STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	BPM 6384-24-001		1
STATE	DISTRICT	COUNTY	
TEXAS	LFK	SAN AUGUSTINE, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
6384	24	001	SH 21, ETC.

PLANS OF PROPOSED
STATE HIGHWAY ROUTINE MAINTENANCE CONTRACT

TYPE OF WORK:

BRIDGE PREVENTATIVE MAINTENANCE

BPM 6384-24-001

SH 21, ETC.

SAN AUGUSTINE, ETC.

LIMITS: VARIOUS LOCATIONS WITHIN THE
SAN AUGUSTINE, ANGELINA, NACOGDOCHES, SHELBY AND SABINE MAINTENANCE SECTIONS

INDEX OF SHEETS

SEE LOCATION MAP

SHEET 2 - 6

BARRICADES AND WARNING SIGNS

THE CONTRACTOR SHALL PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jeremy King, P.E. P.E. 9/2/2021
5135292FE4184A4...
DATE

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

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014 AND SPECIAL SPECIFICATION ITEMS INCLUDED IN THE CONTRACT SHALL GOVERN ON THIS PROJECT.

NO EXEPTIONS
NO EQUATIONS
NO RR CROSSINGS

RECOMMENDED FOR LETTING:
DocuSigned by:
Jeremy King, P.E. 9/2/2021
5135292FE4184A4...
DISTRICT MAINTENANCE ENGINEER DATE

APPROVED FOR LETTING:
DocuSigned by:
DA6ECD29BC5C492...
DIRECTOR OF OPERATIONS 9/2/2021 DATE

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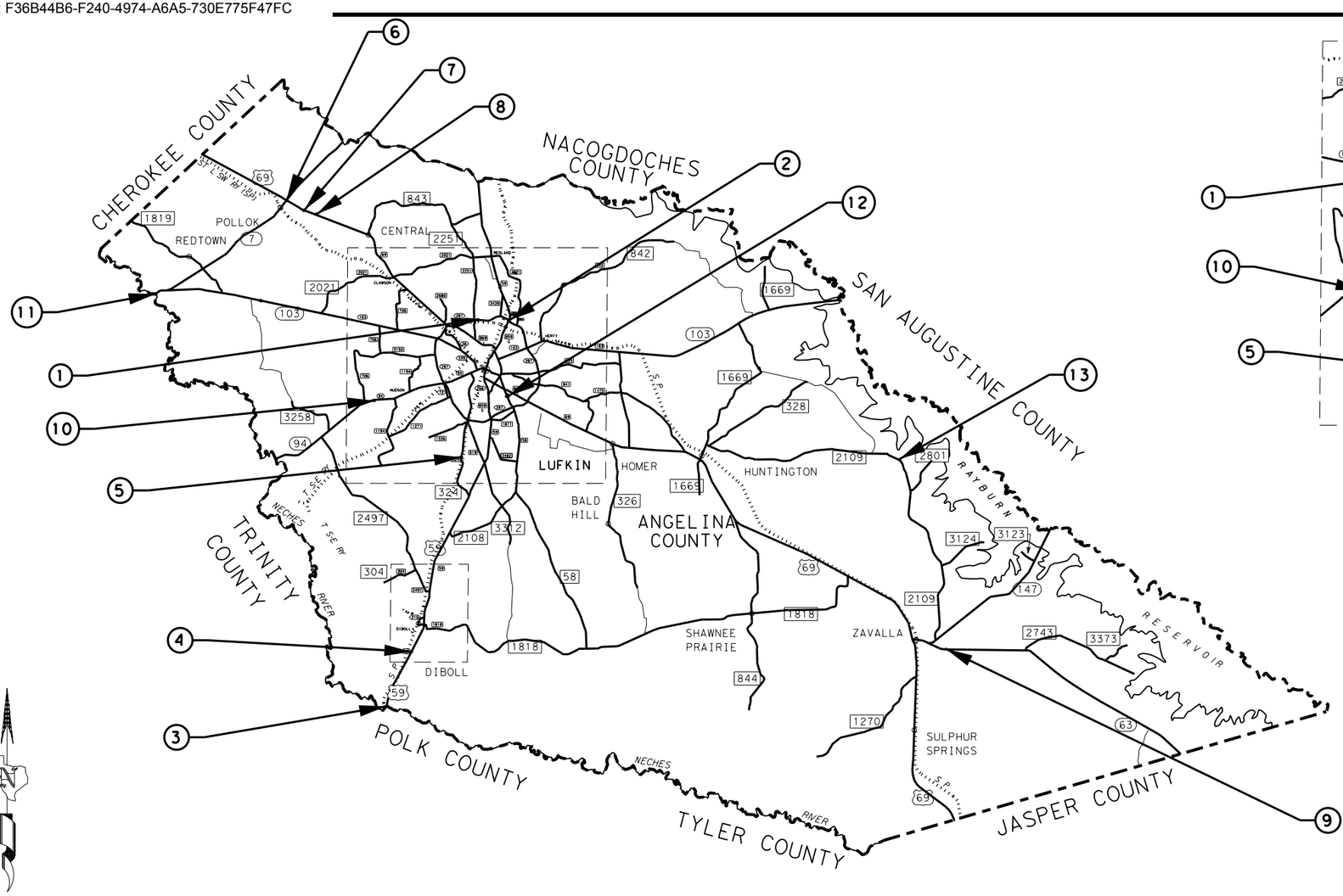

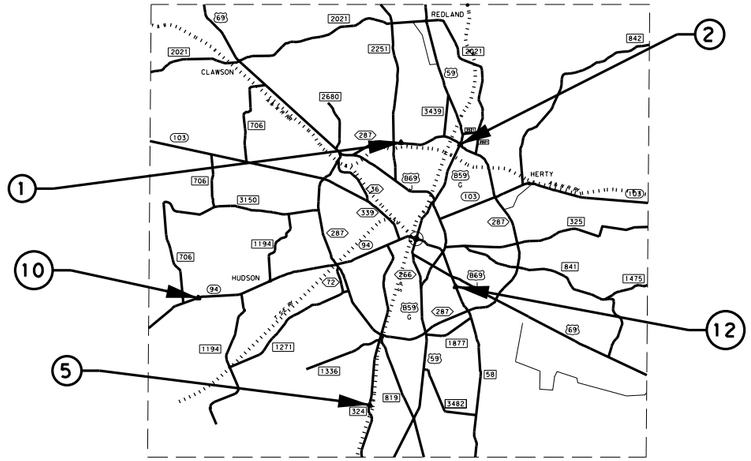

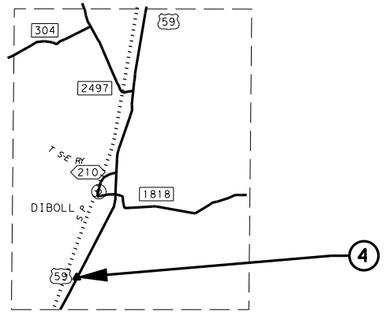

LOCATION MAP FOR
ANGELINA COUNTY

SITE	COUNTY	STRUCTURE ID	LATITUDE	LONGITUDE	LOCATION
1	ANGELINA	110030255301012	31.371249	-94.731316	SL 287 @ DRAW
2	ANGELINA	110030017602079	31.369805	-94.710299	US 59 NB @ LOOP 287
3	ANGELINA	110030017603054	31.133263	-94.809994	US 59 SBL @ NECHES RIVER
4	ANGELINA	110030017603059	31.166207	-94.791473	US 59 NB @ WHITE OAK CREEK
5	ANGELINA	110030017608065	31.284838	-94.748548	FM 324 @ HURRICANE CREEK
6	ANGELINA	110030019904012	31.452476	-94.868584	US 69 @ MULBERRY BRANCH
7	ANGELINA	110030019904013	31.443870	-94.852552	US 69 @ DRAW
8	ANGELINA	110030019904014	31.441894	-94.847048	US 69 @ BODAN CREEK
9	ANGELINA	110030024401003	31.151850	-94.394492	SH 63 @ MILL CREEK
10	ANGELINA	110030031904043	31.324323	-94.811285	SH 94 @ JACK CREEK RELIEF
11	ANGELINA	110030033603015	31.396736	-94.965886	SH 7 @ NECHES RIVER
12	ANGELINA	110030057602001	31.324379	-94.714503	FM 58 @ HURRICANE CREEK TRIB
13	ANGELINA	110030089302002	31.369002	-94.707154	FM 2109 @ STANLEY CREEK

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation®

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		2

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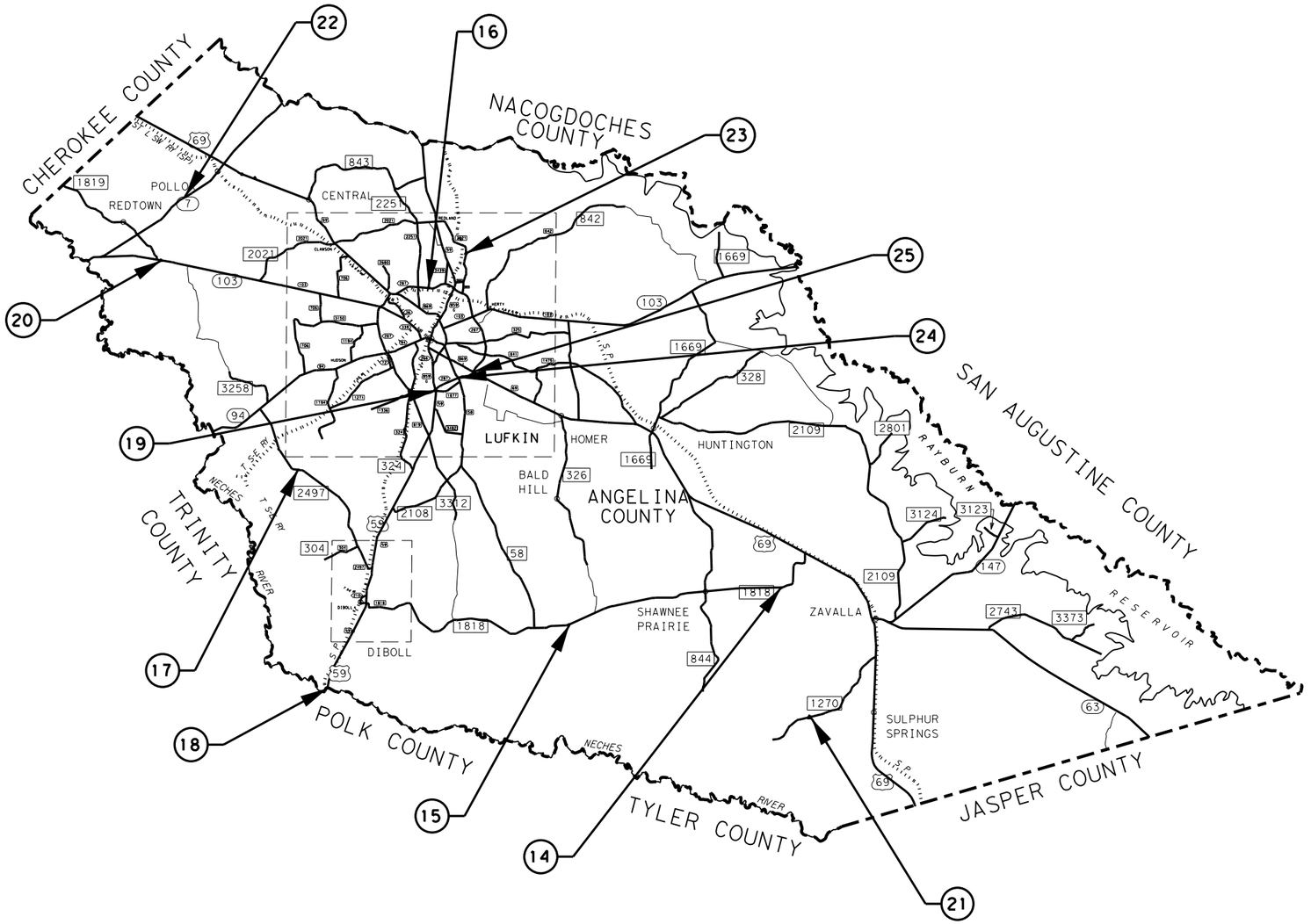

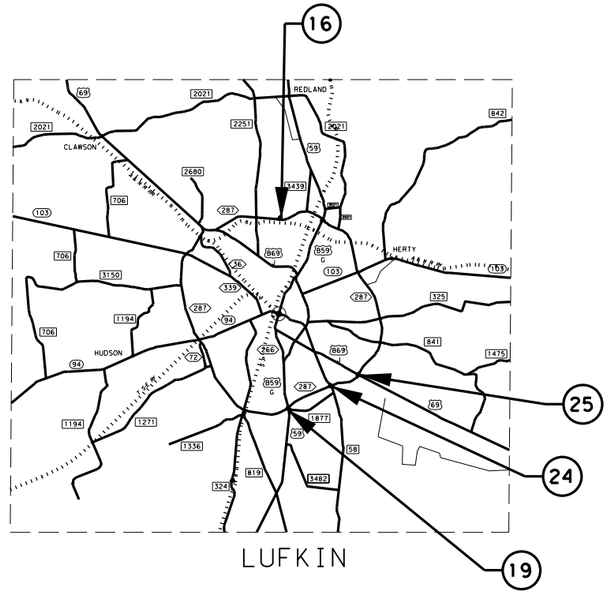

LOCATION MAP FOR ANGELINA COUNTY

SITE	COUNTY	STRUCTURE ID	LATITUDE	LONGITUDE	LOCATION
14	ANGELINA	110030179401001	31.181466	-94.496393	FM 1818 @ SHAWNEE CREEK
15	ANGELINA	110030179401002	31.164928	-94.638361	FM 1818 @ BILOXI CREEK
16	ANGELINA	110030255301011	31.370863	-94.727497	SL 287 @ DRAW
17	ANGELINA	110030258901001	31.263270	-94.823208	FM 2497 @ JACK CREEK
18	ANGELINA	110030017603069	31.132915	-94.810033	US 59 NB @ NECHES RIVER
19	ANGELINA	110030017603090	31.310518	-94.725814	US 59 SB @ BUS 59 & SL 287
20	ANGELINA	110030033603011	31.395117	-94.916866	SH 103 @ BODAN CREEK
21	ANGELINA	110030039004057	31.099266	-94.479546	FM 1270 @ SHAWNEE CREEK
22	ANGELINA	110030089401003	31.428268	-94.902910	SH 7 @ RED BAYOU
23	ANGELINA	110030187402002	31.388883	-94.701967	FM 2021 @ MILL CREEK
24	ANGELINA	110030255301006	31.315640	-94.710290	FM 58 @ SL 287 & US 59
25	ANGELINA	110030255301116	31.263270	-94.823208	SL 287 & US 59 @ BUS 69

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation®

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		3

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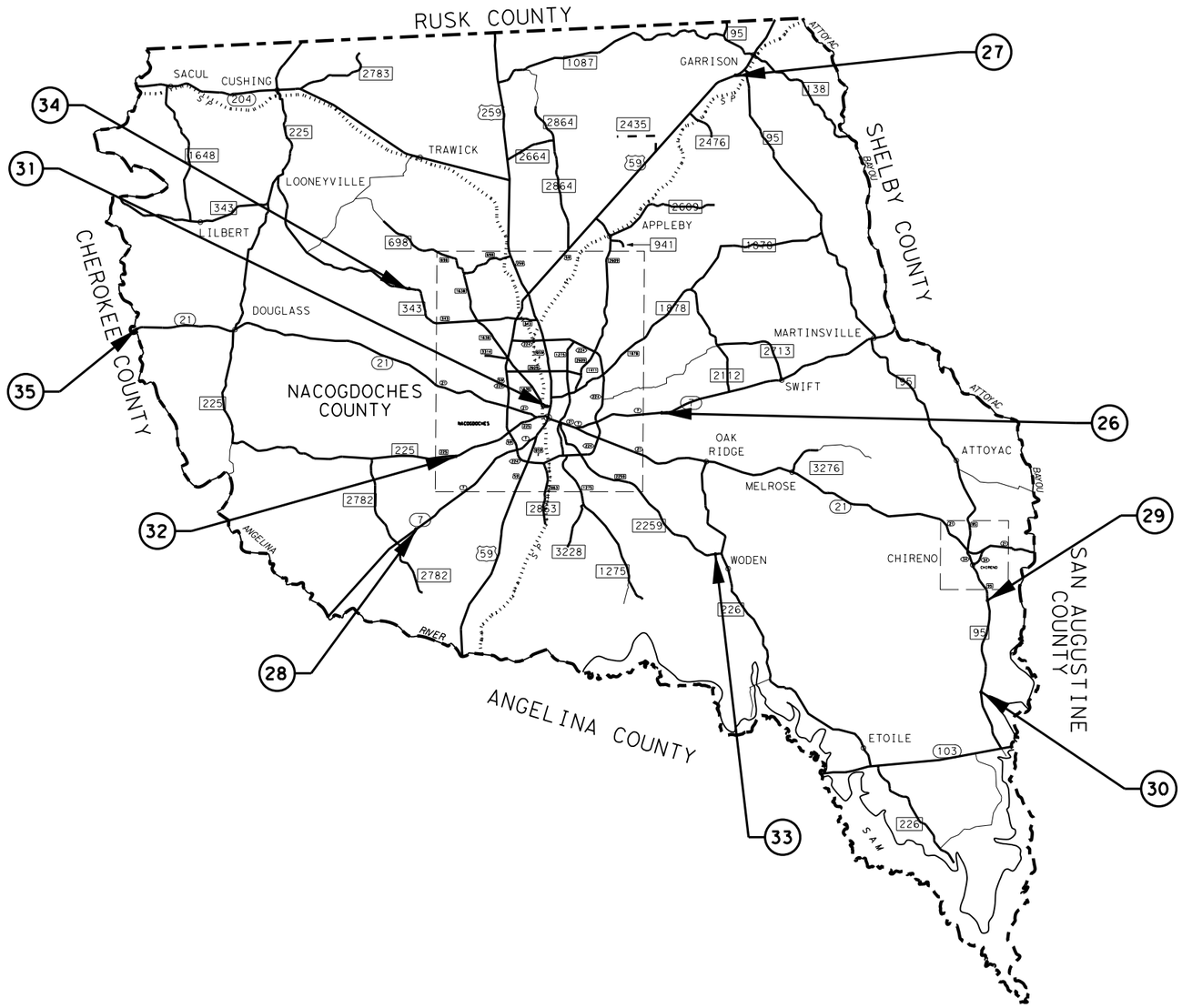
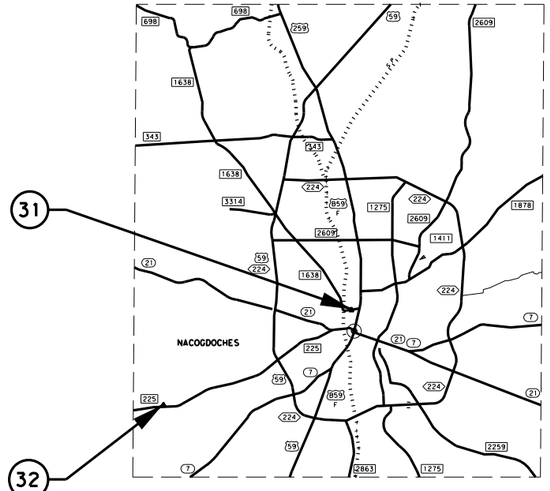
SITE	COUNTY	STRUCTURE ID	LATITUDE	LONGITUDE	LOCATION
26	NACOGDOCHES	111740005901028	31.603049	-94.571315	SH 7 @ CARRIZO CREEK RELIEF
27	NACOGDOCHES	111740017507016	31.813264	-94.502885	US 59 @ INDIAN CREEK
28	NACOGDOCHES	111740055303001	31.534376	-94.760980	SH 7 @ ALAZAN CREEK
29	NACOGDOCHES	111740070605013	31.476017	-94.341698	FM 95 @ POLYSOT CREEK
30	NACOGDOCHES	111740070605015	31.415690	-94.347282	FM 95 @ TRIB OF LAGROULLE CR
31	NACOGDOCHES	111740140702001	31.610732	-94.658151	FM 1638 @ BONITA CREEK
32	NACOGDOCHES	111740181002002	31.582481	-94.724344	FM 225 @ MORRAL BAYOU
33	NACOGDOCHES	111740211601001	31.512258	-94.540589	FM 2259 @ CARRIZO CREEK
34	NACOGDOCHES	111740230001001	31.688485	-94.753321	FM 343 @ LOCO CREEK
35	NACOGDOCHES	111740011806082	31.671706	-94.952579	SH 21 @ ANGELINA RIVER





LOCATION MAP FOR
NACOGDOCHES COUNTY

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation®

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		4

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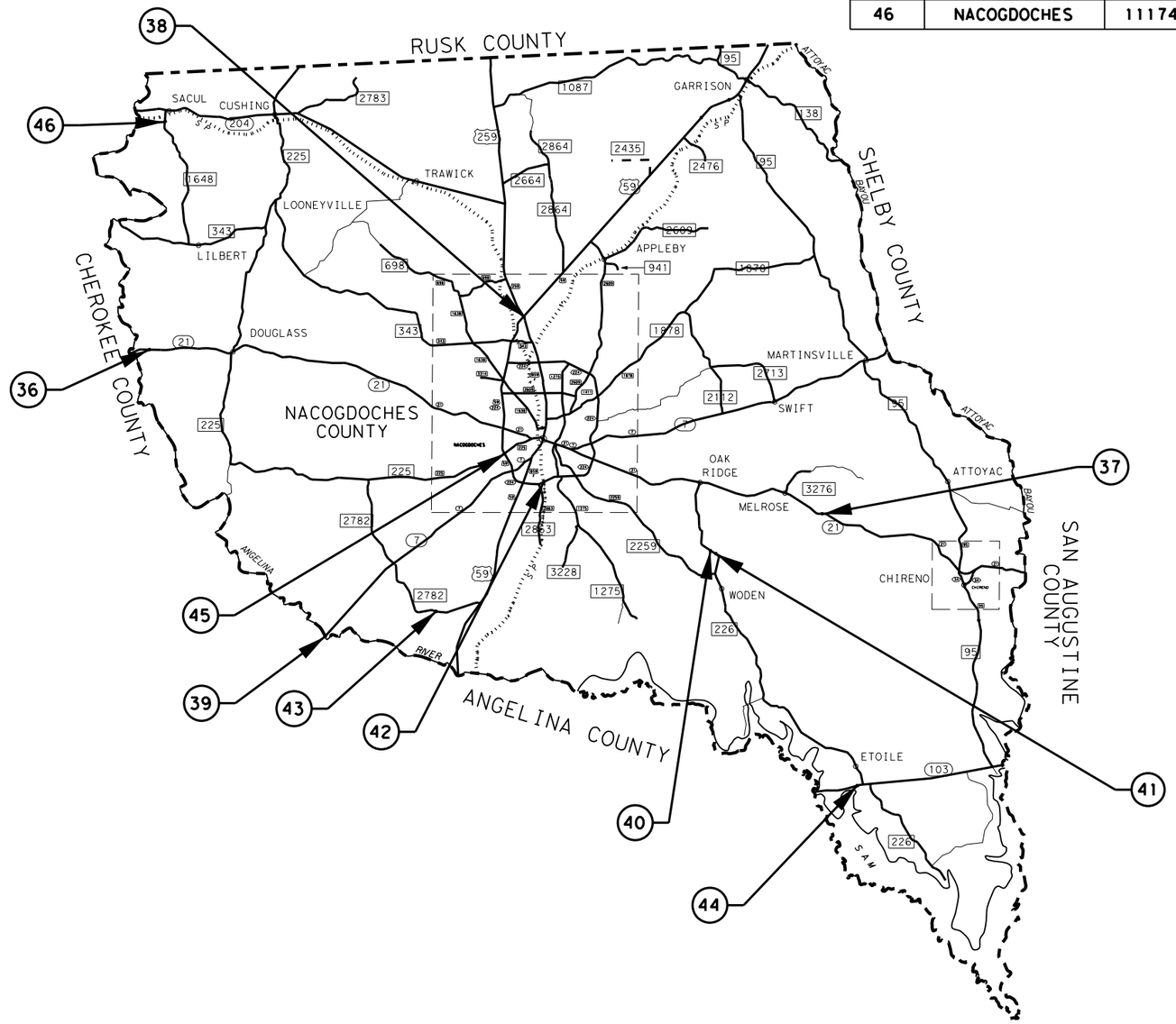
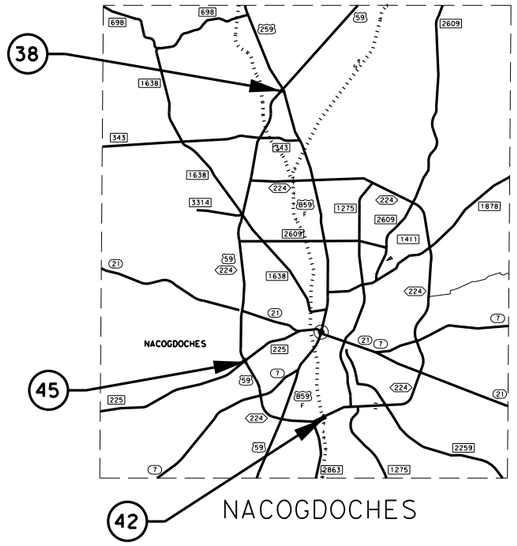
SITE	COUNTY	STRUCTURE ID	LATITUDE	LONGITUDE	LOCATION
36	NACOGDOCHES	111740011806083	31.672098	-94.946640	SH 21 @ ANGELINA RIVER RELIEF
37	NACOGDOCHES	111740011808066	31.547732	-94.452372	SH 21 @ MOSS CREEK
38	NACOGDOCHES	111740017507079	31.681811	-94.665999	US 259 NB @ US 59
39	NACOGDOCHES	111740055303011	31.486792	-94.823543	SH 7 @ ANGELINA RIVER
40	NACOGDOCHES	111740089301013	31.527811	-94.536663	FM 226 @ ATASCOSO CREEK
41	NACOGDOCHES	111740089301014	31.526496	-94.534818	FM 226 @ ATASCOSO CREEK RELIEF
42	NACOGDOCHES	111740256001002	31.577354	-94.654630	SL 224 @ LA NANA CREEK
43	NACOGDOCHES	111740280802002	31.497051	-94.741659	FM 2782 @ ALAZAN BAYOU
44	NACOGDOCHES	111740033606037	31.374159	-94.438320	SH 103 @ DURAZNO CREEK
45	NACOGDOCHES	111740256001018	31.596089	-94.684764	US 59 & SL 224 NB @ FM 225
46	NACOGDOCHES	111740250903001	31.816881	-94.924323	FM 1648 @ INDIAN CREEK





LOCATION MAP FOR
NACOGDOCHES COUNTY

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation®

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		5

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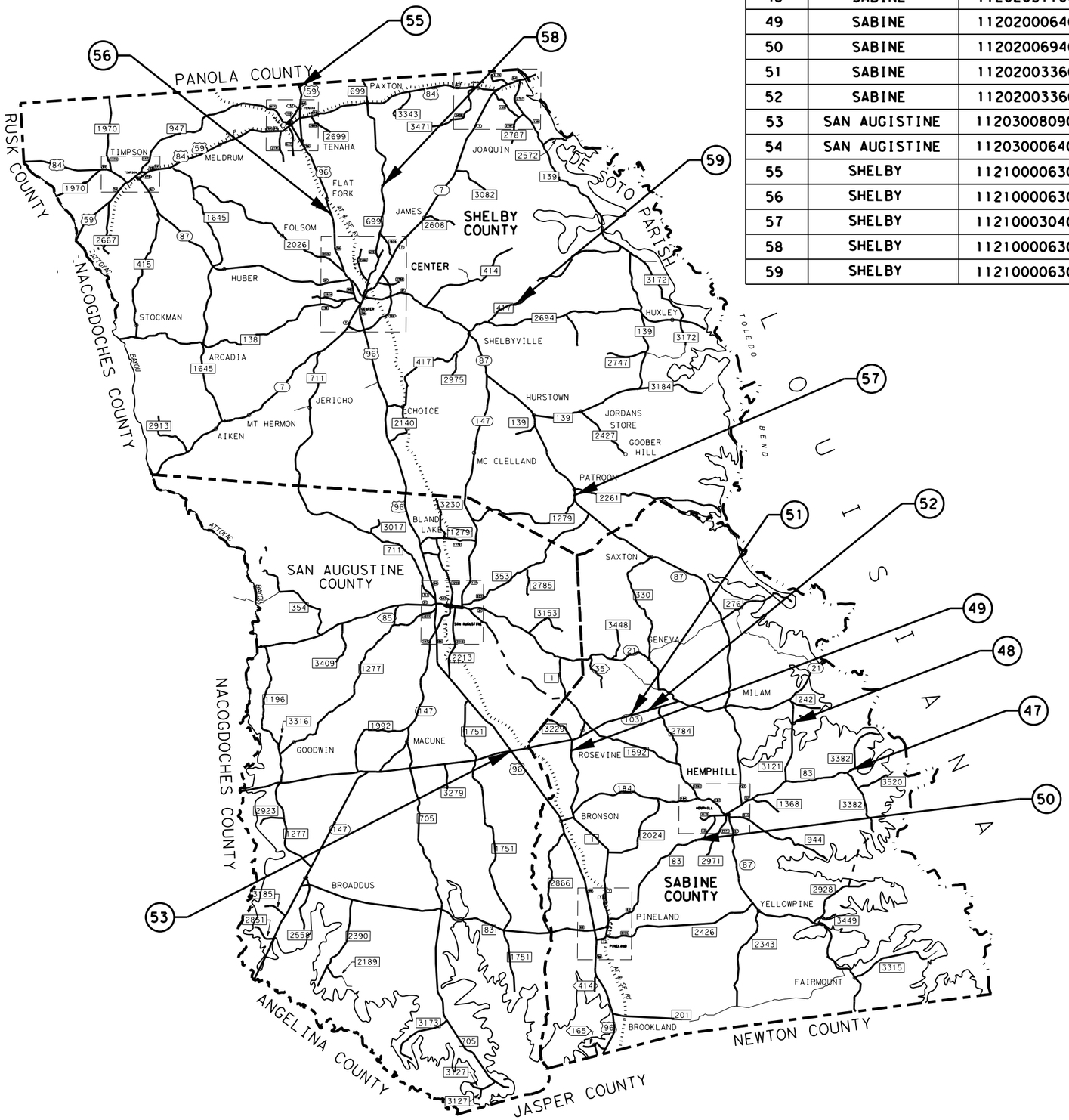
SITE	COUNTY	STRUCTURE ID	LATITUDE	LONGITUDE	LOCATION
47	SABINE	112020167801003	31.372521	-93.726482	FM 83 @ COMA CREEK
48	SABINE	112020317001001	31.414083	-93.781111	FM 3121 @ PALO GAUCHO BAYOU
49	SABINE	112020006405054	31.405282	-93.999352	FM 1 @ DONAHUE CREEK
50	SABINE	112020069401017	31.321001	-93.882639	FM 83 @ HOUSEN BAYOU RELIEF
51	SABINE	112020033608033	31.430121	-93.940173	SH 103 @ PALO GAUCHO BAYOU RELIEF
52	SABINE	112020033608035	31.432062	-93.930925	SH 103 @ MADDOX CREEK
53	SAN AUGUSTINE	112030080904041	31.405925	-94.057544	SH 103 @ US 96
54	SAN AUGUSTINE	112030006403018	31.569478	-94.090309	SH 147 @ FRIZELLE BRANCH
55	SHELBY	112100006306028	31.973840	-94.232964	US 59 @ WALLER CREEK
56	SHELBY	112100006306104	31.864724	-94.208276	US 96 @ CHICKEN BAYOU
57	SHELBY	112100030401080	31.617475	-93.983811	SH 87 @ PATROON BAYOU
58	SHELBY	112100006306028	31.890723	-94.154838	FM 699 @ FLAT FORK CREEK
59	SHELBY	112100006306028	31.783076	-94.027051	FM 417 @ BEAUCHAMP CREEK



LOCATION MAP FOR SHELBY, SAN AUGUSTINE AND SABINE COUNTIES

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation®

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		6

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GENERAL NOTES:

PROJECT DESCRIPTION: This project consists of Bridge Preventative Maintenance throughout the Lufkin District.

TXDOT PROJECT SUPERVISORS: All work on this contract will be scheduled and directed by the Maintenance Section Supervisor(s) listed below. Payment will be made on a monthly basis for work completed and accepted according to specifications. All payment requests should be directed to the following Maintenance Section Supervisor(s) listed below.

COUNTY	SUPERVISOR	ADDRESS	CONTACT #
ANGELINA	Josh Bobbitt	1410 Kurth Drive Lufkin, TX 75901	(936) 634-3414
NACOGDOCHES	Jack Smith	918 Industrial Blvd. Nacogdoches, TX 75964	(936) 585-7041
SABINE	Kenneth Courville, Jr.	300 FM 83 Hemphill, TX 75948	(409) 787-1751
SAN AUGUSTINE	Scott Duffey	551 S El Camino Crossing San Augustine, TX 75972	(936) 275-9671
SHELBY	Clint Norton	638 SH 7 East Center, TX 75935	(936) 598-4113

CONTRACT PROSECUTION:

Each contract awarded by the Department stands on its own and, as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process any or all contracts at the same time.

Existing regulatory, warning, and guide signs within project limits are to remain visible to the traveling public at all times. If a sign must be repositioned during construction operations, move and install the sign to an approved location. Use care when working near existing signs and repair or replace signs damaged by work operations. All work involved repositioning existing signs will be subsidiary to various bid items.

Furnish materials and make repairs to the existing roadway at any location damaged by construction operations. This work shall be done in an approved manner and will be subsidiary to various bid items.

Maintain adequate surface drainage throughout the project limits during all phases of construction.

Project Number: BPM 6384-24-001 **Control: 6384-24-001**

County: SAN AUGUSTINE, ETC. **Highway: SH 21, ETC.**

There is a potential for work to be done in environmentally sensitive areas within these maintenance sections. All work shall be performed as directed by the appropriate Maintenance Section Supervisor to avoid impacts to these areas.

Remove dirt, silt, rocks, debris and other foreign matter that accumulates in structures due to the Contractor's operations as directed. Keep stream channels open at all times. This work will not be paid for directly, but will be subsidiary to pertinent items.

It is the intent of this contract for work to be performed under traffic.

Prior to beginning the repair operations, a preconstruction conference between the Contractor and Engineer will be conducted.

All work shall be verified in the field by the Engineer prior to construction.

Minimize vehicles and equipment in construction areas to lessen the impact on existing vegetation. The intent of the plans is to prepare only that portion of TxDOT right-of-way necessary for construction.

All workers and/or visitors on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night. Non-compliance with any of these requirements shall be grounds for suspension of work.

Contractor questions on this project are to be emailed to the following individual(s):

Jeremy King Jeremy.King@TxDOT.gov
Tammy Gibson Tamara.Gibson@TxDOT.gov

Contractor questions will be accepted through email, phone, and in person by the above individual(s).

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
ftp://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

ITEM 2: INSTRUCTIONS TO BIDDERS

View plans on-line or download from the web at:
http://www.txdot.gov/business/contractors_consultants/plans_online.htm

Order plans from any of the plan reproduction companies shown on the web at:
http://www.txdot.gov/business/contractors_consultants/repro_companies.htm

ITEM 5: CONTROL OF THE WORK

In the event utility lines needing unforeseen adjustments are encountered during construction operations, alter operations and continue to prosecute the contract in such a manner that will allow utility adjustments to be made by others. An extension of working time may be granted for any delays caused by the utility adjustments if deemed necessary.

ITEM 7: LEGAL RELATIONS AND RESPONSIBILITIES

The proposed work of this project is to perform Bridge Preventative Maintenance at various locations within the Lufkin District. This activity maintains the original line and grade, hydraulic capacity and original purpose of the sites. Therefore, this project meets the definition of a routine maintenance activity as defined in the TPDES General Permit (CGP) No. TXR150000 issued March 5, 2013 and TCEQ's TPDES CGP does not apply.

ITEM 8: PROSECUTION AND PROGRESS

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.4, “Standard Workweek.”

This contract is for 70 working days and is intended to be completed by June 30, 2022.

ITEM 401: FLOWABLE BACKFILL

All forming to contain flowable fill and all work to create access to place flowable fill shall be subsidiary to Item 401.

ITEM 429: CONCRETE STRUCTURE REPAIR

Repair all concrete in accordance with the TxDOT Concrete Repair Manual shown on the web at: http://onlinemanuals.txdot.gov/txdotmanuals/crm/crm.pdf.

Dewatering for concrete repair shall be considered subsidiary to Item 429.

ITEM 432: RIPRAP

Stone Riprap (Stone Common) (Dry) shall have a minimum thickness of 12 inches.

Stone riprap will require the placement of filter fabric prior to placement of stones.

Project Number: BPM 6384-24-001 **Control: 6384-24-001**

County: SAN AUGUSTINE, ETC. **Highway: SH 21, ETC.**

ITEM 502: BARRICADES, SIGNS, AND TRAFFIC HANDLING

Traffic Control Plan (TCP):

Ensure the Contractor’s Responsible Person (CRP) for Barricades, Signs and Traffic Handling is available at all times and able to receive instructions from the Engineer or authorized Department representative. The CRP shall be a person that is usually at the project site during normal working hours.

For protection of the traveling public, direct traffic through the work area using signs, flaggers and other devices. Required signs are shown in the plans on the Barricade and Construction Standards and Traffic Control Plan Sheets. The latest edition of the "Texas Manual on Uniform Traffic Control Devices" shall also be used as a guide for handling traffic on this project.

Install "No Center Line" (CW8-12) signs as directed.

In general, restrict construction work to single lane widths. Control traffic in accordance with standard drawings

Unless otherwise approved, use an advance warning, flashing arrow panel in addition to the necessary signs, barricades, or other traffic control devices at the work area.

Restrict construction work to single lane widths with only minor disruptions in traffic flow. Lane closures shall conform to the Traffic Control Plan for lane closures as shown in the plans. Overnight closures will only be permitted at Site A.

Limit lane closures for multilane roads (4 or more lanes) to 2 miles in length, unless otherwise approved.

Limit lane closures for 2 lane roads to 1 mile in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

Plan the sequence of work to minimize the time lane closures are in place. Install lane closures only where construction operations are anticipated to start within 1 hour and limited to the amount of lane that can be reached by the construction activity within 2 hours unless otherwise approved.

No lane closures will be allowed on US 59 or US 190 after Noon on Fridays or on days preceding Major Holidays unless otherwise approved.

Extra time has been added to the total number of working days allocated for this project to account for not working on Friday afternoons or the afternoon preceding a major holiday. Work shall be planned such that this is not a limiting factor in the schedule.

Provide a flashing arrow panel and a truck-mounted attenuator to supplement required signs and devices for each lane closure.

Provide temporary rumble strips as shown on WZ(RS)-16.

Provide a pilot car to lead traffic through the work area. The pilot car will not be paid for directly, but will be subsidiary to various bid items.

Install “Be Prepared to Stop” (CW3-4) and “Flagger Ahead” (CW20-7aD) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained.

When directed, use a flashing arrow board in addition to the required signs to warn motorists of flaggers.

Provide adequate flaggers to protect the traveling public. All flaggers shall wear approved hardhats and reflective safety vests while flagging. Safety vests shall be clean and worn fully fastened.

Use additional flaggers at roadway intersections to direct traffic entering the work area, when deemed necessary by the Engineer.

Open all traffic lanes to traffic at the close of work each day with the exception of Site A.

Provide one high-intensity yellow, rotating dome-light on all equipment such as distributors, spreader boxes, lay-down machines, rollers, backhoes, road graders, loaders, etc. Mount lights high enough to be visible from all directions and operating when the equipment is within 30 feet of the travel way. On all other equipment such as trucks, trailers, automobiles, etc. use emergency flashers while within the work zone.

Restrict construction operations so that no drop off along the edge of pavement will remain overnight.

All blading, rolling and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be considered subsidiary to various bid items.

Notify the Engineer prior to placing any materials or equipment on TxDOT right-of-way. Locate equipment, stockpiles or other materials not in use as far as possible from the driving lanes and in no case closer than 30 feet unless otherwise authorized. Any equipment, stockpiles, or materials placed within 30 feet of the driving lane must have adequate signs, barricades or other warning devices as approved.

As a minimum, place an 8 foot wide TY III Barricade on the approach side of each site that is within 30 feet of the driving lane. Barricade the site similarly on the departure side if the location is within 30 feet of the opposing traffic lane.

Project Number: BPM 6384-24-001 **Control: 6384-24-001**

County: SAN AUGUSTINE, ETC. **Highway: SH 21, ETC.**

The Contractor Force Account “Safety Contingency” that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor’s Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public’s attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while travelling from one work location to another or while parked on TxDOT right-of-way away from the pavement or a work zone.

ITEM 506: TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

The Best Management Practices for this project shall include using the following erosion control measures as directed:

1. Temporary Sediment Control Fence
2. Temporary and Permanent Seeding

Other erosion or water pollution control measures deemed necessary by the Engineer will be paid for in accordance with article 4.4, “Changes in the Work”.

Place temporary sediment control fence at locations as directed.

ITEM 6185: TRUCK MOUNTED ATTENUATORS

Truck Mounted Attenuators (TMA’s) shall meet the requirements of this item and the Department’s Compliant Work Zone Traffic Control Device List.

Truck Mounted Attenuators (TMA’s) as shown on the TCP’s shall be used. Whether shown on the TCP’s or added by the Department, TMA’s shall be paid for under Item 6185, “Truck Mounted Attenuator” for the type of operation being performed.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6384-24-001 **DISTRICT** Lufkin **COUNTY** San Augustine
HIGHWAY US0096

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**6384-24-001**			
		PROJECT ID		**A00178953**			
		COUNTY		**San Augustine**			
		HIGHWAY		**US0096**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	10.000		10.000	
	401-6001	FLOWABLE BACKFILL	CY	37.100		37.100	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	1,030.000		1,030.000	
	429-6009	CONC STR REPAIR (STANDARD)	SF	171.500		171.500	
	432-6024	RIPRAP (STONE COMMON)(DRY)(12 IN)	CY	43.800		43.800	
	432-6027	RIPRAP (STONE COMMON)(DRY)(24 IN)	CY	55.300		55.300	
	438-6001	CLEANING AND SEALING EXISTING JOINTS	LF	3,455.000		3,455.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000		7.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	800.000		800.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	800.000		800.000	
	778-6002	CONCRETE RAIL REPAIR (MISC)	LF	16.000		16.000	
	780-6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	24.000		24.000	
	785-6004	BRIDGE JOINT REPAIR (ARMOR)	LF	12.000		12.000	
	6185-6002	TMA (STATIONARY)	DAY	20.000		20.000	

SUMMARY OF BRIDGE MAINTENANCE ITEMS

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
1	US 287 @ DRAW ANGELINA	110030255301012	FILL UNDERCUT WITH FLOWABLE BACKFILL IN NORTHWEST AND SOUTHEAST CORNERS. FILL HOLE IN SOUTHEAST RIPRAP WITH FLOWABLE BACKFILL. ADD RIPRAP (STONE COMMON)(DRY)(12 IN) TO NORTHWEST, NORTHEAST AND SOUTHEAST CORNERS.		3.3			5.5					
2	US 59 NB @ SL 287 ANGELINA	110030017602079	REPAIR SPALL ON DECK FASCIA, SPAN 1 , WEST END WITH CONC STR REPAIR (STANDARD)				8						
3	US 59 SBL @ NECHES RIVER ANGELINA	110030017603054	REPAIR SPALL ON RAIL WITH CONC STR REPAIR (STANDARD). REPAIR SPALLS ON 5TH BEAM FROM WEST ON BENT 2 & 3 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			11	10.5						
4	US 59 NB @ WHITE OAK CREEK ANGELINA	110030017603059	REPAIR SPALLS ON WEST DECK FASCIA BENT 2, BENT 2, SOFFIT OF SPAN 3, BENT 4, AND BENT 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			102							
5	FM 324 @ HURRICANE CREEK ANGELINA	110030017608065	REPAIR SPALLS ON BENT 2 & 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			40							
6	US 69 @ MELBURRY CREEK ANGELINA	110030019904012	REPAIR SPALL ON SOFFIT OF BOX WITH CONC STR REPAIR (VERTICAL & OVERHEAD). FILL EROSION ON NORTHWEST WING WITH FLOWABLE BACKFILL.	4		8							
7	US 69 @ DRAW ANGELINA	110030019904013	REPAIR SPALL ON SOFFIT OF SPAN 1, SPAN 2 AND NORTH END BENT WALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD. REPAIR CRACK ON SOUTHWEST ABUTMENT WALL WITH CONC CRCK REPR(DISCREET)(ROUT AND SEAL)			27						8	
8	US 69 @ BODAN CREEK ANGELINA	110030019904014	REPAIR SPALL ON SOFFIT AT WIDENING JOINTS WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			40							
9	SH 63 @ MILL CREEK ANGELINA	110030024401003	REPAIR SPALL ON SOFFIT AND INTERIOR WALLS WITH CONC STR REPAIR (VERTICAL & OVERHEAD. REPAIR SCALLING IN INTERIOR WALLS WITH CONC STR REPAIR (STANDARD)			44	30						
			SHEET SUBTOTALS	**4**	**3.3**	**272**	**48.5**	**5.5**	**0**	**0**	**0**	**8**	**0**

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		9

SUMMARY OF BRIDGE MAINTENANCE ITEMS (CONTINUED)

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
10	SH 94 @ JACK CREEK RELIEF ANGELINA	110030031904043	REPAIR SPALL ON SOFFIT AND NORTHEAST WINGWALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD).			24							
11	SH 7 @ NECHES RIVER ANGELINA	110030033603015	REPAIR SPALLS ON BENT 7 WITH CONC STR REPAIR VERTICAL & OVERHEAD) REPAIR CRACK ON BENT 5 WITH CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)			52						6	
12	FM 58 @ HURRICAN CREEK TRIB. ANGELINA	110030057602001	ADD RIPRAP (STONE COMMON)(DRY)(12 IN) TO NORTHWEST CORNER ADD FLOWABLE BACKFILL TO NORTHEAST CORNER EROSION		3.3			6.1					
13	FM 2109 @ STANLEY CREEK ANGELINA	110030089302002	REPAIR SPALLS ON BENT 4 & 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) REPAIR CRACK ON WEST ABUTMENT WITH CONC CRCK REPR(DISCREET)(ROUT AND SEAL)			56						2	
14	FM 1818 @ SHAWNEE CREEK ANGELINA	110030179401001	REPAIR SPALL ON BENT CAP 2 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			8							
15	FM 1818 @ BILOXI CREEK ANGELINA	110030179401002	REPAIR SPALLS ON BENT CAP 2, 3, 5, AND SOFFIT OF SPAN 7 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			40							
16	LP 287 @ DRAW ANGELINA	110030255301011	REPAIR SPALL ON NORTH HEADWALL WITH CONC STR REPAIR (STANDARD) REPAIR CRACK ON HEADWALL WITH CONC CRCK REPR (DISCRETE)(ROUT AND SEAL)				4					8	
17	FM 2497 @ JACK CREEK ANGELINA	110030258901001	REPAIR SPALLS ON BENT 2, SOUTH PARAPET BENT 2, AND BENT 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			25							
18	US 59 NB @ NECHES RIVER ANGELINA	110030017603069	REPAIR SPALL ON BRIDGE RAIL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			40							
			SHEET SUBTOTALS	**0**	**3.3**	**245**	**4**	**6.1**	**0**	**0**	**0**	**16**	**0**

QUANTITY SUMMARIES

Texas Department of Transportation®

SHEET 2 OF 7

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		10

SUMMARY OF BRIDGE MAINTENANCE ITEMS (CONTINUED)

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
19	US 59 SB DIR CONN @ US 59 BUS & SL 287 ANGELINA	110030017603090	CLEAN AND RESEAL JOINT AT BENT 4							28			
20	SH 103 @ BODAN CREEK ANGELINA	110030033603011	REPAIR SPALLS ON BENT CAP 5 & 7 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) ADD EMBANKMENT TO NORTHEAST CORNER	3		30							
21	FM 1270 @ SHAWNEE CREEK ANGELINA	110030039004057	ADD RIPRAP (STONE COMMON)(DRY)(12 IN) TO NORTHEAST CORNER					5					
22	SH 7 @ RED BAYOU ANGELINA	110030089401003	CLEAN AND RESEAL BRIDGE ABUTMENT JOINTS							90			
23	FM 2021 @ MILL CREEK ANGELINA	110030187402002	REPAIR SPALLS IN BENT 3 & SOFFIT OF SPAN 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			28							
24	FM 58 @ SL 287 @ US 59 ANGELINA	110030255301006	CLEAN AND RESEAL BIDGE JOINTS							344			
25	SL 287 & US 59 @ BUS 59 ANGELINA	110030255301116	REPAIR LOOSE ARMOUR JOINT & CLEAN AND RESEAL BENT 3 SOUTH BOUND LANE REPAIR SPALLS ON SPAN 2 BEAM 3 & 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			16				39			12
26	SH 7 @ CARRIZO CREEK RELIEF NACOGDOCHES	111740005901028	REPAIR LOSS OF CONCRETE ON CONCRETE WALLS 2-5 SOUTH SIDE & 5 NORTH SIDE WITH CONC STR REPAIR (STANDARD)				30						
27	US 59 @ INDIAN CREEK NACOGDOCHES	111740017507016	REPAIR SPALL AT NORTH WIDENING JOINT WITH CONC STR REPAIR (VERTICAL & OVERHEAD) REPAIR CRACK ON EAST ABUTMENT AT SOUTH WIDENING WITH CONC REPAIR (DISCRETE)(SURFSEAL)			20					10		
			SHEET SUBTOTALS	**3**	**0**	**94**	**30**	**5**	**0**	**501**	**10**	**0**	**12**

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		11

SUMMARY OF BRIDGE MAINTENANCE ITEMS (CONTINUED)

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
28	SH 7 @ ALAZAN CREEK NACOGDOCHES	111740055303001	REPAIR SPALL ON BENT 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			18							
29	FM 95 @ POLYSOT CREEK NACOGDOCHES	111740070605013	REPAIR SPALL ON BENT 3 & BENT 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD FILL EROSION AT SOUTHEAST EMBANKMENT WITH FLOWABLE BACKFILL		3	12							
30	FM 95 @ TRIB. OF LAGROULLE CREEK NACOGDOCHES	111740070605015	REPAIR SOUTHEAST WINGWALL WITH CONC STR REPAIR (STANDARD)				10						
31	FM 1638 @ BANITA CREEK NACOGDOCHES	111740140702001	REPAIR SPALLS ON BENT 2, 4, AND 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) FILL EROSION IN NORTHWEST AND SOUTHWEST RIPRAP WITH FLOWABLE BACKFILL ADD RIPRAP (STONE COMMON) (DRY) (12 IN) AT SOUTHWEST , NORTHWEST EMBANKMENT AND NORTHWEST FLUME .		3.5	46		10.7					
32	FM 225 @ MORRAL BAYOU NACOGDOCHES	111740181002002	REPAIR SPALL ON BENT 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)				4						
33	FM 2259 @ CARRIZO CREEK NACOGDOCHES	111740211601001	REPAIR SPALL ON BENT 3 WITH CONC STR REPAIR (VARTICAL & OVERHEAD) FILL EROSION AT WEST EMBANKMENT WITH FLOWABLE BACKFILL REPAIR SPALL ON EAST ABUTMENT WITH CONC STR REPAIR (STANDARD)		3	15	4						
34	FM 343 @ LOCO CREEK NACOGDOCHES	111740230001001	REPAIR SPALLS ON BENT 2 AND 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) ADD RIPRAP (STONE COMMON) (DRY) (24 IN) AT EAST AND WEST EMBANKMENT			20			42				
35	SH 21 @ ANGELINA RIVER NACOGDOCHES	111740011806082	CLEAN AND RESEAL BRIDGE JOINTS 1-5.							220			
36	FM 225 @ ANGELINA RIVER RELIEF NACOGDOCHES	111740011806083	CLEAN AND RESEAL BRIDGE JOINTS 1-8							352			
			SHEET SUBTOTALS	**0**	**9.5**	**111**	**18**	**10.7**	**42**	**572**	**0**	**0**	**0**

QUANTITY SUMMARIES

Texas Department of Transportation®

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		12

SUMMARY OF BRIDGE MAINTENANCE ITEMS (CONTINUED)

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
37	SH 21 @ MOSS CREEK NACOGDOCHES	111740011808066	REPAIR SPALL ON SOFFIT OF BOX 2 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) REPAIR VOID IN ABUTMENT WALL WITH CONC STR REPAIR (STANDARD)			20	25						
38	US 259 NB @ US 59 NACOGDOCHES	111740017507079	RAPIR SPALL IN SPAN 3 BEAMS 1-5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) FILL EROSION IN WEST CORNER WITH FLOWABLE BACKFILL		3	21							
39	SH 7 @ ANGELINA RIVER NACOGDOCHES	111740055303011	CLEAN AND RESEAL BRIDGE JOINTS 1-13							572			
40	FM 226 @ ATASCOSO CREEK NACOGDOCHES	111740089301013	CLEAN AND RESEAL JOINTS 1-4 FILL EROSION IN SOUTH & NORTHWEST CORNER WITH FLOWABLE BACKFILL		3					136			
41	FM 226 @ ATASCOSO CREEK RELIEF NACOGDOCHES	111740089301014	CLEAN AND RESEAL BRIDGE JOINTS 1-4 FILL EROSION AT NORTHWEST CORNER RIPRAP & APPROACH SLAB		3					136			
42	SL 224 @ LA NANA CREEK NACOGDOCHES	111740256001002	REPAIR SPALLS IN BENT CAP 4, 6 AND NORTHEAST ABUTMENT WALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			54							
43	FM 2782 @ ALAZAN BAYOU NACOGDOCHES	111740280802002	CLEAN AND RESEAL ABUTMENT JOINTS REPAIR SPALL IN BENT 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) REPAIR SPALL AT ABUTMENT WITH CONC STR REPAIR (STANDARD) FILL EAST CORNER EROSION WITH FLOWABLE BACKFILL		3	16	6			70			
44	SH 103 @ DURAZNO CREEK NACOGDOCHES	111740033606037	CLEAN AND RESEAL BRIDGE JOINTS 1-5.							220			
45	US 59 & SL 224 NB @ FM 225 NACOGDOCHES	111740256001018	CLEAN AND RESEAL BRIDGE JOINTS 1-4 FILL NORTH CORNER EROSION WITH FLOWABLE BACKFILL REPAIR SPALL SOUTHEAST APROACH SLAB CORNER WITH CONC STR REPAIR (STANDARD)		3		2			144			
			SHEET SUBTOTALS		**15**	**111**	**33**	**0**	**0**	**1278**	**0**	**0**	**0**

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		13

SUMMARY OF BRIDGE MAINTENANCE ITEMS (CONTINUED)

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
46	FM 1648 @ INDIAN CREEK NACOGDOCHES	111740250903001	REPAIR SPALL ON BENT 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			12							
47	FM 83 @ COMA CREEK SABINE	112020167801003	REPAIR BRIDGE CONCRETE RAIL WITH CONCRETE RAIL REPAIR(MISC)								6		
48	FM 3121 @ PALO GAUCHO BAYOU SABINE	112020317001001	REPAIR SPALL ON BENT 22 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			50							
49	FM 1 @ DONAHUE CREEK SABINE	112020006405054	REPAIR SPALLS ON BENT 2, 3, AND 4 WITH CONC STR REPAIR (STANDARD) FILL EROSION IN NORTHWEST AND SOUTHEAST WITH FLOWABLE BACKFILL		3	12							
50	FM 83 @ HOUSEN BAYOU RELIEF SABINE	112020069401017	REPAIR SPALL ON SPAN 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD) REPAIR SPALL ON BENT 2, 4, 5, AND 6 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			5	38						
51	SH 103 @ PALO GAUCHO BAYOU RELIEF SABINE	112020033608033	REPAIR SPALL ON BENT 3 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			12							
52	SH 103 @ MADDOX CREEK SABINE	112020033608035	REPAIR SPALL ON BENT 3 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			40							
53	SH 103 @ US 96 SAN AUGUSTINE	112030080904041	ADD RIPRAP (STONE COMMON)(DRY)(12 IN) TO EAST ABUTMENT REPAIR SPALLS IN SPAN 2, BEAMS 1-6 FROM SOUTH WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			52		16.5					
54	SH 147 @ FRIZELLE BRANCH SAN AUGUSTINE	112030006403018	ADD FLOWABLE BACKFILL AT NORTHEAST CORNER RIPRAP ADD EMBANKMENT BEHIND NORTHEAST WING WALL	3	3								
			SHEET SUBTOTALS	**3**	**6**	**183**	**38**	**16.5**	**0**	**0**	**6**	**0**	**0**

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		14

SUMMARY OF BRIDGE MAINTENANCE ITEMS (CONTINUED)

SITE	LOCATION/COUNTY	STRUCTURE ID	ITEM NO.	132	401	429		432		438	778	780	785
			WORK DESCRIPTION	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	FLOWABLE BACKFILL	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	RIPRAP (STONE COMMON) (DRY) (12 IN)	RIPRAP (STONE COMMON) (DRY) (24 IN)	CLEAN AND RESEAL JOINT	CONCRETE RAIL REPAIR (MISC)	CONC CRCK REPR (DISCRETE) (ROUT AND SEAL)	BRIDGE JOINT REPAIR (ARMOUR)
				CY	CY	SF	SF	CY	CY	LF	LF	LF	LF
55	US 59 @ WALLER CREEK SHELBY	112100006306028	REPAIR SPALL ON SOFFIT OF SOUTH BOX WITH CONC STR REPAIR (VERTICAL & OVERHEAD)			14							
56	US 96 @ CHICKEN BAYOU SHELBY	112100006306104	CLEAN AND RESEAL BRIDGE JOINTS 1-5.							360			
57	SH 87 @ PATRON BAYOU SHELBY	112100030401080	REPAIR CONCTRETE RAIL WITH CONC STR REPAIR (STANDARD)						13.3	288			
58	FM 699 @ FLAT FORK CREEK SHELBY	112100080901006	CLEAN AND RESEAL BRIDGE JOINTS 1-12							312			
59	FM 417 @ BEAUCHAMP CREEK SHELBY	112100081002006	CLEAN AND RESEAL BRIDGE JOINTS 1-4							144			
			SHEET SUBTOTALS	**0**	**0**	**14**	**0**	**0**	**13.3**	**1104**	**0**	**0**	**0**
			PROJECT TOTALS	**10**	**37.1**	**1030**	**171.5**	**43.8**	**55.3**	**3455**	**16**	**24**	**12**

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	ITEM 506	
	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	LF	LF
VARIOUS	800	800

USE AS DIRECTED BY THE ENGINEER

SUMMARY OF TRUCK MOUNTED ATTENUATORS (TMAs)

LOCATION	ITEM 6185
	TMA (STATIONARY)
	DAY
VARIOUS	20

USE AS DIRECTED BY THE ENGINEER

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		15

DATE: 9/1/2021 9:14:03 AM
FILE: T:\LFKDOM\Maint Contracts\Design\BPM 6384-24-001 NORTH\STANDARDS\bc-21.dgn

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

BC(1)-21

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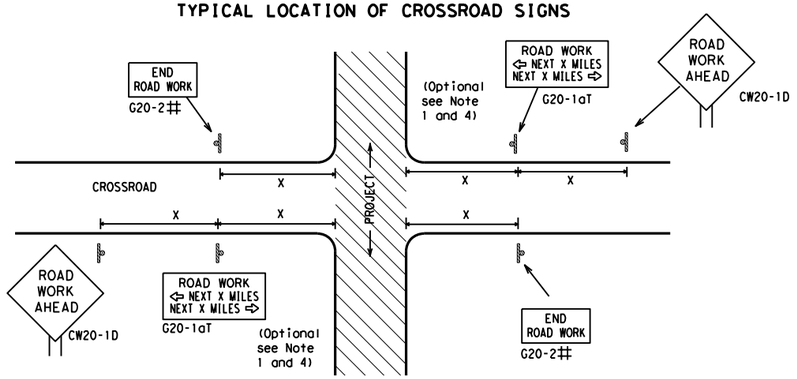
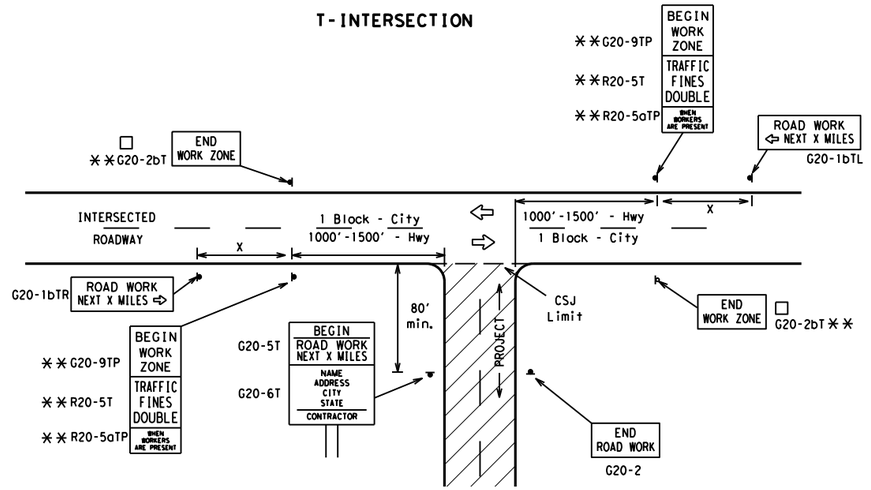
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

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

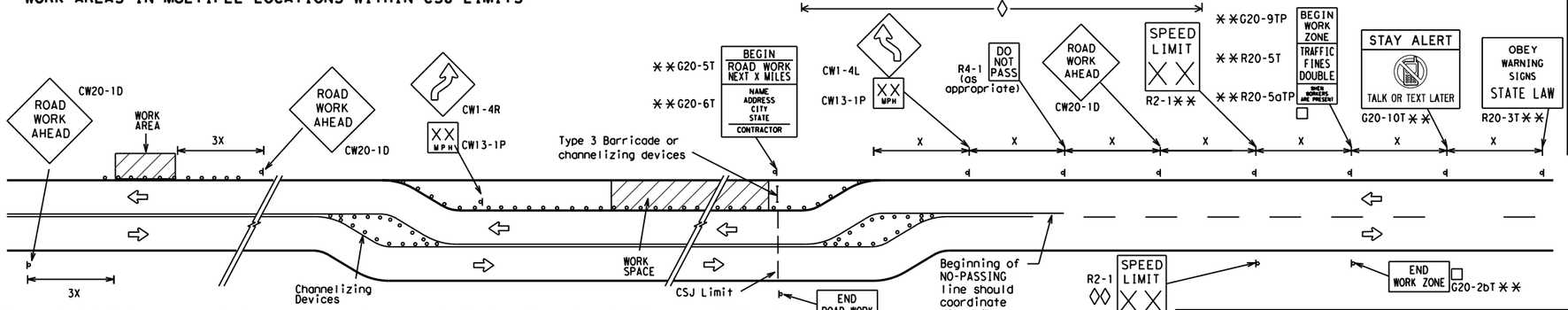
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

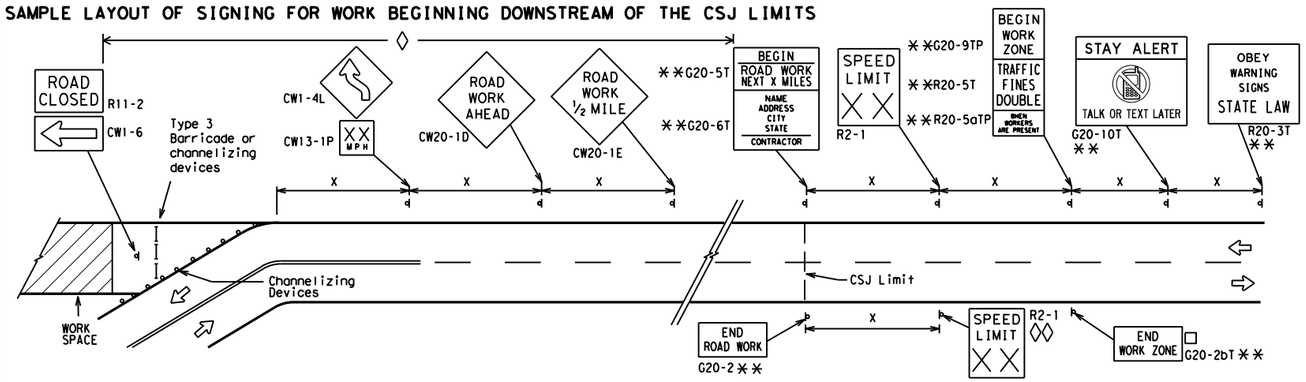
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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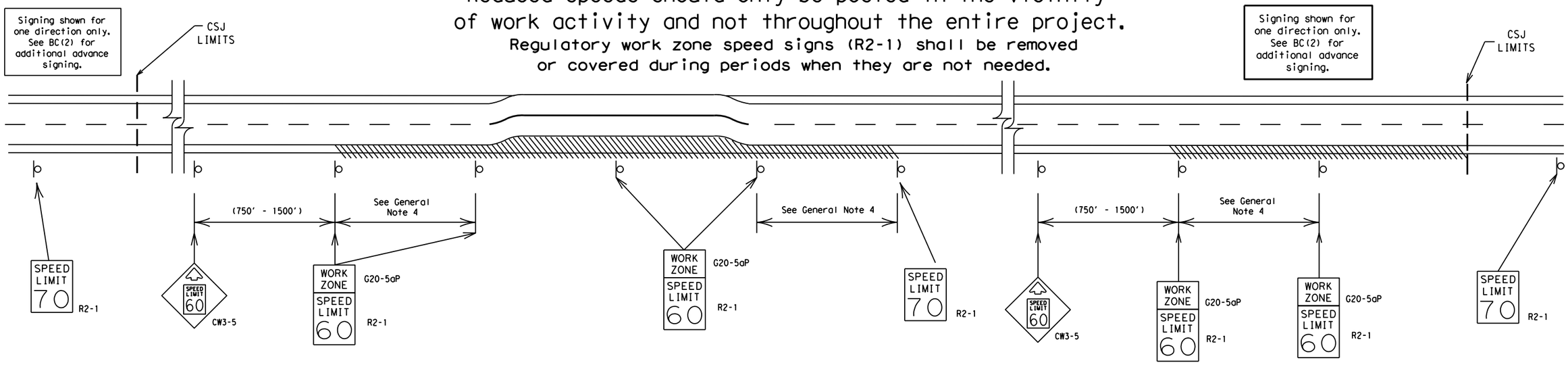
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

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

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"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.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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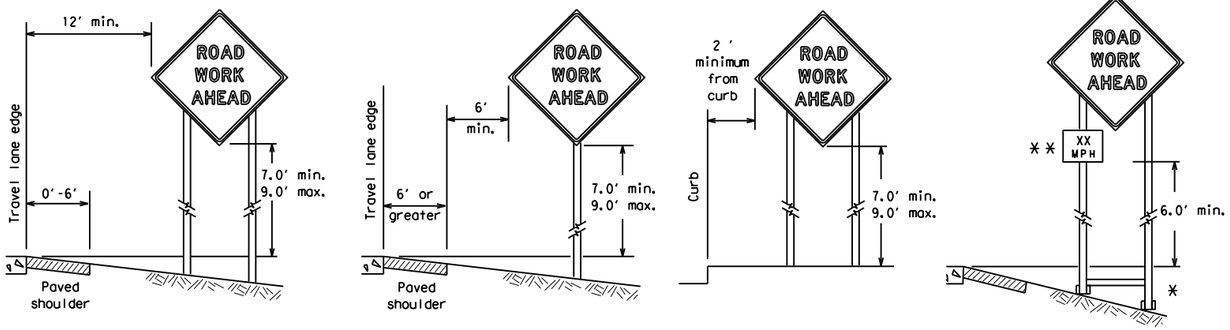
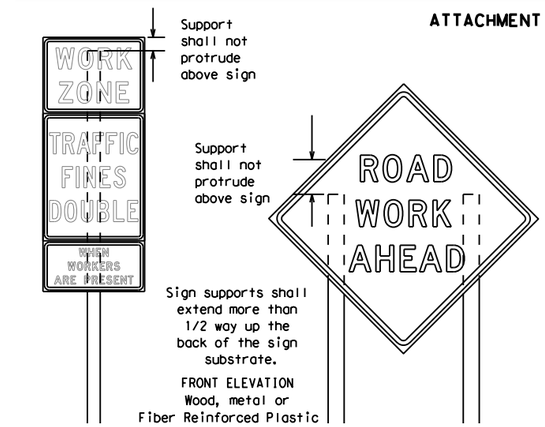
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

