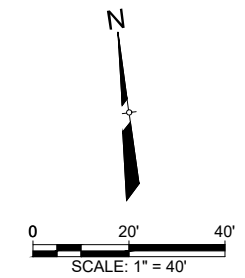
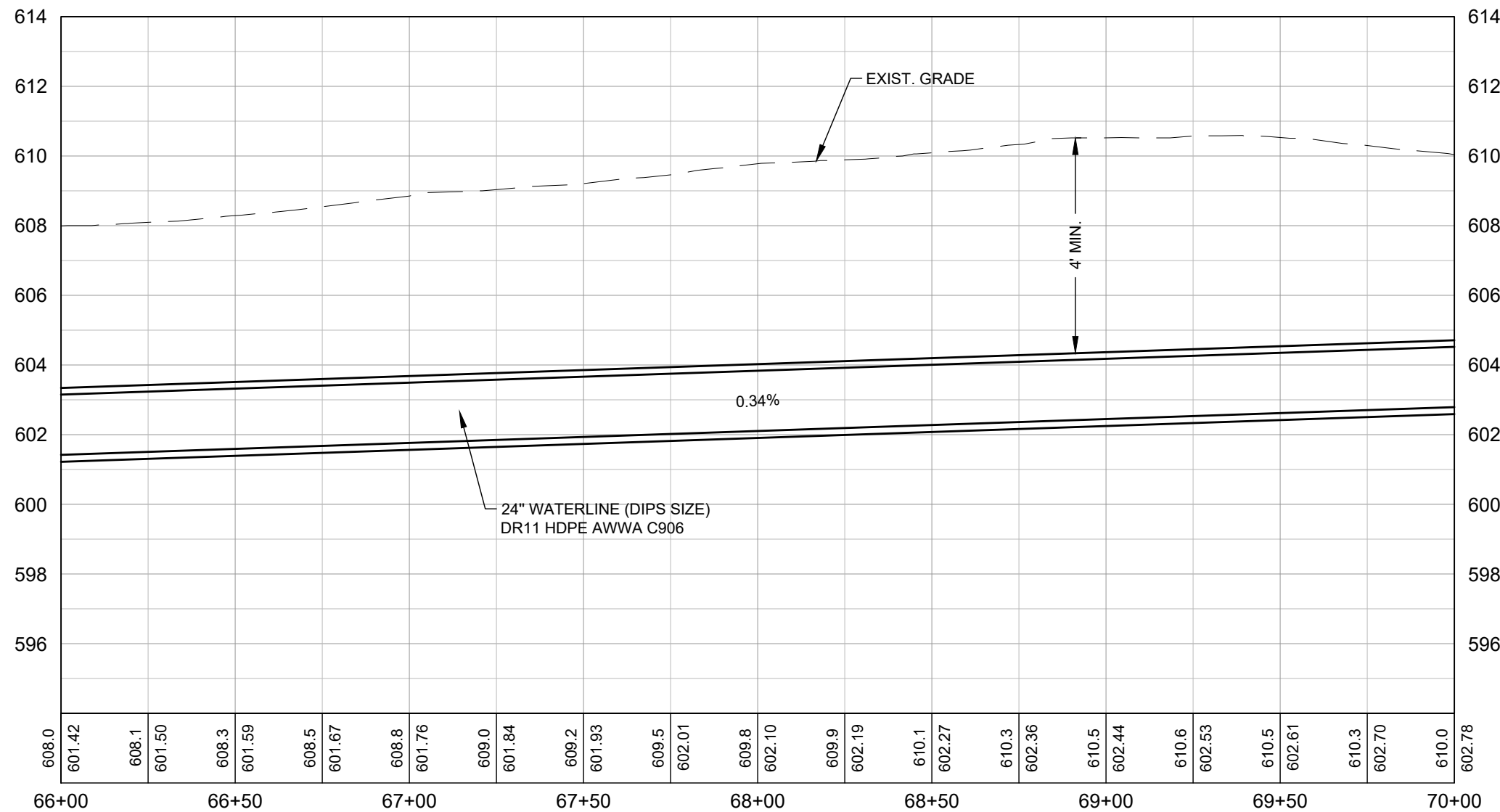
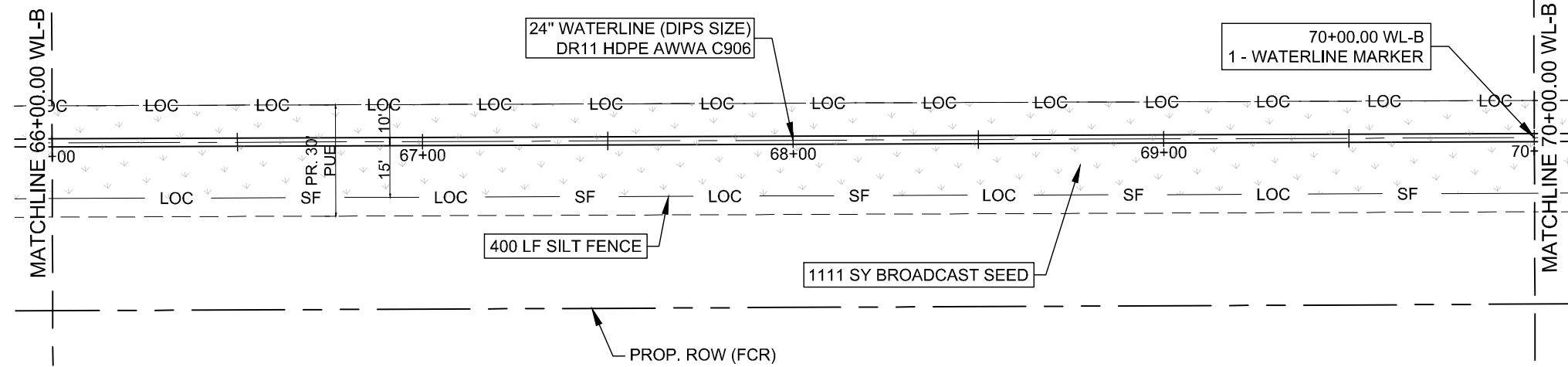
PROJ. NO: 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: J. HASTINGS
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

STATE OF TEXAS
K. VAN HOOSIER
136882
LICENSED PROFESSIONAL ENGINEER
3/30/2022




THESE DESIGN DOCUMENTS ARE NOT TO BE USED FOR CONSTRUCTION PRIOR TO REGULATORY SIGNATURE AND PERMIT.

SHEET
C-318
22 of 66





LEGEND

- | | |
|---|--------------------------|
| ————— | EX. RIGHT-OF-WAY |
| ————— | PR. RIGHT-OF-WAY |
| ----- | TEMP. CONST. ESMT. |
| ————— 2" W ————— | EX. 2" WATER |
| ————— 12" W ————— | EX. 12" WATER |
| ————— 16" W ————— | EX. 16" WATER |
| ————— | PR. WATER |
| —— LOC —— | LIMITS OF CONS. |
| —— SF —— | SILT FENCE |
| ○○○○○○○○○○ | ROCK BERM |
|  | BROADCAST SEED |
| —— G —— | EX. GAS LINE |
| —— OE —— | EX. OVERHEAD ELECTRIC |
| —— OC —— | EX. OVERHEAD CABLE |
| —— OH —— | EX. OVERHEAD UTILITIES |
| —— OT —— | EX. OVERHEAD TELECOM |
| —— UT —— | EX. U.G. TELECOM |
| —— UE —— | EX. U.G. ELECTRIC |
| —— X —— | EX. FENCE |
|  | PR. WATER VALVE |
|  | PR. DRAIN VALVE ASSEMBLY |

GENERAL NOTES:

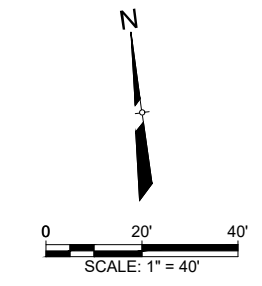
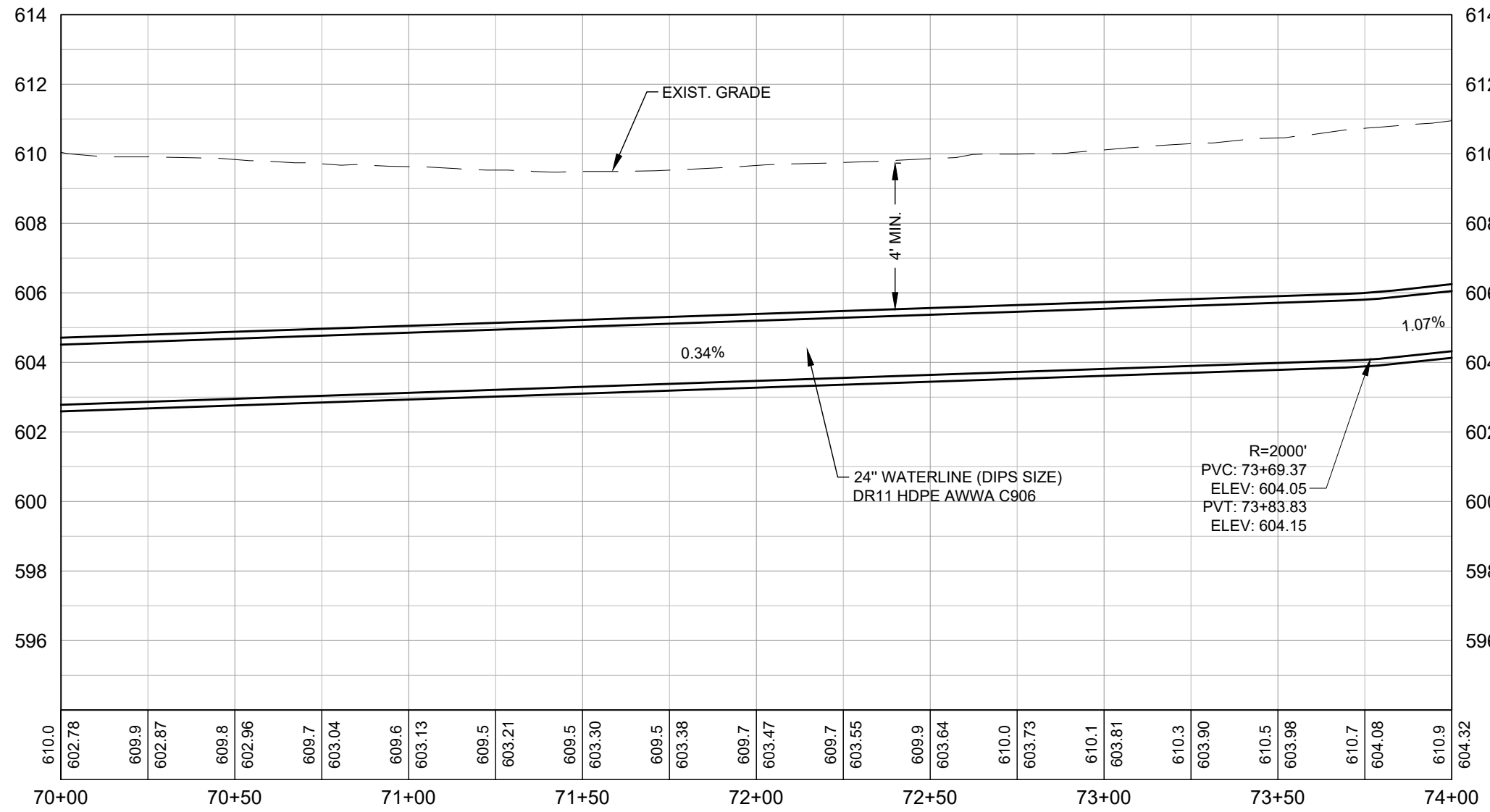
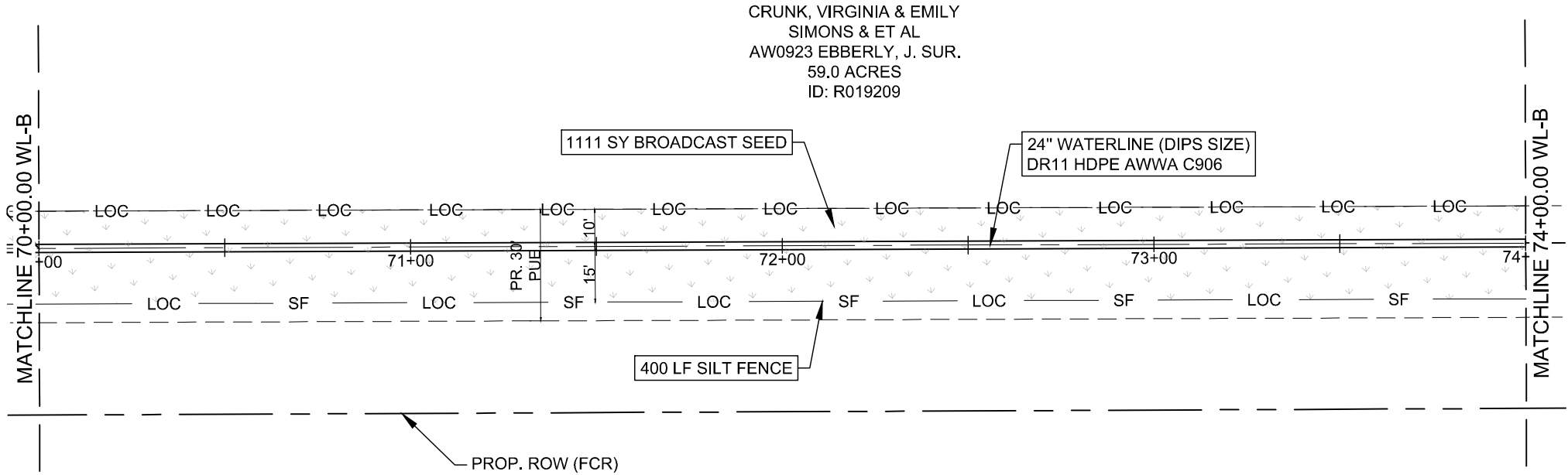
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EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

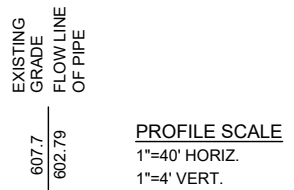
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Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-06.dwg - Tab: 21 - Plotted: 3/28/2022 4:03 PM By: KRISTEN VAN HOOSIER



LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	LIMITS OF CONS.
---	SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
---	G
---	EX. GAS LINE
---	OE
---	EX. OVERHEAD ELECTRIC
---	OC
---	EX. OVERHEAD CABLE
---	OH
---	EX. OVERHEAD UTILITIES
---	OT
---	EX. OVERHEAD TELECOM
---	UT
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APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

CRUNK, VIRGINIA & EMILY
SIMONS & ET AL
AW0923 EBBERLY, J. SUR.
59.0 ACRES
ID: R019209

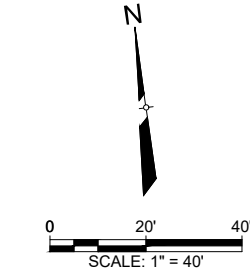
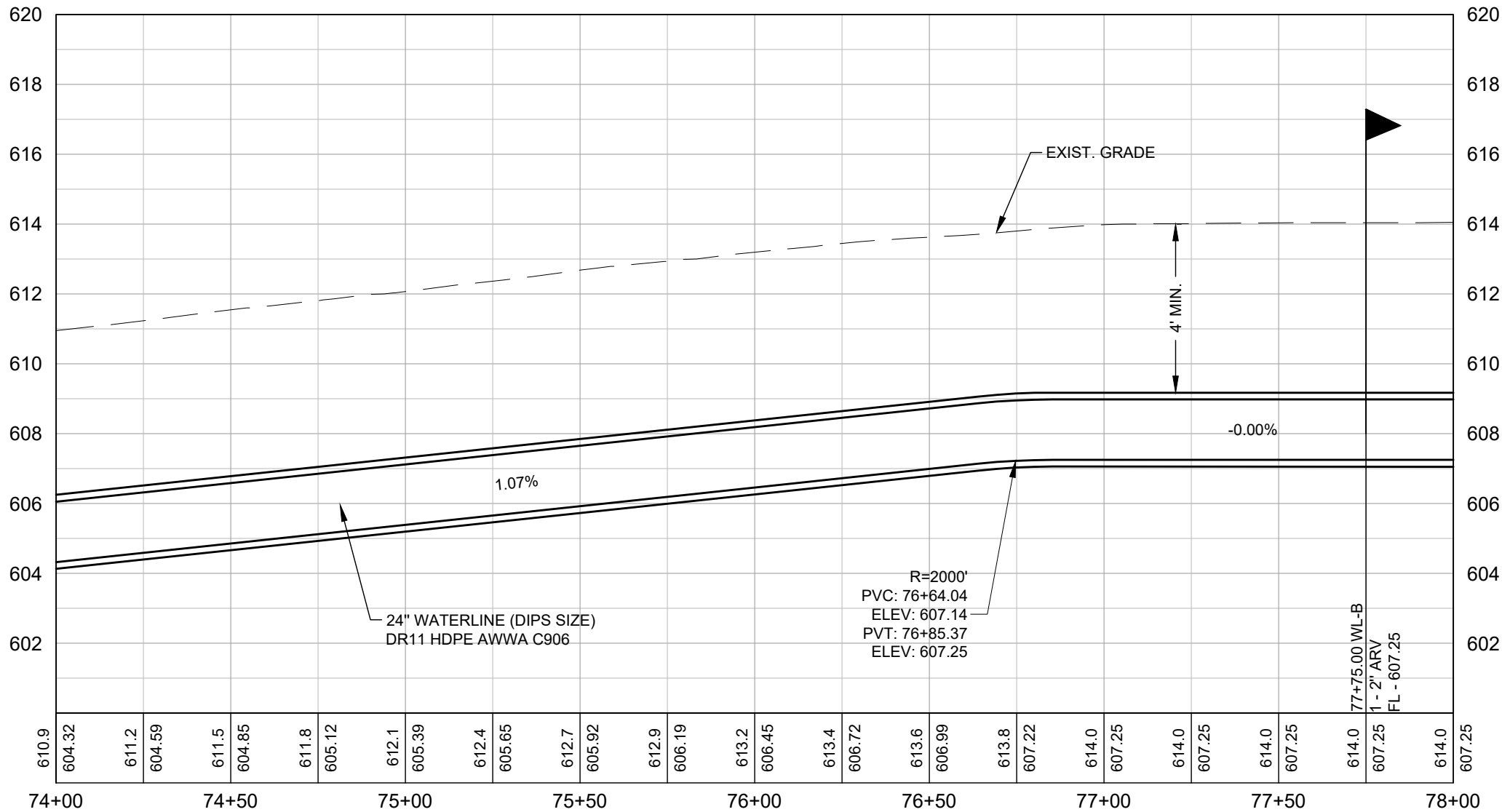
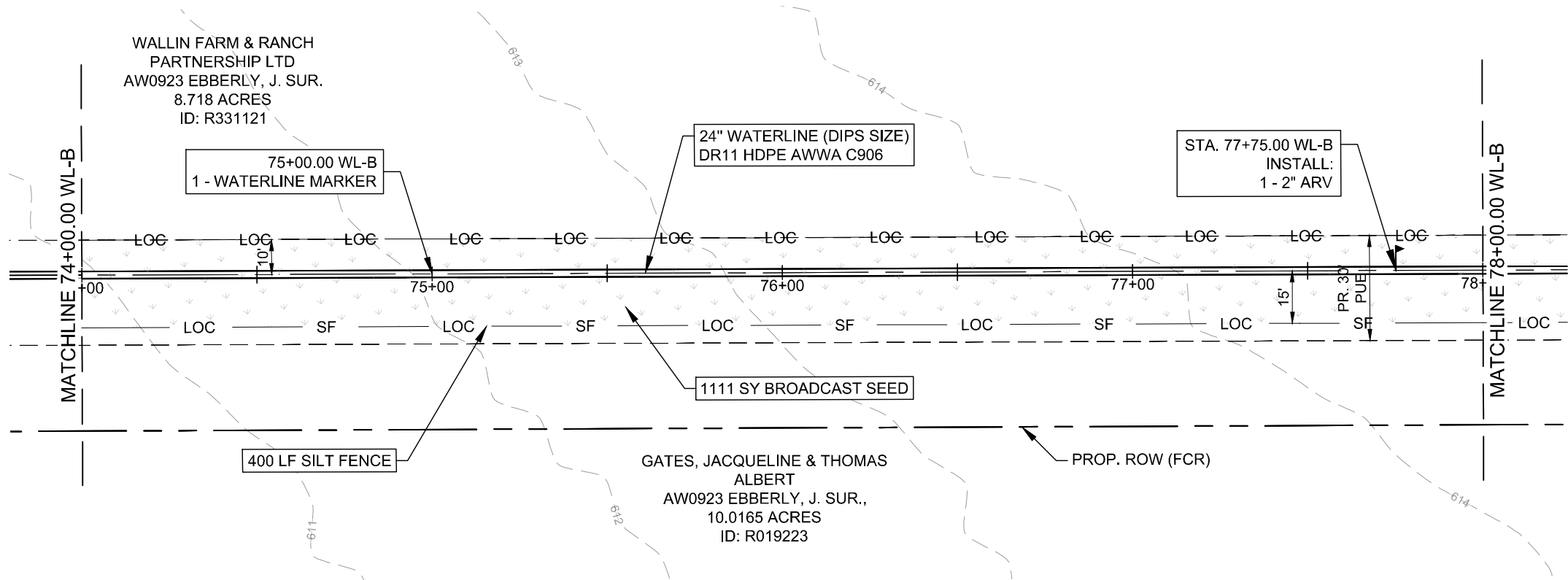
WATER LINE B PLAN AND PROFILE
70+00 TO 74+00

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET
C-321
25 of 66

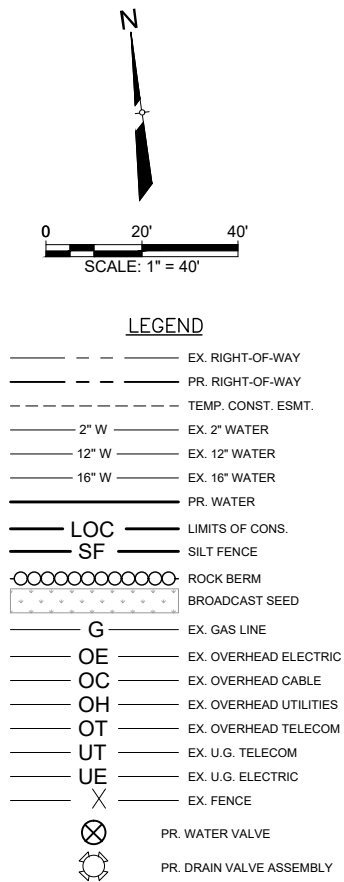
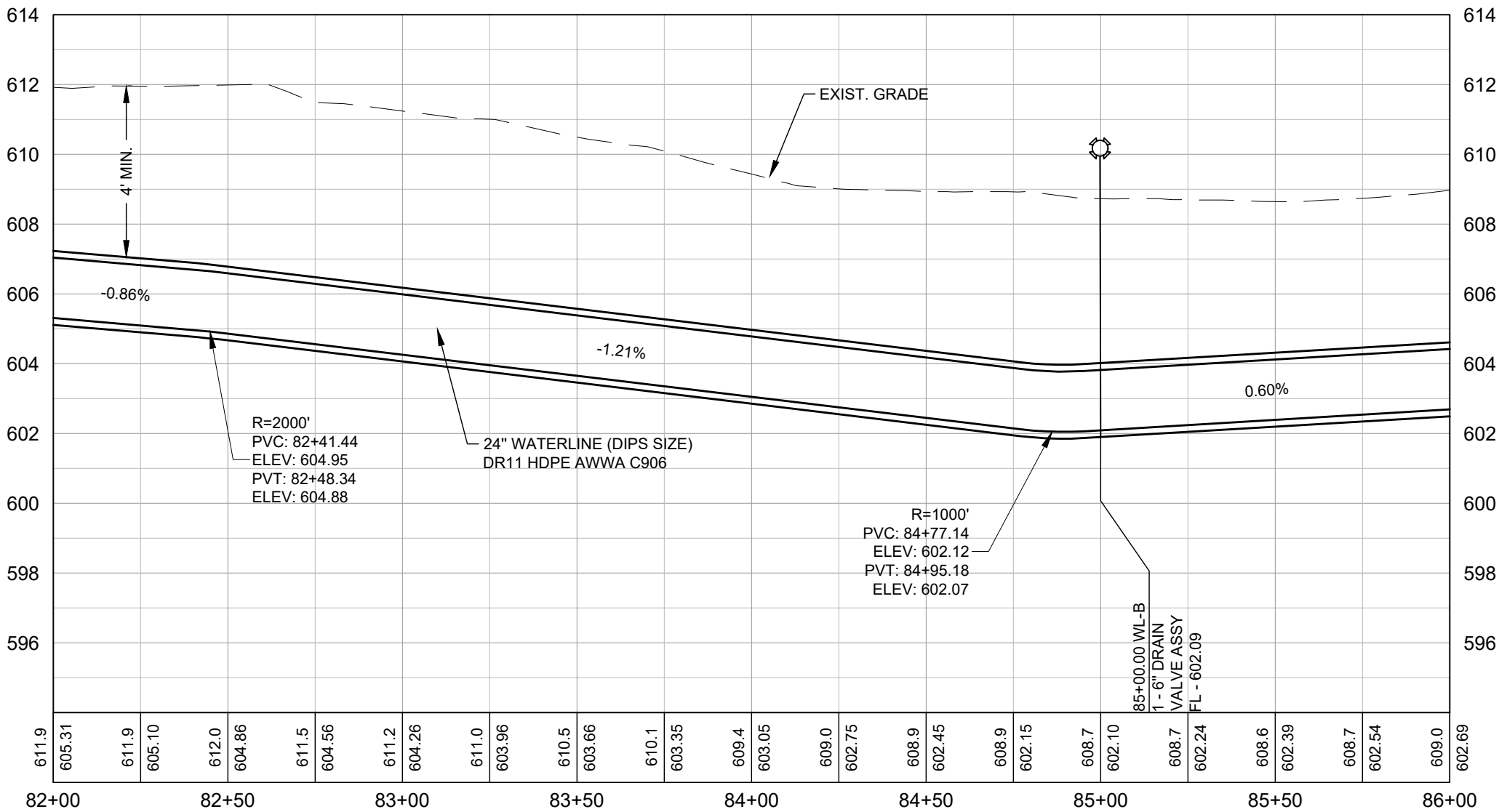
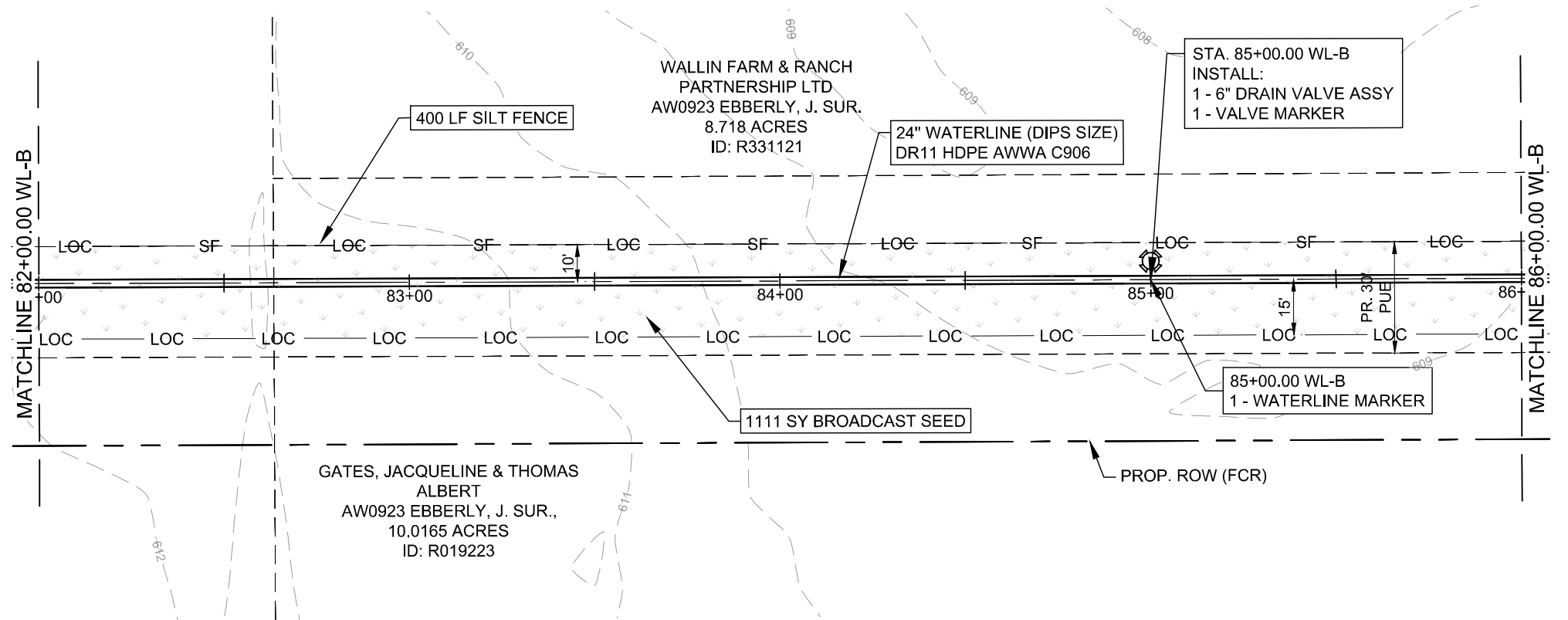
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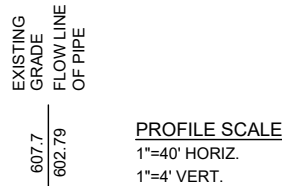
- LEGEND**
- EX. RIGHT-OF-WAY
 - PR. RIGHT-OF-WAY
 - TEMP. CONST. ESMT.
 - EX. 2" WATER
 - EX. 12" WATER
 - EX. 16" WATER
 - PR. WATER
 - LOC LIMITS OF CONS.
 - SF SILT FENCE
 - ROCK BERM
 - BROADCAST SEED
 - G EX. GAS LINE
 - OE EX. OVERHEAD ELECTRIC
 - OC EX. OVERHEAD CABLE
 - OH EX. OVERHEAD UTILITIES
 - OT EX. OVERHEAD TELECOM
 - UT EX. U.G. TELECOM
 - UE EX. U.G. ELECTRIC
 - EX. FENCE
 - PR. WATER VALVE
 - PR. DRAIN VALVE ASSEMBLY

- GENERAL NOTES:**
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 - HDPE FITTINGS SHALL BE SHOP-FABRICATED HDPE IN ACCORDANCE WITH AWWA STANDARD C906. FIELD FABRICATION OF FITTINGS

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-07.dwg -- Tab: 24 -- Plotted: 3/28/2022 4:06 PM By: KRISTEN VAN HOOSIER



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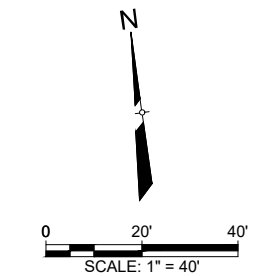



















REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET
C-324
28 of 66



- ## LEGEND
- | | |
|--|--------------------------|
|  | EX. RIGHT-OF-WAY |
|  | PR. RIGHT-OF-WAY |
|  | TEMP. CONST. ESMT. |
| 2" W  | EX. 2" WATER |
| 12" W  | EX. 12" WATER |
| 16" W  | EX. 16" WATER |
|  | PR. WATER |
|  | PR. WATER |
|  LOC  | LIMITS OF CONS. |
|  SF  | SILT FENCE |
|  | ROCK BERM |
|  | BROADCAST SEED |
| G | EX. GAS LINE |
| OE | EX. OVERHEAD ELECTRIC |
| OC | EX. OVERHEAD CABLE |
| OH | EX. OVERHEAD UTILITIES |
| OT | EX. OVERHEAD TELECOM |
| UT | EX. U.G. TELECOM |
| UE | EX. U.G. ELECTRIC |
|  | EX. FENCE |
|  | PR. WATER VALVE |
|  | PR. DRAIN VALVE ASSEMBLY |

GENERAL NOTES:

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8. HDPE FITTINGS SHALL BE SHOP-FABRICATED FIELD JOINTS IN ACCORDANCE WITH ANWWA STANDARD C909. FIELD FABRICATION OF FITTINGS IS PROHIBITED. ALL FITTINGS MUST BE PRESSURE-RATED FOR 200 PSI.
9. THE MINIMUM COIL BENDING RADIUS OF DR11 HDPE 24" PIPE IS 54 FEET. THESE PLANS SHOW A MINIMUM BENDING RADIUS OF 200 FEET. THE CONTRACTOR SHALL BRING TO THE IMMEDIATE ATTENTION OF THE ENGINEER ANY LOCATION WHERE FIELD BENDING CANNOT BE ACCOMPLISHED.