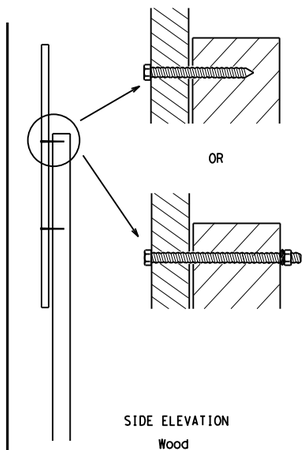


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





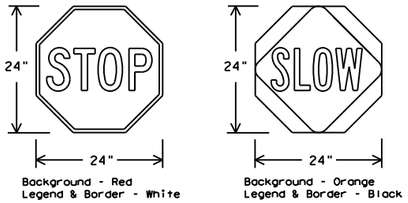
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle 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.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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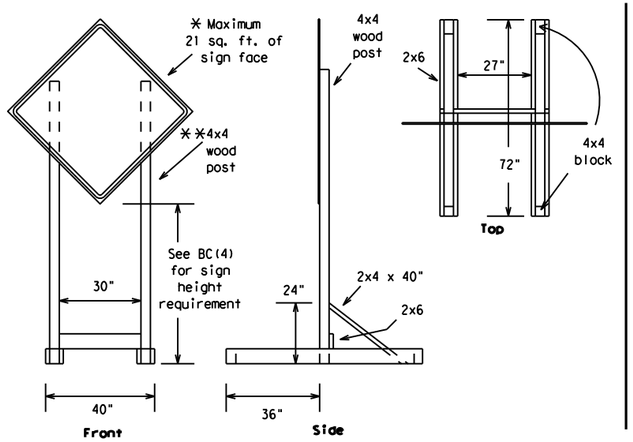
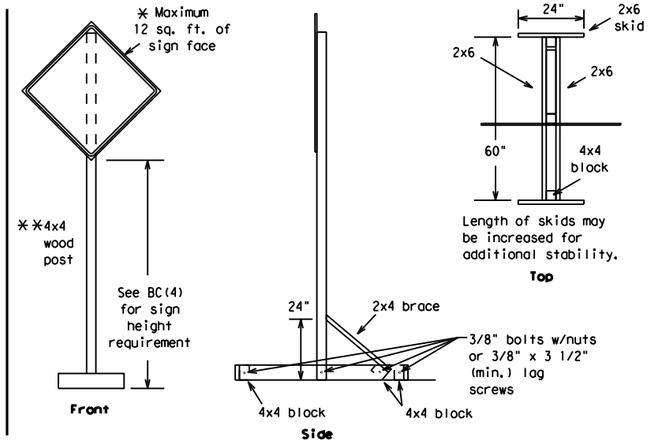
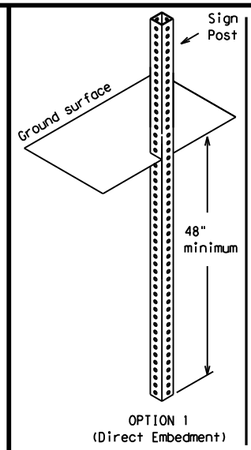
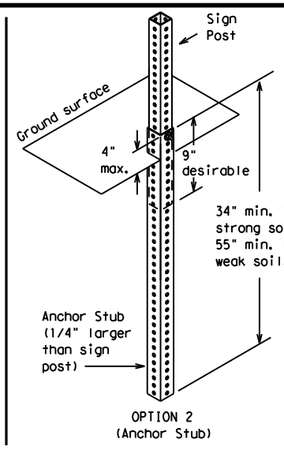


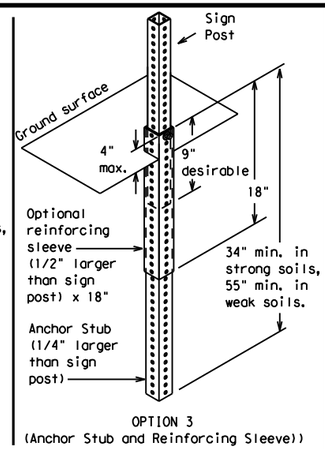


SKID MOUNTED WOOD SIGN SUPPORTS

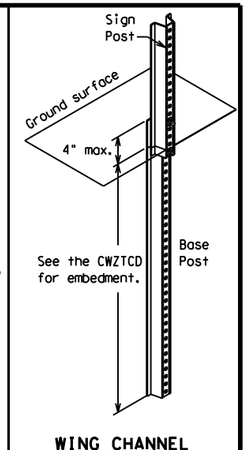
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







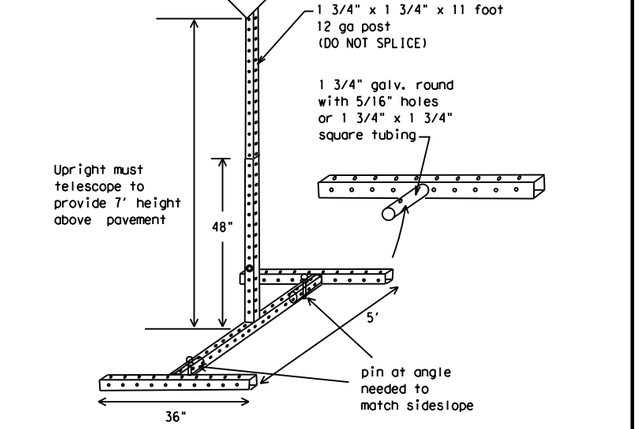
PERFORATED SQUARE METAL TUBING

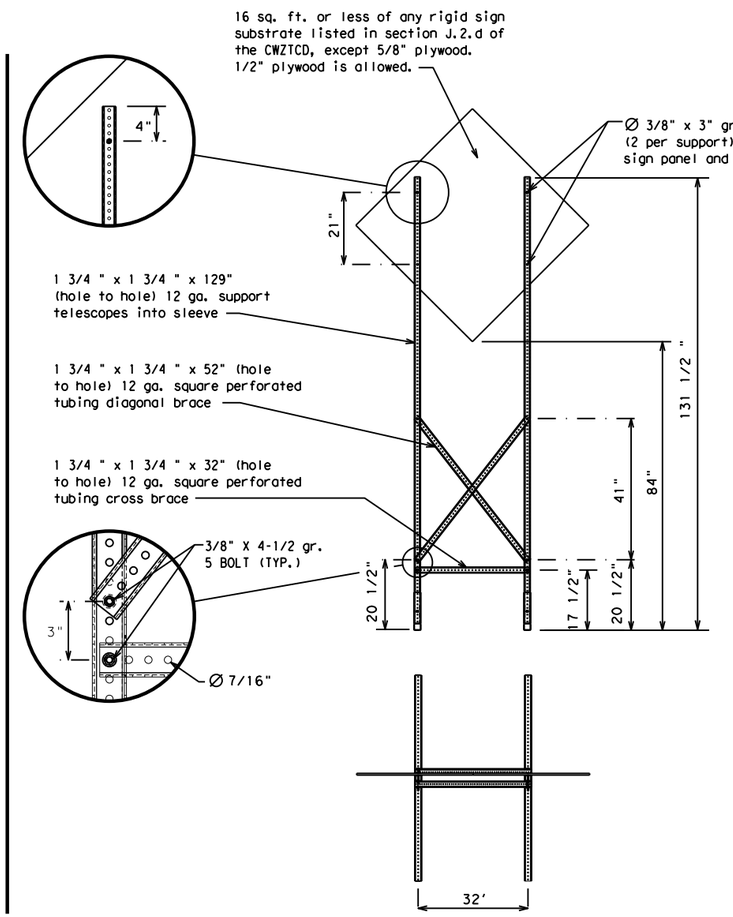


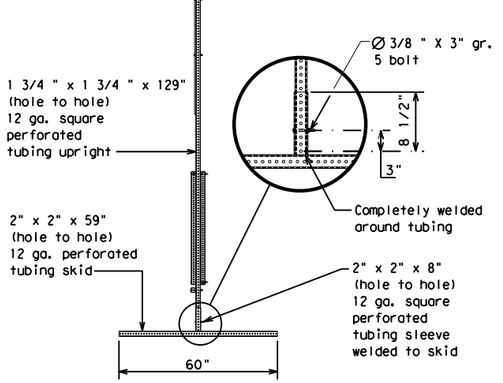
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

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

GENERAL NOTES

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.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6384	24	001	SH 21, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SAN AUGUSTINE, ETC.		20

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		6384	24	001	SH 21, ETC.
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		LFK	SAN AUGUSTINE, ETC.		21

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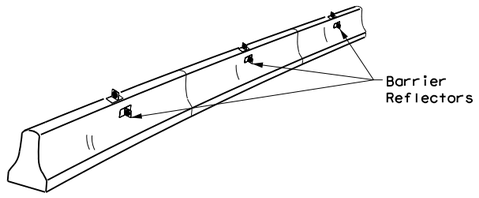
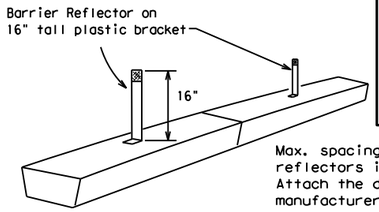
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

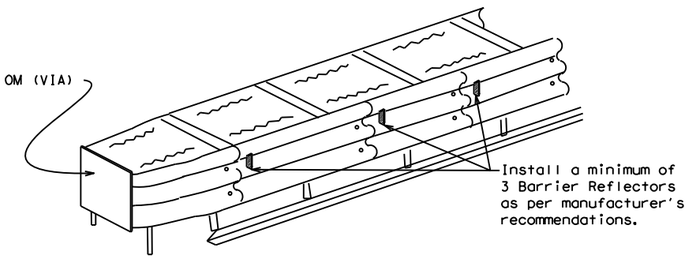


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

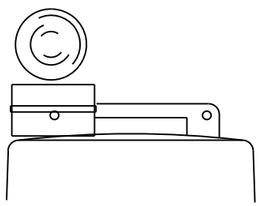


DELINEATION OF END TREATMENTS

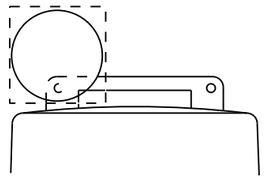
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate 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



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

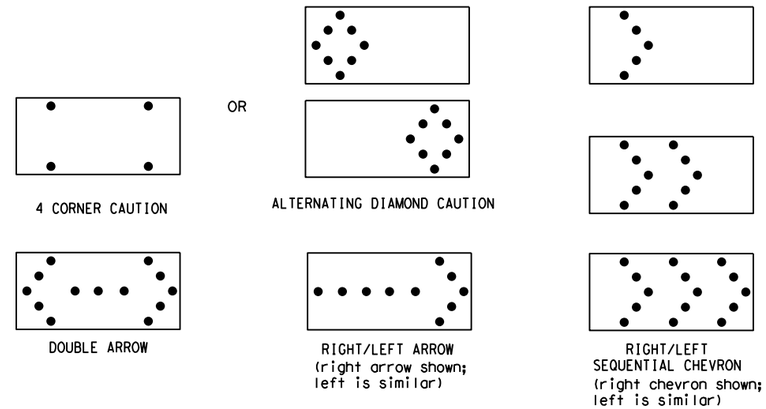
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	6384	24	001	SH 21, ETC.
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

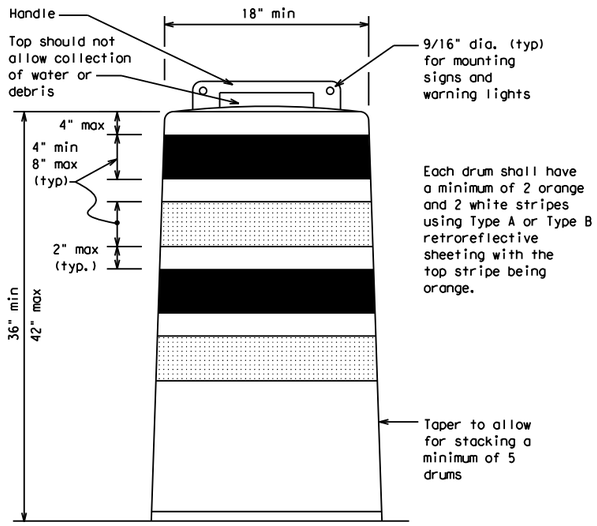
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

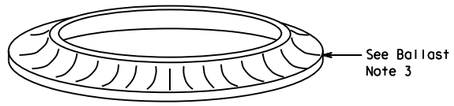
RETROREFLECTIVE SHEETING

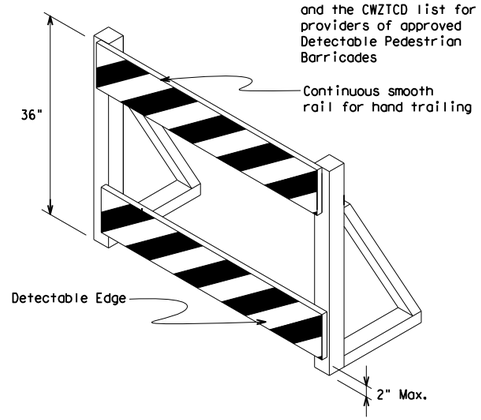
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

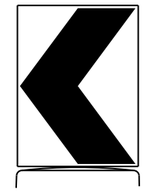




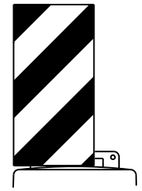


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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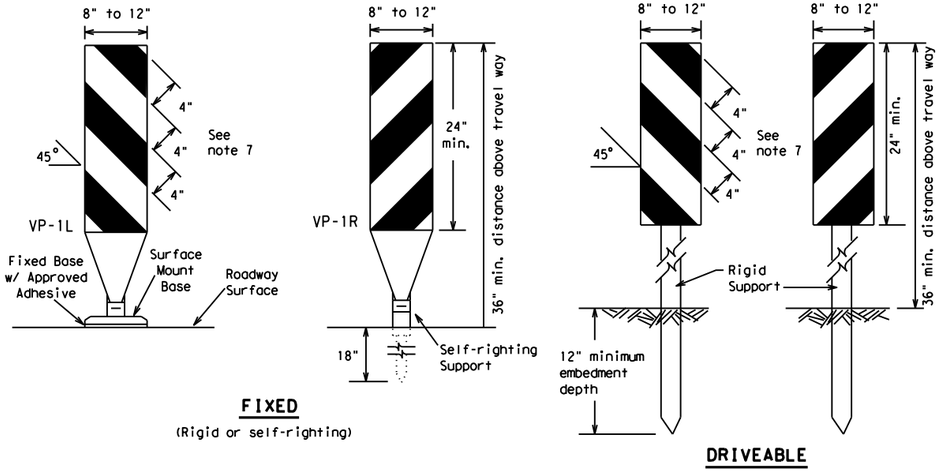
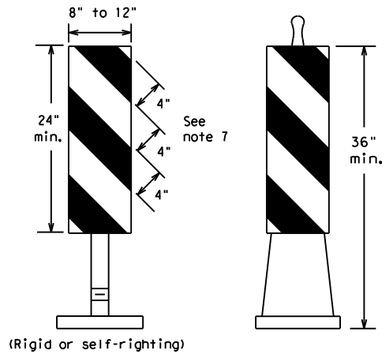


FIXED
(Rigid or self-righting)

DRIVEABLE

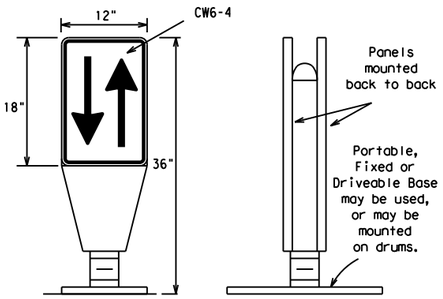


(Rigid or self-righting)

PORTABLE

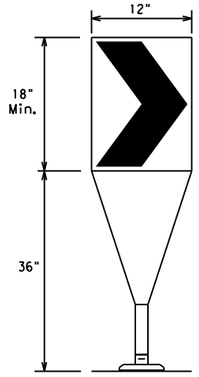
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the 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.

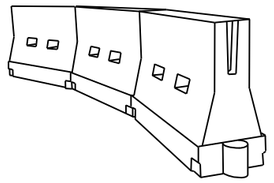
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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 ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices 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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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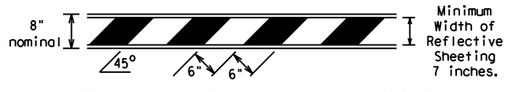
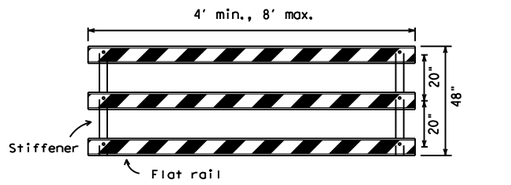
TYPE 3 BARRICADES

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.



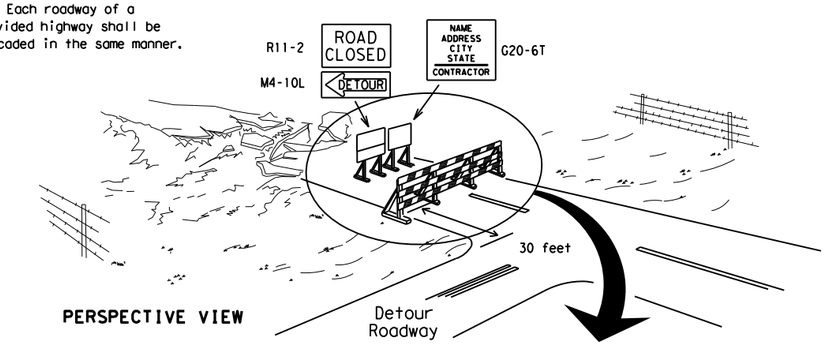
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

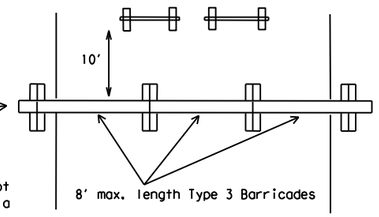
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

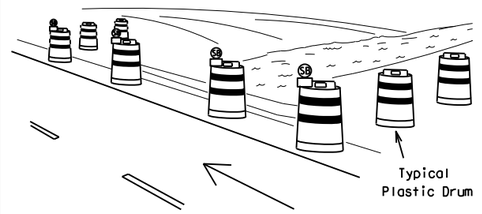
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

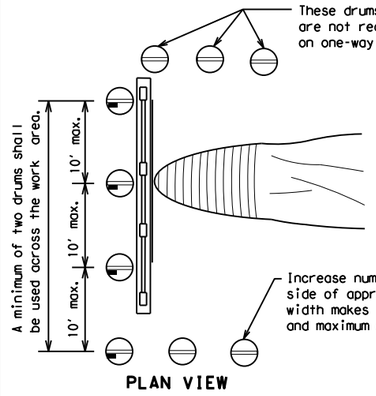
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

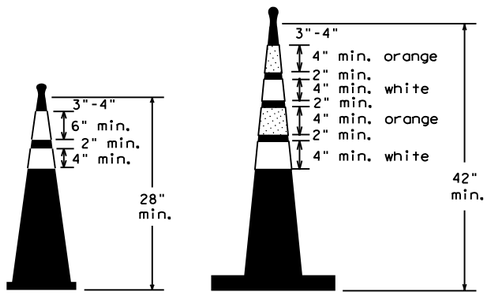
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



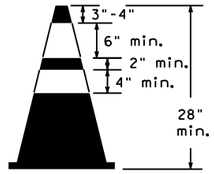
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

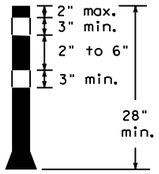
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

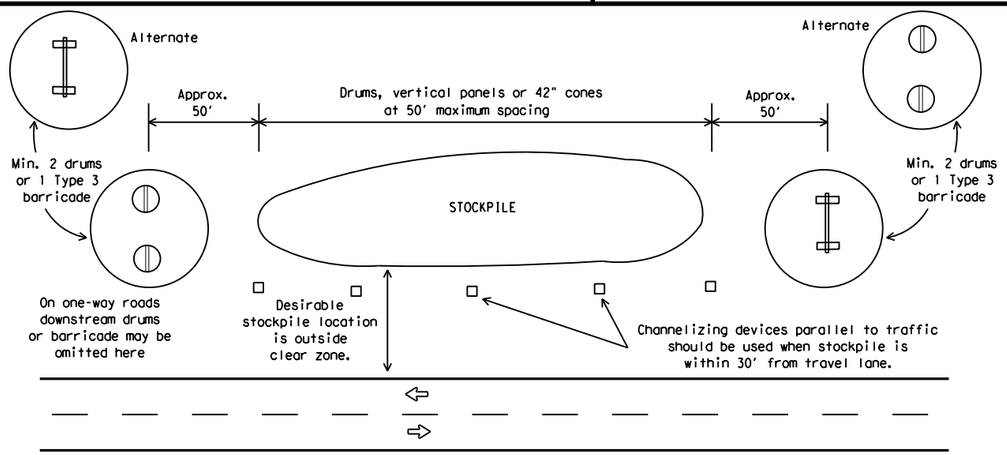


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6384	24	001	SH 21, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SAN AUGUSTINE, ETC.		25

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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.

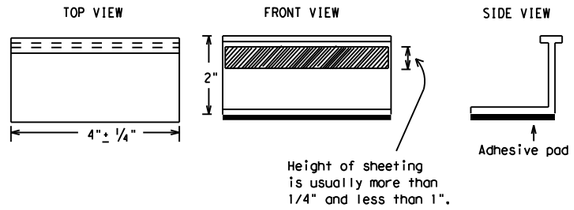
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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).

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6384	24	001	SH 21, ETC.
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11-02 8-14				

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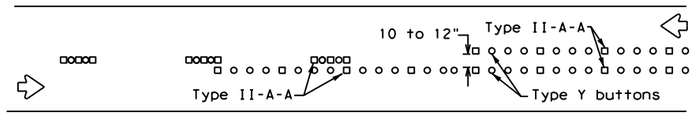
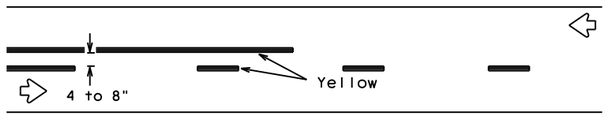
PAVEMENT MARKING PATTERNS

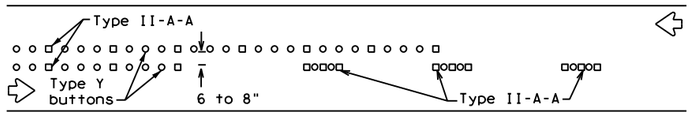
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



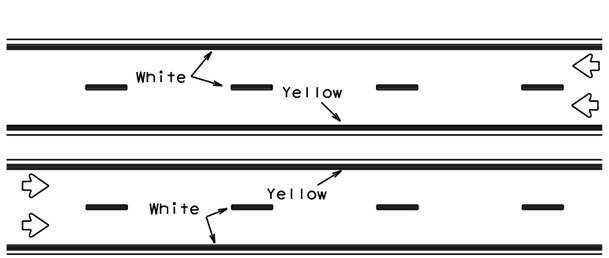
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



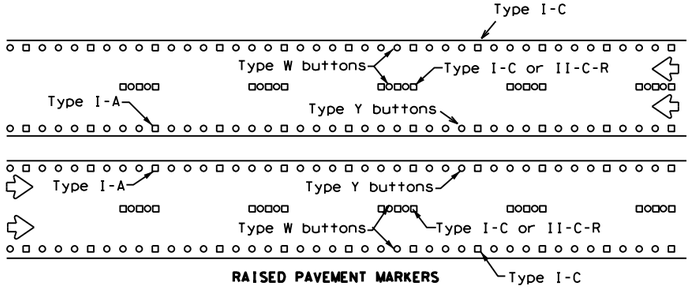
RAISED PAVEMENT MARKERS - PATTERN B

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

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



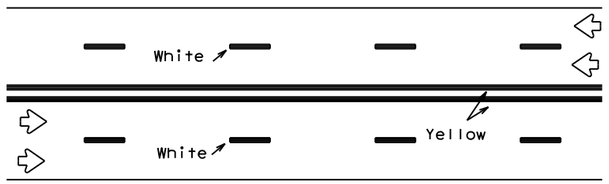
REFLECTORIZED PAVEMENT MARKINGS



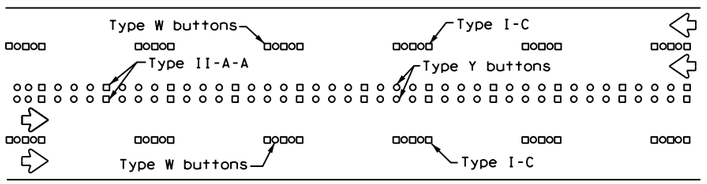
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



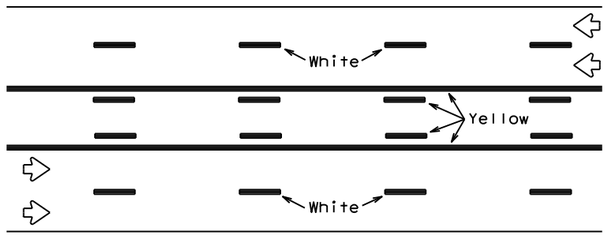
REFLECTORIZED PAVEMENT MARKINGS



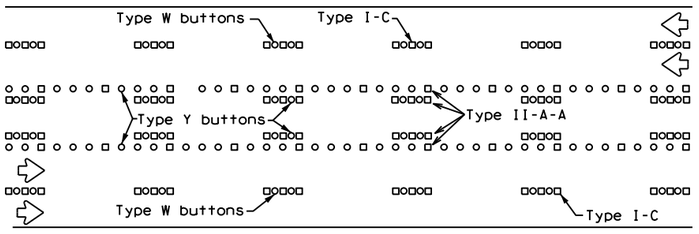
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

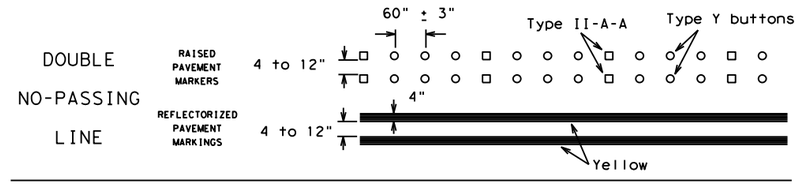
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

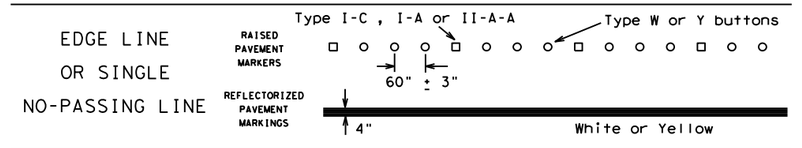
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

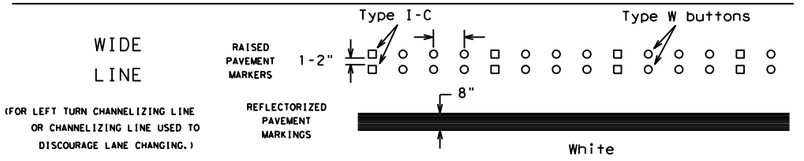


EDGE LINE OR SINGLE NO-PASSING LINE



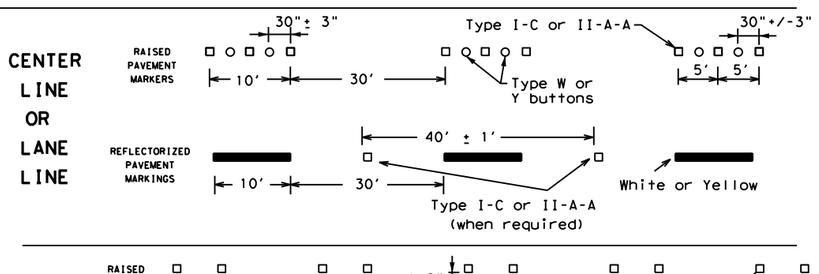
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

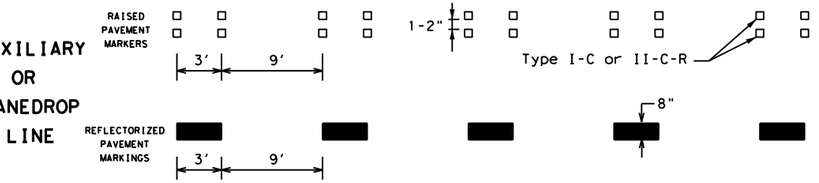


BROKEN LINES

CENTER LINE OR LANE LINE

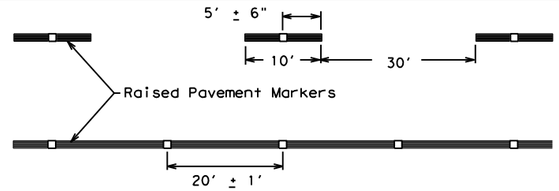


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	6384	24	001	SH 21, ETC.
	DIST	COUNTY		SHEET NO.
	LFK	SAN AUGUSTINE, ETC.		27

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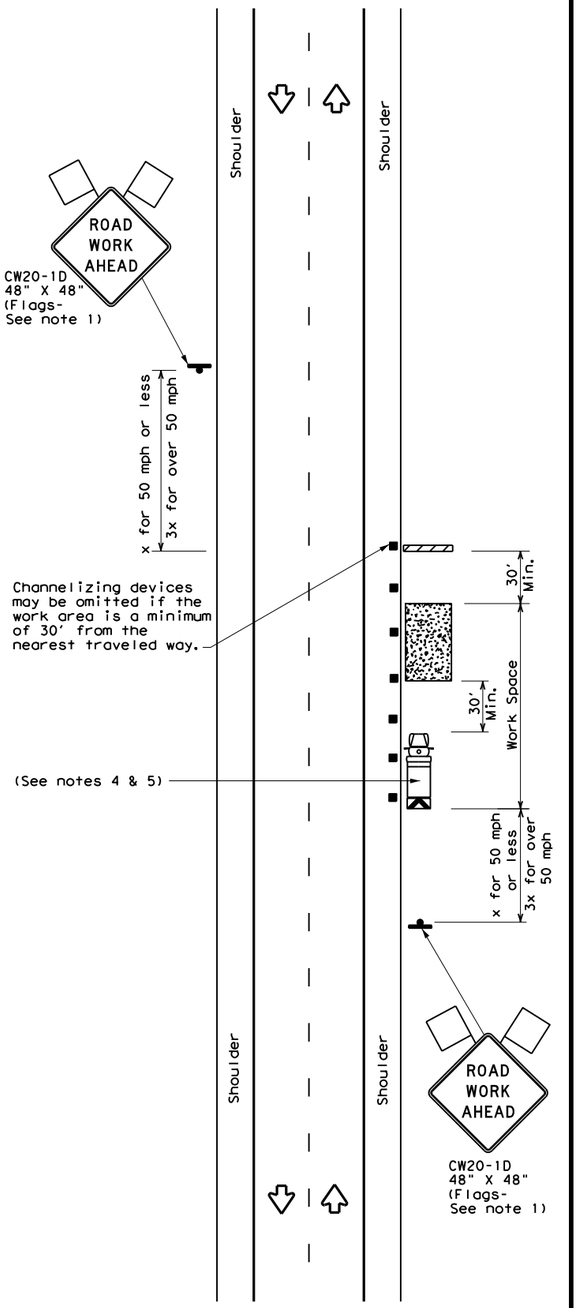
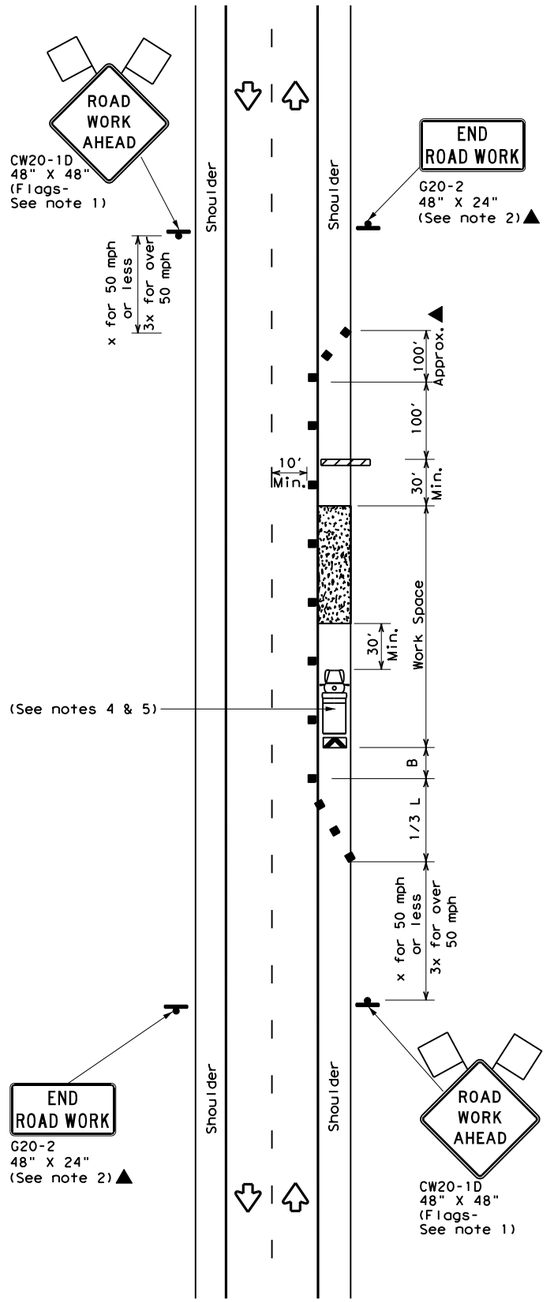


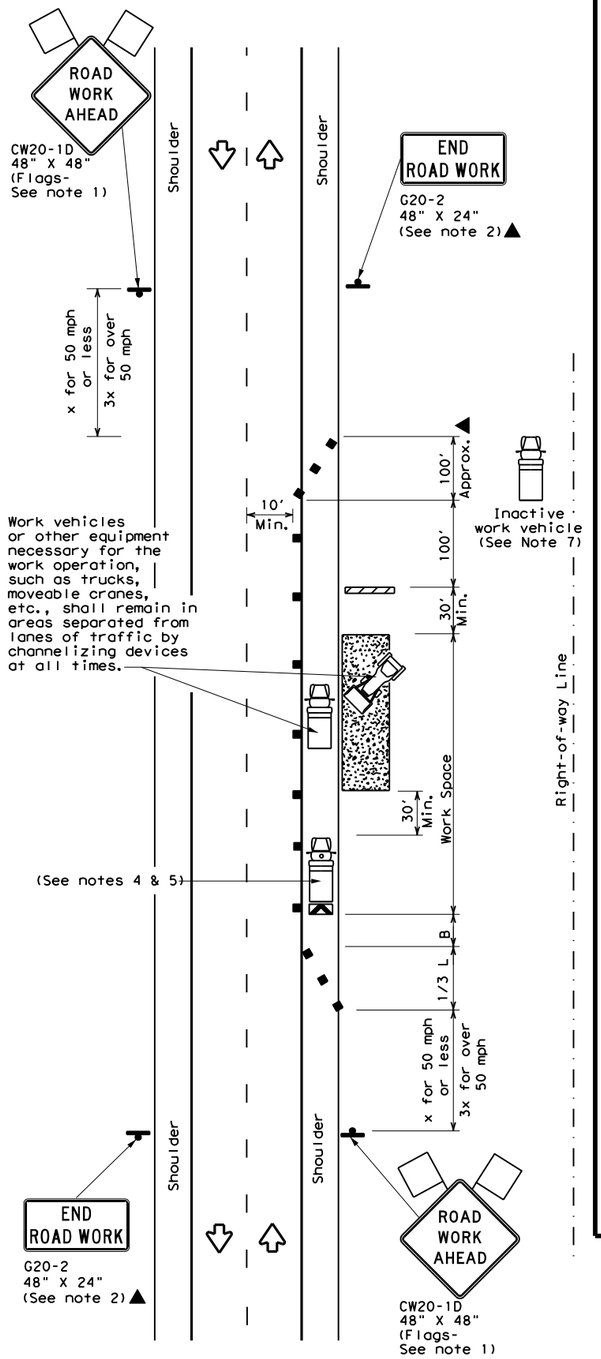
TCP (2-1a)

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	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	6384	24	001	SH 21, ETC.
	DIST	COUNTY		SHEET NO.
	LFK	SAN AUGUSTINE, ETC.		28

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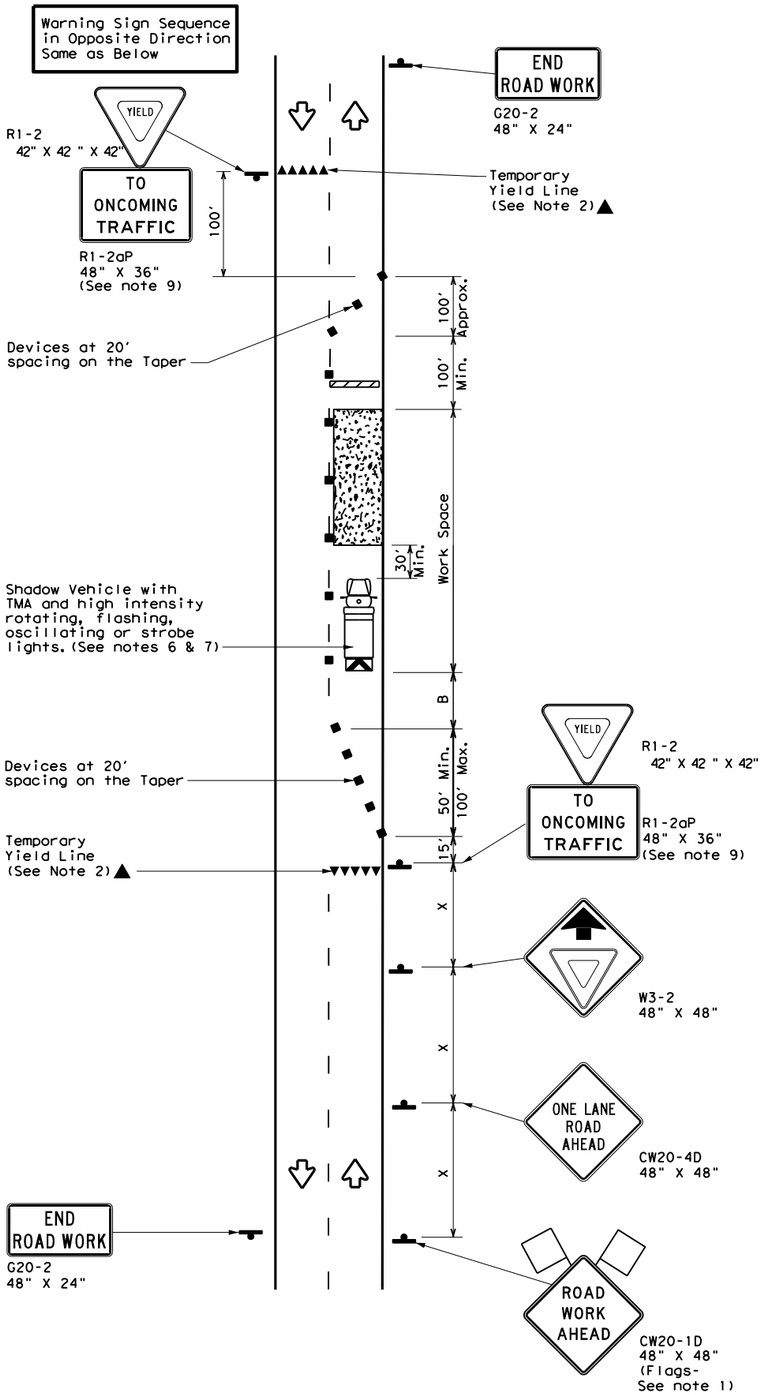


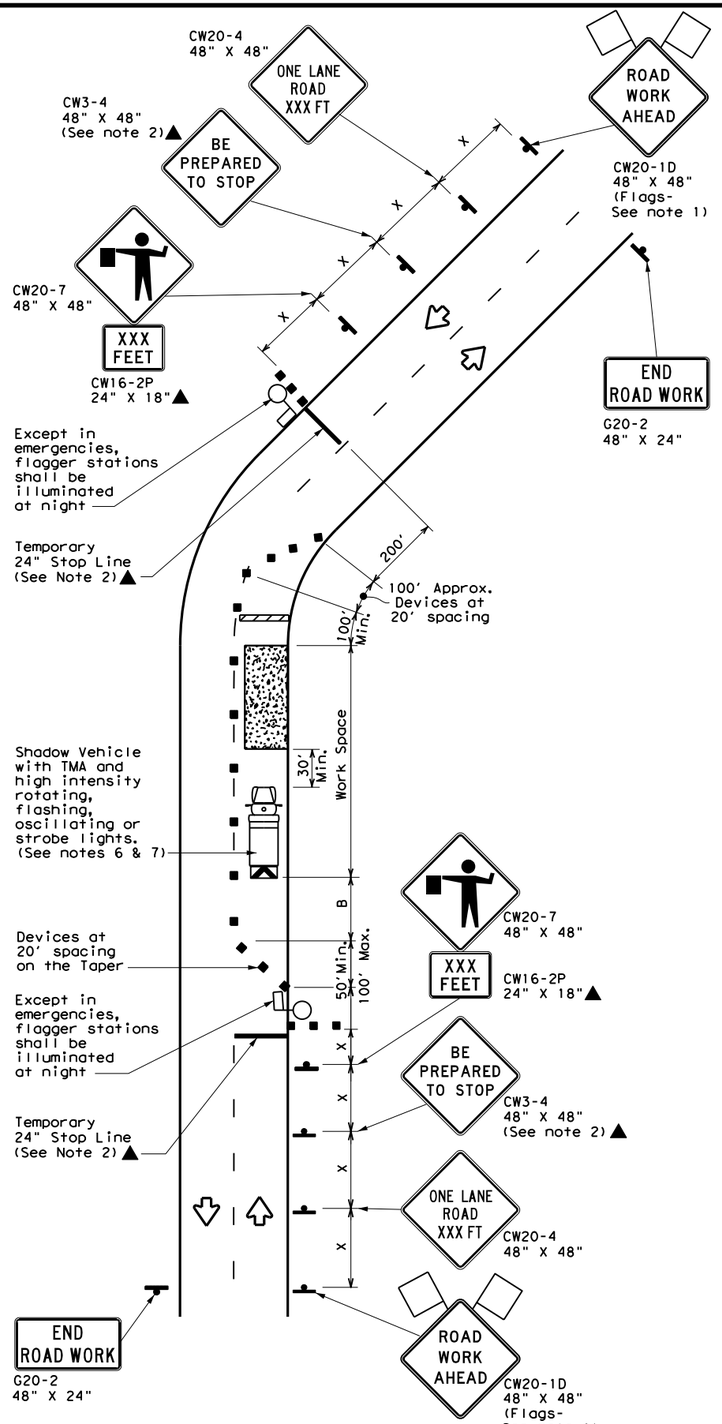
TCP (2-2a)

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	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The 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.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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.
7. 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)

8. 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.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. 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).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation

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:	CK:
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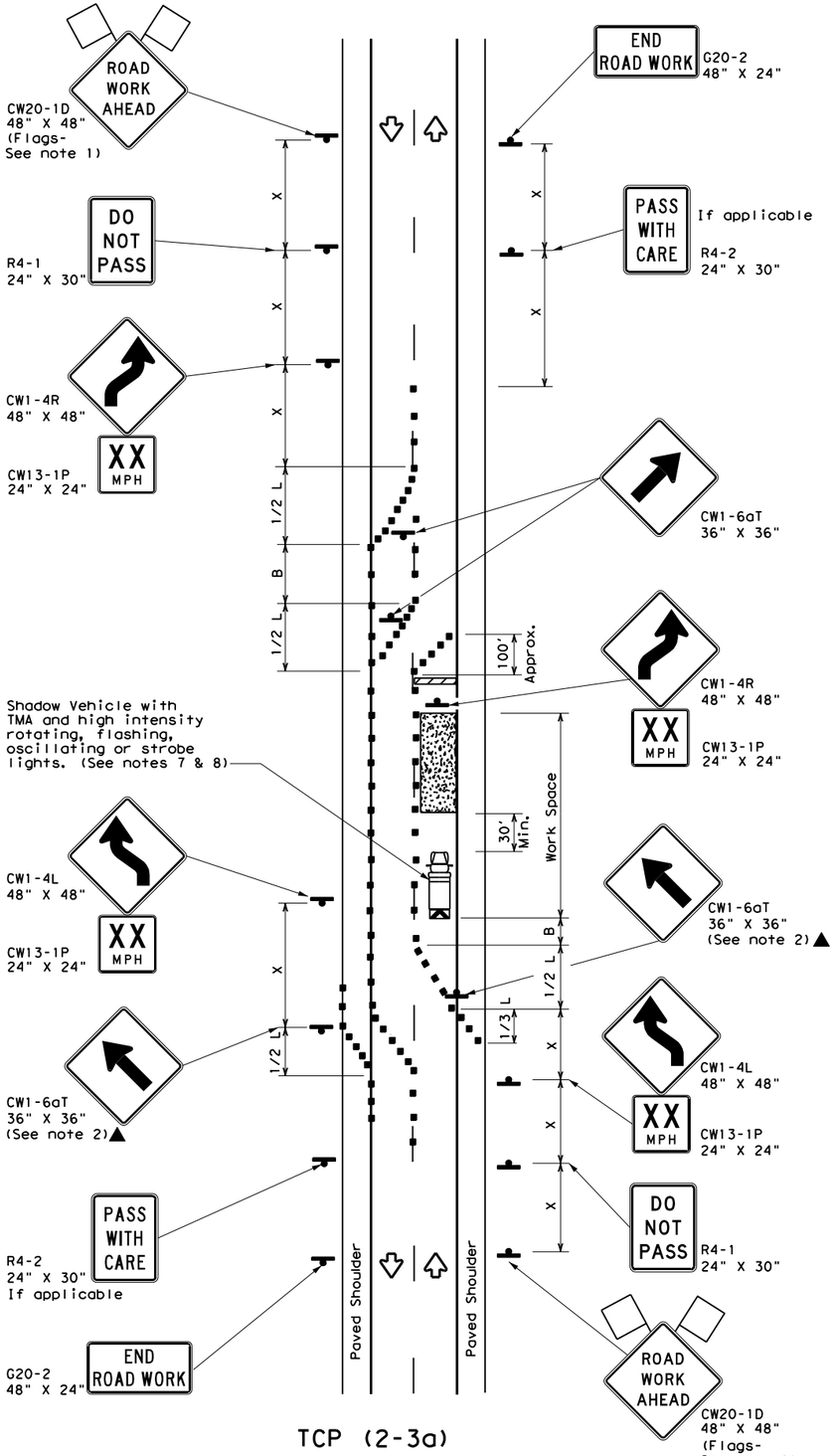
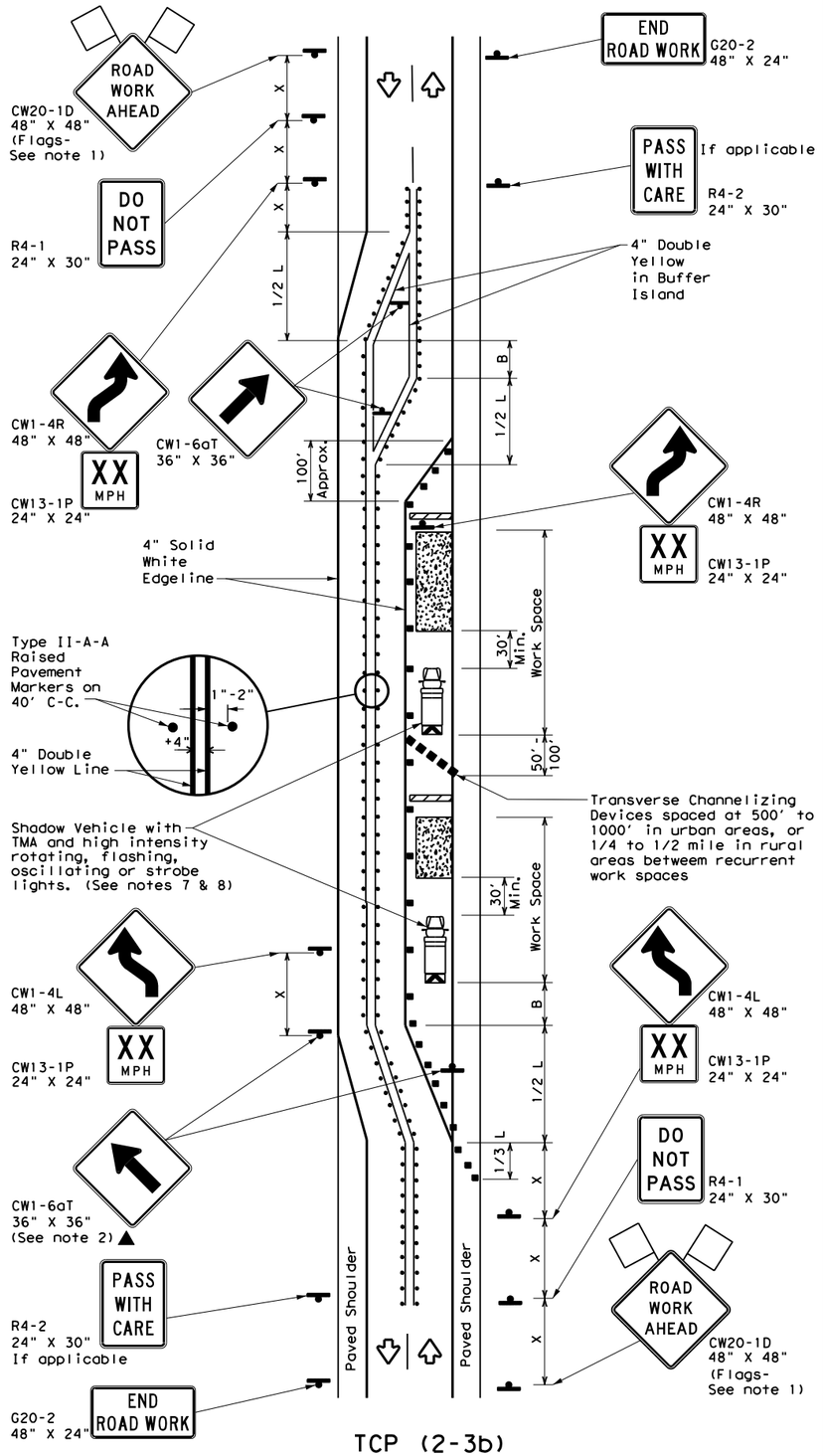
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	6384	24	001	SH 21, ETC.
	DIST	COUNTY		SHEET NO.
	LFK	SAN AUGUSTINE, ETC.		29



TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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 ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
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
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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.
4. 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.
5. 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.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. 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)

9. 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.

Texas Department of Transportation

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:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	6384	24	001	SH 21, ETC.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	LFK	SAN AUGUSTINE, ETC.		30

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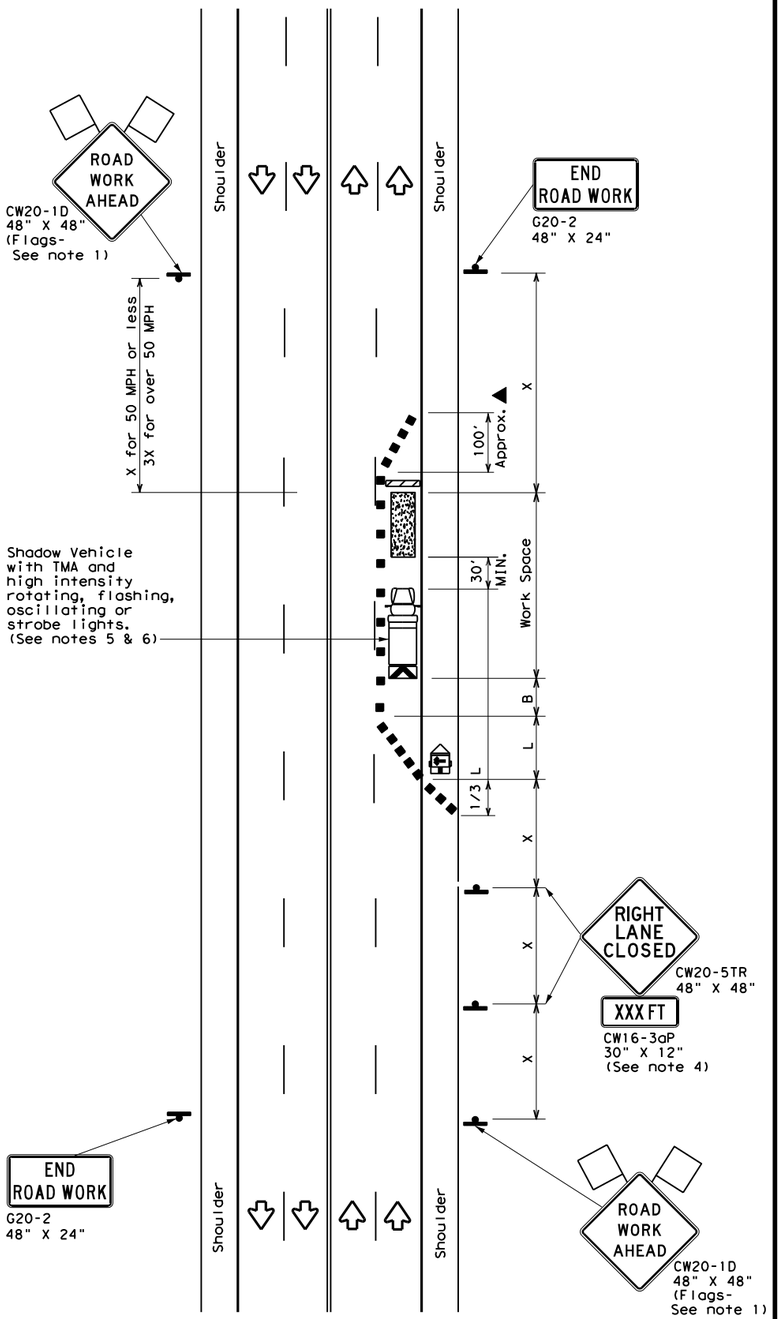
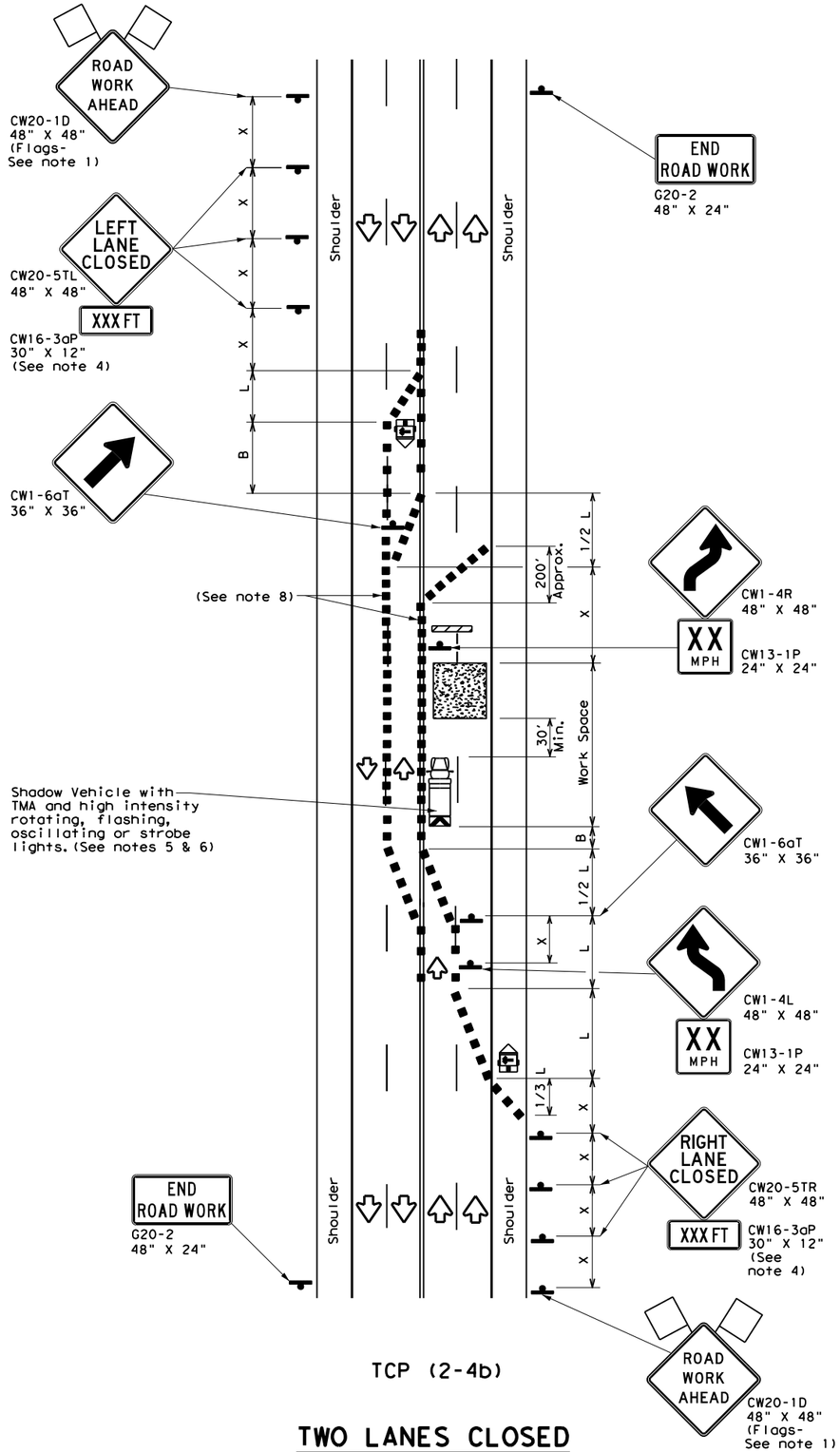


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. 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 devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	6384	24	001	SH 21, ETC.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	LFK	SAN AUGUSTINE, ETC.		31

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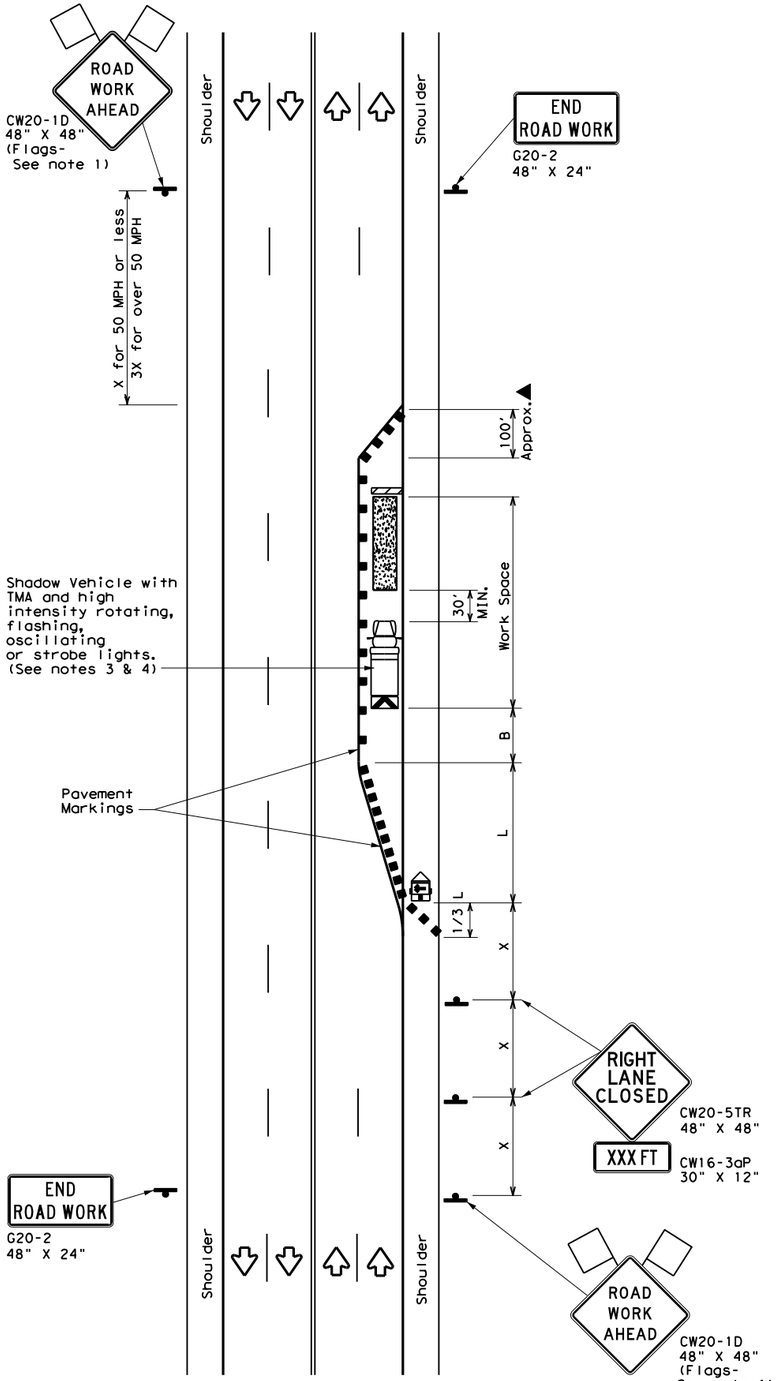
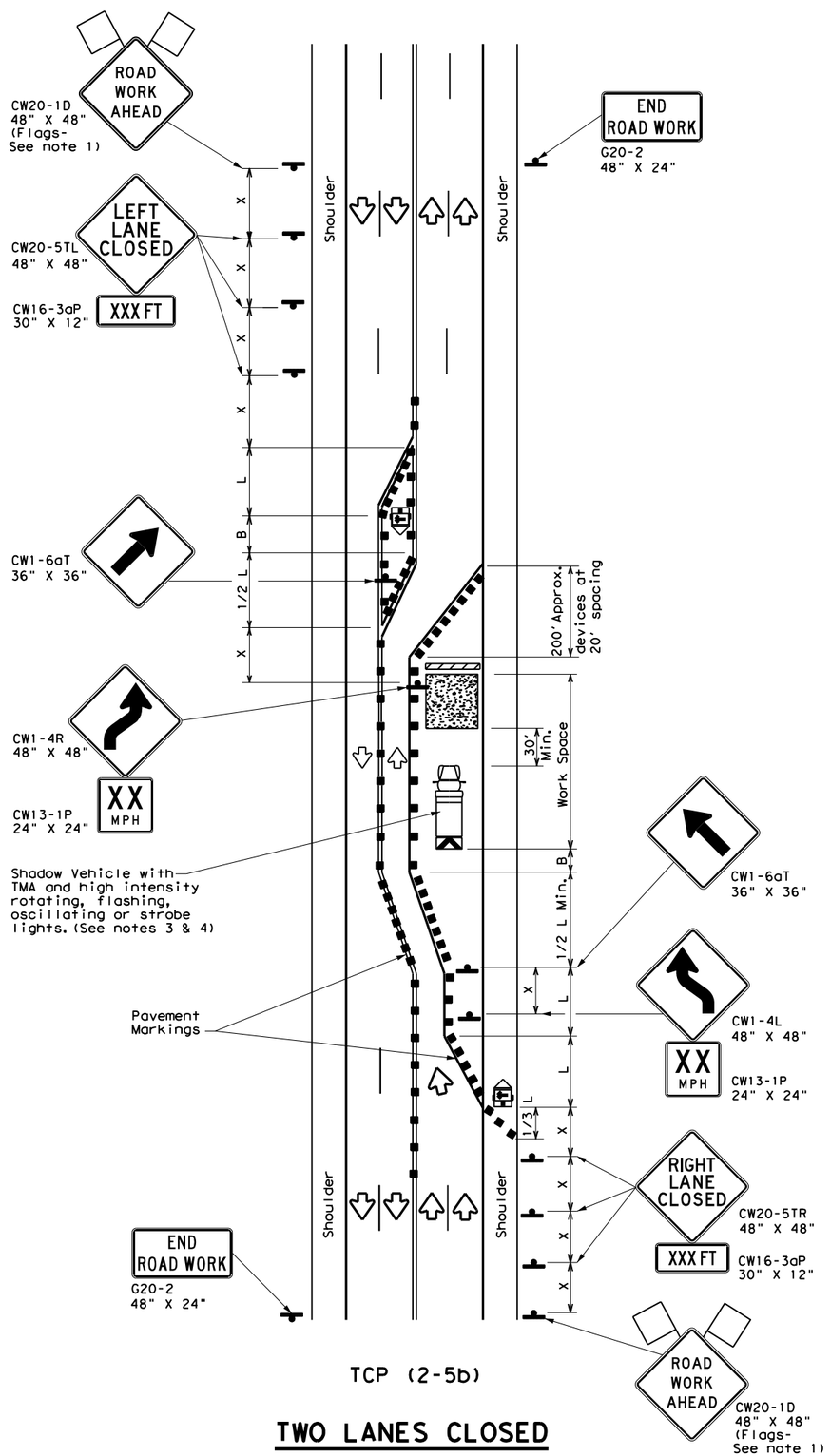


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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 eposure 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 substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12 1-97 3-03 4-98 2-18	6384	24	001	SH 21, ETC.
	DIST	COUNTY		SHEET NO.
	LFK	SAN AUGUSTINE, ETC.		32

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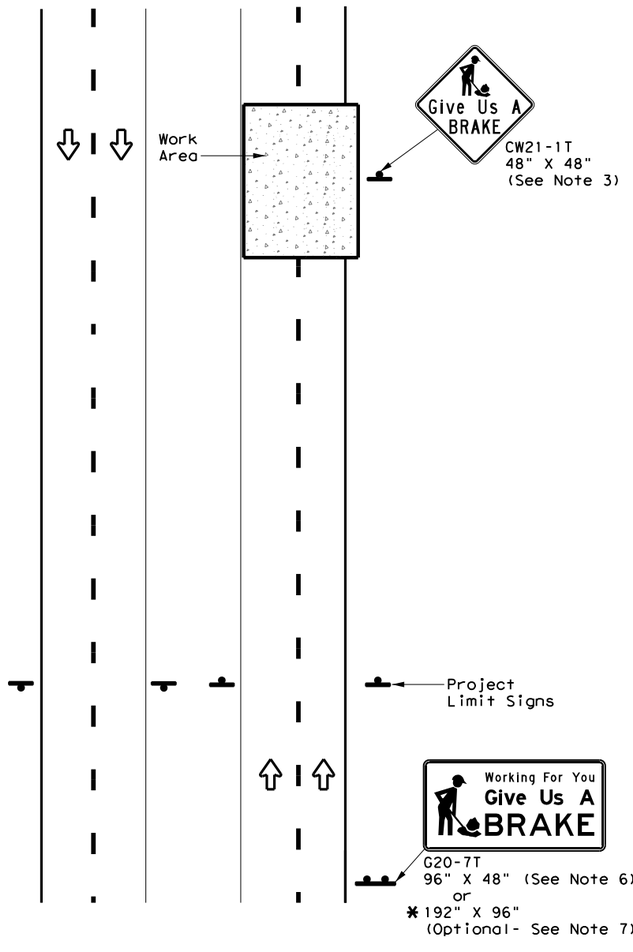
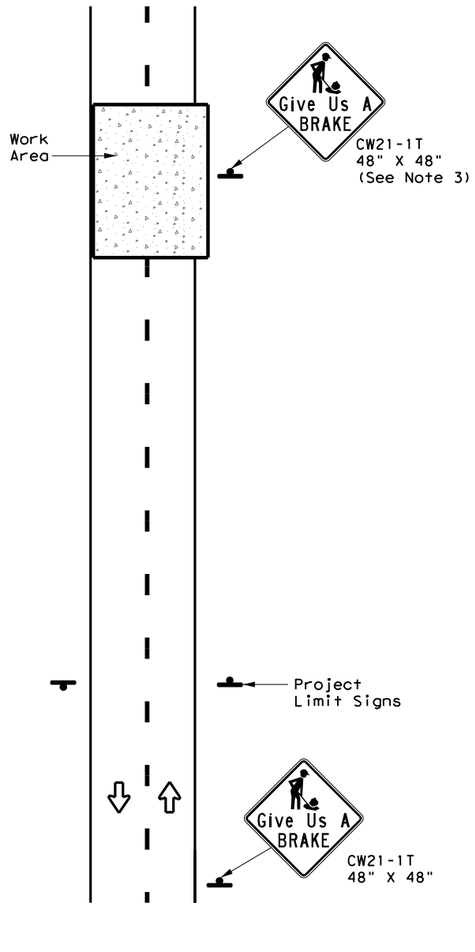


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL Size	GALVANIZED STRUCTURAL STEEL (LF) ①	GALVANIZED STRUCTURAL STEEL (LF) ②	DRILLED SHAFT 24" DIA. (LF)
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
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.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	6384	24	001	SH 21, ETC.
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	LFK	SAN AUGUSTINE, ETC.		33

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DATE: 9/1/2021 9:14:15 AM
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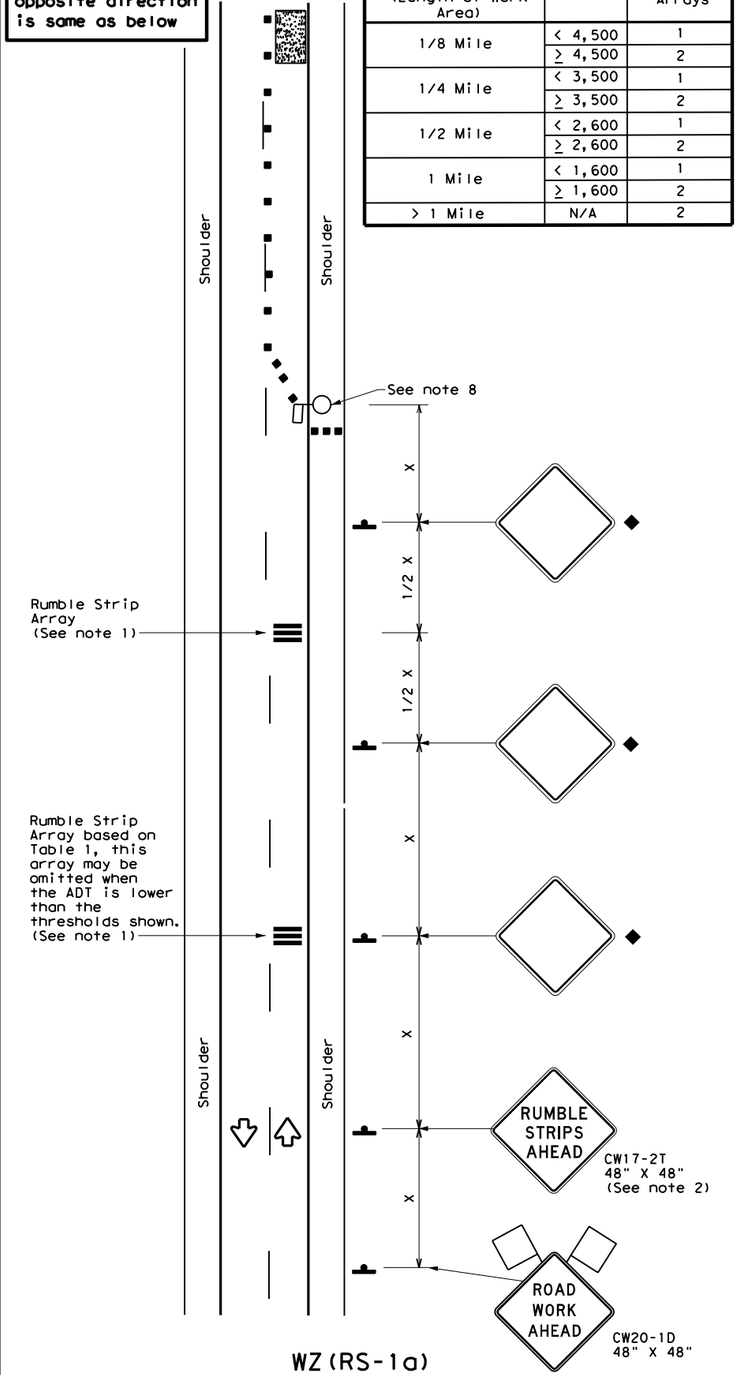
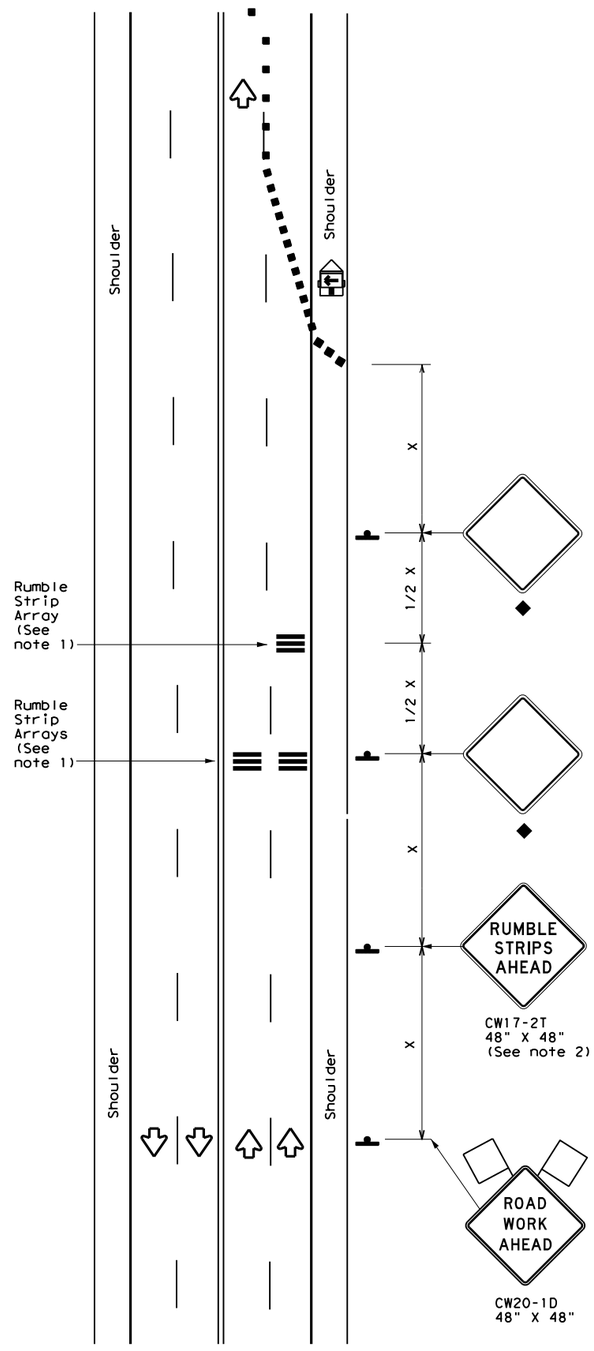
Warning sign and rumble strip sequence in opposite direction is same as below



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
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
	✓	✓		

◆ **Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.**

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE:	wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS		6384	24	001	SH 21, ETC.
2-14		DIST	COUNTY		SHEET NO.
4-16		LFK	SAN AUGUSTINE, ETC.		34

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NORTHWEST CORNER EROSION

FILL RIPRAP UNDERCUT WITH FLOWABLE BACKFILL.
8'x2.5'x2.5'= 1.85CY

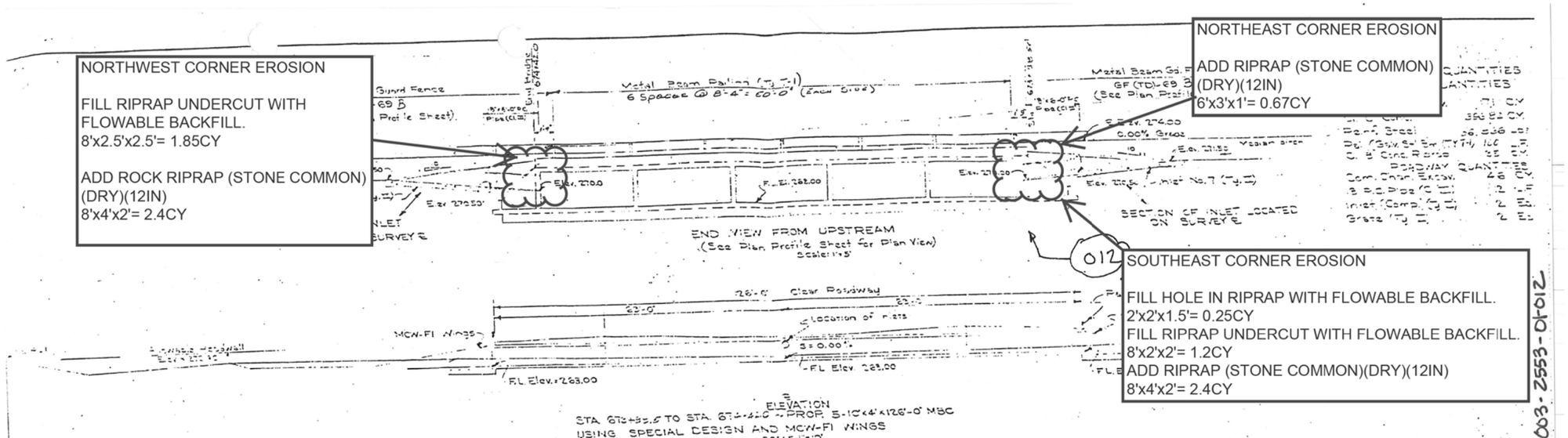
ADD ROCK RIPRAP (STONE COMMON) (DRY)(12IN)
8'x4'x2'= 2.4CY

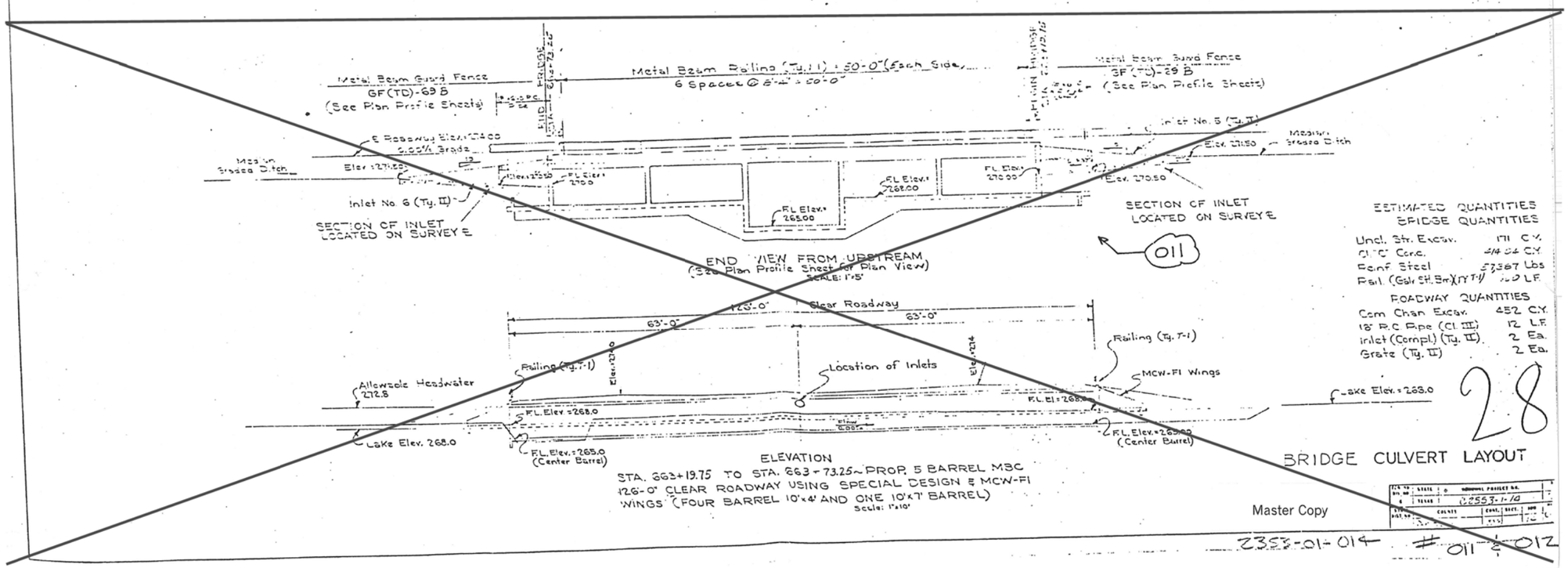
NORTHEAST CORNER EROSION

ADD RIPRAP (STONE COMMON) (DRY)(12IN)
6'x3'x1'= 0.67CY

SOUTHEAST CORNER EROSION

FILL HOLE IN RIPRAP WITH FLOWABLE BACKFILL.
2'x2'x1.5'= 0.25CY
FILL RIPRAP UNDERCUT WITH FLOWABLE BACKFILL.
8'x2'x2'= 1.2CY
ADD RIPRAP (STONE COMMON)(DRY)(12IN)
8'x4'x2'= 2.4CY





SITE 1-ANGELINA COUNTY
SL 287 @ DRAW
11-003-0-2553-01-012

JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

DocuSigned by:
Jeremy King, P.E.
5135292FF4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 1)

2021
Texas Department of Transportation®
SHEET 1 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		35

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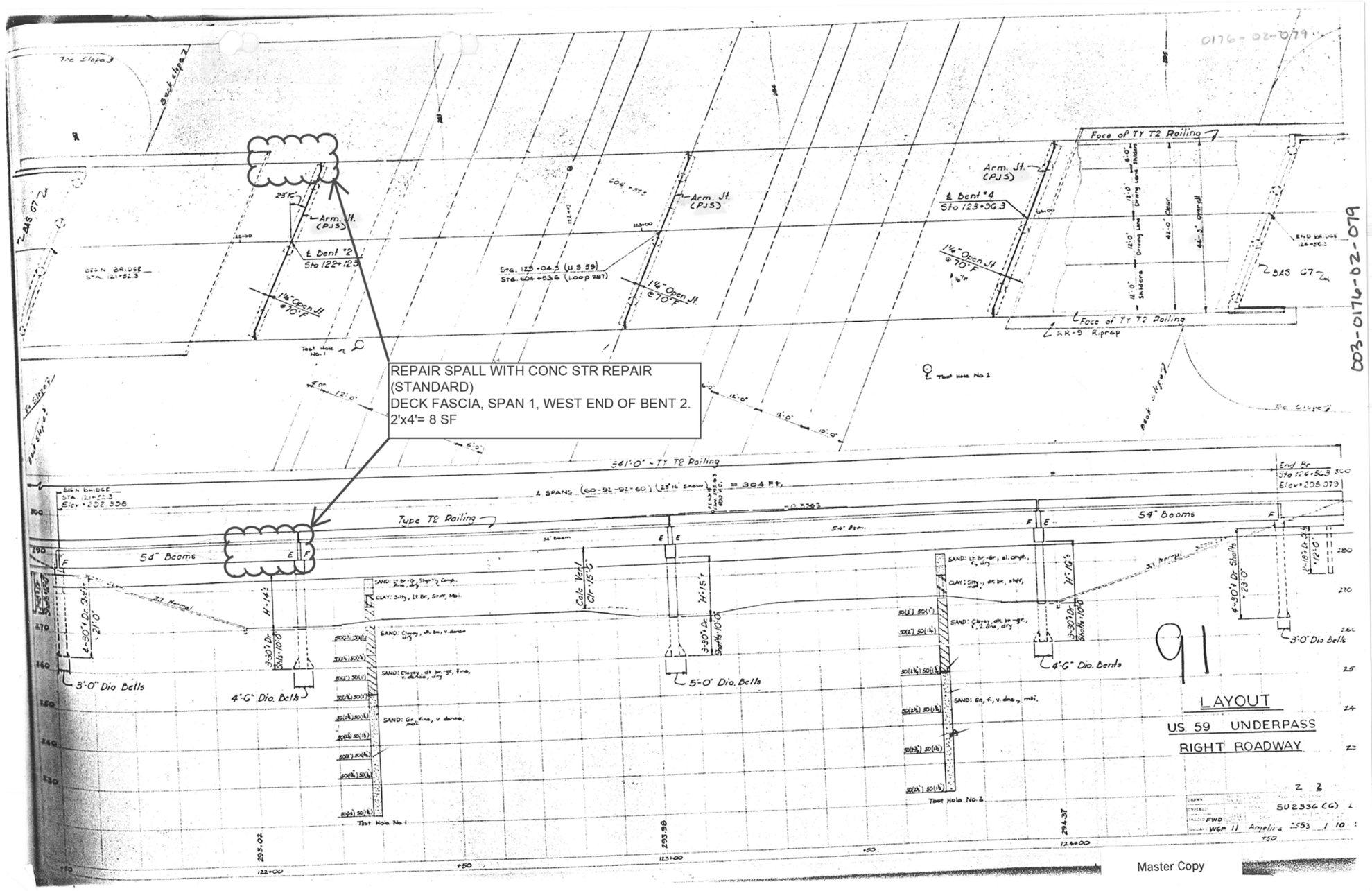

SITE 2-ANGELINA COUNTY
US 59 NB @ SL 287
11-003-0-0176-02-079

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT (SITE 2)

2021
Texas Department of Transportation®
SHEET 2 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		36

9/1/2021 9:14:25 AM
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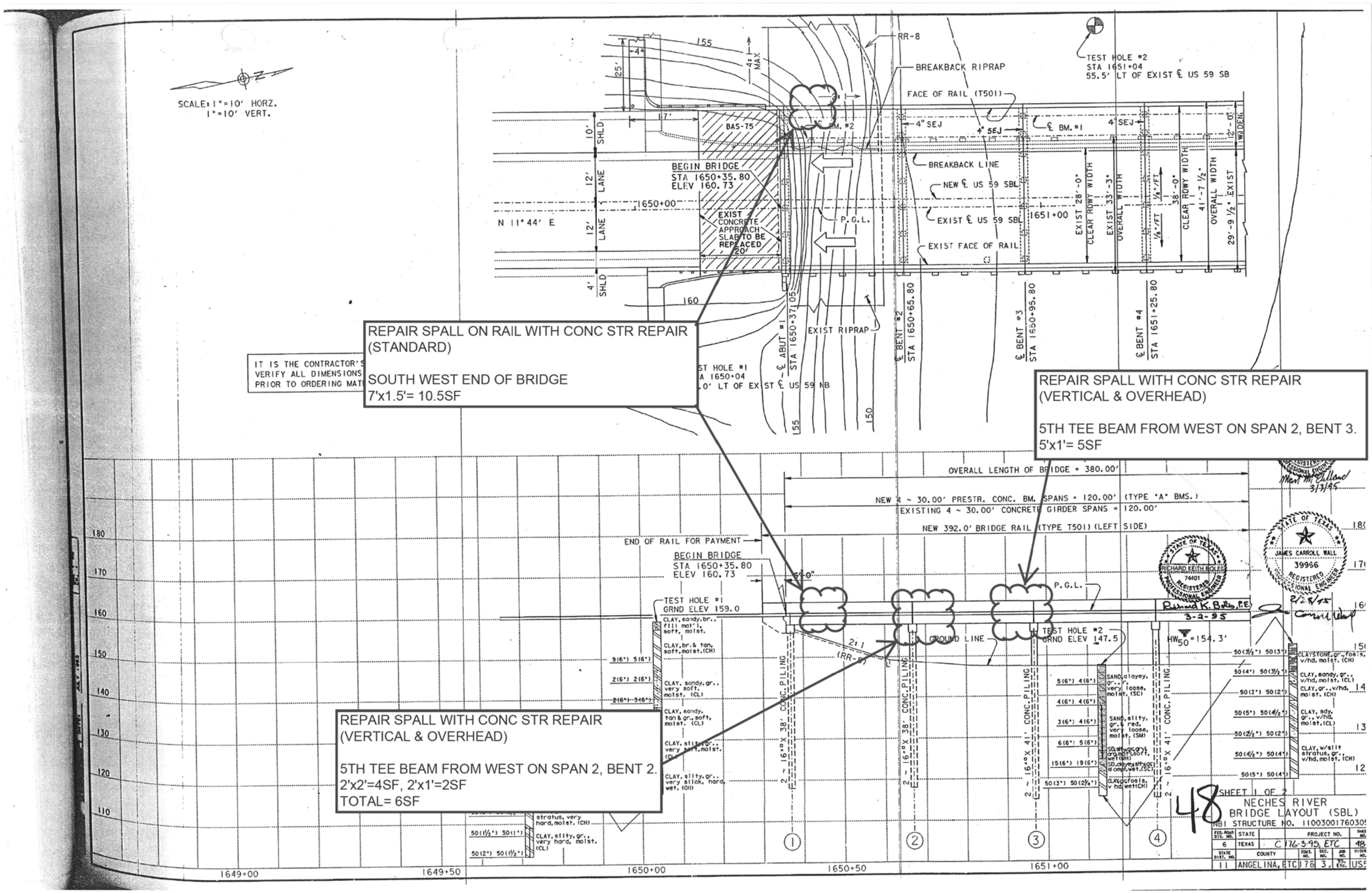

REPAIR SPALL ON RAIL WITH CONC STR REPAIR (STANDARD)
SOUTH WEST END OF BRIDGE
7'x1.5'= 10.5SF
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)
5TH TEE BEAM FROM WEST ON SPAN 2, BENT 3.
5'x1'= 5SF
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)
5TH TEE BEAM FROM WEST ON SPAN 2, BENT 2.
2'x2'=4SF, 2'x1'=2SF
TOTAL= 6SF
SCALE: 1"=10' HORZ. 1"=10' VERT.
BREAKBACK RIPRAP
FACE OF RAIL (T501)
TEST HOLE #2 STA 1651+04 55.5' LT OF EXIST ℄ US 59 SB
BEGIN BRIDGE STA 1650+35.80 ELEV 160.73
EXIST CONCRETE APPROACH SLAB TO BE REPLACED
BREAKBACK LINE
NEW ℄ US 59 SBL
EXIST ℄ US 59 SBL
EXIST FACE OF RAIL
EXIST RIPRAP
N 11° 44' E
IT IS THE CONTRACTOR'S ... VERIFY ALL DIMENSIONS ... PRIOR TO ORDERING MAT...
OVERALL LENGTH OF BRIDGE = 380.00'
NEW 4 ~ 30.00' PRESTR. CONC. BM. SPANS = 120.00' (TYPE "A" BMS.)
EXISTING 4 ~ 30.00' CONCRETE GIRDER SPANS = 120.00'
NEW 392.0' BRIDGE RAIL (TYPE T501) (LEFT SIDE)
END OF RAIL FOR PAYMENT
TEST HOLE #1 GRND ELEV 159.0
TEST HOLE #2 GRND ELEV 147.5
GROUND LINE
SHEET 1 OF 2
NECHES RIVER
BRIDGE LAYOUT (SBL)

BRIDGE LAYOUT
(SITE 3)

SITE 3-ANGELINA COUNTY
US 59 SB @ NECHES RIVER
11-003-0-0176-03-054

2021 Texas Department of Transportation®

SHEET 3 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE,ETC.	37

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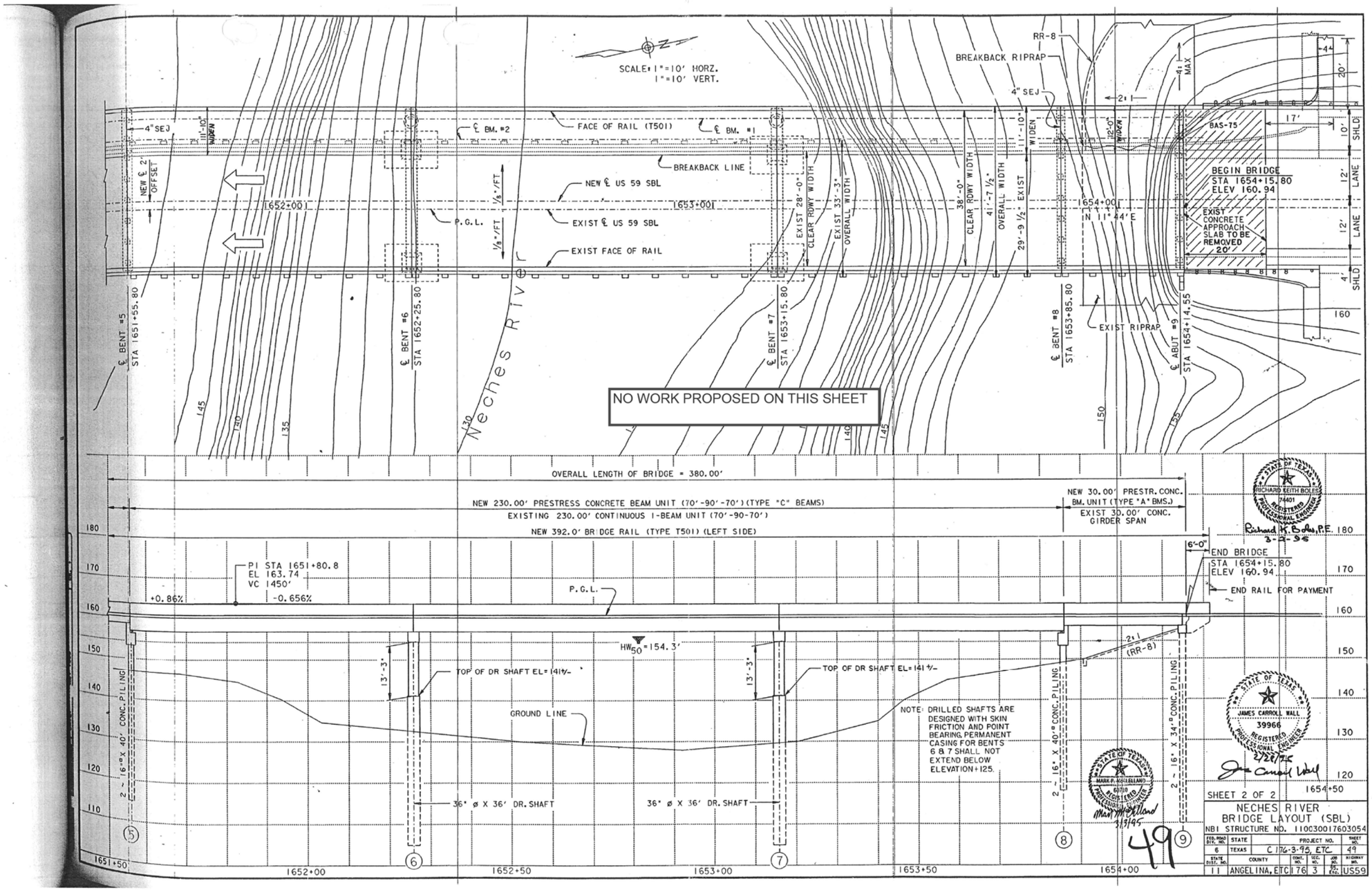

SITE 3-ANGELINA COUNTY
US 59 SB @ NECHES RIVER
11-003-0-0176-03-054

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102170
LICENSED PROFESSIONAL ENGINEER
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BRIDGE LAYOUT
(SITE 3)

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Texas Department of Transportation®
SHEET 4 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		38

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

SOFFIT OF SPAN 3.
4'x6'= 24SF

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

BENT 2
7'x2'= 14SF

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

WEST DECK FASCIA BENT 2.
2'x2'= 4SF

REPAIR SPALLS ON BENT 5 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

SPALL ON NORTH SIDE
8'x2'= 16SF
SPALL ON SOUTH SIDE
8'x3'= 24SF

TOTAL= 40SF

REPAIR SPALLS ON BENT 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

SPALL ON WENST END CAP.
3'x2'= 6SF
SPALL BETWEEN COLUMNS 1-2 (UNDERSIDE)
2'x2'= 4SF
SPALL NORTH SIDE BETWEEN SCOLUMS 4-5.
3'x2'= 6SF
SPALL ON SOUTH SIDE OVER COLUMN 6
4'x1'= 4SF

TOTAL= 20SF

STATE	FISCAL YEAR	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
TEXAS	19	(3)	37	72
COUNTY		STATE PROJECT NO.		
ANGELINA	16-3-19		US 59	

0053-0176-03-059

ESTIMATED QUANTITIES

Class A Concrete (Slabs)	278.24	Cu. Yds.	
Class A Concrete (Bents)	39.78	Cu. Yds.	
Reinforcing Steel	50,966	Pounds	
Unclass. Struct. Excav.	66	Cu. Yds.	200
Railing Special Channel (Type)	50	Lin. Ft.	
16" Precast Concrete Piling	1020	Lin. Ft.	
16" Precast Conc. Test Piling	70	Lin. Ft.	180
Dry Rip-Rap-Type A	83	Cu. Yds.	
Grouted Rip-Rap Type A	8	Cu. Yds.	
			180

NOTES: Lengths of Piling shown are for estimating purposes except that minimum penetrations as shown shall be obtained.
Elevations of Caps are at Centerline of Roadway.

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LAYOUT
WHITE OAK CREEK BRIDGE
ANGELINA COUNTY
HIGHWAY U.S. 59

SITE 4-ANGELINA COUNTY
US 59 NB @ WHITE OAK CREEK
11-003-0-0176-03-059

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BRIDGE LAYOUT
(SITE 4)

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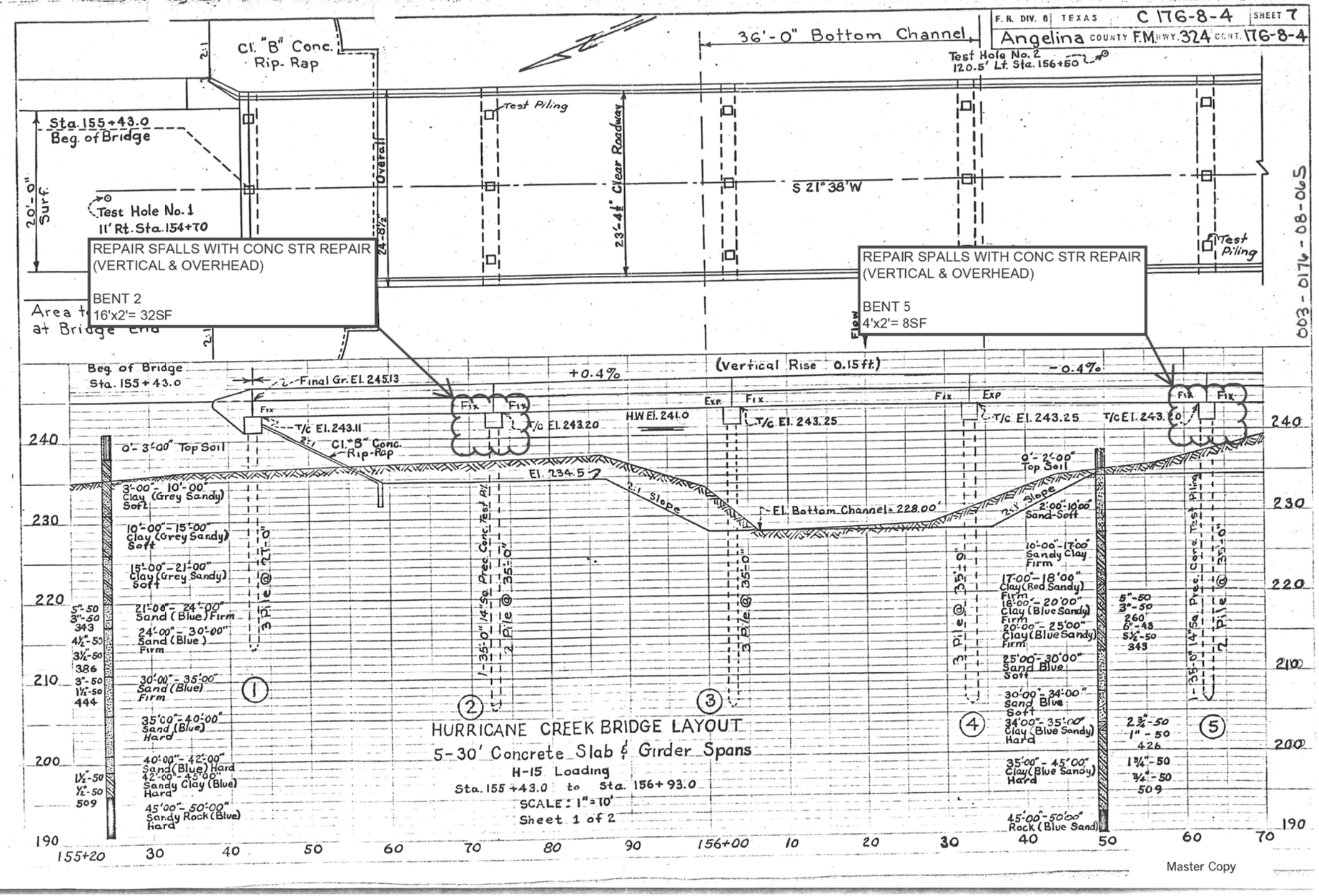
SHEET 5 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		39

F. R. DIV. 6 | TEXAS | C 176-8-4 | SHEET 7

Angelina COUNTY F.M. HWY. 324 CONT. 176-8-4



HURRICANE CREEK BRIDGE LAYOUT

5-30' Concrete Slab & Girder Spans

H-15 Loading

Sta. 155+43.0 to Sta. 156+93.0

SCALE: 1"=10'

Sheet 1 of 2

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BRIDGE LAYOUT
(SITE 5)

SITE 5-ANGELINA COUNTY
FM 324 @ HURRICANE CREEK
11-003-0-0176-08-065

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SHEET 6 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		40

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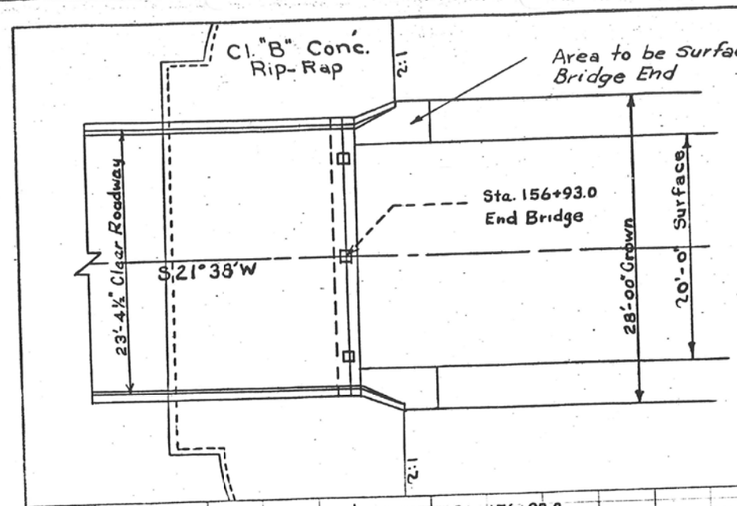

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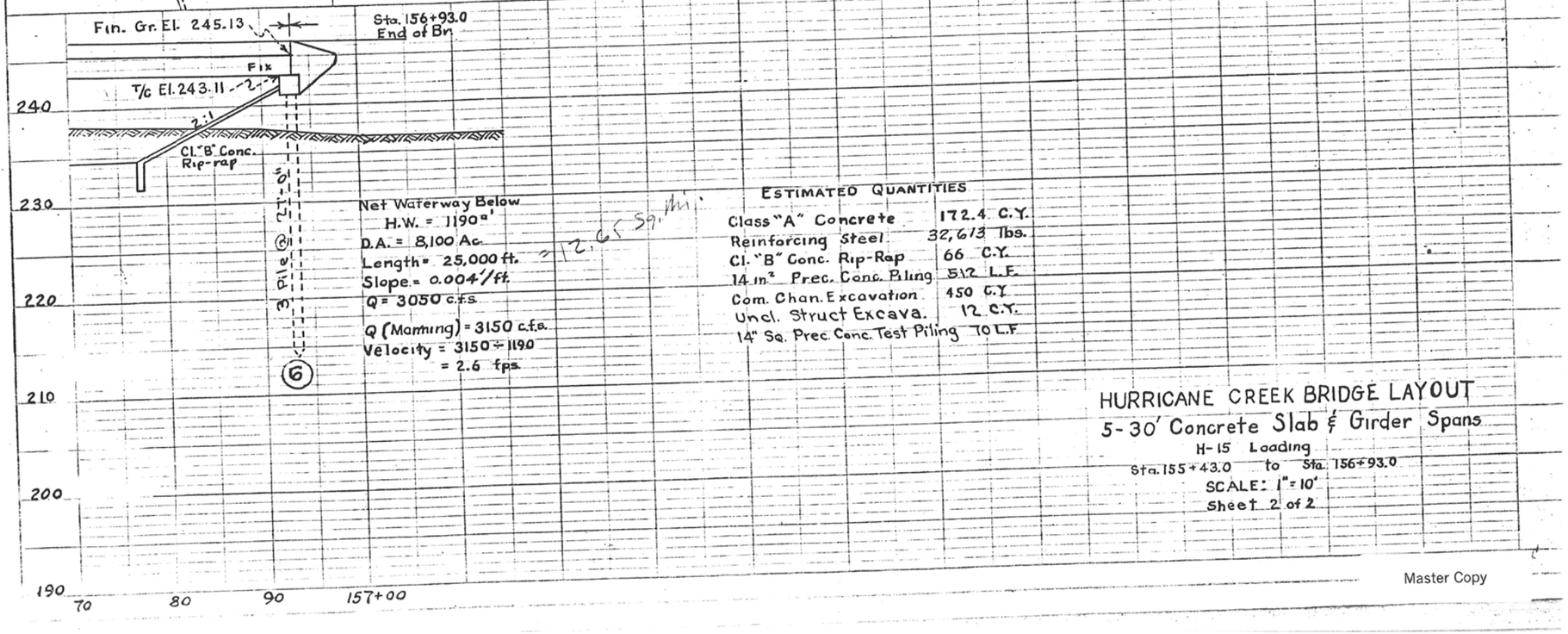

Net Waterway Below H.W. = 1190'
D.A. = 8,100 Ac. = 12.65 Sq. Mi.
Length = 25,000 ft.
Slope = 0.004'/ft
Q = 3050 c.f.s.

Q (Manning) = 3150 c.f.s.
Velocity = 3150 ÷ 1190
= 2.6 fps.

ESTIMATED QUANTITIES

Class "A" Concrete	172.4 C.Y.
Reinforcing Steel	32,613 lbs.
Cl. "B" Conc. Rip-Rap	66 C.Y.
14 in² Prec. Conc. Piling	512 L.F.
Com. Chan. Excavation	450 C.Y.
Uncl. Struct Excava.	12 C.Y.
14" Sq. Prec. Conc. Test Piling	70 L.F.

HURRICANE CREEK BRIDGE LAYOUT
5-30' Concrete Slab & Girder Spans
H-15 Loading
Sta. 155+43.0 to Sta. 156+93.0
SCALE: 1" = 10'
Sheet 2 of 2

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SITE 5-ANGELINA COUNTY
FM 324 @ HURRICANE CREEK
11-003-0-0176-08-065

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BRIDGE LAYOUT
(SITE 5)

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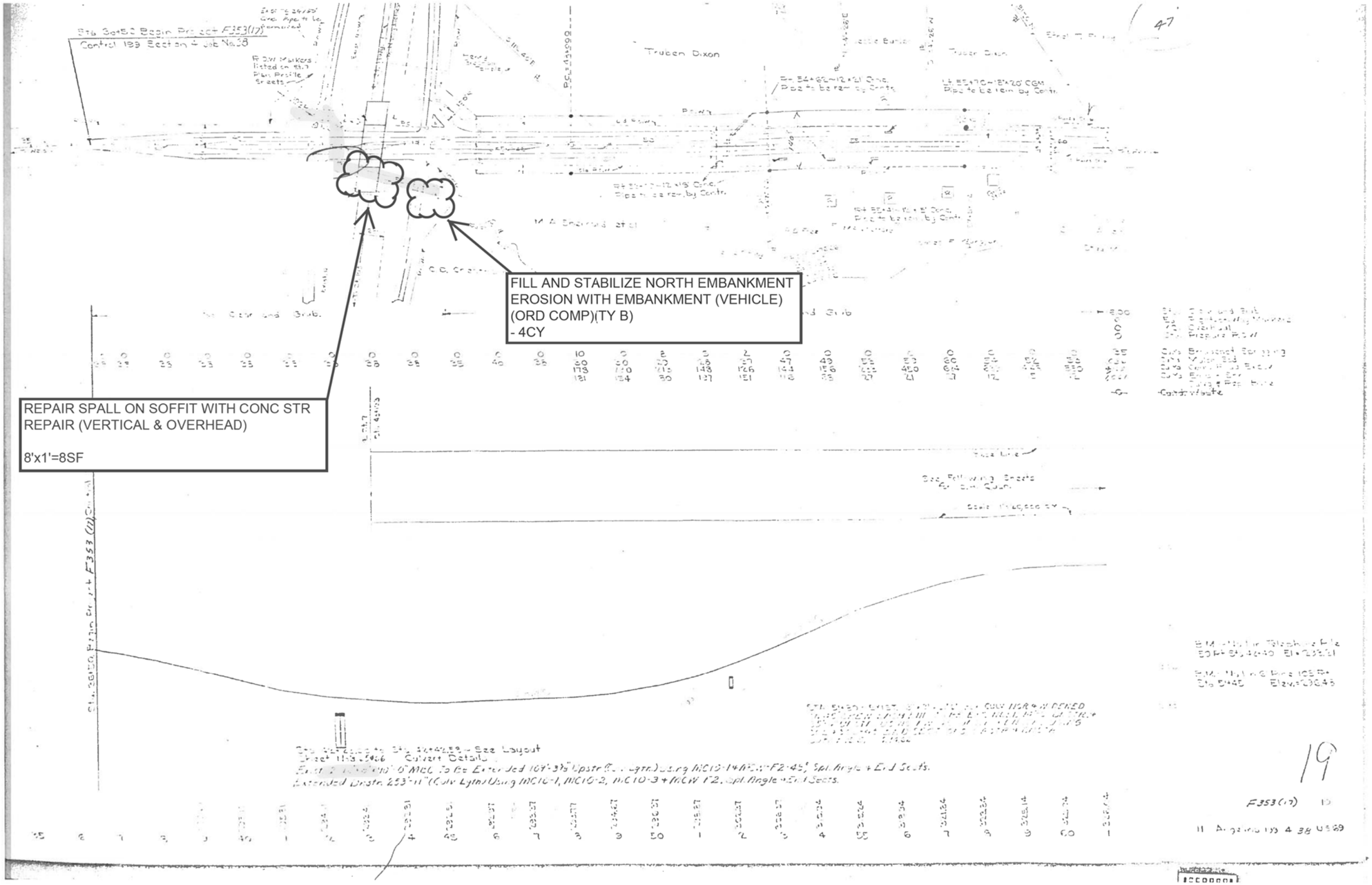
SHEET 7 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		41



SITE 6-ANGELINA COUNTY
US 69 @ MULBERRY BRANCH
11-003-0-0199-04-012

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BRIDGE LAYOUT (SITE 6)

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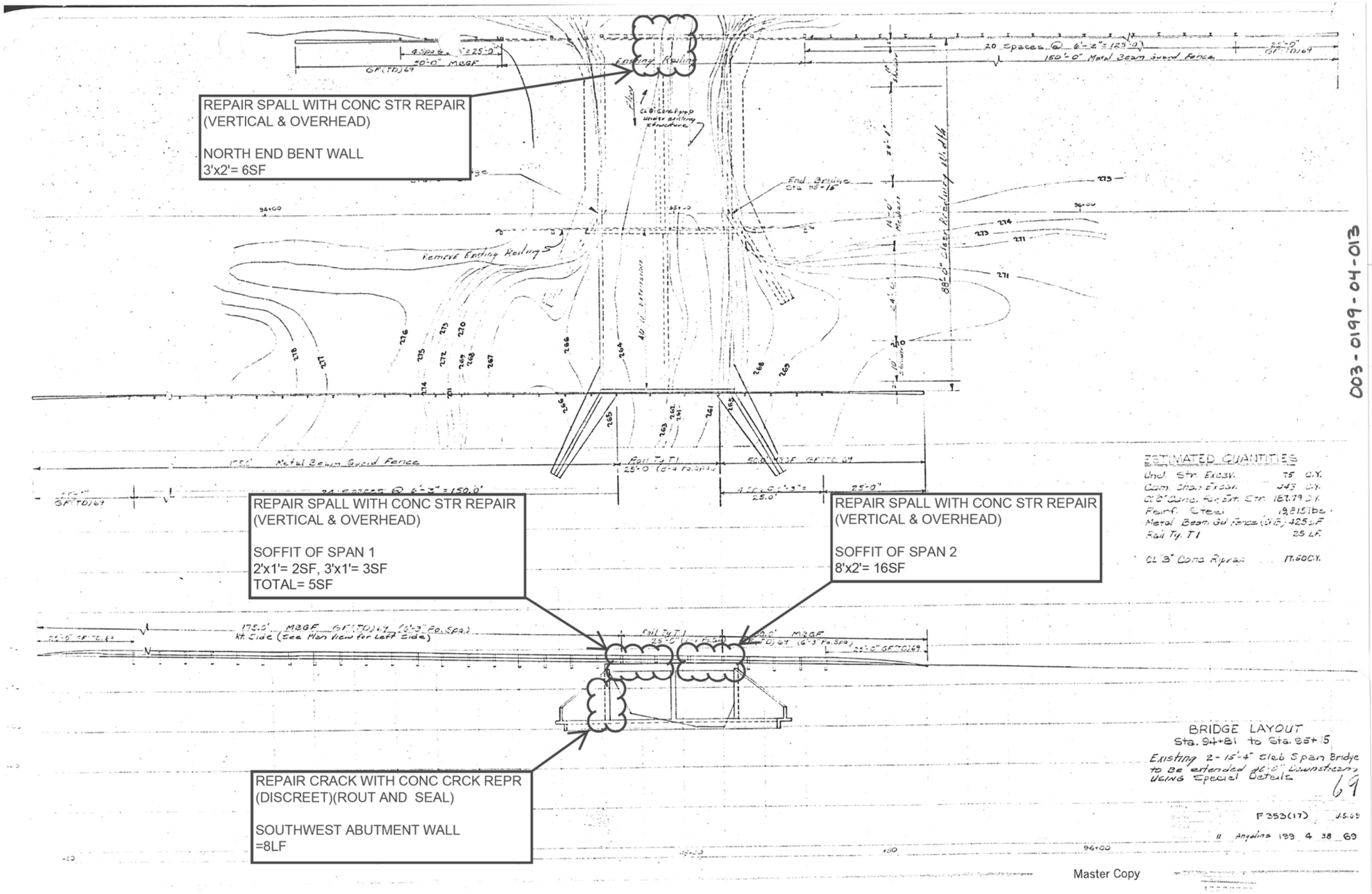
SHEET 8 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		42



ESTIMATED QUANTITIES

Uncl. Str. Excav.	75 C.Y.
Com. Str. Excav.	343 C.Y.
Cl C Conc. for Str. Str.	187.79 C.Y.
Reinf. Steel	19,815 lbs.
Metal Beam Gd. Fence (Typ B)	425 L.F.
Rail Ty. T1	25 L.F.
Cl. 3" Conc. Riprap	17.60 C.Y.

BRIDGE LAYOUT
Sta. 94+81 to Sta. 95+15
Existing 2-15'-4" Slab Span Bridge to be extended 6'-0" Downstream Using Special Details

69

F 353(17) US 69
11 Angelina 199 4 38 69

003-0199-04-013

SITE 7-ANGELINA COUNTY
US 69 @ DRAW
11-003-0-0199-04-013

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BRIDGE LAYOUT (SITE 7)

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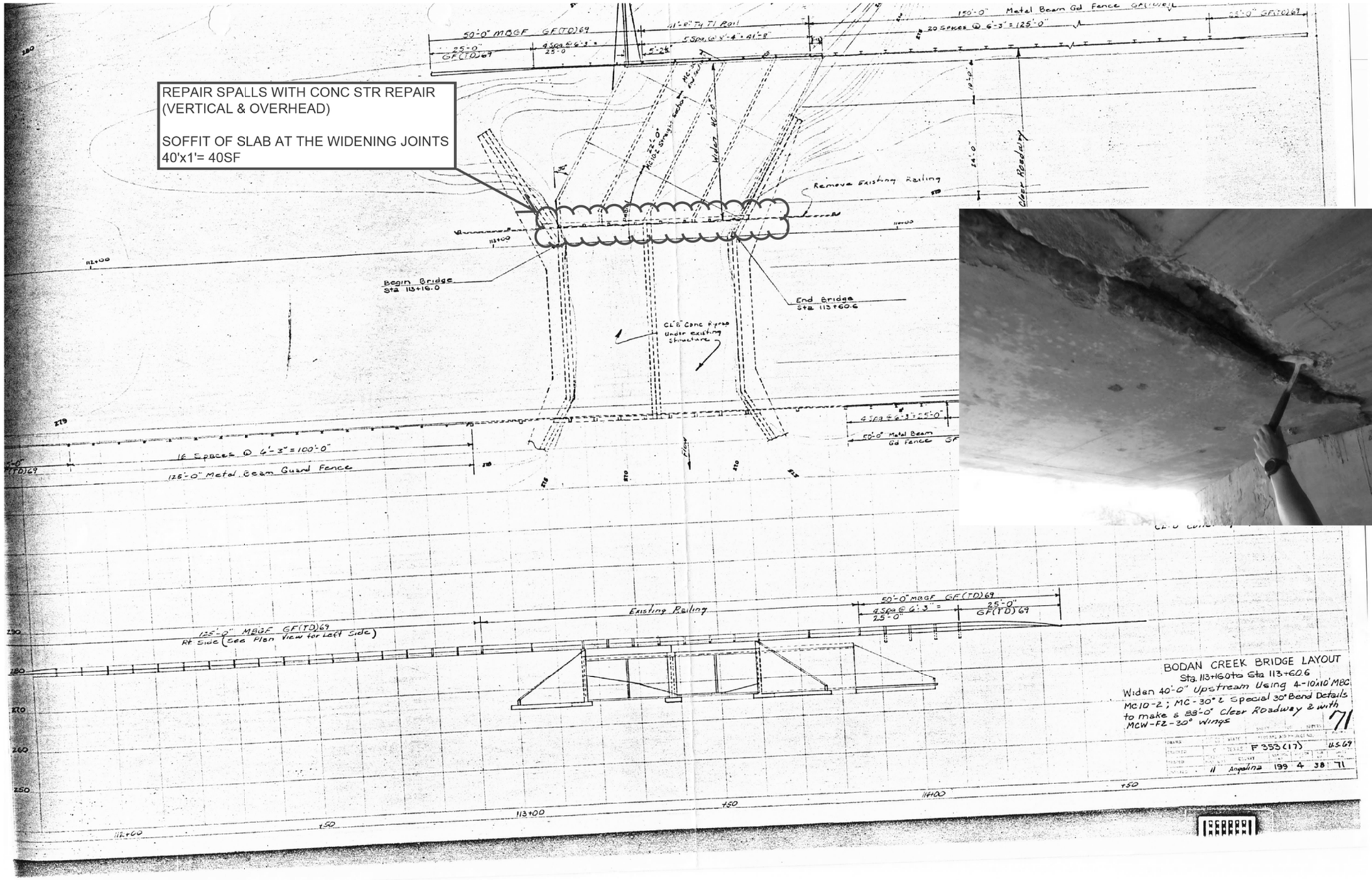
SHEET 9 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		43



SITE 8-ANGELINA COUNTY
US 69 @ BODAN CREEK
11-003-0-0199-04-014

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BRIDGE LAYOUT (SITE 8)

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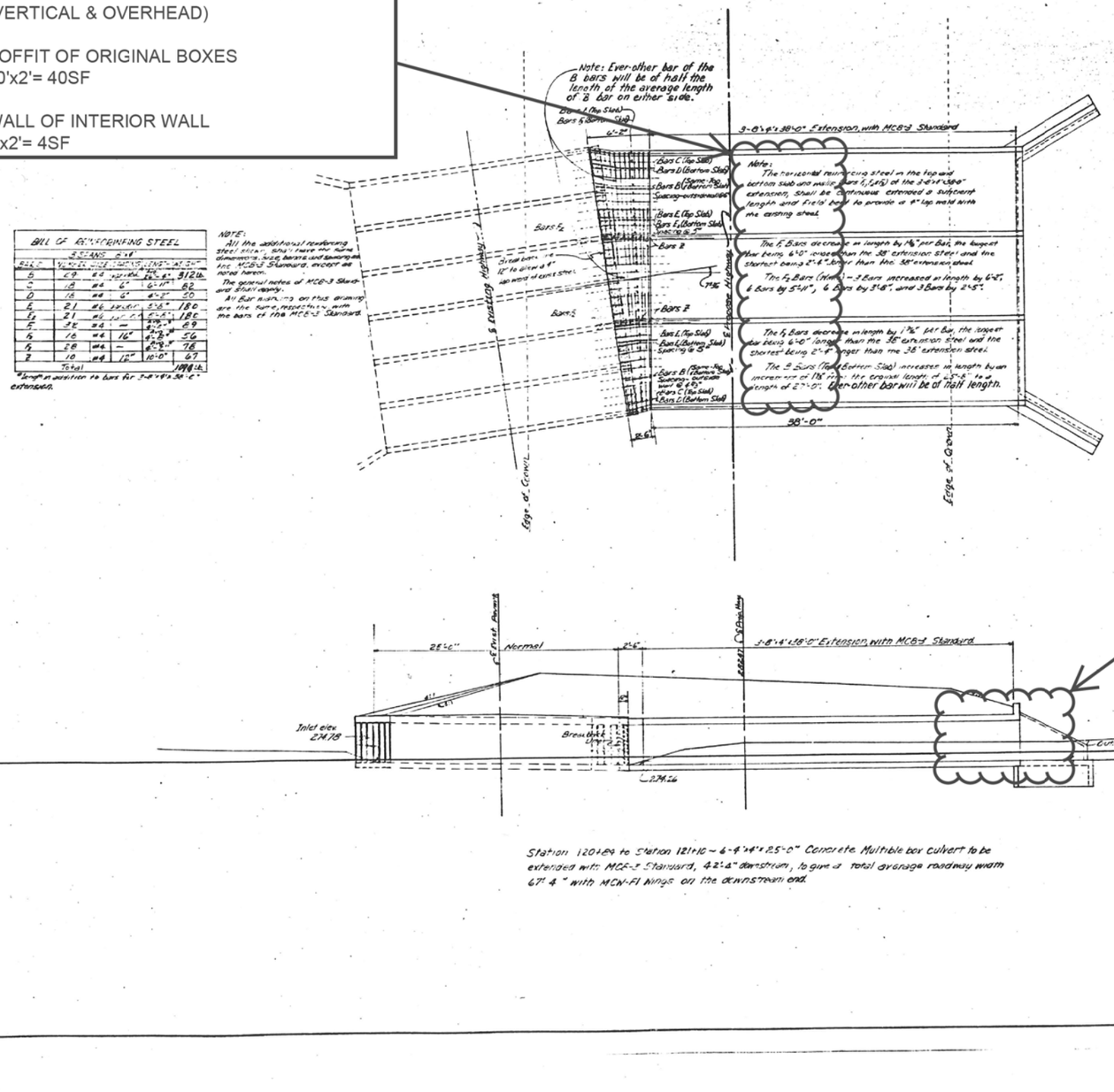
CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	44



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REPAIR SPALL WITH CONC STR REPAIR
(VERTICAL & OVERHEAD)

SOFFIT OF ORIGINAL BOXES
20'x2'= 40SF

WALL OF INTERIOR WALL
2'x2'= 4SF

BILL OF REINFORCING STEEL					
3 SPANS 8'x4'					
BARS	NUMBER	SIZE	SPACING	LENGTH	WEIGHT
B	29	#4	variable	Avg. 26'-4"	312 Lb.
C	18	#4	6"	6'-11"	82
D	18	#4	6"	4'-2"	50
E	21	#6	[illegible]	5'-6"	180
E₂	21	#6	[illegible]	5'-6"	180
F	32	#4	—	Avg. 4'-2"	89
F₂	16	#4	16"	Avg. 4'-8"	56
F₃	28	#4	—	Avg. 4'-2"	76
Z	10	#4	12"	10'-0"	67
Total					1098 Lb.

*Length in addition to bars for 3-8'x4'x38'-0" extension.

NOTE:
All the additional reinforcing steel shown, shall have the same dimensions, size, bends and spacing as the MCB-3 Standard, except as noted hereon.

The general notes of MCB-3 Standard shall apply.

All Bar marking on this drawing are the same, respectively, with the bars of the MCB-3 Standard.

Note:
The horizontal reinforcing steel in the top and bottom slab and walls (Bars E, E₂ & F₂) of the 3-8'x4'x38'-0" extension, shall be continuous extended a sufficient length and field bent to provide a 4" lap weld with the existing steel.

The F Bars decrease in length by 1⅛" per Bar, the longest bar being 6'-0" longer than the 38' extension steel and the shortest being 2'-4" longer than the 38' extension steel.

The F₂ Bars (Walls) – 3 Bars increased in length by 6'-2", 6 Bars by 5'-11", 6 Bars by 3'-8", and 3 Bars by 2'-5".

The F₃ Bars decrease in length by 1⁵⁄₁₆" per Bar, the longest bar being 6'-0" longer than the 38' extension steel and the shortest being 2'-4" longer than the 38' extension steel.

The B Bars (Top & Bottom Slab) increases in length by an increment of 1⅛" from the original length of 25'-8" to a length of 27'-0". Every other bar will be of half length.

Class A Concrete For ext Str.	65.26	Cu Yd.
Reinforcing Steel	16,283	Lb.
Common Channel Excavation	167	Cu Yd.
Unclassified Structure Excav.	67	Cu Yd.

003-0244-01-003

REPAIR SCALING ON IN INTERIOR WALLS WITH CONC STR REPAIR (STANDARD)

INTERIOR WALLS OF ORIGINAL BOXES
2-(3'x5')= 30SF

Station 120+84 to Station 121+10 ~ 6-4'x4'x25'-0" Concrete Multible box culvert to be extended with MCB-3 Standard, 42'-4" downstream, to give a total average roadway width 67'-4" with MCW-F1 Wings on the downstream end.

#003

FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.			SHEET NO.
6	TEXAS	S82(3)			26
STATE DIST NO.	COUNTY		CONT.	SECT.	JOB	HIGHWAY NO.
11	ANGELINA		244	1	18	St. 63

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BRIDGE LAYOUT
(SITE 9)

SITE 9-ANGELINA COUNTY
SH 63 @ MILL CREEK
11-003-0-0244-01-003

2021
Texas Department of Transportation®
SHEET 11 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	45

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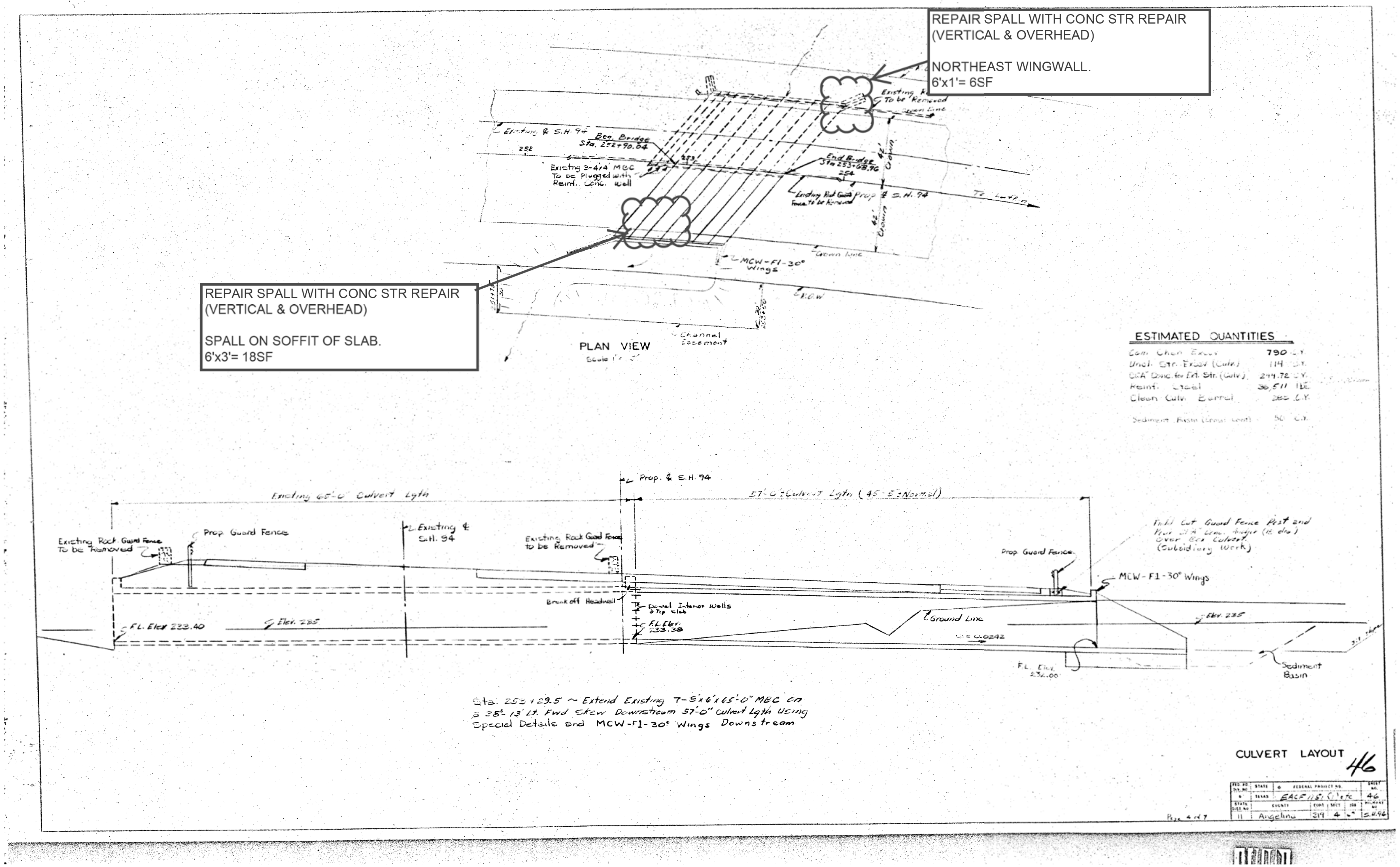

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BRIDGE LAYOUT (SITE 10)

SITE 10-ANGELINA COUNTY
SH 94 @ JACK CREEK RELIEF
11-003-0-0319-04-043

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SHEET 12 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		46

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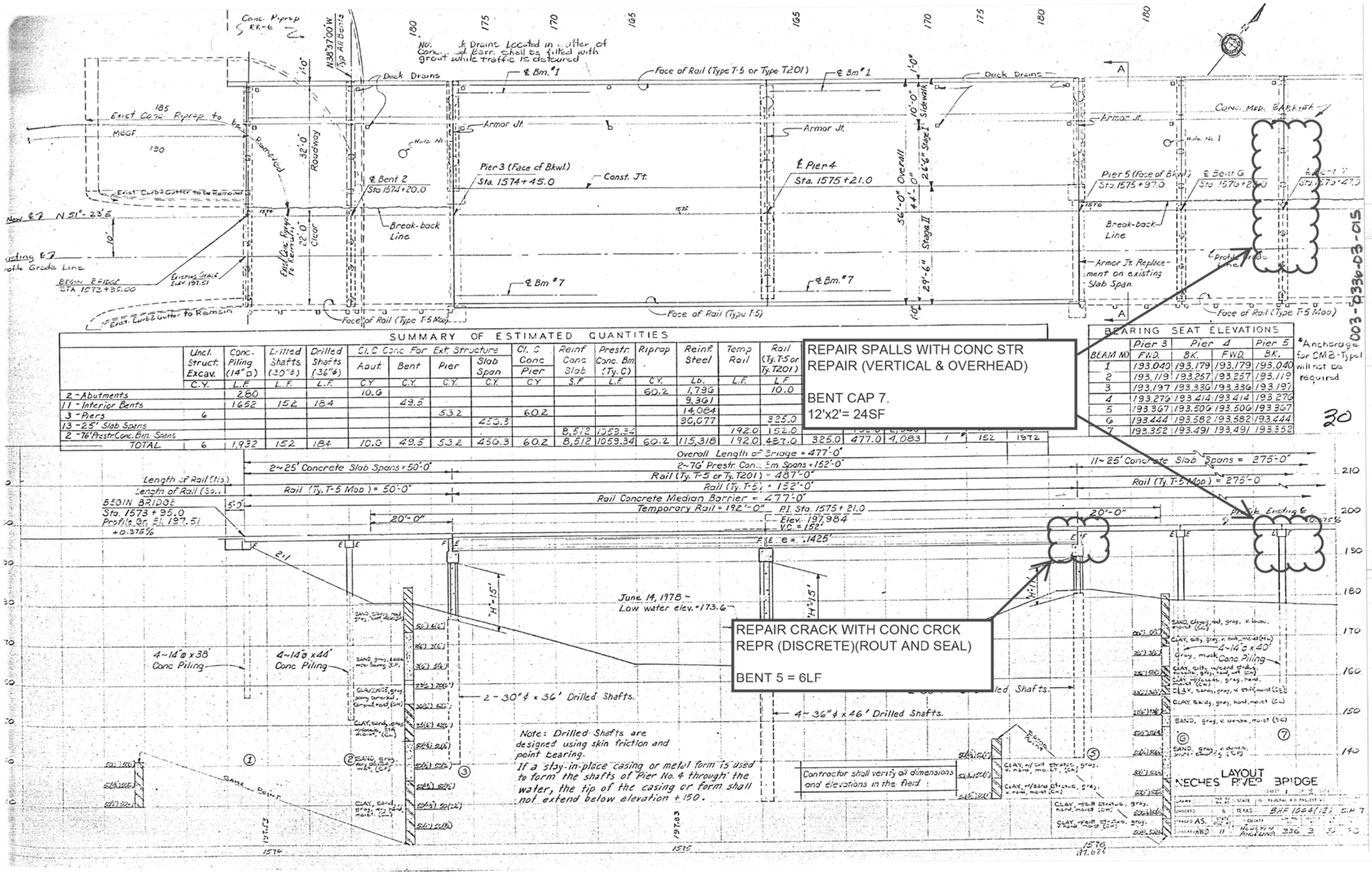

REPAIR SPALLS WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

BENT CAP 7.
12'x2'= 24SF

REPAIR CRACK WITH CONC CRCK REPR (DISCRETE)(ROUT AND SEAL)

BENT 5 = 6LF

SUMMARY OF ESTIMATED QUANTITIES

	Uncl. Struct. Excav.	Conc. Piling (14"□)	Drilled Shafts (30"⌀)	Drilled Shafts (36"⌀)	Cl. C Conc For Ext. Structure				Cl. C Conc	Reinf Conc Slab	Prestr. Conc. Bm (Ty. C)	Riprap	Reinf. Steel	Temp Rail	Rail (Ty. T-5 or Ty. T201)						
					Abut.	Bent	Pier	Slab Span	Pier												
	C.Y.	L.F.	L.F.	L.F.	C.Y.	C.Y.	C.Y.	C.Y.	CY	S.F	L.F.	C.Y.	Lb.	L.F.	L.F						
2 - Abutments		280			10.6							60.2	1,796		10.0						
11 - Interior Bents		1652	152	184		49.5							9,361								
3 - Piers	6						53.2		60.2				14,084								
13 - 25' Slab Spans								456.3					90,077		325.0						
2 - 76' Prestr. Conc. Bm. Spans										8,512	1059.34			192.0	152.0						
TOTAL	6	1,932	152	184	10.6	49.5	53.2	456.3	60.2	8,512	1059.34	60.2	115,318	192.0	487.0	325.0	477.0	4,083	1	152	1972

BEARING SEAT ELEVATIONS

BEAM NO	Pier 3 FWD.	Pier 4 BK.	Pier 4 FWD.	Pier 5 BK.
1	193.040	193.179	193.179	193.040
2	193.119	193.257	193.257	193.119
3	193.197	193.336	193.336	193.197
4	193.276	193.414	193.414	193.276
5	193.367	193.506	193.506	193.367
6	193.444	193.582	193.582	193.444
7	193.352	193.491	193.491	193.352

*Anchorage for CMB-Type I will not be required

SITE 11-ANGELINA COUNTY
SH 7 @ NECHES RIVER
11-003-0-0336-03-015

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BRIDGE LAYOUT
(SITE 11)

2021
Texas Department of Transportation®
SHEET 13 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		47

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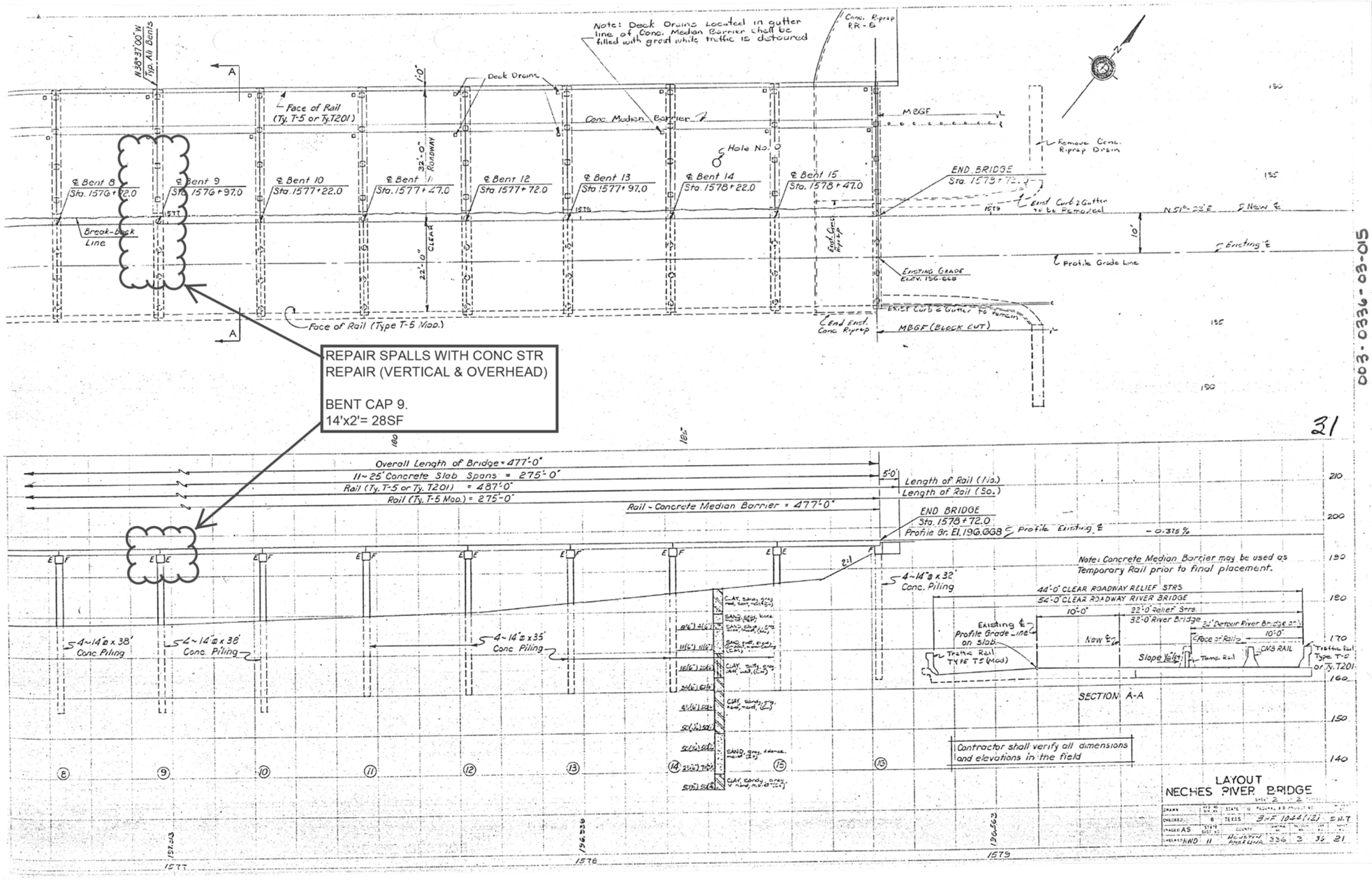

21

003-0336-03-015

SITE L-ANGELINA COUNTY
SH 7 @ NECHES RIVER
11-003-0-0336-03-015

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STATE OF TEXAS

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BRIDGE LAYOUT (SITE 11)

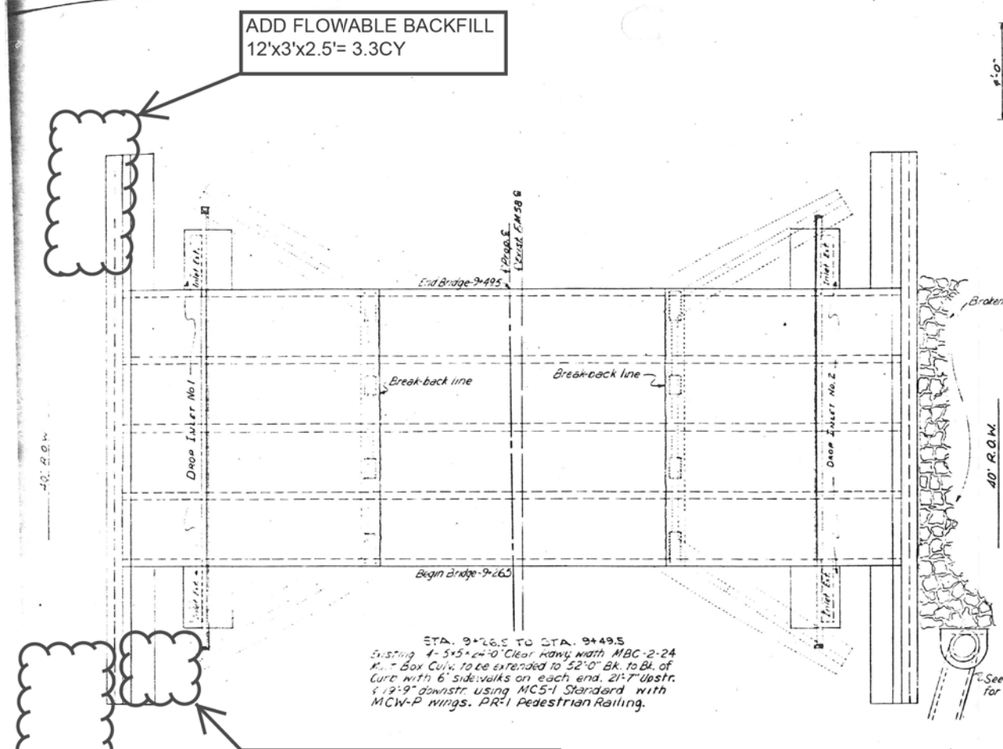
2021
Texas Department of Transportation®
SHEET 14 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		48

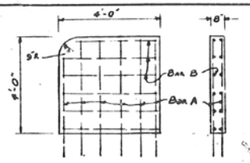
ADD FLOWABLE BACKFILL
12'x3'x2.5'= 3.3CY

ADD RIPRAP (COMMON STONE)
(DRY)(12IN)
2'x2'x4'= 0.6 CY

ADD RIPRAP (COMMON STONE)
(DRY)(12IN) TO BANK.
10'x5'x3'= 5.5CY



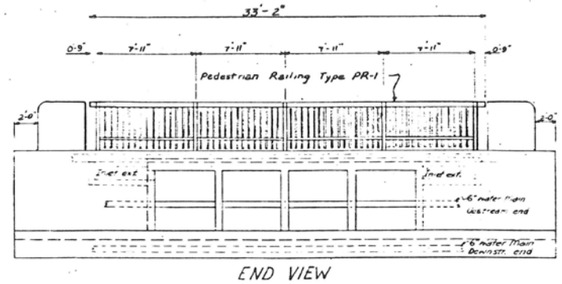
STA. 9+26.5 TO STA. 9+49.5
Existing 1-5'x5'x24'-0" Clear Hwy. width MBC 2-24 R. Box Culv. to be extended to 52'-0" BK. to BK. of Curb with 6' Sidewalks on each end. 21'-7" Ubstr. & 19'-9" Dwnstr. using MC5-1 Standard with MCW-P wings. PR-1 Pedestrian Railing.