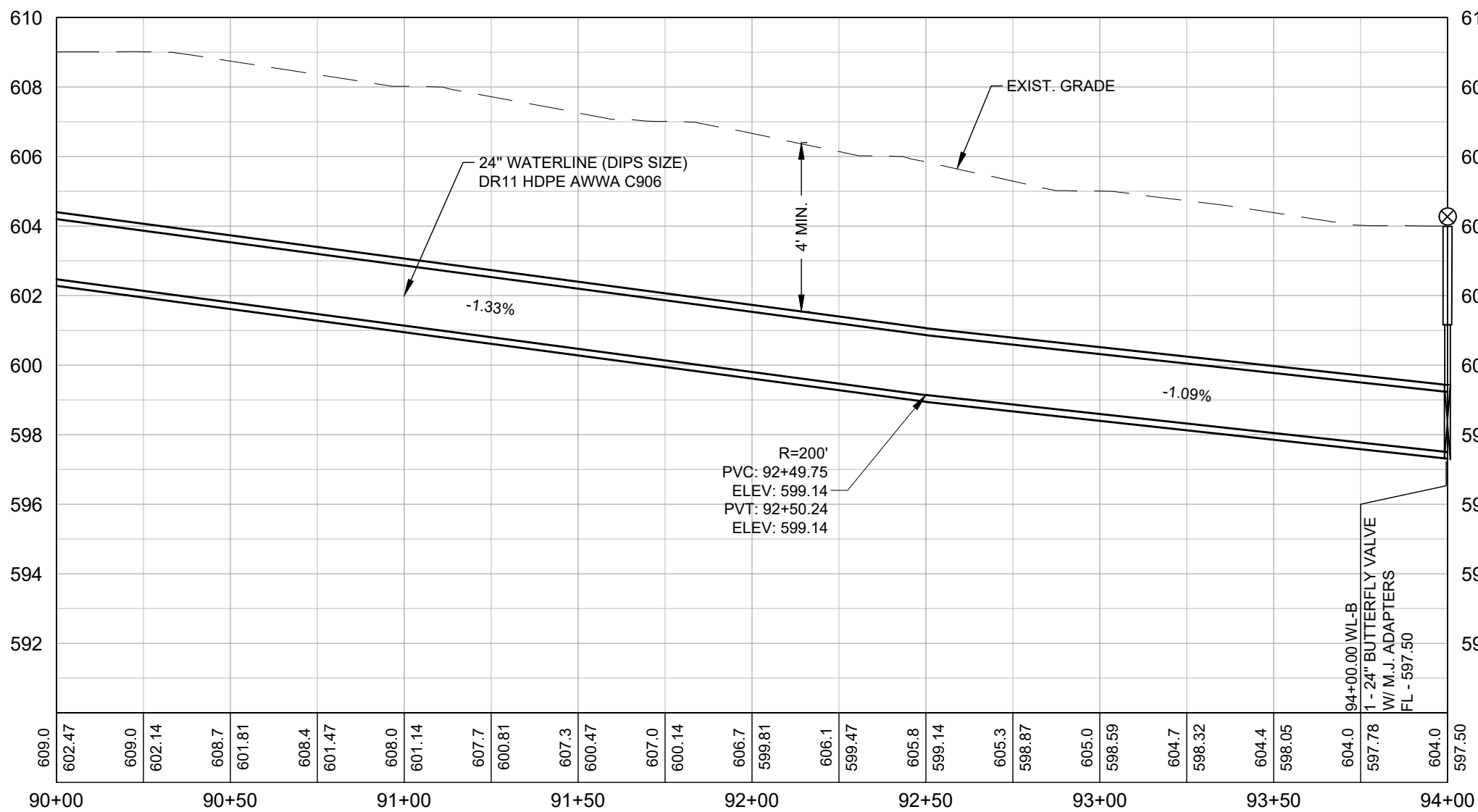
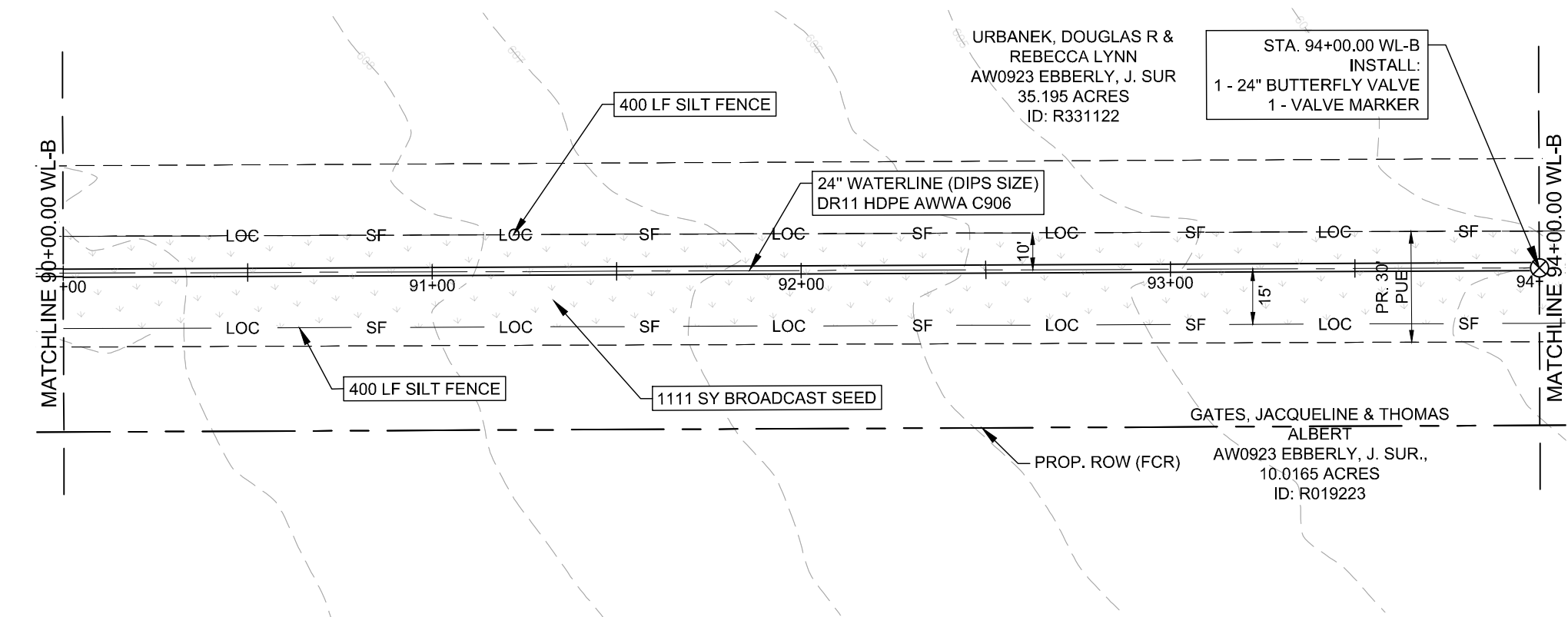
EXISTING
GRADE
FLOW LINE
OF PIPE

607.7	
602.79	

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

[illegible]

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-08.dwg - Tab: 26 - Plotted: 3/28/2022 4:08 PM By: KRISTEN VAN HOOSIER



LEGEND

---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	LIMITS OF CONS.
---	SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
---	G
---	EX. GAS LINE
---	OE
---	EX. OVERHEAD ELECTRIC
---	OC
---	EX. OVERHEAD CABLE
---	OH
---	EX. OVERHEAD UTILITIES
---	OT
---	EX. OVERHEAD TELECOM
---	UT
---	EX. U.G. TELECOM
---	UE
---	EX. U.G. ELECTRIC
---	EX. FENCE
---	PR. WATER VALVE
---	PR. DRAIN VALVE ASSEMBLY

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EXISTING GRADE

FLOW LINE

OF PIPE

PROFILE SCALE

1"=40' HORIZ.

1"=4' VERT.

APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

WATER LINE B PLAN AND PROFILE

90+00 TO 94+00

CR 404 HUTTO 24" WATER LINE

TAYLOR, TEXAS

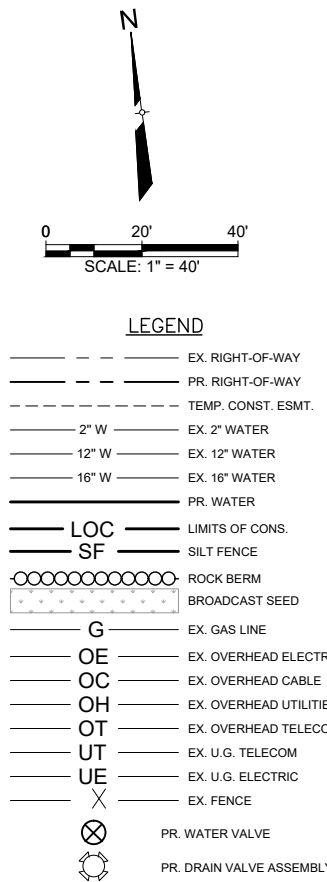
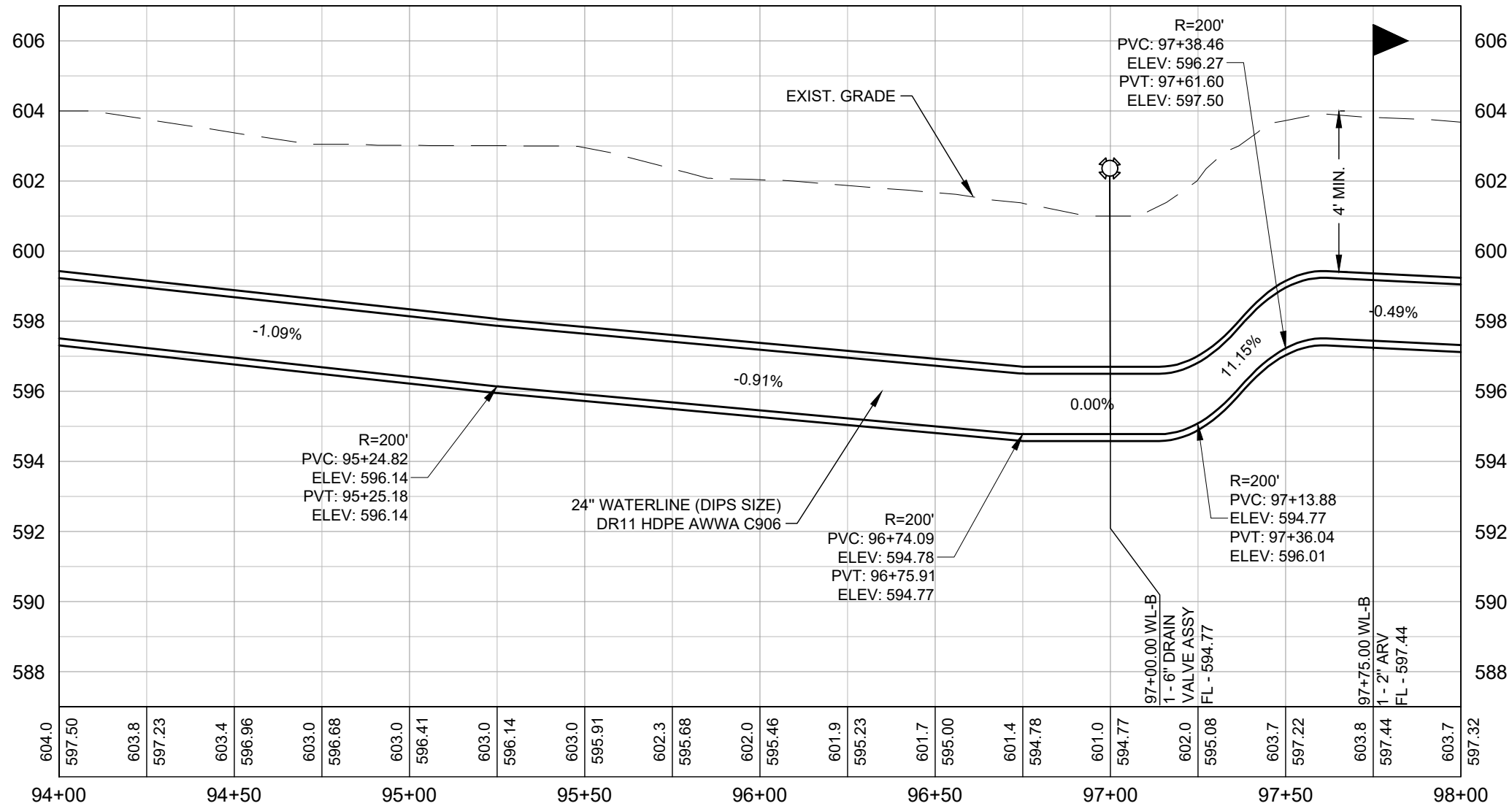
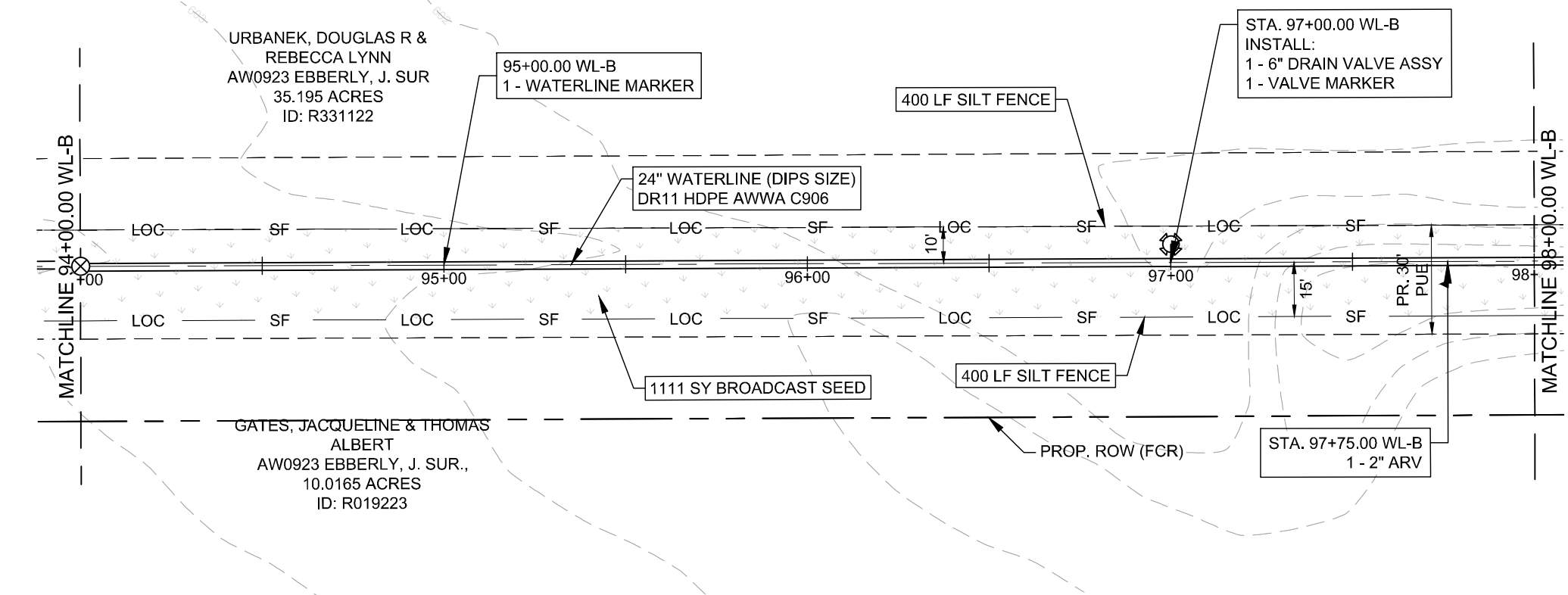
PROJ. NO: 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET

C-326

30 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-08.dwg - Tab: 27 - Plotted: 3/28/2022 4:09 PM By: KRISTEN VAN HOOSIER



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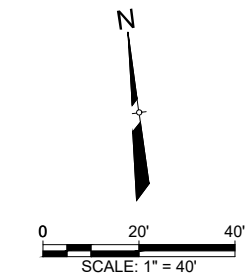
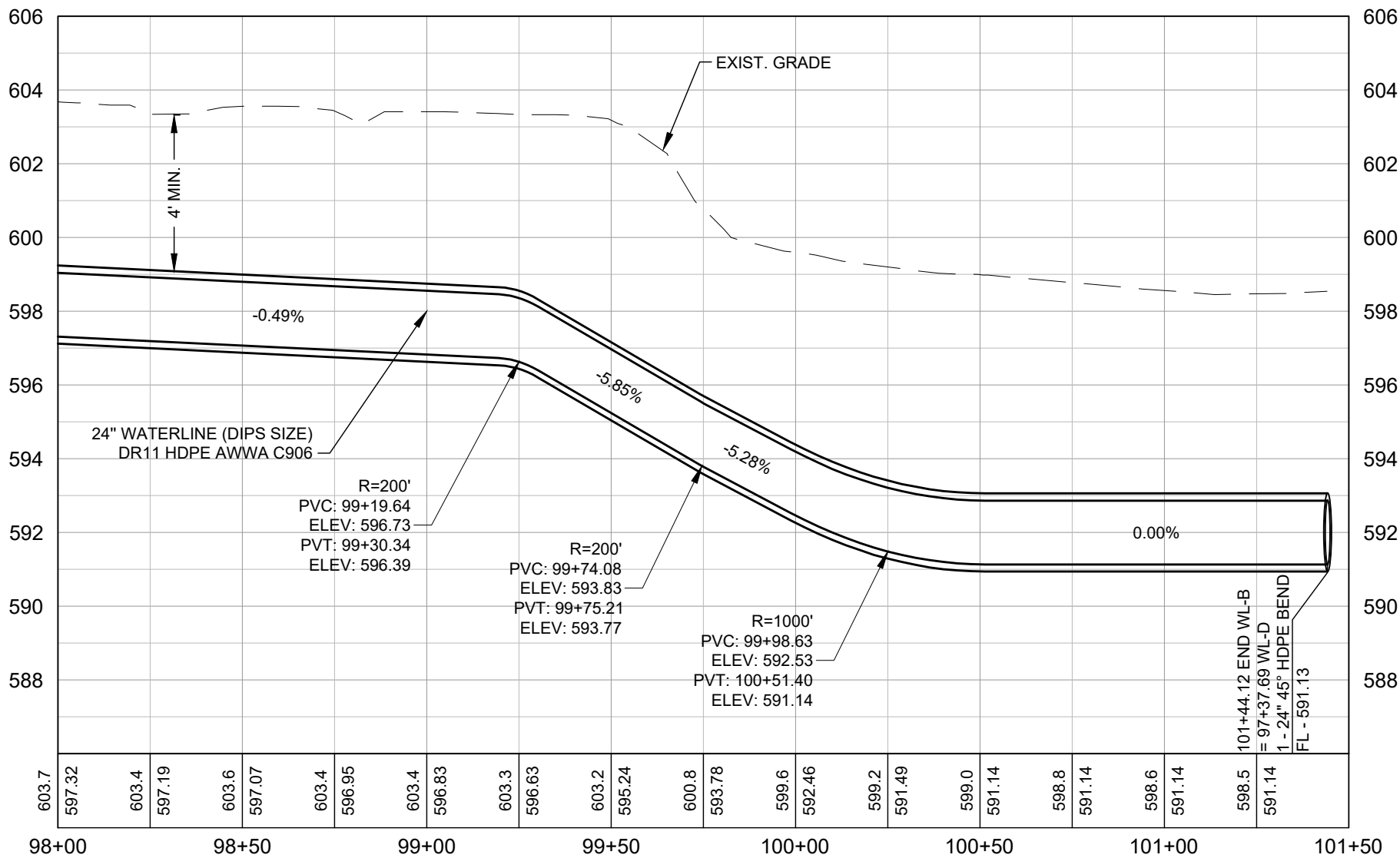
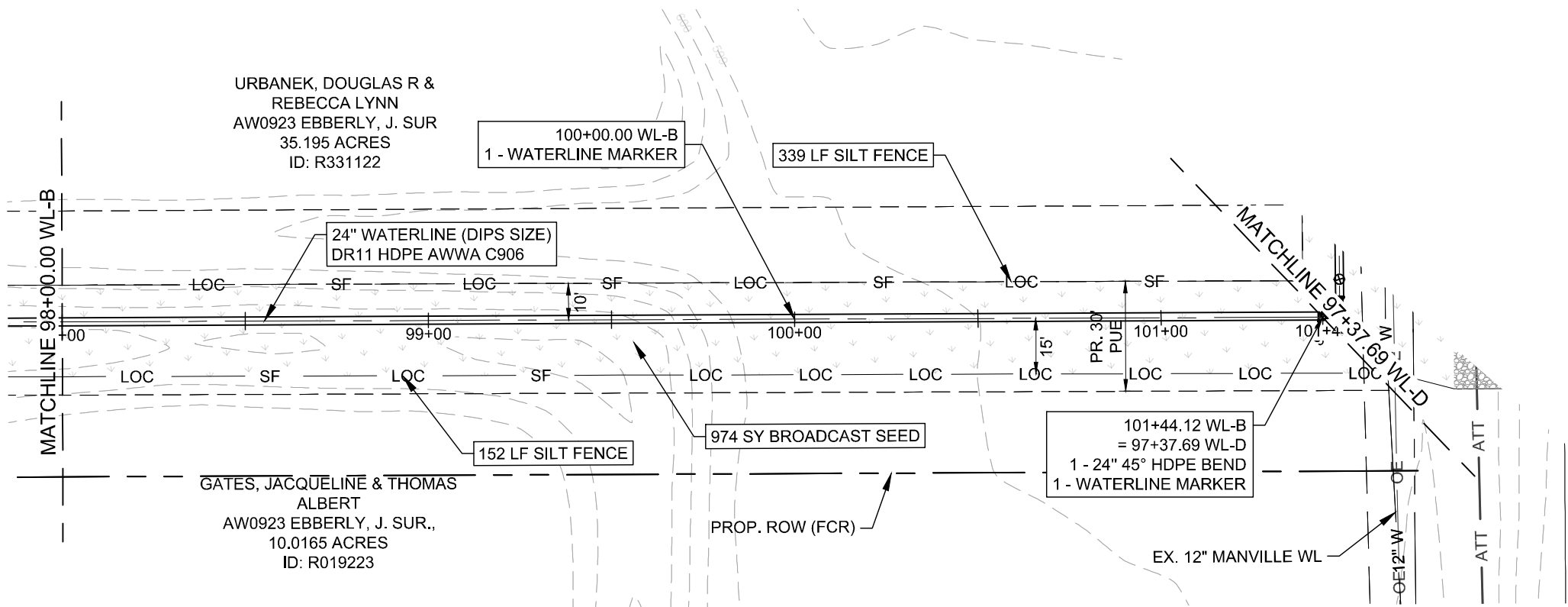
REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE

CR 404 HUTTO TO 24" WATER LINE
TAYLOR, TEXAS






















PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/28/2022

SHEET
C-327
31 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-08.dwg - Tab: 28 - Plotted: 3/28/2022 4:09 PM By: KRISTEN VAN HOOSIER



LEGEND

	EX. RIGHT-OF-WAY
	PR. RIGHT-OF-WAY
	TEMP. CONST. ESMT.
	EX. 2\" WATER
	EX. 12\" WATER
	EX. 16\" WATER
	PR. WATER
	LIMITS OF CONS.
	SILT FENCE
	ROCK BERM
	BROADCAST SEED
	EX. GAS LINE
	EX. OVERHEAD ELECTRIC
	EX. OVERHEAD CABLE
	EX. OVERHEAD UTILITIES
	EX. OVERHEAD TELECOM
	EX. U.G. TELECOM
	EX. U.G. ELECTRIC
	EX. FENCE
	PR. WATER VALVE
	PR. DRAIN VALVE ASSEMBLY

GENERAL NOTES:

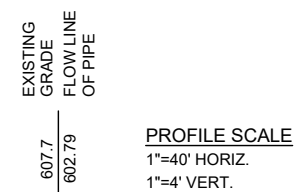
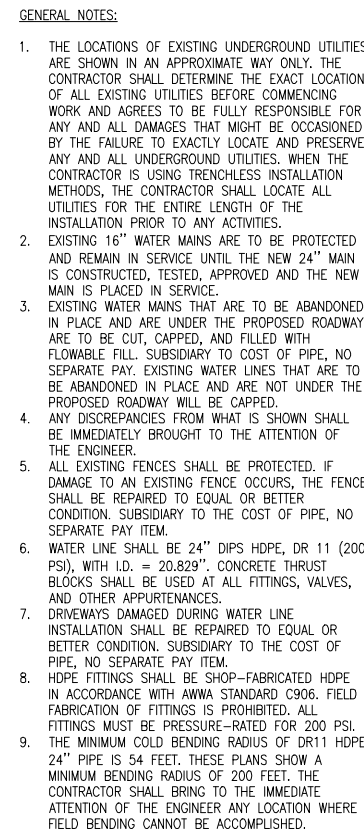
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EXISTING
GRADE
FLOW LINE
OF PIPE

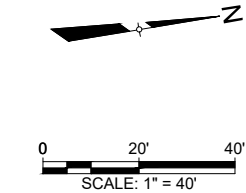
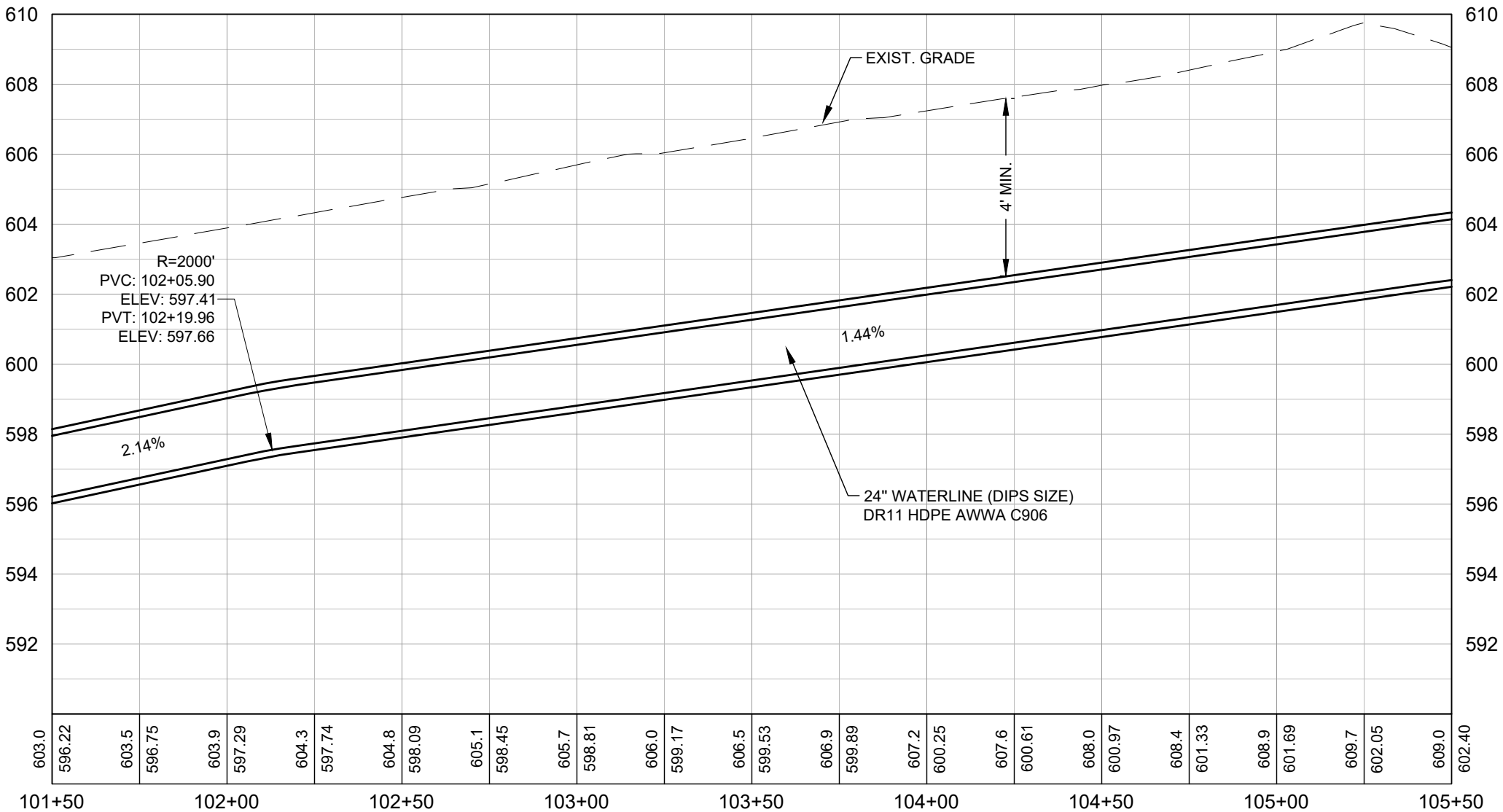
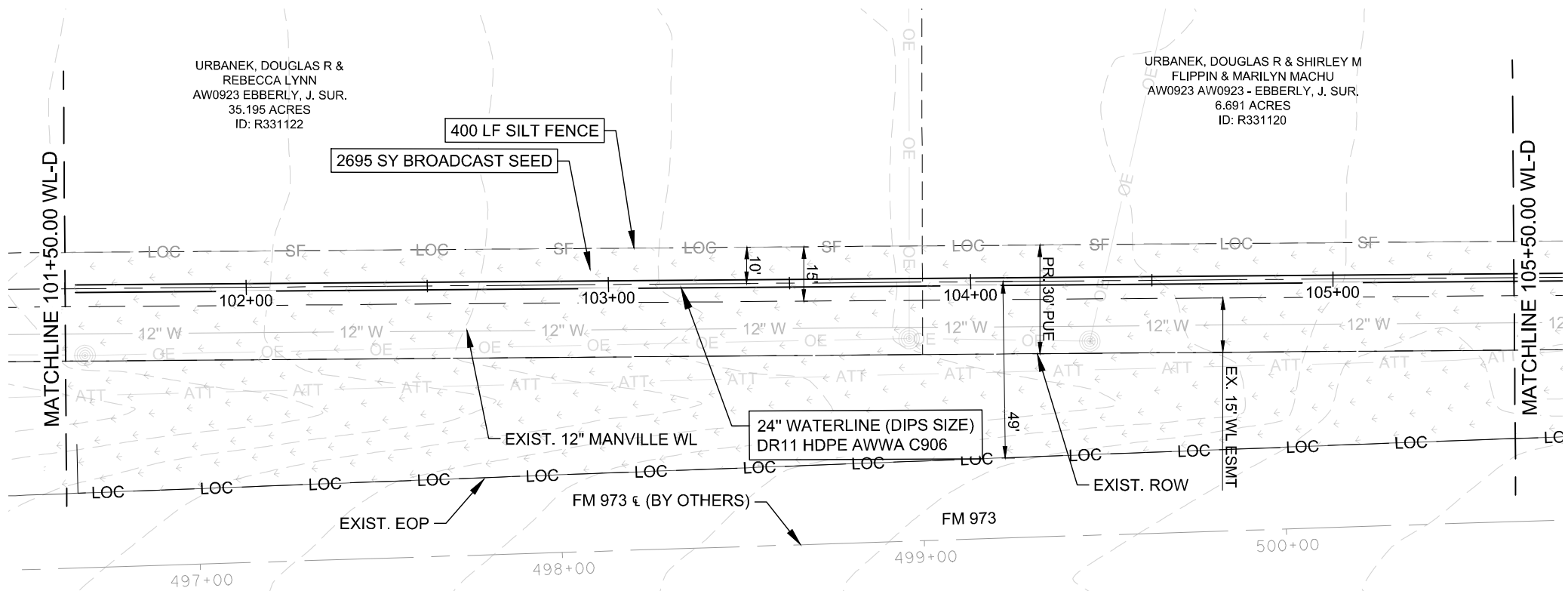
PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	
WATER LINE B PLAN AND PROFILE 98+00 TO 101+44.22	
CR 404 HUTTO TO 24" WATER LINE TAYLOR, TEXAS	
PROJ. NO: 1903-099-05-57 DESIGN: H. NEWTON DRAWN: H. NEWTON CHECK: J. HASTINGS APPR: K. VAN HOOSIER DATE: 3/29/2022	
SHEET C-328 32 of 66	

NOTE:
HORIZONTAL LOCATIONS
OF EXISTING CULVERTS
ARE BASED ON AERIAL
IMAGERY. EXISTING
UTILITIES AND ROW ARE
BASED ON LVL-D
INFORMATION. VERTICAL
LOCATIONS ARE
ASSUMED MINIMUM
DEPTH. CONTRACTOR
SHALL VERIFY
HORIZONTAL AND
VERTICAL LOCATIONS
AND MAINTAIN MINIMUM
HORIZONTAL AND
VERTICAL CLEARANCE
WHEN INSTALLING THE
WATERLINE.

[illegible]

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-09.dwg -- Tab: 30 -- Plotted: 3/28/2022 4:12 PM By: KRISTEN VAN HOOSIER



LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	LIMITS OF CONS.
---	BROADCAST SEED
---	EX. GAS LINE
---	EX. OVERHEAD ELECTRIC
---	EX. OVERHEAD CABLE
---	EX. OVERHEAD UTILITIES
---	EX. OVERHEAD TELECOM
---	EX. U.G. TELECOM
---	EX. U.G. ELECTRIC
---	EX. FENCE
---	PR. WATER VALVE
---	PR. DRAIN VALVE ASSEMBLY

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EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.