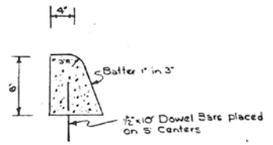
SPECIAL WINGS

BILL OF REINFORCING STEEL FOR FOUR SP. WINGS

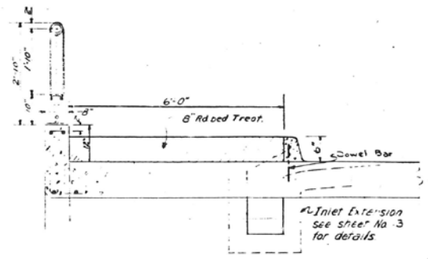
Bar	No.	Size	Length	Wt.	Estimated Quantities
A	48	#4	4'-6"	146	Cl. "A" Conc. Inlet. Ext. = 16
B	48	#6	3'-8"	117	Reinf. St. = 261 lbs.



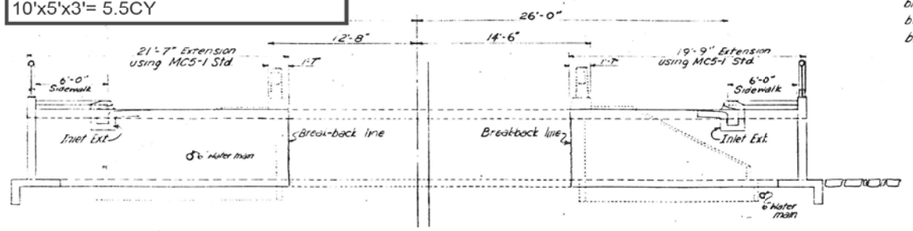
END VIEW



6' CONC. CURB (DOWEL)



CURB, WALK & RAIL SECTION



GENERAL NOTES

Existing bars exposed by break-back shall be cleaned and bent into position to provide a tie to the new concrete extension.

The removal of the existing structure to the break-back line shown will not be paid for directly but shall be considered subsidiary work to the bid item "Class A" Concrete for Extending Culverts."

ESTIMATED QUANTITIES

Class A Conc. for Ext Str (Culv)	=	75.90 Cu
Class B Conc RipRap	=	3.36 Cu.
Reinforcing Steel	=	12,006 Lb.
Railing, Type PR-1	=	66.33 L.f
Com Chan. Excav.	=	30 Cu
Uncl. Str. Excav. (Culv.)	=	42 Cu.
Inlet Extension	=	4 Ea
Conc. Curb (Dowel)(6 in)	=	46 L.f

BRIDGE LAYOUT
#001

Master Copy

FED. RD. DIV. NO.	STATE	STATE PROJECT NO.
6	TEXAS	C576-2-17
STATE	COUNTY	SHEET NO.

SITE 12-ANGELINA COUNTY
FM 58 @ HURRICANE CREEK TRIBUTARY
11-003-0-0576-02-001

003-0576-02-001

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT
(SITE 12)

2021 Texas Department of Transportation®

SHEET 15 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		49

9/1/2021 9:16:08 AM
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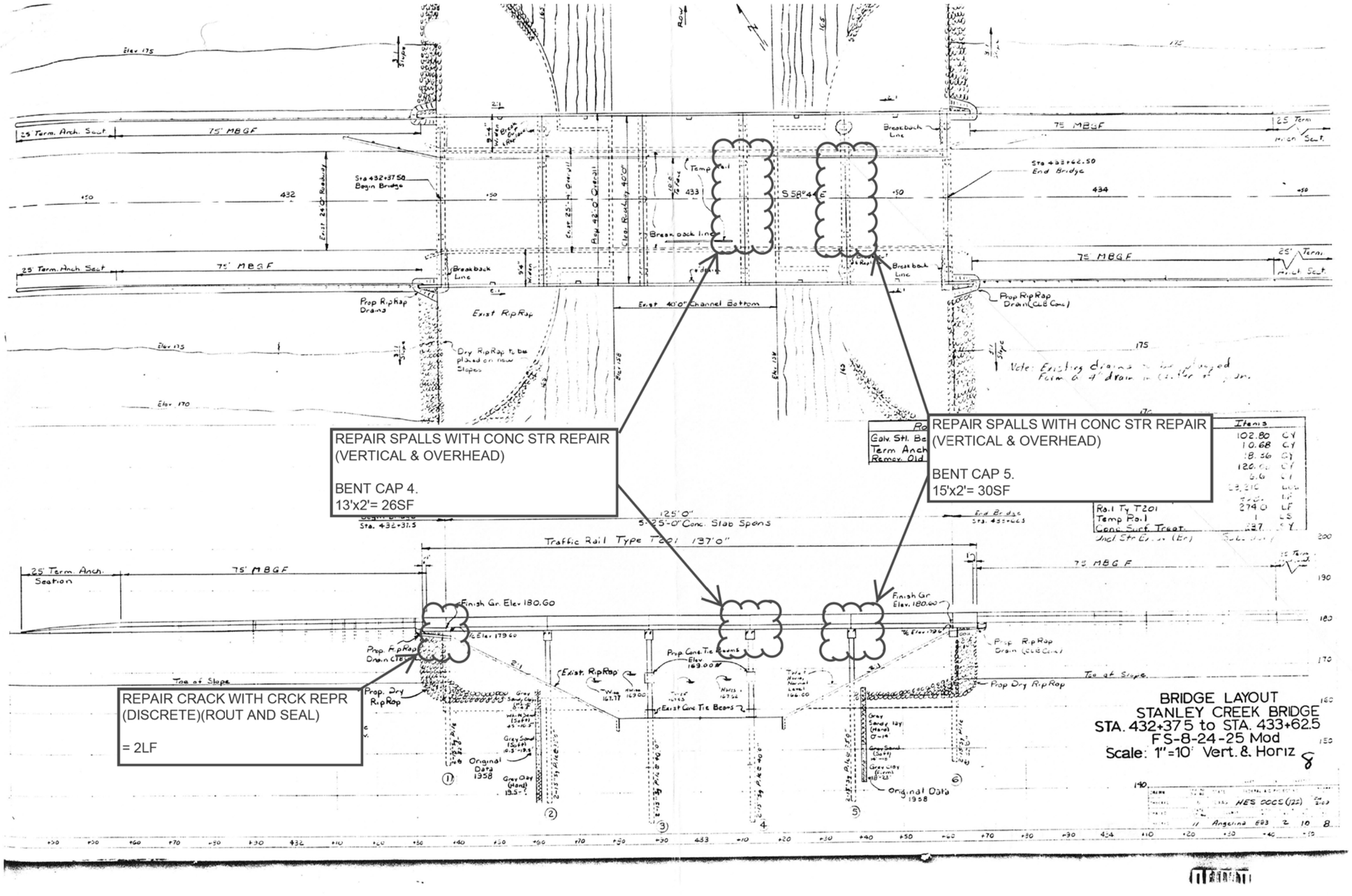

SITE 13-ANGELINA COUNTY
FM 2109 @ STANLEY CREEK
11-003-0-0893-02-002

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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BRIDGE LAYOUT
(SITE 13)

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Texas Department of Transportation®
SHEET 16 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		50

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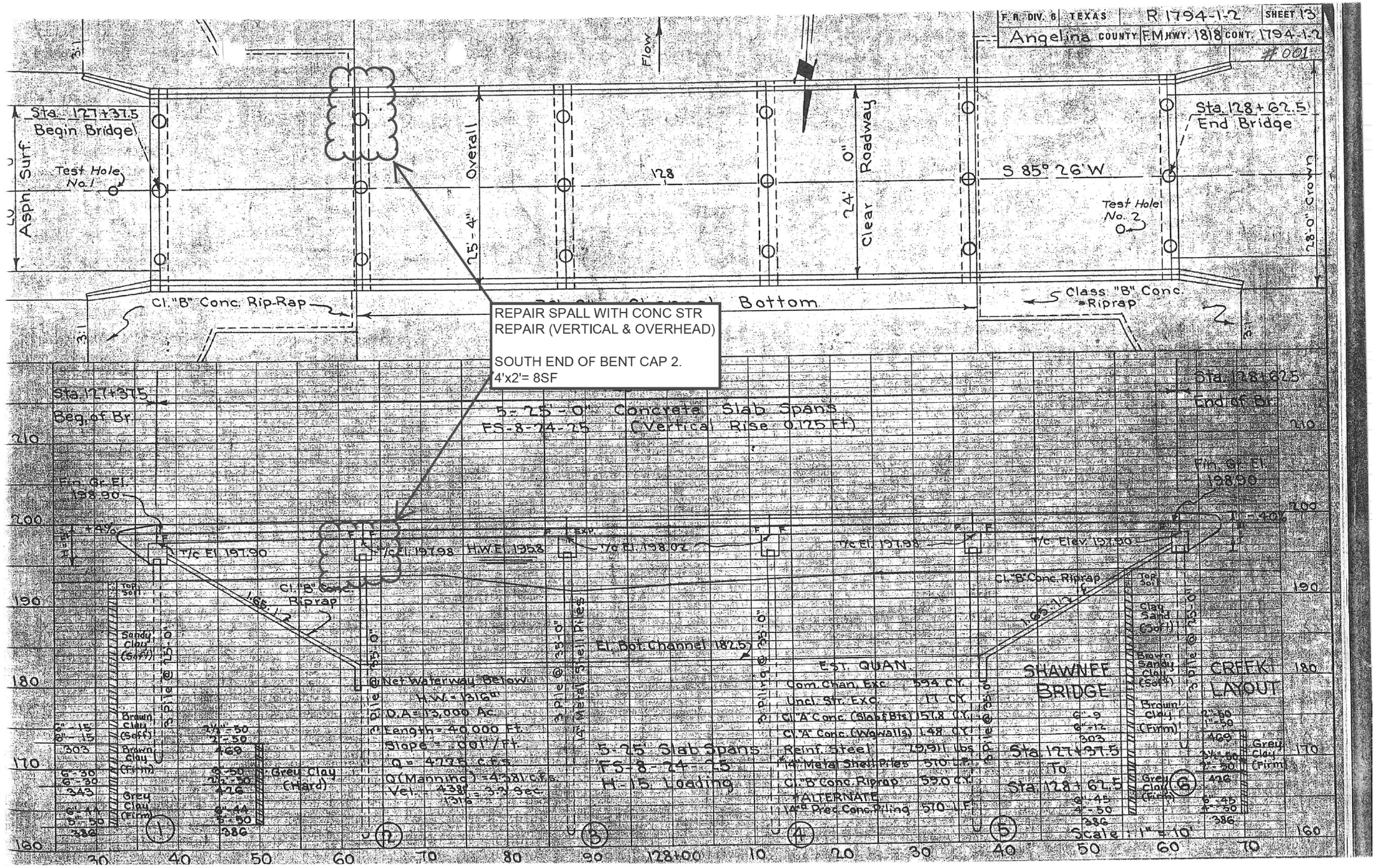

SITE 14-ANGELINA COUNTY
FM 1818 @ SHAWNEE CREEK
11-003-0-1794-01-001

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JEREMY KING
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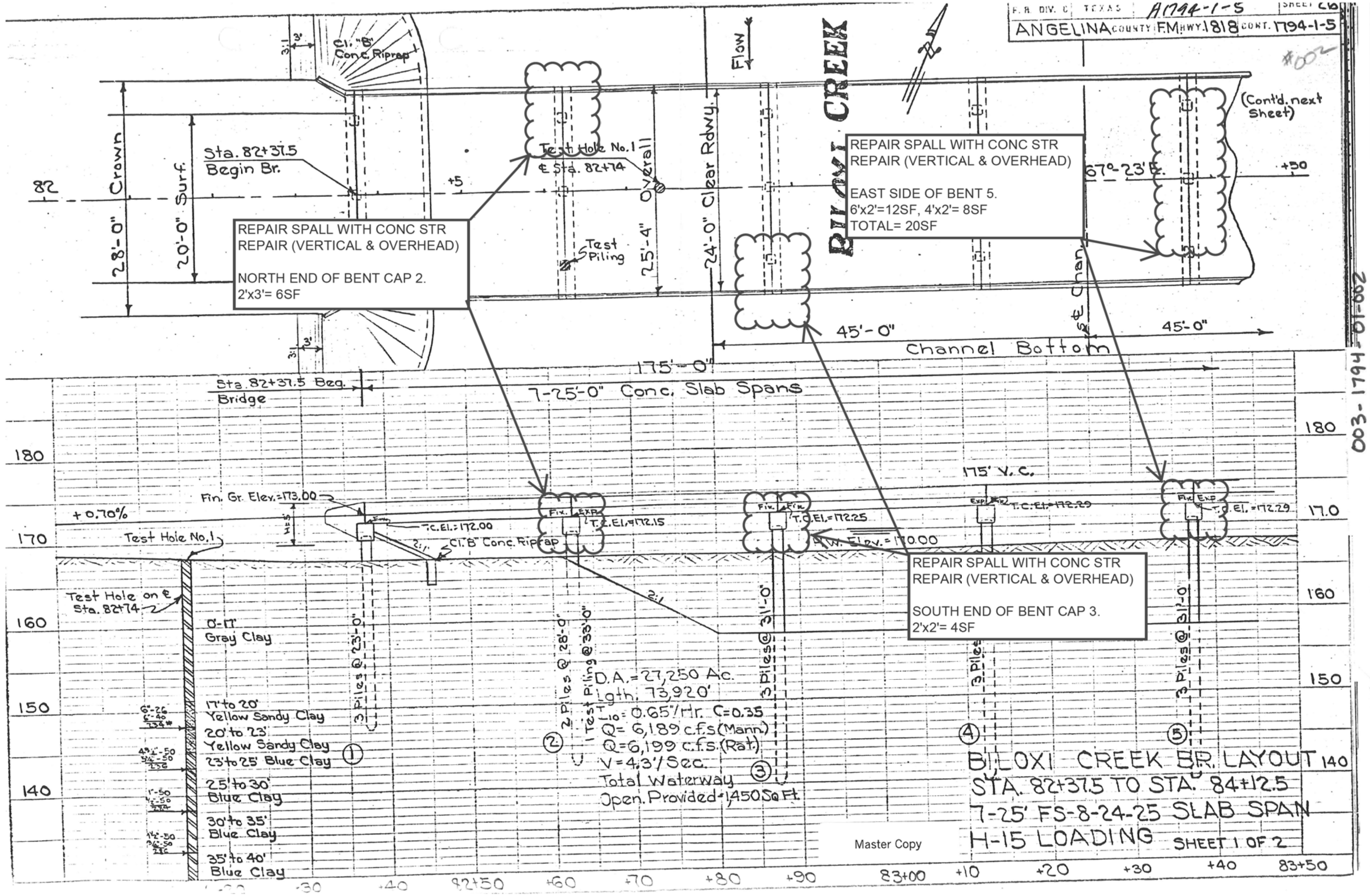
BRIDGE LAYOUT (SITE 14)

2021
Texas Department of Transportation®
SHEET 17 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		51


F.A. DIV. 6 TEXAS AM94-1-5
ANGELINA COUNTY FM HWY. 1818 CONT. 1794-1-5
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)
NORTH END OF BENT CAP 2.
2'x3'= 6SF
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)
EAST SIDE OF BENT 5.
6'x2'=12SF, 4'x2'= 8SF
TOTAL= 20SF
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)
SOUTH END OF BENT CAP 3.
2'x2'= 4SF
BILOXI CREEK
Sta. 82+37.5 Begin Br.
Test Hole No. 1 ℄ Sta. 82+74
Test Piling
Cl. "B" Conc. Riprap
(Cont'd. next Sheet)
Channel Bottom
175'-0"
7-25'-0" Conc. Slab Spans
Fin. Gr. Elev.=173.00
Test Hole on ℄ Sta. 82+74
0-17' Gray Clay
17' to 20' Yellow Sandy Clay
20' to 23' Yellow Sandy Clay
23' to 25' Blue Clay
25' to 30' Blue Clay
30' to 35' Blue Clay
35' to 40' Blue Clay
D.A.=27,250 Ac.
Lgth. 73,920'
Q=6,189 c.f.s.(Mann.)
Q=6,199 c.f.s.(Rat.)
V=4.3'/Sec.
Total Waterway Open. Provided=1,450 Sq.Ft.
BILOXI CREEK BR. LAYOUT
STA. 82+37.5 TO STA. 84+12.5
7-25' FS-8-24-25 SLAB SPAN
H-15 LOADING SHEET 1 OF 2
Master Copy
003-1794-01-002

BRIDGE LAYOUT
(SITE 15)

SITE 15-ANGELINA COUNTY
FM 1818 @ BILOXI CREEK
11-003-0-1794-01-002

2021 Texas Department of Transportation®
SHEET 18 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		52

9/1/2021 9:16:31 AM
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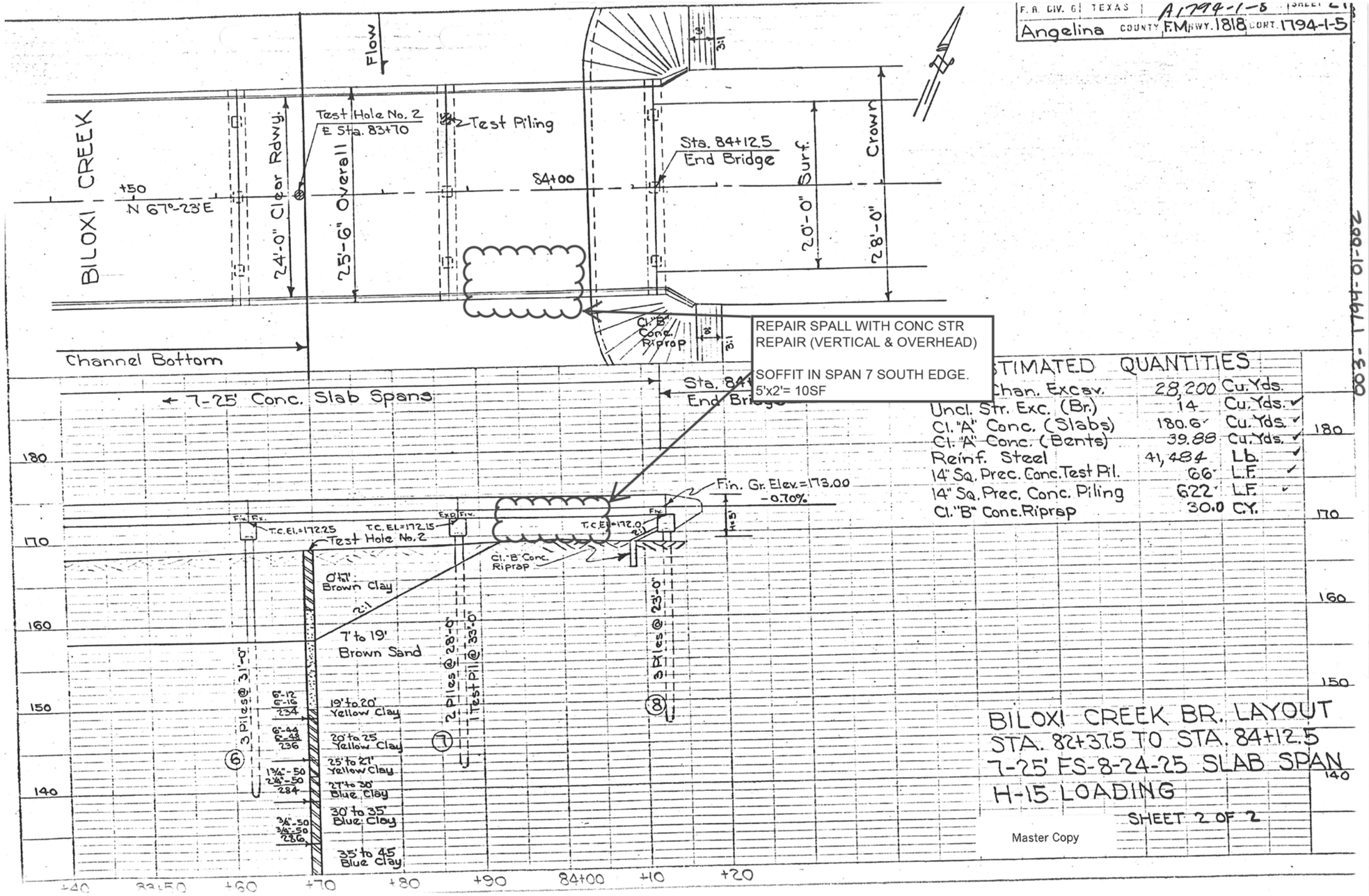
F.A. DIV. 6 | TEXAS | A1794-1-5 | SHEET 2

Angelina COUNTY | F.M. HWY. 1818 | CONT. 1794-1-5



ESTIMATED QUANTITIES

Chan. Excav.	28,200	Cu.Yds.
Uncl. Str. Exc. (Br.)	14	Cu.Yds. ✓
Cl. "A" Conc. (Slabs)	180.6	Cu.Yds. ✓
Cl. "A" Conc. (Bents)	39.88	Cu.Yds. ✓
Reinf. Steel	41,484	Lb. ✓
14" Sq. Prec. Conc. Test Pil.	66	L.F. ✓
14" Sq. Prec. Conc. Piling	622	L.F. ✓
Cl. "B" Conc. Riprap	30.0	C.Y.

11-003-0-1794-01-002

BILOXI CREEK BR. LAYOUT
STA. 82+37.5 TO STA. 84+12.5
7-25' ES-8-24-25 SLAB SPAN
H-15 LOADING

SHEET 2 OF 2

Master Copy

SITE 15-ANGELINA COUNTY
FM 1818 @ BILOXI CREEK
11-003-0-1794-01-002

JEREMY KING
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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

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BRIDGE LAYOUT
(SITE 15)

2021 Texas Department of Transportation®

SHEET 19 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		53

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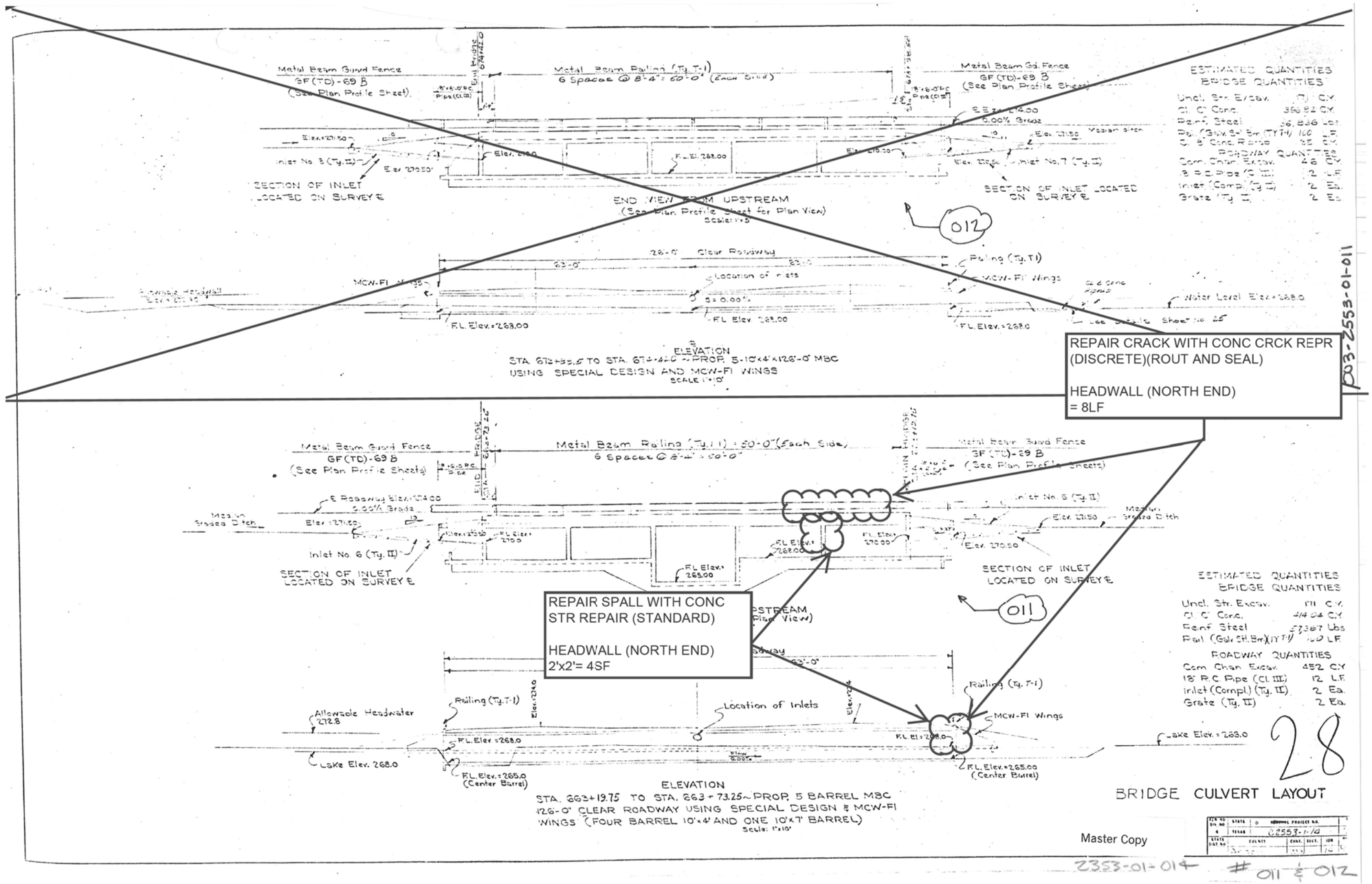

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STATE OF TEXAS

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9/2/2021

BRIDGE LAYOUT (SITE 16)

SITE 16-ANGELINA COUNTY
SL 287 @ DRAW
11-003-0-2553-01-011

2021 Texas Department of Transportation®
SHEET 20 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		54

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REPAIR SPALLS ON BENT 4 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

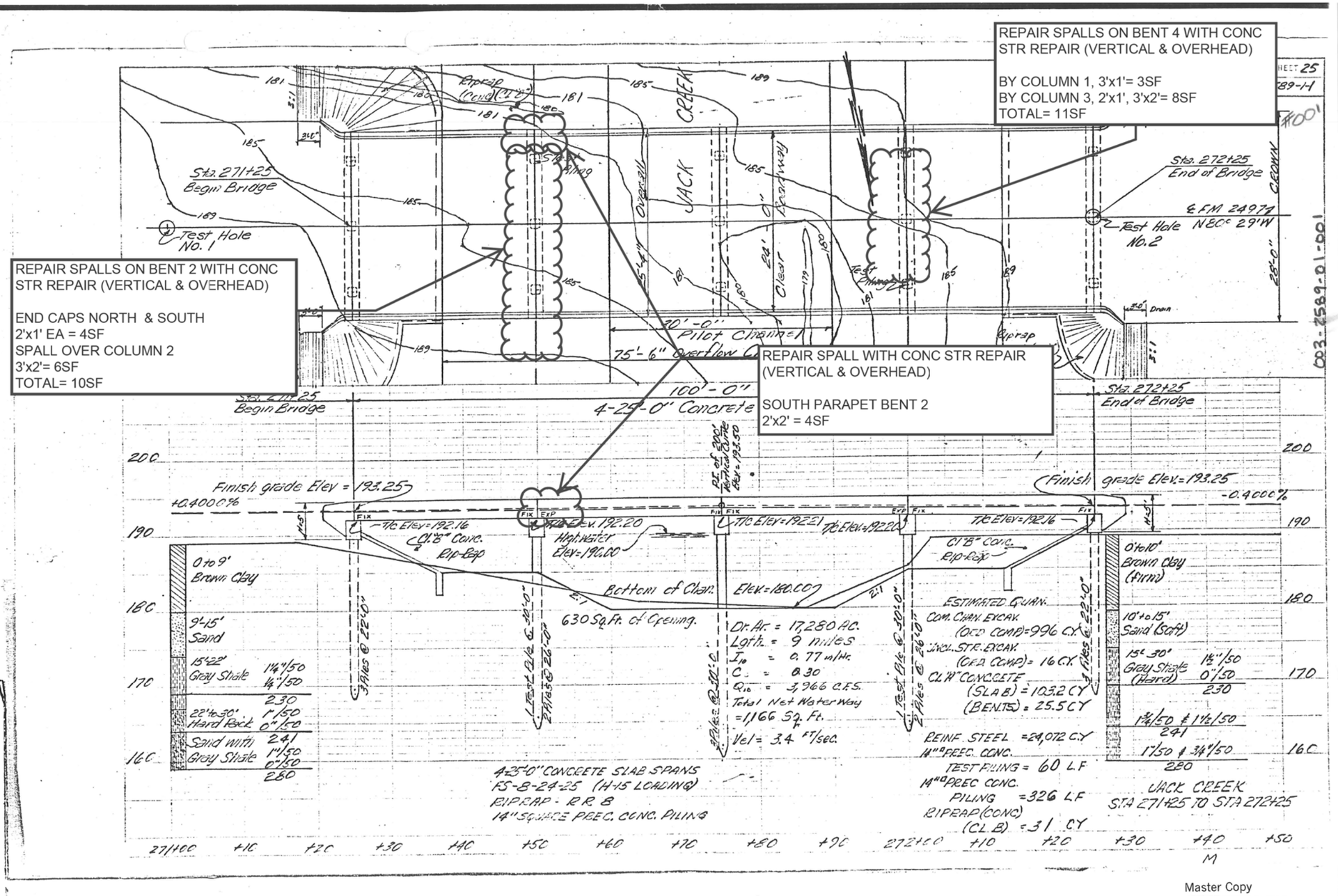
BY COLUMN 1, 3'x1'= 3SF
BY COLUMN 3, 2'x1', 3'x2'= 8SF
TOTAL= 11SF

REPAIR SPALLS ON BENT 2 WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

END CAPS NORTH & SOUTH
2'x1' EA = 4SF
SPALL OVER COLUMN 2
3'x2'= 6SF
TOTAL= 10SF

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

SOUTH PARAPET BENT 2
2'x2' = 4SF



SITE 17-ANGELINA COUNTY
FM 2497 @ JACK CREEK
11-003-0-2589-01-001

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JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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9/2/2021

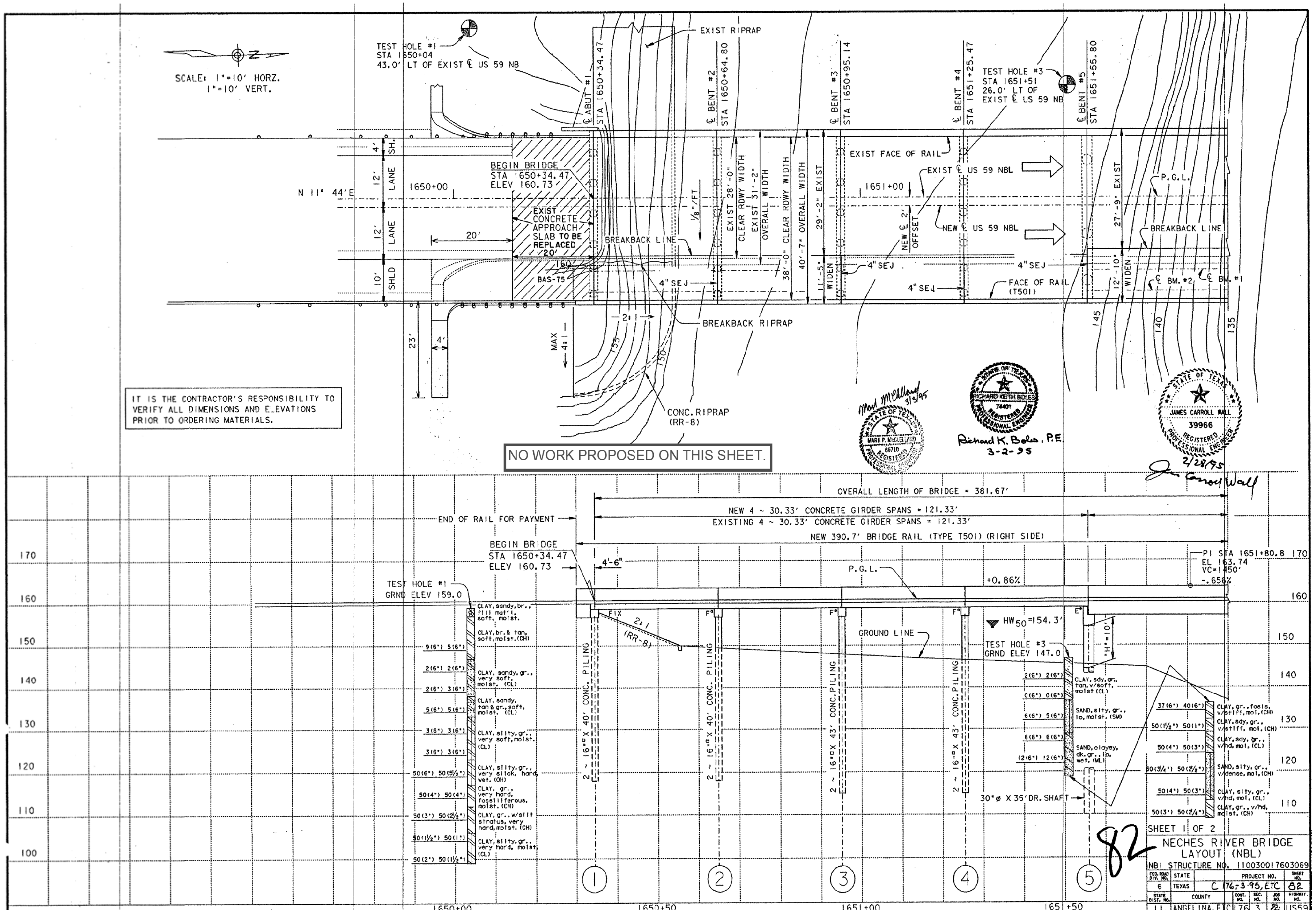
BRIDGE LAYOUT (SITE 17)

2021 Texas Department of Transportation®

SHEET 21 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		55

Master Copy



JEREMY KING
102170
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PROFESSIONAL ENGINEER
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Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 18)

SITE 18-ANGELINA COUNTY
US 59 NBL @ NECHES RIVER
11-003-0-0176-03-069

2021
Texas Department of Transportation®
SHEET 22 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		56

9/1/2021 9:17:02 AM
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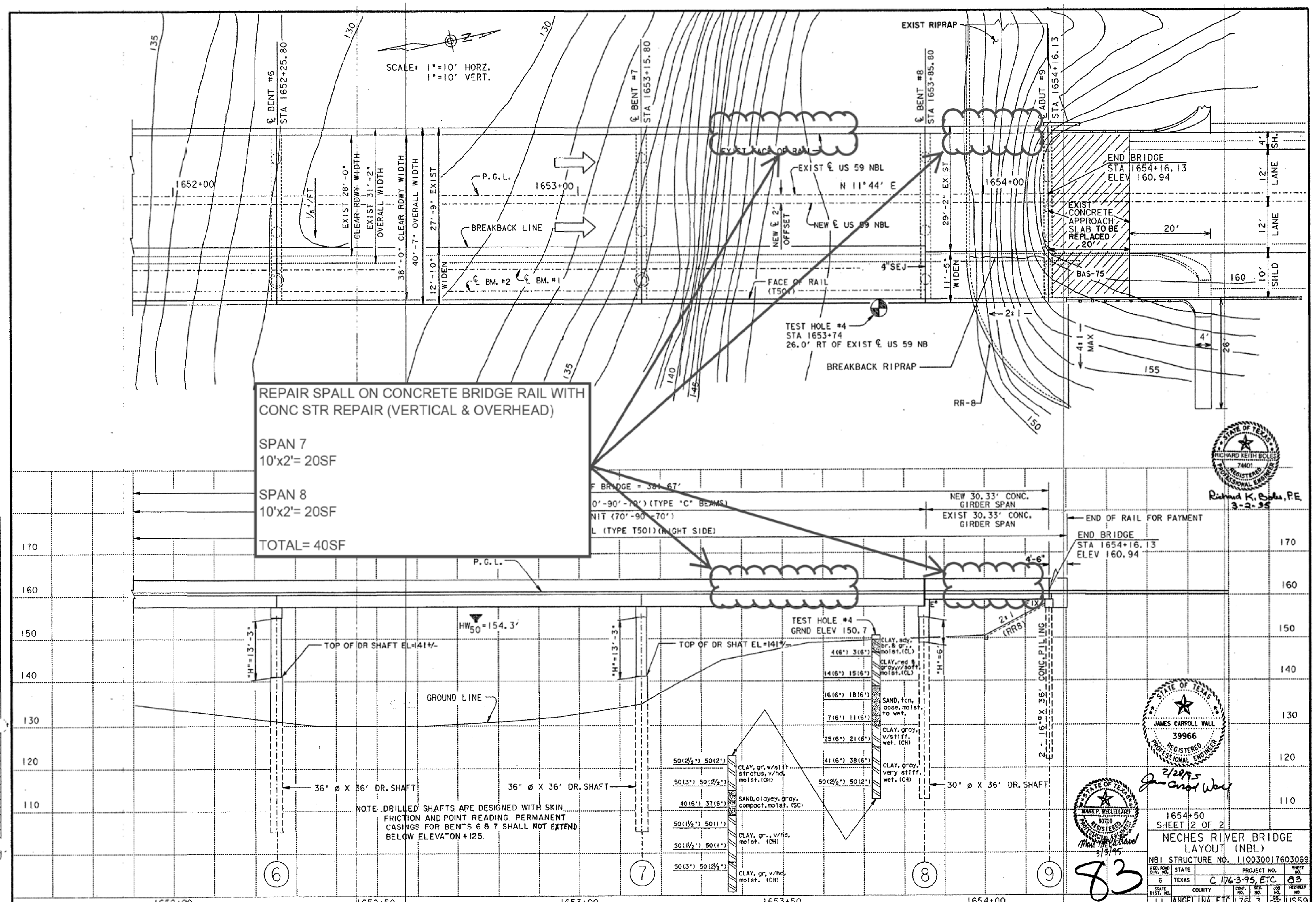

REPAIR SPALL ON CONCRETE BRIDGE RAIL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)
SPAN 7
10'x2'= 20SF
SPAN 8
10'x2'= 20SF
TOTAL= 40SF
SCALE: 1"=10' HORZ. 1"=10' VERT.
EXIST RIPRAP
END BRIDGE STA 1654+16.13 ELEV 160.94
EXIST CONCRETE APPROACH SLAB TO BE REPLACED
TEST HOLE #4 STA 1653+74 26.0' RT OF EXIST ℄ US 59 NB
BREAKBACK RIPRAP
NEW 30.33' CONC. GIRDER SPAN
EXIST 30.33' CONC. GIRDER SPAN
END OF RAIL FOR PAYMENT
TOP OF DR SHAFT EL=141+/-
GROUND LINE
36" ø X 36' DR. SHAFT
30" ø X 36' DR. SHAFT
NOTE: DRILLED SHAFTS ARE DESIGNED WITH SKIN FRICTION AND POINT READING. PERMANENT CASINGS FOR BENTS 6 & 7 SHALL NOT EXTEND BELOW ELEVATON +125.
NECHES RIVER BRIDGE LAYOUT (NBL)
NBI STRUCTURE NO. 110030017603069

SITE 18-ANGELINA COUNTY
US 59 NBL @ NECHES RIVER
11-003-0-0176-03-069

JEREMY KING 102170 LICENSED PROFESSIONAL ENGINEER

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5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 18)

2021
Texas Department of Transportation®
SHEET 23 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		57

9/1/2021 9:17:13 AM
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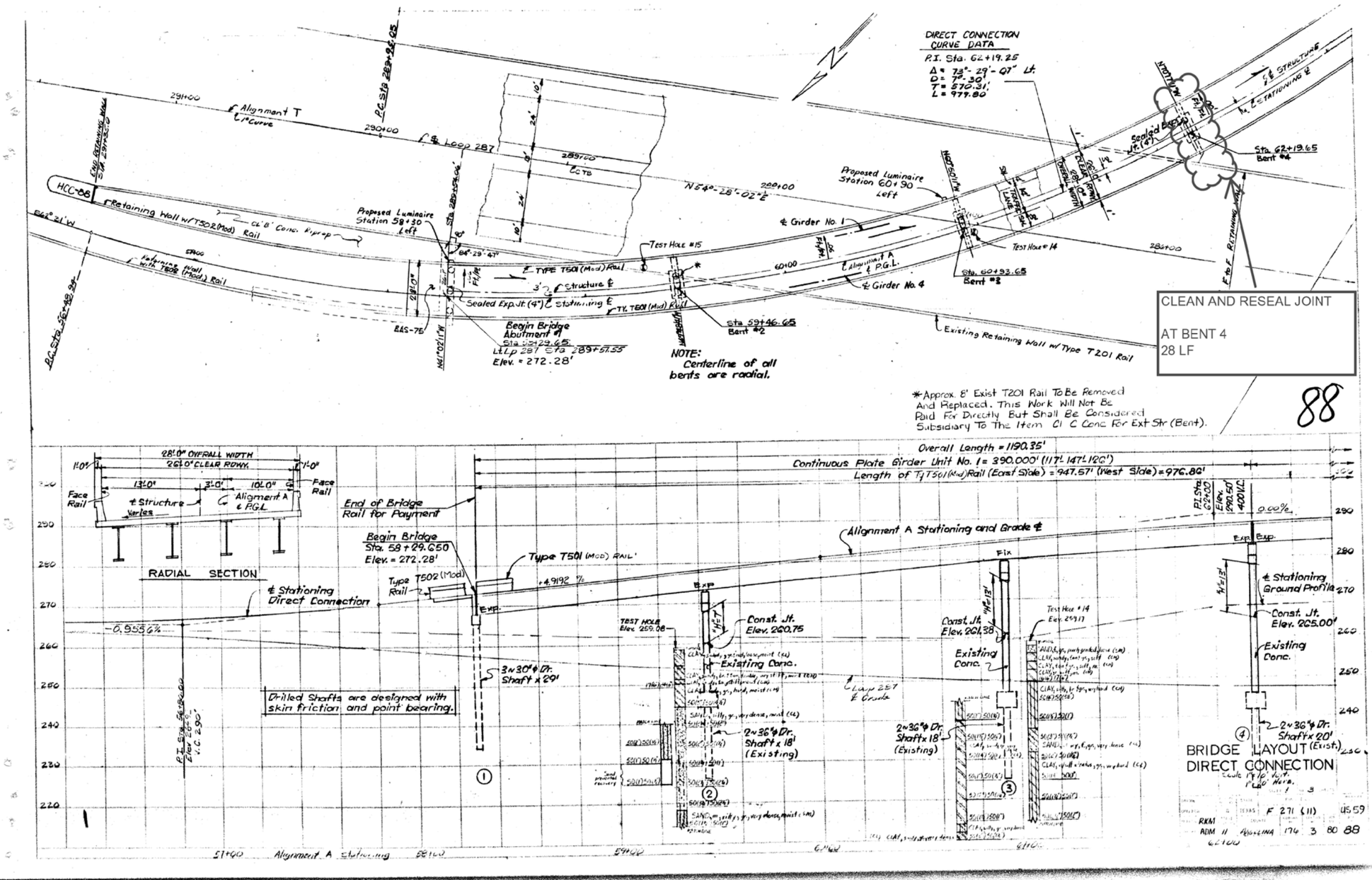
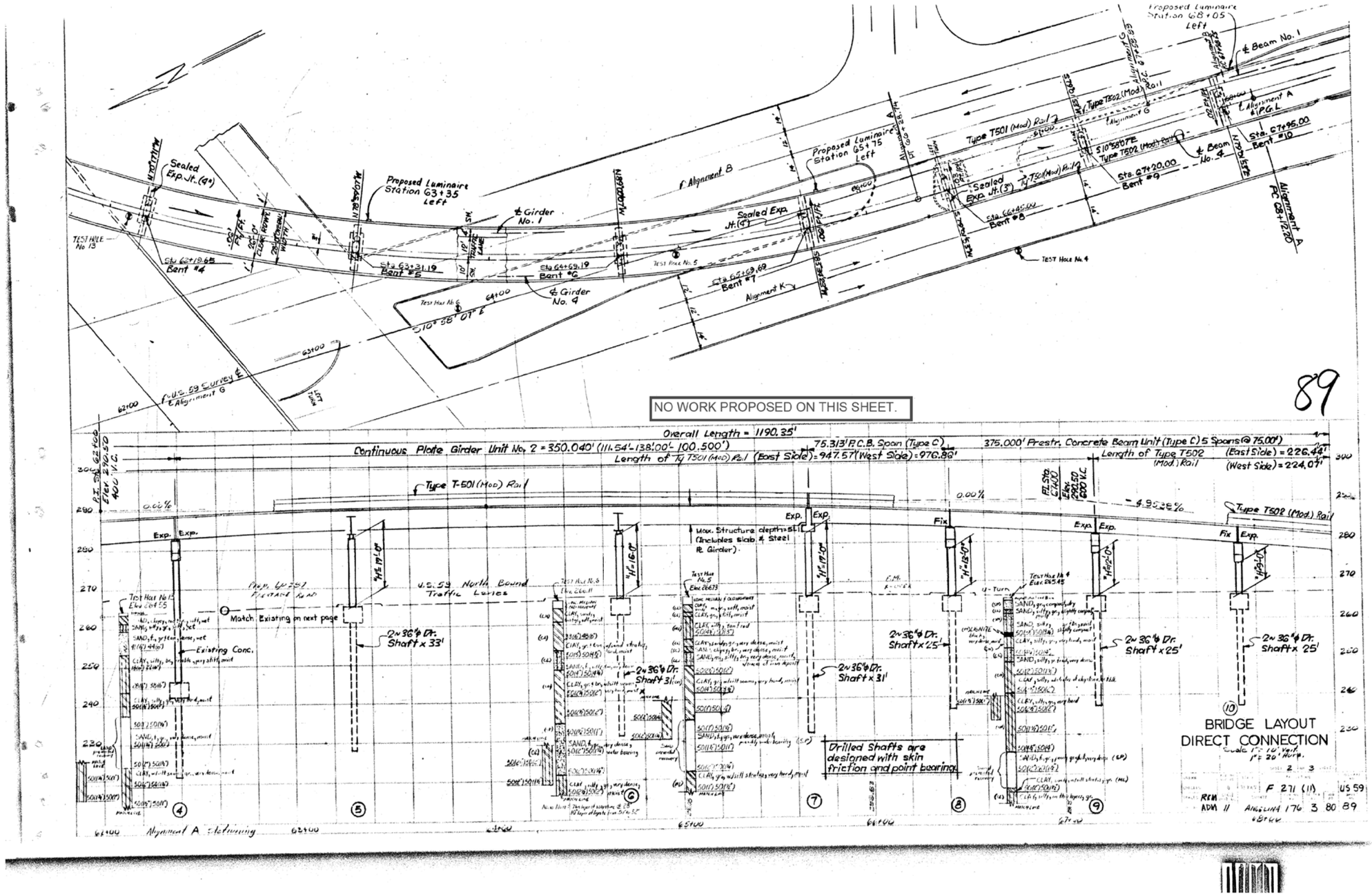


BRIDGE LAYOUT (SITE 19)

SITE 19-ANGELINA COUNTY
US 59SB DIR CONN @ BU 59 & SL 287
11-003-0-0173-03-090

2021 Texas Department of Transportation®
SHEET 24 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		58



NO WORK PROPOSED ON THIS SHEET.

SITE 19-ANGELINA COUNTY
US 59SB DIR CONN @ BU 59 & SL 287
11-003-0-0173-03-090

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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9/2/2021

BRIDGE LAYOUT
(SITE 19)

2021
Texas Department of Transportation®
SHEET 25 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		59

F 271 (11) US 59
RCH ADM II ANGELINA 176 3 80 89

9/1/2021 9:17:34 AM
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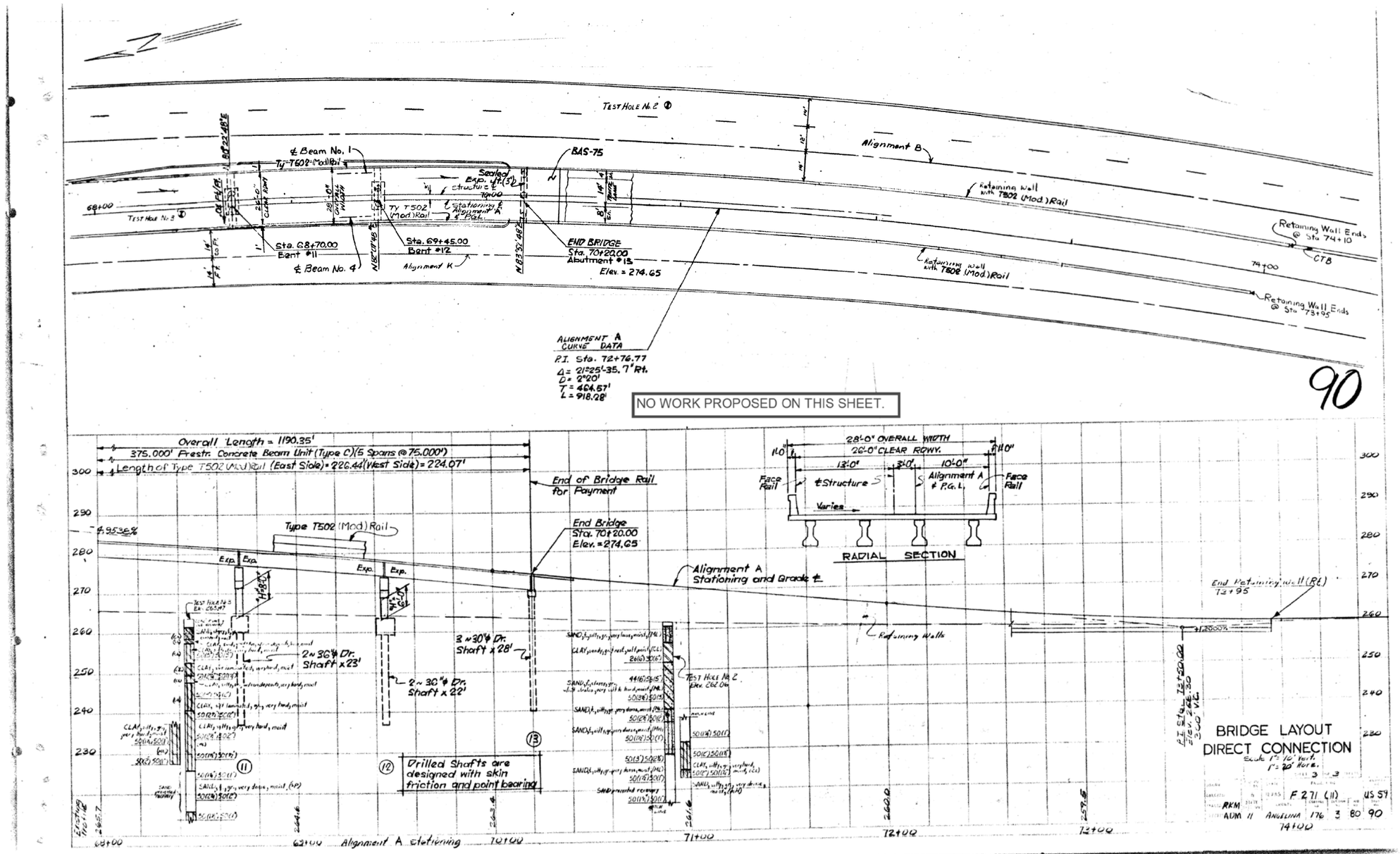

SITE 19-ANGELINA COUNTY
US 59SB DIR CONN @ BU 59 & SL 287
11-003-0-0173-03-090

STATE OF TEXAS
JEREMY KING
102170
LICENSED
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9/2/2021

BRIDGE LAYOUT (SITE 19)

2021
Texas Department of Transportation®
SHEET 26 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		60

FILL EMBANKMENT EROSION WITH EMBANKMENT (VEHICLE)(ORD COMP)(TY B)

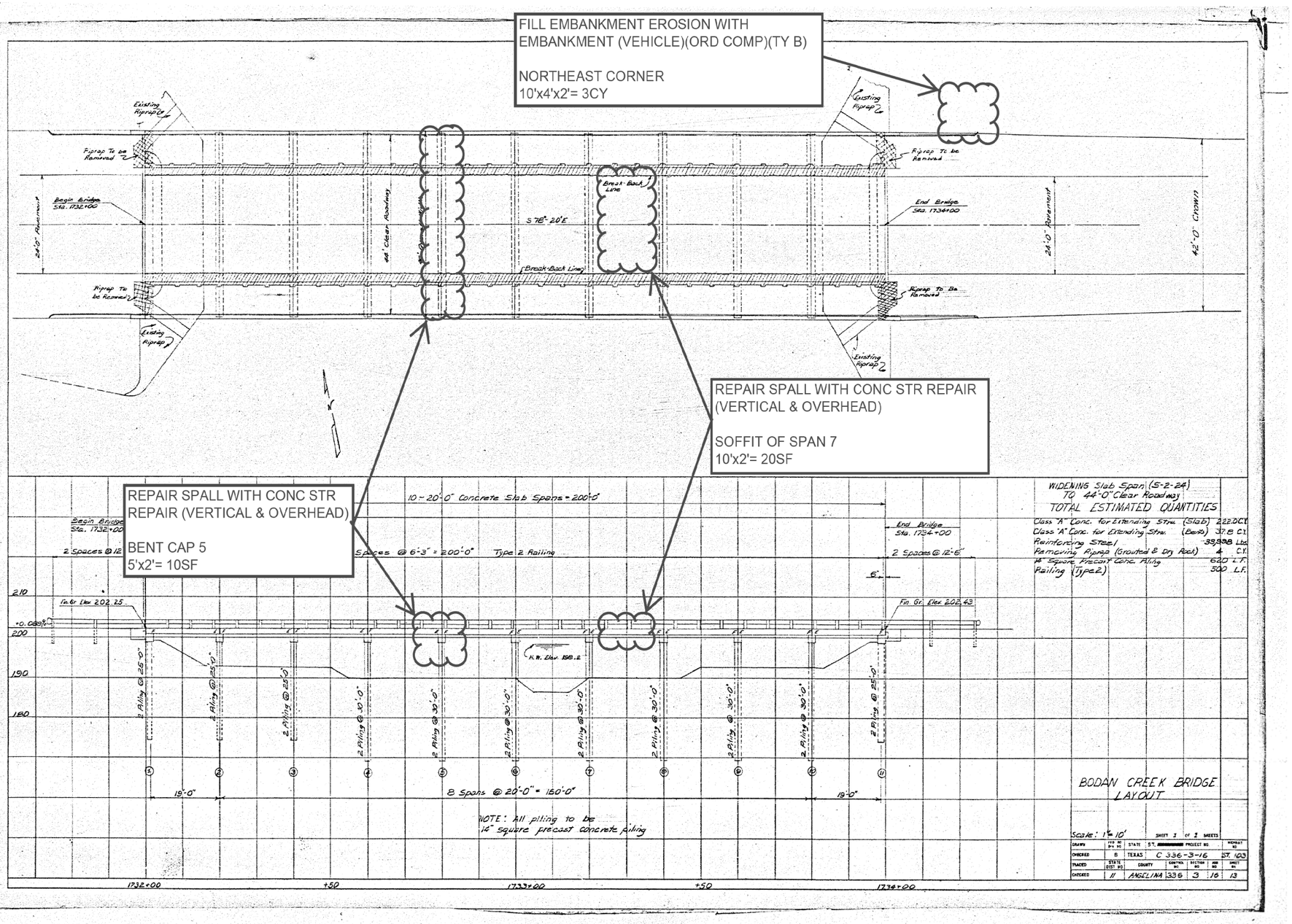
NORTHEAST CORNER
10'x4'x2'= 3CY

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

SOFFIT OF SPAN 7
10'x2'= 20SF

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

BENT CAP 5
5'x2'= 10SF



WIDENING Slab Span (S-2-24) TO 44'-0" Clear Roadway
TOTAL ESTIMATED QUANTITIES

Class "A" Conc. for Extending Strs. (Slab)	222 C.Y.
Class "A" Conc. for Extending Strs. (Beam)	37.8 C.Y.
Reinforcing Steel	33,398 Lbs.
Removing Riprap (Grouted & Dry Rock)	4 C.Y.
14" Square Precast Conc. Piling	620 L.F.
Railing (Type 2)	500 L.F.

BODAN CREEK BRIDGE LAYOUT

Scale: 1"=10' SHEET 3 OF 3 SHEETS

DRAWN	FED RD DIV NO.	STATE	ST. PROJECT NO.			HIGHWAY NO.	
CHECKED	6	TEXAS	C 336-3-16			ST. 103	
TRACED	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
CHECKED	11	ANGELINA	336	3	16	13	

SITE 20-ANGELINA COUNTY
SH 103 @ BODAN CREEK
11-003-0-0336-03-011

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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9/2/2021

BRIDGE LAYOUT
(SITE 20)

2021 Texas Department of Transportation®
SHEET 27 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		61

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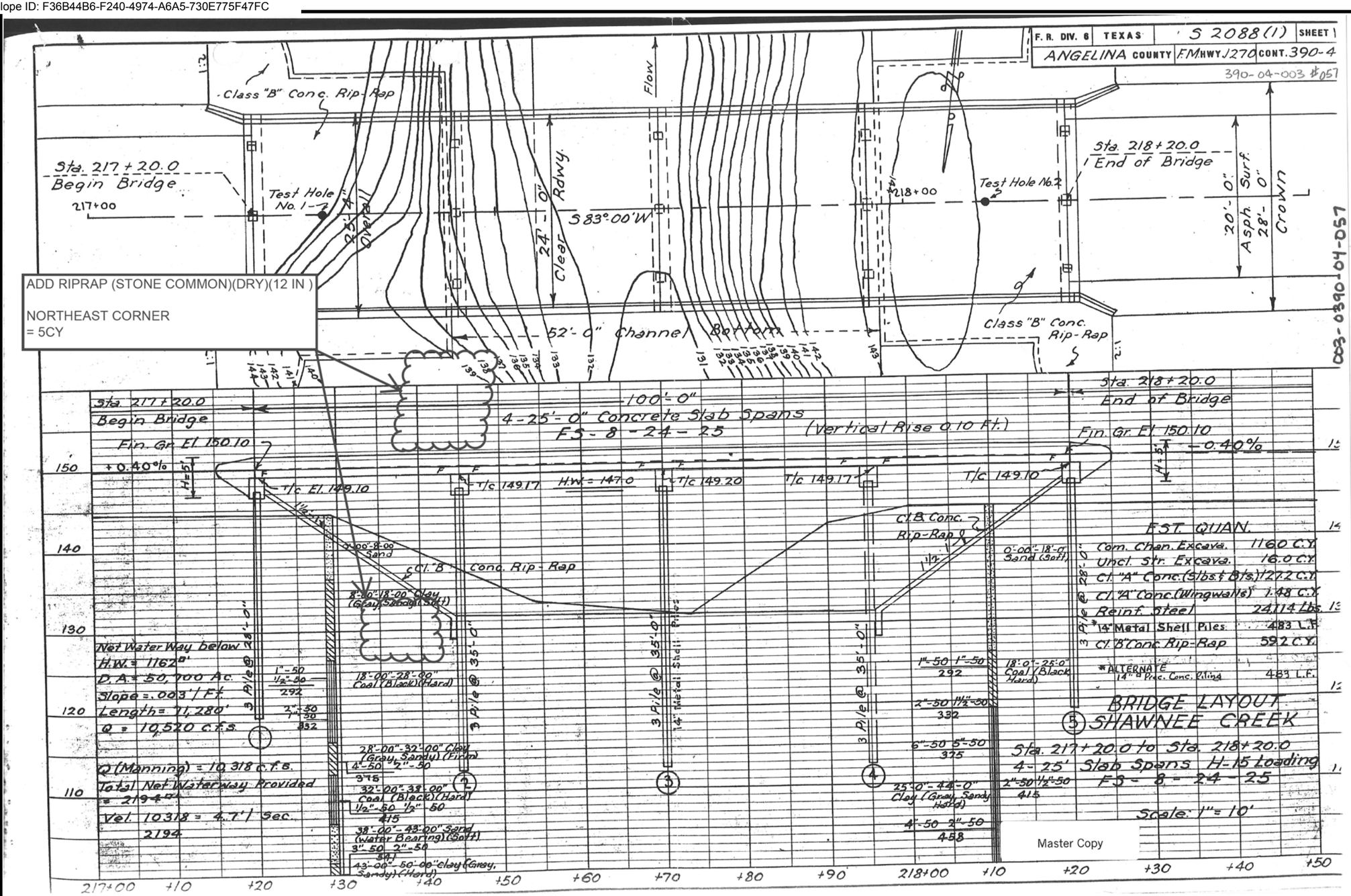
F. R. DIV. 6	TEXAS	S 2088(1)	SHEET 1
ANGELINA COUNTY	FM HWY. 1270	CONT. 390-4	

390-04-003 #057



003-0390-04-057

SITE 21-ANGELINA COUNTY
FM 1270 @ SHAWNEE CREEK
11-003-0-0390-04-057

STATE OF TEXAS
JEREMY KING
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LICENSED PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...

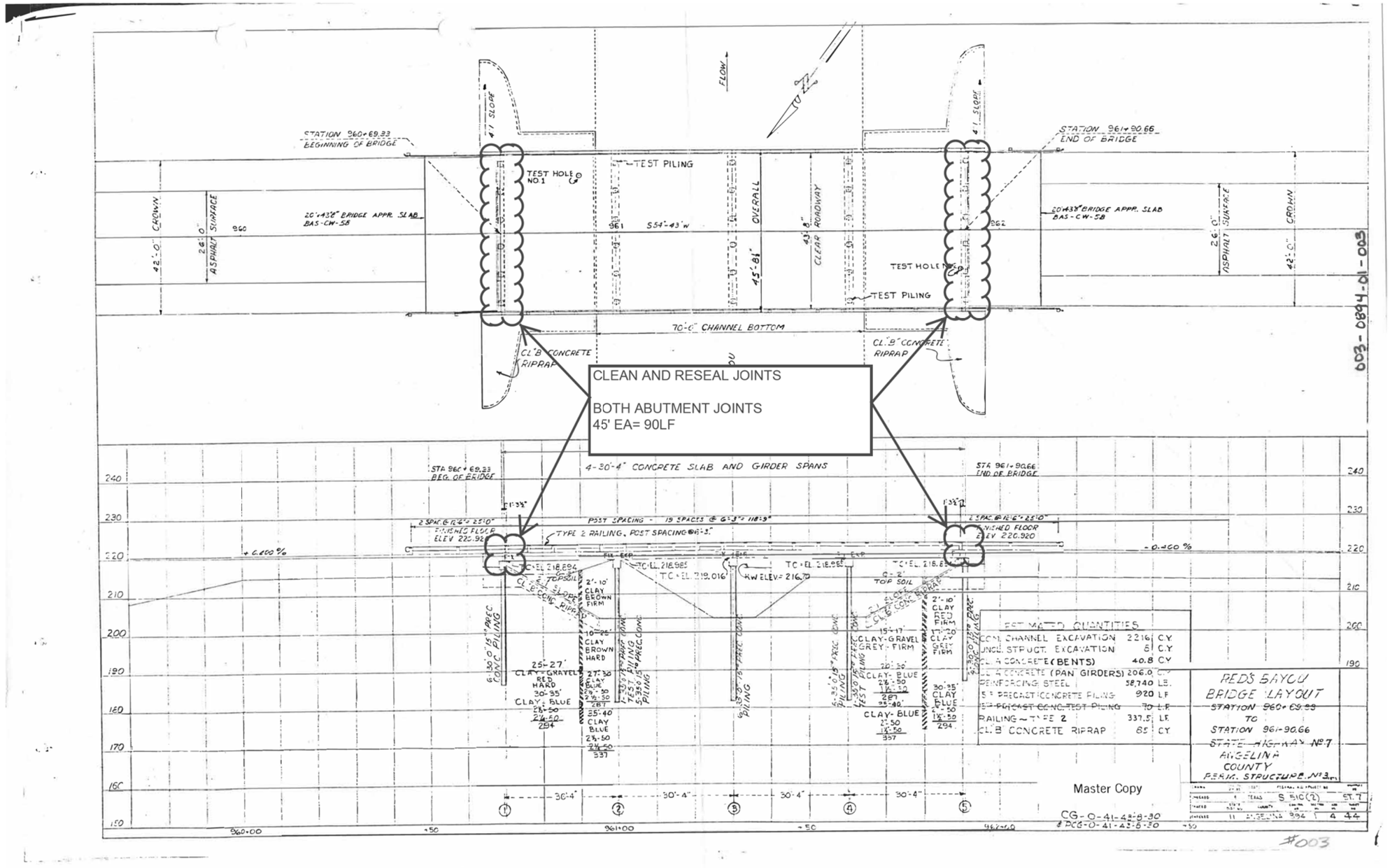
9/2/2021

BRIDGE LAYOUT
(SITE 21)

Texas Department of Transportation®

SHEET 28 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		62



ESTIMATED QUANTITIES		
CONT. CHANNEL EXCAVATION	2216	C.Y.
UNCL. STRUCT. EXCAVATION	61	C.Y.
CL. A CONCRETE (BENTS)	40.8	C.Y.
CL. A CONCRETE (PAN GIRDERS)	206.0	C.Y.
REINFORCING STEEL	58,740	LB.
15" PRECAST CONCRETE PILING	920	L.F.
15" PRECAST CONC. TEST PILING	70	L.F.
RAILING - TYPE 2	337.5	L.F.
CL 'B' CONCRETE RIPRAP	85	C.Y.

REDS BAYOU
BRIDGE LAYOUT
STATION 960+69.33
TO
STATION 961+90.66
STATE HIGHWAY NO. 7
ANGELINA
COUNTY
F.E.H.W. STRUCTURE NO. 3

Master Copy

CG-0-41-43-0-30
& PCG-0-41-43-5-30

#003

SITE 22-ANGELINA COUNTY
SH 7 @ RED BAYOU
11-003-0-0894-01-003

003-0894-01-003

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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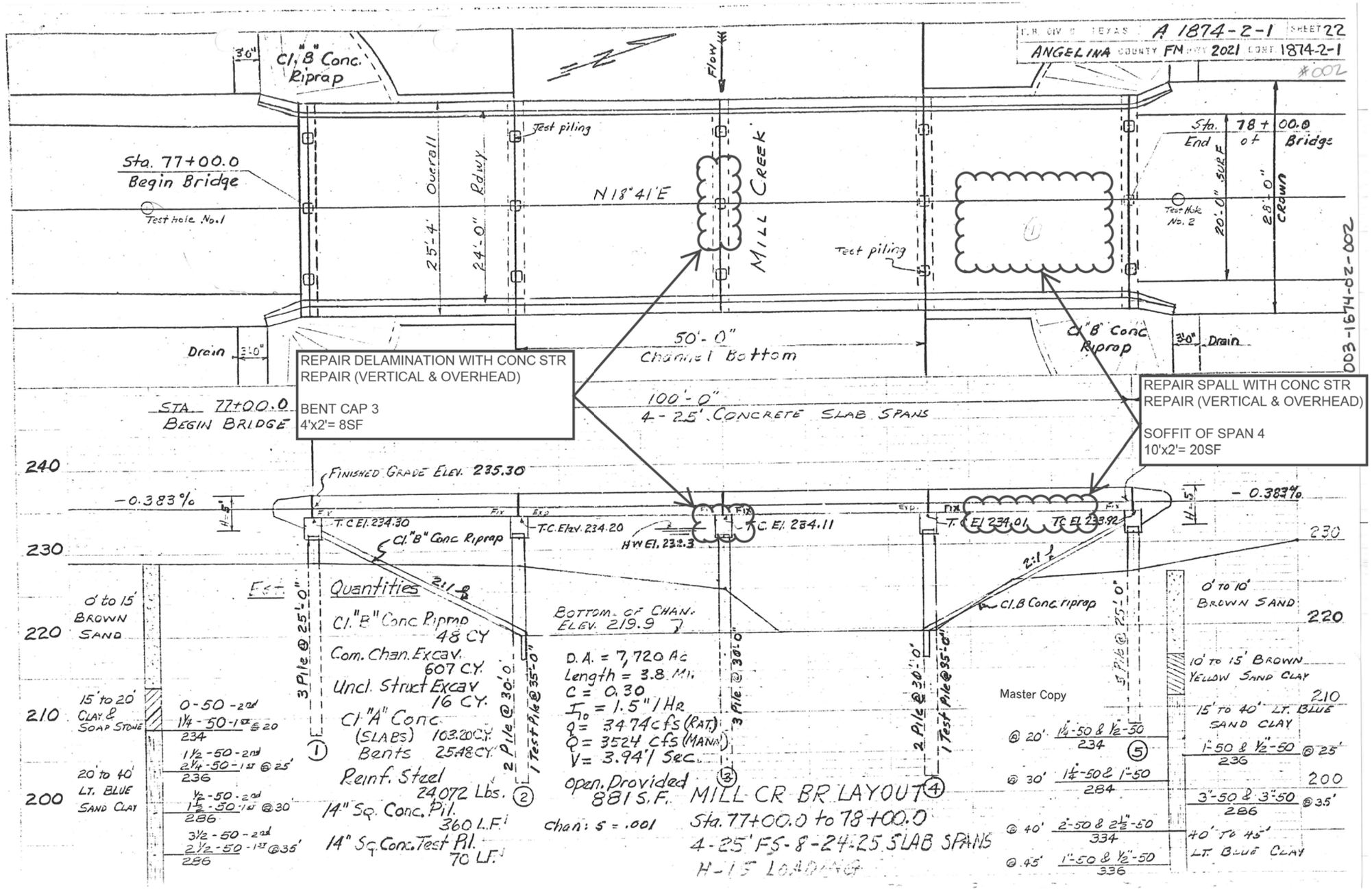
Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT
(SITE 22)

2021
Texas Department of Transportation®
SHEET 29 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		63



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102170
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STATE OF TEXAS

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Jeremy King, P.E.
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BRIDGE LAYOUT (SITE 23)

SITE 23-ANGELINA COUNTY
FM 2021 @ MILL CREEK
11-003-0-1874-02-002

2021 Texas Department of Transportation®
SHEET 30 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		64

9/1/2021 9:18:22 AM
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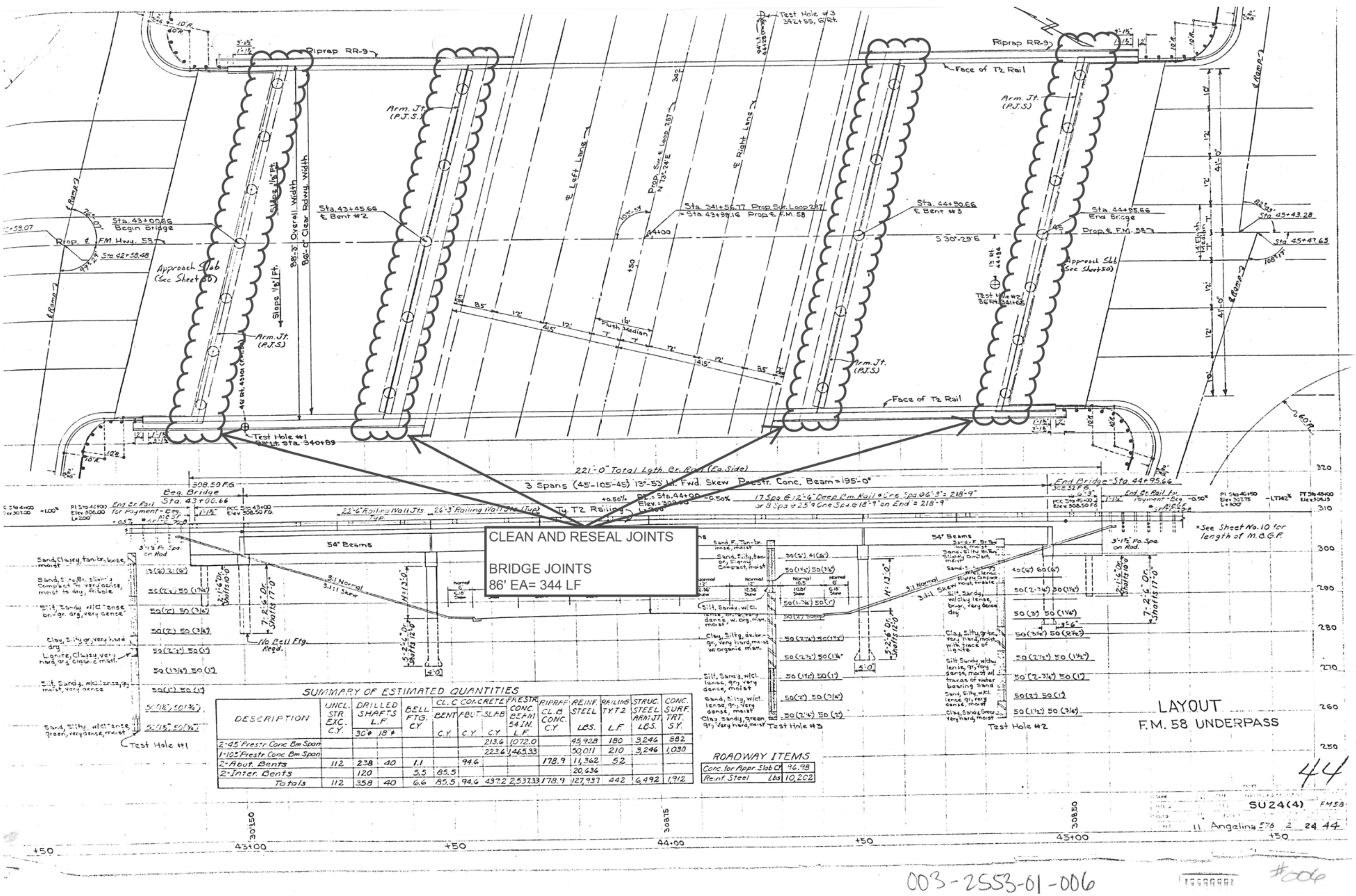

SUMMARY OF ESTIMATED QUANTITIES

DESCRIPTION	UNCL. STR. EXC. C.Y.	DRILLED SHAFTS L.F. 30"Φ	DRILLED SHAFTS L.F. 18"Φ	BELL FTG. C.Y.	CL. C CONCRETE BENT C.Y.	CL. C CONCRETE ABUT. C.Y.	CL. C CONCRETE SLAB C.Y.	PRESTR. CONC. BEAM 54 IN. L.F.	RIPRAP CL. B CONC. C.Y.	REINF. STEEL LBS.	RAILING TY. T2 L.F.	STRUC. STEEL ARM JT. LBS.	CONC. SURF. TRT. S.Y.
2-45' Prestr. Conc. Bm Span							213.6	1072.0		45,928	180	3,246	882
1-105' Prestr. Conc. Bm Span							223.6	1465.33		50,011	210	3,246	1,030
2-Abut. Bents	112	238	40	1.1		94.6			178.9	11,362	52		
2-Inter. Bents		120		5.5	85.5					20,636			
Totals	112	358	40	6.6	85.5	94.6	437.2	2,537.33	178.9	127,937	442	6,492	1,912

ROADWAY ITEMS

Conc. for Appr. Slab	CY	96.98
Reinf. Steel	Lbs	10,202

SITE 24-ANGELINA COUNTY
FM 58 @ SL 287 & US 59
11-003-0-2553-01-006

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BRIDGE LAYOUT
(SITE 24)

2021
Texas Department of Transportation®
SHEET 31 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	65

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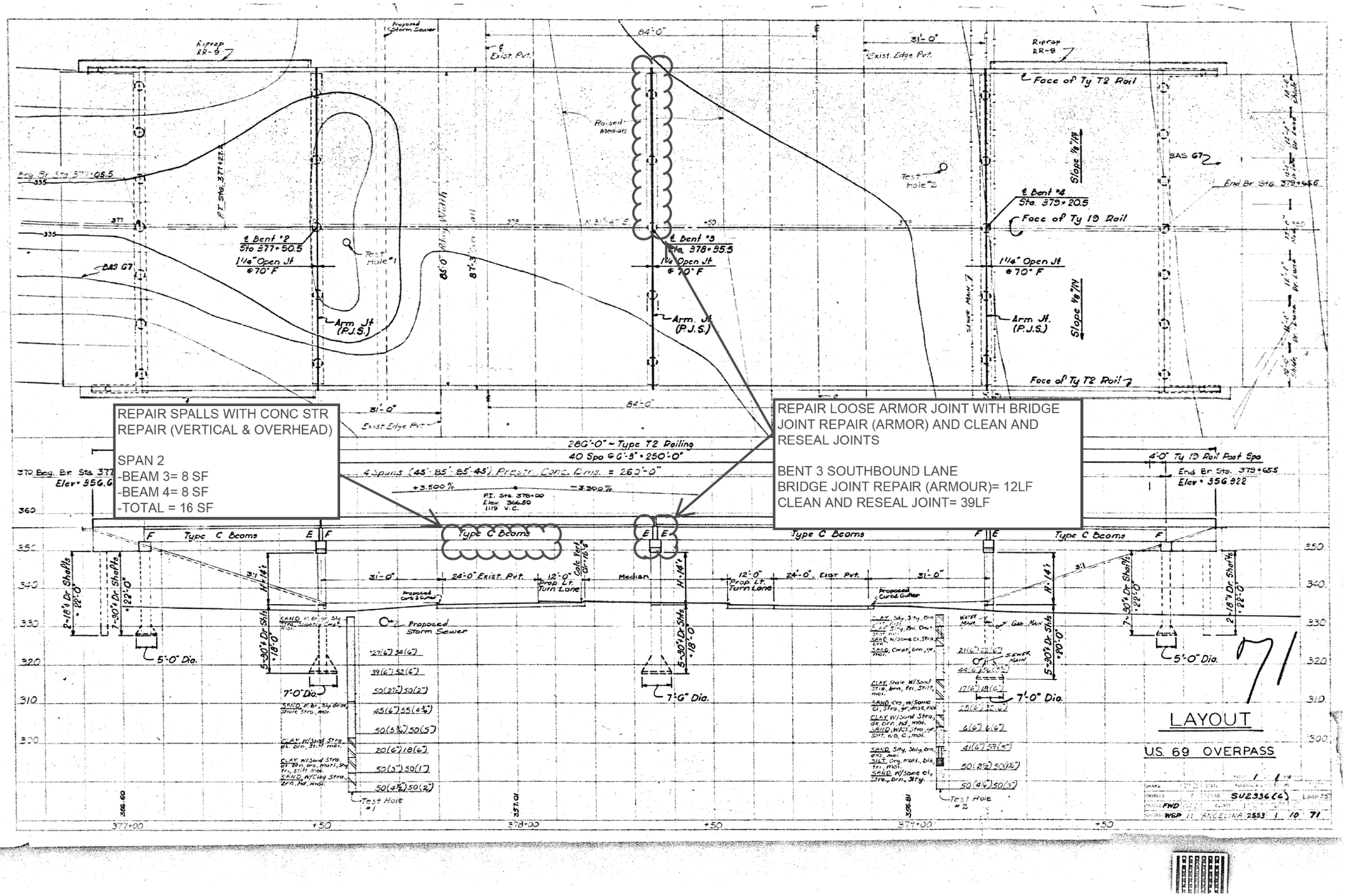
REPAIR SPALLS WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

SPAN 2
-BEAM 3= 8 SF
-BEAM 4= 8 SF
-TOTAL = 16 SF

REPAIR LOOSE ARMOR JOINT WITH BRIDGE JOINT REPAIR (ARMOR) AND CLEAN AND RESEAL JOINTS

BENT 3 SOUTHBOUND LANE
BRIDGE JOINT REPAIR (ARMOUR)= 12LF
CLEAN AND RESEAL JOINT= 39LF



LAYOUT

US 69 OVERPASS

SITE 25- ANGELINA COUNTY
LP 287 & US 59 @ BUS 59
11-003-0-2553-01-116

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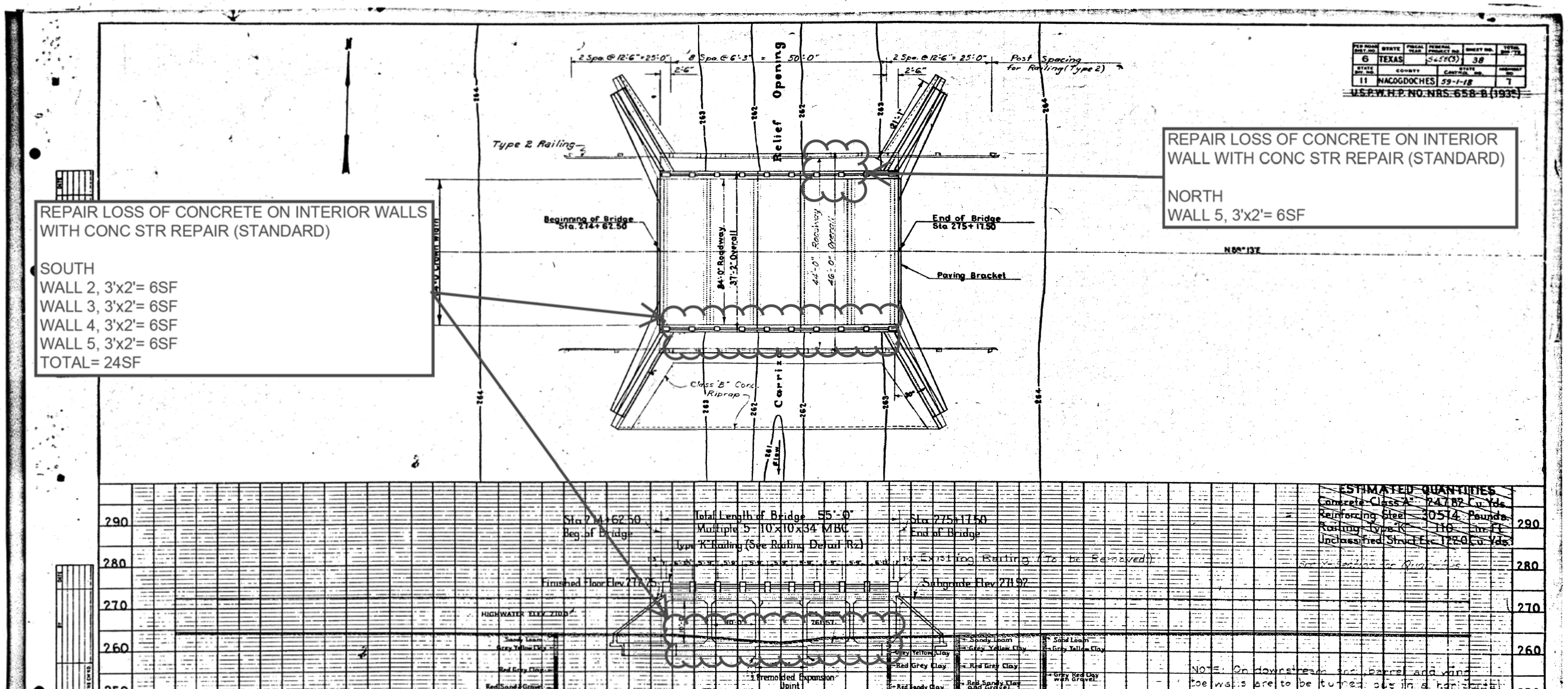
BRIDGE LAYOUT
(SITE 25)

Texas Department of Transportation®

SHEET 32 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		66



REPAIR LOSS OF CONCRETE ON INTERIOR WALLS WITH CONC STR REPAIR (STANDARD)

SOUTH
WALL 2, 3'x2'= 6SF
WALL 3, 3'x2'= 6SF
WALL 4, 3'x2'= 6SF
WALL 5, 3'x2'= 6SF
TOTAL= 24SF

REPAIR LOSS OF CONCRETE ON INTERIOR WALL WITH CONC STR REPAIR (STANDARD)

NORTH
WALL 5, 3'x2'= 6SF

SITE 26-NACOGDOCHES COUNTY
SH 7 @ CARRIZO CREEK RELIEF
11-174-0-0059-01-028

STATE OF TEXAS
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9/2/2021

BRIDGE LAYOUT
(SITE 26)

2021
Texas Department of Transportation®
SHEET 33 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	67

9/1/2021 9:18:48 AM
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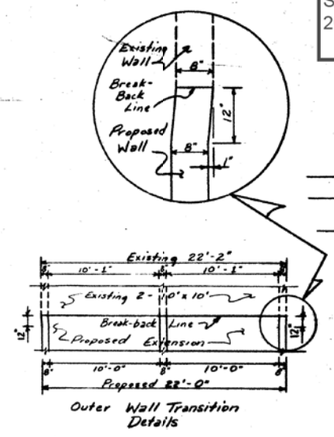
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

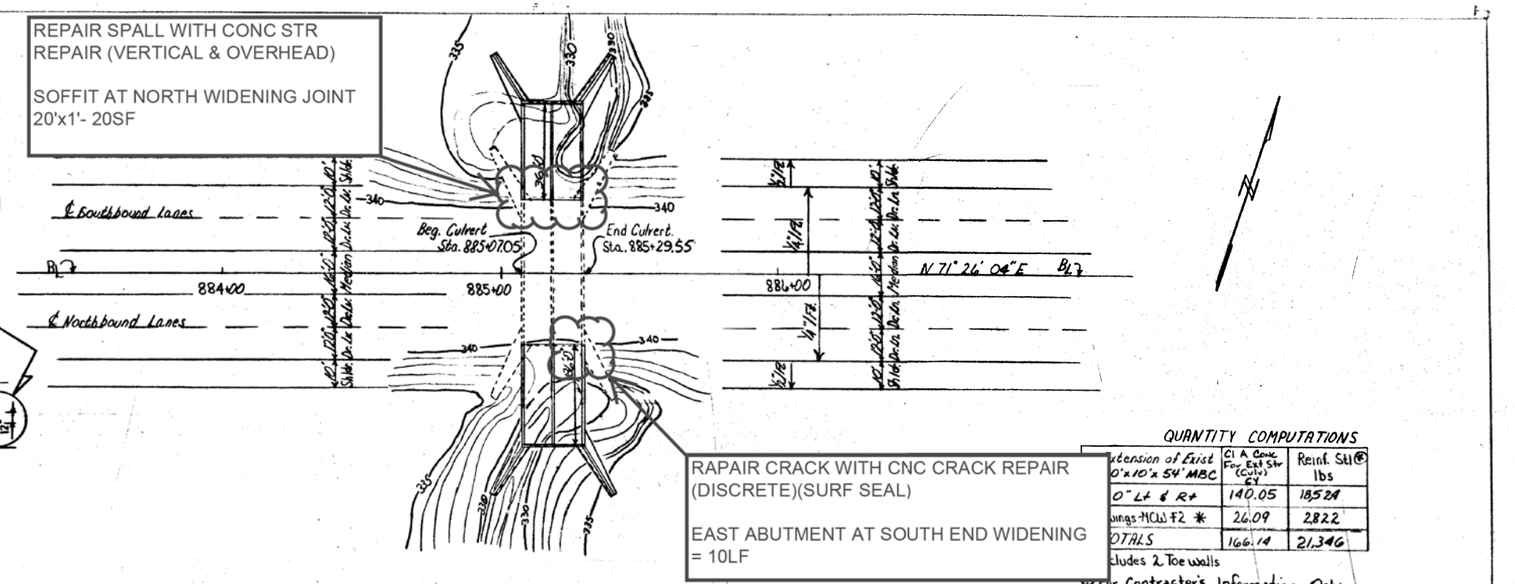
SOFFIT AT NORTH WIDENING JOINT
20'x1'- 20SF

REPAIR CRACK WITH CNC CRACK REPAIR (DISCRETE)(SURF SEAL)

EAST ABUTMENT AT SOUTH END WIDENING
= 10LF



Outer Wall Transition Details



QUANTITY COMPUTATIONS

Extension of Exist 10'x10'x54' MBC	Cl A Conc For Ext Str (Culv) CY	Reinf. Stl @ lbs
0" Lt & Rt	140.05	18,524
Wings-MCW-F2 *	26.09	2,822
TOTALS	166.14	21,346

Includes 2 Toe walls

@ For Contractor's Information Only.

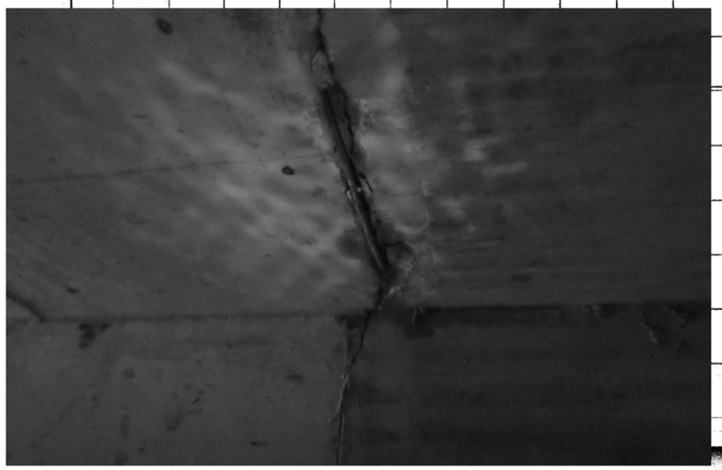
	25 yr.	100 yr.
Design (HW) =	334.43	335.10
Vel. (Nat. Chan.) =	5.45	3.74
Vel. (Thru Struc) =	4.13	6.11
Backwater =	.23	.36
Q =	826	1219

100 yr. HW=335.10 — 25 yr. HW= 334.43

℄ Sta. 885+07.05 to ℄ Sta. 885+29.55
Exist 2-10'x10'x54' MBC-10 (Mod.) with MCW-F2
Prop. Remove Hdwls, wings & 10 LF US & DS. Extend US with 2-10'x10'x36.0 LF MC-10-2 and MCW-F2. Extend DS with 2-10'x10'x36.0 LF MC-10-2 and MCW-F2, to make a 2-10'x10'x72.0' Multiple Box Culvert.

LARGE DRAINAGE STRUCTURE
INDIAN CREEK
℄ Sta. 885+07.05 to ℄ Sta. 885+29.55
NBI STRUCTURE No. 11740017507016
Scale: 1" = 20' Horiz. & Vertical

92



SPALL IN TOP SLAB AT NORTHWEST WIDENING

SITE 27-NACOGDOCHES COUNTY
US 59 @ INDIAN CREEK
11-174-0-0175-07-016

STATE OF TEXAS
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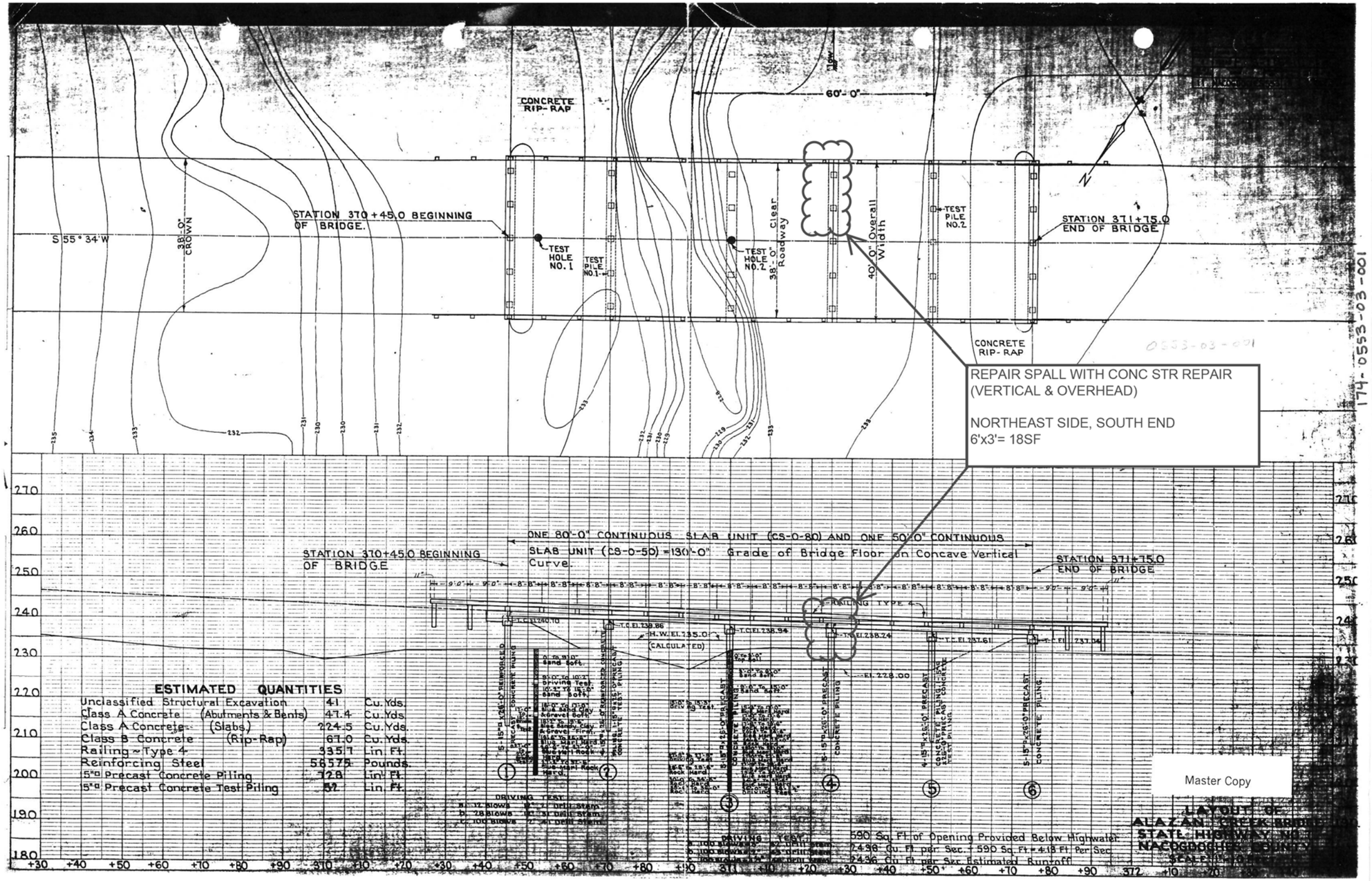
BRIDGE LAYOUT
(SITE 27)

2021 Texas Department of Transportation®
SHEET 34 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		68



ESTIMATED QUANTITIES

Unclassified Structural Excavation	41	Cu. Yds.
Class A Concrete (Abutments & Bents)	47.4	Cu. Yds.
Class A Concrete (Slabs)	224.5	Cu. Yds.
Class B Concrete (Rip-Rap)	67.0	Cu. Yds.
Railing - Type 4	335.7	Lin. Ft.
Reinforcing Steel	58575	Pounds.
15"ø Precast Concrete Piling	328	Lin. Ft.
15"ø Precast Concrete Test Piling	52	Lin. Ft.

SITE 28-NACOGDOCHES COUNTY
SH 7 @ ALAZAN CREEK
11-174-0-0553-03-001

JEREMY KING
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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

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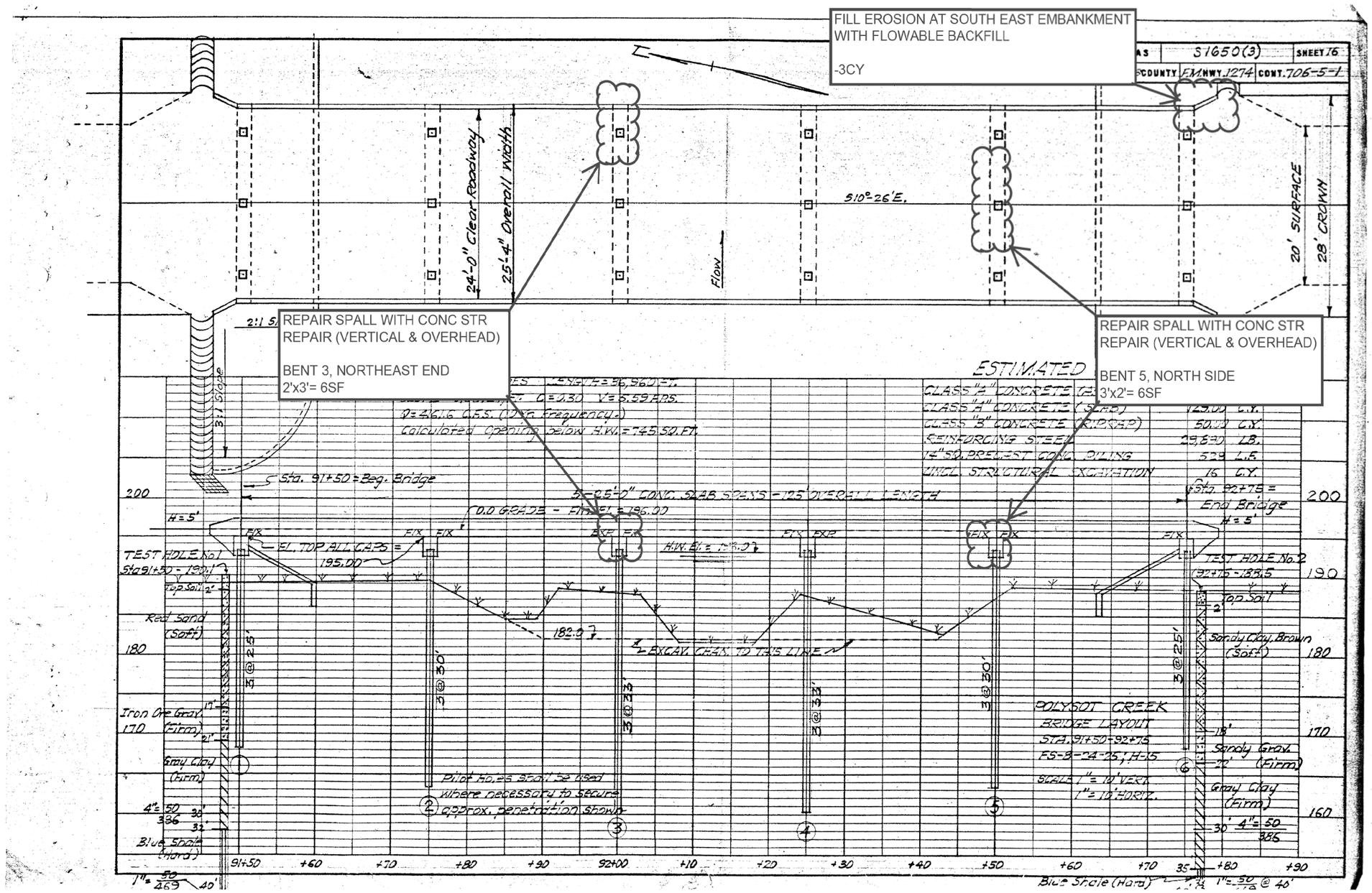
BRIDGE LAYOUT (SITE 28)

2021 Texas Department of Transportation®
SHEET 35 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		69



SITE 29-NACOGDOCHES COUNTY
FM 95 @ POLYSOT CREEK
11-174-0-0706-05-013

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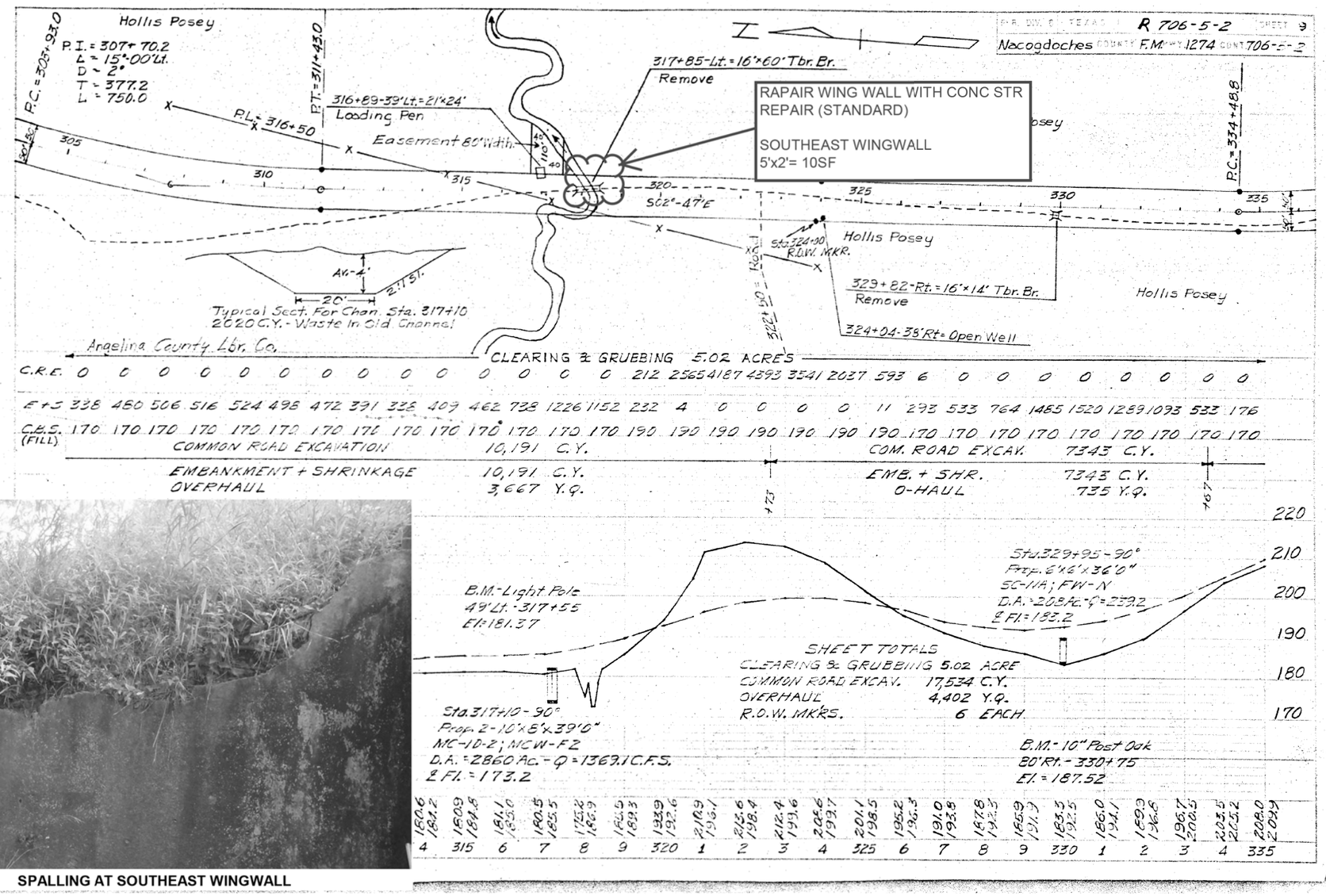
BRIDGE LAYOUT (SITE 29)

2021 Texas Department of Transportation®
SHEET 36 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		70



SPALLING AT SOUTHEAST WINGWALL

SITE 30-NACOGDOCHES COUNTY
FM 95 @ TRIB OF LAGROULLE CREEK
11-174-0-0706-05-015

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BRIDGE LAYOUT (SITE 30)

2021 Texas Department of Transportation®

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		71

FILL EROSION AT NORTHWEST CORNER WITH FLOWABLE BACKFILL

12'x1.5'x1.5'= 1CY
12'x1.5'x1.5'= 1CY
TOTAL = 2CY

ADD RIPRAP (STONE COMMON)(DRY)(12 IN)
8'x2'x1'= 0.6CY

STABILIZE EROSION ALONG NORTHWEST FLUME WITH RIPRAP (STONE COMMON) (DRY)(12 IN)

16'x2'x1'= 1.2CY

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

WEST SIDE OF BENT 2
12'x1'= 12SF

ADD RIPRAP (STONE COMMON) (DRY)(12 IN)

20'x6'x2'= 8.9CY

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

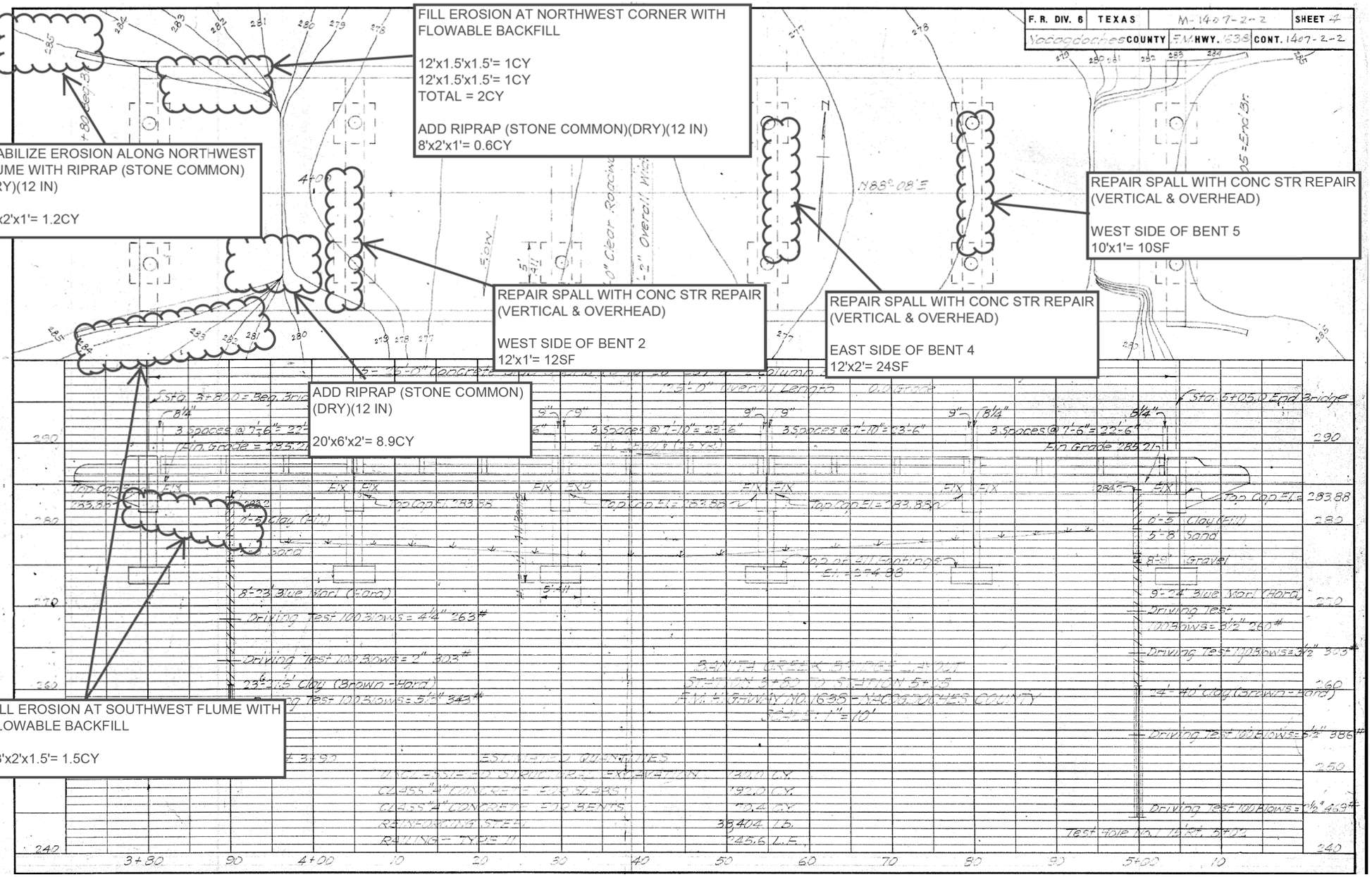
EAST SIDE OF BENT 4
12'x2'= 24SF

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

WEST SIDE OF BENT 5
10'x1'= 10SF

FILL EROSION AT SOUTHWEST FLUME WITH FLOWABLE BACKFILL

13'x2'x1.5'= 1.5CY

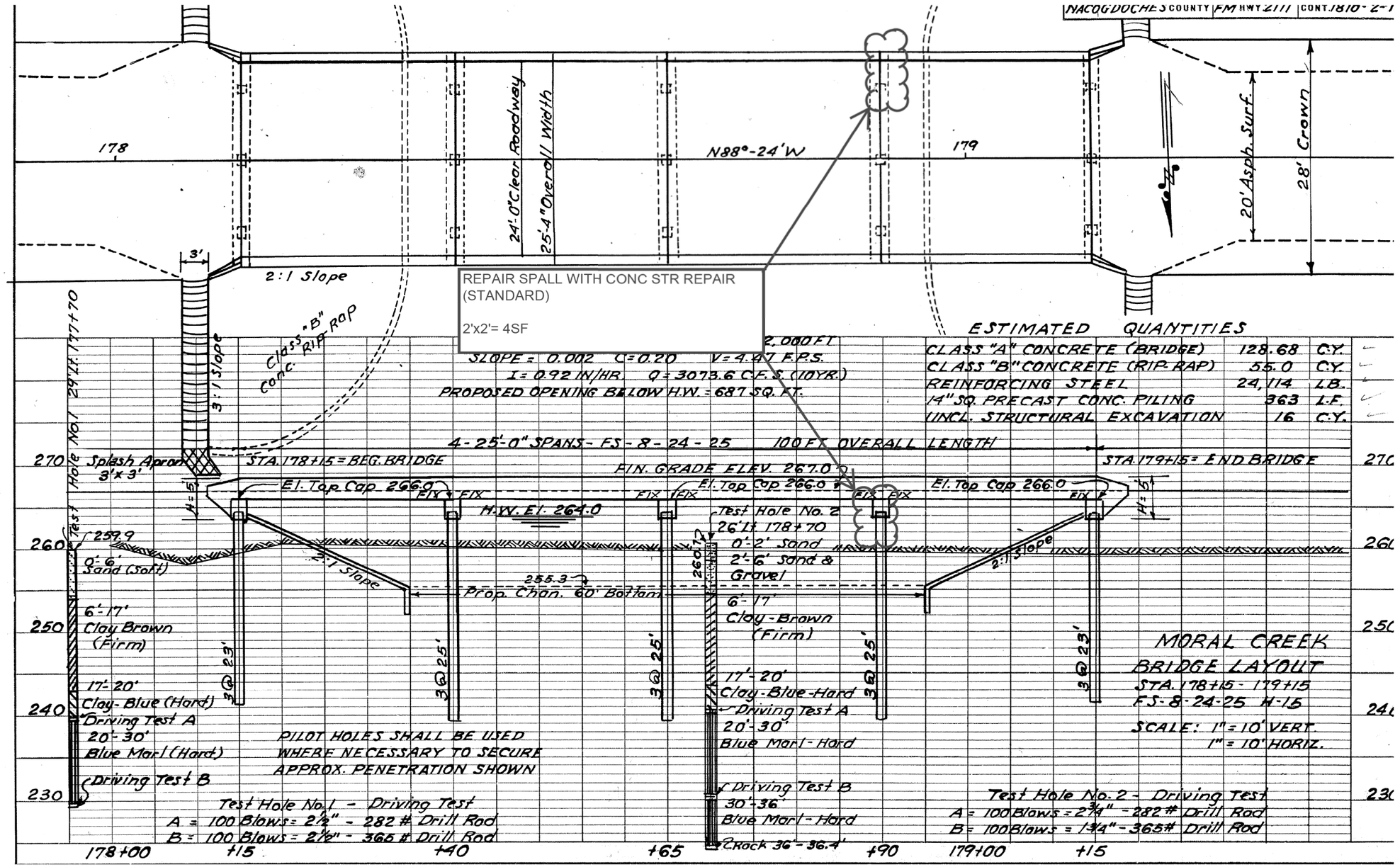


BRIDGE LAYOUT
(SITE 31)

SITE 31-NACOGDOCHES COUNTY
FM 1638 @ BANITA CREEK
11-174-0-1407-02-001

2021 Texas Department of Transportation®
SHEET 38 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		72



ESTIMATED QUANTITIES

CLASS "A" CONCRETE (BRIDGE)	128.68	C.Y.
CLASS "B" CONCRETE (RIP RAP)	55.0	C.Y.
REINFORCING STEEL	24,114	LB.
14" SQ. PRECAST CONC. PILING	363	L.F.
UNCL. STRUCTURAL EXCAVATION	16	C.Y.

MORAL CREEK BRIDGE LAYOUT

STA. 178+15 - 179+15
FS-8-24-25 H-15
SCALE: 1" = 10' VERT.
1" = 10' HORIZ.

SITE 32-NACOGDOCHES COUNTY
FM 225 @ MORRAL BAYOU
11-174-0-1810-02-002

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102170
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STATE OF TEXAS

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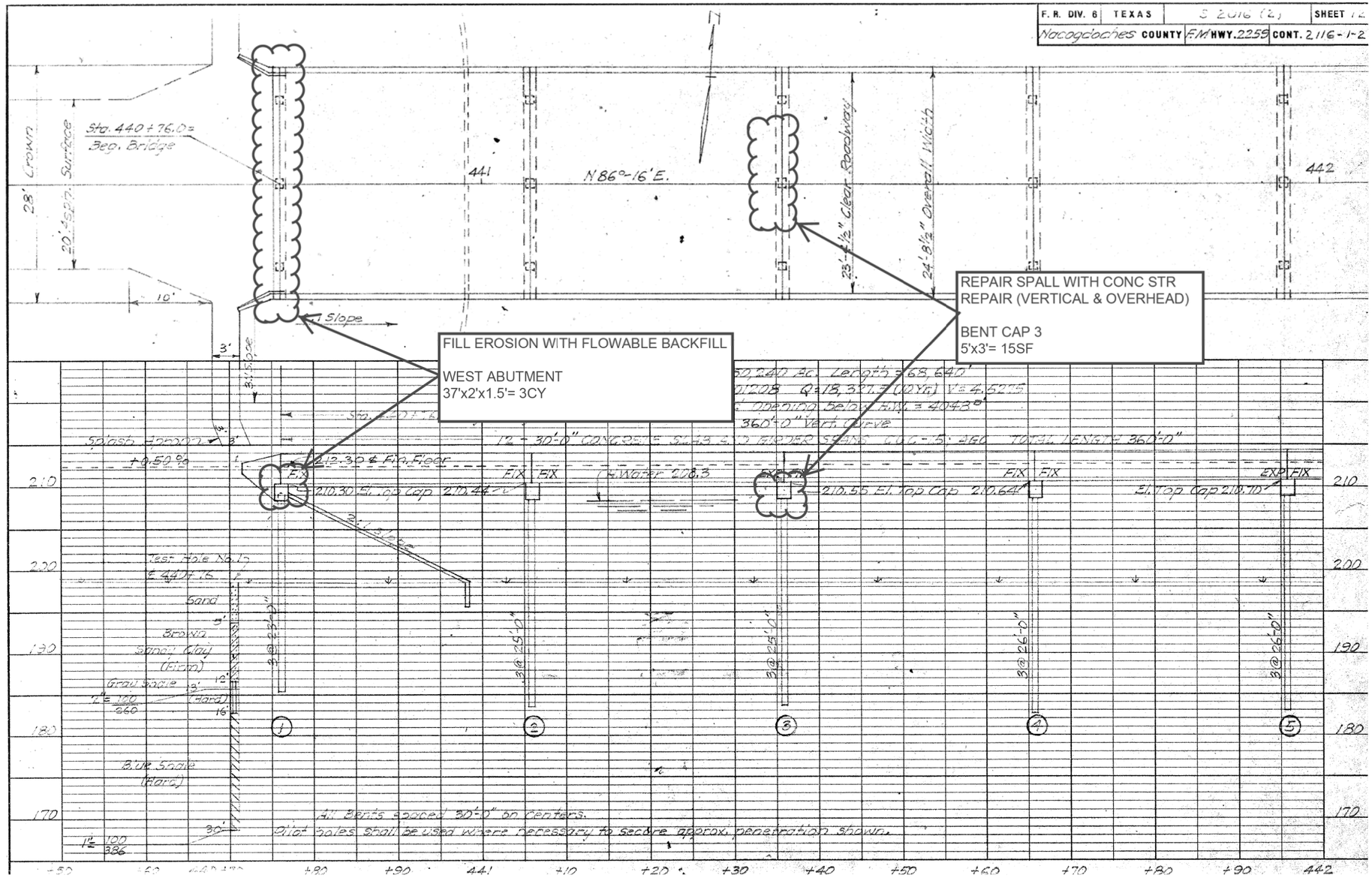
BRIDGE LAYOUT
(SITE 32)

2021
Texas Department of Transportation®
SHEET 39 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		73

F. R. DIV. 6	TEXAS	S 2016 (2)	SHEET 12
Nacogdoches COUNTY	FM HWY. 2255	CONT. 2116-1-2	



SITE 33-NACOGDOCHES COUNTY
FM 2259 @ CARRIZO CREEK
11-174-0-2116-01-001

STATE OF TEXAS
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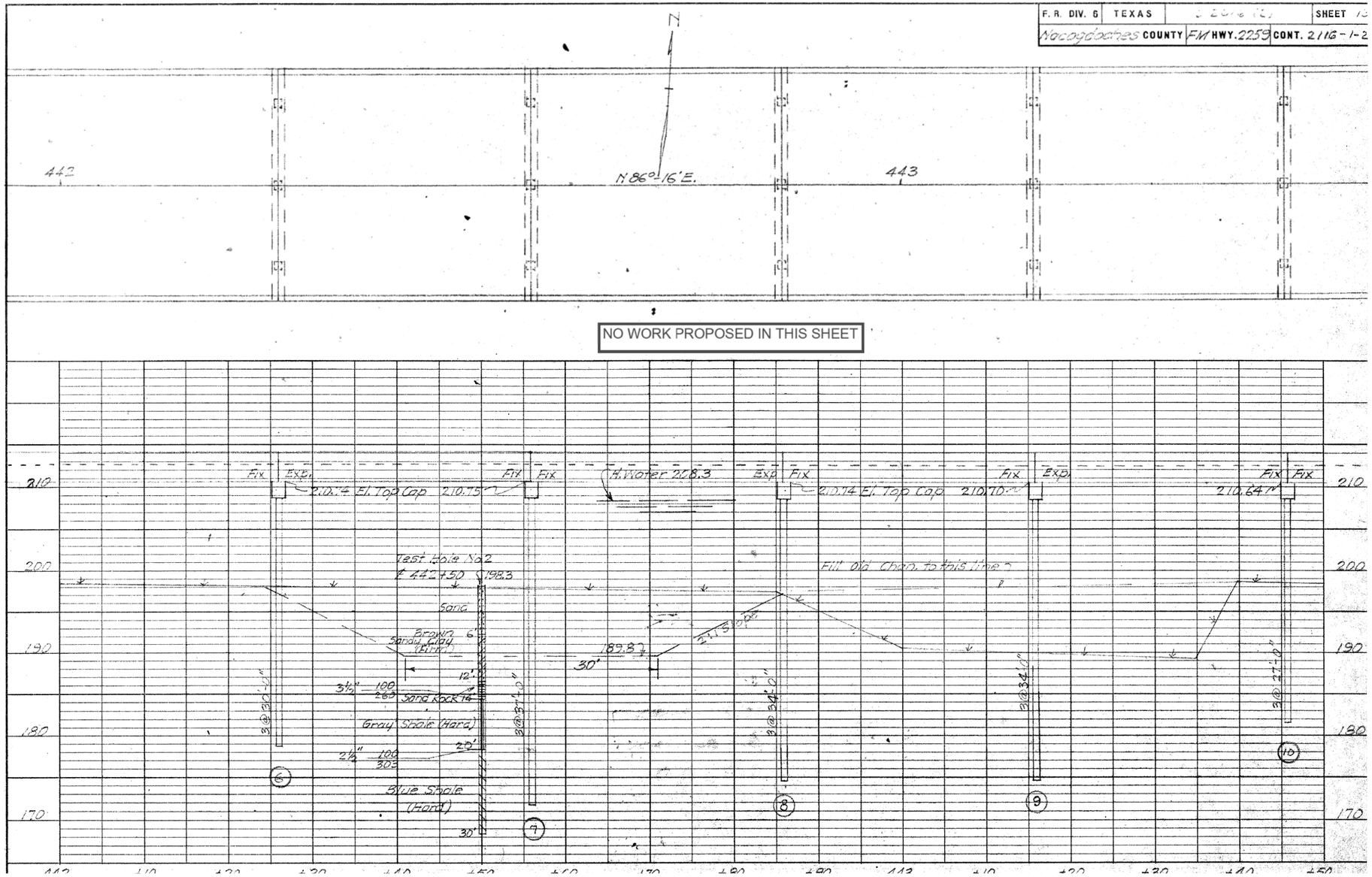
9/2/2021

BRIDGE LAYOUT
(SITE 33)

2021
Texas Department of Transportation®
SHEET 40 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		74



SITE 33-NACOGDOCHES COUNTY
FM 2259 @ CARRIZO CREEK
11-174-0-2116-01-001

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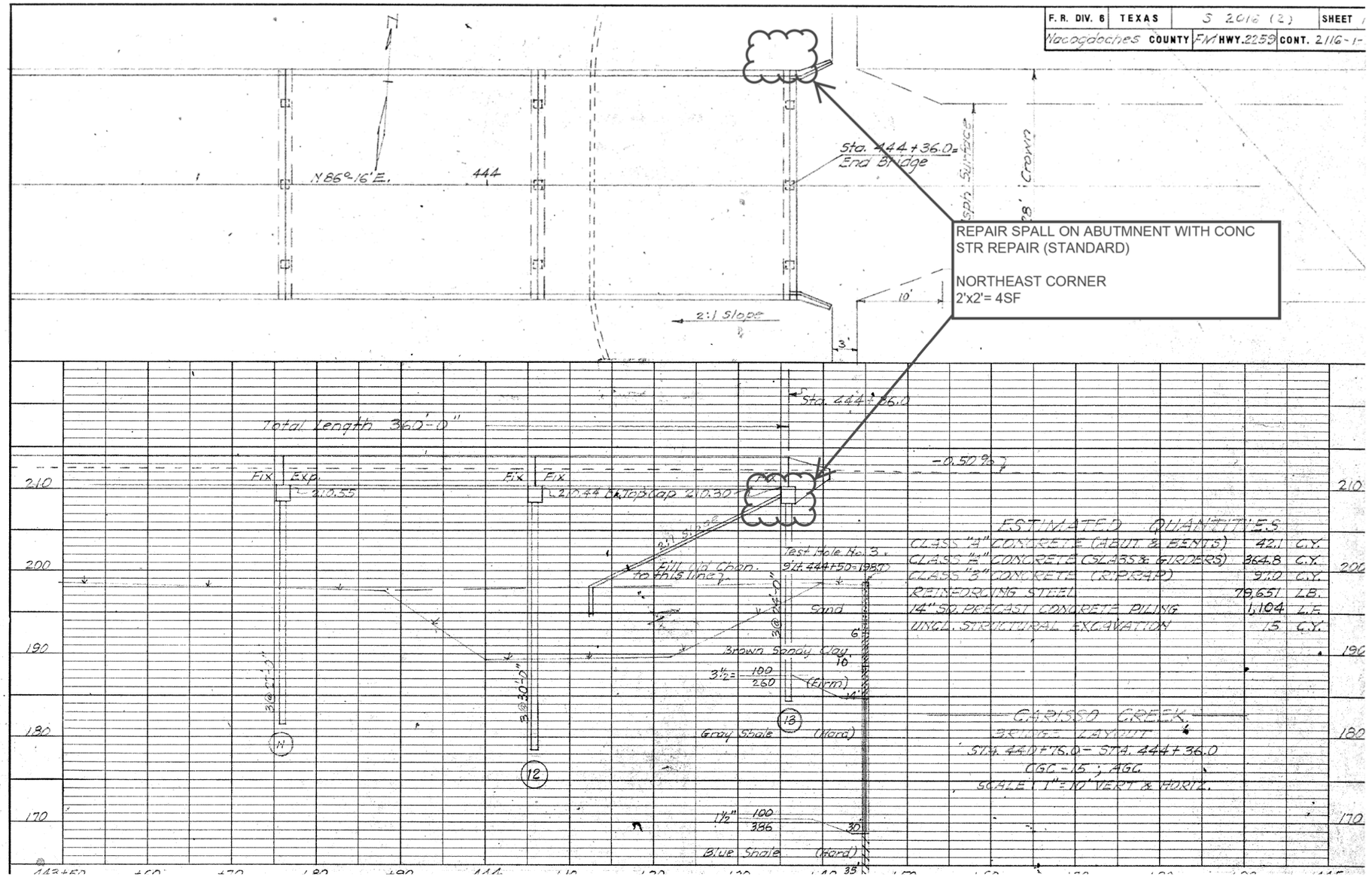
BRIDGE LAYOUT (SITE 33)

2021 Texas Department of Transportation®

SHEET 41 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		75

F. R. DIV. 6	TEXAS	S 2016 (2)	SHEET /
Nacogdoches COUNTY	FM HWY. 2259	CONT. 2116-1-	



ESTIMATED QUANTITIES

CLASS "S" CONCRETE (ABUT. & BENTS)	42.1	C.Y.
CLASS "H" CONCRETE (CLASS S GIRDERS)	364.8	C.Y.
CLASS "B" CONCRETE (RIPRAP)	9.0	C.Y.
REINFORCING STEEL	79,651	LB.
14" SQ. PRECAST CONCRETE PILING	1,104	L.F.
UNCL. STRUCTURAL EXCAVATION	15	C.Y.

CARRIZO CREEK
BRIDGE LAYOUT
STA. 440+76.0 - STA. 444+36.0
CGC-15 ; AGC
SCALE 1"=10' VERT & HORIZ.

SITE 33-NACOGDOCHES COUNTY
FM 2259 @ CARRIZO CREEK
11-174-0-2116-01-001

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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9/2/2021

BRIDGE LAYOUT (SITE 33)

2021 Texas Department of Transportation®

SHEET 42 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		76

WEST EMBANKMENT EROSION

ADD RIPRAP (STONE COMMON)(DRY)(24 IN)
20'x8'x2'= 12CY

EAST EMBANKMENT EROSION

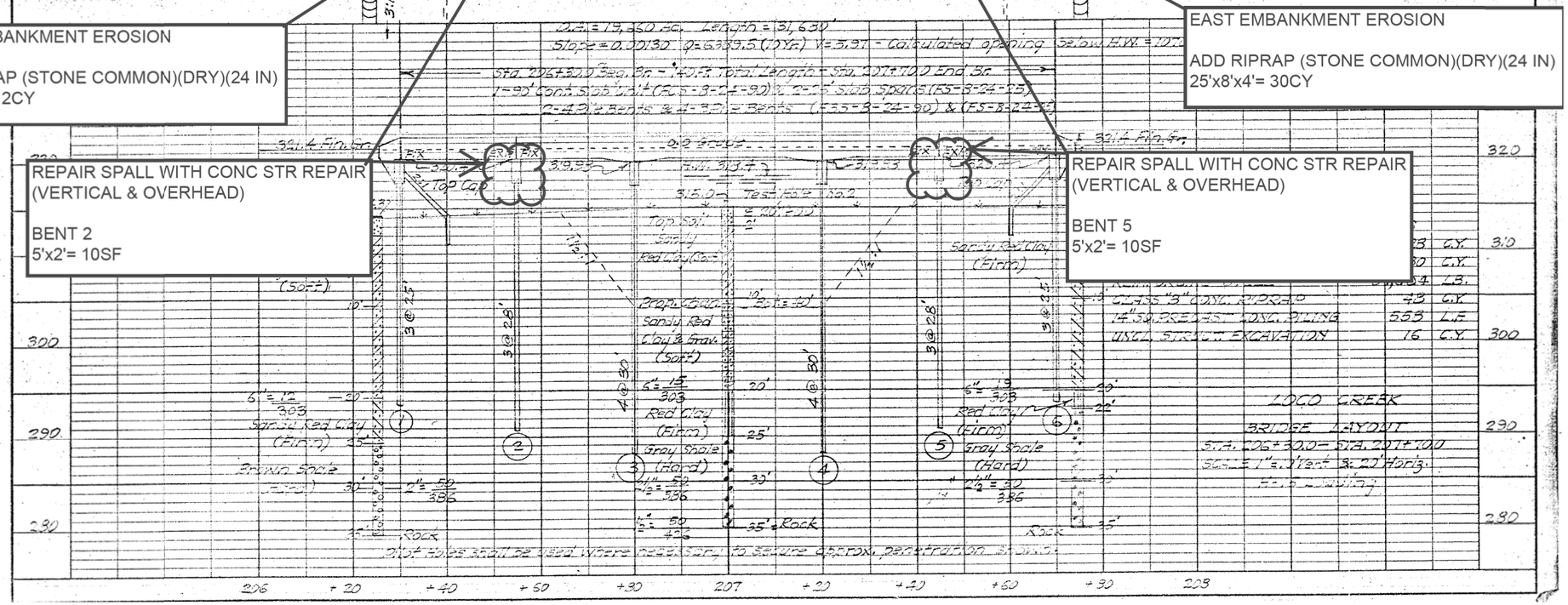
ADD RIPRAP (STONE COMMON)(DRY)(24 IN)
25'x8'x4'= 30CY

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

BENT 2
5'x2'= 10SF

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

BENT 5
5'x2'= 10SF

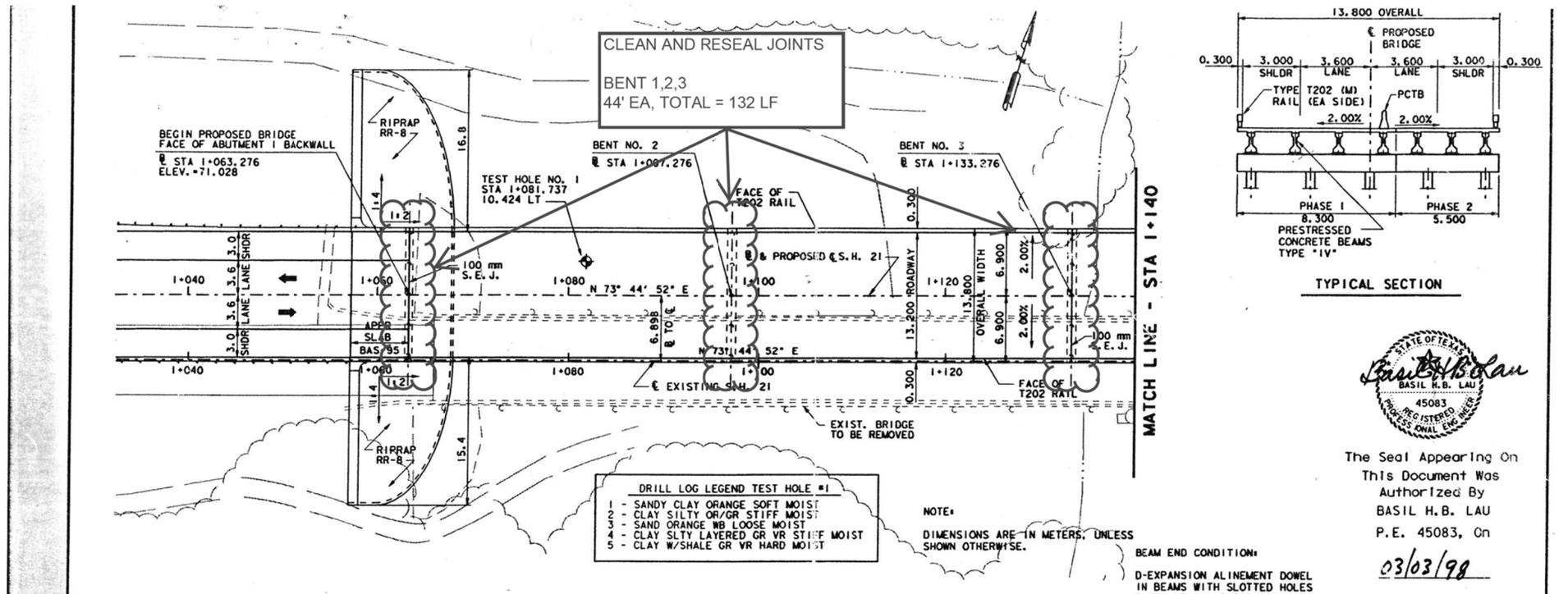


BRIDGE LAYOUT (SITE 34)

SITE 34-NACOGDOCHES COUNTY
FM 343 @ LOCO CREEK
11-174-0-2300-01-001

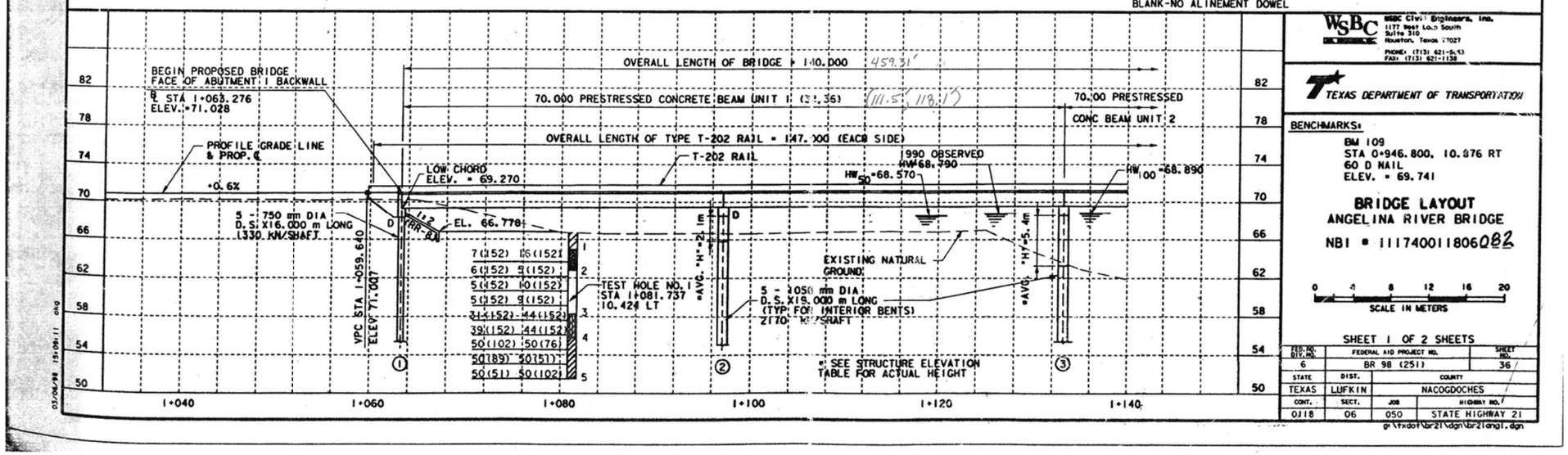
2021 Texas Department of Transportation®
SHEET 43 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		77



TYPICAL SECTION

The Seal Appearing On This Document Was Authorized By BASIL H.B. LAU P.E. 45083, On 03/03/98



WSBC Civil Engineers, Inc.
1177 West Loop South
Suite 310
Houston, Texas 77027
PHONE: (713) 621-5453
FAX: (713) 621-1139

TEXAS DEPARTMENT OF TRANSPORTATION

BENCHMARKS:
BM 109
STA 0+946.800, 10.876 RT
60 D NAIL
ELEV. = 69.741

BRIDGE LAYOUT
ANGELINA RIVER BRIDGE
NBI = 111740011806082

SCALE IN METERS 0 4 8 12 16 20

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	BR 98 (251)	36

STATE	DIST.	COUNTY
TEXAS	LUFKIN	NACOGDOCHES

CONT.	SECT.	JOB	HIGHWAY NO.
0118	06	050	STATE HIGHWAY 21

g:\txdot\br21\dgn\br21angl.dgn

JEREMY KING 102170 LICENSED PROFESSIONAL ENGINEER

DocuSigned by: Jeremy King, P.E. 5135292FE4184A4...