WATER LINE D PLAN AND PROFILE
101+50 TO 105+50
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

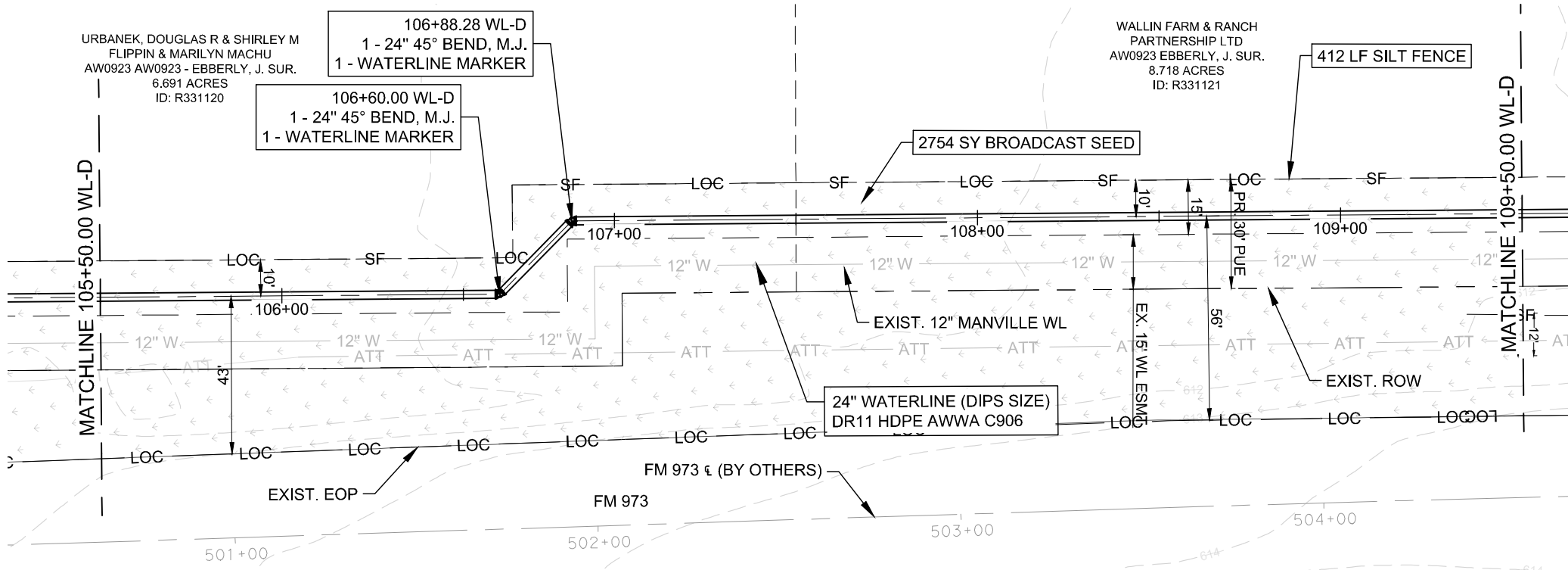


PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. BYRNE
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

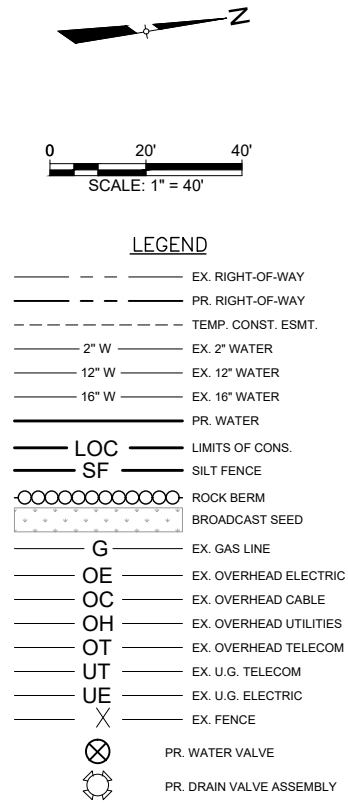


SHEET
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34 of 66

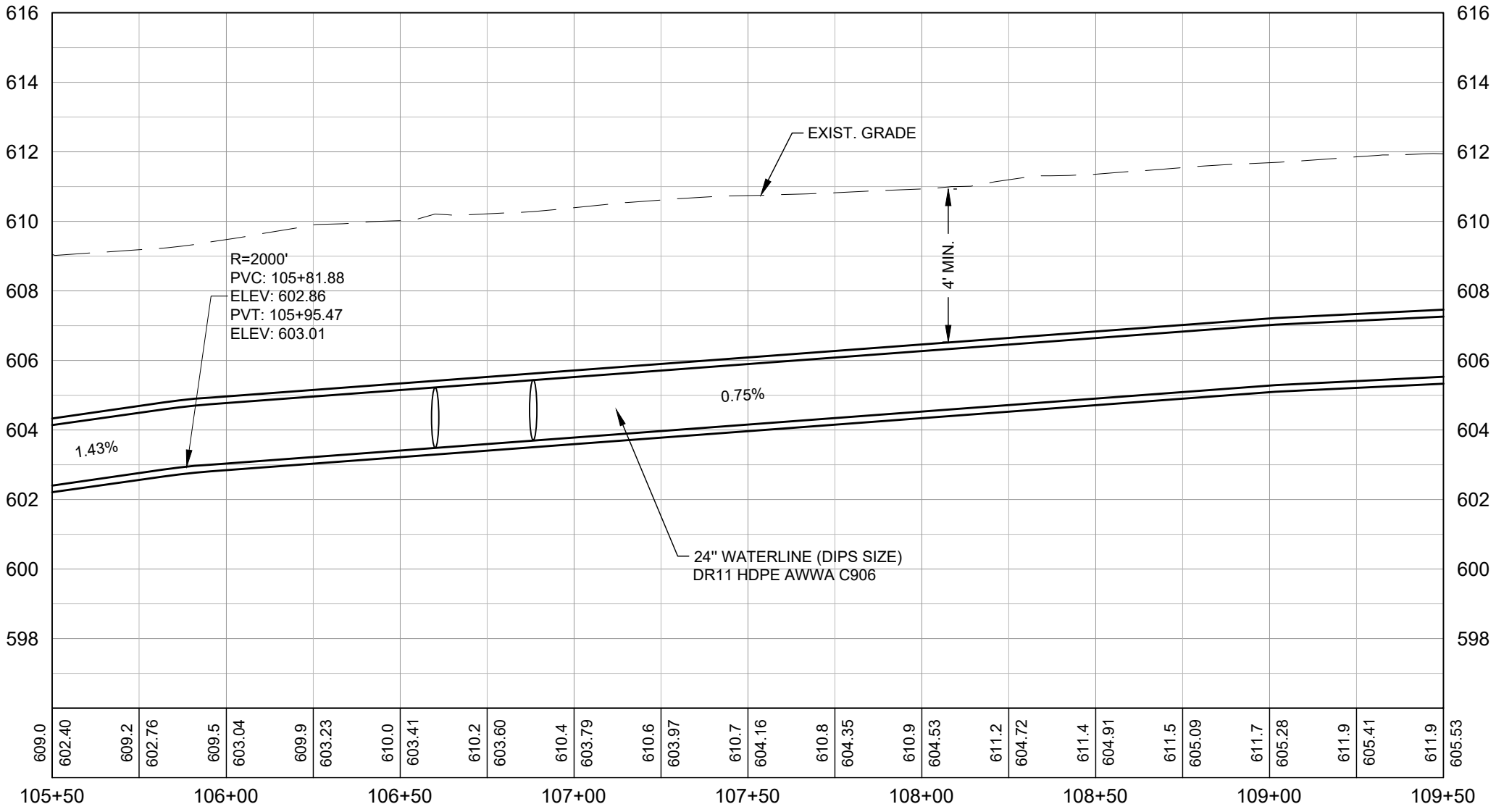
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- NOTE:
- HORIZONTAL LOCATIONS OF EXISTING UTILITIES ARE BASED ON LVL-D INFORMATION. CONTRACTOR SHALL VERIFY HORIZONTAL LOCATIONS AND MAINTAIN MINIMUM CLEARANCE WHEN INSTALLING THE WATERLINE.
 - CONTRACTOR SHALL ENSURE 2' MINIMUM OD TO OD SEPARATION BETWEEN PROPOSED AND EXISTING WATERLINES



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WATER LINE D PLAN AND PROFILE
105+50 TO 109+50
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

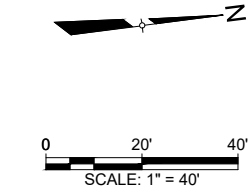
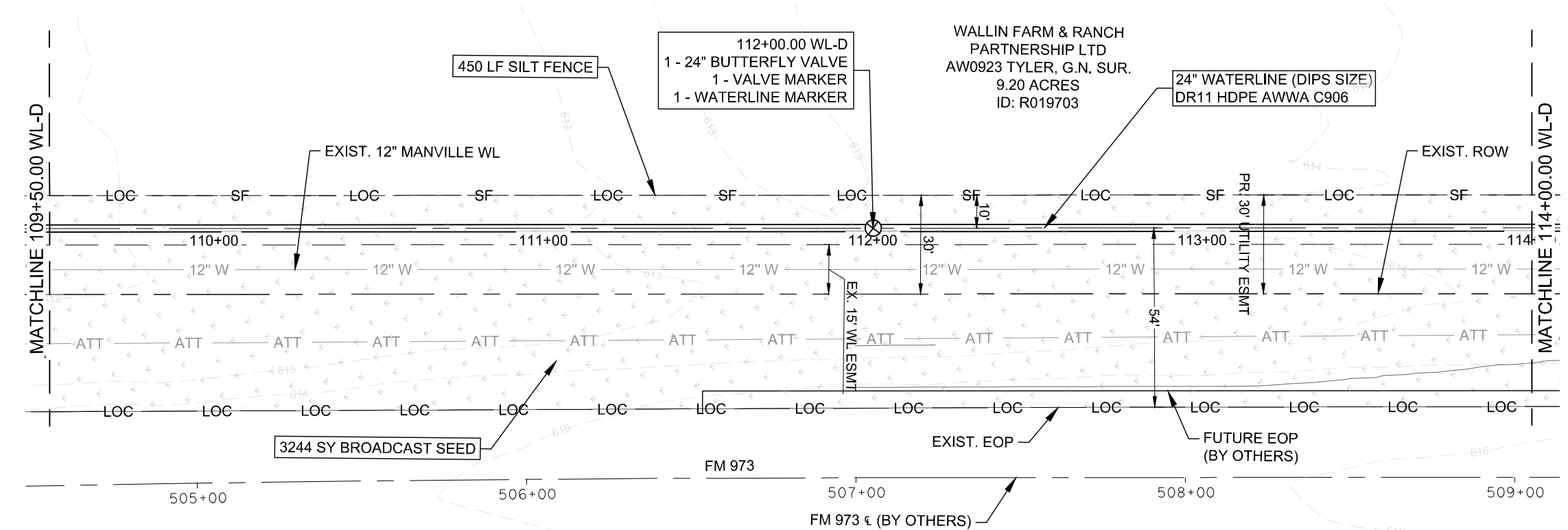


PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. BYRNE
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



SHEET
C-331
35 of 66

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-10.dwg -- Tab: 32 -- Plotted: 3/28/2022 4:13 PM By: KRISTEN VAN HOOSIER



LEGEND	
---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	EX. 2" WATER
---	EX. 12" WATER
---	EX. 16" WATER
---	PR. WATER
---	LOC
---	SF
---	ROCK BERM
---	BROADCAST SEED
G	EX. GAS LINE
OE	EX. OVERHEAD ELECTRIC
OC	EX. OVERHEAD CABLE
OH	EX. OVERHEAD UTILITIES
OT	EX. OVERHEAD TELECOM
UT	EX. U.G. TELECOM
UE	EX. U.G. ELECTRIC
X	EX. FENCE
⊗	PR. WATER VALVE
⊕	PR. DRAIN VALVE ASSEMBLY

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EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.



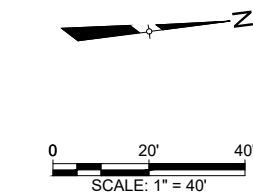
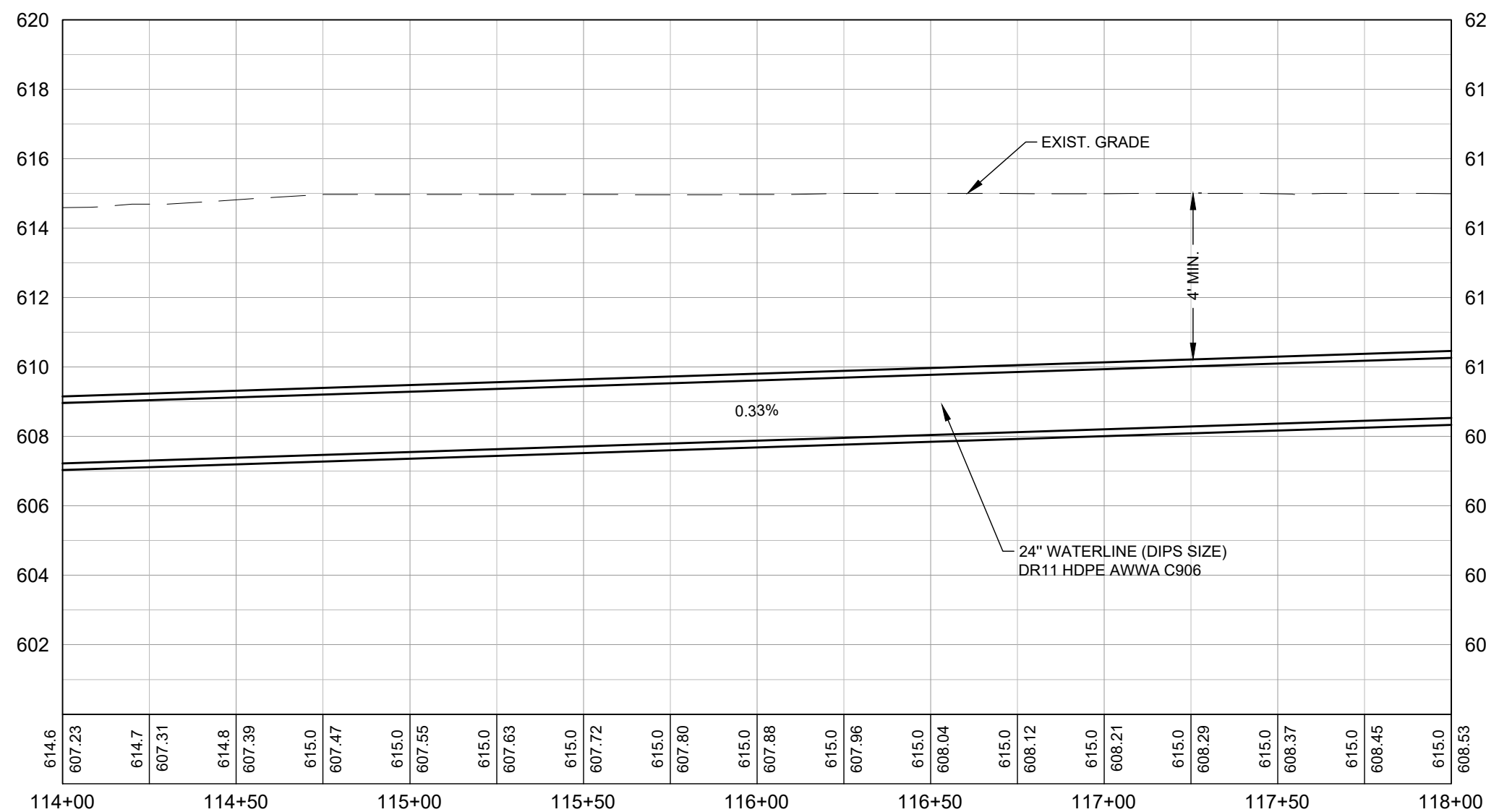
WATER LINE D PLAN AND PROFILE
109+50 TO 114+00
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS



PROJ. NO. 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



SHEET
C-332
36 of 66



---	EX. RIGHT-OF-WAY
- - -	PR. RIGHT-OF-WAY
----	TEMP. CONST. ESMT.

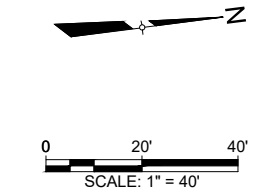
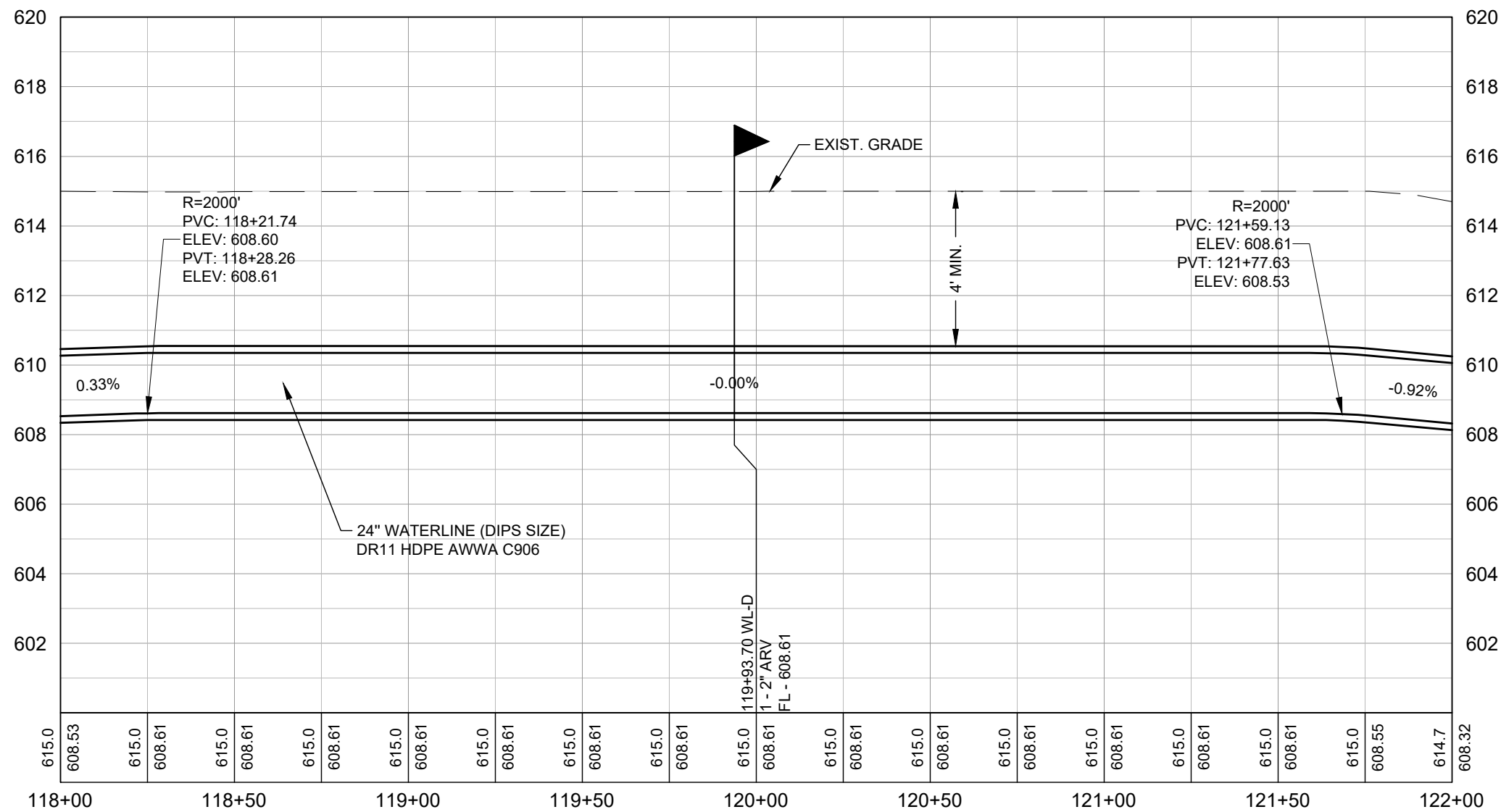
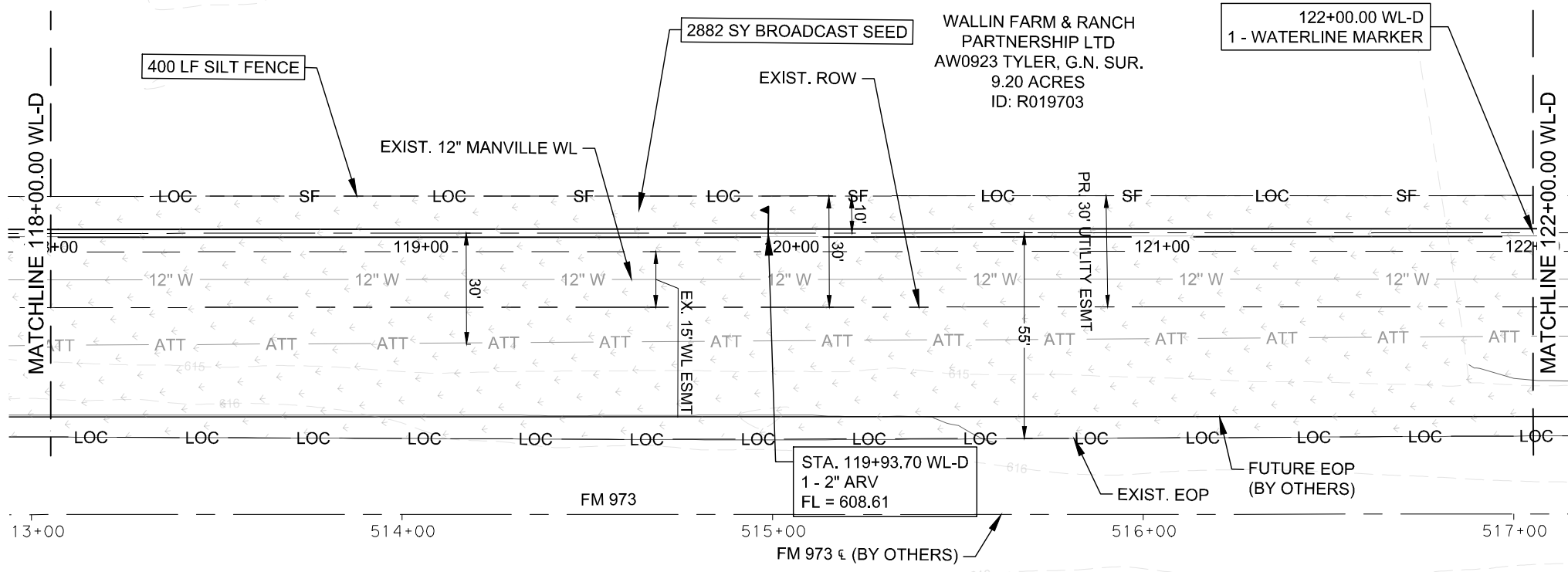
2" W	EX. 2" WATER
12" W	EX. 12" WATER
16" W	EX. 16" WATER
=====	PR. WATER
== LOC ==	LIMITS OF CONS.
== SF ==	SILT FENCE
○ ○ ○ ○ ○ ○ ○ ○ ○ ○	ROCK BERM
[* * * * *]	BROADCAST SEED
G	EX. GAS LINE
OE	EX. OVERHEAD ELECTRIC
OC	EX. OVERHEAD CABLE
OH	EX. OVERHEAD UTILITIES
OT	EX. OVERHEAD TELECOM
UT	EX. U.G. TELECOM
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EXISTING GRADE	607.7
FLOW LINE OF PIPE	602.79

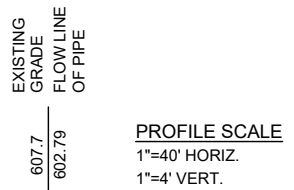
PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

Dwg. Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-10.dwg -- Tab: 34 -- Plotted: 3/28/2022 4:14 PM By: KRISTEN VAN HOOSIER



- LEGEND**
- EX. RIGHT-OF-WAY
 - PR. RIGHT-OF-WAY
 - TEMP. CONST. ESMT.
 - 2" W --- EX. 2" WATER
 - 12" W --- EX. 12" WATER
 - 16" W --- EX. 16" WATER
 - PR. WATER
 - LOC --- LIMITS OF CONS.
 - SF --- SILT FENCE
 - ROCK BERM
 - BROADCAST SEED
 - G --- EX. GAS LINE
 - OE --- EX. OVERHEAD ELECTRIC
 - OC --- EX. OVERHEAD CABLE
 - OH --- EX. OVERHEAD UTILITIES
 - OT --- EX. OVERHEAD TELECOM
 - UT --- EX. U.G. TELECOM
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REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE

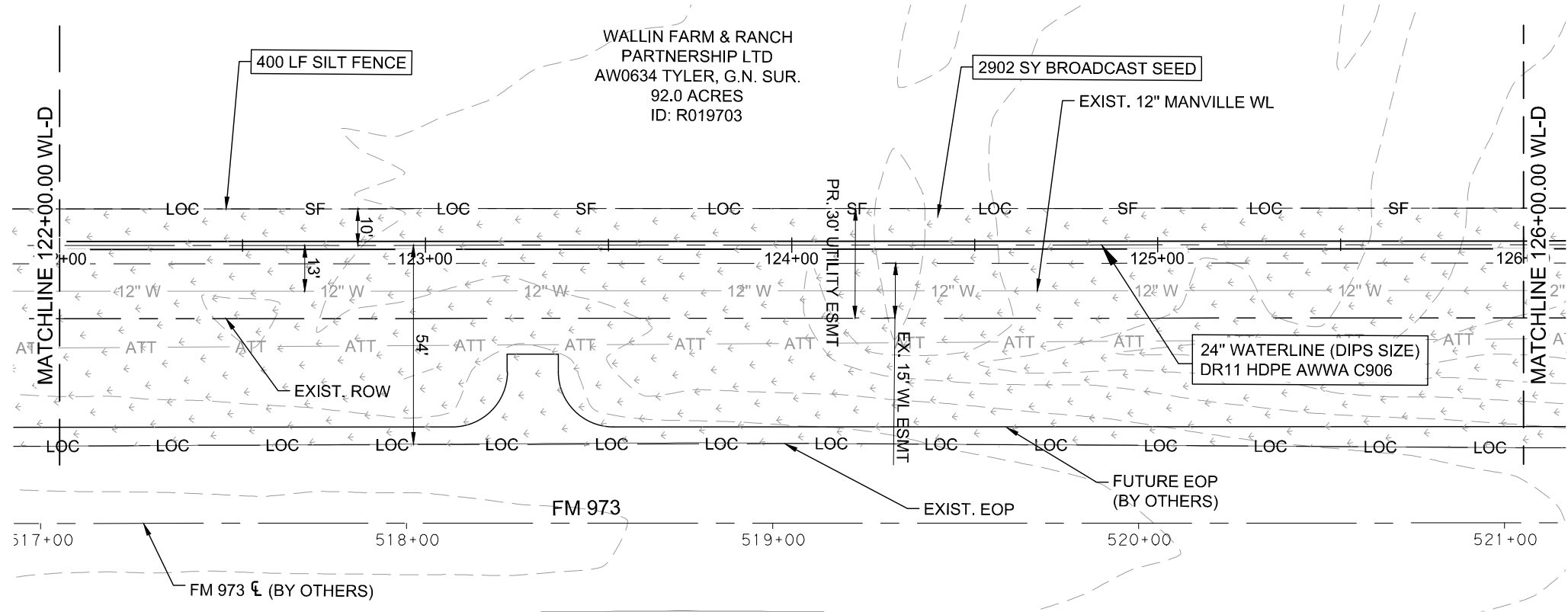
CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO: 1903-099-05-57
DESIGN: H. NEWTON
DRAWN: H. NEWTON
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DATE: 3/29/2022

STATE OF TEXAS
KRISTEN VAN HOOSIER
136882
LICENSED PROFESSIONAL ENGINEER
3/30/2022

SHEET
C-334
38 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-11.dwg -- Tab: 35 -- Plotted: 3/28/2022 4:16 PM By: KRISTEN VAN HOOSIER

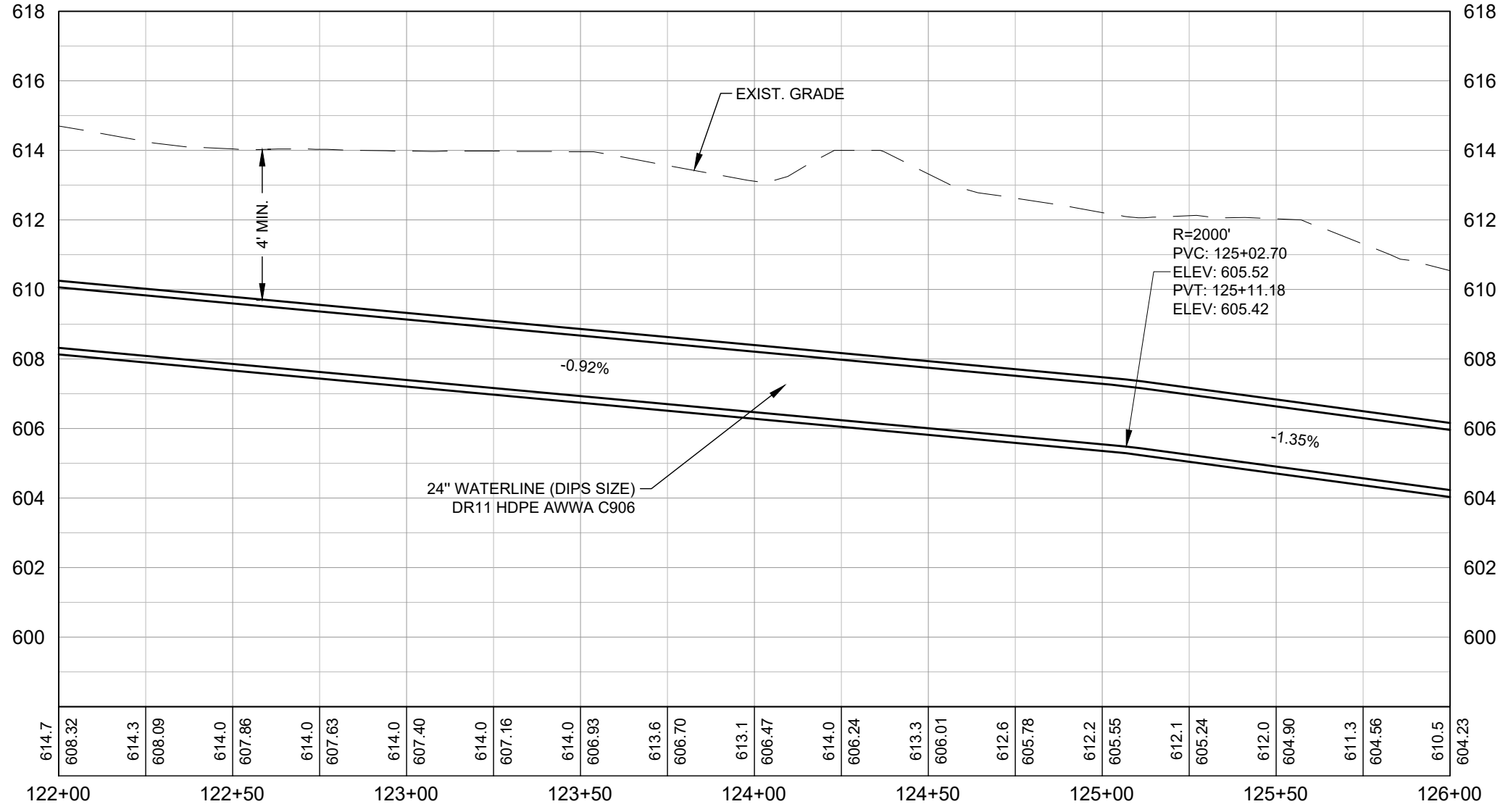


NOTE:
CONTRACTOR SHALL
PROVIDE ACCESS TO
PRIVATE PROPERTIES
DURING CONSTRUCTION
AND RESTORE TO EQUAL
OR BETTER CONDITIONS
(AS APPLICABLE)

LEGEND

---	EX. RIGHT-OF-WAY
---	PR. RIGHT-OF-WAY
---	TEMP. CONST. ESMT.
---	2" W EX. 2" WATER
---	12" W EX. 12" WATER
---	16" W EX. 16" WATER
---	PR. WATER
---	LOC LIMITS OF CONS.
---	SF SILT FENCE
---	ROCK BERM
---	BROADCAST SEED
G	EX. GAS LINE
OE	EX. OVERHEAD ELECTRIC
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UT	EX. U.G. TELECOM
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FLOW LINE OF PIPE

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1"=40' HORIZ.

1"=4' VERT.

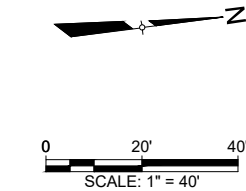
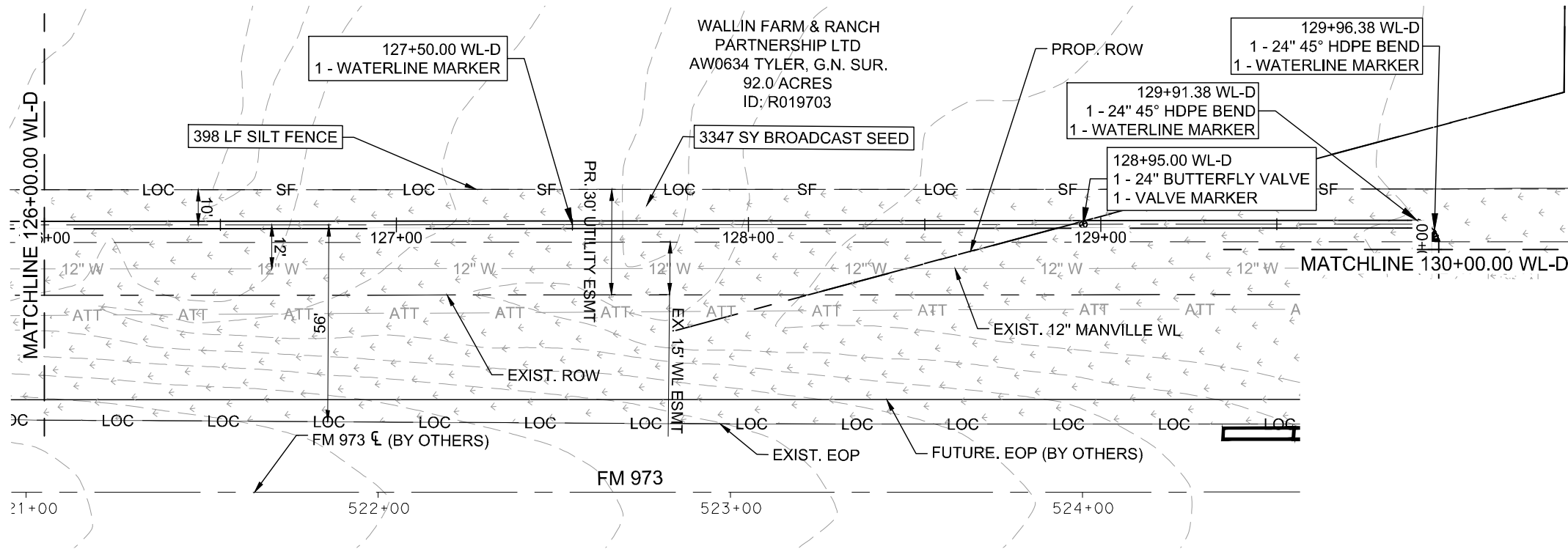
APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	



















CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO: 1903-099-05-57
DESIGN: K. VAN HOOSIER
DRAWN: K. VAN HOOSIER
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET
C-335
39 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-301-WATR-11.dwg - Tab: 36 - Plotted: 3/29/2022 2:49 PM By: KRISTEN VAN HOOSIER

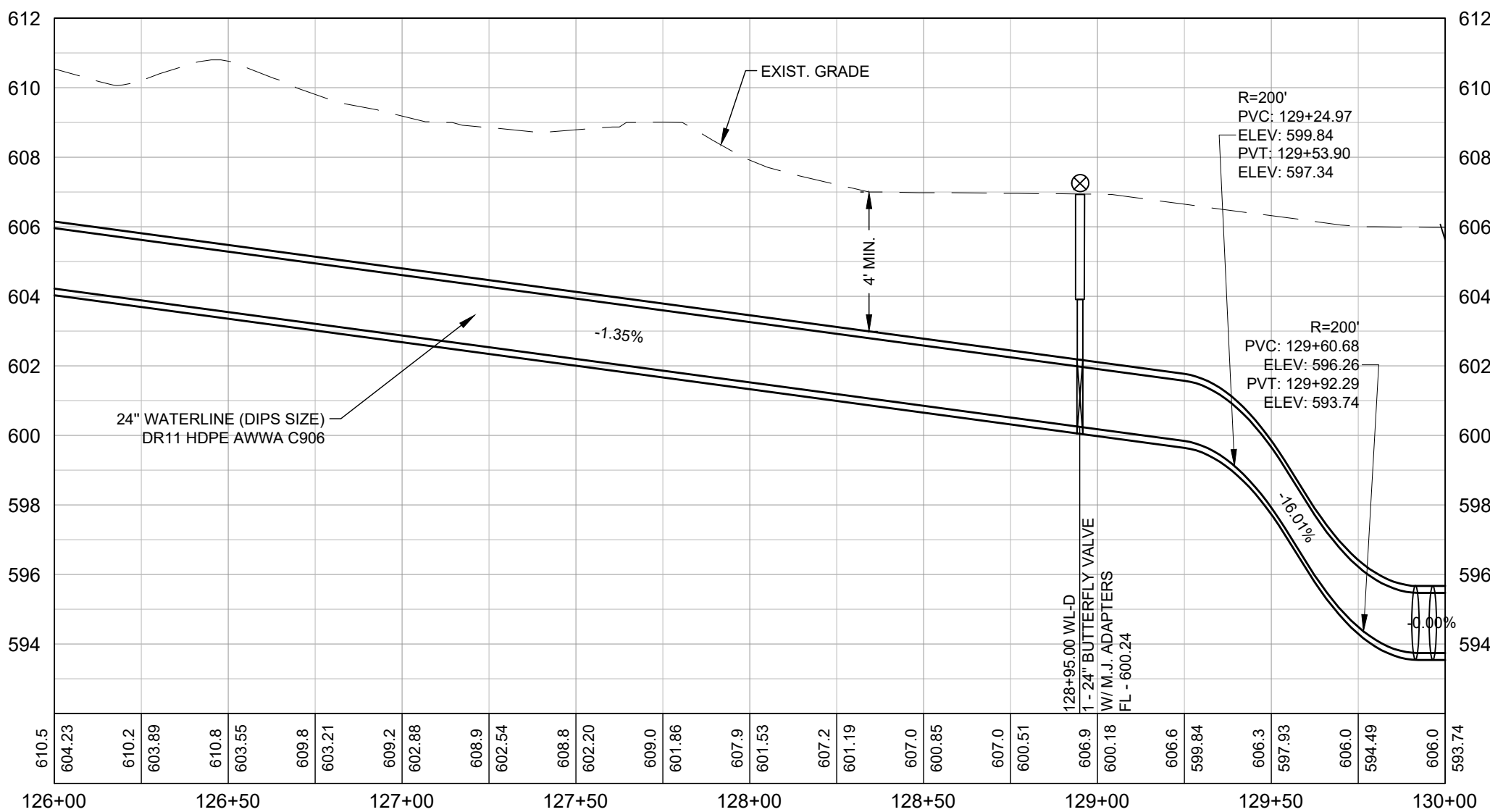


LEGEND	
	EX. RIGHT-OF-WAY
	PR. RIGHT-OF-WAY
	TEMP. CONST. ESMT.
	EX. 2\" WATER
	EX. 12\" WATER
	EX. 16\" WATER
	PR. WATER
	LIMITS OF CONS.
	SILT FENCE
	ROCK BERM
	BROADCAST SEED
	EX. GAS LINE
	EX. OVERHEAD ELECTRIC
	EX. OVERHEAD CABLE
	EX. OVERHEAD UTILITIES
	EX. OVERHEAD TELECOM
	EX. U.G. TELECOM
	EX. U.G. ELECTRIC
	EX. FENCE
	PR. WATER VALVE
	PR. DRAIN VALVE ASSEMBLY

- GENERAL NOTES:
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
 - EXISTING 16" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN IS CONSTRUCTED, TESTED, APPROVED AND THE NEW MAIN IS PLACED IN SERVICE.
 - EXISTING WATER MAINS THAT ARE TO BE ABANDONED IN PLACE AND ARE UNDER THE PROPOSED ROADWAY ARE TO BE CUT, CAPPED, AND FILLED WITH FLOWABLE FILL. SUBSIDIARY TO COST OF PIPE, NO SEPARATE PAY. EXISTING WATER LINES THAT ARE TO BE ABANDONED IN PLACE AND ARE NOT UNDER THE PROPOSED ROADWAY WILL BE CAPPED.
 - ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
 - ALL EXISTING FENCES SHALL BE PROTECTED. IF DAMAGE TO AN EXISTING FENCE OCCURS, THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
 - WATER LINE SHALL BE 24" DIPS HDPE, DR 11 (200 PSI), WITH I.D. = 20.829". CONCRETE THRUST BLOCKS SHALL BE USED AT ALL FITTINGS, VALVES, AND OTHER APPURTENANCES.
 - DRIVEWAYS DAMAGED DURING WATER LINE INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
 - HDPE FITTINGS SHALL BE SHOP-FABRICATED HDPE IN ACCORDANCE WITH AWWA STANDARD C906. FIELD FABRICATION OF FITTINGS IS PROHIBITED. ALL FITTINGS MUST BE PRESSURE-RATED FOR 200 PSI.
 - THE MINIMUM COLD BENDING RADIUS OF DR11 HDPE 24" PIPE IS 54 FEET. THESE PLANS SHOW A MINIMUM BENDING RADIUS OF 200 FEET. THE CONTRACTOR SHALL BRING TO THE IMMEDIATE ATTENTION OF THE ENGINEER ANY LOCATION WHERE FIELD BENDING CANNOT BE ACCOMPLISHED.

EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

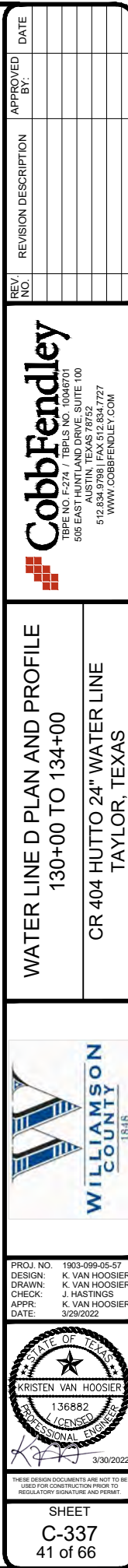


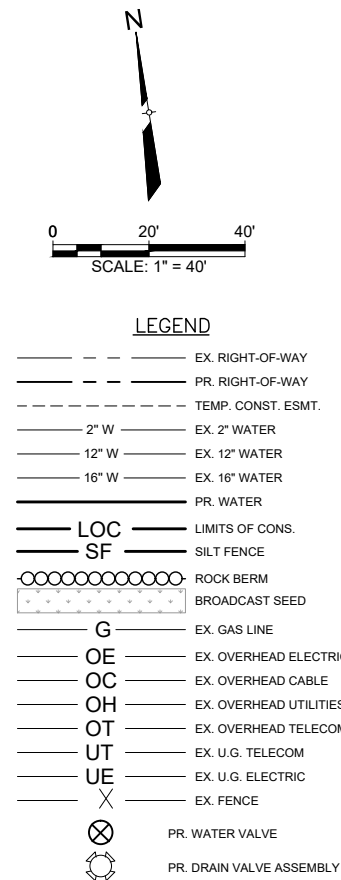
APPROVED BY:	DATE:
REVISION DESCRIPTION	
REV. NO.	

CR 404 HUTTO TO 24" WATER LINE
TAYLOR, TEXAS

PROJ. NO: 1903-099-05-57
DESIGN: K. VAN HOOSIER
DRAWN: K. VAN HOOSIER
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

SHEET
C-336
40 of 66





1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
2. EXISTING 16" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN IS CONSTRUCTED, TESTED, APPROVED AND THE NEW MAIN IS PLACED IN SERVICE.
3. EXISTING WATER MAINS THAT ARE TO BE ABANDONED IN PLACE AND ARE UNDER THE PROPOSED ROADWAY ARE TO BE CUT, CAPPED, AND FILLED WITH FLOWABLE FILL. SUBSIDIARY TO COST OF PIPE, NO SEPARATE PAY. EXISTING WATER LINES THAT ARE TO BE ABANDONED IN PLACE AND ARE NOT UNDER THE PROPOSED ROADWAY WILL BE CAPPED.
4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. ALL EXISTING FENCES SHALL BE PROTECTED. IF DAMAGE TO AN EXISTING FENCE OCCURS, THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
6. WATER LINE SHALL BE 24" DIPS HDPE, DR 11 (200 PSL), WITH I.D. = 20.829". CONCRETE THRUST BLOCKS SHALL BE USED AT ALL FITTINGS, VALVES, AND OTHER APPURTENANCES.
7. DRIVEWAYS DAMAGED DURING WATER LINE INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF PIPE, NO SEPARATE PAY ITEM.
8. HDPE FITTINGS SHALL BE SHOP-FABRICATED HDPE IN ACCORDANCE WITH AWWA STANDARD C906. FIELD FABRICATION OF FITTINGS IS PROHIBITED. ALL FITTINGS MUST BE PRESSURE-RATED FOR 200 PSI.
9. THE MINIMUM COLD BENDING RADIUS OF DR11 HDPE 24" PIPE IS 54 FEET. THESE PLANS SHOW A MINIMUM BENDING RADIUS OF 200 FEET. THE CONTRACTOR SHALL BRING TO THE IMMEDIATE ATTENTION OF THE ENGINEER ANY LOCATION WHERE FIELD BENDING CANNOT BE ACCOMPLISHED.

EXISTING
GRADE
FLOW LINE
OF PIPE

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

<div style="text-align: center;">  <h1 style="margin: 0;">CobbFendley</h1> <p style="margin: 0;"> TBPE NO. F-274 / TBPLS NO. 10048701 505 EAST HUNTLAND DRIVE, SUITE 100 AUSTIN, TEXAS 78752 512.834.9798 FAX 512.834.7727 WWW.COBBFENDLEY.COM </p> </div>	REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE

<h2 style="margin: 0;">WATER LINE D PLAN AND PROFILE</h2> <h3 style="margin: 0;">134+00 TO END</h3>	<h2 style="margin: 0;">CR 404 HUTTO 24" WATER LINE</h2> <h3 style="margin: 0;">TAYLOR, TEXAS</h3>
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WILLIAMSON COUNTY

PROJ. NO. 1903-099-05-51 DESIGN: K. VAN HOOSIER DRAWN: K. VAN HOOSIER CHECK: J. HASTINGS APPR: K. VAN HOOSIER DATE: 3/29/2022	3/30/2022
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KRISTEN VAN HOOSIER
 136882
 (CENST)
 PROFESSIONAL ENGINEER

SHEET

C-338

42 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-400-DETL-ESC.dwg -- Tab: DETL-ESC -- Plotted: 3/28/2022 4:17 PM By: KRISTEN VAN HOOSIER

GUIDELINES FOR DESIGN AND INSTALLATION OF
TEMPORARY EROSION AND SEDIMENTATION CONTROLS

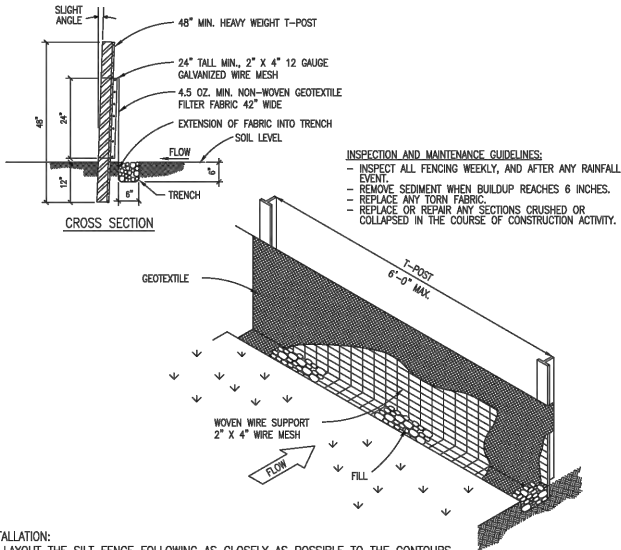
TYPE OF STRUCTURE	TYPE OF STRUCTURE	TYPE OF STRUCTURE	TYPE OF STRUCTURE
SILT FENCE	N/A	2 ACRES	0 - 10%
	200 FEET	2 ACRES	10% - 20%
	100 FEET	1 ACRE	20% - 30%
	50 FEET	1/2 ACRE	> 30%
TRIANGLE FILTER DIKE	100 FEET	1/2 ACRE	< 30%
	50 FEET	1/4 ACRE	> 30%
ROCK BERM *, **	500 FEET	< 5 ACRES	0 - 10%

* FOR ROCK BERM DESIGN, WHERE PARAMETERS ARE OTHER THAN STATED, DRAINAGE AREA CALCULATION AND ROCK BERM DESIGN MUST BE SUBMITTED FOR REVIEW.
** HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF HUTTO.



CITY OF HUTTO
CONSTRUCTION STANDARDS AND DETAILS
TEMPORARY EROSION AND
SEDIMENTATION CONTROL
ENGINEERING & PUBLIC WORKS

DRAWING NO. ESC01
UPDATED: 02/01/2019
DRAWN BY: BB
SCALE: N.T.S.
FILE NAME: ESC01.DWG

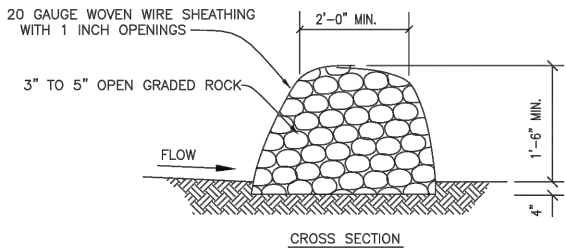


- INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT.
 - REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
 - REPLACE ANY TORN FABRIC.
 - REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.
- INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOURS.
 - CLEAR THE GROUND OF DEBRIS, ROCKS AND/OR PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE.
 - EXCAVATE 6" DEEP BY 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
 - DRIVE THE HEAVY DUTY T-POST AT LEAST 12 INCHES (12") 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 SIX TIMES WITH HOG RINGS.
 - THE SILT FENCE TO BE INSTALLED WITH A SKIRT MINIMUM OF 6" WIDE, PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE THE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY ON INCH (1").
 - ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
 - GEOTEXTILE SPLICES, MINIMUM 18" WIDE, SHOULD BE ATTACHED IN A LEAST SIX PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
 - SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.



CITY OF HUTTO
CONSTRUCTION STANDARDS AND DETAILS
SILT
FENCE
ENGINEERING & PUBLIC WORKS

DRAWING NO. ESC02
UPDATED: 02/01/2019
DRAWN BY: BB
SCALE: N.T.S.
FILE NAME: ESC02.DWG



- INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOURS.
 - CLEAR THE GROUND OF ANY DEBRIS, ROCKS AND/OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
 - PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCLOSE THE FINISHED SIZE OF THE BERM.
 - PLACE THE ROCK ALONG WITH THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
 - WRAP THE STRUCTURE WITH PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH THAT, WHEN WALKED ACROSS, THE STRUCTURE RETAINS ITS SHAPE.
 - SECURE WITH THE WIRE.
 - THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4" 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.

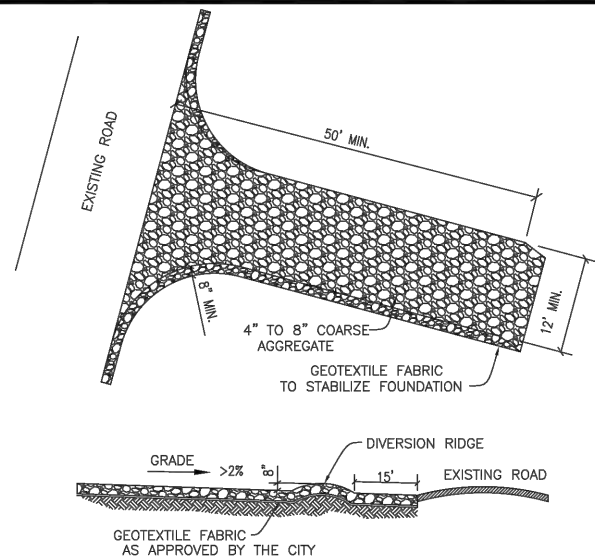
INSPECTION AND MAINTENANCE GUIDELINES:

- INSPECTIONS SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAM BEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES (6") 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.



CITY OF HUTTO
CONSTRUCTION STANDARDS AND DETAILS
ROCK
BERM
ENGINEERING & PUBLIC WORKS

DRAWING NO. ESC03
UPDATED: 02/01/2019
DRAWN BY: BB
SCALE: N.T.S.
FILE NAME: ESC03.DWG



- 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.
 - PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
 - PLACE ROCK AS APPROVED BY THE CITY.
- INSPECTIONS AND MAINTENANCE GUIDELINES:
- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-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 ONTO PUBLIC RIGHT-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
 - WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAYS.
 - 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.



CITY OF HUTTO
CONSTRUCTION STANDARDS AND DETAILS
STABILIZED
CONSTRUCTION ENTRANCE
ENGINEERING & PUBLIC WORKS

DRAWING NO. ESC06
UPDATED: 02/01/2019
DRAWN BY: BB
SCALE: N.T.S.
FILE NAME: ESC06.DWG



EROSION CONTROL STANDARD
DETAILS
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

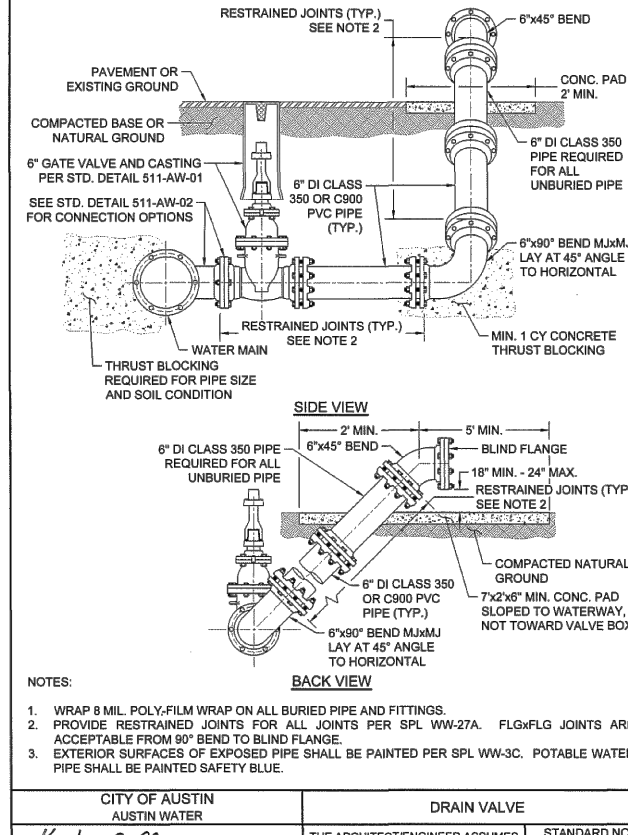
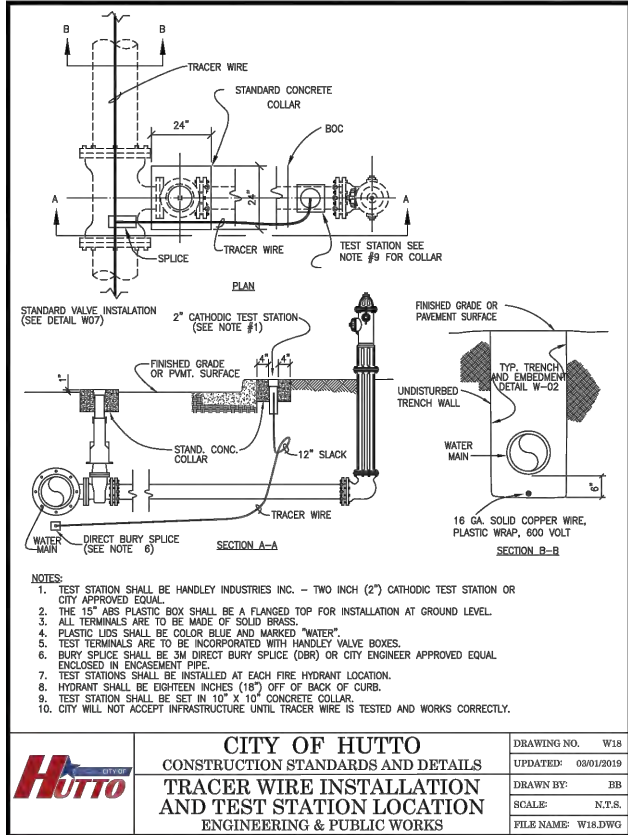
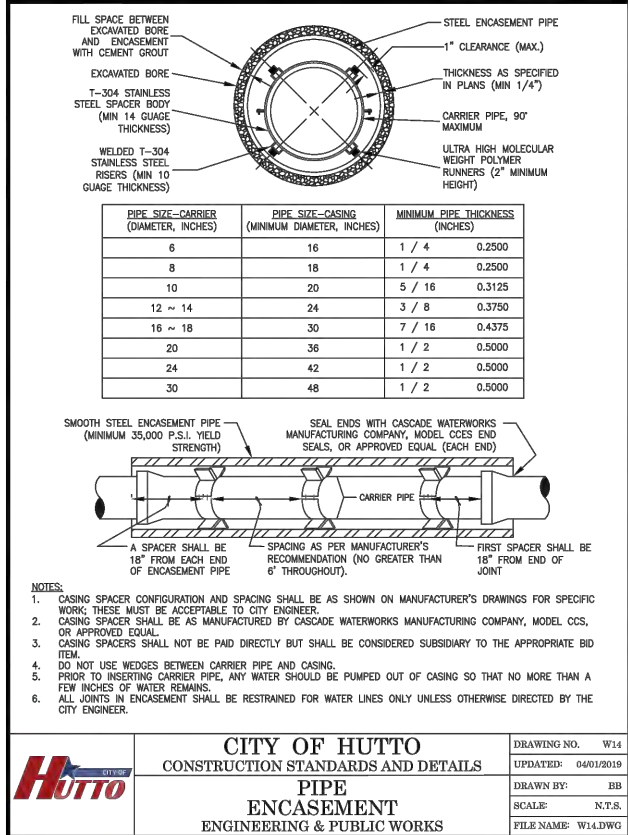
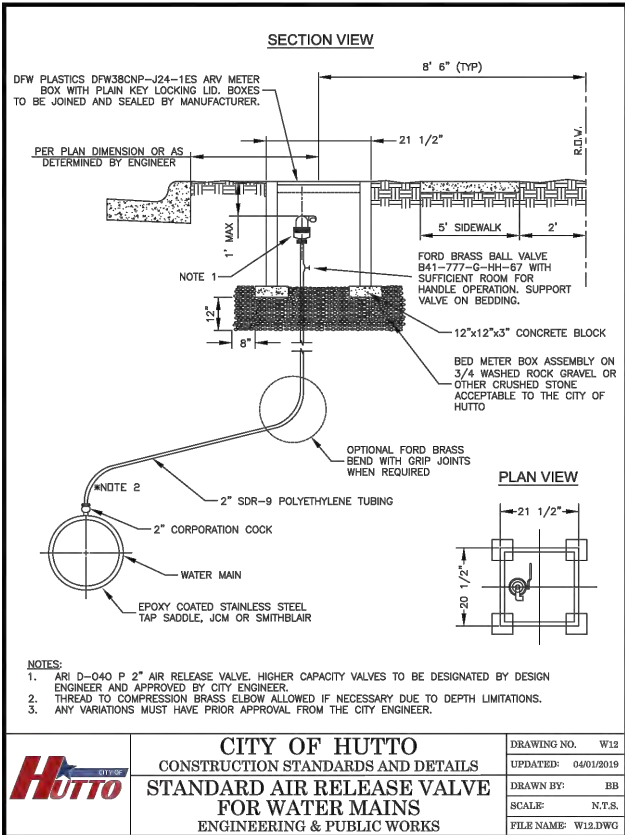
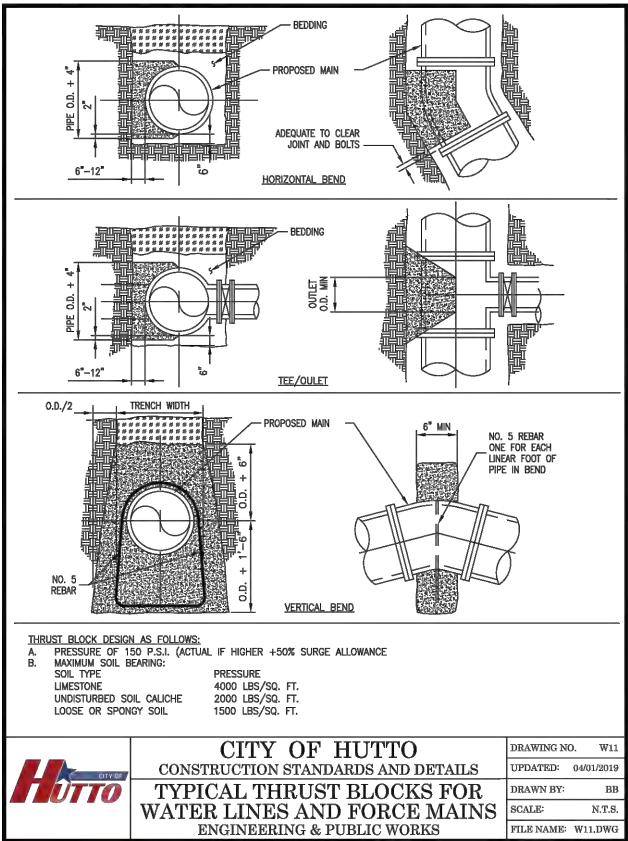
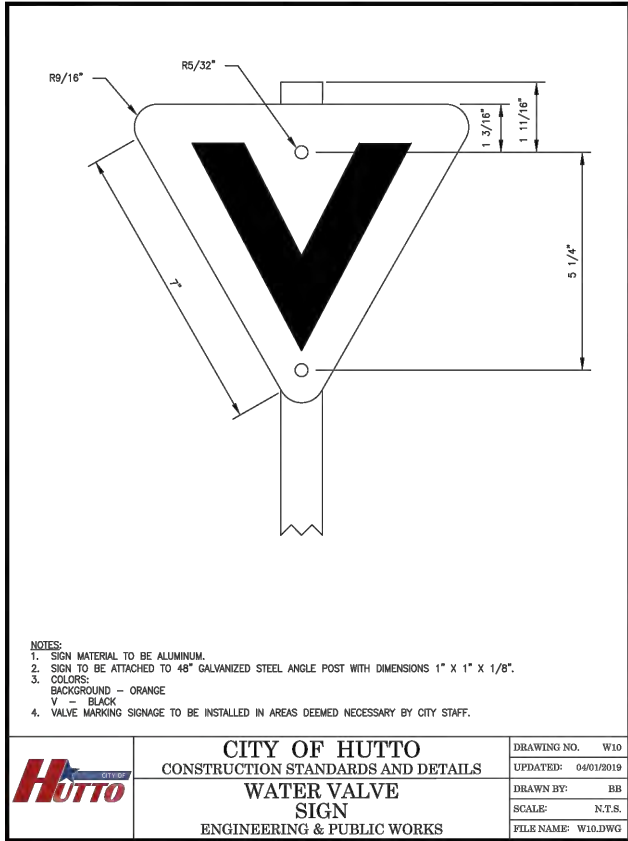
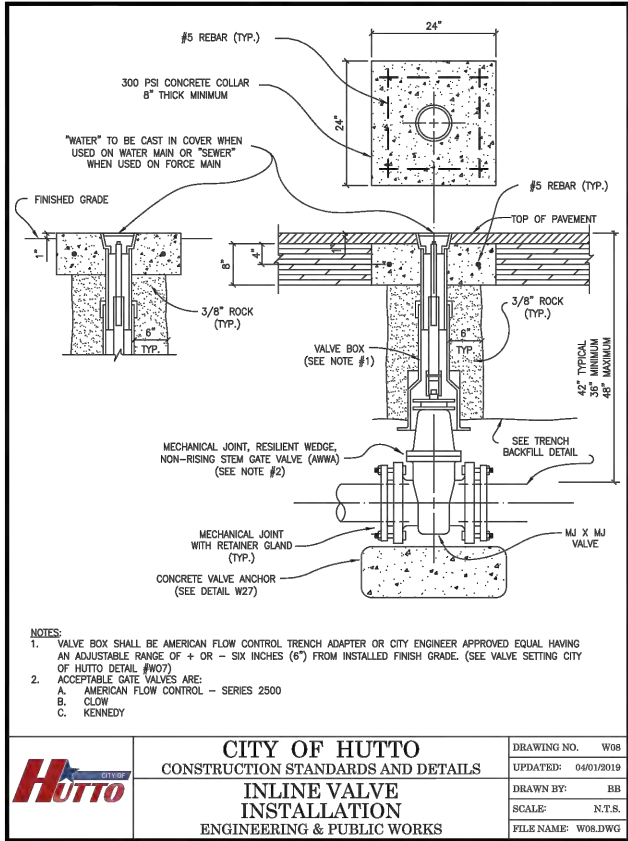
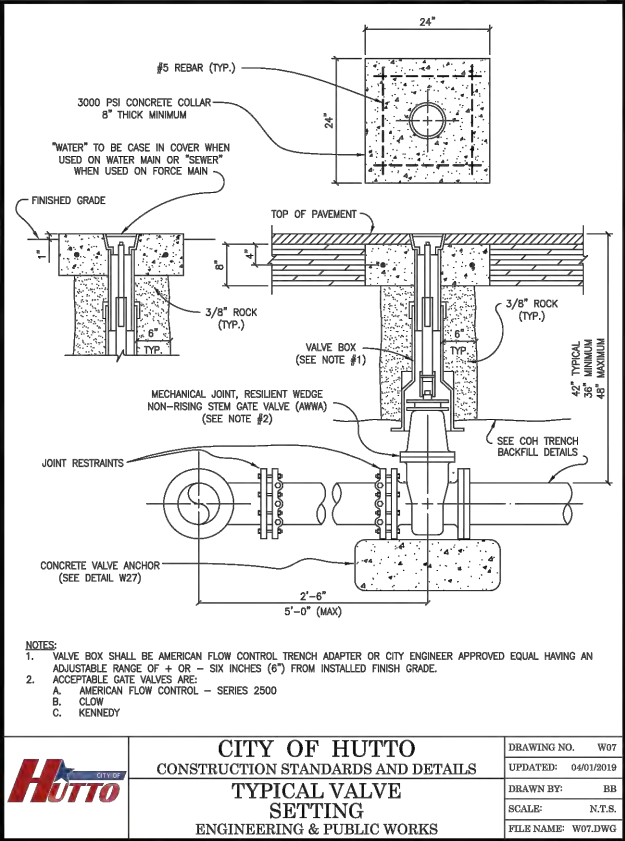


PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



SHEET
C-401
43 of 66

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-600-DET1-WATR.dwg - Tab: DET1-WATR-01 - Plotted: 3/28/2022 4:17 PM By: KRISTEN VAN HOOSIER



APPROVED BY: DATE

REVISION DESCRIPTION

REV. NO.