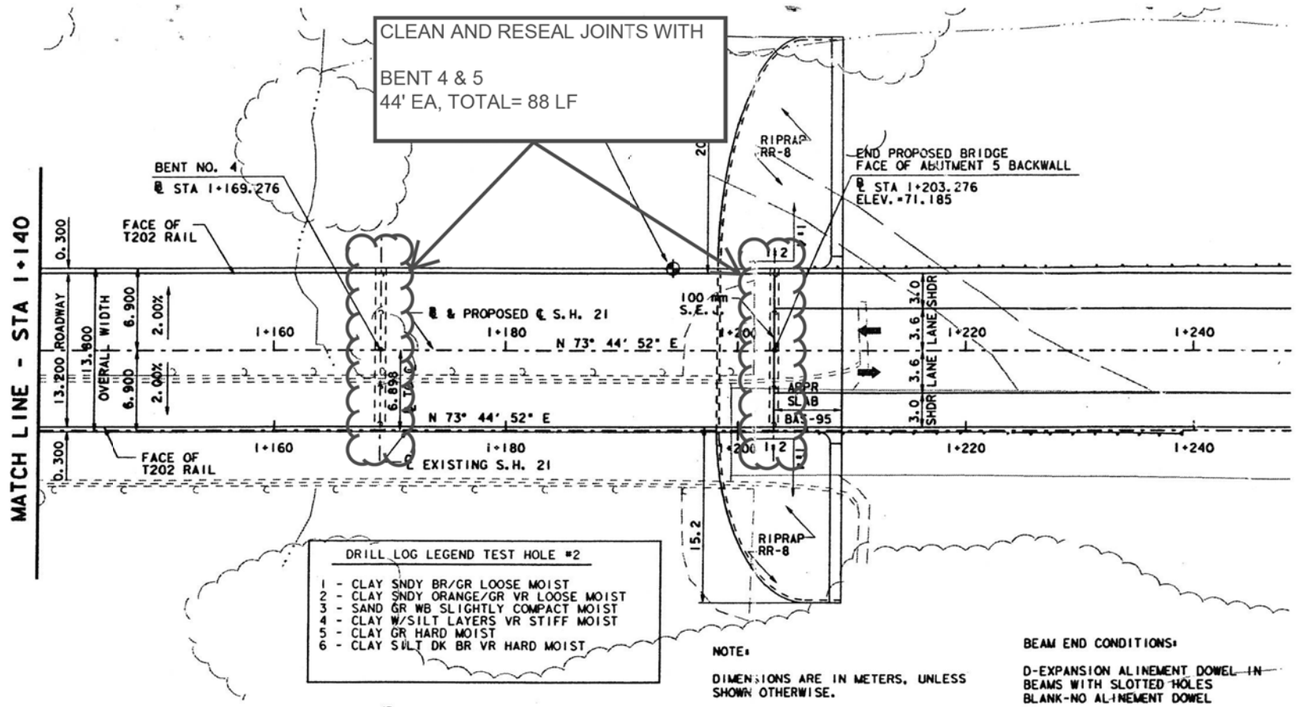
9/2/2021

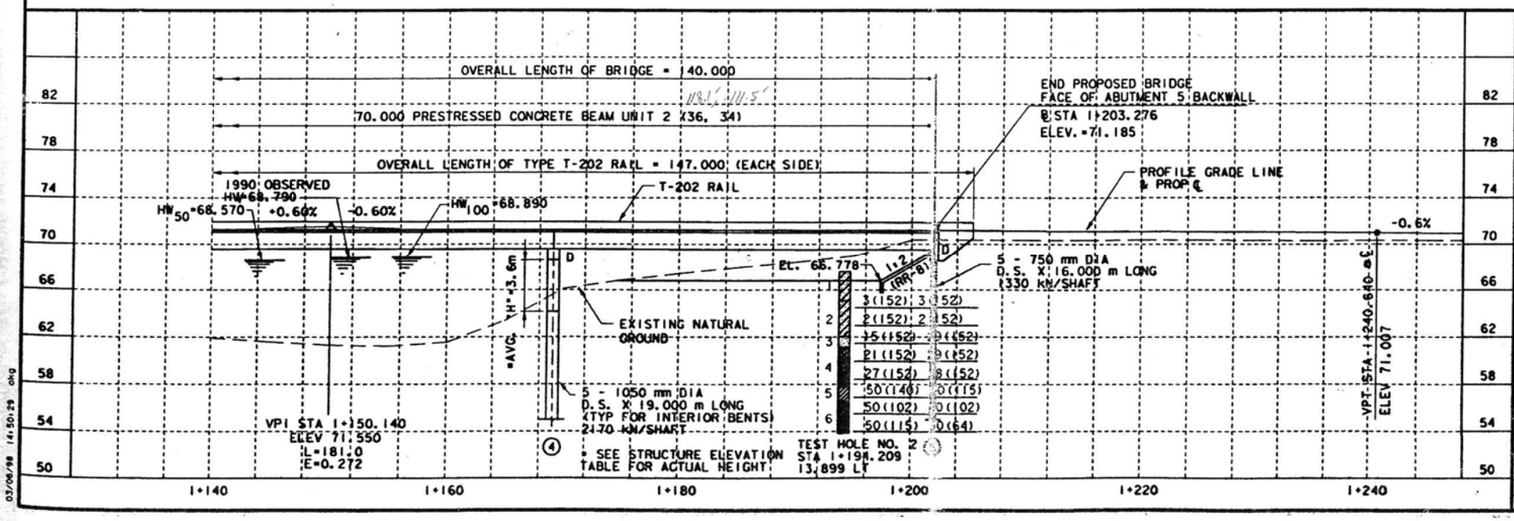
BRIDGE LAYOUT
(SITE 35)

SITE 35-NACOGDOCHES COUNTY
SH 21 @ ANGELINA RIVER
11-174-0-0118-06-082

2021 Texas Department of Transportation®
SHEET 44 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		78





WSBC Civil Engineers, Inc.
1177 West Loop South
Suite 310
Houston, Texas 77027
PHONE: (713) 621-2555
FAX: (713) 621-1136

TEXAS DEPARTMENT OF TRANSPORTATION

BENCHMARKS:

BM 109
STA 0+946.800, 10.876 RT
60 D NAIL
ELEV. = 69.741

BRIDGE LAYOUT
ANGELINA RIVER BRIDGE

0 4 8 12 16 20
SCALE IN METERS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	BR 98 (251)	37

STATE	DIST.	COUNTY
TEXAS	LUFKIN	NACOGDOCHES

CONT.	SECT.	JOB	HIGHWAY NO.
0118	06	050	STATE HIGHWAY 21

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STATE OF TEXAS
BASIL H.B. LAU
45083
REGISTERED PROFESSIONAL ENGINEER

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03/03/98

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT
(SITE 35)

SITE 35-NACOGDOCHES COUNTY
SH 21 @ ANGELINA RIVER
11-174-0-0118-06-082

2021
Texas Department of Transportation®
SHEET 45 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		79

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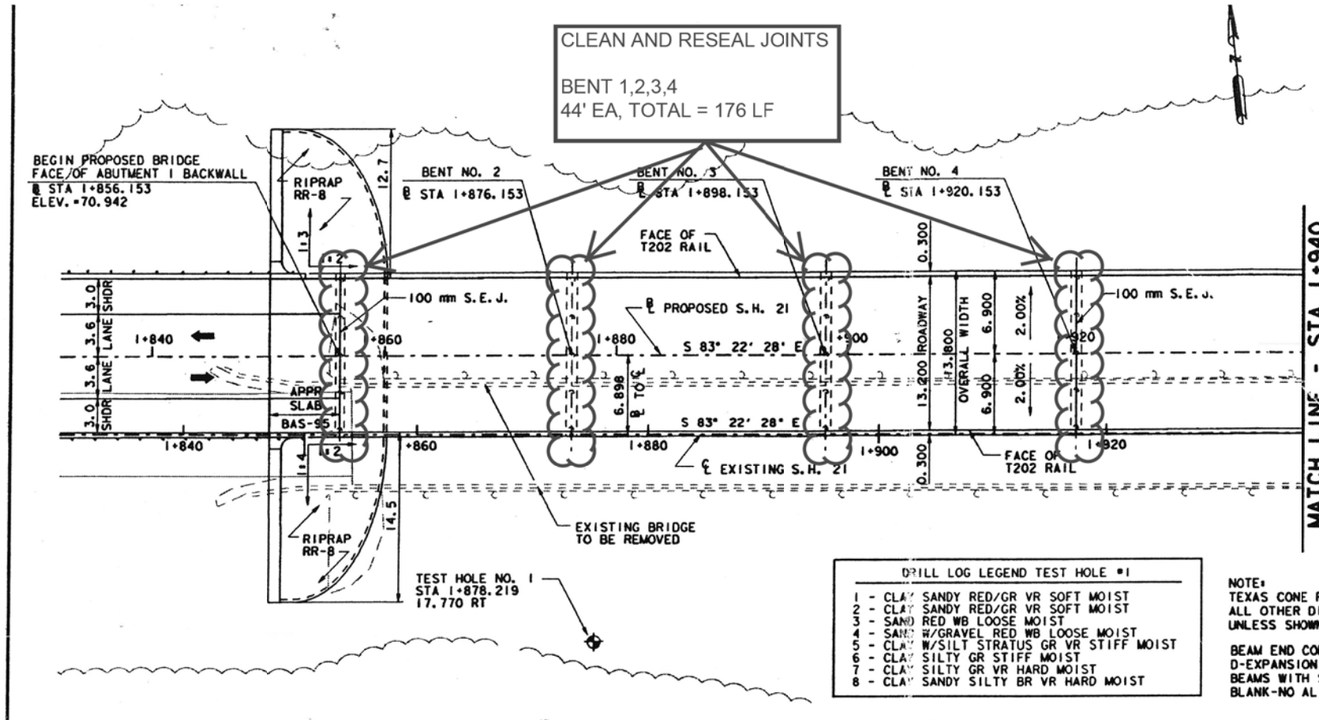
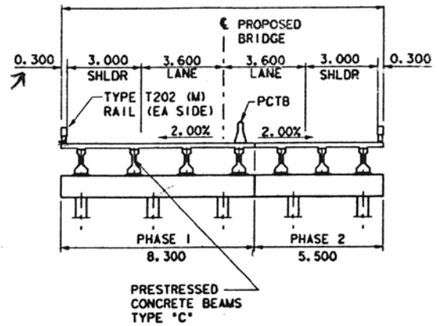
T:\LFKDOM\Maint Contracts\Design\BPM 6384-24-001 NORTH\DGN\BRIDGE LAYOUTS\(35) 11-174-0-0118-06-082 (Site-).dgn

CLEAN AND RESEAL JOINTS

BENT 1,2,3,4
44' EA, TOTAL = 176 LF





TYPICAL TRANSVERSE SECTION

DRILL LOG LEGEND TEST HOLE #1

1	CLAY SANDY RED/GR VR SOFT MOIST
2	CLAY SANDY RED/GR VR SOFT MOIST
3	SAND RED WB LOOSE MOIST
4	SAND W/GRAVEL RED WB LOOSE MOIST
5	CLAY W/SILT STRATUS GR VR STIFF MOIST
6	CLAY SILTY GR STIFF MOIST
7	CLAY SILTY GR VR HARD MOIST
8	CLAY SANDY SILTY BR VR HARD MOIST

NOTE:
TEXAS CONE PENETRATION DATA IN MILLIMETERS.
ALL OTHER DIMENSIONS ARE IN METERS,
UNLESS SHOWN OTHERWISE.

BEAM END CONDITIONS:
D-EXPANSION ALINEMENT DOWEL IN
BEAMS WITH SLOTTED HOLES
BLANK-NO ALINEMENT DOWEL

STATE OF TEXAS
BASIL H.B. LAU
45083
REGISTERED PROFESSIONAL ENGINEER

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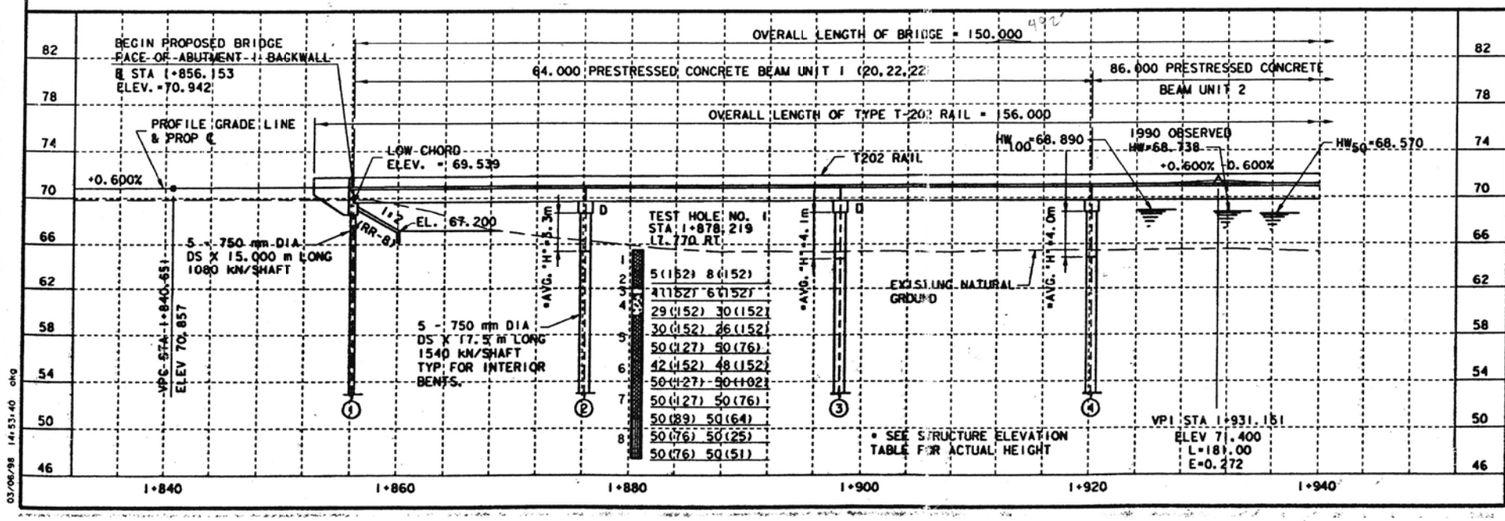

WSBC Civil Engineers, Inc.
1177 West Loop South
Suite 316
Houston, Texas 77027
PHONE: (713) 621-5853
FAX: (713) 621-1750

TEXAS DEPARTMENT OF TRANSPORTATION

BENCHMARKS:

BM 251
STA 2+158.446, 21.339 RT
⅝" IRON ROD
ELEV. = 66.547

BRIDGE LAYOUT
ANGELINA RIVER
RELIEF BRIDGE

NBI = 111740011806083

0 4 8 12 16 20
SCALE IN METERS

SHEET 1 OF 2 SHEETS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	BR 98 (251)	45
STATE	DIST.	COUNTY
TEXAS	LUFKIN	NACOGDOCHES
CONT.	SECT.	JOB	HIGHWAY NO.
0118	06	050	STATE HIGHWAY 21

g:\txdot\br21\dgn\br21rail.dgn

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT (SITE 36)

SITE 36-NACOGDOCHES COUNTY
SH 21 @ ANGELINA RIVER REIEF
11-174-0-0118-06-083

2021
Texas Department of Transportation®
SHEET 46 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		80

9/1/2021 9:20:55 AM
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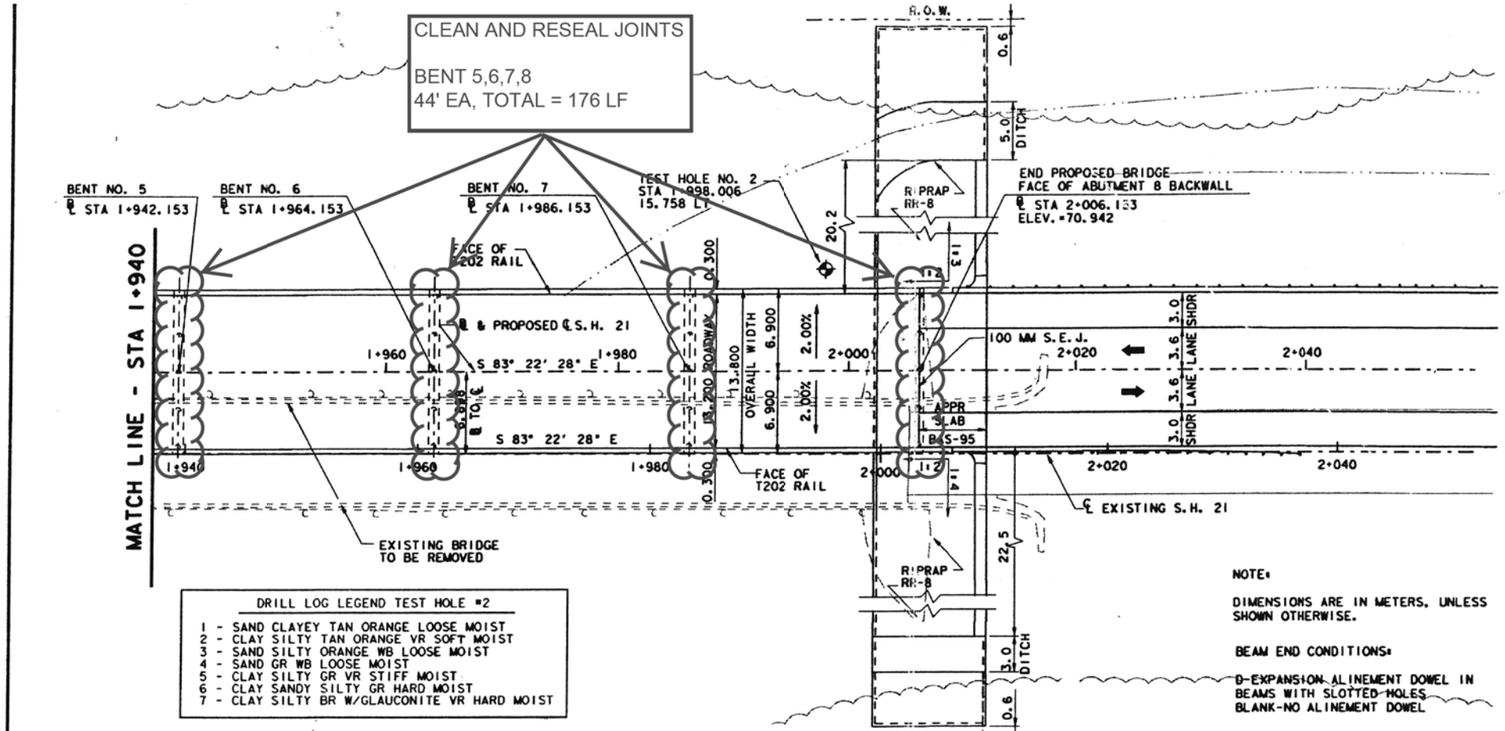
CLEAN AND RESEAL JOINTS

BENT 5,6,7,8
44' EA, TOTAL = 176 LF



DRILL LOG LEGEND TEST HOLE #2

1 - SAND CLAYEY TAN ORANGE LOOSE MOIST
2 - CLAY SILTY TAN ORANGE VR SOFT MOIST
3 - SAND SILTY ORANGE WB LOOSE MOIST
4 - SAND GR WB LOOSE MOIST
5 - CLAY SILTY GR VR STIFF MOIST
6 - CLAY SANDY SILTY GR HARD MOIST
7 - CLAY SILTY BR W/GLAUCONITE VR HARD MOIST

NOTE:

DIMENSIONS ARE IN METERS, UNLESS SHOWN OTHERWISE.

BEAM END CONDITIONS:

D-EXPANSION ALINEMENT DOWEL IN BEAMS WITH SLOTTED HOLES
BLANK-NO ALINEMENT DOWEL

STATE OF TEXAS
BASIL H.B. LAU
45083
REGISTERED PROFESSIONAL ENGINEER

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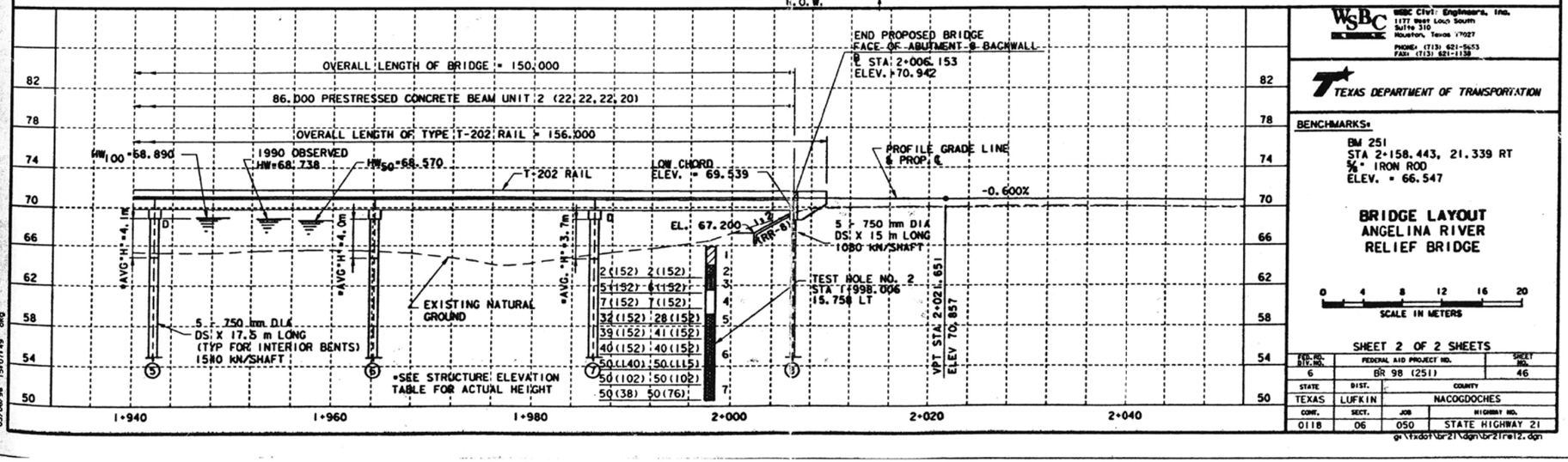

WSBC Civil Engineers, Inc.
1177 West Loop South
Suite 310
Houston, Texas 77027
PHONE: (713) 621-5653
FAX: (713) 621-1138

TEXAS DEPARTMENT OF TRANSPORTATION

BENCHMARKS:

BM 251
STA 2+158.443, 21.339 RT
⅝" IRON ROD
ELEV. = 66.547

BRIDGE LAYOUT
ANGELINA RIVER
RELIEF BRIDGE

0 4 8 12 16 20
SCALE IN METERS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	BR 98 (251)	46
STATE	DIST.	COUNTY
TEXAS	LUFKIN	NACOGDOCHES
CONT.	SECT.	JOB	HIGHWAY NO.
0118	06	050	STATE HIGHWAY 21

gr\txdot\br21\dgn\br21re12.dgn

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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BRIDGE LAYOUT
(SITE 36)

SITE 36-NACOGDOCHES COUNTY
SH 21 @ ANGELINA RIVER REIEF
11-174-0-0118-06-083

2021
Texas Department of Transportation®
SHEET 47 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		81

9/1/2021 9:21:04 AM
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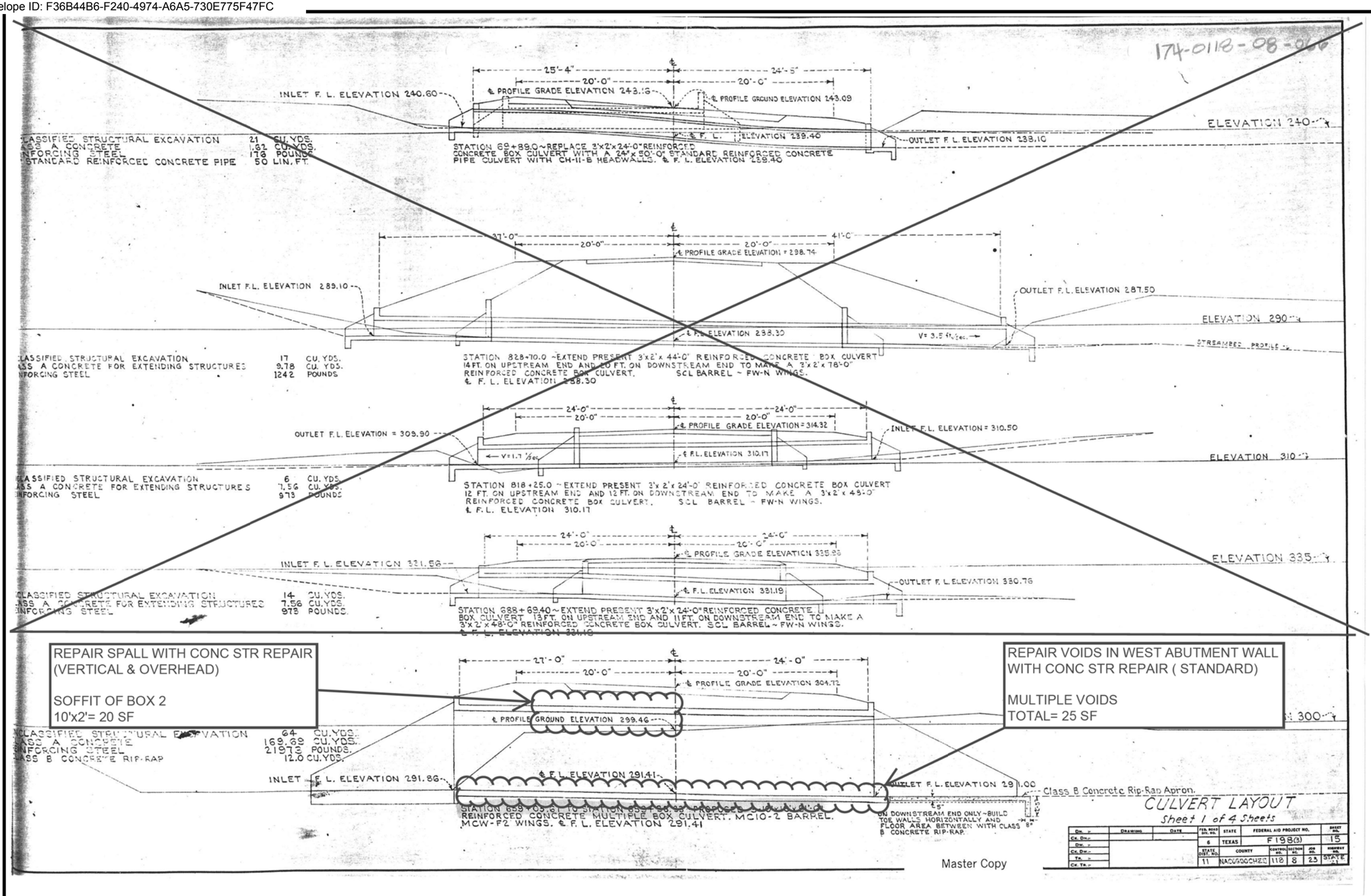
174-0118-08-066



SITE 37- NACOGDOCHES COUNTY
SH 21 @ MOSS CREEK
11-174-0-0118-08-066

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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Jeremy King, P.E.
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9/2/2021

BRIDGE LAYOUT (SITE 37)

Texas Department of Transportation®

SHEET 48 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		82

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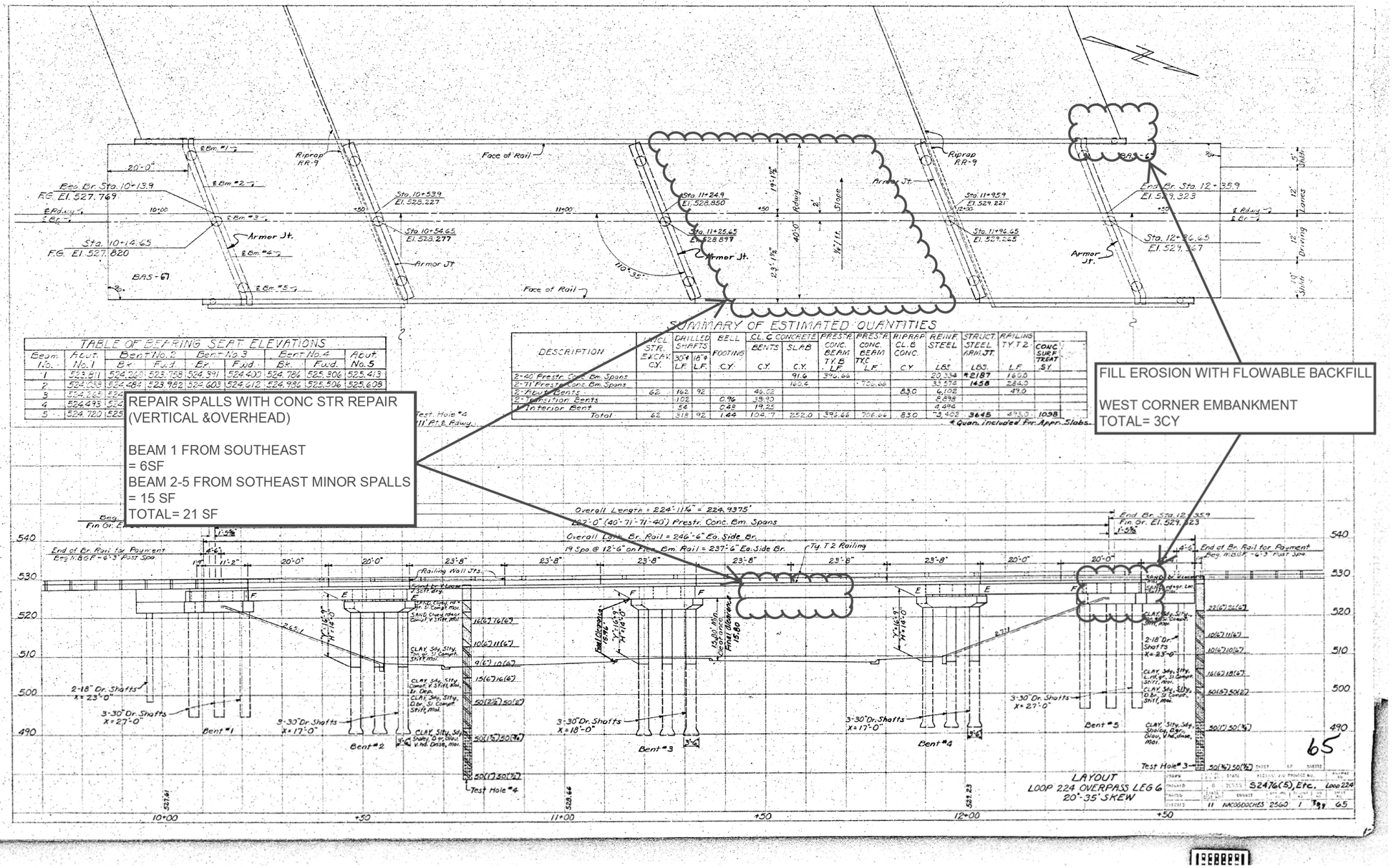

TABLE OF BEARING SEAT ELEVATIONS

Beam No.	Abut. No.1	Bent No.2 Bk.	Bent No.2 Fwd.	Bent No.3 Bk.	Bent No.3 Fwd.	Bent No.4 Bk.	Bent No.4 Fwd.	Abut. No.5
1	523.811	524.240	523.758	524.391	524.400	524.786	525.306	525.413
2	524.055	524.484	523.982	524.603	524.612	524.986	525.506	525.608
3	524.225	524.654						
4	524.495	524.924						
5	524.720	525.149						

SUMMARY OF ESTIMATED QUANTITIES

DESCRIPTION	MISCL STR. EXCAV. C.Y.	DRILLED SHAFTS 30" L.F.	DRILLED SHAFTS 18" L.F.	BELL FOOTING C.Y.	CL. C CONCRETE BENTS C.Y.	CL. C CONCRETE SLAB C.Y.	PRESTR. CONC. BEAM TY.C L.F.	PRESTR. CONC. BEAM TYC L.F.	RIPRAP CL. B CONC. C.Y.	REINF. STEEL LBS.	STRUCT. STEEL FRM. JT. LBS.	RAILING TY T 2 L.F.	CONC SURF TREAT S.Y.
2-40' Prestr. Conc. Bm. Spans						91.6	394.66			20,334	*2187	160.0	
2-11' Prestr. Conc. Bm. Spans						160.6		706.66		33,672	1458	284.0	
2-Rein. Conc. Bents	62	162	92		46.52				83.0	6,102		41.0	
2-Reinforced Bents		102		0.96	38.90					8,898			
1-Interior Bent		54		0.48	19.25					4,494			
Total	62	318	92	1.44	104.7	252.0	394.66	706.66	83.0	73,503	3645	485.0	1038

*Quan. included for Appr. Slabs.

REPAIR SPALLS WITH CONC STR REPAIR (VERTICAL &OVERHEAD)

BEAM 1 FROM SOUTHEAST
= 6SF
BEAM 2-5 FROM SOTHEAST MINOR SPALLS
= 15 SF
TOTAL= 21 SF

FILL EROSION WITH FLOWABLE BACKFILL

WEST CORNER EMBANKMENT
TOTAL= 3CY

LAYOUT
LOOP 224 OVERPASS LEG G
20°-35' SKEW

SITE 38- NACOGDOCHES COUNTY
US 259 NB @ US 59
11-174-0-0175-07-079

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT (SITE 38)

Texas Department of Transportation®

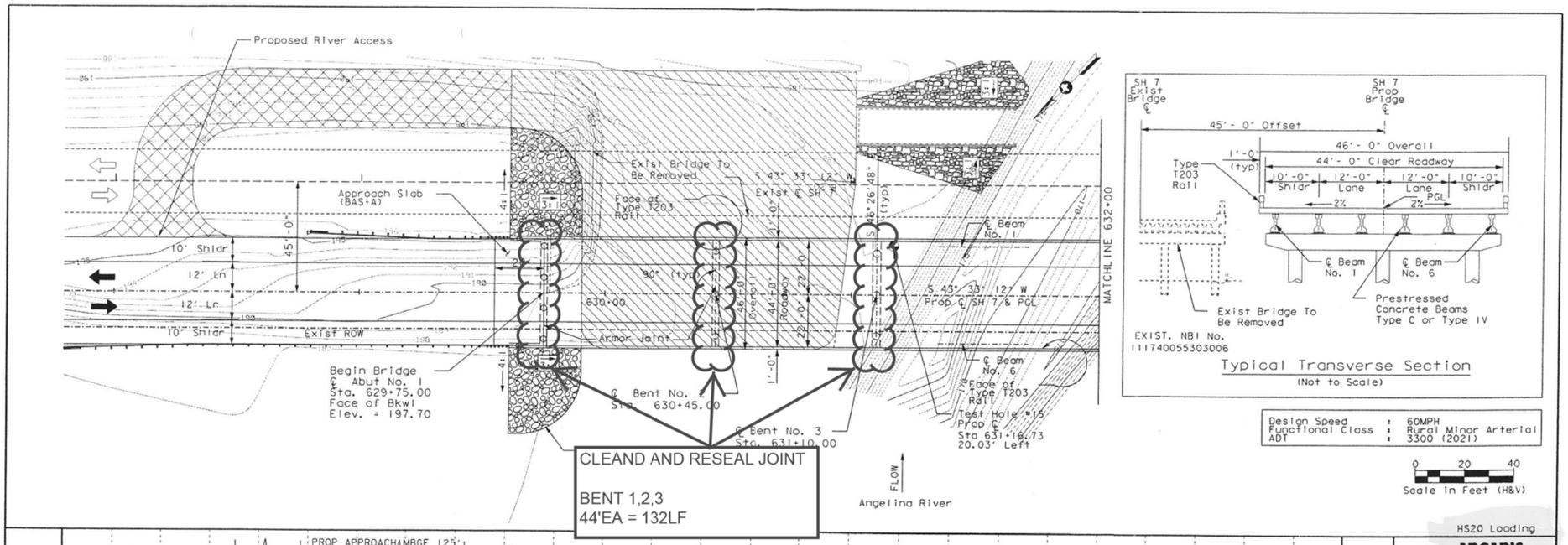
SHEET 49 OF 82

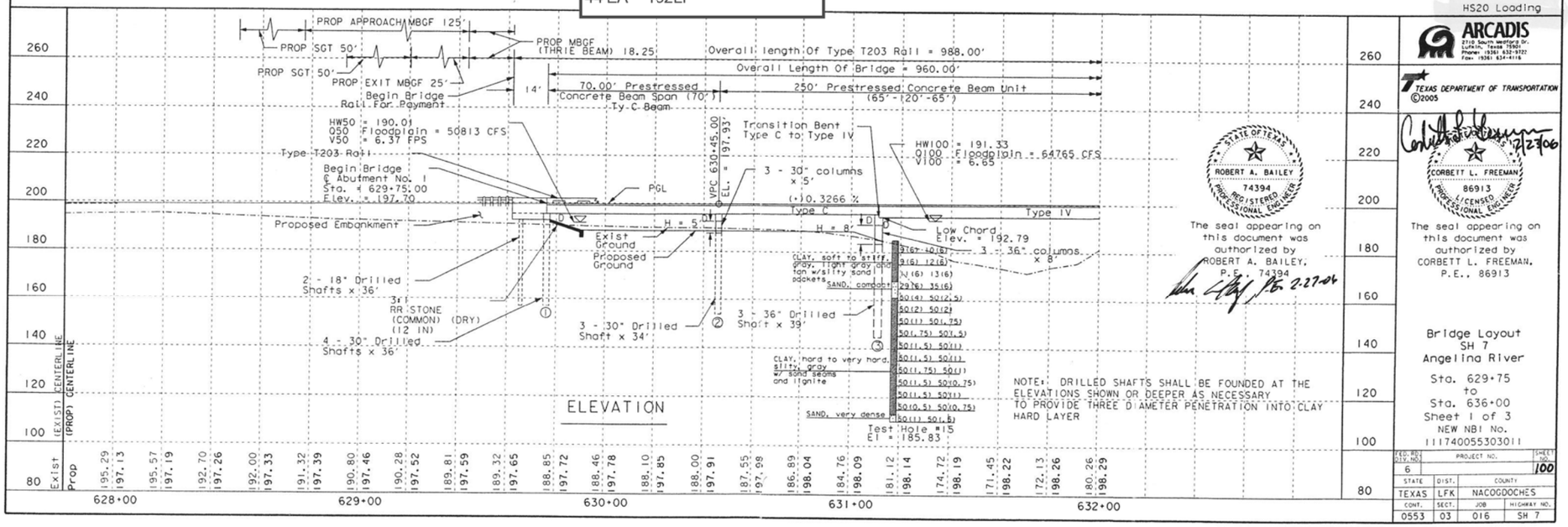
CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		83

STATE	DISTRICT	COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
TEXAS	11	NACOGDOCHES	2560	1	39	65

S2476(5), Etc. Loop 224

65





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JEREMY KING 102170 LICENSED PROFESSIONAL ENGINEER

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9/2/2021

Bridge Layout
SH 7
Angelina River
Sta. 629+75
to
Sta. 636+00
Sheet 1 of 3
NEW NBI No.
111740055303011

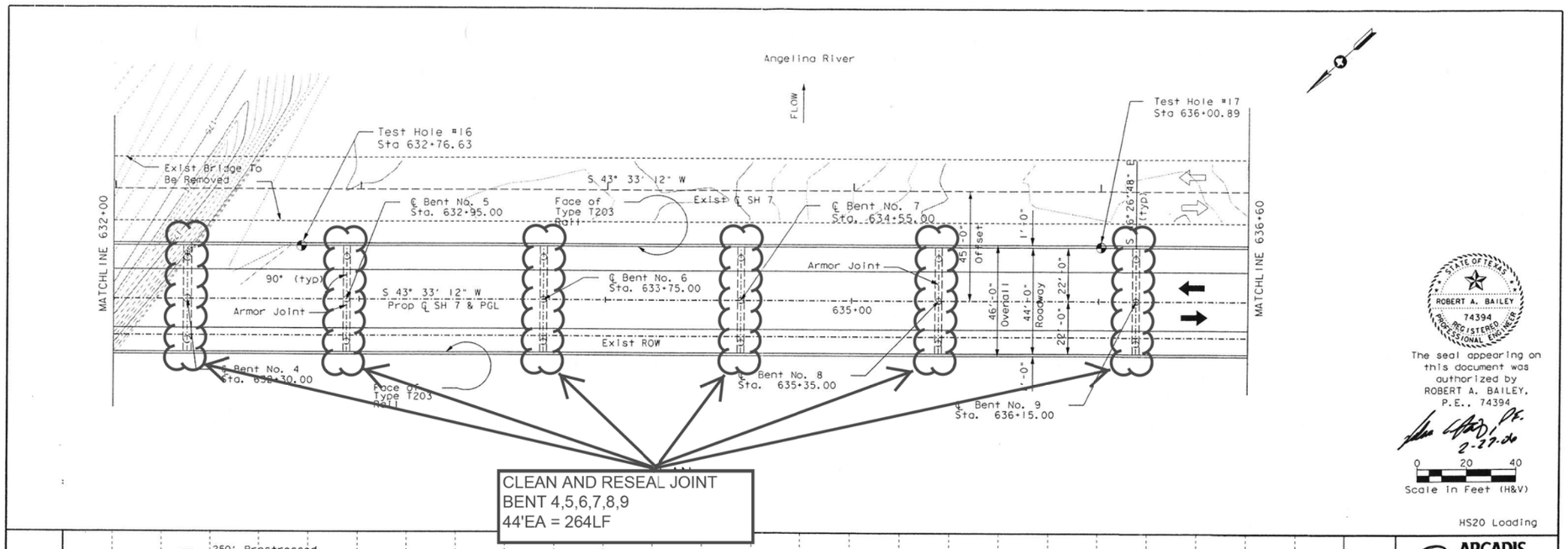
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			100
STATE	DIST.	COUNTY	
TEXAS	LFK	NACOGDOCHES	
CONT.	SECT.	JOB	HIGHWAY NO.
0553	03	016	SH 7

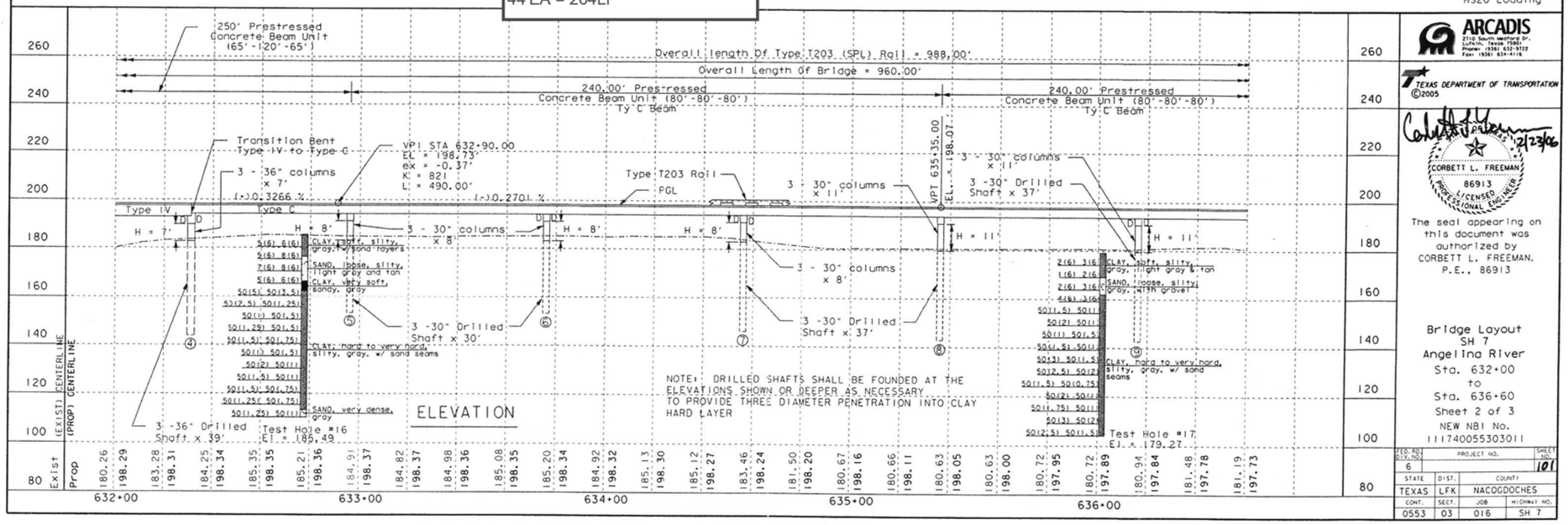
BRIDGE LAYOUT (SITE 39)

SITE 39-NACOGDOCHES COUNTY
SH 7 @ ANGELINA RIVER
11-174-0-0553-03-011

2021 Texas Department of Transportation®
SHEET 50 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		84





ROBERT A. BAILEY
74394
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS

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2-27-06

ARCADIS
3110 South Hartford Dr.
Lufkin, Texas 75901
Phone: (936) 632-9722
Fax: (936) 634-4116

TEXAS DEPARTMENT OF TRANSPORTATION
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86913
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STATE OF TEXAS

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Bridge Layout
SH 7
Angelina River
Sta. 632+00
to
Sta. 636+60
Sheet 2 of 3
NEW NBI No.
111740055303011

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			101
STATE	DIST.	COUNTY	
TEXAS	LFK	NACOGDOCHES	
CONT.	SECT.	JOB	HIGHWAY NO.
0553	03	016	SH 7

JEREMY KING
102170
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STATE OF TEXAS

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Jeremy King, P.E.
5135292FE4184A4...

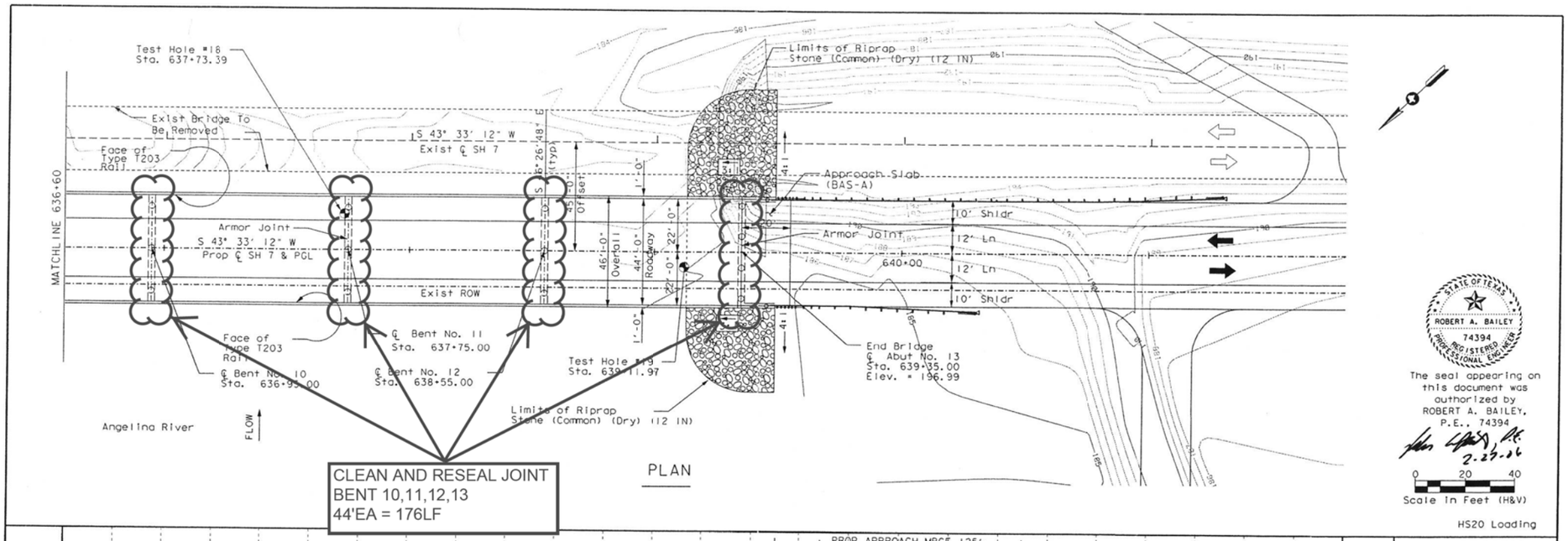
9/2/2021

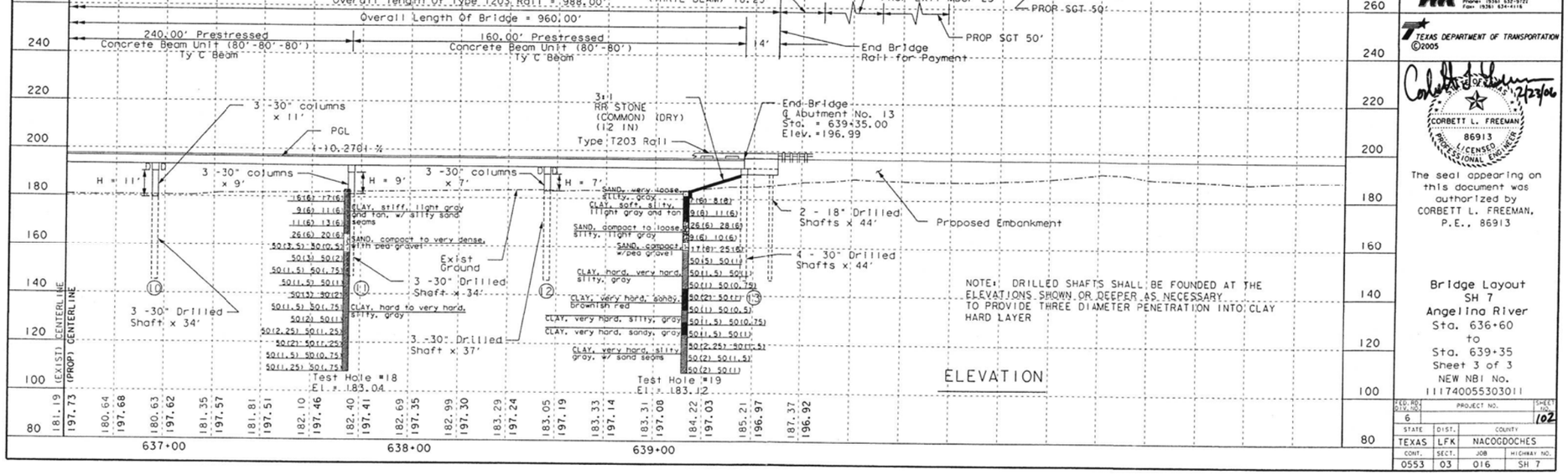
BRIDGE LAYOUT (SITE 39)

SITE 39-NACOGDOCHES COUNTY
SH 7 @ ANGELINA RIVER
11-174-0-0553-03-011

2021
Texas Department of Transportation®
SHEET 51 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		85





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2-27-06

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JEREMY KING 102170 LICENSED PROFESSIONAL ENGINEER

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9/2/2021

ARCADIS
2710 South Mesquite Dr.
Lufkin, Texas 75901
Phone: (936) 632-9722
Fax: (936) 634-4116

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Bridge Layout
SH 7
Angelina River
Sta. 636+60
to
Sta. 639+35
Sheet 3 of 3
NEW NBI No.
111740055303011

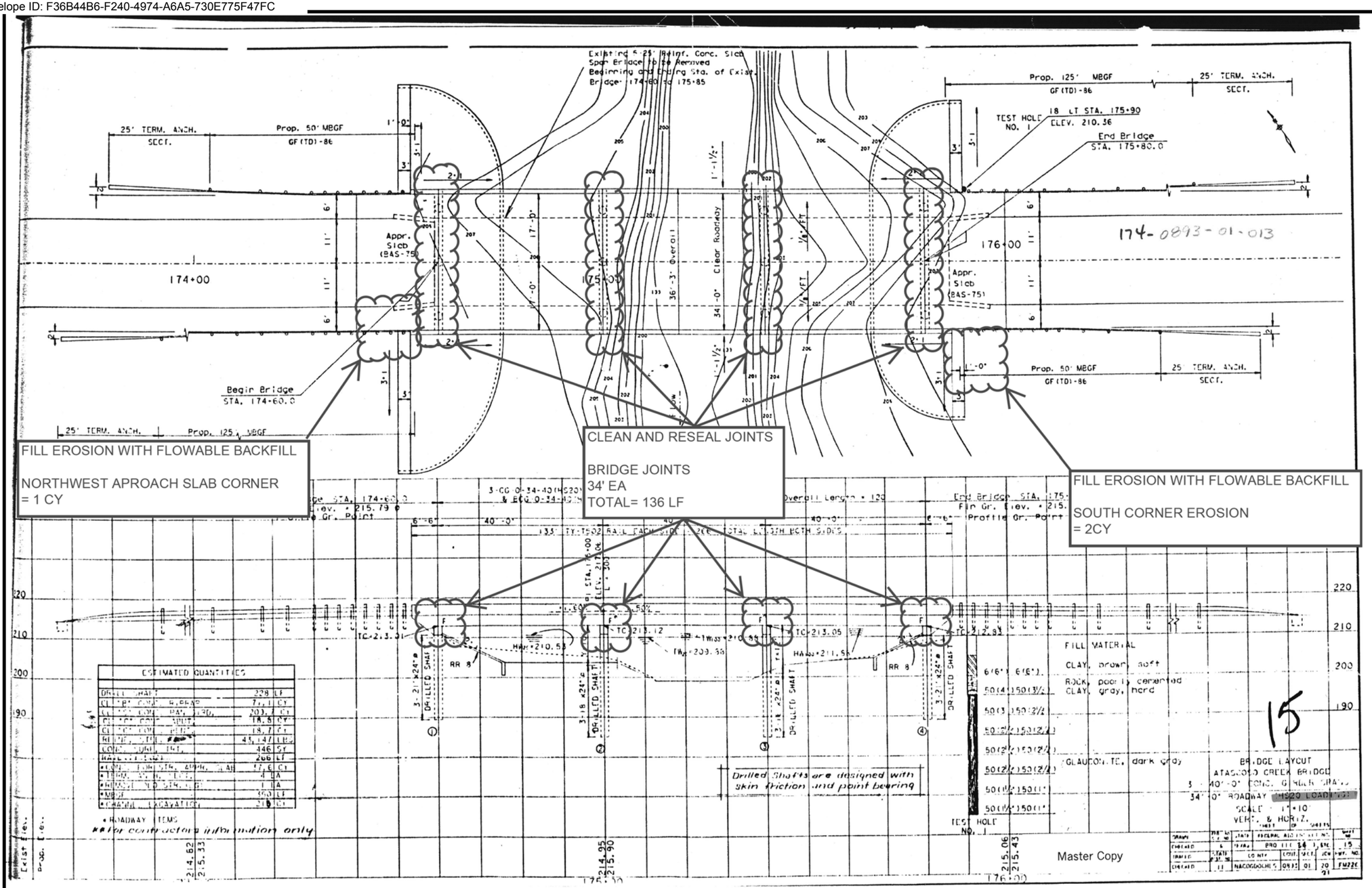
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			102
STATE	DIST.	COUNTY	
TEXAS	LFK	NACOGDOCHES	
CONT.	SECT.	JOB	HIGHWAY NO.
0553	03	016	SH 7

BRIDGE LAYOUT (SITE 39)

SITE 39-NACOGDOCHES COUNTY
SH 7 @ ANGELINA RIVER
11-174-0-0553-03-011

2021 Texas Department of Transportation®
SHEET 52 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		86



SITE 40- NACOGDOCHES COUNTY
FM 226 @ ATASCOSO CREEK
11-174-0-0893-01-013

JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

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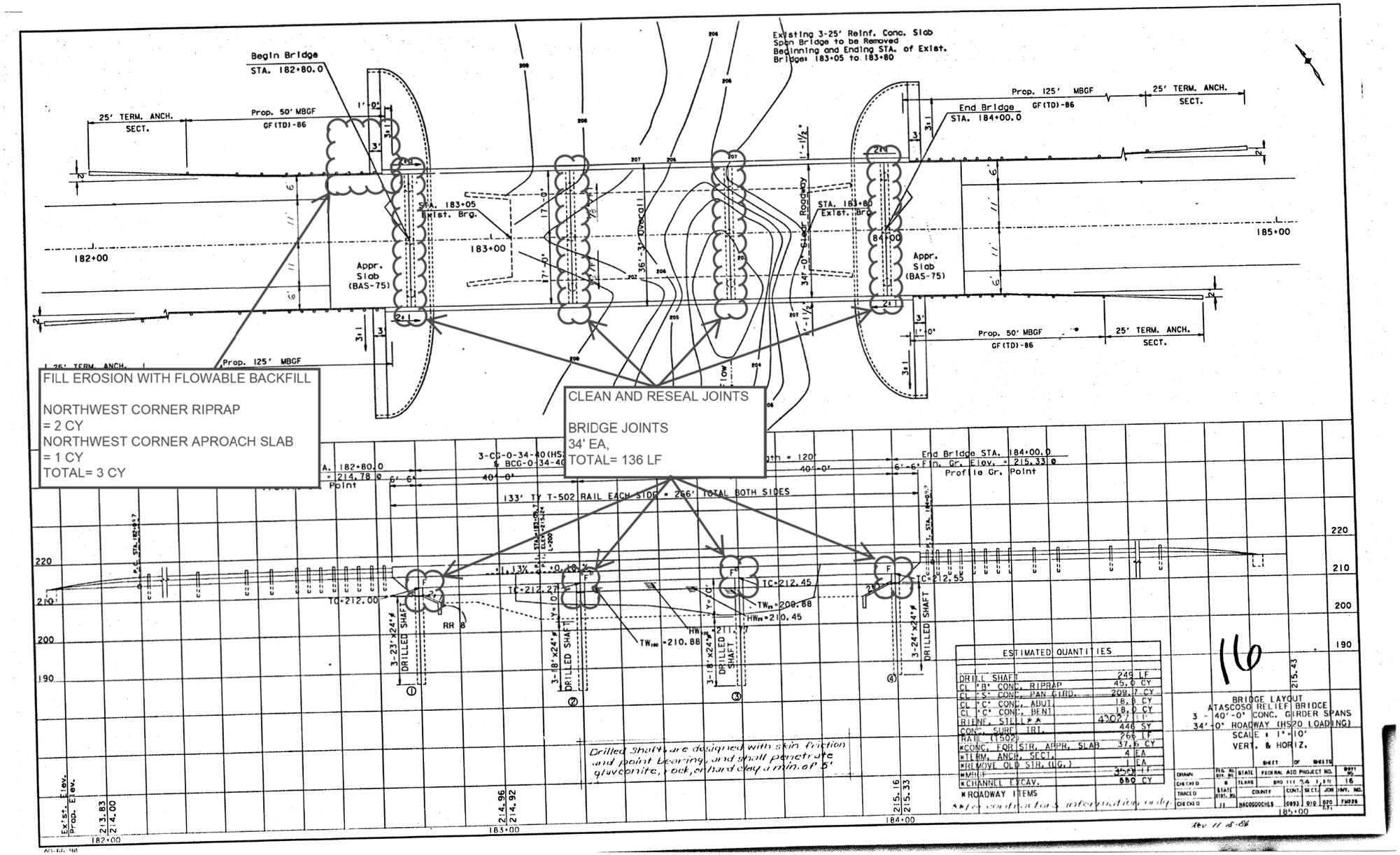
Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 40)

Texas Department of Transportation®
SHEET 53 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		87



ESTIMATED QUANTITIES	
DRILL SHAFT	249 LF
CL "B" CONC. RIPRAP	45.0 CY
CL "S" CONC. PAN GIRD.	209.7 CY
CL "C" CONC. ABUT.	18.8 CY
CL "C" CONC. BENT	18.0 CY
REINF. STEEL	43027 LB
CONC. SURF. TRT.	446 SY
RAIL (T502)	266 LF
*CONC. FOR STR. APPR. SLAB	37.5 CY
*TERM. ANCH. SECT.	4 EA
*REMOVE OLD STR. (LG.)	1 EA
*MISC.	350 LF
*CHANNEL EXCAV.	550 CY

*ROADWAY ITEMS
Refer contractor's information only.

16

BRIDGE LAYOUT
ATASCOSO RELIEF BRIDGE
3 - 40'-0" CONC. GIRDER SPANS
34'-0" ROADWAY (HS20 LOADING)
SCALE: 1"=10'
VERT. & HORIZ.

DRAWN	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
CHECKED	6	TEXAS	BRO 111 24 1 ETC	16
TRACED	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HWY. NO.
CHECKED	11	NACOGDOCHES	0893	01	014	FM226

Rev 11-16-06

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 41)

SITE 41- NACOGDOCHES COUNTY
FM 226 @ ATASCOSO CREEK RELIEF
11-174-0-0893-01-014

Texas Department of Transportation®

SHEET 54 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		88

9/1/2021 9:22:01 AM
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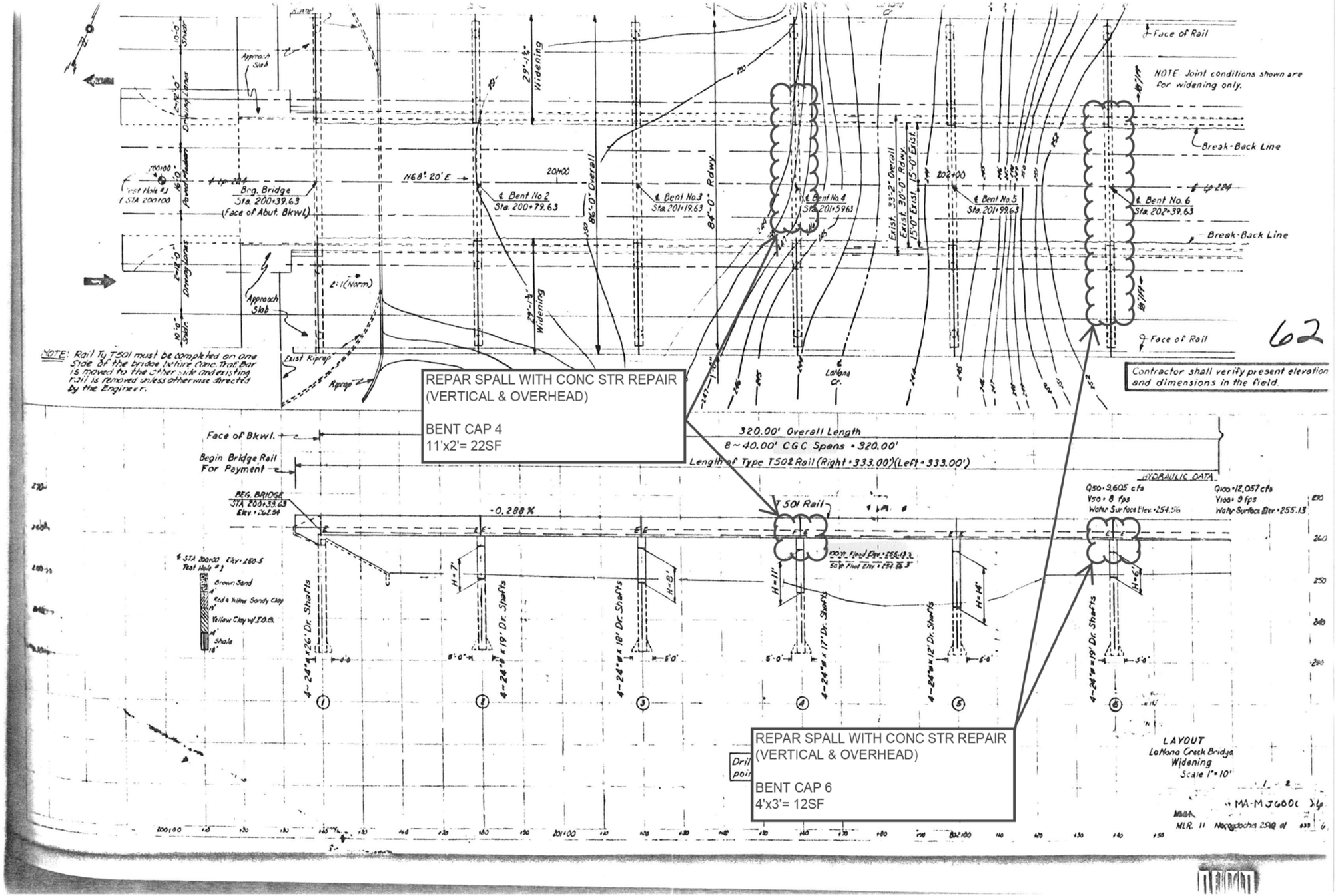

SITE 42-NACOGDOCHES COUNTY
SL 224 @ LA NANA CREEK
11-174-0-2560-01-002

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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Jeremy King, P.E.
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9/2/2021

BRIDGE LAYOUT (SITE 42)

2021 Texas Department of Transportation®

SHEET 55 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		89

9/1/2021 11:48:04 AM
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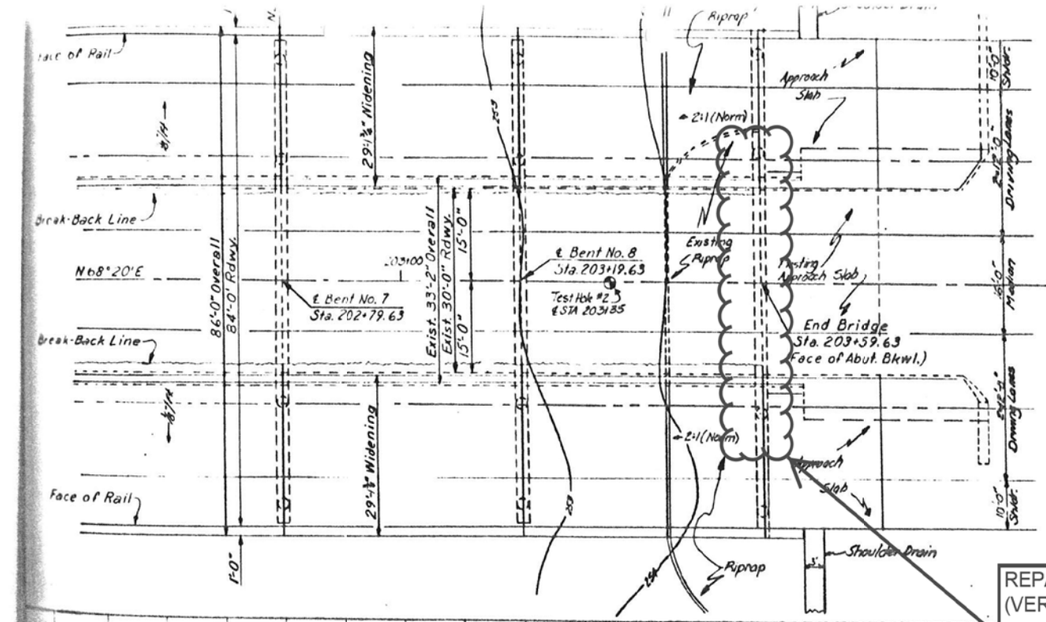


ITEM / DESCRIPTION	SUMMARY OF ESTIMATED QUANTITIES: DRILLED SHAFTS 24" L.F.	CL. "C" CONC. FOR EXT. STR. ABUT. C.Y.	CL. "C" CONC. FOR EXT. STR. BENT C.Y.	CL. "S" CONC. FOR EXT. STR. (PAN GIRDER) C.Y.	CONCRETE SURFACE TREATM'T S.Y.	RIPRAP (CONC.) (CL. B) C.Y.	* REINF. STEEL L.B.	RAILING TY T502 L.F.	Army Item CONC APP ST APPR SLAB (CL A) CY	Army Item CONC TRAF BAR (PDAT) LF
2~ ABUTMENTS	204	26.8					6202	26		
1~ INTERIOR BENTS	504		104.7				32069			
8~ 40'-0" C.G.C. SPANS				907.2			163488	640		
TOTAL	708	26.8	104.7	907.2	1990	1000	201,759	666	56.76	350

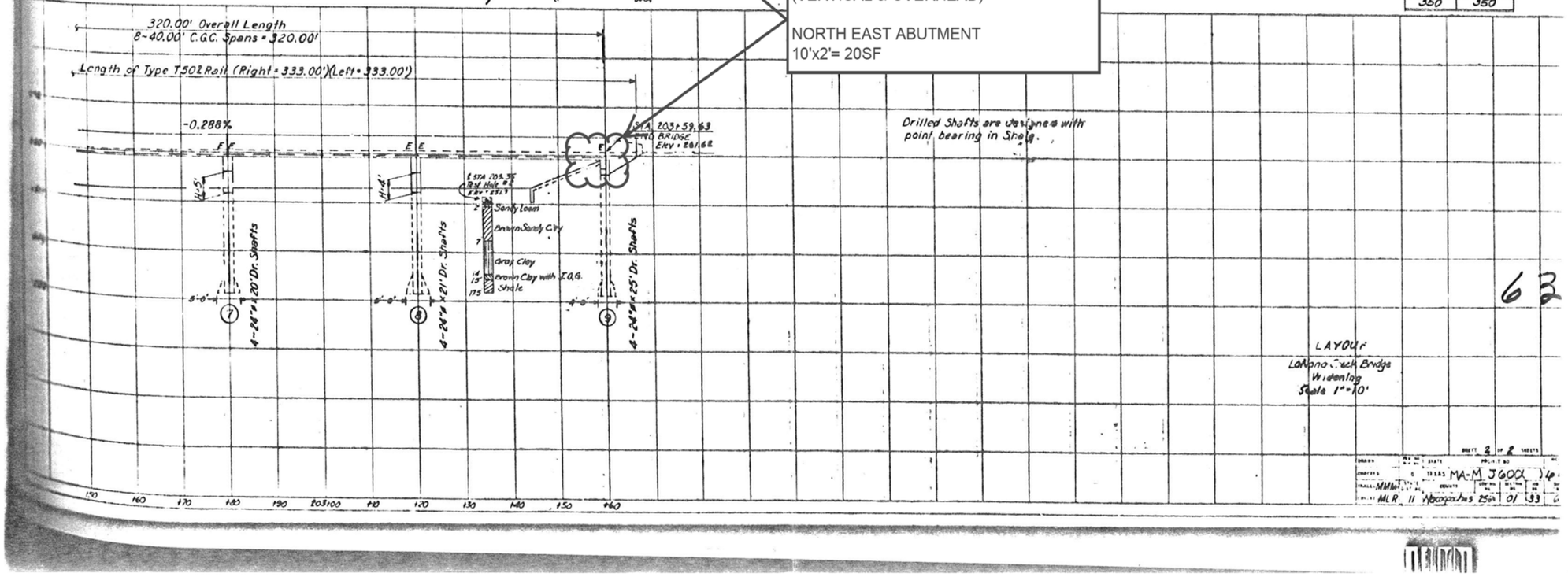
* FOR CONTRACTORS W.P.D. ONLY

NOTE: Joint conditions shown are for widening only.