CobbFendley
ENGINEERING & ARCHITECTURE
1000 E. HUNTER DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9788 FAX 512.834.7727
WWW.COBBFENDLEY.COM

STANDARD WATER DETAILS -
SHEET 1 OF 2

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

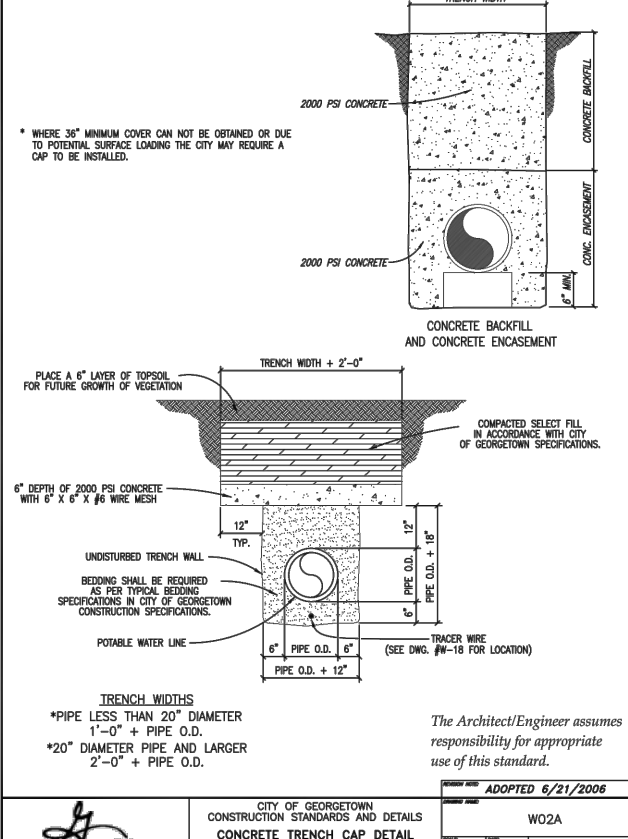
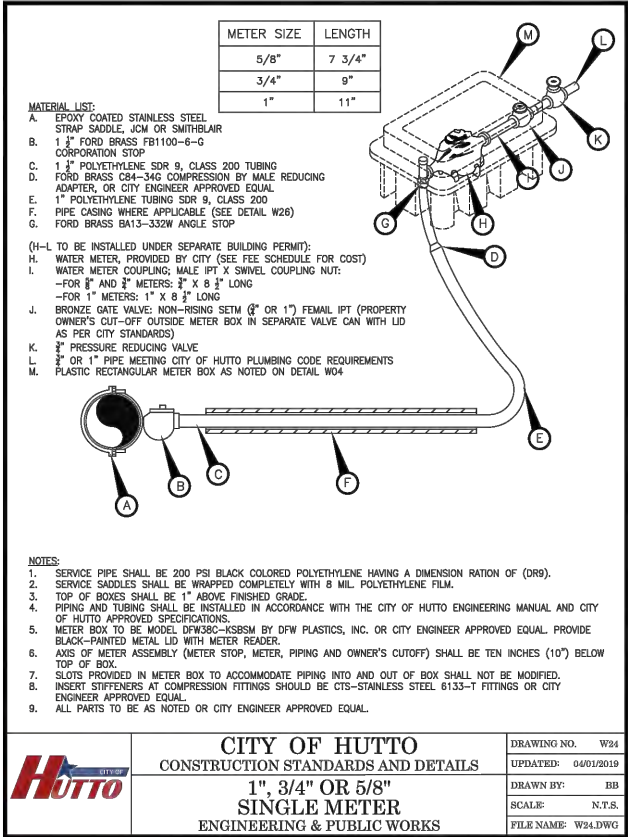
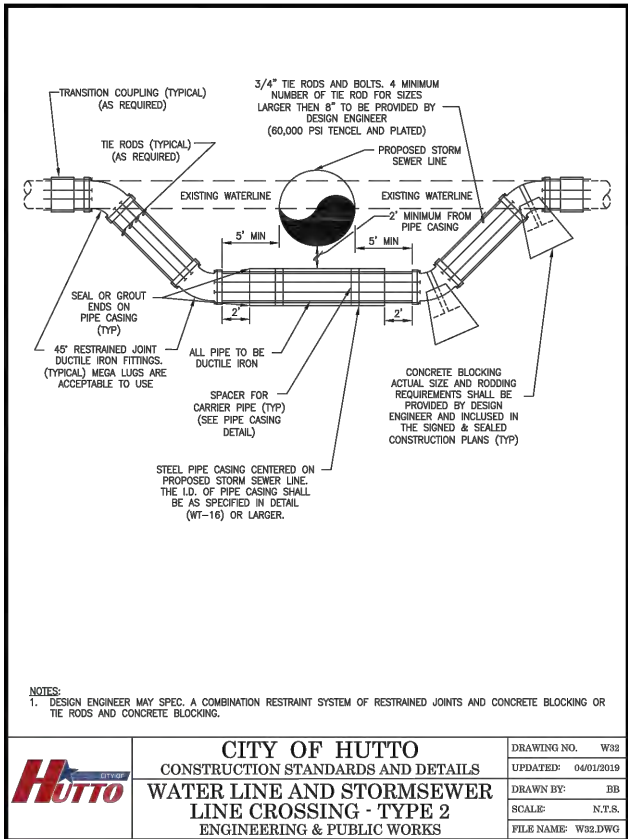
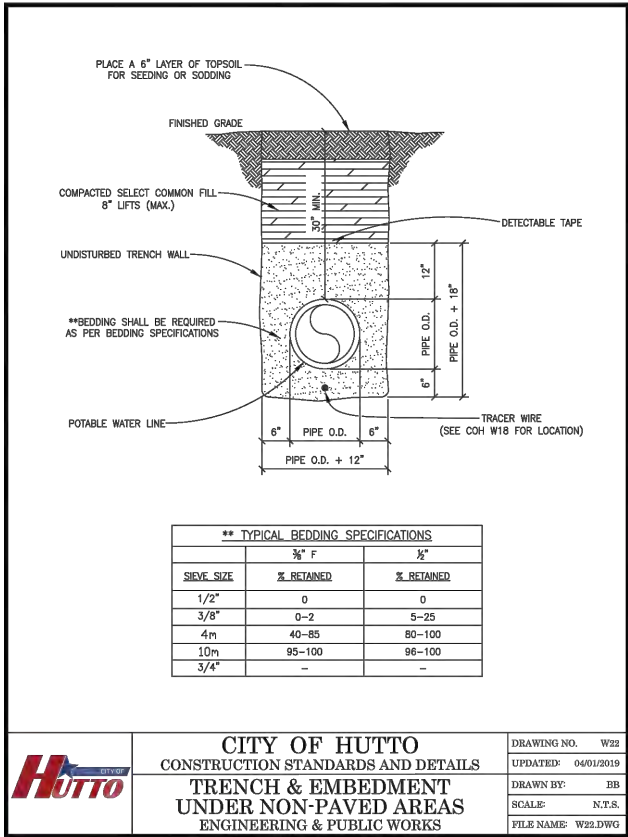
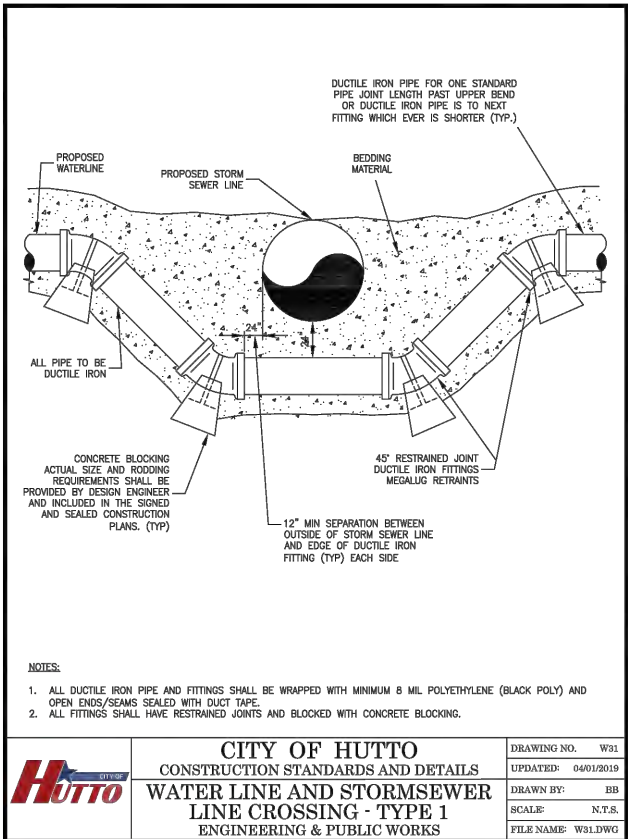
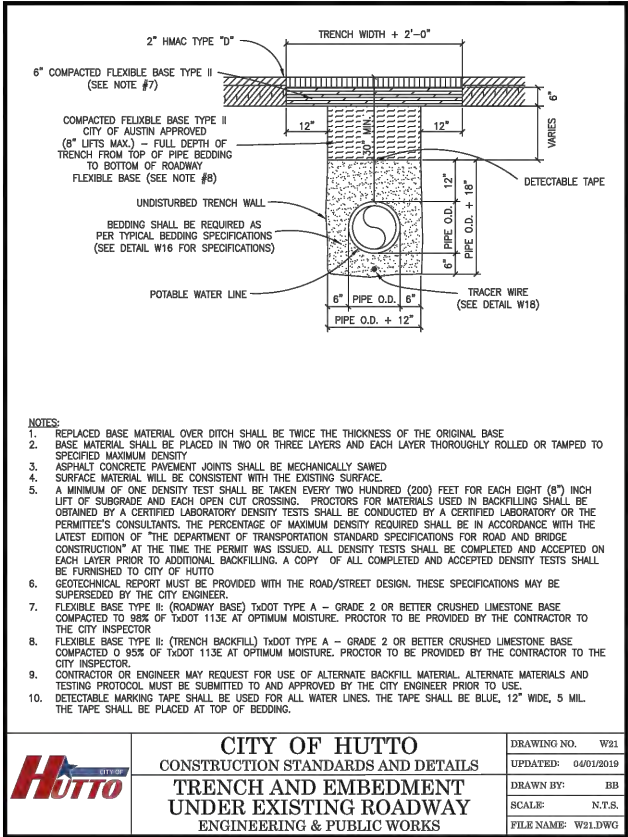
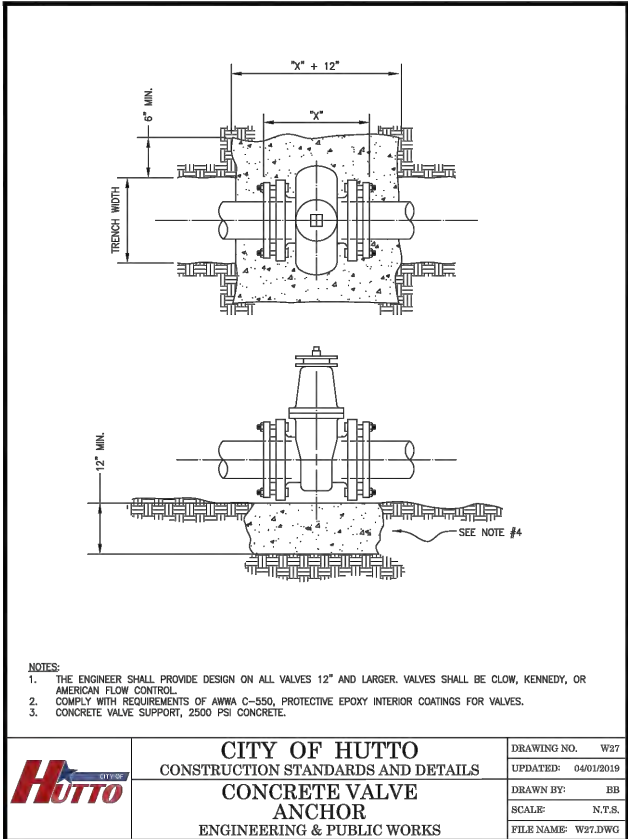
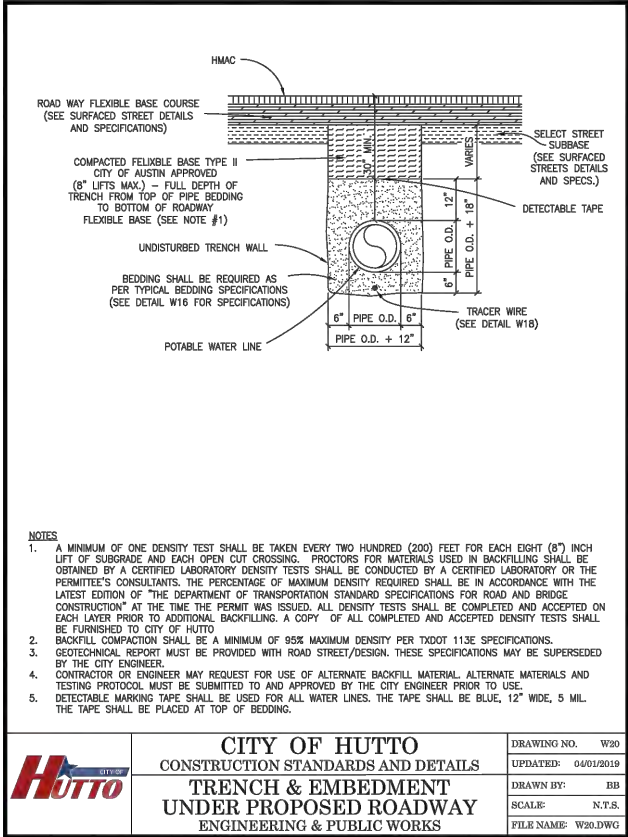
WILLIAMSON COUNTY
1848

PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWING: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

THESE DESIGN DOCUMENTS ARE NOT TO BE
USED FOR CONSTRUCTION PRIOR TO
REGULATORY SIGNATURE AND PERMIT.

SHEET
C-501
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Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\39_CR404_Hutto\DESIGN\C-600-DET1-WATR.dwg -- Tab: DET1-WATR-02 -- Plotted: 3/28/2022 4:18 PM By: KRISTEN VAN HOOSIER



APPROVED BY: DATE

REVISION DESCRIPTION

REV. NO.

CobbFendley
THE CITY OF HUTTO, TEXAS
505 EAST HUNTLAND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.334.9788 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

STANDARD WATER DETAILS -
SHEET 2 OF 2

CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS

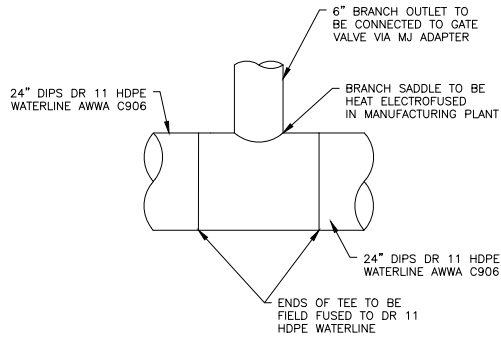
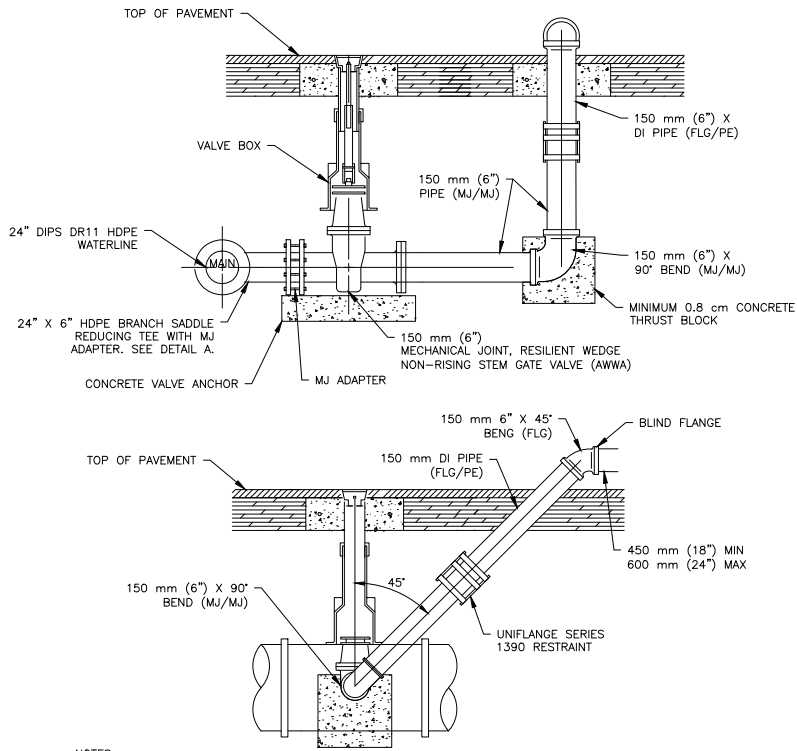
WILLIAMSON COUNTY
1848

PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022

STATE OF TEXAS
136882
K. VAN HOOSIER
3/30/2022

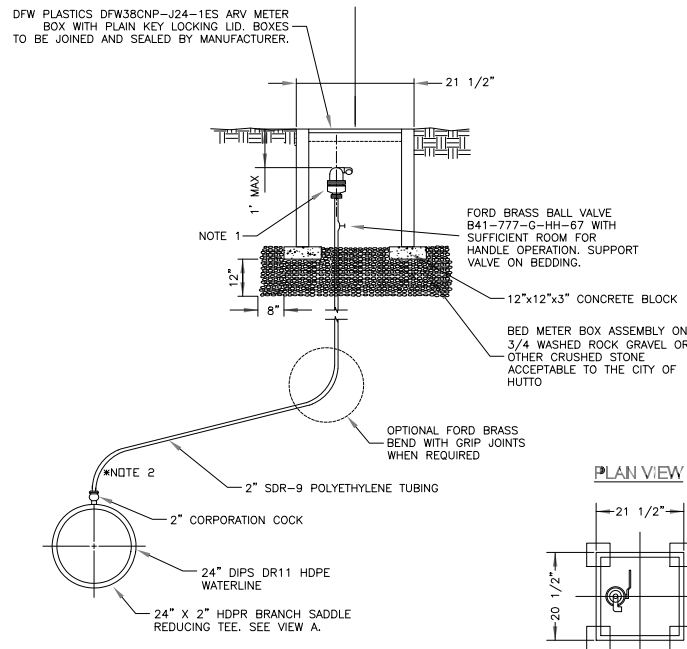
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C-502
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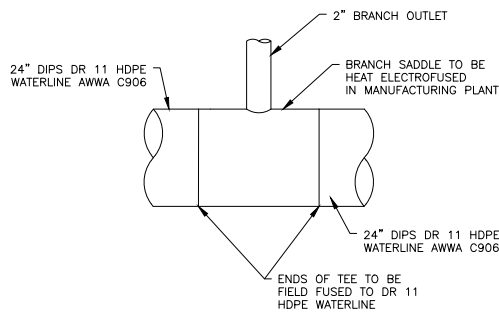
NOTES:
1. THIS FITTING SHALL BE SHOP FABRICATED IN ACCORDANCE WITH SPECIFICATIONS AND AWWA C906. FITTING SHALL BE SUPPLIED TO SITE AS ONE PIECE, READY TO BE FUSED TO DR11 HDPE PIPE.
2. FITTING SHALL BE PRESSURE RATED TO 200 PSI.

Drain Valve Assembly
(FOR USE WITH HDPE WATER MAINS)
NTS



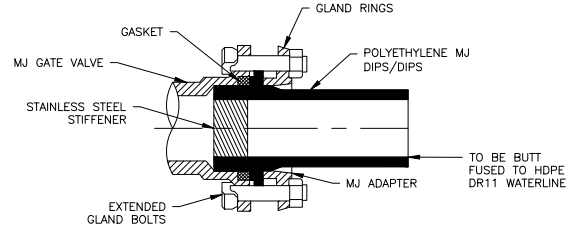
NOTES:
1. ARI D-040 P 2" AIR RELEASE VALVE. HIGHER CAPACITY VALVES TO BE DESIGNATED BY DESIGN ENGINEER AND APPROVED BY CITY ENGINEER.
2. THREAD TO COMPRESSION BRASS ELBOW ALLOWED IF NECESSARY DUE TO DEPTHS LIMITATIONS.
3. ANY VARIATIONS MUST HAVE PRIOR APPROVAL FROM THE CITY ENGINEER

STANDARD AIR RELEASE VALVE FOR WATER MAINS
(FOR USE WITH HDPE WATER MAINS)
NTS



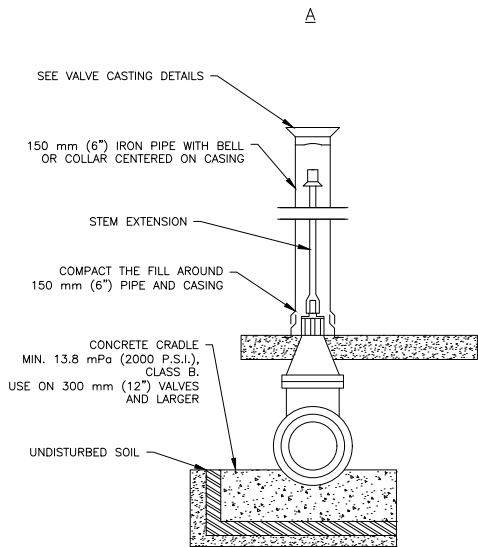
NOTES:
1. THIS FITTING SHALL BE SHOP FABRICATED IN ACCORDANCE WITH SPECIFICATIONS AND AWWA C906. FITTING SHALL BE SUPPLIED TO SITE AS ONE PIECE, READY TO BE FUSED TO DR11 HDPE PIPE.
2. FITTING SHALL BE PRESSURE RATED TO 200 PSI.

VIEW A
NTS



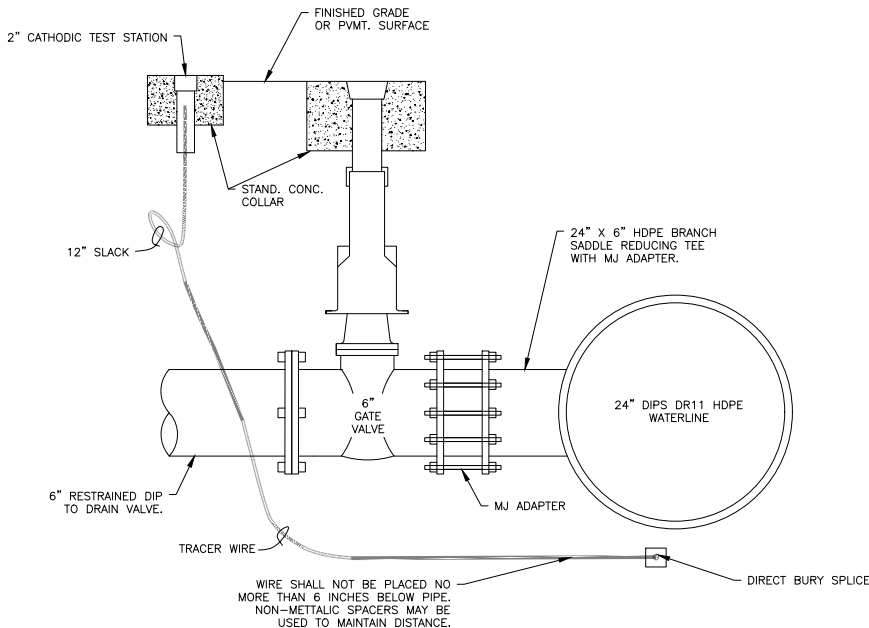
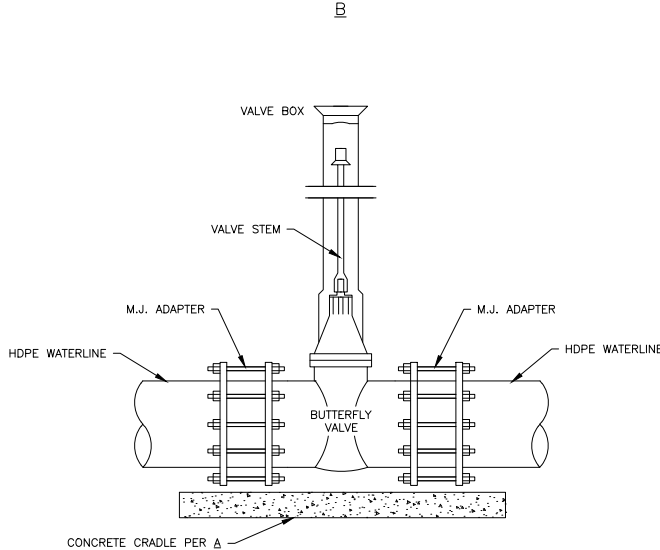
NOTES:
1. STAINLESS STEEL STIFFENER SHALL BE MADE TO FIT THE ACTUAL MEASUREMENTS OF THE PIPE BEING USED.
2. MJ VALVE SHALL BE AWWA C11 COMPLIANT
3. "MJ ADAPTER" AS CALLED OUT IN THE PLANS REFERENCES THIS COMPLETE INSTALLATION. MJ ADAPTER KIT SHALL INCLUDE THE MJ ADAPTER, SS STIFFENER, EXTENDED TEE BOLTS AND NUTS (SS), GLAND AND GASKET.
4. THIS ASSEMBLY SHALL BE SUBSIDIARY TO THE COST OF THE DRAIN VALVE ASSEMBLY.

HDPE MJ ADAPTER ASSEMBLY
NTS



NOTES:
1. WELD SOCKET 64 mm X 51 mm (2 1/2 inch X 2 inch) DEEP TO 25 mm (1 inch) SCH. 40 ROUND STEM EXTENSION, FITTED ON OPERATING NUT, SCH. 80 FOR LENGTHS OVER 3 m (10').
2. NUT AT TOP OF VALVE EXTENSION ROD SHALL BE SQUARE 51 mm (2 inch) LONG WELDED TO TOP OF ROD.
3. VALVE EXTENSIONS ARE REQUIRED ON ALL VALVES THAT EXCEED 0.9 m (3 feet) DEEP FROM FINISHED GRADE. VALVE EXTENSIONS SHALL BE PLACED SUCH THAT THE EXTENSION NUT IS BETWEEN 450 AND 600 mm (18 inch AND 24 inch) FROM FINISHED GRADE.
4. CRADLE SHALL EXTEND 6 FT ON EITHER SIDE OF THE VALVE

24" BUTTERFLY VALVE DETAIL
(FOR USE WITH HDPE WATER MAINS)
NTS



NOTES:
1. SPLICES SHALL BE MADE USING A 3M DIRECT BURY SPLICE KIT (DBR) OR APPROVED EQUIVALENT ENCLOSED IN ENCASEMENT PIPE.
2. AS-BUILT DRAWINGS SHALL SHOW TRACER WIRE AND ACCESS POINTS.
3. TRACER WIRE SHALL BE TESTED BY OWNER AS PART OF FINAL ACCEPTANCE OF PROJECT.

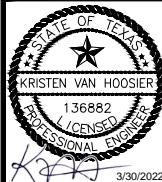
TRACER WIRE DETAIL
(FOR USE WITH HDPE WATER MAINS)
NTS



HDPE WATER DETAILS
CR 404 HUTTO 24" WATER LINE
TAYLOR, TEXAS



PROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: R. RODRIGUEZ
CHECK: J. HASTINGS
APPR: K. VAN HOOSIER
DATE: 3/29/2022



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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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


WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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



Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS

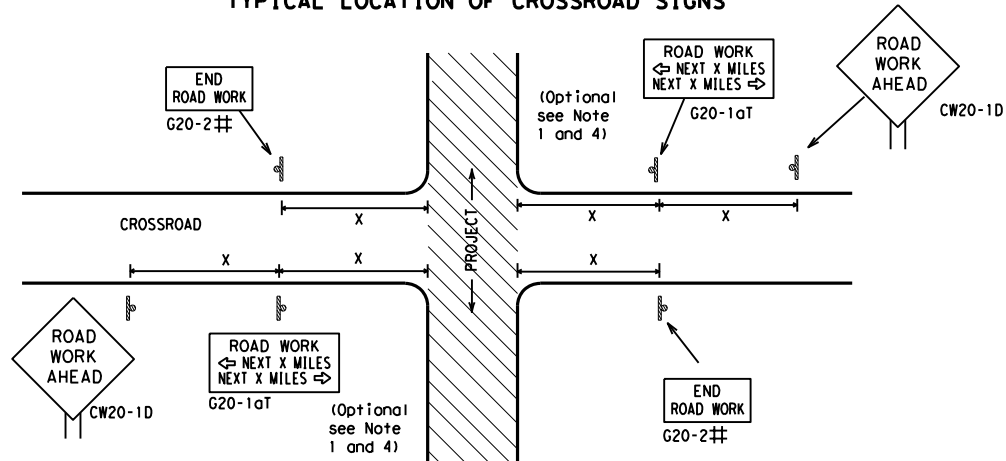
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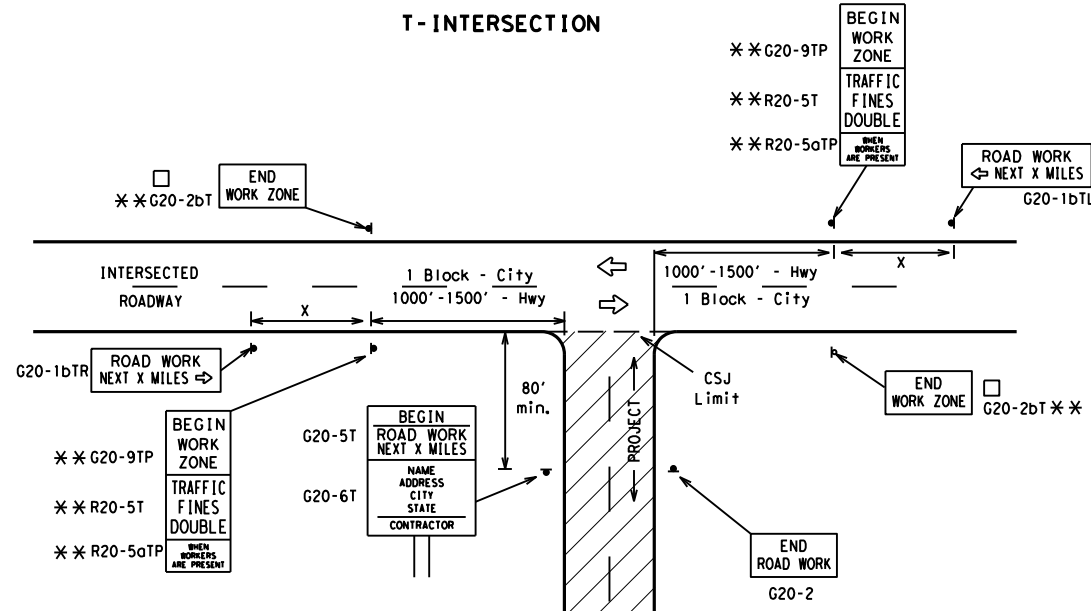
TYPICAL LOCATION OF CROSSROAD SIGNS



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

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES" (G20-1aT) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME" (G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow (G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{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
			*	*

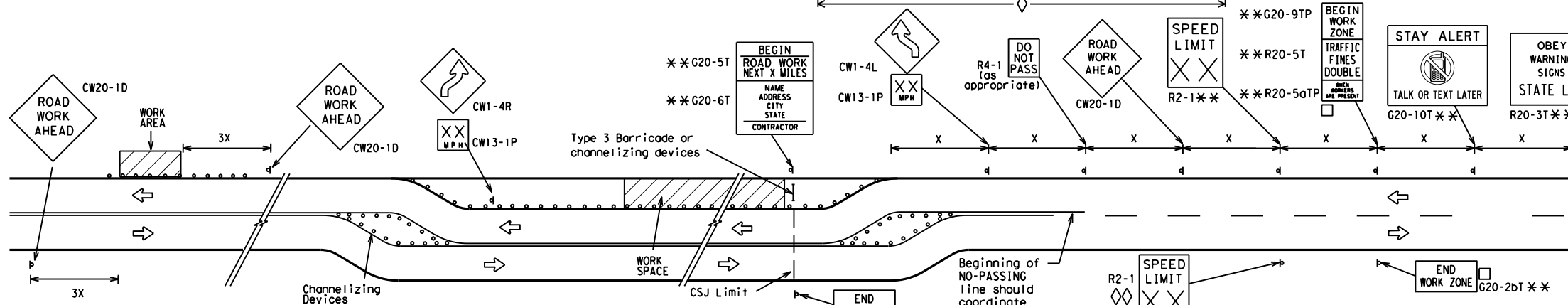
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

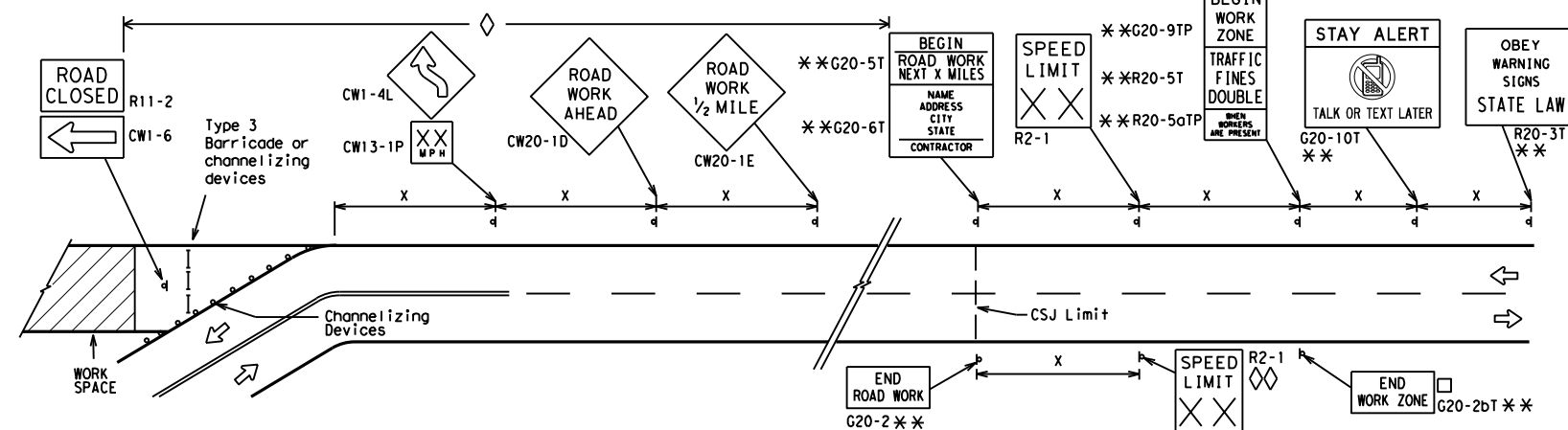
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



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

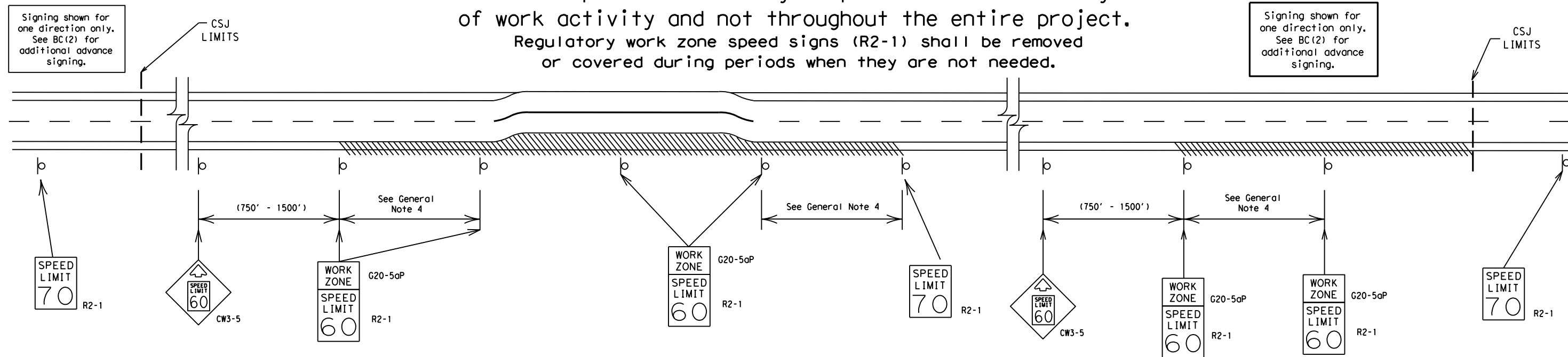
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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:
 - A. Law enforcement.
 - B. Flagger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low-power (drone) radar transmitter.
 - E. Speed monitor trailers or signs.
- 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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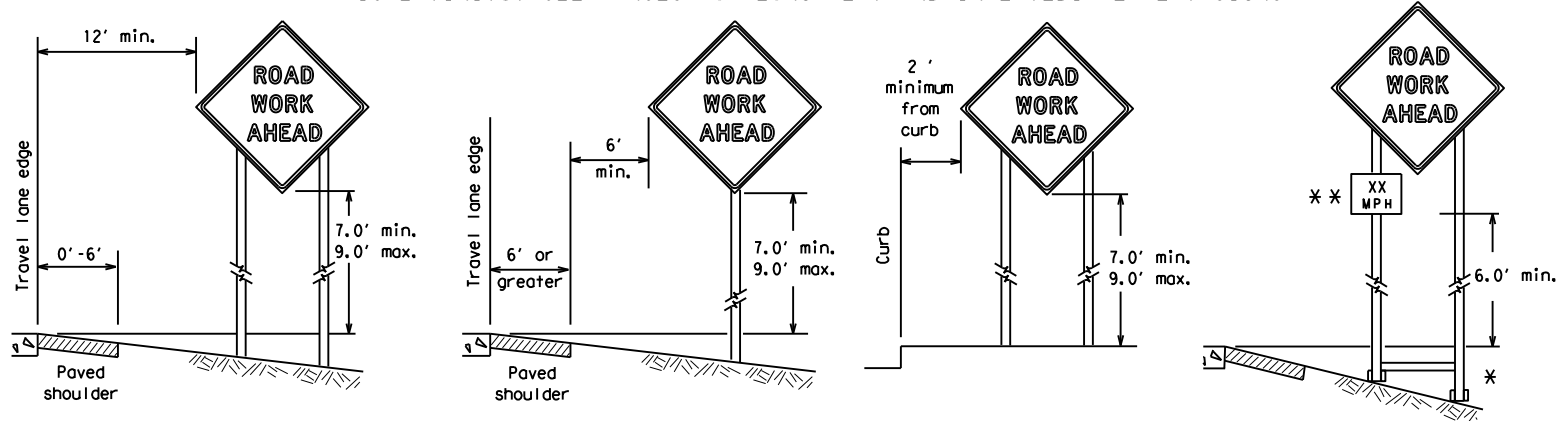
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BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
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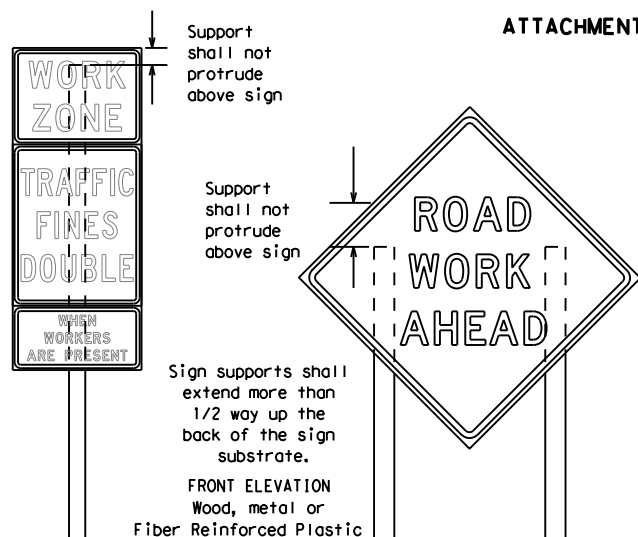
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



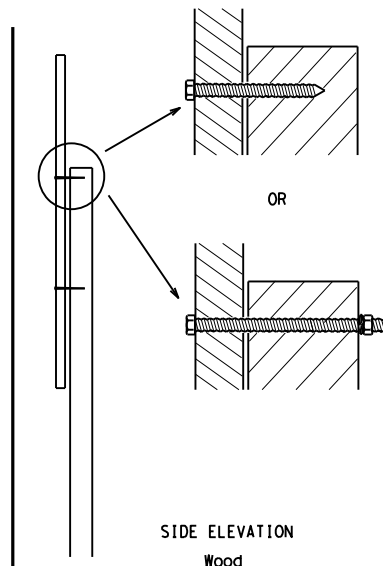
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

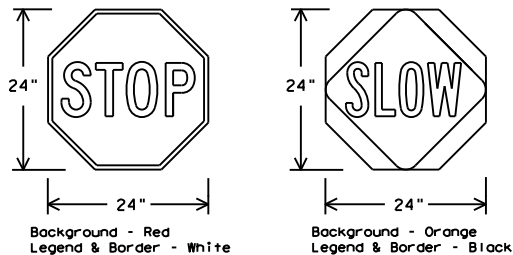


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

STOP/SLOW PADDLES

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

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on 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.
5. 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.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (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.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. 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.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

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

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. 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

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

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

SHEET 4 OF 12

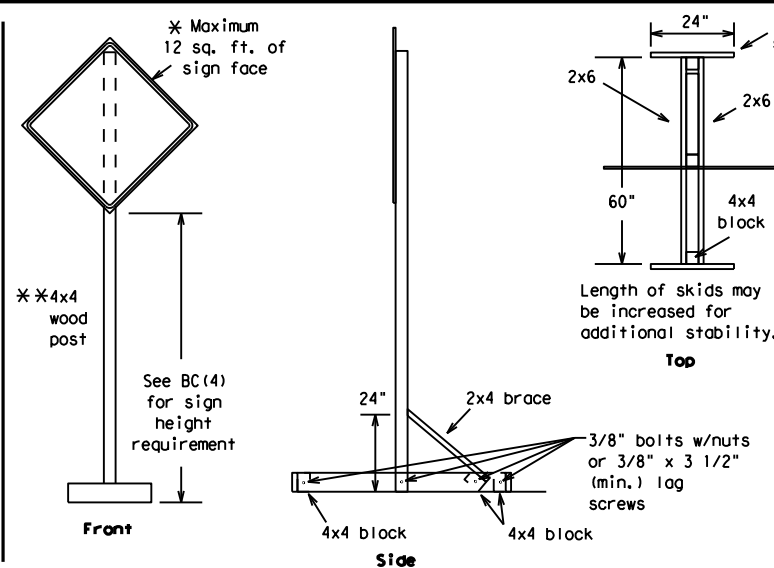
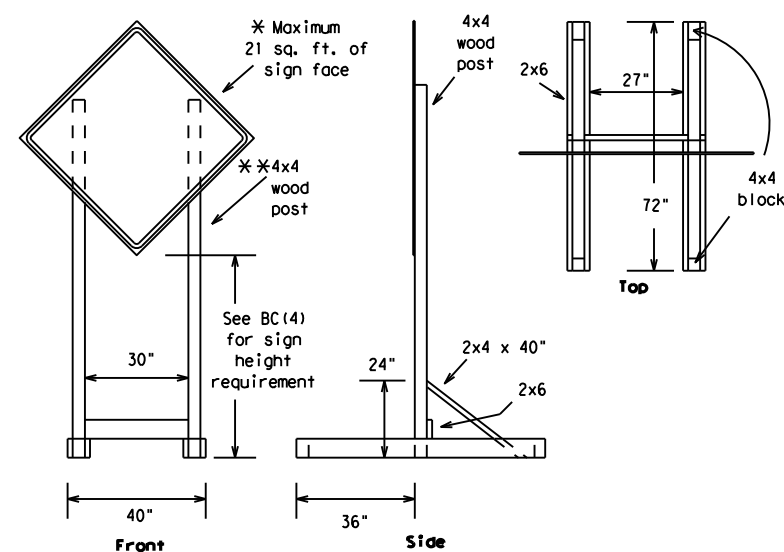


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) -21

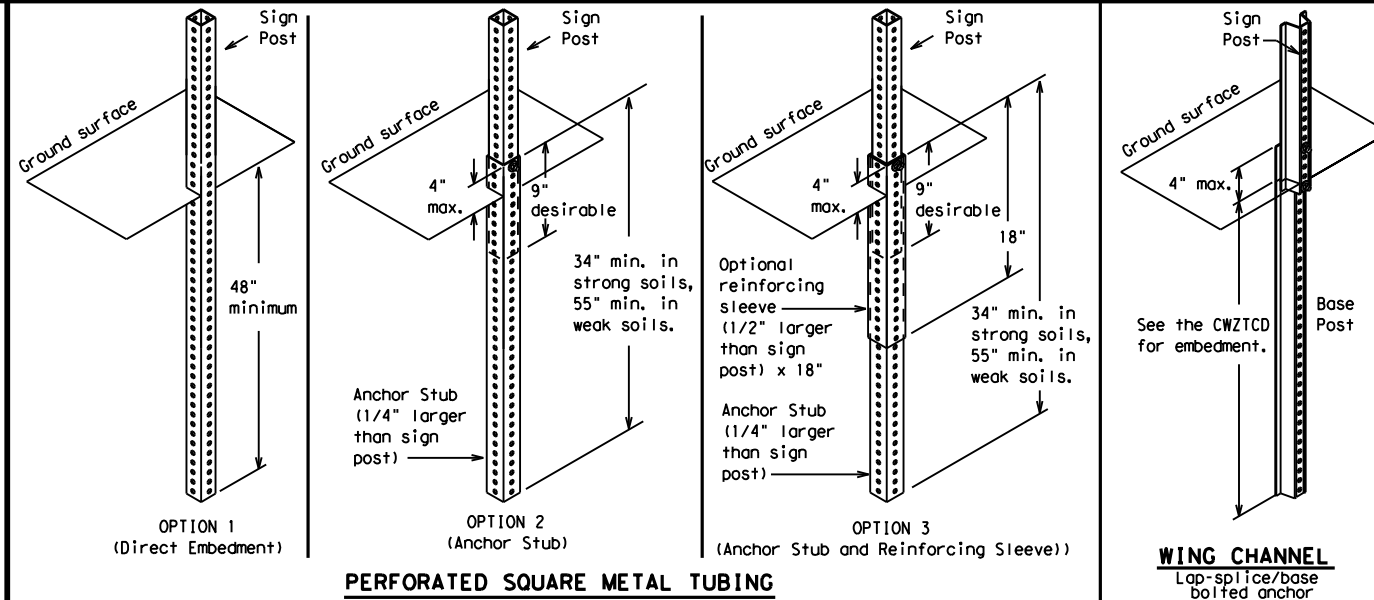
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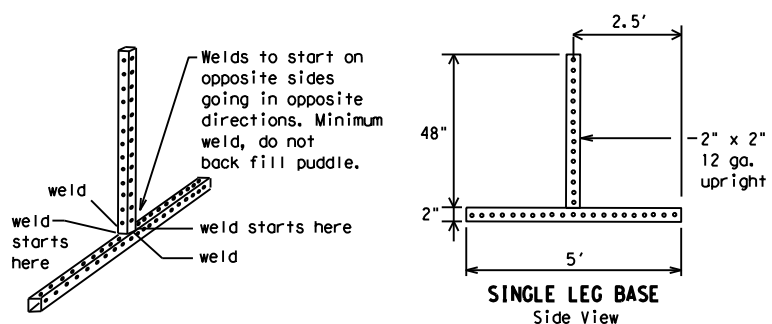
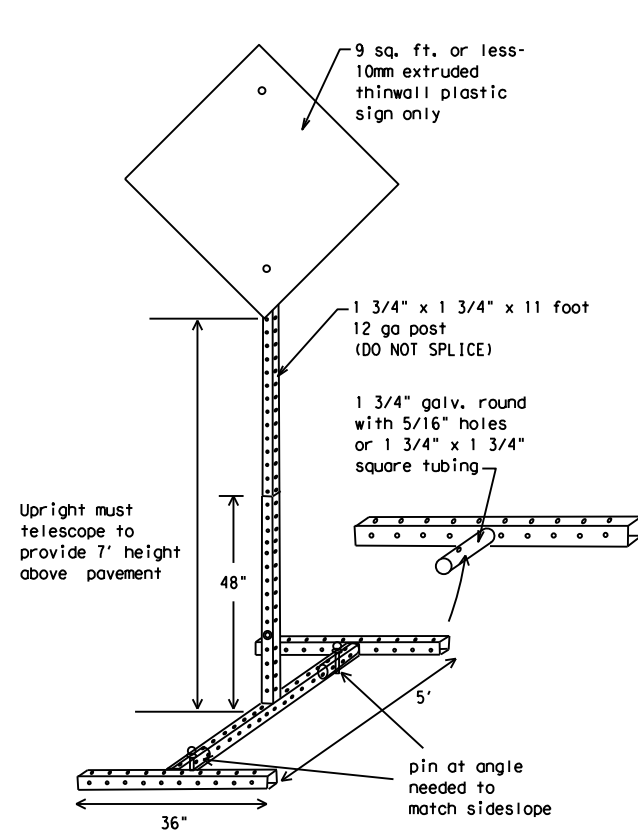
SKID MOUNTED WOOD SIGN SUPPORTS

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



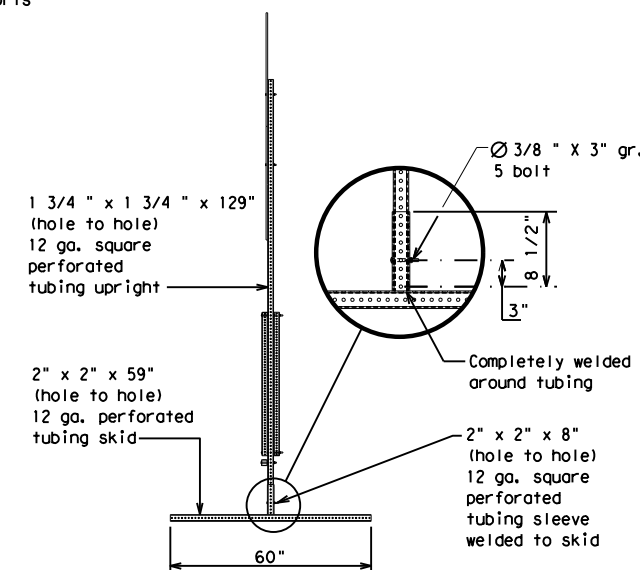
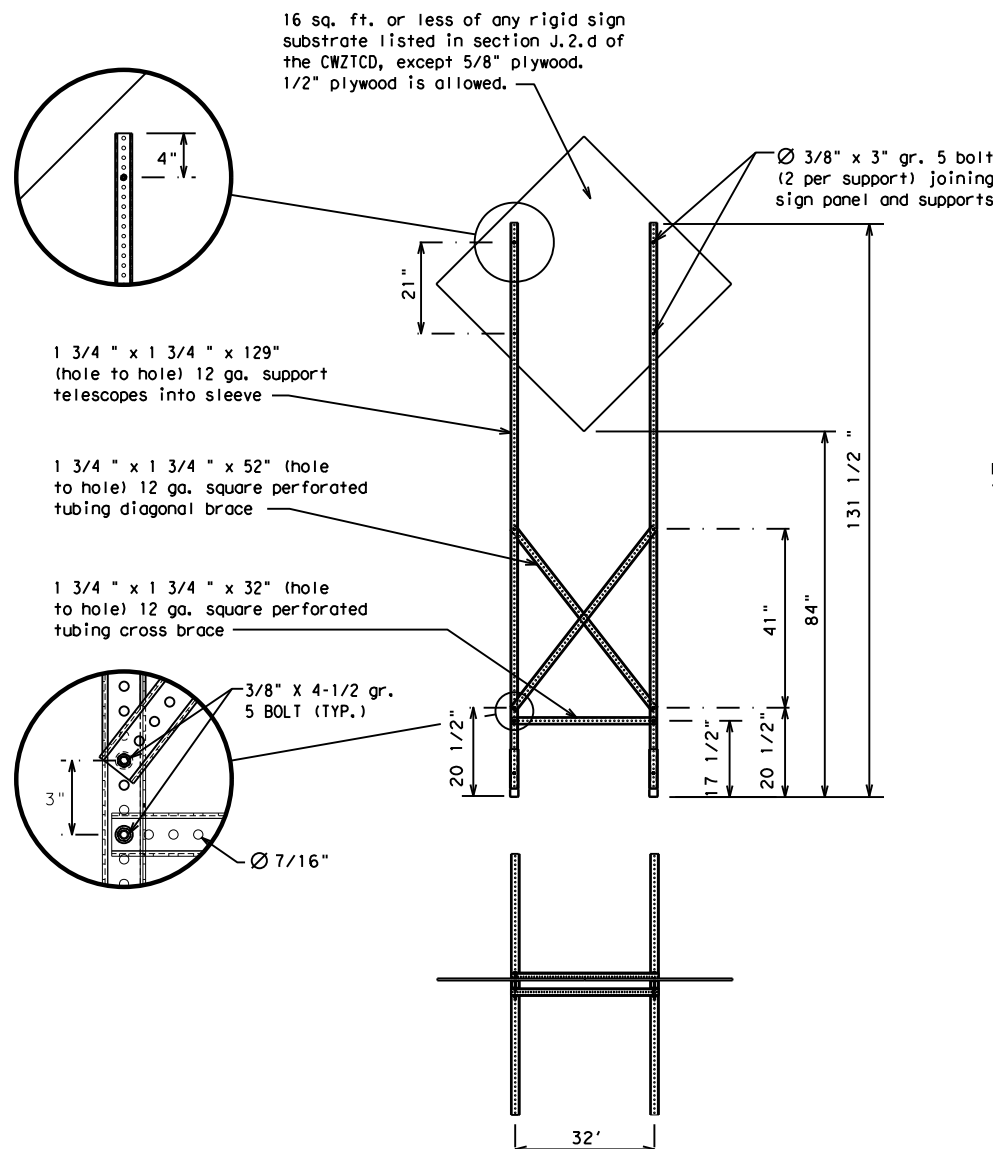
GROUND MOUNTED SIGN SUPPORTS

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.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

* See BC(4) for definition of "Work Duration."

✱✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



Texas Department of Transportation

**Traffic
Safety
Division
Standard**

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC (5) - 21

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

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

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

Phase 2: Possible Component Lists

Other Condition List

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

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

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, 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.

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

** Advance
Notice List

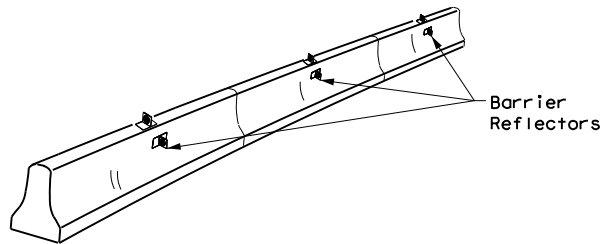
** See Application Guidelines Note 6.

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

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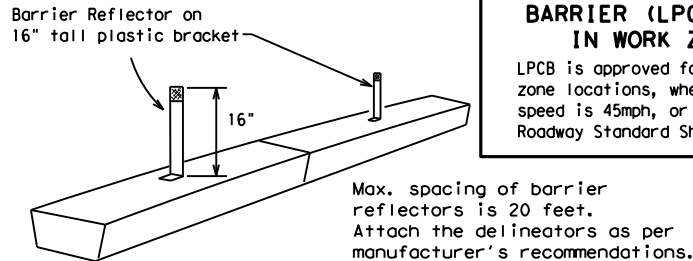
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

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

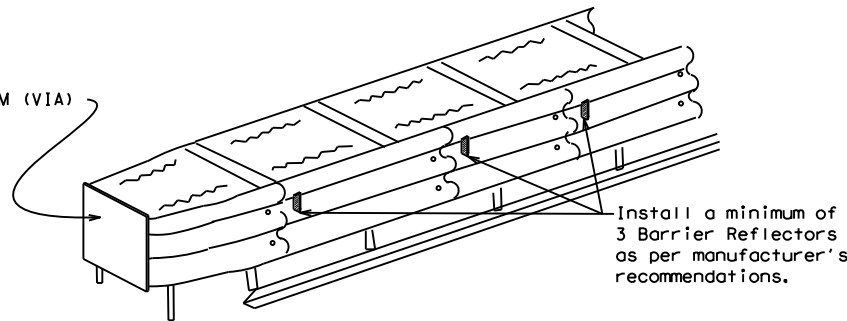


LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

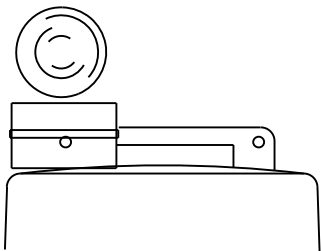
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

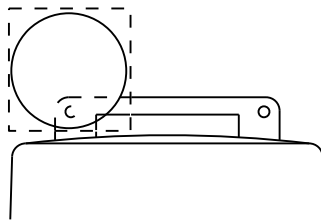
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



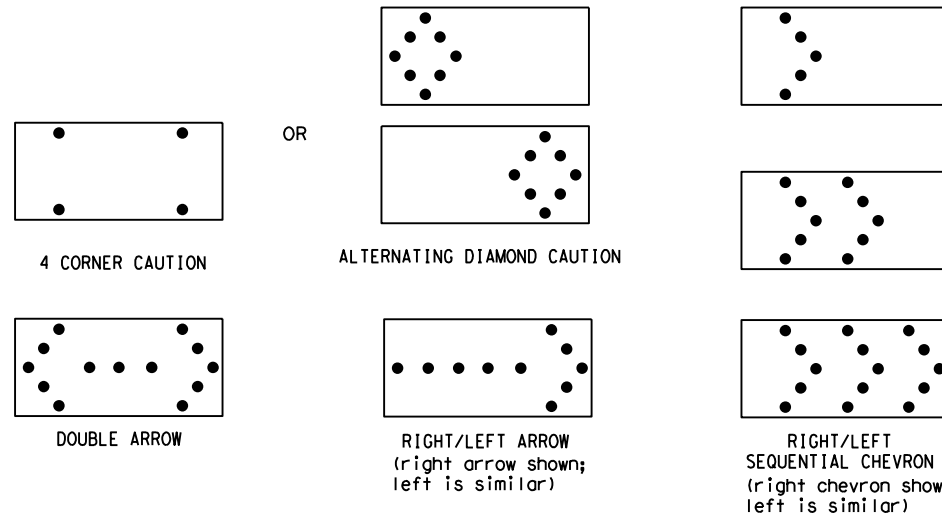
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC(7)-21

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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:

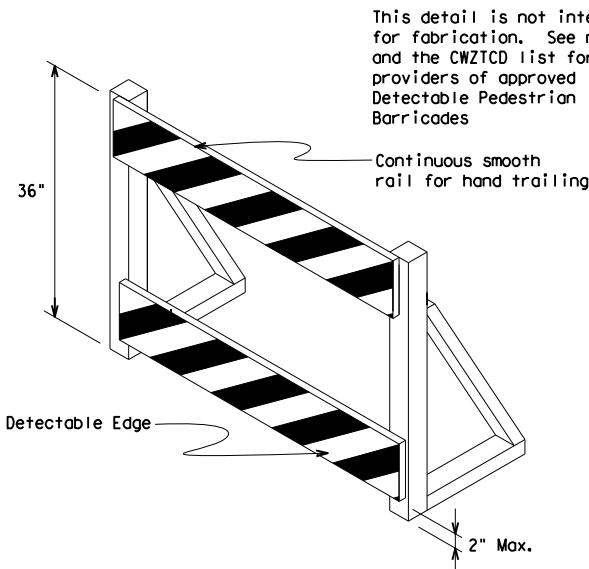
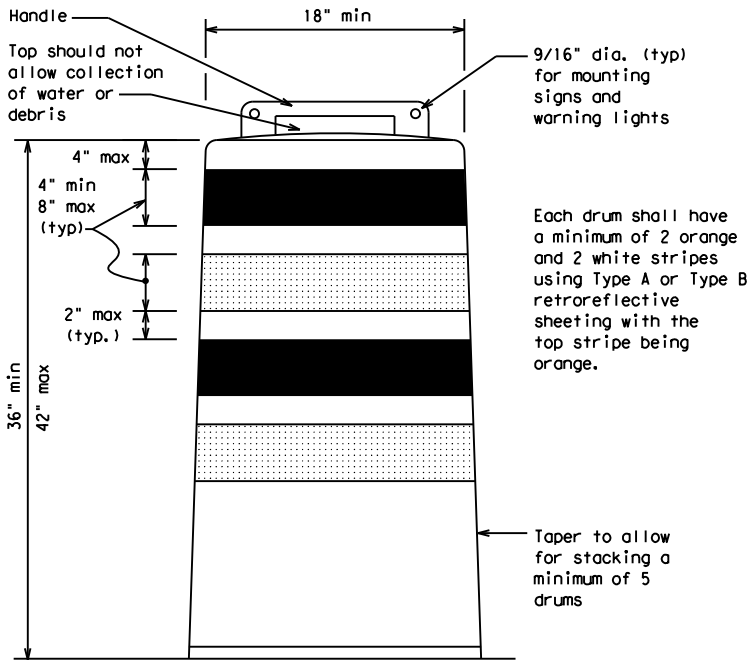
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

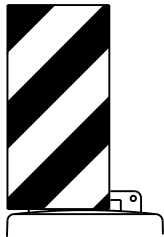
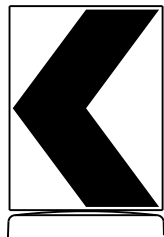
BALLAST

- 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.



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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

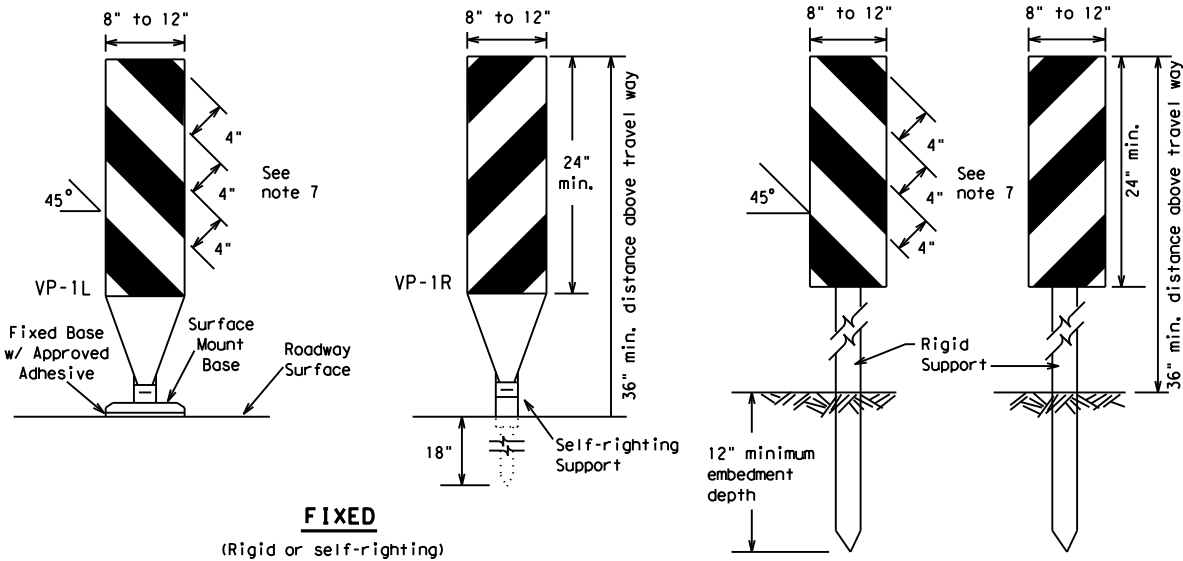
- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face 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

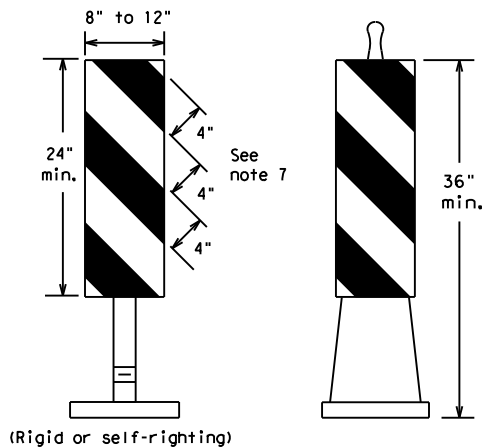
		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES			
BC(8) - 21			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CONT	SECT
REVISIONS		JOB	
4-03	8-14	HIGHWAY	
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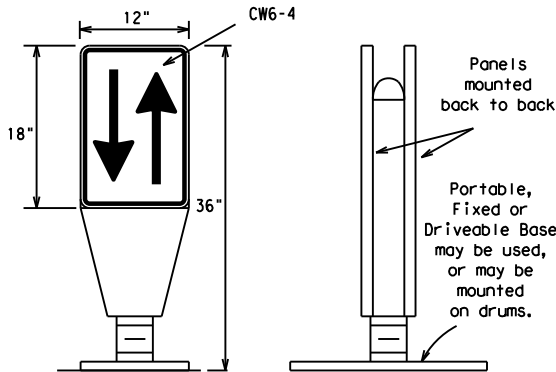
FIXED
(Rigid or self-righting)



PORTABLE

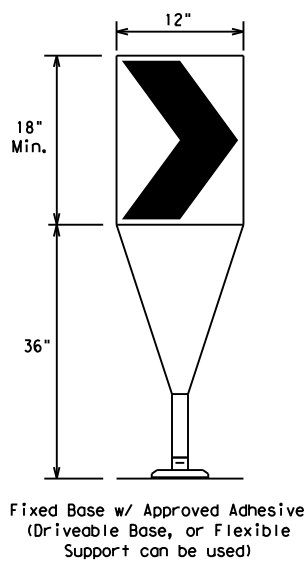
VERTICAL PANELS (VPs)

1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



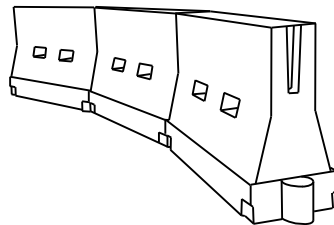
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

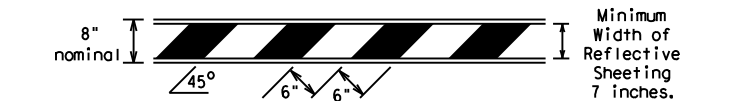
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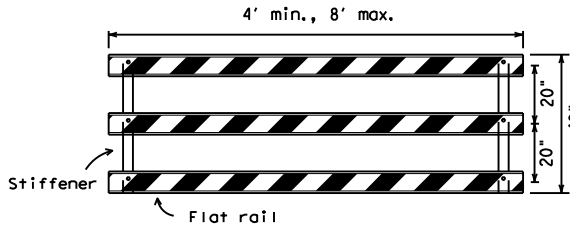
TYPE 3 BARRICADES

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.