Army Item CONC TRAF BAR (MOVE AND RESET) LF	Army Item CONC TRAF BAR (REMOVE) LF
350	350

REPAIR SPALL WITH CONC STR REPAIR
(VERTICAL & OVERHEAD)

NORTH EAST ABUTMENT
10'x2'= 20SF



Drilled Shafts are designed with point bearing in Shale.

LAYOUT
LaNana Creek Bridge
Widening
Scale 1"=10'

SHEET 2 OF 2 SHEETS

DIST	COUNTY	CONTROL	SECT	JOB	HIGHWAY
LFK	NAC	MA-M J600(	24	001	SH 21, ETC.

MLR II Nacogdoches 25th 01 93

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9/2/2021

BRIDGE LAYOUT (SITE 42)

SITE 42-NACOGDOCHES COUNTY
SL 224 @ LA NANA CREEK
11-174-0-2560-01-002

2021
Texas Department of Transportation®
SHEET 56 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	90

REMOVE AND RESEAL JOINT WITH

AT ABUTMENT JOINTS
35' EA= 70LF

FILL EROSION WITH FLOWABLE BACKFILL

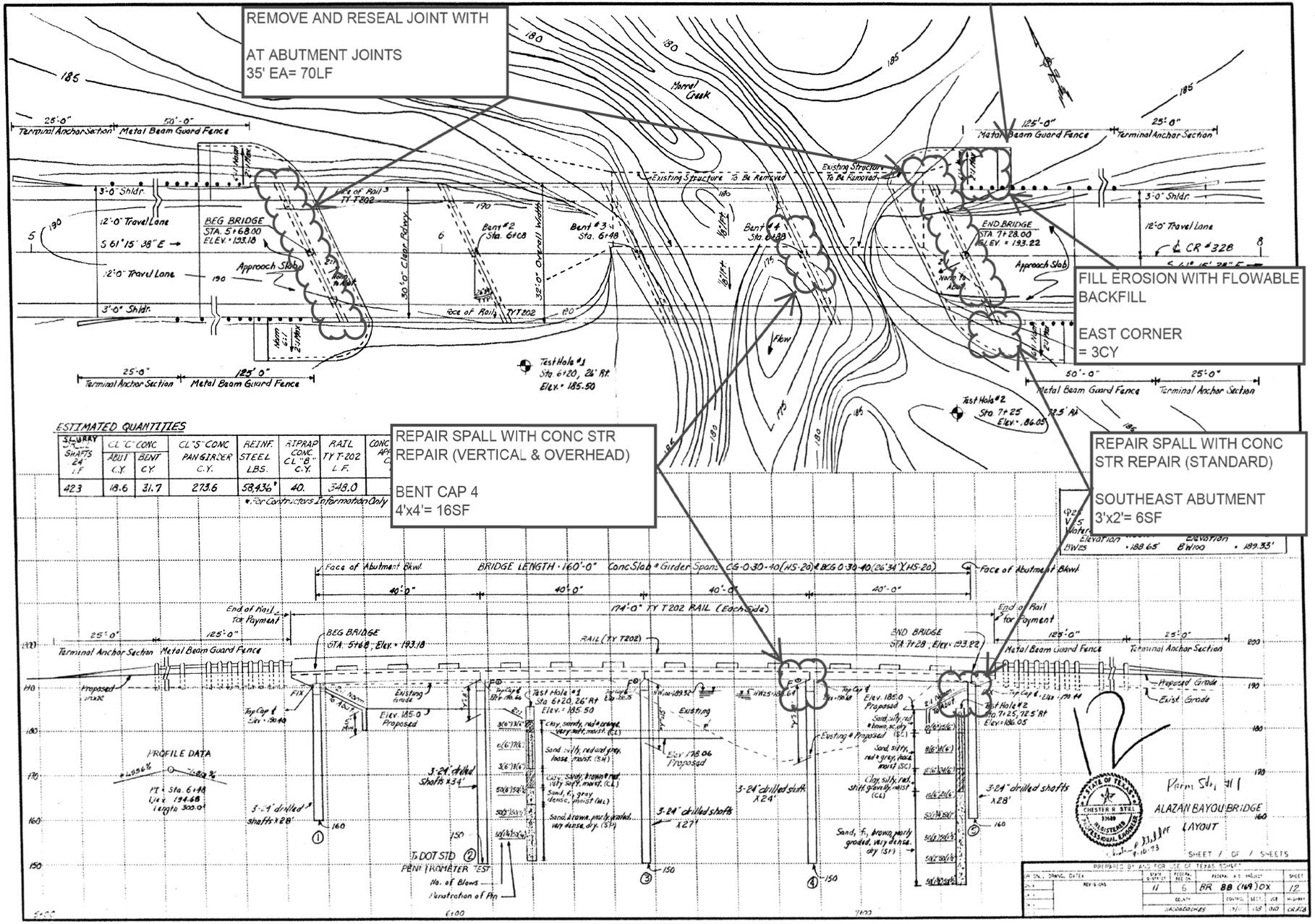
EAST CORNER
= 3CY

REPAIR SPALL WITH CONC STR REPAIR (VERTICAL & OVERHEAD)

BENT CAP 4
4'x4'= 16SF

REPAIR SPALL WITH CONC STR REPAIR (STANDARD)

SOUTHEAST ABUTMENT
3'x2'= 6SF



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9/2/2021

CHESTER R STIL 73689 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS

BRIDGE LAYOUT (SITE 43)

SITE 43-NACOGDOCHES COUNTY
FM 2782 @ ALAZAN BAYOU
11-174-0-2808-02-002

2021 Texas Department of Transportation®
SHEET 57 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		91

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9/1/2021 9:22:41 AM
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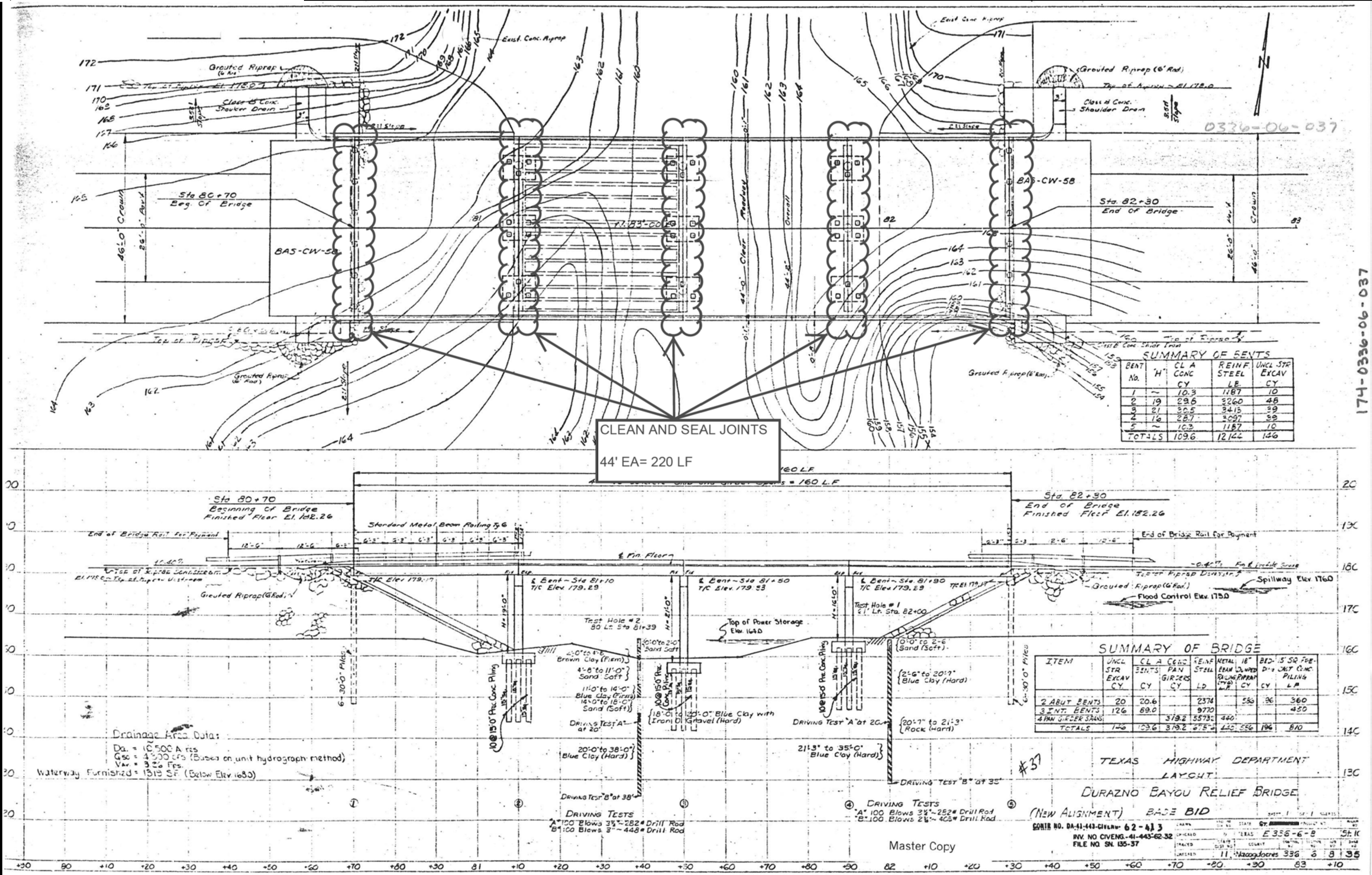

SUMMARY OF BENTS

BENT No.	"H"	CL A CONC CY	REINF. STEEL LB.	UNCL STR EXCAV CY
1	~	10.3	1187	10
2	19	29.6	3260	48
3	21	30.5	3413	39
4	16	28.7	3097	39
5	~	10.3	1187	10
TOTALS		109.6	12144	146

SUMMARY OF BRIDGE

ITEM	UNCL STR EXCAV CY	CL A CONC BENTS CY	CL A CONC PAN GIRDERS CY	REINF STEEL LB	METAL BEAM RAILING (TY 6) LF	18" DUMPED RIPRAP CY	BEDDING CY	15" SQ PRE-CAST CONC PILING LF
2 ABUT BENTS	20	20.6		2374		556	.96	360
3 INT. BENTS	126	89.0		9770				450
4 PAN GIRDER SPANS			319.2	5573[illegible]	440			
TOTALS	146	109.6	319.2	[illegible]	440	556	196	810

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9/2/2021

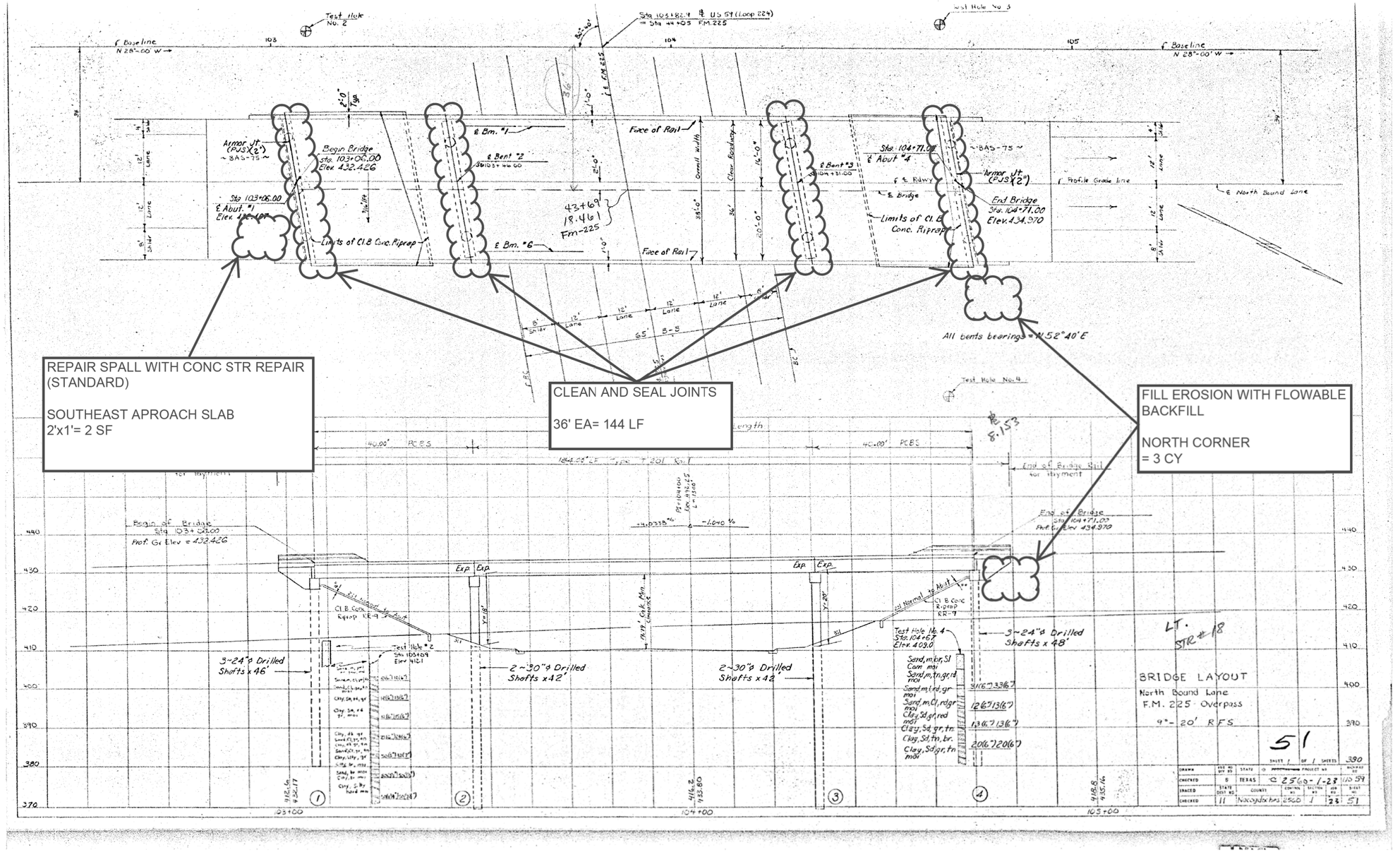
BRIDGE LAYOUT
(SITE 44)

SITE 44- NACOGDOCHES COUNTY
SH 103 @ DURAZNO BAYOU RELIEF
11-174-0-0336-06-037

Texas Department of Transportation®
SHEET 58 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	92



REPAIR SPALL WITH CONC STR REPAIR (STANDARD)

SOUTHEAST APROACH SLAB
2'x1'= 2 SF

CLEAN AND SEAL JOINTS

36' EA= 144 LF

FILL EROSION WITH FLOWABLE BACKFILL

NORTH CORNER
= 3 CY

SITE 45 - NACOGDOCHES COUNTY
US 59 & LP 224 NB @ FM 225
11-174-0-2560-01-018

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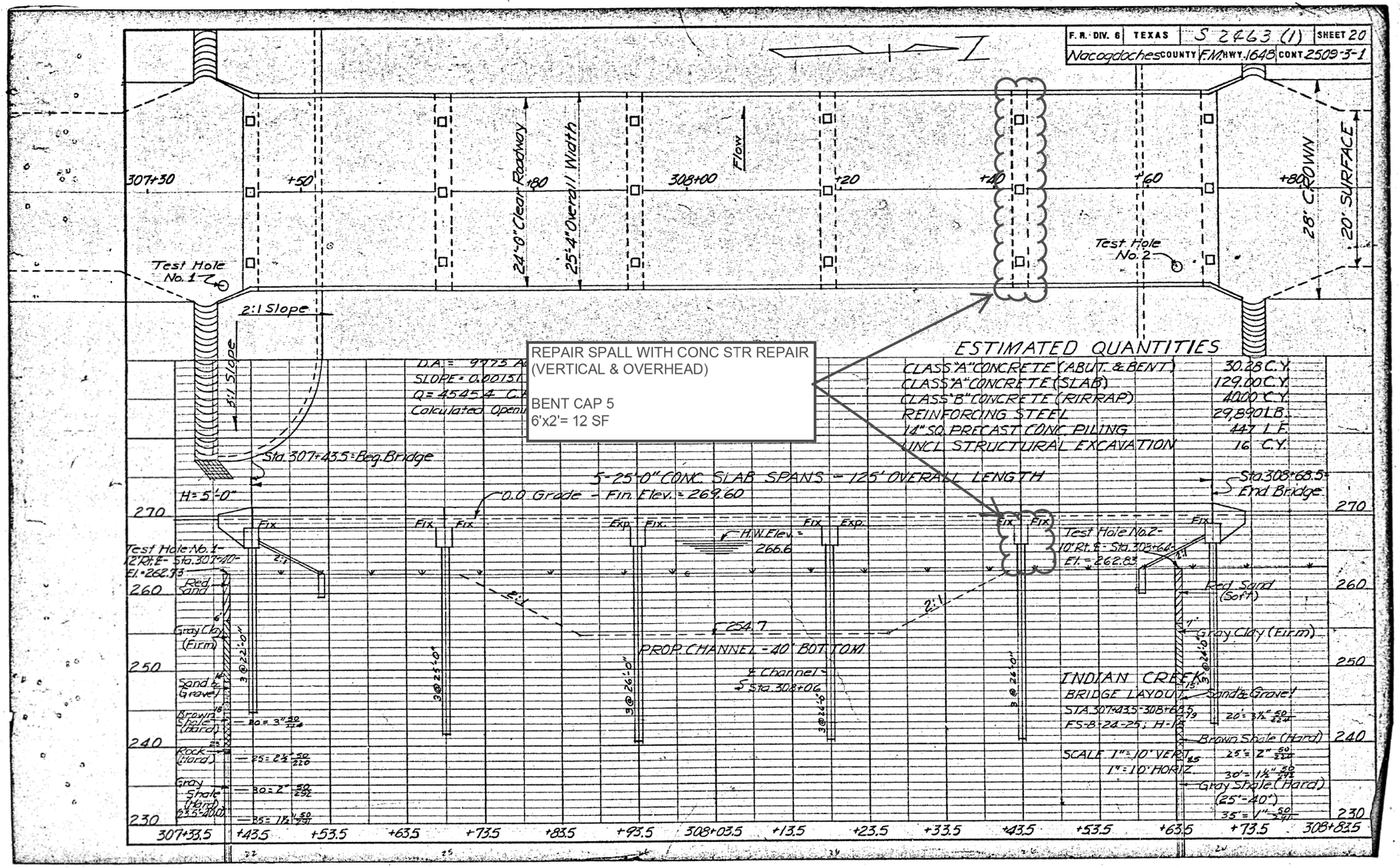
BRIDGE LAYOUT
(SITE 45)

Texas Department of Transportation®

SHEET 59 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		93



SITE 46- NACOGDOCHES COUNTY
FM 1648 @ INDIAN CREEK
11-174-0-2509-03-001

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BRIDGE LAYOUT (SITE 46)

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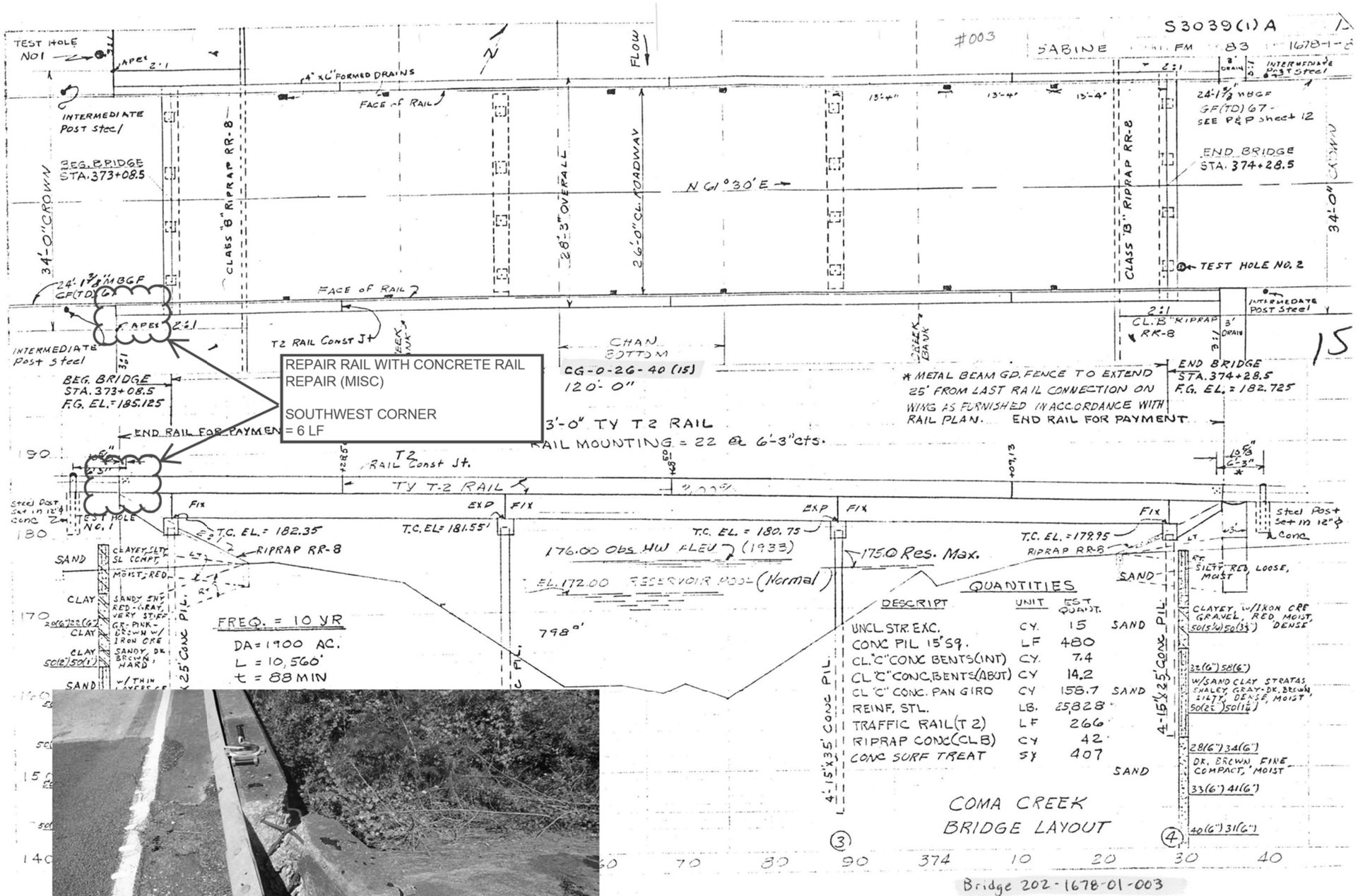
CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	94



IMPACT DAMAGE TO RAIL AT SOUTH CORNER

SITE 47-SABINE COUNTY
FM 83 @ COMA CREEK
11-202-0-1678-01-003

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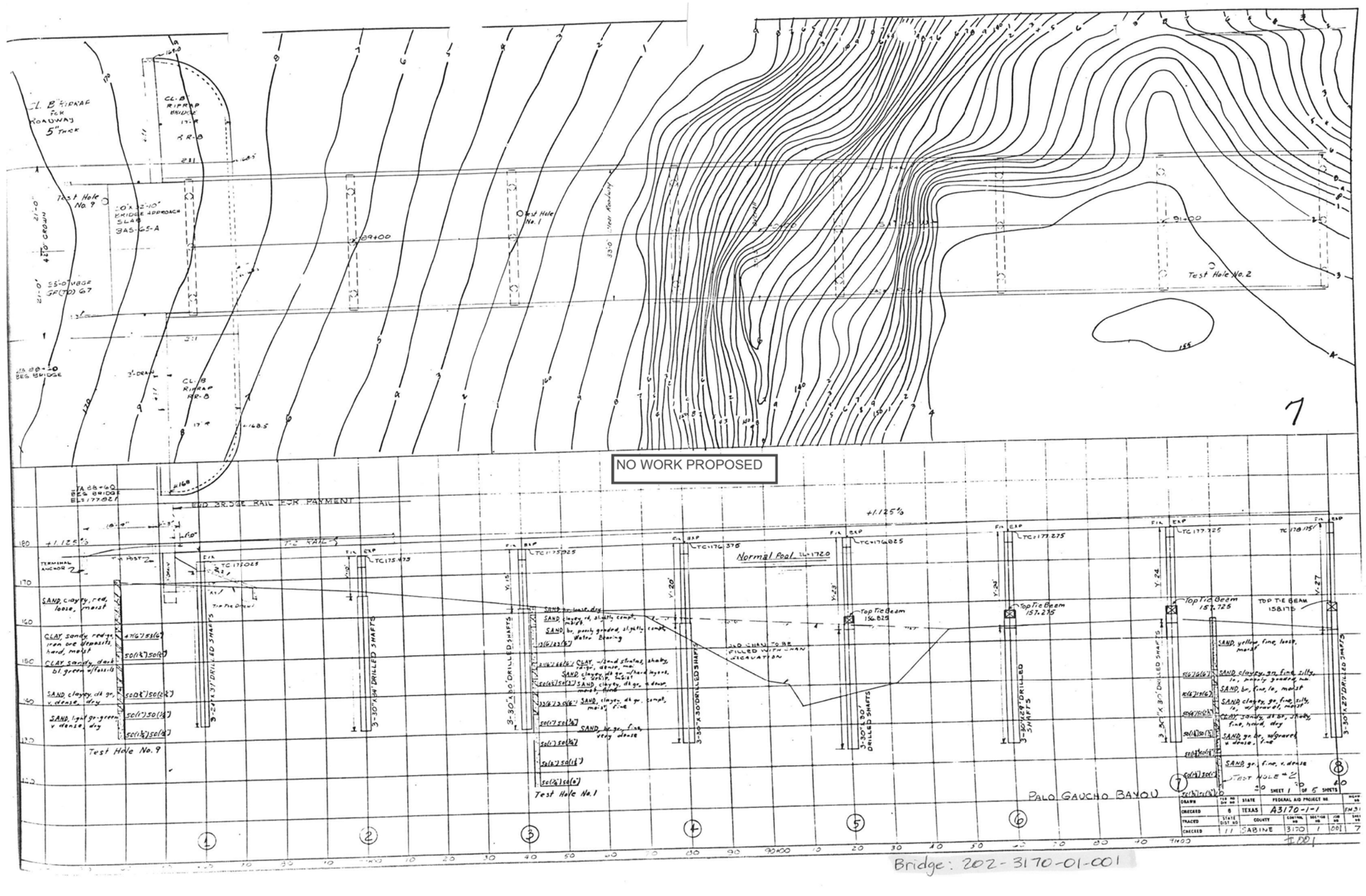
BRIDGE LAYOUT (SITE 47)

2021 Texas Department of Transportation®

SHEET 61 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		95



SITE 48-SABINE COUNTY
FM 3121 @ PALO GAUCHO BAYOU
11-202-0-3170-01-001

JEREMY KING
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BRIDGE LAYOUT
(SITE 48)

2021
Texas Department of Transportation®
SHEET 62 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		96

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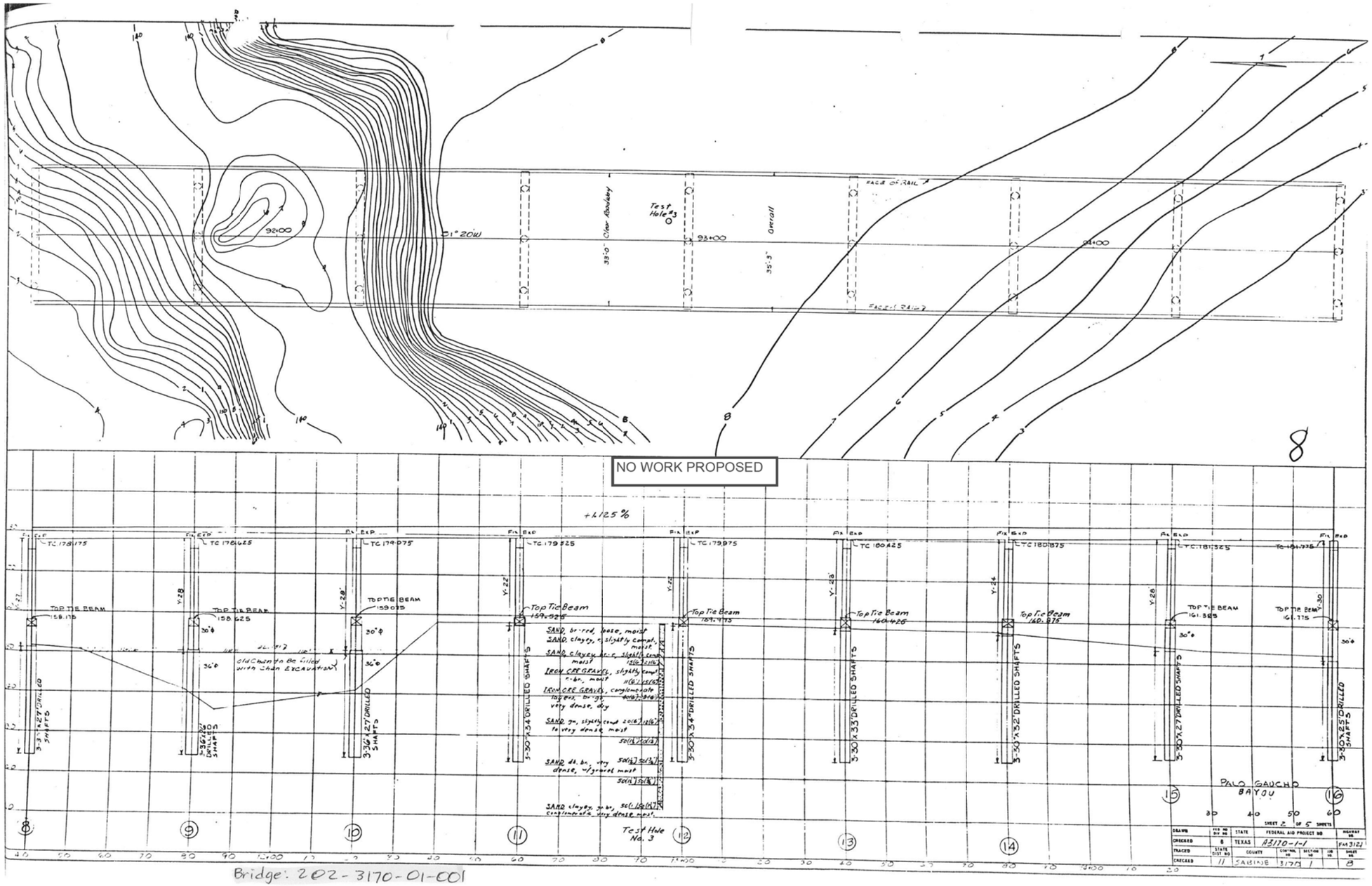

SITE 48-SABINE COUNTY
FM 3121 @ PALO GAUCHO BAYOU
11-202-0-3170-01-001

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JEREMY KING
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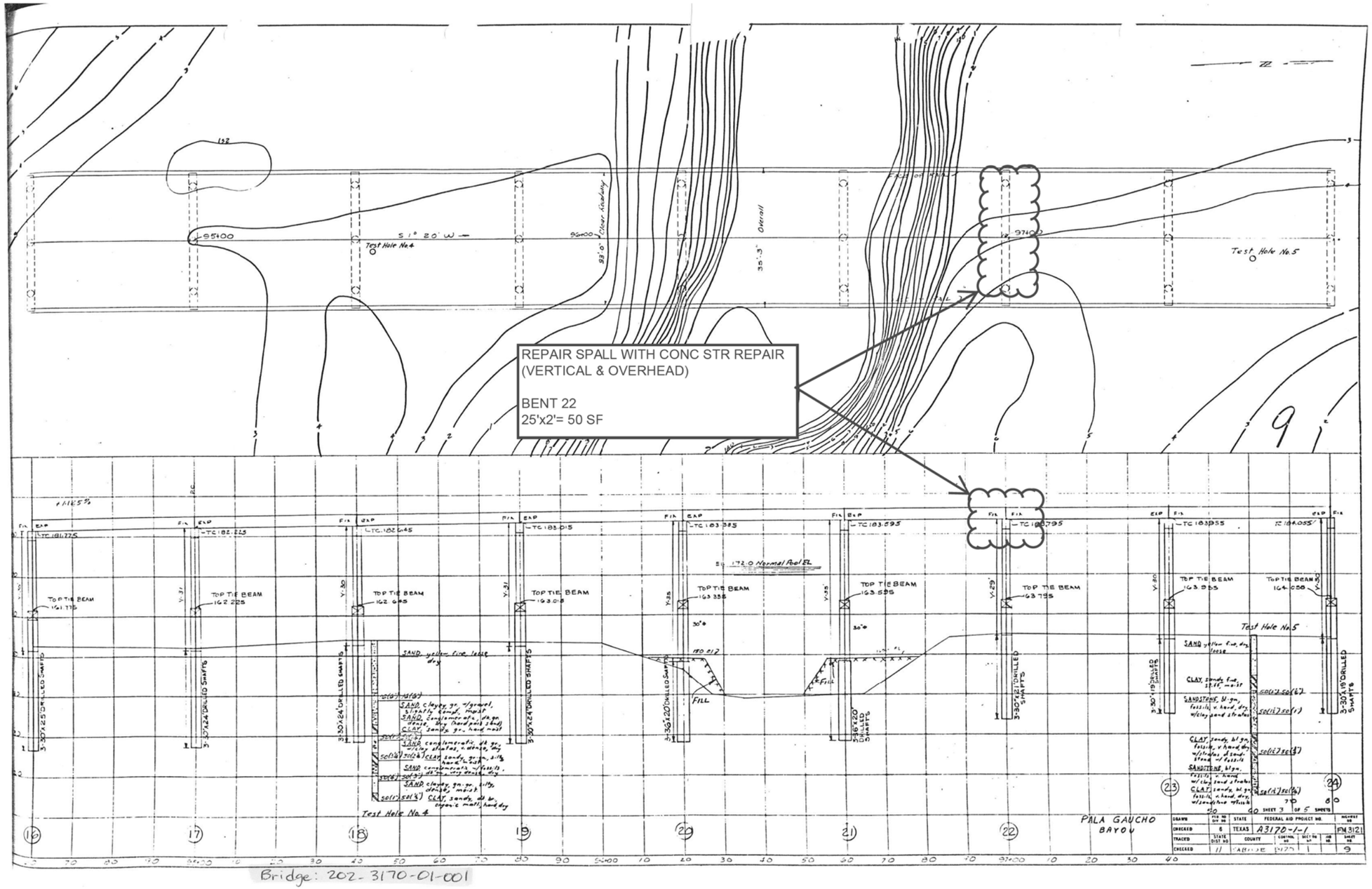
BRIDGE LAYOUT (SITE 48)

2021 Texas Department of Transportation®

SHEET 63 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		97



SITE 48-SABINE COUNTY
FM 3121 @ PALO GAUCHO BAYOU
11-202-0-3170-01-001

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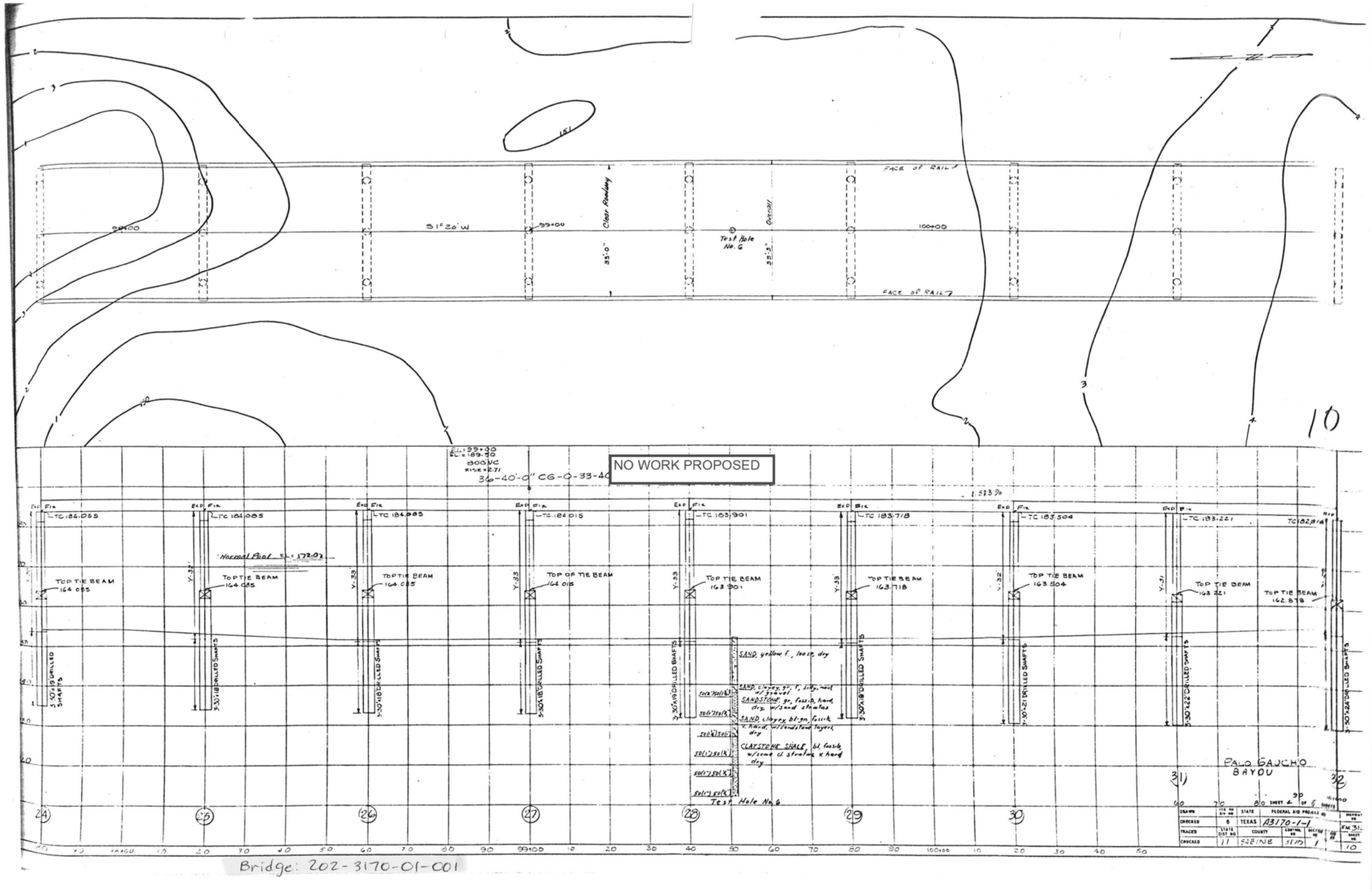
9/2/2021

BRIDGE LAYOUT
(SITE 48)

2021
Texas Department of Transportation®

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		98



10

SITE 48-SABINE COUNTY
FM 3121 @ PALO GAUCHO BAYOU
11-202-0-3170-01-001

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9/2/2021

BRIDGE LAYOUT (SITE 48)

2021
Texas Department of Transportation®
SHEET 65 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		99

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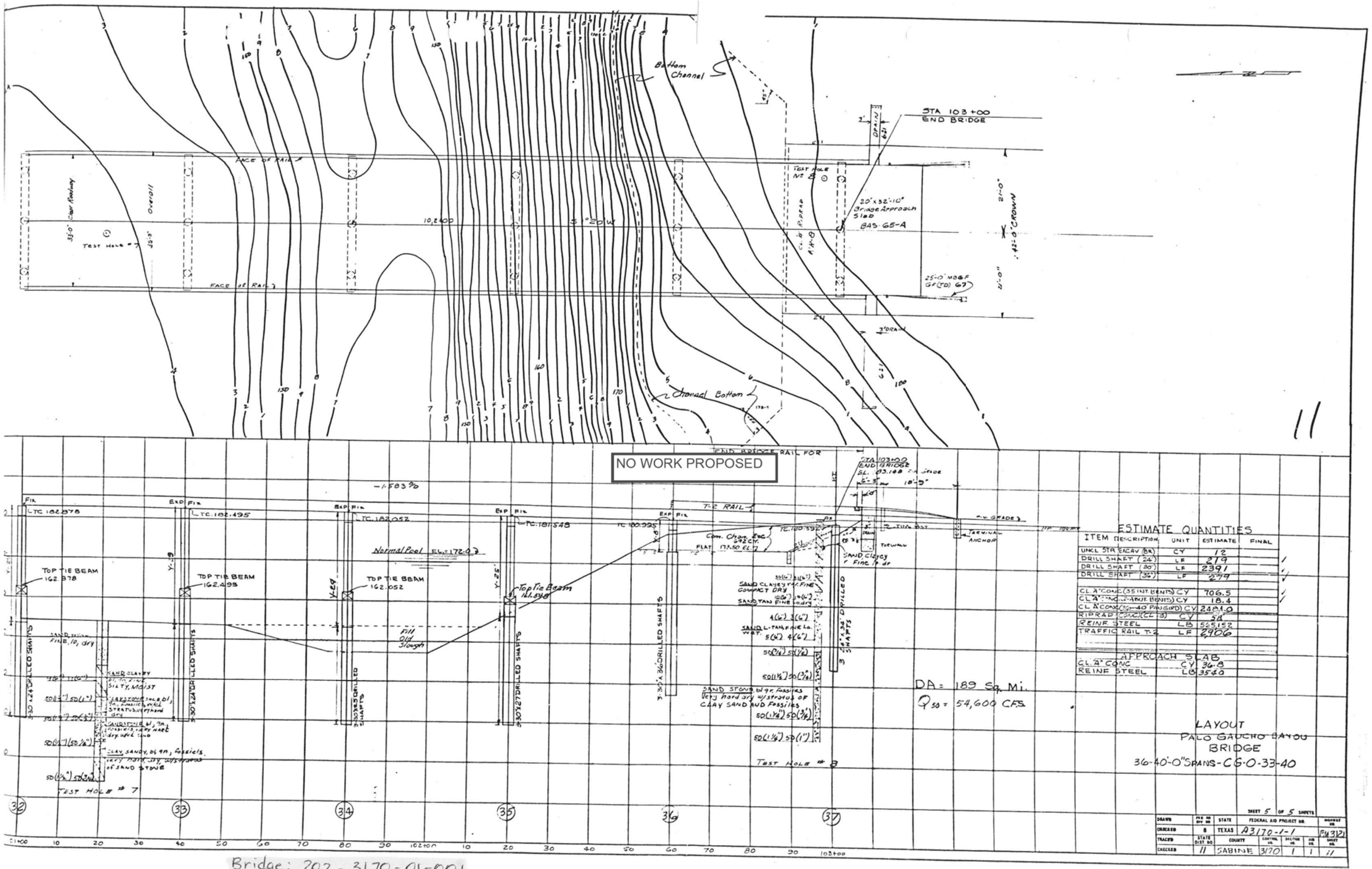

ESTIMATE QUANTITIES

ITEM DESCRIPTION	UNIT	ESTIMATE	FINAL
UNCL STR EXCAV (BR)	CY	12	
DRILL SHAFT (24")	LF	219	
DRILL SHAFT (30")	LF	2391	
DRILL SHAFT (36")	LF	279	
CL. "A" CONC (35 INT. BENTS)	CY	706.5	
CL. "A" CONC (2-ABUT. BENTS)	CY	18.4	
CL "A" CONC (36-40' PAN GIRD)	CY	2481.0	
RIPRAP (CONC)(CL 3)	CY	58	
REINF. STEEL	LB	565,152	
TRAFFIC RAIL T-2	LF	2906	
APPROACH SLAB			
CL. "A" CONC	CY	36.8	
REINF STEEL	LB	3540	

STATE OF TEXAS
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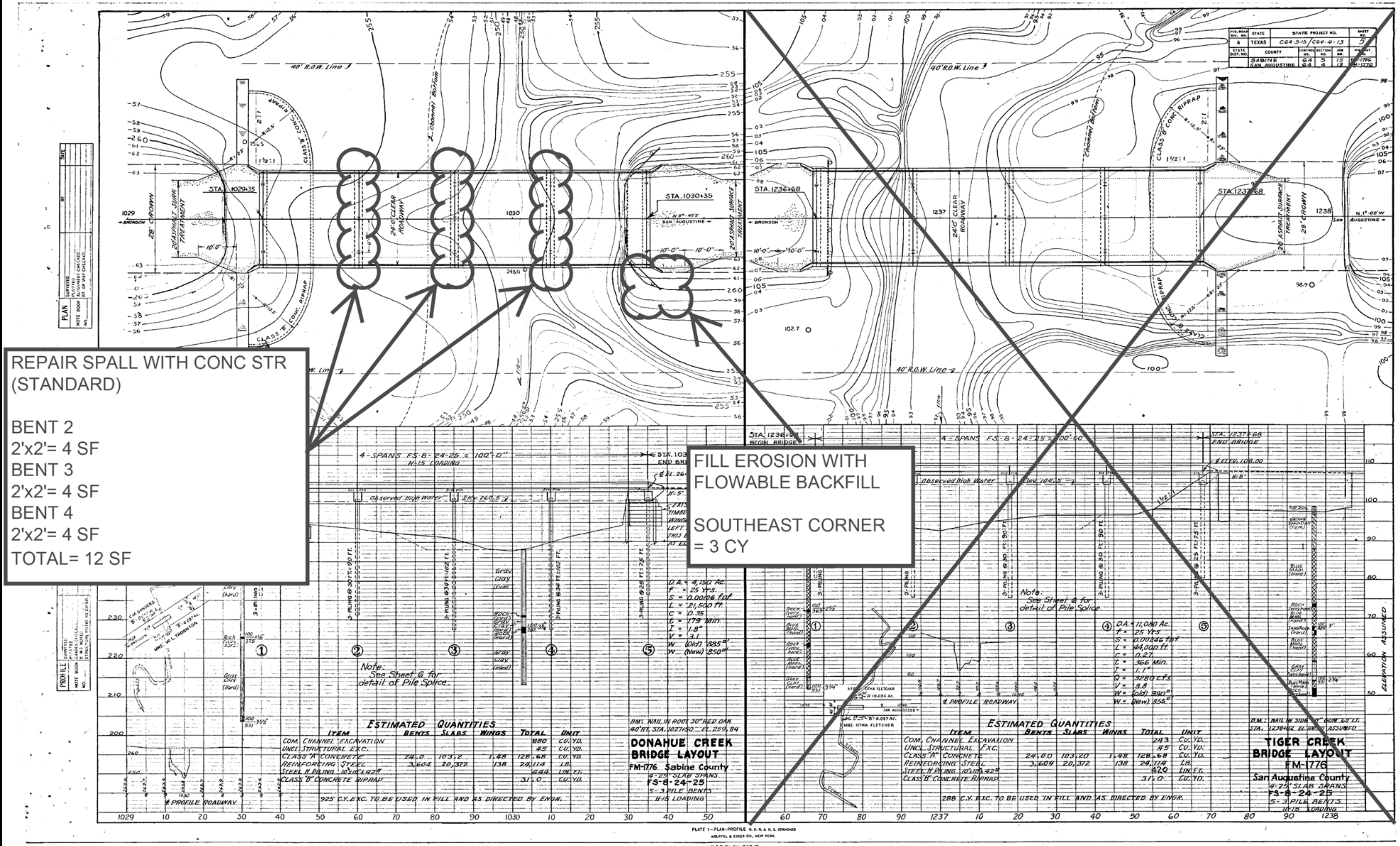
BRIDGE LAYOUT (SITE 48)

SITE 48-SABINE COUNTY
FM 3121 @ PALO GAUCHO BAYOU
11-202-0-3170-01-001

2021
Texas Department of Transportation®
SHEET 66 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE,ETC.		100



SITE 49 - SABINE COUNTY
FM 1 @ DONAHUE CREEK
11-202-0-0064-05-054

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5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 49)

SHEET 67 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		101

9/1/2021 9:23:50 AM
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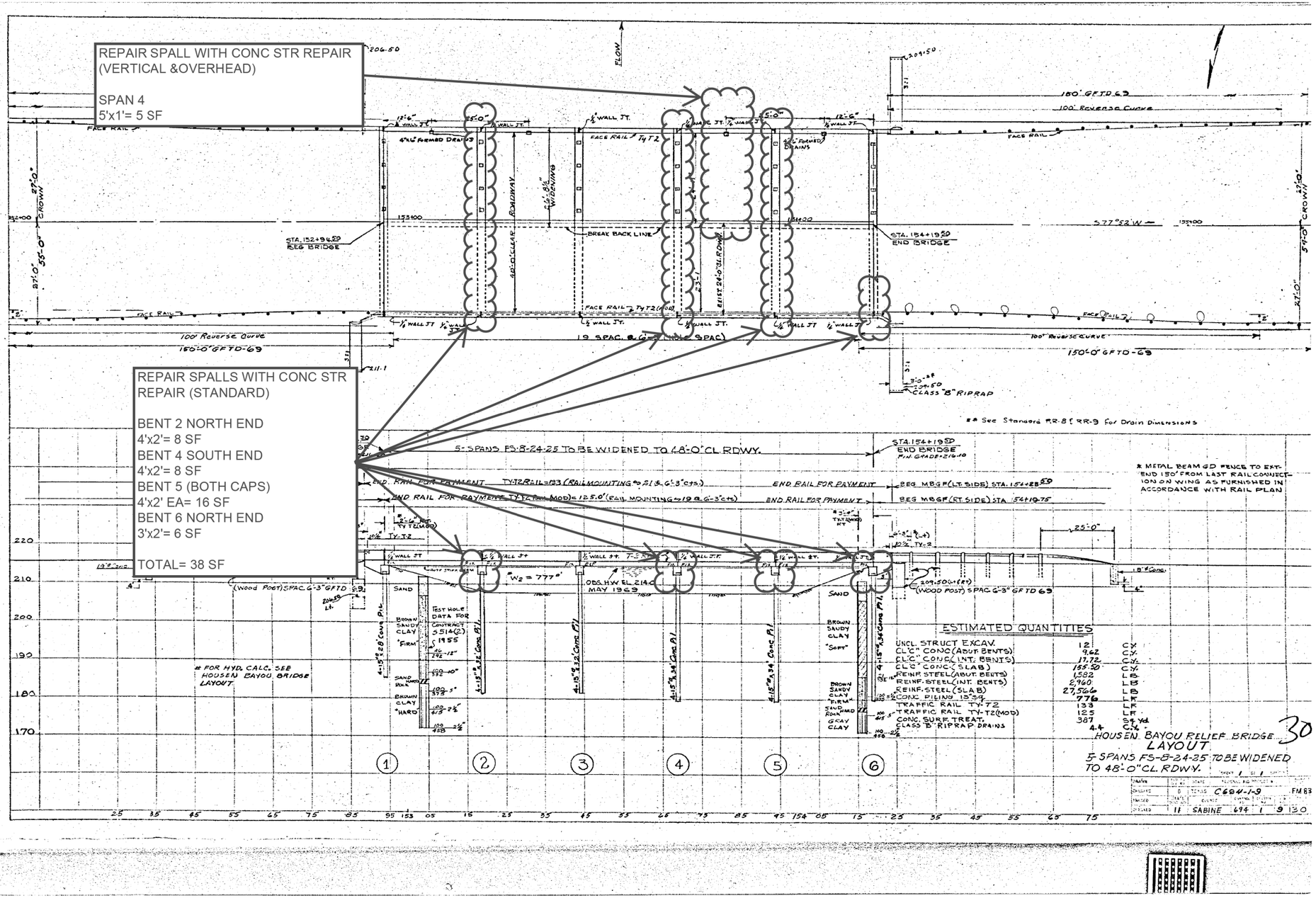
REPAIR SPALL WITH CONC STR REPAIR (VERTICAL &OVERHEAD)

SPAN 4
5'x1'= 5 SF

REPAIR SPALLS WITH CONC STR REPAIR (STANDARD)

BENT 2 NORTH END
4'x2'= 8 SF
BENT 4 SOUTH END
4'x2'= 8 SF
BENT 5 (BOTH CAPS)
4'x2' EA= 16 SF
BENT 6 NORTH END
3'x2'= 6 SF

TOTAL= 38 SF



SITE 50 - SABINE COUNTY
FM 83 @ HOUSEN BAYOU RELIEF
11-202-0-0694-01-017

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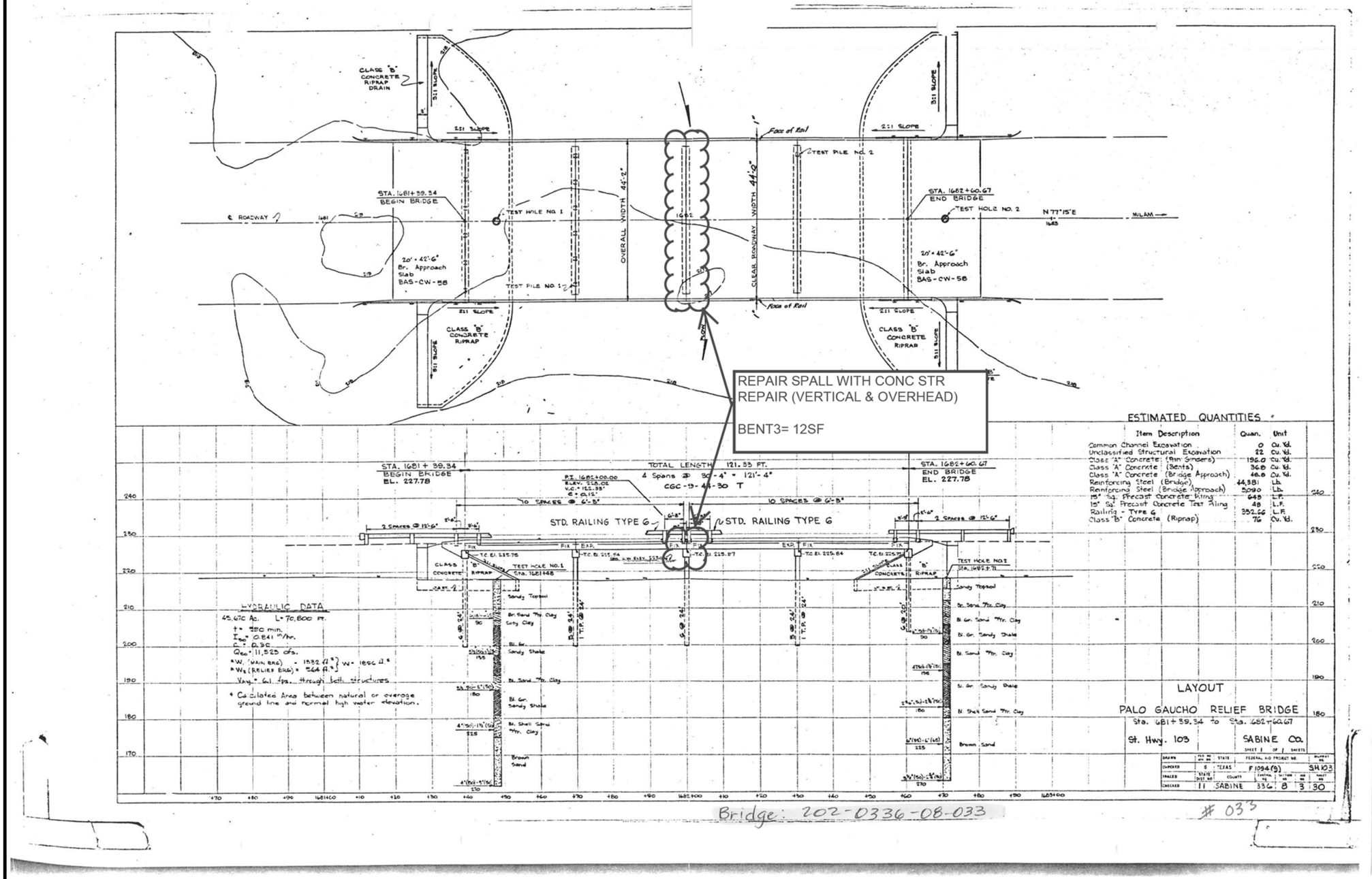
BRIDGE LAYOUT
(SITE 50)

Texas Department of Transportation®

SHEET 68 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		102



ESTIMATED QUANTITIES

Item Description	Quan.	Unit
Common Channel Excavation	0	Cu. Yd.
Unclassified Structural Excavation	22	Cu. Yd.
Class "A" Concrete: (Rein Smdrs)	196.0	Cu. Yd.
Class "A" Concrete: (Bents)	36.0	Cu. Yd.
Class "A" Concrete (Bridge Approach)	48.0	Cu. Yd.
Reinforcing Steel (Bridge)	44,381	Lb.
Reinforcing Steel (Bridge Approach)	5080	Lb.
18" Sq. Precast Concrete Piling	648	L.F.
16" Sq. Precast Concrete Test Piling	48	L.F.
Railing - Type G	352.66	L.F.
Class "B" Concrete (Riprap)	76	Cu. Yd.

Bridge: 202-0336-08-033 # 033

SITE 51- SABINE COUNTY
SH 103 @ PALO GAUCHO BAYOU RELIEF
11-202-0-0336-08-033

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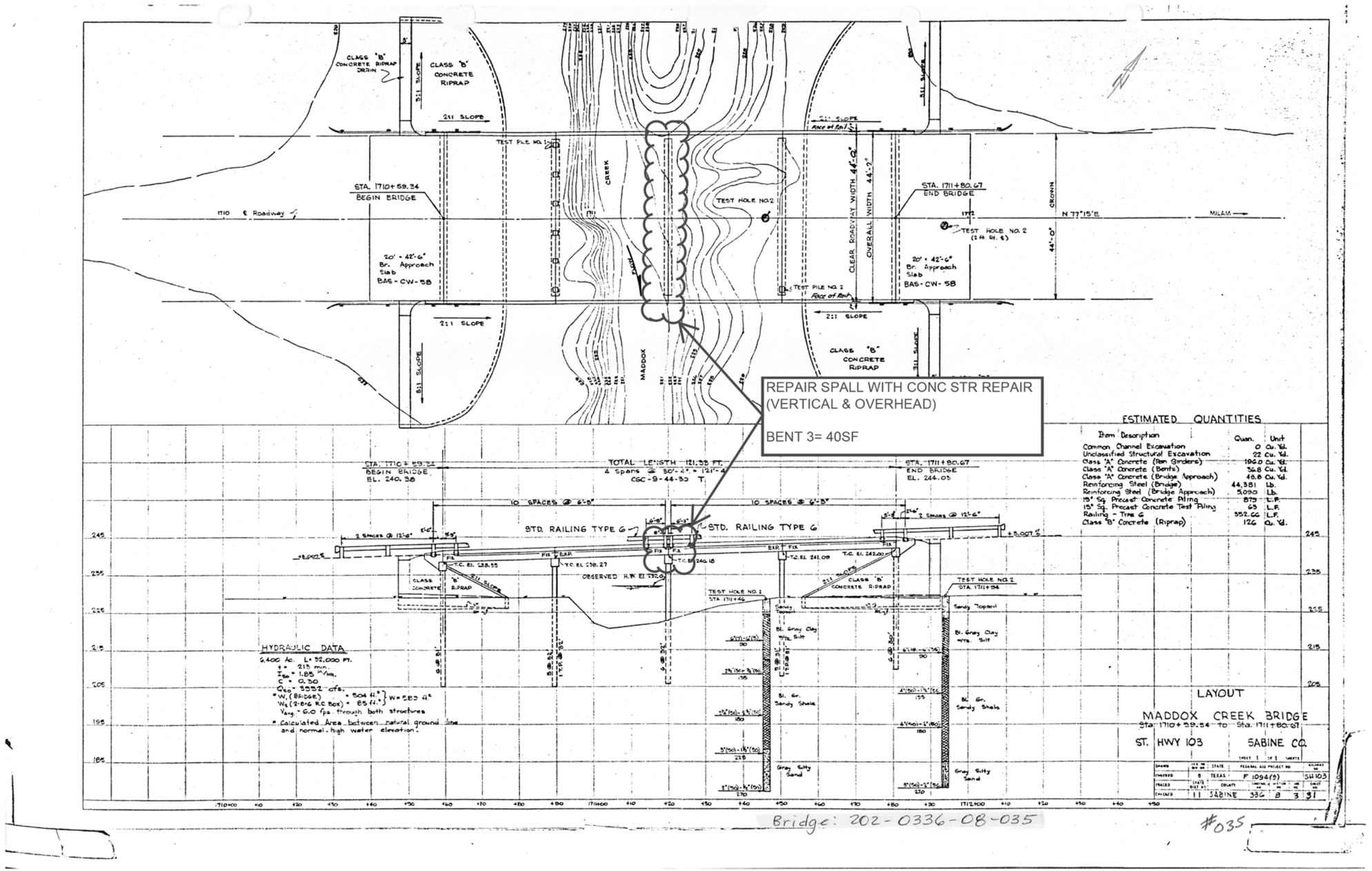
9/2/2021

BRIDGE LAYOUT (SITE 51)

Texas Department of Transportation®

SHEET 69 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		103



ESTIMATED QUANTITIES

Item Description	Quan.	Unit
Common Channel Excavation	0	Cu. Yd.
Unclassified Structural Excavation	22	Cu. Yd.
Class "A" Concrete (Rein Girders)	196.0	Cu. Yd.
Class "A" Concrete (Bents)	76.8	Cu. Yd.
Class "A" Concrete (Bridge Approach)	48.8	Cu. Yd.
Reinforcing Steel (Bridge)	44,381	Lb.
Reinforcing Steel (Bridge Approach)	5,090	Lb.
15" Sq. Precast Concrete Piling	879	L.F.
15" Sq. Precast Concrete Test Piling	65	L.F.
Railing - Type G	352.66	L.F.
Class "B" Concrete (Riprap)	126	Cu. Yd.

Bridge: 202-0336-08-035

#035

SITE 52 - SABINE COUNTY
SH 103 @ MADDOX CREEK
11-202-0-0336-08-035

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5135292FE4184A4...

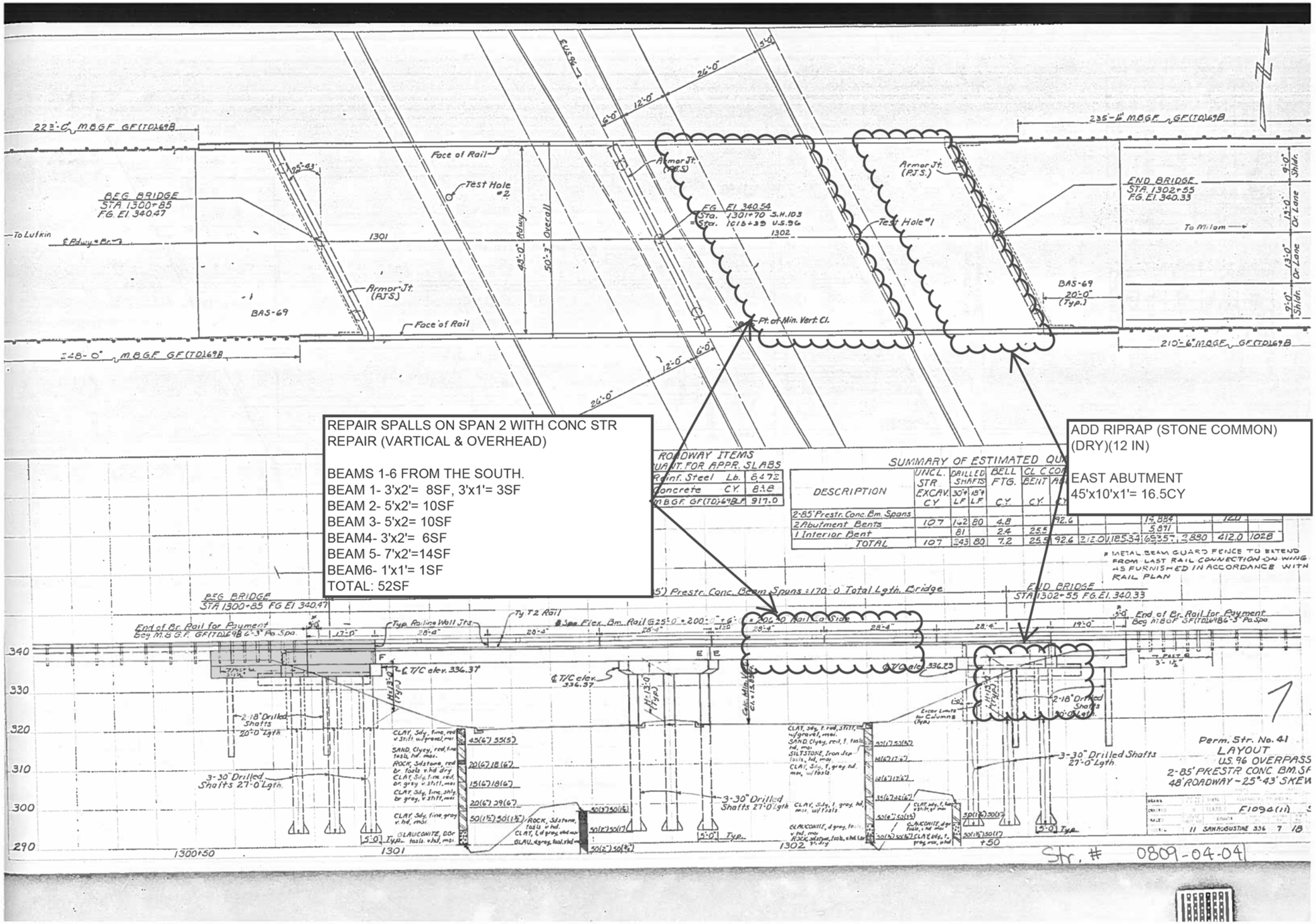
9/2/2021

BRIDGE LAYOUT
(SITE 52)

Texas Department of Transportation®

SHEET 70 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		104



SITE 53-SAN AUGUSTINE COUNTY
SH 103 @ US 96
11-203-0-0809-04-041

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STATE OF TEXAS

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Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT (SITE 53)

2021
Texas Department of Transportation®
SHEET 71 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		105

9/1/2021 9:24:28 AM
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ADD EMBANKMENT(VEHICLE)(ORD COMP)(TY B)

BENHIND NORTHEAST WING WALL
= 3 CY

ADD FLOWABLE BACKFILL

NORTHEAST CORNER RIPRAP
= 3 CY

0064-03-018 MASTER COPY

SITE 54- SAN AUGUSTINE COUNTY
SH 147 @ FRIZELLE BRANCH
11-203-0-0064-03-018

CROWN SPAN LAYOUT
CULVERT
#18

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

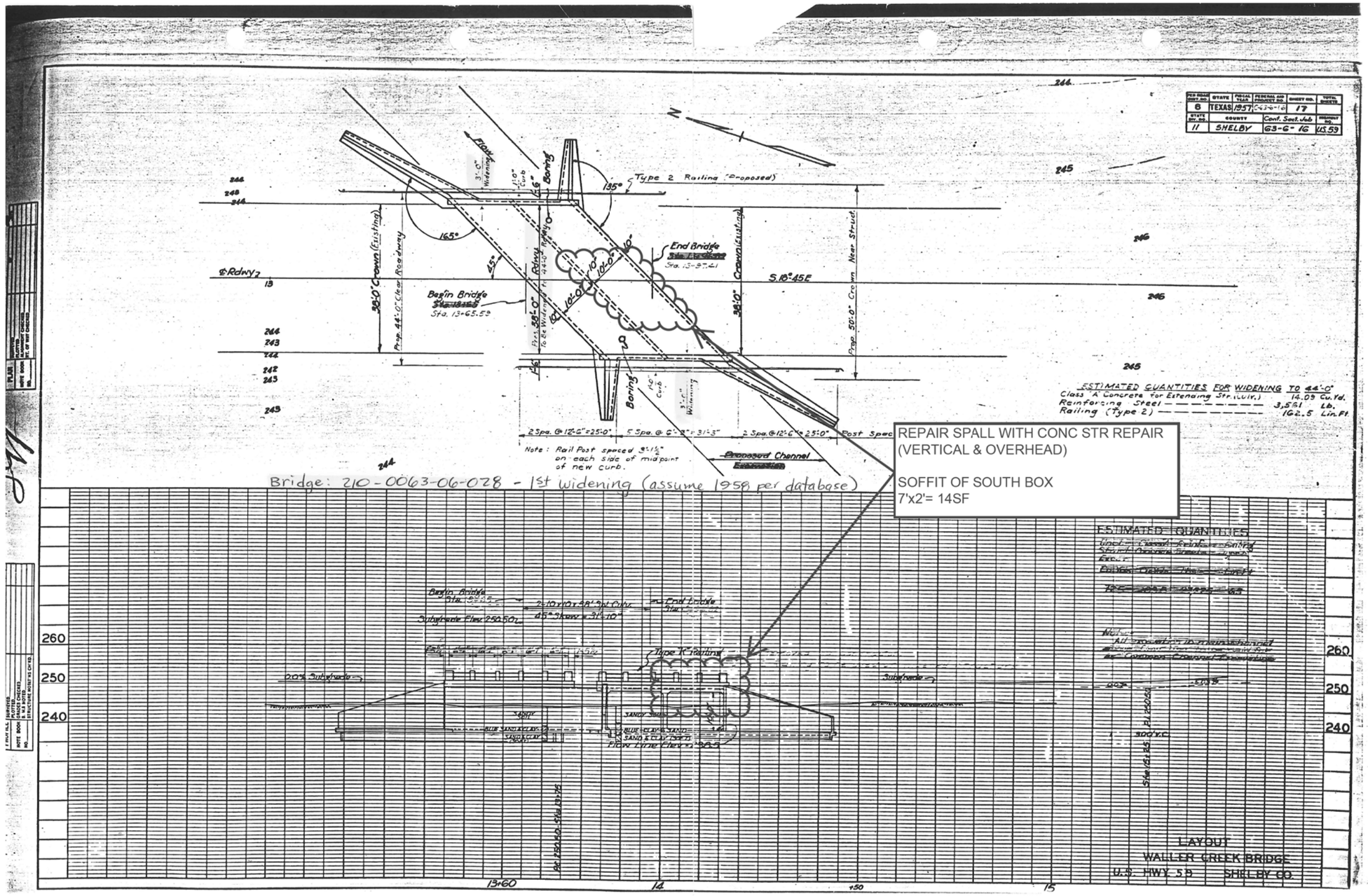
BRIDGE LAYOUT
(SITE 54)

Texas Department of Transportation®

SHEET 72 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		106

FED ROAD DIST. NO.	STATE	FISCAL YEAR	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
6	TEXAS	1957	[illegible]	17	
STATE DIST. NO.	COUNTY		Cont. Sect. Job		HIGHWAY NO.
11	SHELBY		63-6-16		US 59



SITE 55-SHELBY COUNTY
US 59 @ WALLER CREEK
11-210-0-0063-06-028

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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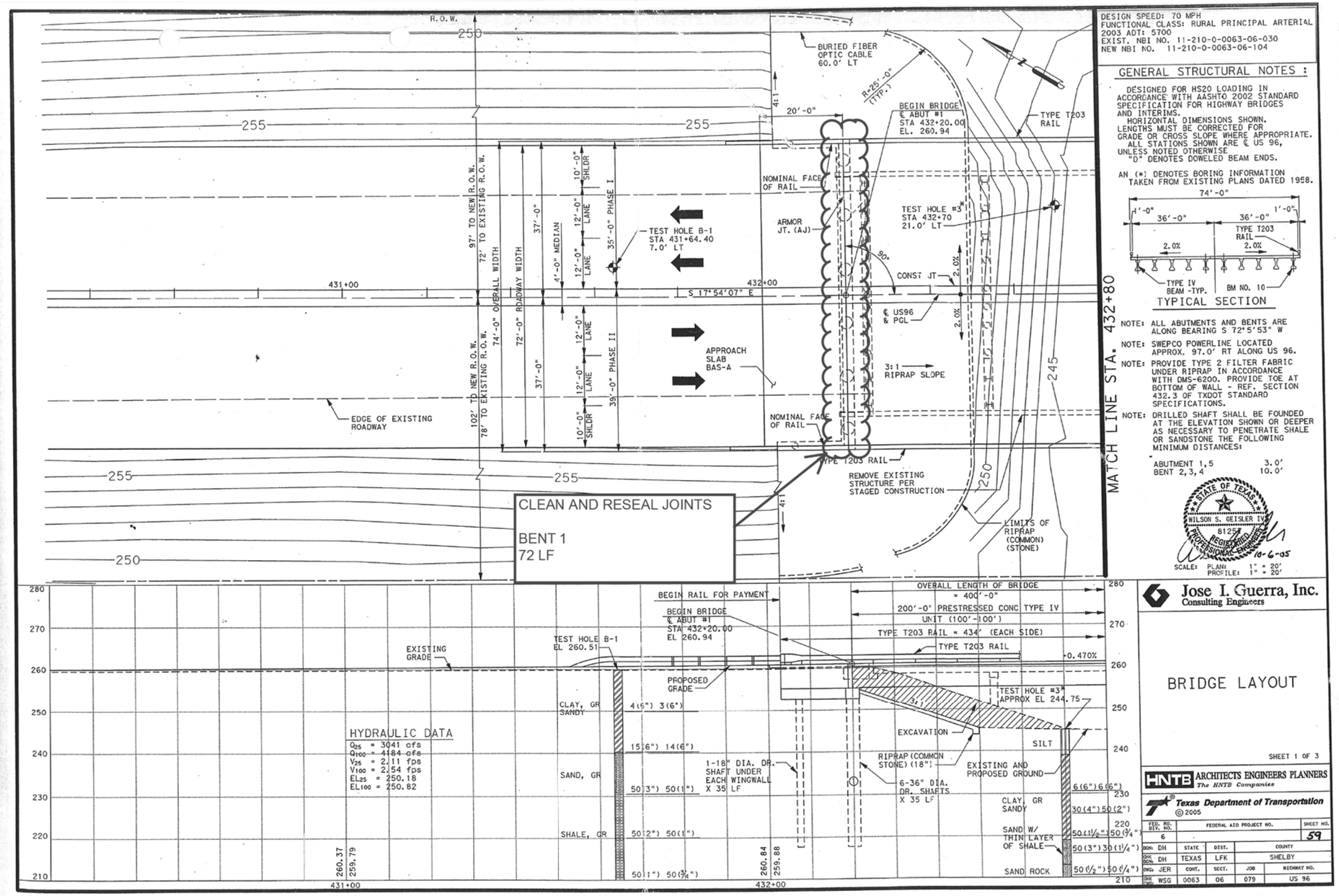
Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT (SITE 55)

2021
Texas Department of Transportation®
SHEET 73 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		107



HYDRAULIC DATA

Q_{25} = 3041 cfs
Q_{100} = 4184 cfs
V_{25} = 2.11 fps
V_{100} = 2.54 fps
EL25 = 250.18
EL100 = 250.82

DESIGN SPEED: 70 MPH
FUNCTIONAL CLASS: RURAL PRINCIPAL ARTERIAL
2003 ADT: 5700
EXIST. NBI NO. 11-210-0-0063-06-030
NEW NBI NO. 11-210-0-0063-06-104

GENERAL STRUCTURAL NOTES :

DESIGNED FOR HS20 LOADING IN ACCORDANCE WITH AASHTO 2002 STANDARD SPECIFICATION FOR HIGHWAY BRIDGES AND INTERIMS.
HORIZONTAL DIMENSIONS SHOWN. LENGTHS MUST BE CORRECTED FOR GRADE OR CROSS SLOPE WHERE APPROPRIATE.
ALL STATIONS SHOWN ARE ℄ US 96, UNLESS NOTED OTHERWISE
"D" DENOTES DOWELED BEAM ENDS.