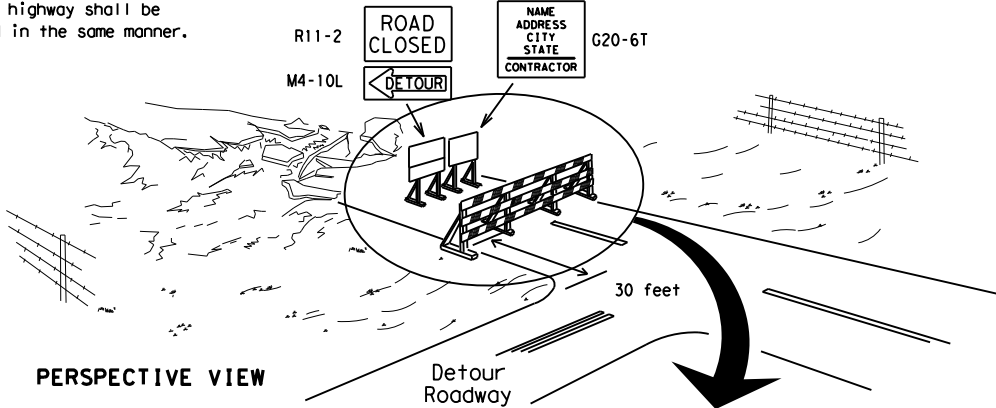


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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

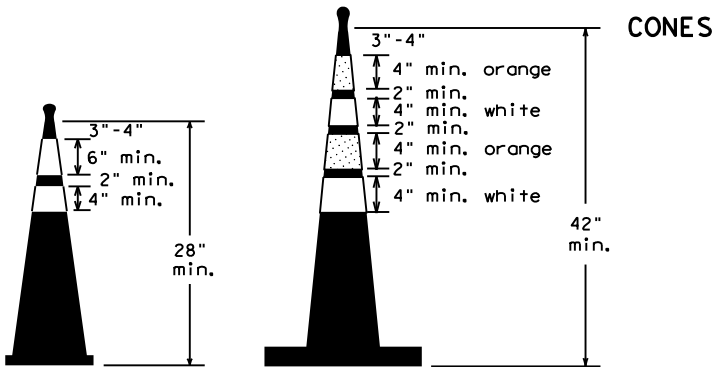


The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

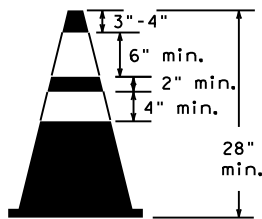
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

PLAN VIEW

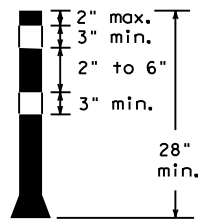
TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



Two-Piece cones



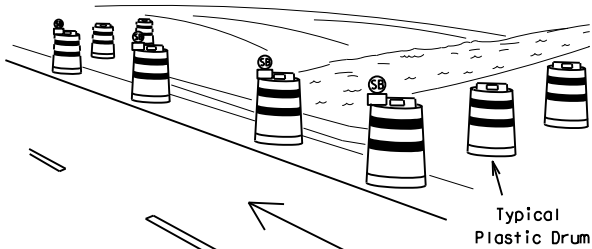
One-Piece cones



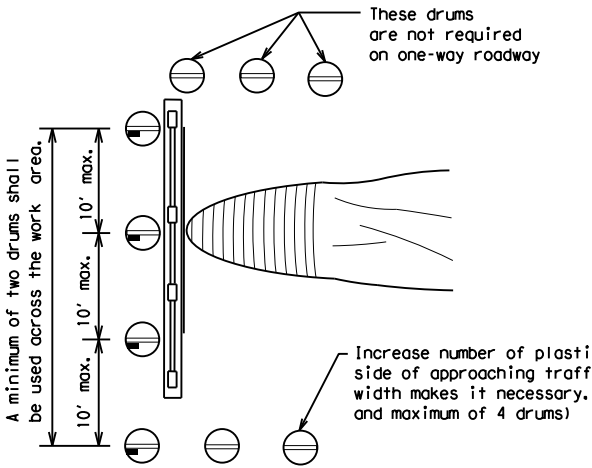
Tubular Marker

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.



PERSPECTIVE VIEW



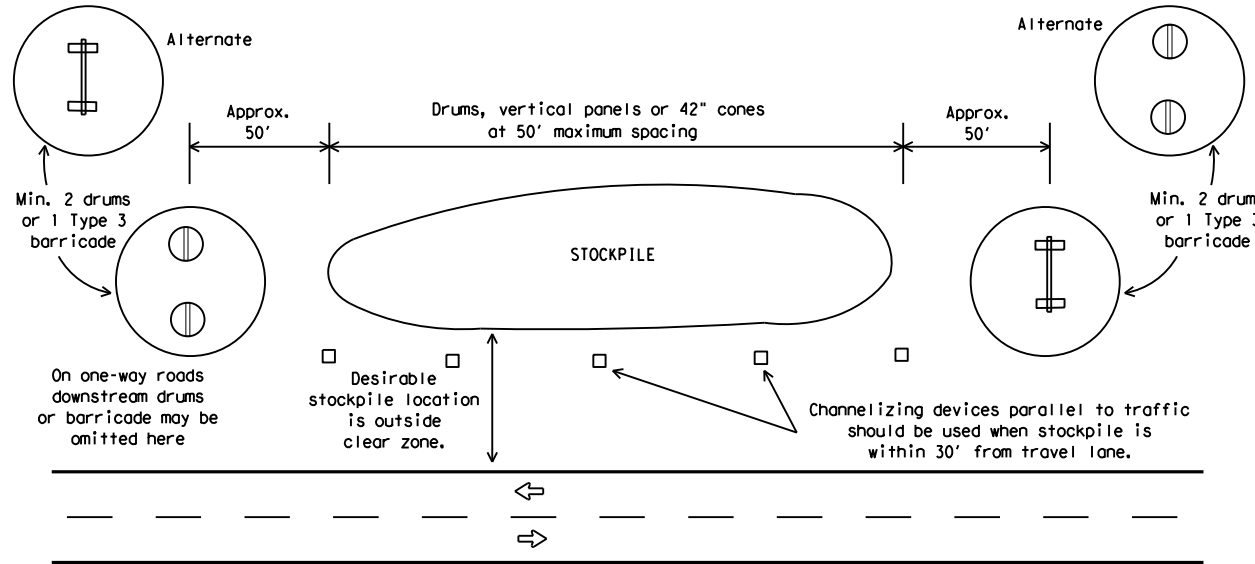
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

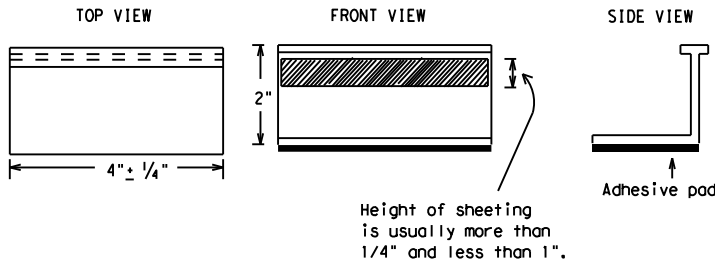
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



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

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
 - A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
 - B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

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Texas Department of Transportation

Traffic
Safety
Division
Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

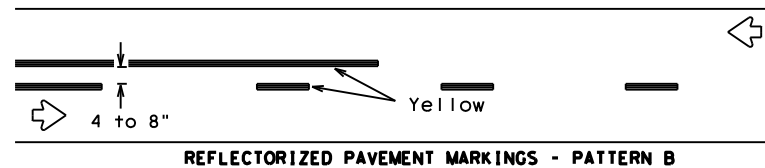
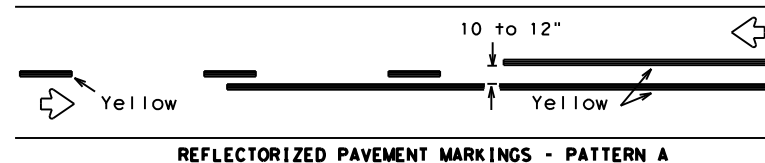
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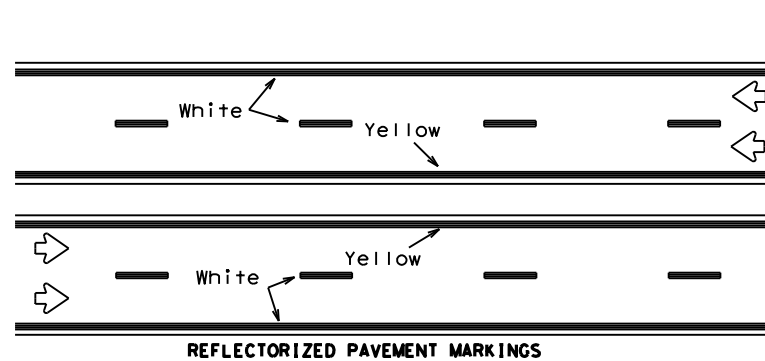
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PAVEMENT MARKING PATTERNS



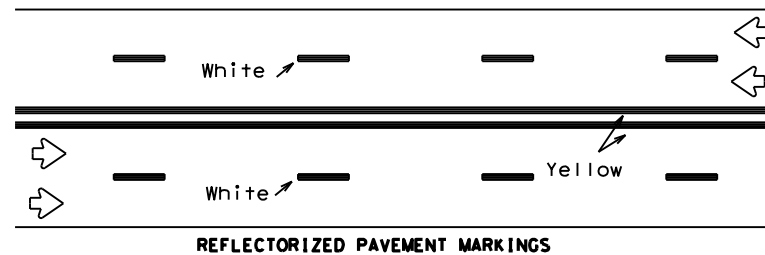
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



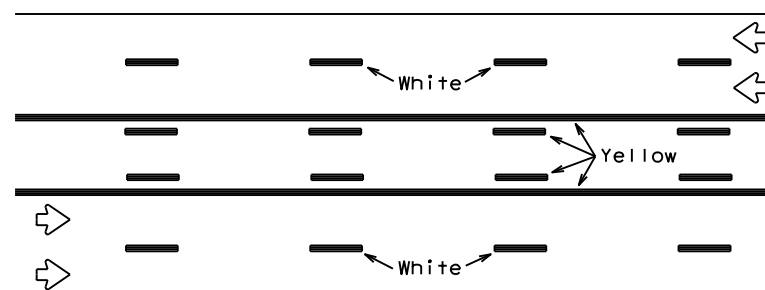
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



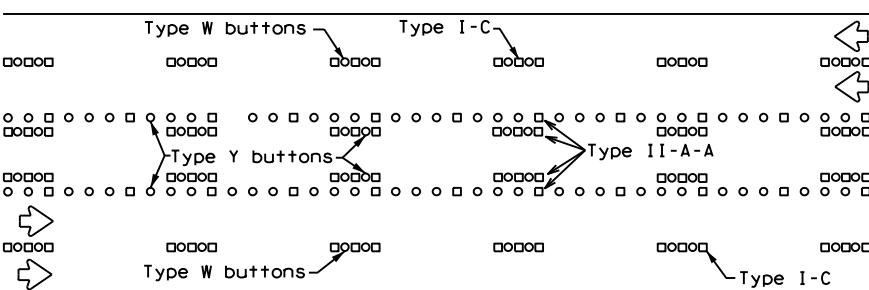
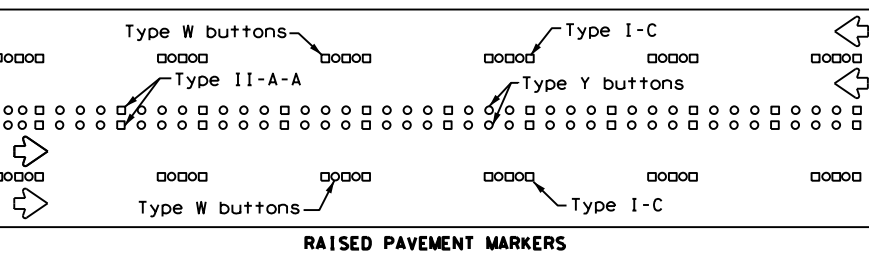
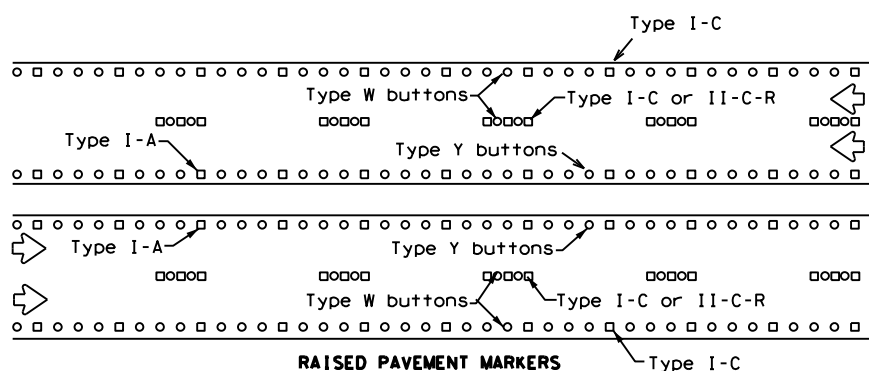
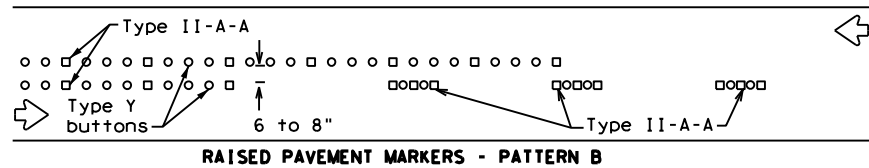
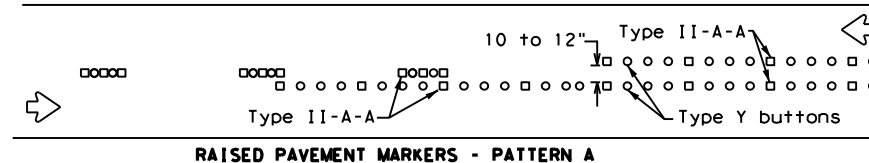
Prefabricated markings may be substituted for reflectORIZED pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



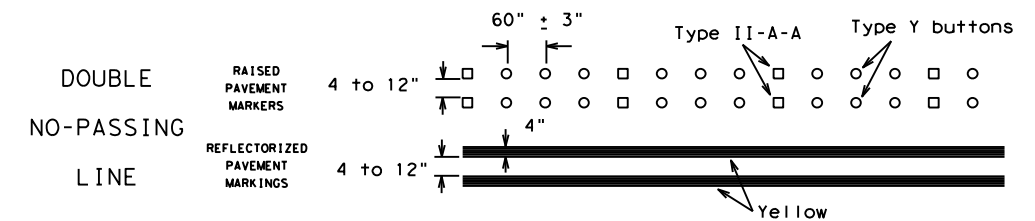
Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE

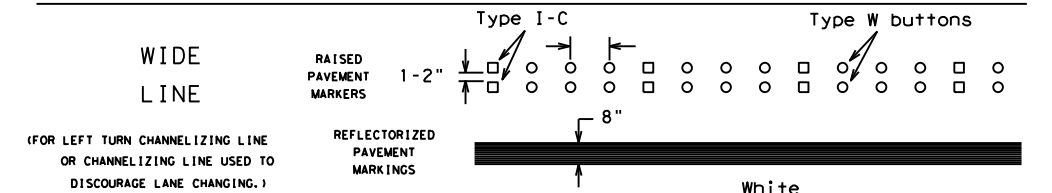
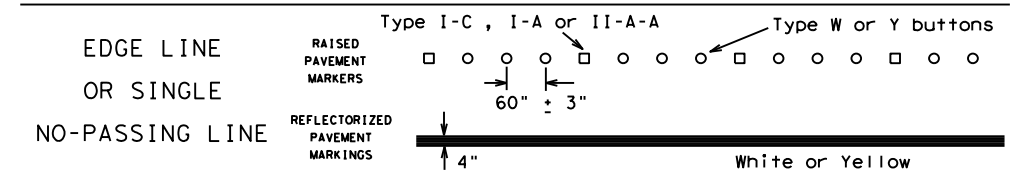


Prefabricated markings may be substituted for reflectORIZED pavement markings.

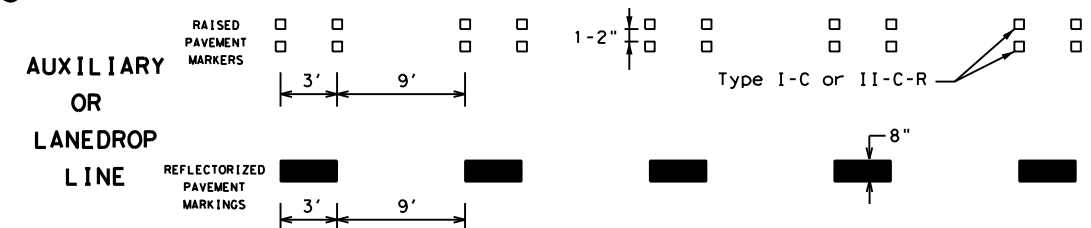
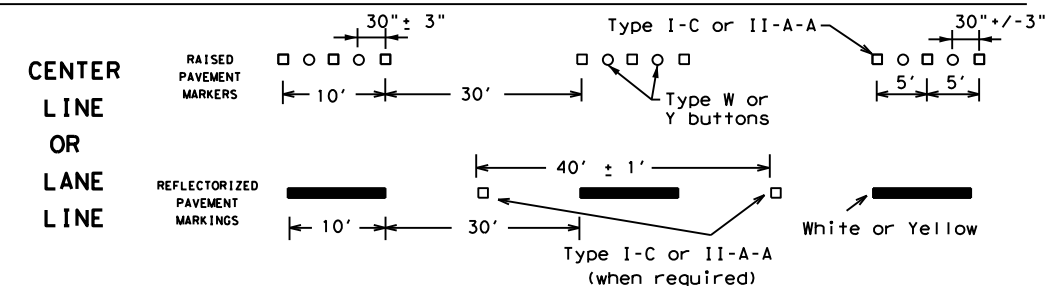
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

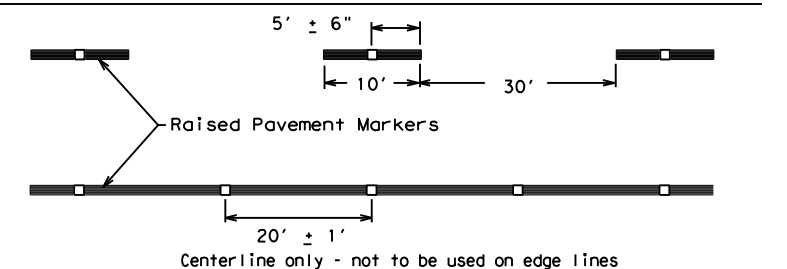


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



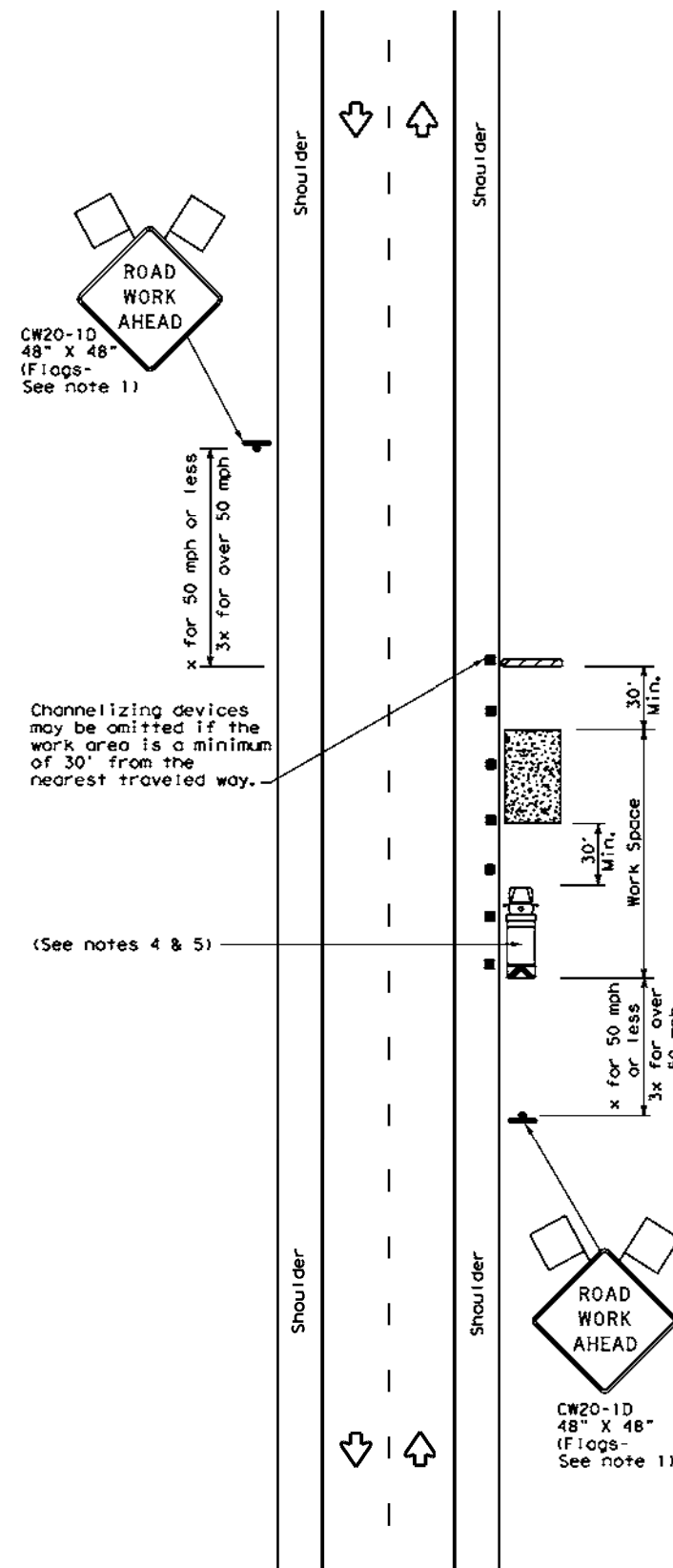
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
1-97 9-07 5-21				
2-98 7-13				
11-02 8-14				
	DIST	COUNTY		SHEET NO.
				58 of 66

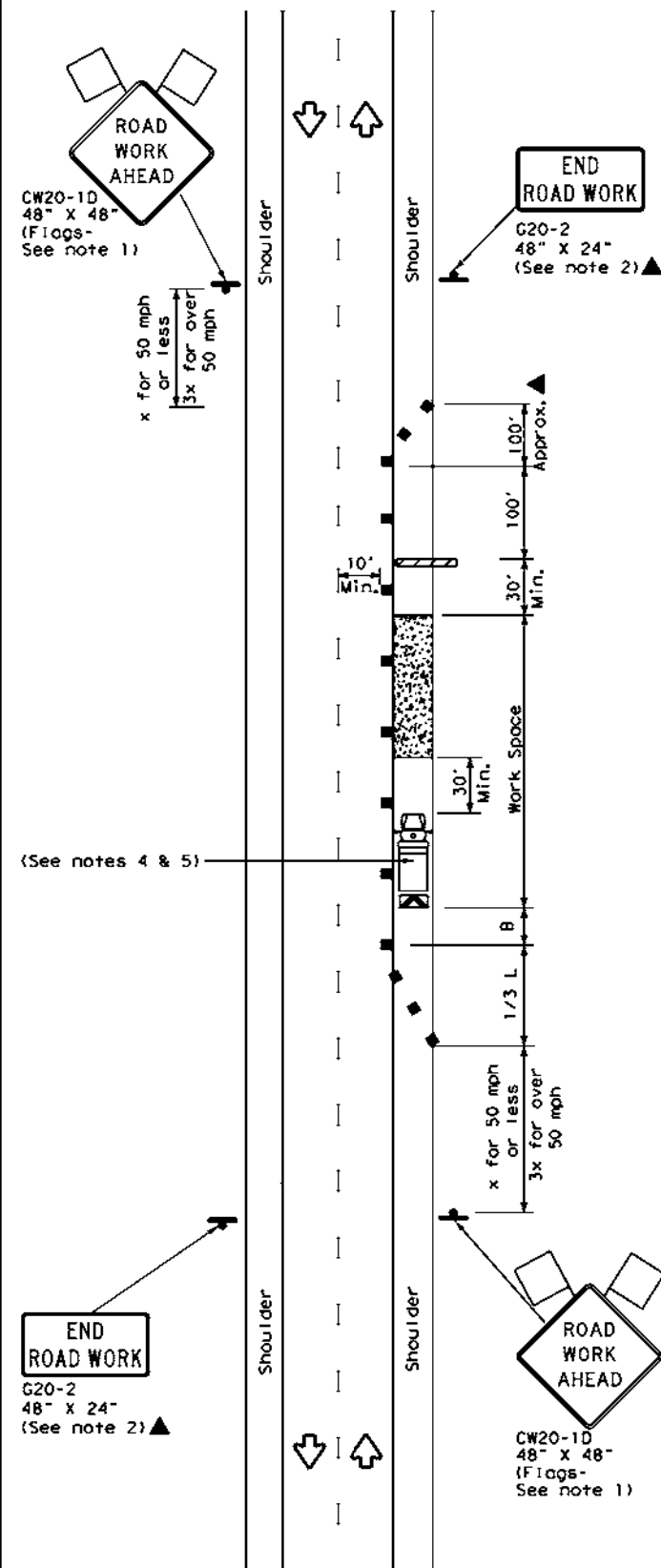
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:



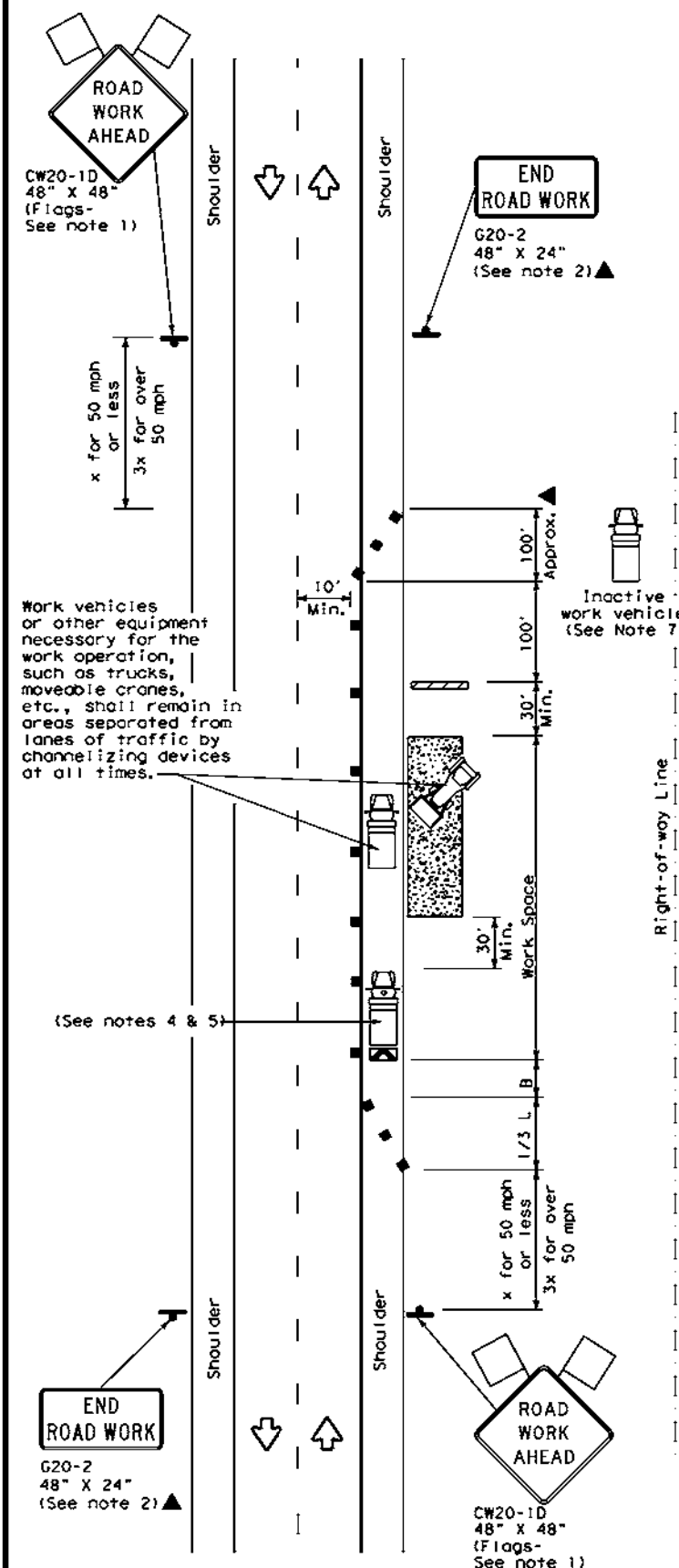
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

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	$L = \frac{WS^2}{60}$	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

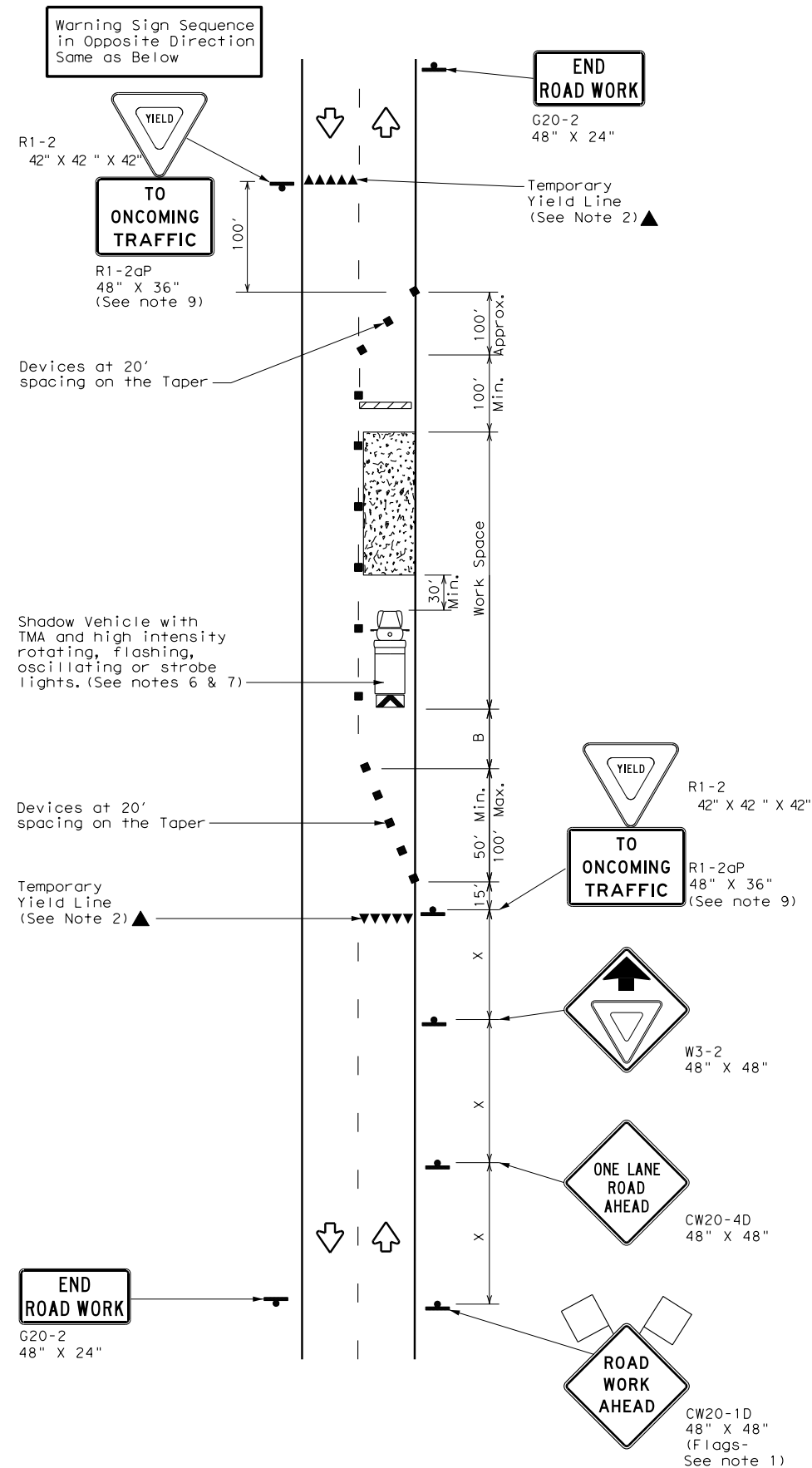
- Flags attached to signs where shown, are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
- Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
- Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. 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 a wider work space.
- See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- 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**

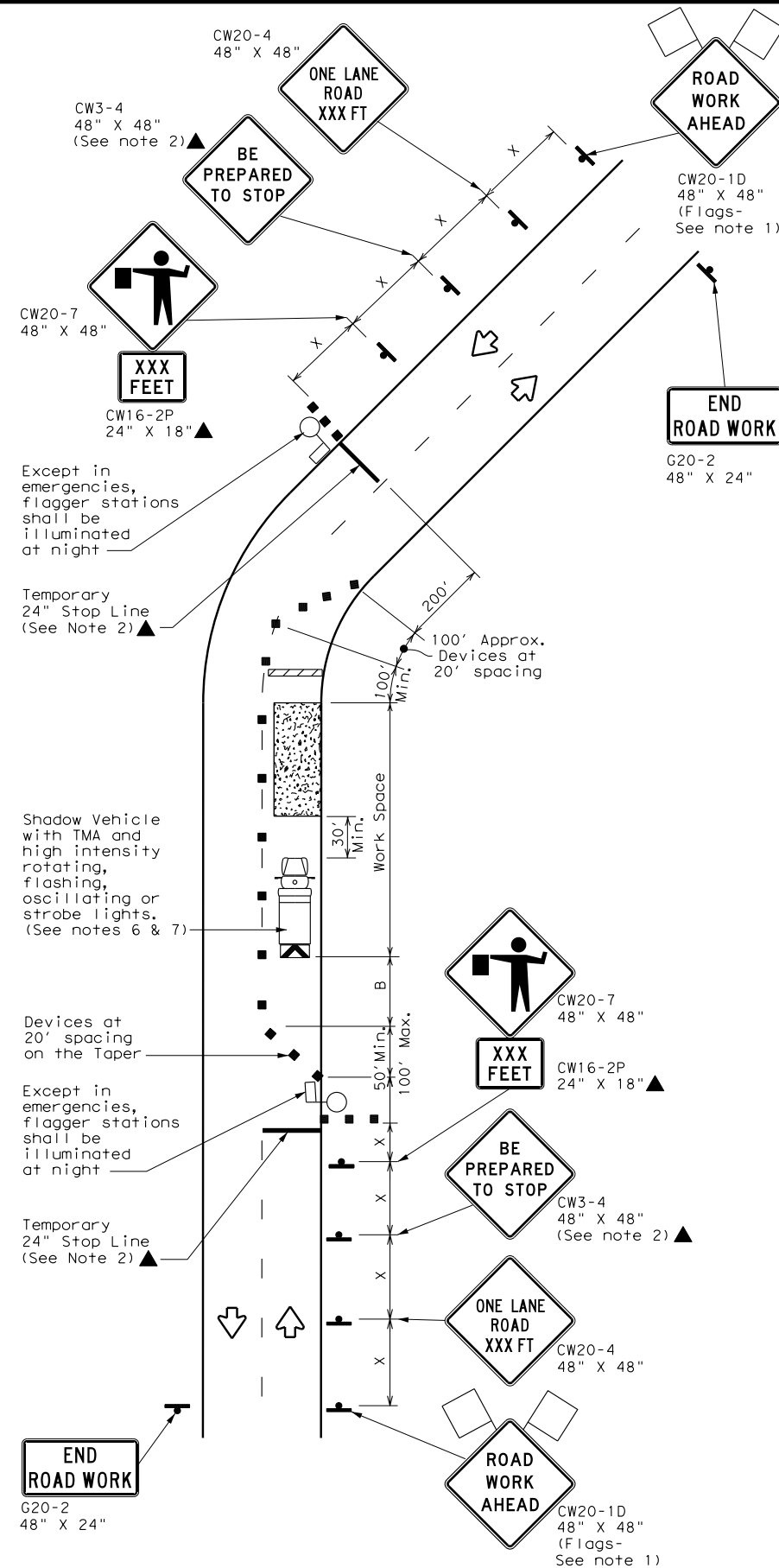
TCP (2-1) - 18

FILE: tcp2-1-18.dgn	DN:	CK:	DN:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-94 4-98				
8-95 2-12				
1-97 2-18				
DIST COUNTY				SHEET NO.
				59 of 66

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TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

Posted Speed *	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	$L = \frac{WS^2}{60}$	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 CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
- 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.
- 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 a wider work space.