AN (*) DENOTES BORING INFORMATION TAKEN FROM EXISTING PLANS DATED 1958.

TYPICAL SECTION

NOTE: ALL ABUTMENTS AND BENTS ARE ALONG BEARING S 72°5'53" W

NOTE: SWEPCO POWERLINE LOCATED APPROX. 97.0' RT ALONG US 96.

NOTE: PROVIDE TYPE 2 FILTER FABRIC UNDER RIPRAP IN ACCORDANCE WITH DMS-6200. PROVIDE TOE AT BOTTOM OF WALL - REF. SECTION 432.3 OF TXDOT STANDARD SPECIFICATIONS.

NOTE: DRILLED SHAFT SHALL BE FOUNDED AT THE ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE OR SANDSTONE THE FOLLOWING MINIMUM DISTANCES:

ABUTMENT 1,5	3.0'
BENT 2,3,4	10.0'

STATE OF TEXAS
WILSON S. GEISLER IV
81257
REGISTERED PROFESSIONAL ENGINEER
10-6-05

SCALE: PLAN: 1" = 20'
PROFILE: 1" = 20'

Jose I. Guerra, Inc.
Consulting Engineers

BRIDGE LAYOUT

SHEET 1 OF 3

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

Texas Department of Transportation
© 2005

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6				59
DGN: DH	STATE	DIST.	COUNTY	
CHK DGN: DH	TEXAS	LFK	SHELBY	
DWG: JER	CONT.	SECT.	JOB	HIGHWAY NO.
CHK DWG: WSG	0063	06	079	US 96

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT
(SITE 56)

SITE 56-SHELBY COUNTY
US 96 @ CHICKEN BAYOU
11-210-0-0063-06-104

2021
Texas Department of Transportation®
SHEET 74 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		108

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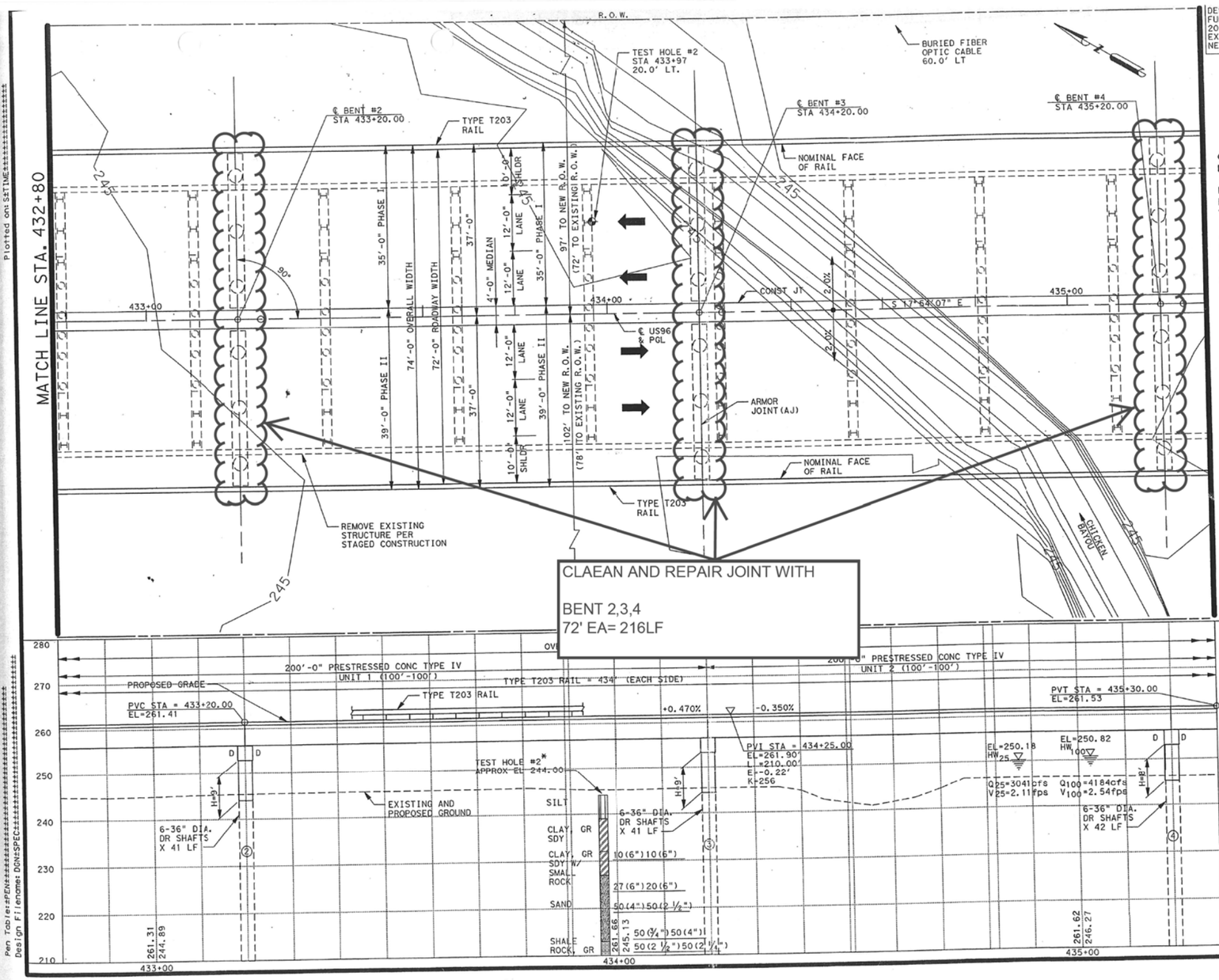
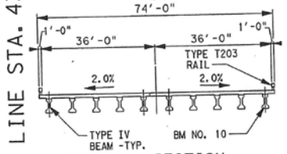


DESIGN SPEED: 70 MPH
FUNCTIONAL CLASS: RURAL PRINCIPAL ARTERIAL
2003 ADT: 5700
EXIST. NBI NO. 11-210-0-0063-06-030
NEW NBI NO. 11-210-0-0063-06-104

GENERAL STRUCTURAL NOTES :

DESIGNED FOR HS20-44 LOADING IN ACCORDANCE WITH AASHTO 2002 STANDARD SPECIFICATION FOR HIGHWAY BRIDGES AND INTERIMS.
HORIZONTAL DIMENSIONS SHOWN. LENGTHS MUST BE CORRECTED FOR GRADE OR CROSS SLOPE WHERE APPROPRIATE.
ALL STATIONS SHOWN ARE ℄ US 96, UNLESS NOTED OTHERWISE
"D" DENOTES DOWELED BEAM ENDS.

AN (X) DENOTES BORING INFORMATION TAKEN FROM EXISTING PLANS DATED 1958.



TYPICAL SECTION

NOTE: ALL ABUTMENTS AND BENTS ARE ALONG BEARING S 72°5'53" W

NOTE: SWEPCO POWERLINE LOCATED APPROX. 97.0' RT ALONG US 96.

NOTE: POWER POLE LOCATED AT STA 433+35.07, 97.40' RT

NOTE: DRILLED SHAFT SHALL BE FOUNDED AT THE ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE OR SANDSTONE THE FOLLOWING MINIMUM DISTANCES:

ABUTMENT 1,5	3.0'
BENT 2,3,4	10.0'

STATE OF TEXAS
WILSON S. GEISLER IV
81251
REGISTERED
PROFESSIONAL ENGINEER
10-11-05

SCALE: PLAN: 1" = 20'
PROFILE: 1" = 20'

Jose I. Guerra, Inc.
Consulting Engineers

BRIDGE LAYOUT

SHEET 2 OF 3

HNTB ARCHITECTS ENGINEERS PLANNERS
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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6				60
DGN: DH	STATE	DIST.	COUNTY	
CHK: DH	TEXAS	LFK	SHELBY	
CWG: JER	CONT.	SECT.	JOB	HIGHWAY NO.
CHK: WSG	0063	06	079	US 96

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

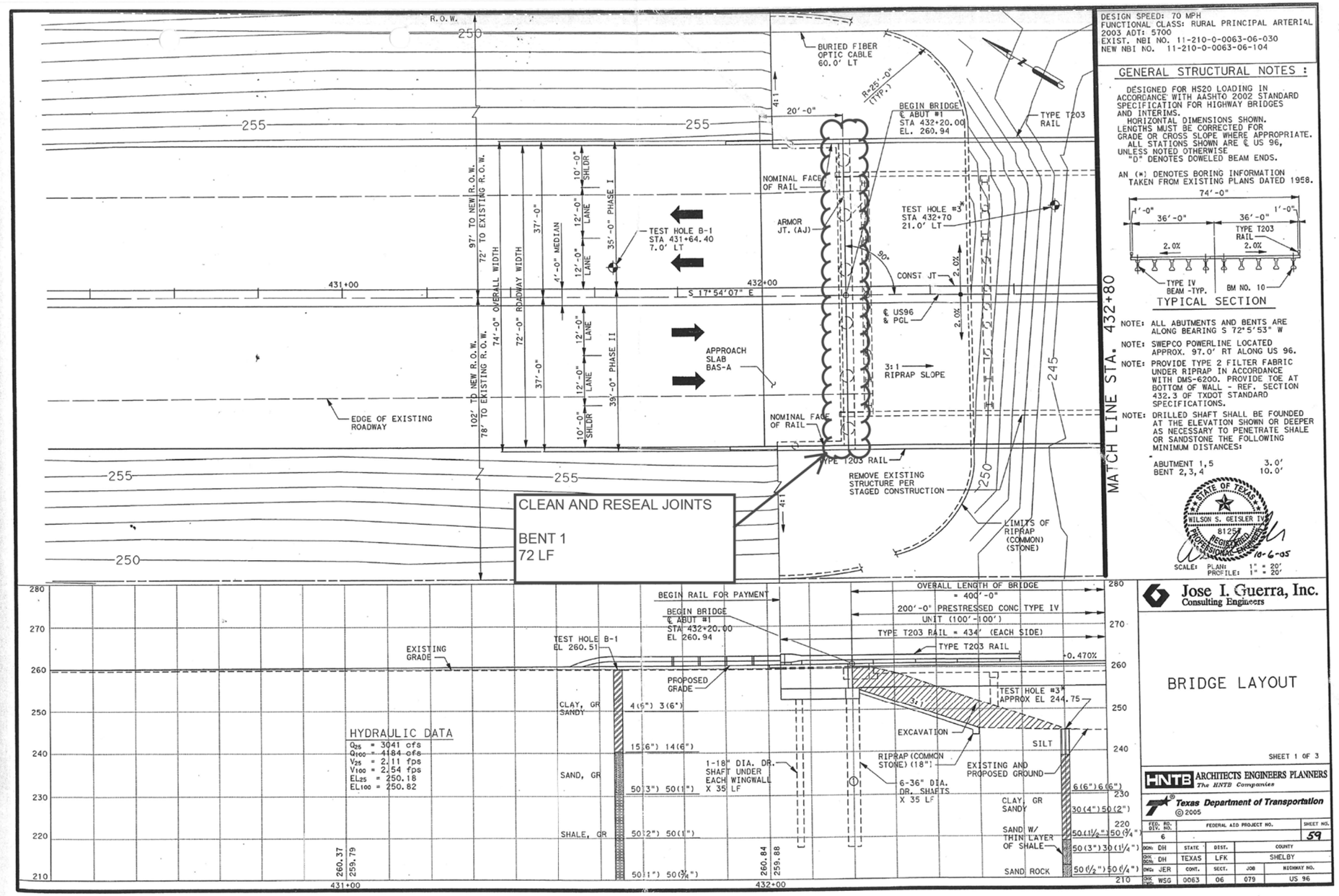
DocuSigned by:
Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

BRIDGE LAYOUT
(SITE 56)

SITE 56-SHELBY COUNTY
US 96 @ CHICKEN BAYOU
11-210-0-0063-06-104

2021
Texas Department of Transportation®
SHEET 75 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		109



DESIGN SPEED: 70 MPH
FUNCTIONAL CLASS: RURAL PRINCIPAL ARTERIAL
2003 ADT: 5700
EXIST. NBI NO. 11-210-0-0063-06-030
NEW NBI NO. 11-210-0-0063-06-104

GENERAL STRUCTURAL NOTES :

DESIGNED FOR HS20 LOADING IN ACCORDANCE WITH AASHTO 2002 STANDARD SPECIFICATION FOR HIGHWAY BRIDGES AND INTERIMS.
HORIZONTAL DIMENSIONS SHOWN. LENGTHS MUST BE CORRECTED FOR GRADE OR CROSS SLOPE WHERE APPROPRIATE. ALL STATIONS SHOWN ARE ℄ US 96, UNLESS NOTED OTHERWISE
"D" DENOTES DOWELED BEAM ENDS.

AN (*) DENOTES BORING INFORMATION TAKEN FROM EXISTING PLANS DATED 1958.

TYPICAL SECTION

NOTE: ALL ABUTMENTS AND BENTS ARE ALONG BEARING S 72°5'53" W

NOTE: SWEPCO POWERLINE LOCATED APPROX. 97.0' RT ALONG US 96.

NOTE: PROVIDE TYPE 2 FILTER FABRIC UNDER RIPRAP IN ACCORDANCE WITH DMS-6200. PROVIDE TOE AT BOTTOM OF WALL - REF. SECTION 432.3 OF TXDOT STANDARD SPECIFICATIONS.

NOTE: DRILLED SHAFT SHALL BE FOUNDED AT THE ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE OR SANDSTONE THE FOLLOWING MINIMUM DISTANCES:

ABUTMENT 1,5	3.0'
BENT 2,3,4	10.0'

STATE OF TEXAS
WILSON S. GEISLER IV
81257
REGISTERED PROFESSIONAL ENGINEER
10-6-05

SCALE: PLAN: 1" = 20'
PROFILE: 1" = 20'

Jose I. Guerra, Inc.
Consulting Engineers

BRIDGE LAYOUT

SHEET 1 OF 3

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

Texas Department of Transportation
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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6				59
DGN: DH	STATE	DIST.	COUNTY	
CHK DGN: DH	TEXAS	LFK	SHELBY	
DWN: JER	CONT.	SECT.	JOB	HIGHWAY NO.
CHK DWG: WSG	0063	06	079	US 96

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT (SITE 56)

SITE 56-SHELBY COUNTY
US 96 @ CHICKEN BAYOU
11-210-0-0063-06-104

2021
Texas Department of Transportation®
SHEET 76 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		110

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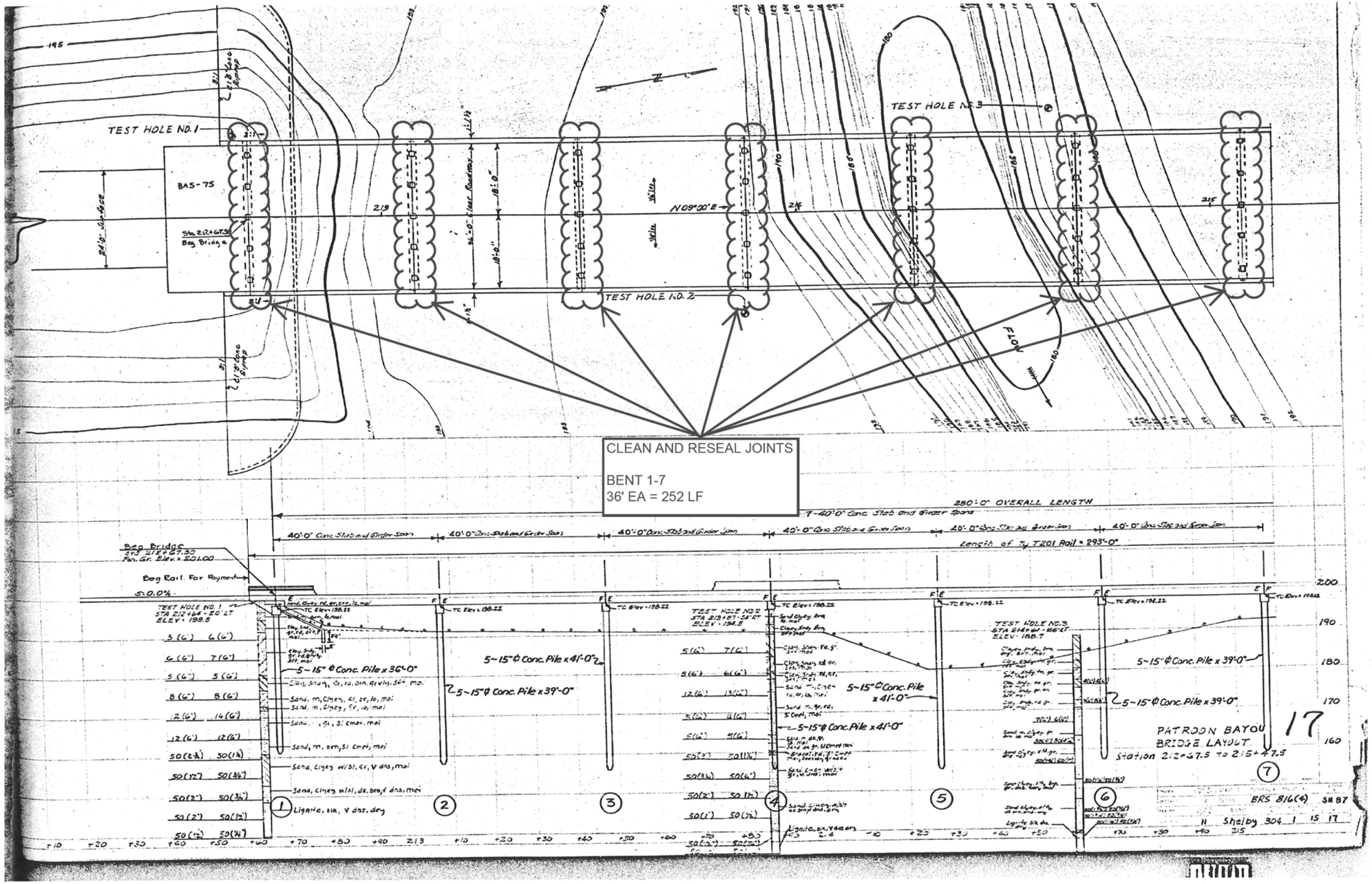

SITE 57- SHELBY COUNTY
SH 87 @ PATROON BAYOU
11-210-0-0304-01-080

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

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Jeremy King, P.E.
5135292FE4184A4...

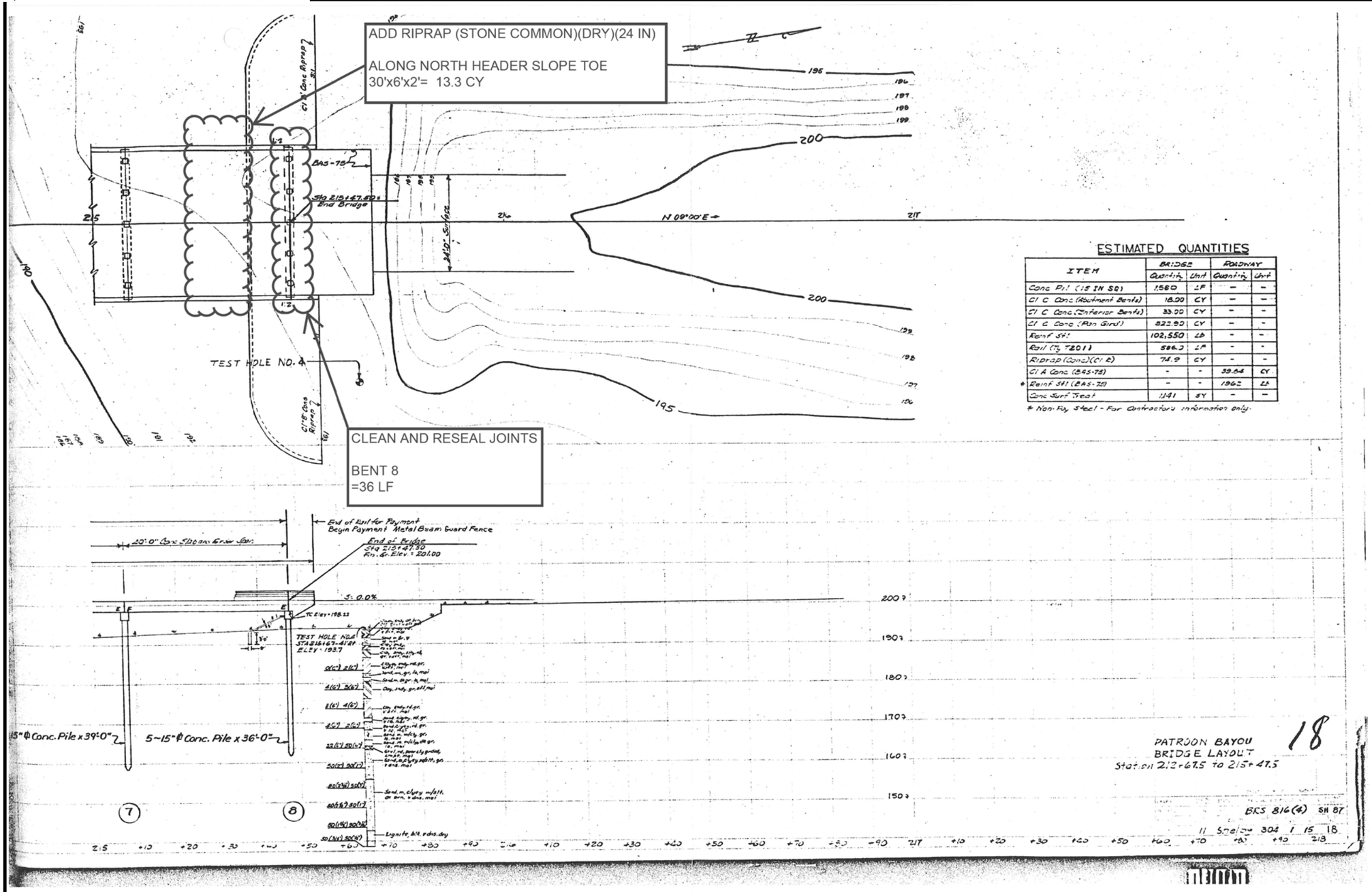
9/2/2021

BRIDGE LAYOUT
(SITE 57)

Texas Department of Transportation®

SHEET 77 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		111



ESTIMATED QUANTITIES

ITEM	BRIDGE		ROADWAY	
	Quantity	Unit	Quantity	Unit
Conc Pil (15 IN SQ)	1,560	LF	-	-
Cl C Conc (Abutment Bents)	18.00	CY	-	-
Cl C Conc (Interior Bents)	33.00	CY	-	-
Cl C Conc (Pan Gird)	522.90	CY	-	-
Reinf St!	102,550	LB	-	-
Rail (Ty T201)	586.3	LF	-	-
Riprap (Conc)(Cl B)	74.9	CY	-	-
Cl A Conc (BAS-75)	-	-	39.64	CY
* Reinf St! (BAS-75)	-	-	1962	LB
Conc Surf Treat	1141	SY	-	-

* Non-Pay Steel - For Contractors information only.

PATROON BAYOU
BRIDGE LAYOUT
Station 212+67.5 to 215+47.5

18

BRS 816(4) SH 87

11 Sheets 304 1 15 18

SITE 57- SHELBY COUNTY
SH 87 @ PATROON BAYOU
11-210-0-0304-01-080

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PROFESSIONAL ENGINEER

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BRIDGE LAYOUT
(SITE 57)

Texas Department of Transportation®

SHEET 78 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		112

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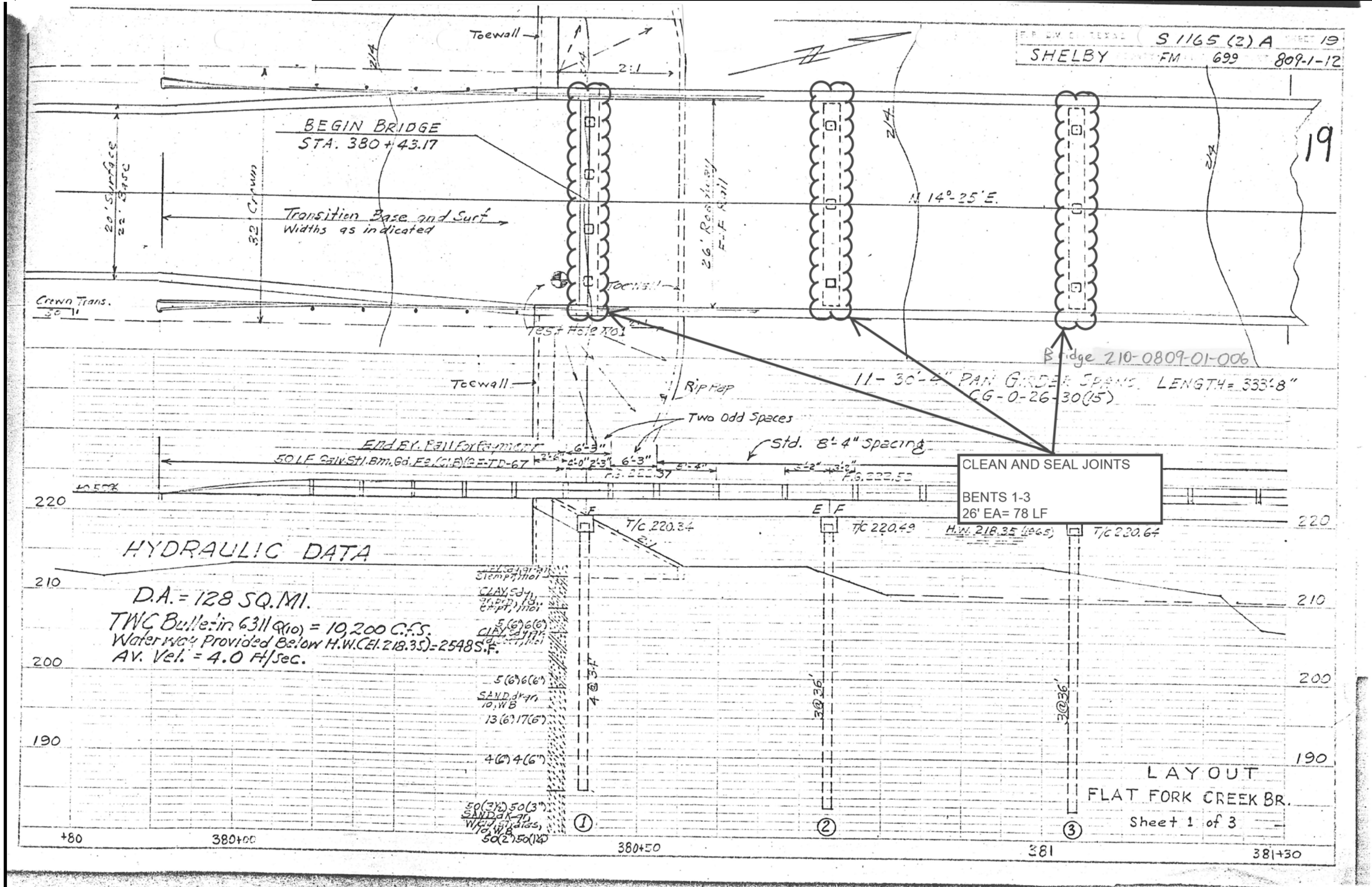

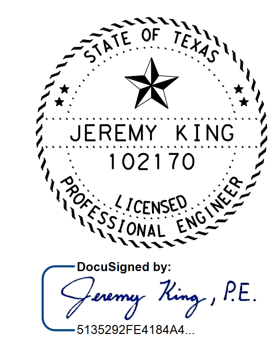

9/2/2021

BRIDGE LAYOUT
(SITE 58)

SITE 58- SHELBY COUNTY
FM 699 @ FLAT FORK CREEK
11-210-0-0809-01-006

SHEET 79 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		113

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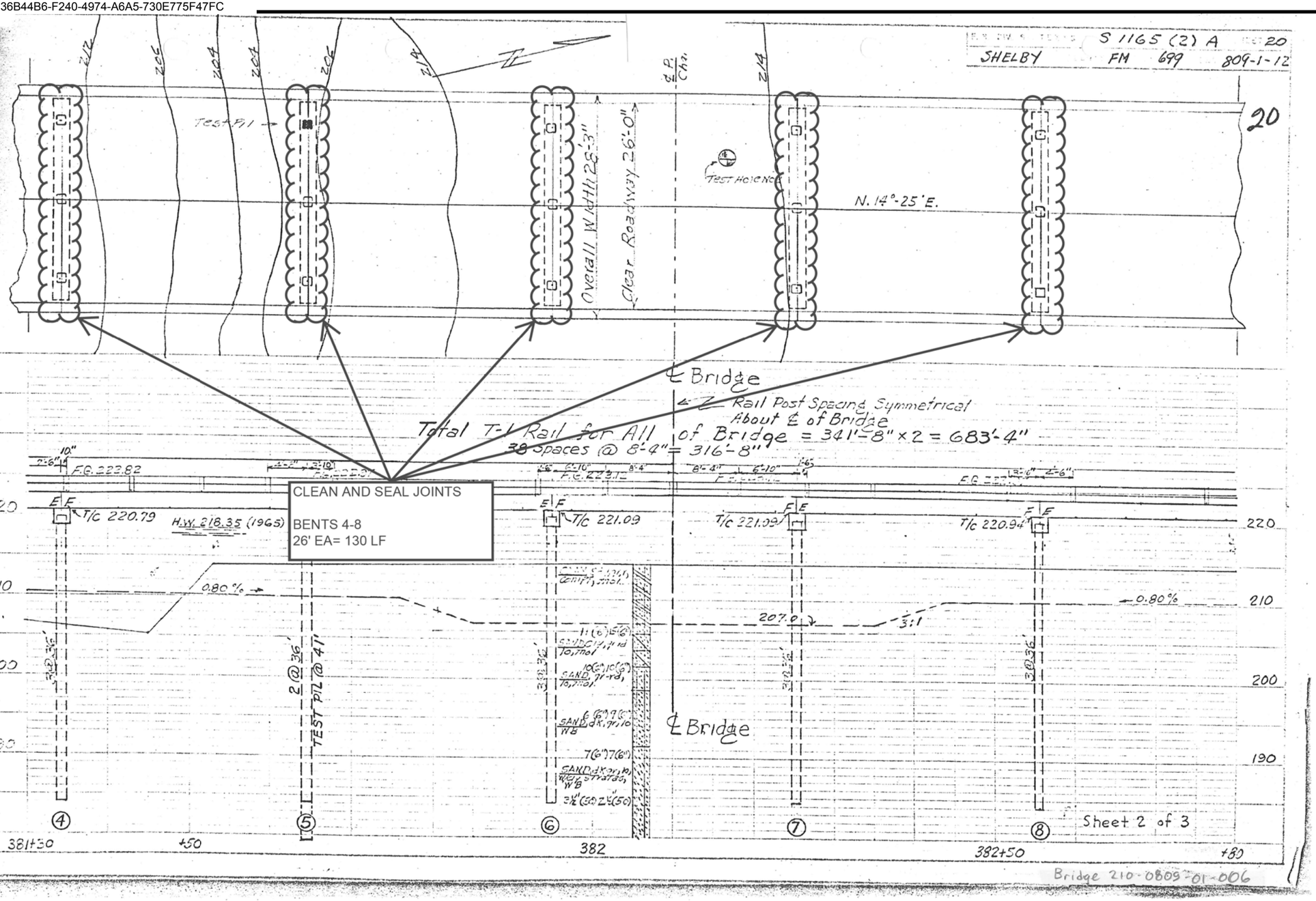

SITE 58- SHELBY COUNTY
FM 699 @ FLAT FORK CREEK
11-210-0-0809-01-006

JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

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Jeremy King, P.E.
5135292FE4184A4...

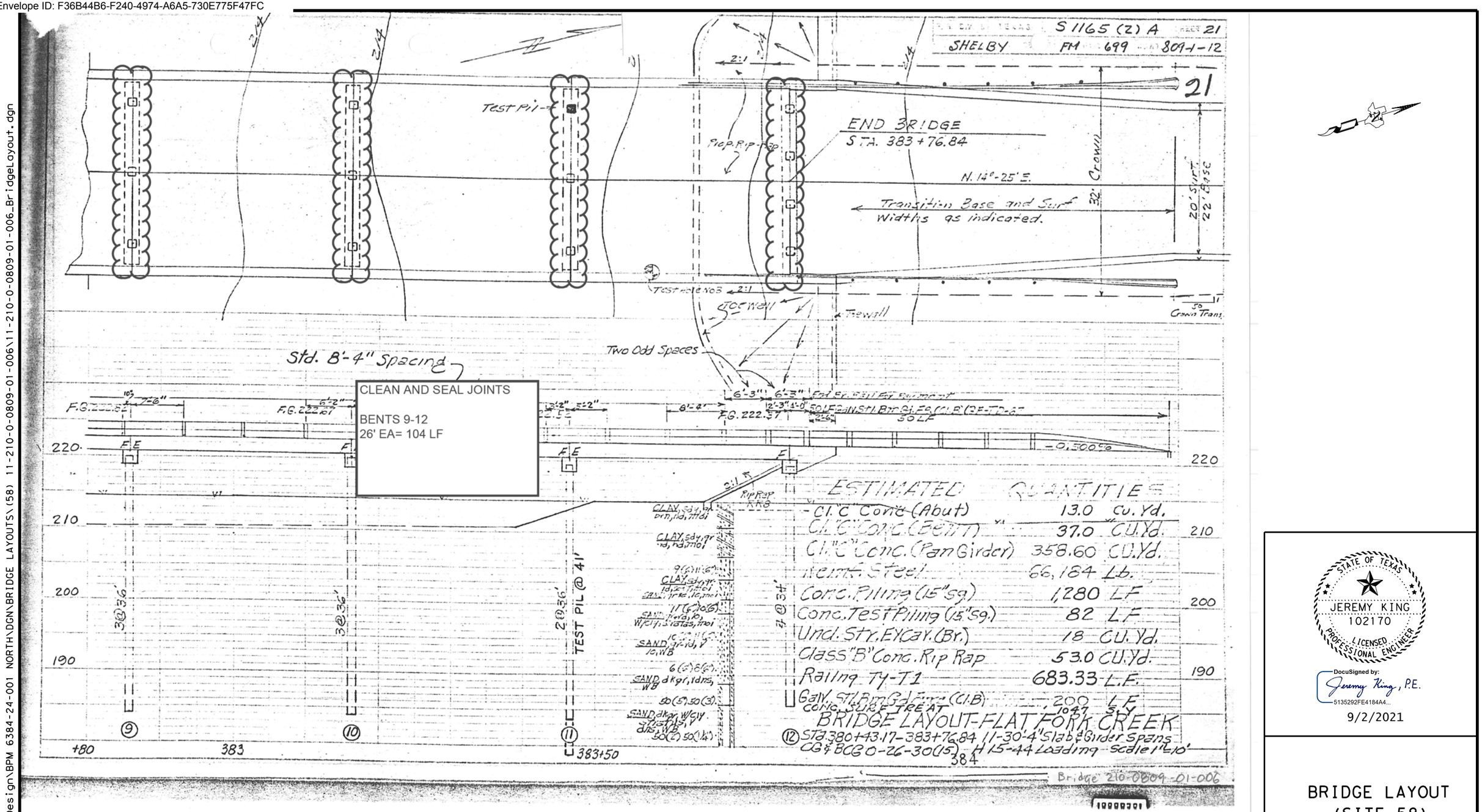
9/2/2021

BRIDGE LAYOUT (SITE 58)

Texas Department of Transportation®

SHEET 80 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		114



SITE 58- SHELBY COUNTY
FM 699 @ FLAT FORK CREEK
11-210-0-0809-01-006

STATE OF TEXAS
JEREMY KING
102170
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jeremy King, P.E.
5135292FE4184A4...

9/2/2021

BRIDGE LAYOUT (SITE 58)

Texas Department of Transportation®

SHEET 81 OF 82

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		115

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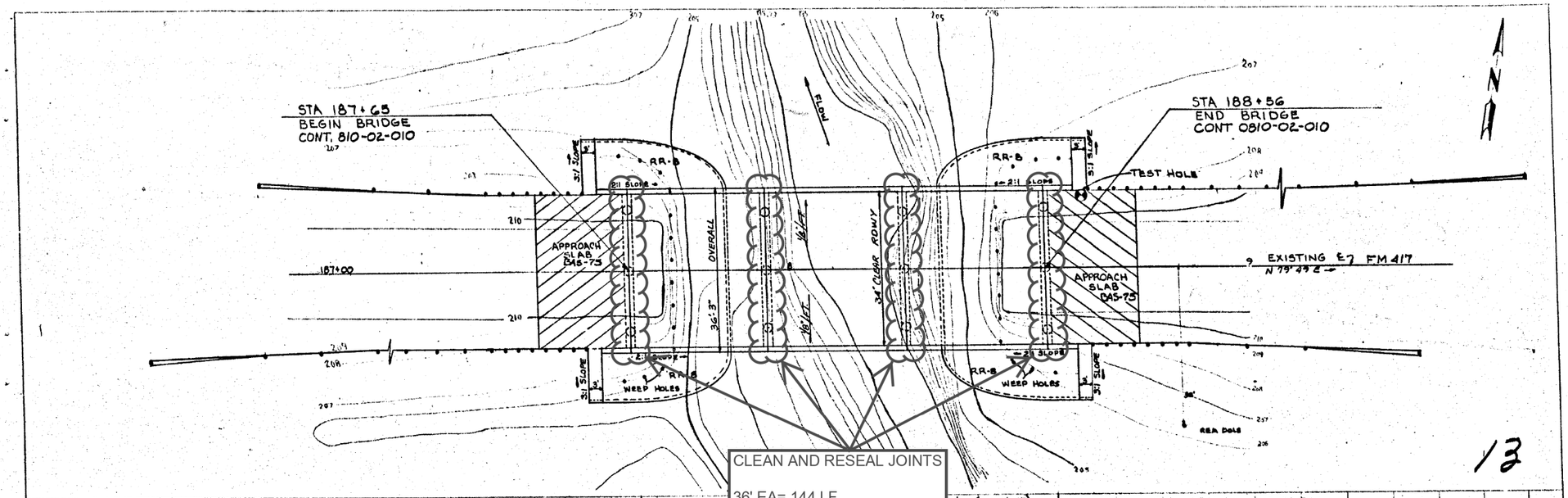

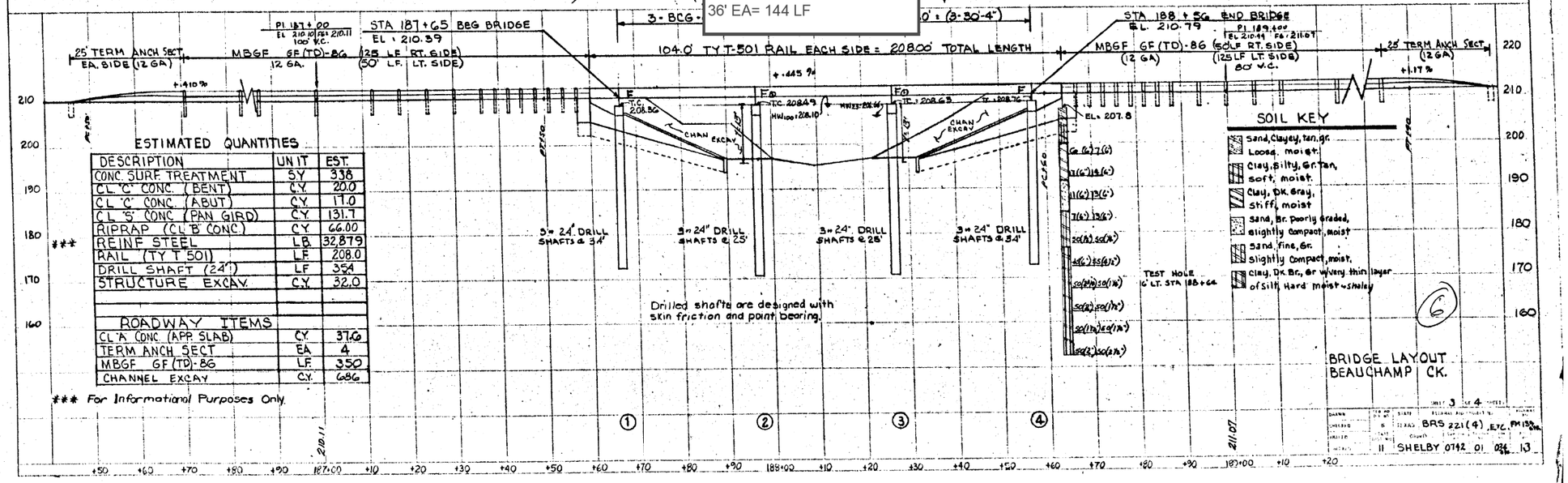

ESTIMATED QUANTITIES

DESCRIPTION	UNIT	EST.
CONC. SURF. TREATMENT	SY	338
CL "C" CONC. (BENT)	C.Y.	20.0
CL "C" CONC. (ABUT)	C.Y.	17.0
CL "S" CONC. (PAN GIRD)	C.Y.	131.7
RIPRAP (CL "B" CONC)	C.Y.	66.00
REINF STEEL	LB.	32,879
RAIL (TY T 501)	LF	208.0
DRILL SHAFT (24")	LF	354
STRUCTURE EXCAV.	C.Y.	32.0
ROADWAY ITEMS		
CL "A" CONC (APP SLAB)	C.Y.	37.0
TERM ANCH SECT	EA	4
MBGF GF(TD)-8G	LF	350
CHANNEL EXCAV	C.Y.	686

*** For Informational Purposes Only.

SITE 59- SHELBY COUNTY
FM 417 @ BEAUCHAMP CREEK
11-210-0-0810-02-006

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

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5135292FE4184A4...

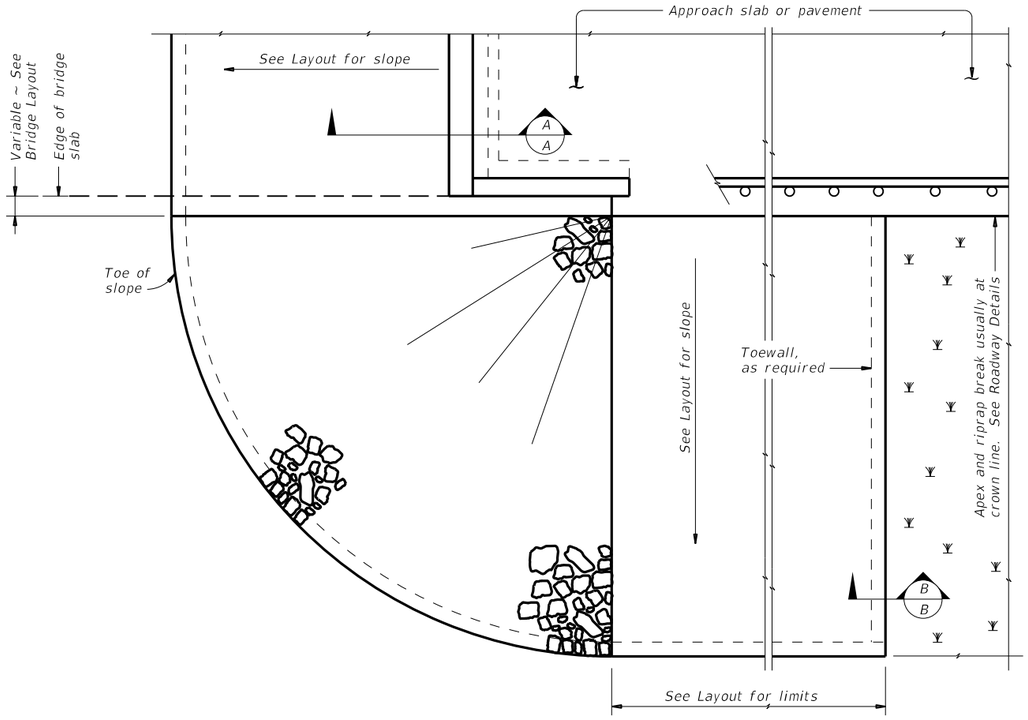
9/2/2021

BRIDGE LAYOUT (SITE 59)

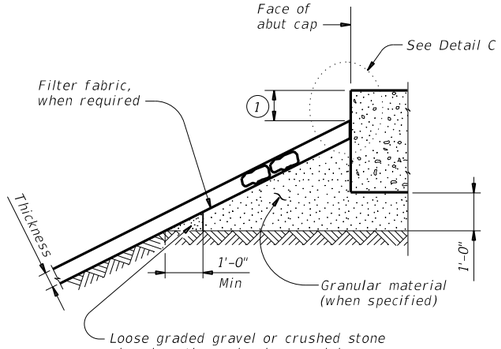
Texas Department of Transportation®

SHEET 82 OF 82

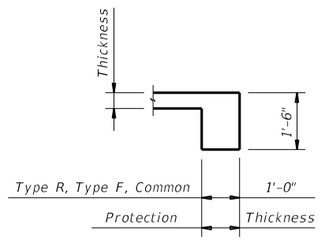
CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.
DIST	COUNTY		SHEET NO.
LFK	SAN AUGUSTINE, ETC.		116



PLAN

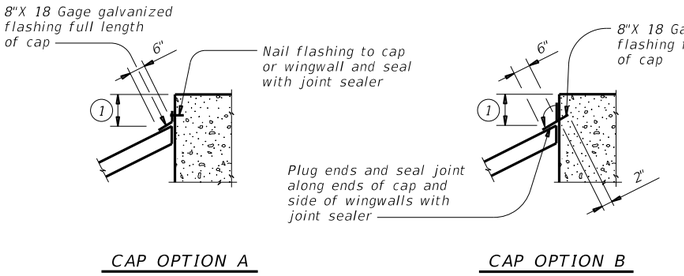


SECTION A-A AT CAP



SECTION B-B

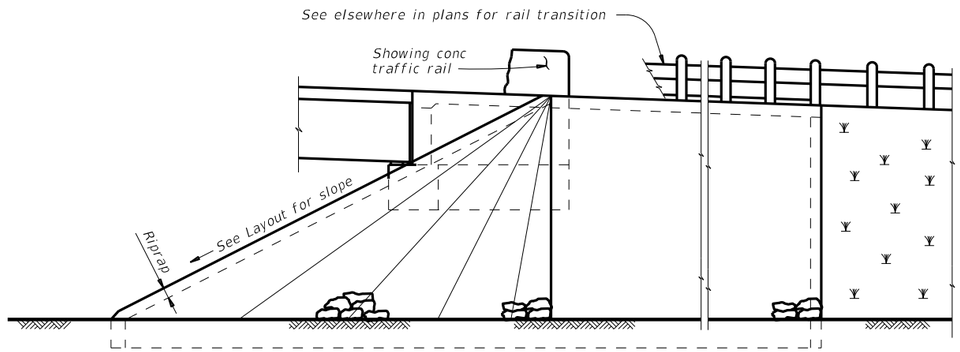
Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C



ELEVATION

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:
Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
See elsewhere in plans for locations and details of shoulder drains.

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES			
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY			
REVISIONS	6384	24	001	SH 21, ETC.			
	DIST	COUNTY		SHEET NO.			
	LFK	SAN AUGUSTINE, ETC.		117			

DATE: 9/1/2021 9:26:00 AM
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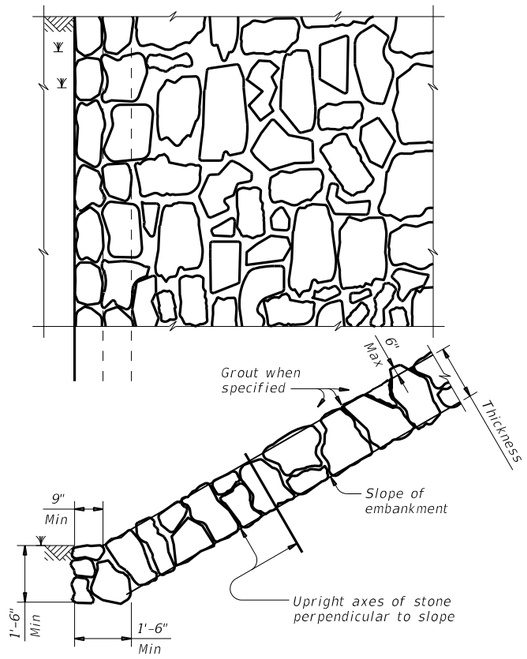


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

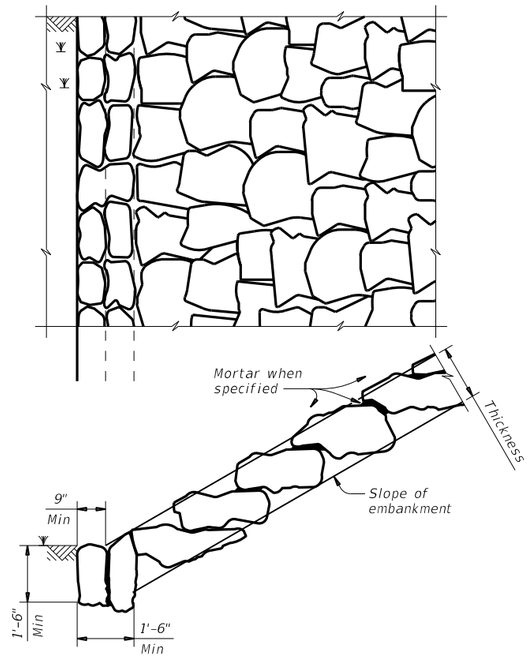


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

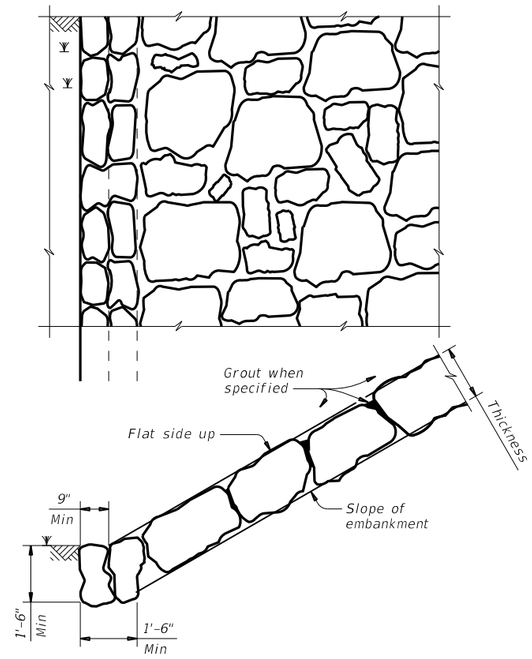


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

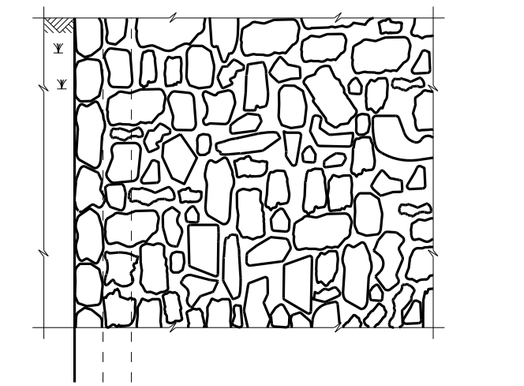


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

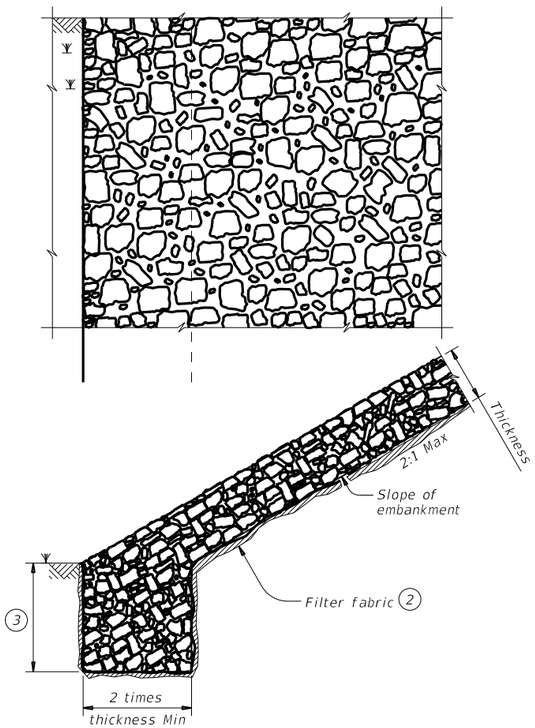


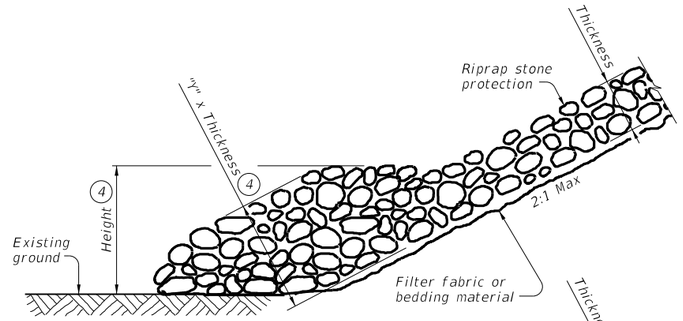
FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

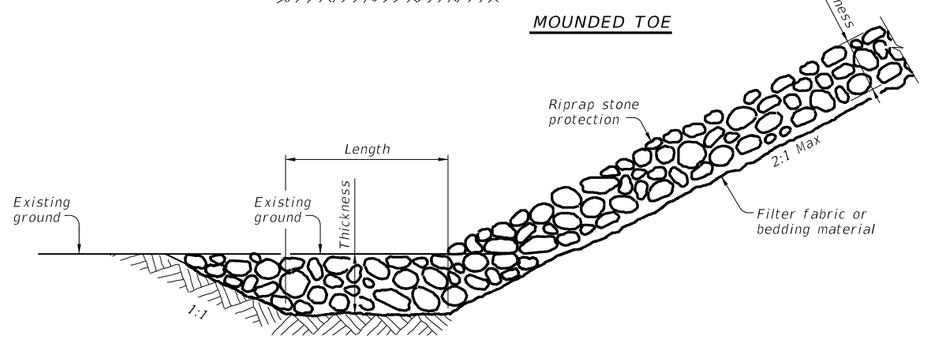
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(4) "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.

(5) List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn		DN: AES	CK: JGD	DW: BWH	CK: AES		
©TxDOT April 2019		CONT	SECT	JOB	HIGHWAY		
REVISIONS		6384	24	001	SH 21, ETC.		
		DIST	COUNTY		SHEET NO.		
		LFK	SAN AUGUSTINE, ETC.		118		

THE TOTAL DISTURBED AREA SHOWN IN THE PLANS IS LESS THAN 1 ACRE. THE DISTURBED AREA IN THE PLANS AND THE CONTRACTOR PROJECT SPECIFIC LOCATIONS (PSLS) WITHIN 1 MILE OF THE PROJECT LIMITS FOR THE CONTRACT, WILL FURTHER ESTABLISH THE AUTHORIZATION REQUIREMENTS FOR STORM WATER DISCHARGES. AS THE DISTURBED AREA INCLUDING PSLS IS LESS THAN 1 ACRE, THE TPDES CGP DOES NOT APPLY, HOWEVER, THE CONTRACTOR SHALL PLACE BMP'S AS DIRECTED. IF THE TOTAL AREA DISTURBED SHOWN IN THE PLANS AND PSLS WITHIN 1 MILE OF THE PROJECT LIMITS EXCEEDS 1 ACRE, THE ENGINEER WILL DEVELOP AN SWP3 SITE PLAN AND POST A SMALL CONSTRUCTION SITE NOTICE FOR THE CONSTRUCTION ACTIVITIES.

STATE OF TEXAS
JEREMY KING
102170
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Jeremy King, P.E.
5135292FE4184A4...
9/2/2021

TXDOT SWP3 INDEX

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
6384	24	001	SH 21, ETC.

DIST	COUNTY	SHEET NO.
LFK	SAN AUGUSTINE, ETC.	119

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DATE:
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. N/A

☒ No Action Required ☐ Required Action

Action No.

1. The proposed work of this project involves silt removal, structure repair and maintenance at various locations. These activities maintain the original line and grade, hydraulic capacity and original purpose of the structures. Therefore, this project meets the definition of a routine maintenance activity as defined in the TPDES General Permit No. TXR150000 issued March 5, 2013 and TCEQ's TPDES CGP does not apply.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☐ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☒ Other Nationwide Permit Required: NWP# 3 A and C

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

Maintenance activities require work within waters of the U.S. Removal of silt and debris within streams is limited to within 50' of culvert ends or end of bridge. Access required through wetlands will require the use of mats (i.e. wood mats, geotextile fabric with non-erodible fill).

Due to the presence of wetlands, the contractor must submit an access plan to the Area Engineer prior to the commencement of any work at the below locations.

1. Site A - LP 287 at Draw - Wetlands on north and south sides of project area
2. Site G - US 69 at Draw - Emergent Wetlands on north east side of project area
3. Site R - LP 287 at Draw - Wetland on north and south sides of project area
4. Site AF - FM 1751 at Dickey Creek - Wetland on east side of project area

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☒ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☒ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SWP3:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

VII. OTHER ENVIRONMENTAL ISSUES

☒ No Action Required ☐ Required Action

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

SHEET 1 OF 2

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY	
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	6384	24	001	SH 21, ETC	
	DIST	COUNTY		SHEET NO.	
	LFK	SAN AUGUSTINE, ETC		120	

NWP GENERAL CONDITIONS
As Applicable to
This Project

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that nromally migrate through the area, unless the activity's primary purpose is to impound water.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

8. Adverse Effects from Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water managment activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the actvity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

20. Mitigation. The district engineer will consider the following factors when will consider the following fators when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal.

21. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation or water quality.

23. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions andded by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

For a complete list of General Conditions go to:
http://www.swf.usace.army.mil/pubdata/environ/regulatory/permitting/nwp/2007/index.asp

USACE - Permit #3(a)
As Applicable to
This Project

(a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or af any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The area affected by temporary fills must be revegetated, as appropriate.

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

NOTE:

The project crosses jurisdictional waters of the U.S. and a Nationwide Permit(NWP)#3a has been utilized. This permit authorizes the repair, rehab, or replacement of currently serviceable structures or fill that were previously authorized. The NWP General Conditions and the NWP guidelines must be followed in order to maintain compliance with the NWP. No coordination has taken place with the USACE. If coordination may be needed, contact the TxDOT Lufkin District Environmental Section at 1-800-687-8087.

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC):

USACE

(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

EPIC 2 OF 2

 Texas Department of Transportation

DESIGN BY:		DRAWN BY:		CHECKED BY:	
FED. NO. DIV. NO.	MAINTENANCE PROJECT NO.				SHEET NO.
6	6384-24-001				121
STATE	DISTRICT	COUNTY			
TEXAS	LFK	SAN AUGUSTINE, ETC			
CONTROL	SECTION	JOB		HIGHWAY NO.	
6384	24	001		SH 21, ETC	

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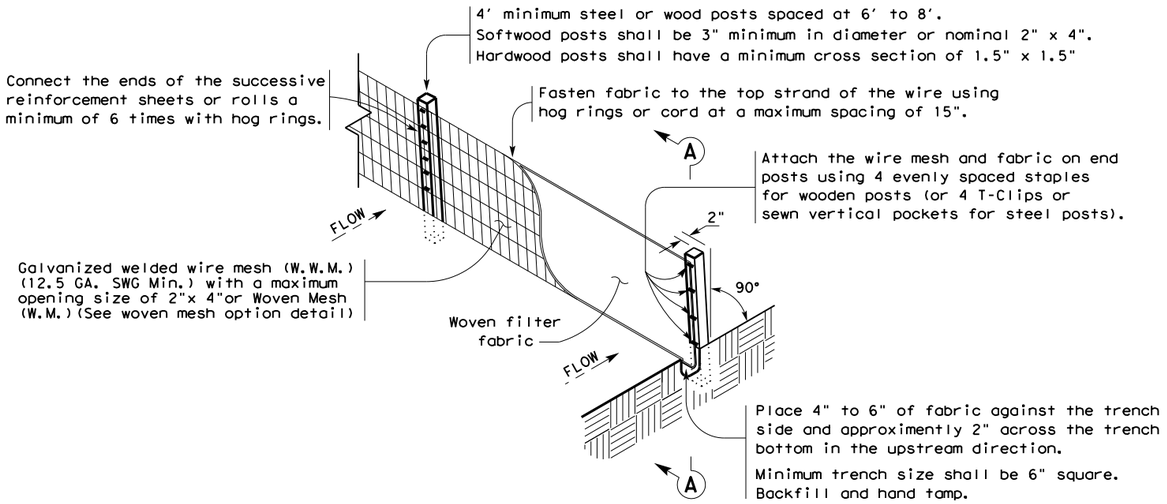
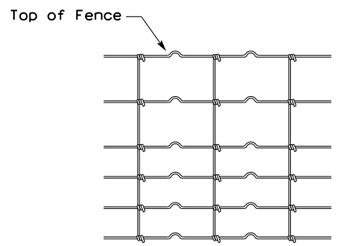
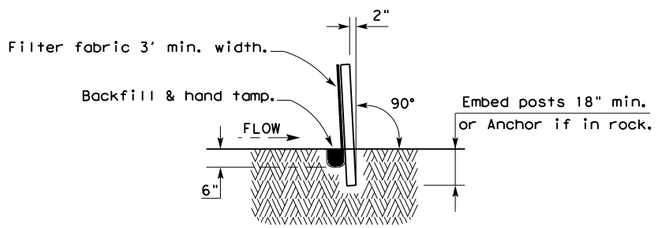


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

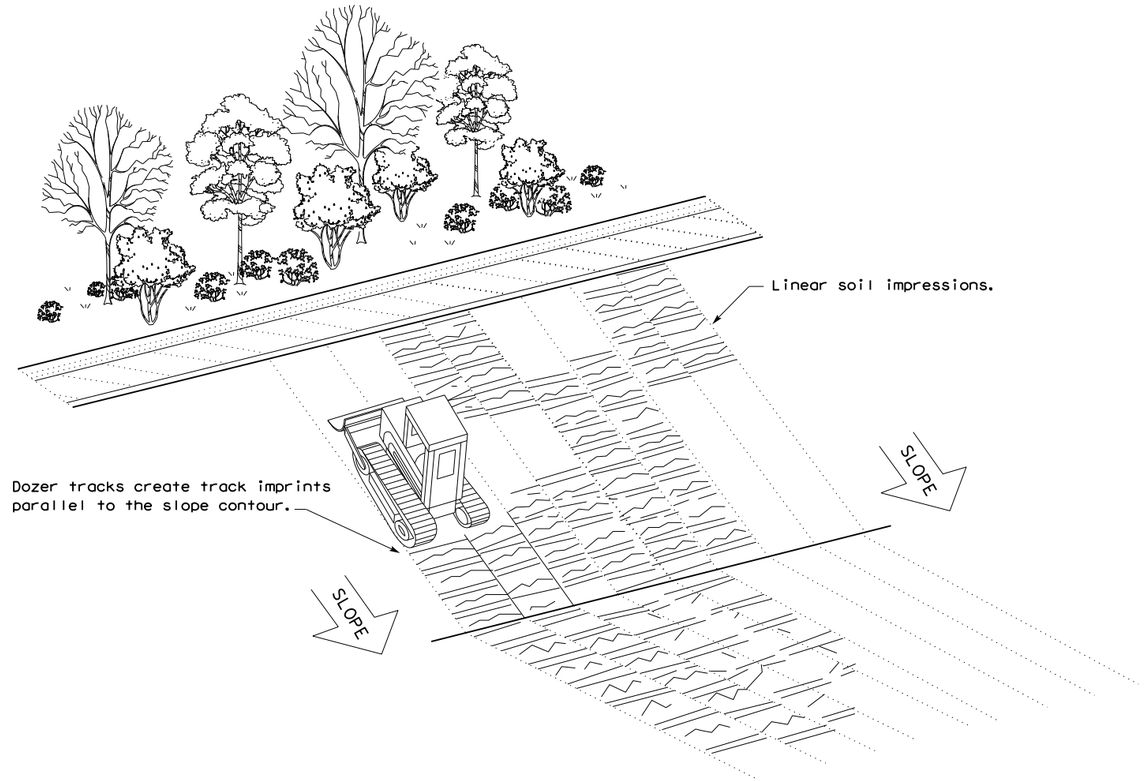
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	6384	24	001		SH 21, ETC.		
	DIST	COUNTY					SHEET NO.
	LFK	SAN AUGUSTINE, ETC.					122