TCP (2-2a)

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

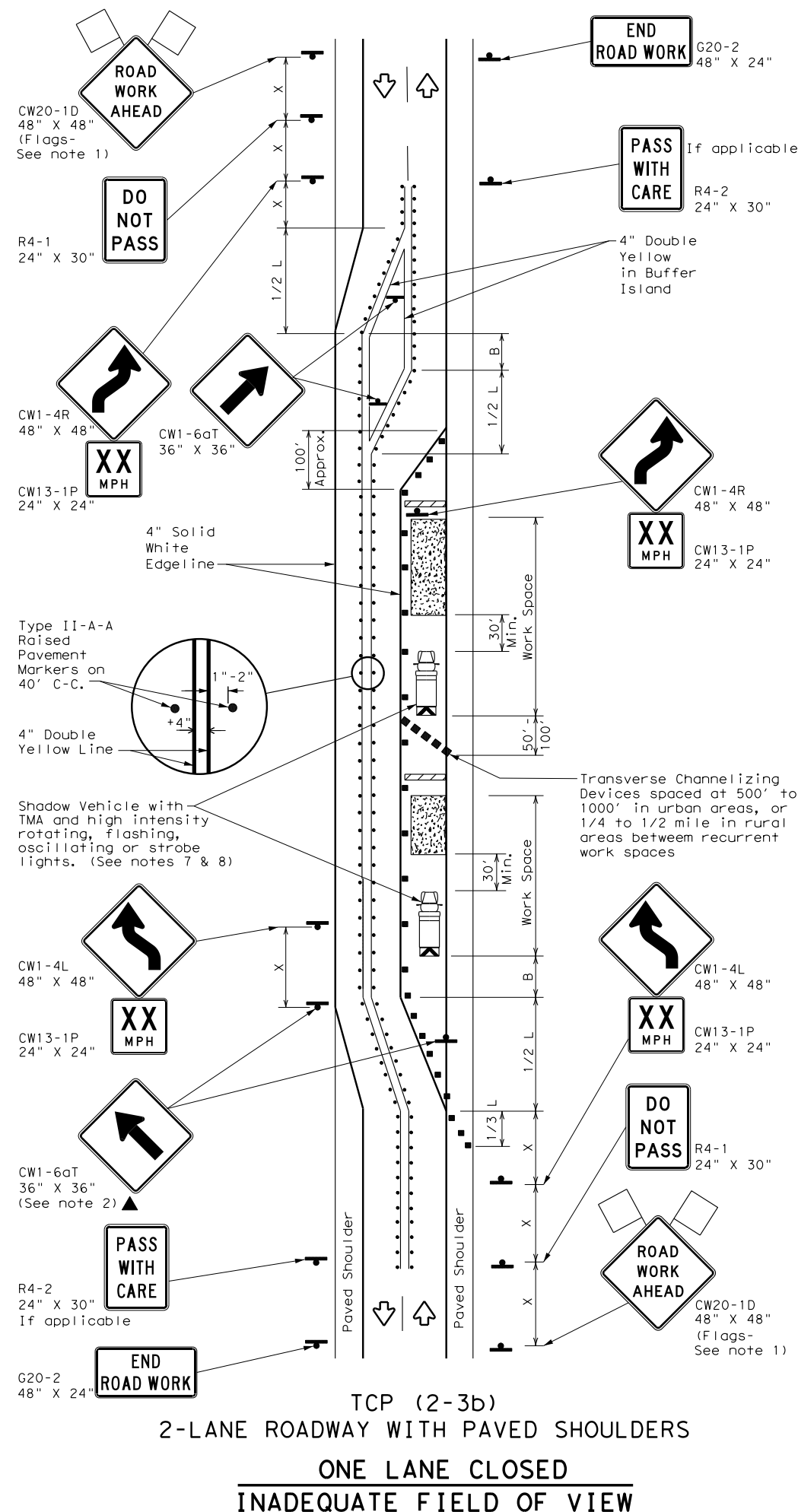
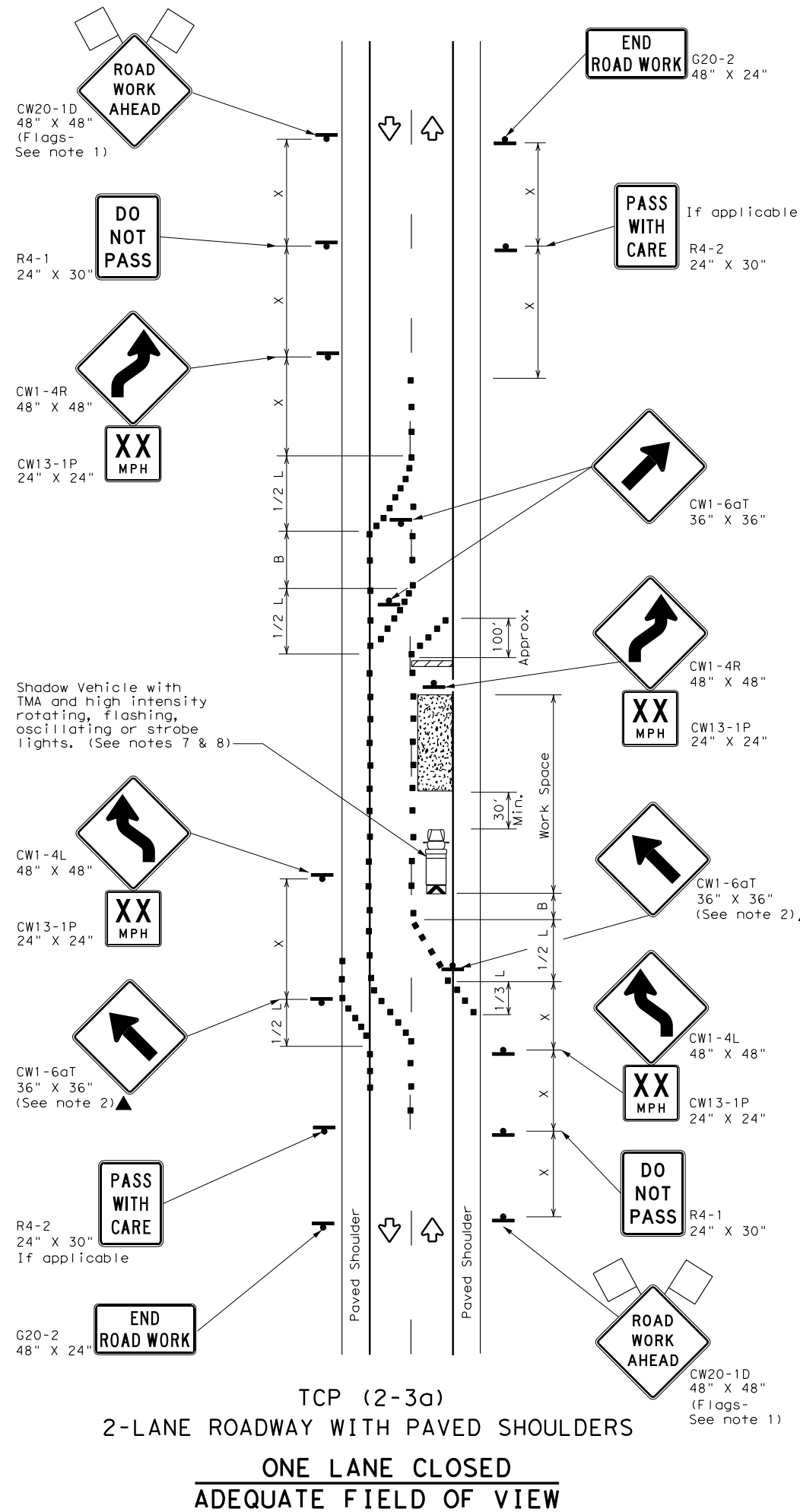
TCP (2-2b)

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

		Traffic Operations Division Standard			
TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL					
TCP (2-2) - 18					
FILE: tcp2-2-18.dgn	DN:	CK:	DW:		
© TxDOT December 1985	CONT	SECT	JOB		
REVISIONS		HIGHWAY			
8-95 3-03					
1-97 2-12					
4-98 2-18					
DIST		COUNTY	SHEET NO.		
			60 of 66		

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LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	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	$L = \frac{WS^2}{60}$	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.
- When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
- Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
- The R4-1 "DO NOT PASS," R4-2 "PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
- Conflicting pavement marking shall be removed for long term projects.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

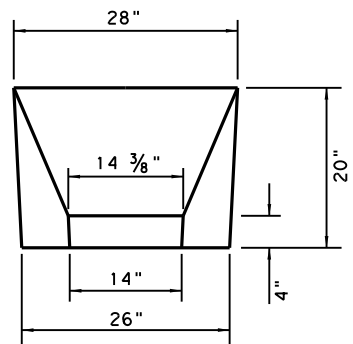
- Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

		Traffic Operations Division Standard			
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS					
TCP (2-3) - 18					
FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:		
© TxDOT December 1985	CONT	SECT	JOB		
REVISIONS		DIST	COUNTY		
8-95 3-03					
1-97 2-12					
4-98 2-18					
		SHEET NO.			
		61 of 66			

DATE: _____
FILE: _____

FILE: lpcb13.dgn		DN: TxDOT		CK: AM		DW: VP		CK:	
(C) TxDOT December 2010		CONT SECT		JOB			HIGHWAY		
REVISONS									
		DIST	COUNTY						SHEET NO.
									62 of 66

DATE: _____
FILE: _____



APPROACH VIEW

1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.



1 1/4" dia.
(Typ)

30"

3" Dia. USS Washer

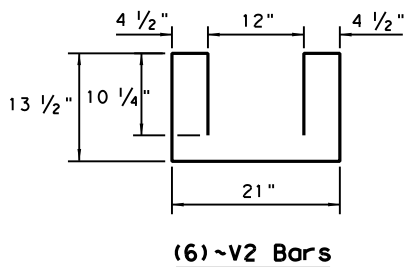
Weld washer to
1 1/4" Steel Pin

Section A-A
(Head of Anchoring Pin)

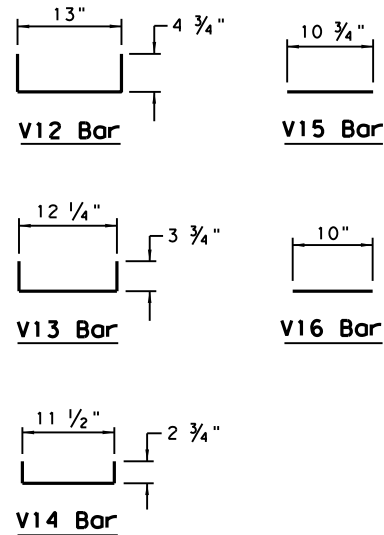
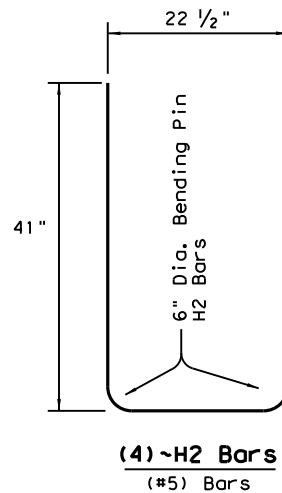
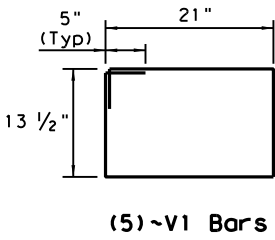
(7) Anchor Pins

ASTM A36 Steel

(See Note 3)



BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/4
V6 BAR	17 1/2	11 1/4
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6



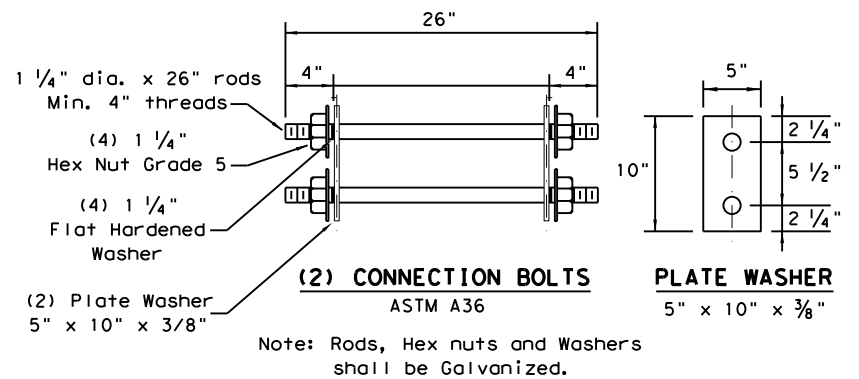
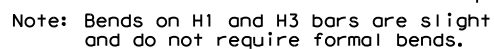
Note: All V Bars are (#4)

16' - 4"

4' - 10"

Approx. bending point

(2) #3 Bars
(5) #5 Bar



(TYPE 2)		
APPROX. QUANTITIES	20 FT. SECTION	
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

SHEET 2 OF 2

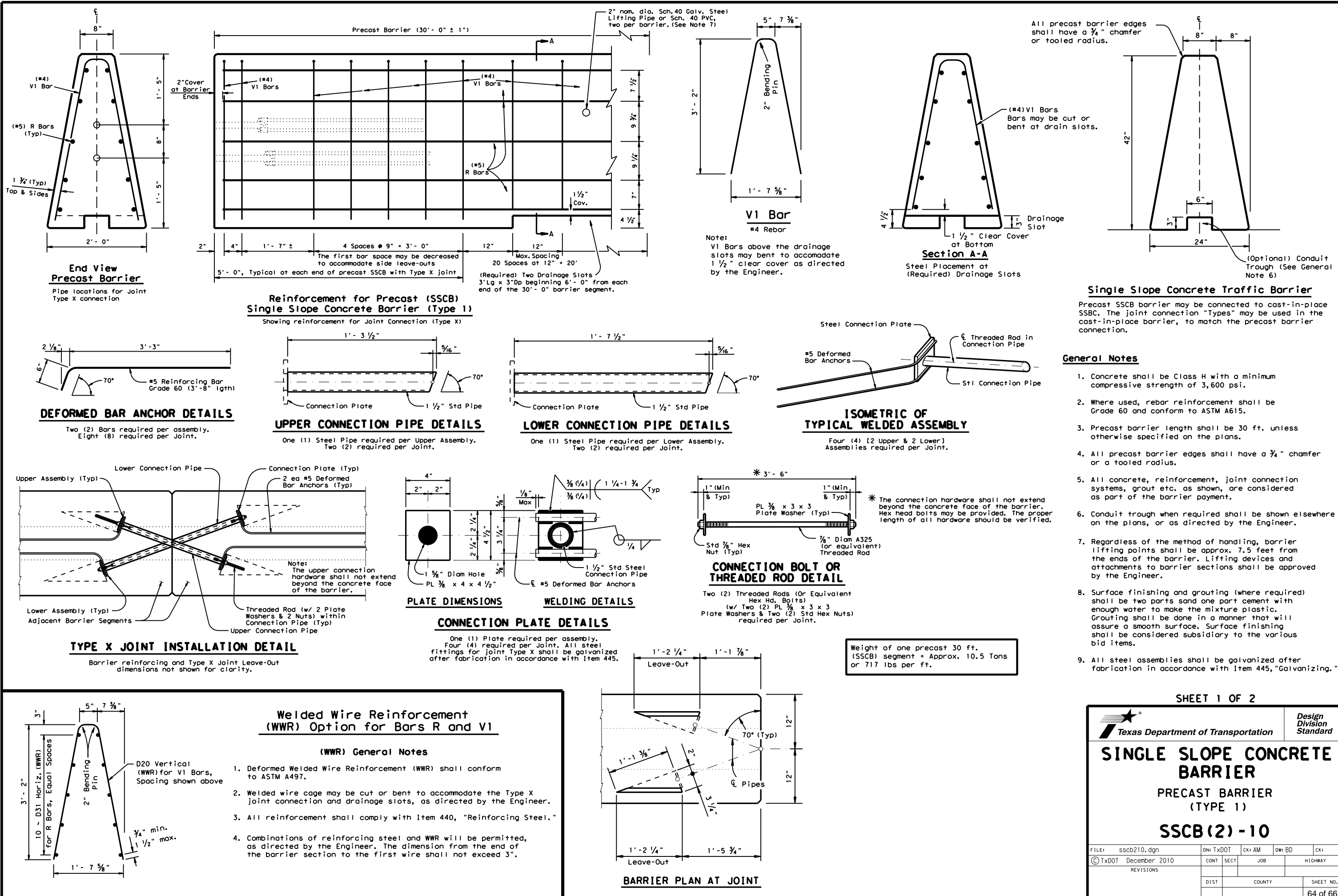


**LOW PROFILE
CONCRETE BARRIER
PRECAST BARRIER
(TYPE 2)
LPCB-13**

FILE: lpcb13.dgn	DN: TxDOT		CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB		HIGHWAY
REVISIONS					
	DIST	COUNTY			SHEET NO.
					63 of 66

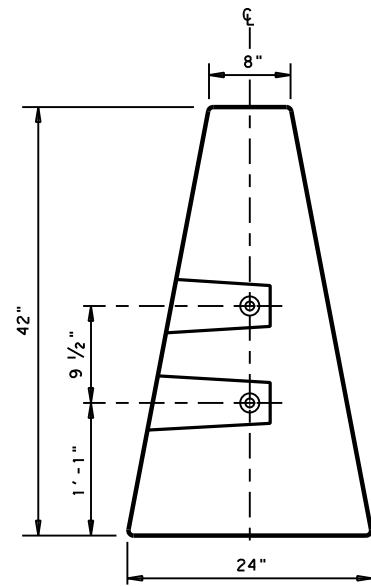
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DATE:
FILE:

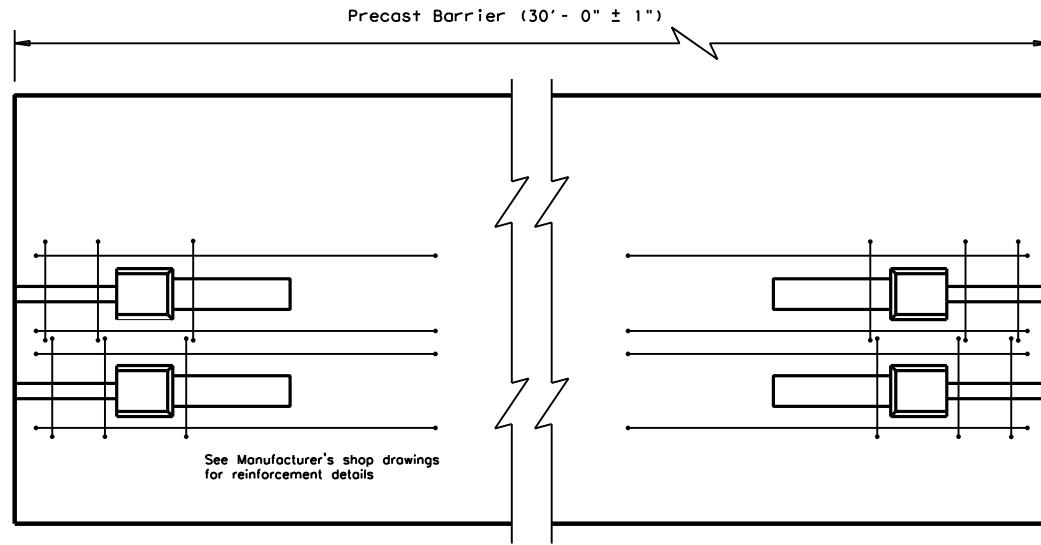


DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

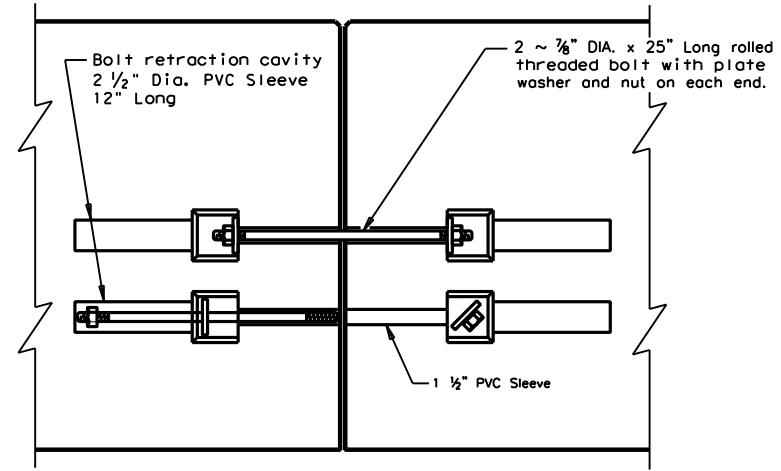
DATE: FILE:



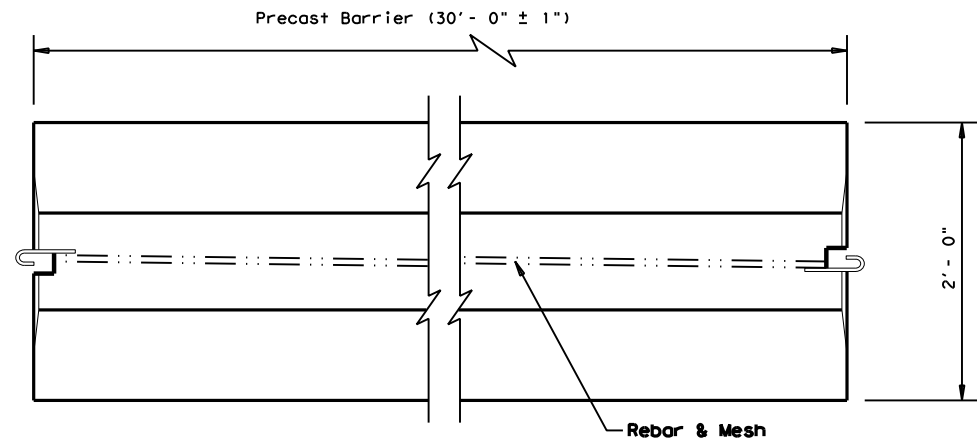
END VIEW
"QUICK-BOLT" POCKET LOCATIONS



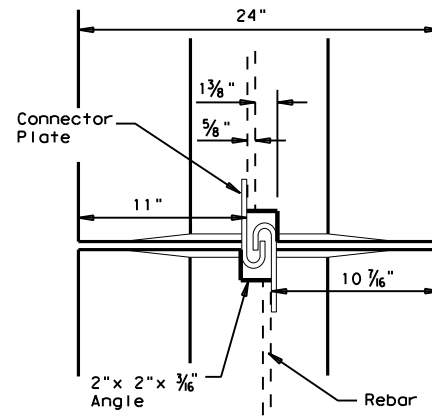
ELEVATION VIEW
"QUICK-BOLT" (SSCB)
See Manufacturer's shop drawing for additional details



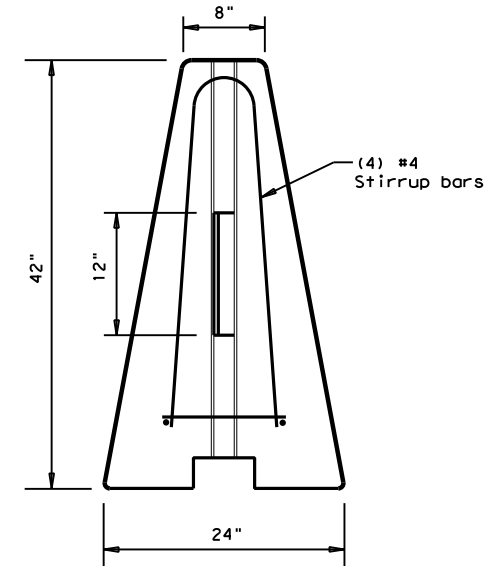
ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"



TOP VIEW
PRECAST (SSCB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE
J-J HOOK CONNECTION



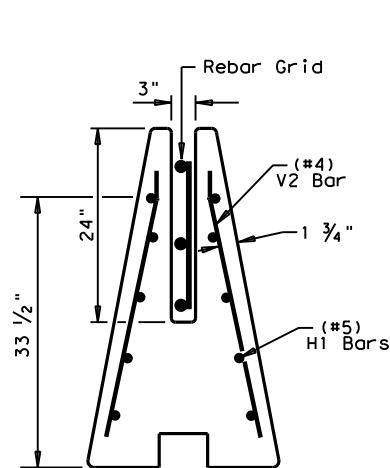
END VIEW

Proprietary Joint Connections (SSCB)

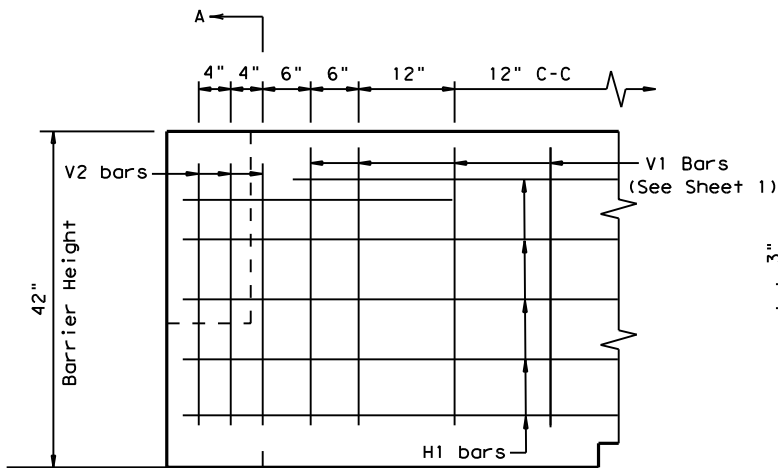
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

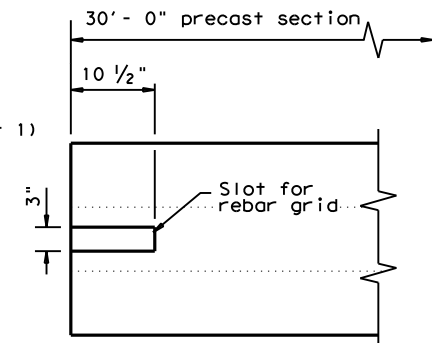
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



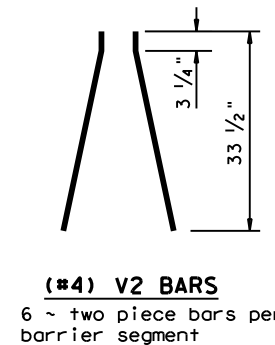
SECTION A-A
Showing (Type R)
Rebar Grid



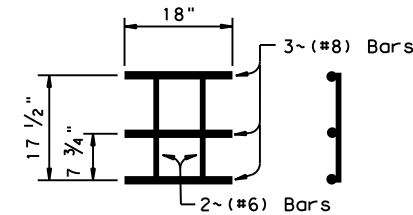
ELEVATION
V1 Bars (See Sheet 1)



TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment



(#4) V2 BARS
6 ~ two piece bars per
barrier segment



WELDED REBAR GRID

SHEET 2 OF 2



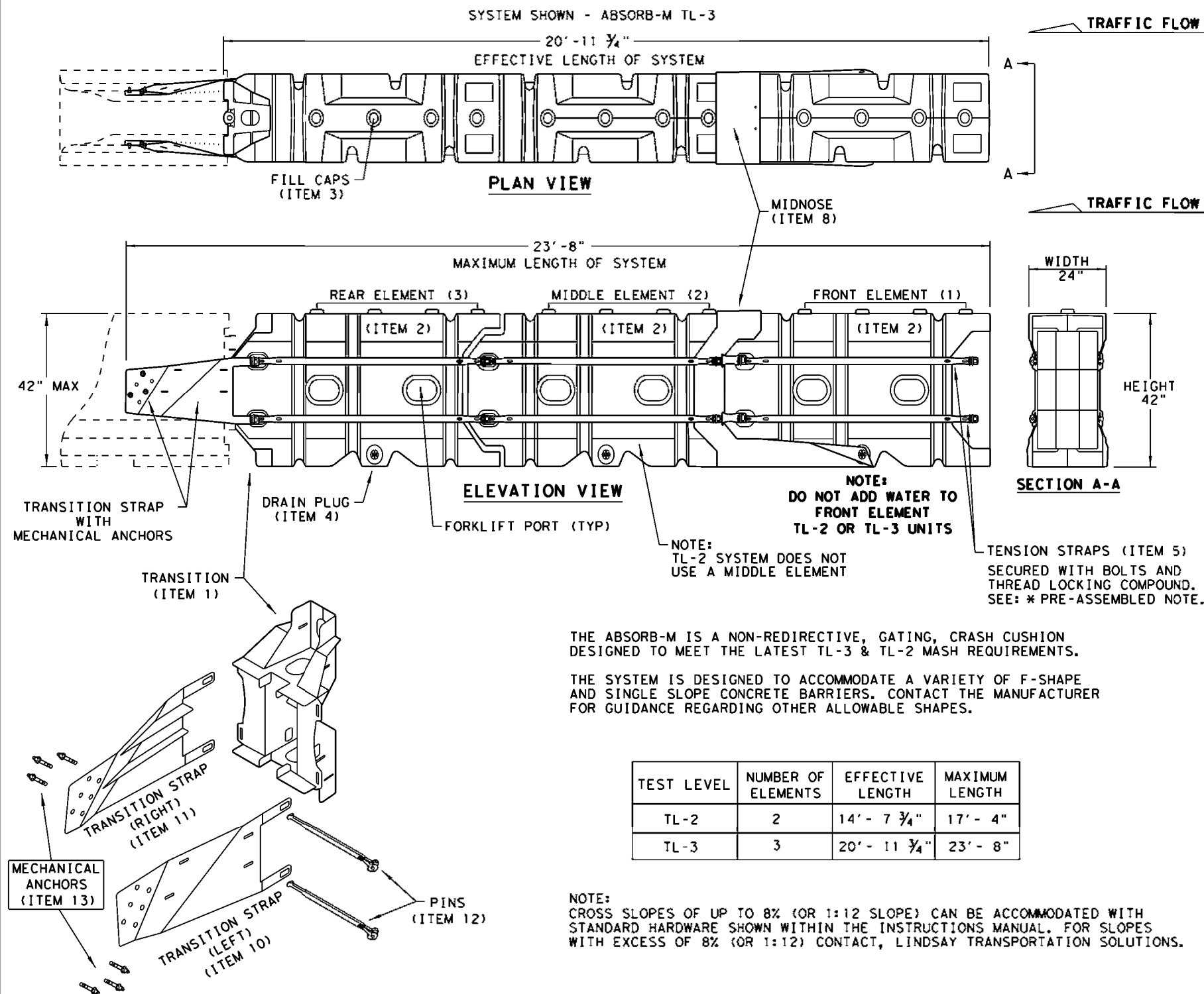
**SINGLE SLOPE CONCRETE
BARRIER**
PRECAST BARRIER
(TYPE 1)

SSCB(2) - 10

FILE: sscb210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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DISCLAIMER: THE USE OF THIS STANDARD IS COVERED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TxDOT FOR ANY PURPOSE WHATSOEVER. TxDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE:
FILE:

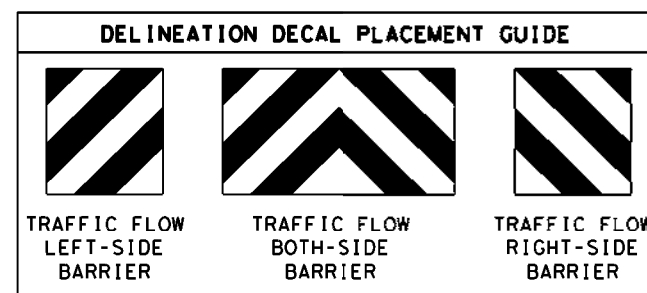


GENERAL NOTES

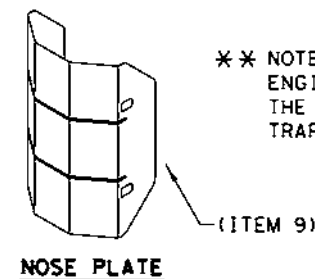
- FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
- THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
- THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
- MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
- THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
- THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
- THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
- DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION - (GALV)	1	1
2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
3	BSI-4004598	FILL CAPS	8	12
4	BSI-4004599	DRAIN PLUGS	2	3
5	BSI-1809053-00	TENSION STRAP - (GALV)	8	12
6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE - (GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND) - (GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND) - (GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

* COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY



** APPLY DECAL



** NOTE: (PROVIDED BY OTHERS) ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE: APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALS ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M. IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

		Design Division Standard	
LINDSAY TRANSPORTATION SOLUTIONS			
CRASH CUSHION			
(MASH TL-3 & TL-2)			
TEMPORARY - WORK ZONE			
ABSORB (M) - 19			
FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP
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