

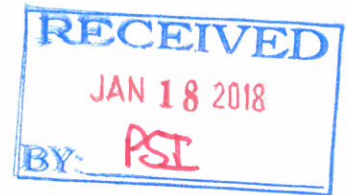
Received

Jan 23, 2018

HNTB Corporation
Round Rock

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 2



1. CONTRACTOR: Cox Commercial Construction
2. Change Order Work Limits: Sta. 413+26 to Sta. 460+15
3. Type of Change (on federal-aid non-exempt projects): Minor (Major/Minor)
4. Reasons: 2E, 3E, 3F & 2E (3 Max. - In order of importance - Primary first)

Project:	<u>1608-108</u>
Roadway:	<u>RM 620 Ph2</u>
CSJ Number:	

5. Describe the work being revised:

2E: Differing Site Conditions (unforeseeable). Miscellaneous difference in site conditions (unforeseeable). This Change Order revises the drainage inlets along Oaklands Drive. **3E: County Convenience. Reduction of future maintenance.** This Change Order revises the signal conduits and controller cabinet at Oaklands Drive and RM 620.

6. Work to be performed in accordance with Items: See attached
7. New or revised plan sheet(s) are attached and numbered: RFI#6: 232,234,243,245; RFI#16: 9,157,167,168,172,173, 176,243,244,245,246,248 & xs18; RFI#22: 198,199; RFI#23: 132,133,135,159,168,199A,217.
8. New Special Provisions/Specifications to the contract are attached: No
9. New Special Provisions to Item N/A No. N/A, Special Specification Item N/A are attached.

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

<i>The contractor must sign the Change Order and, by doing so, agrees to waive any and all claims for additional compensation due to any and all other expenses; additional changes for time, overhead and profit; or loss of compensation as a result of this change.</i> THE CONTRACTOR <u>[Signature]</u> Date <u>1/12/18</u> By _____ Typed/Printed Name <u>DARREN OKRUTUK</u> Typed/Printed Title <u>SR. VP</u>	The following information must be provided Time Ext. #: <u>N/A</u> Days added on this CO: <u>0</u> Amount added by this change order: <u>\$49,456.20</u>
---	--

RECOMMENDED FOR EXECUTION:

[Signature] P.E. 1/12/18
Project Manager Date

N/A
Design Engineer Date

[Signature] 1/19/2018
Program Manager Date

Design Engineer's Seal:

See attached plan sheets

County Commissioner Precinct 1 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 2 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 3 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 4 Date
☐ APPROVED ☐ REQUEST APPROVAL

[Signature] 02-01-18
County Judge Date
☒ APPROVED

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 2

Project # 1608-108

TABLE A: Force Account Work and Materials Placed into Stock

	LABOR	HOURLY RATE			HOURLY RATE

TABLE B: Contract Items:

				ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
618 6046	CONDT (PVC) (SCH 80) (2")	LF	\$11.00	1,455.00	\$16,005.00	125.00	1,580.00	\$17,380.00	\$1,375.00
618 6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	\$22.00	985.00	\$21,670.00	100.00	1,085.00	\$23,870.00	\$2,200.00
618 6053	CONDT (PVC) (SCH 80) (3")	LF	\$15.00	1,600.00	\$24,000.00	100.00	1,700.00	\$25,500.00	\$1,500.00
618 6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	\$26.00	1,435.00	\$37,310.00	100.00	1,535.00	\$39,910.00	\$2,600.00
340 6011	D-GR HMA(SQ) TY-B PG64-22	TN	\$100.00	365.00	\$36,500.00	18.00	383.00	\$38,300.00	\$1,800.00
341 6040	D-GR HMA TY-D PG64-22	TN	\$70.00	3,351.00	\$234,570.00	4.00	3,355.00	\$234,850.00	\$280.00
341 6062	D-GR HMA TY-D PG64-22(LEVEL-UP)	TN	\$70.00	2,654.00	\$185,780.00	77.00	2,731.00	\$191,170.00	\$5,390.00
347 6003	TOM (ASPHALT) PG 70-22	TN	\$90.00	161.00	\$14,490.00	1.00	162.00	\$14,580.00	\$90.00
347 6006	TOM - C (AGGREGATE) SAC - B	TN	\$90.00	2,074.00	\$186,660.00	3.00	2,077.00	\$186,930.00	\$270.00
354 6069	PLANE ASPH CONC PAV (0"- 2 1/2")	SY	\$2.20	16,335.00	\$35,937.00	19.00	16,354.00	\$35,978.80	\$41.80
400 6005	CEM STABIL BKFL	CY	\$110.00	75.00	\$8,250.00	13.00	88.00	\$9,680.00	\$1,430.00
432 6002	RIPRAP (CONC)(5 IN)	CY	\$475.00	455.00	\$216,125.00	(2.00)	453.00	\$215,175.00	(\$950.00)
464 6003	RC PIPE (CL III) (18IN)	LF	\$65.00	2,403.00	\$156,195.00	22.00	2,425.00	\$157,625.00	\$1,430.00
464 6017	RC PIPE (CL IV)(18 IN)	LF	\$68.00	32.00	\$2,176.00	26.00	58.00	\$3,944.00	\$1,768.00
465 6181	INLET (COMPL) (TYII) (15 FT)	EA	\$7,200.00	2.00	\$14,400.00	(2.00)	0.00	\$0.00	(\$14,400.00)
465 6239	INLET (COMPL) (TY AD) (MOD)	EA	\$3,183.00	0.00	\$0.00	1.00	1.00	\$3,183.00	\$3,183.00
465-WC01	INLET (COMPL)(CURB)(TY IIR)(15')	EA	\$12,945.00	0.00	\$0.00	2.00	2.00	\$25,890.00	\$25,890.00
474 6021	CAST-IN-PLACE TRENCH DRAIN	LF	\$499.00	0.00	\$0.00	24.00	24.00	\$11,976.00	\$11,976.00
529 6008	CONC CURB & GUTTER (TY II)	LF	\$20.00	14,101.00	\$282,020.00	5.00	14,106.00	\$282,120.00	\$100.00
6002 6005	VIVDS COMMUNICATION CABLE (COAXIAL)	LF	\$3.10	3,931.00	\$12,186.10	390.00	4,321.00	\$13,395.10	\$1,209.00
6089 6001	ETHERNET CABLE AND CONNECTORS	LF	\$8.00	310.00	\$2,480.00	4.00	314.00	\$2,512.00	\$32.00
618 6046	CONDT (PVC) (SCH 80) (2")	LF	\$11.00	1,455.00	\$16,005.00	20.00	1,475.00	\$16,225.00	\$220.00
618 6053	CONDT (PVC) (SCH 80) (3")	LF	\$15.00	1,600.00	\$24,000.00	40.00	1,640.00	\$24,600.00	\$600.00
620 6007	ELEC CONDR (NO.8) BARE	LF	\$1.00	4,720.00	\$4,720.00	250.00	4,970.00	\$4,970.00	\$250.00
		TOTALS			\$1,531,479.10			\$1,579,763.90	\$48,284.80

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 2

Project # 1608-108

TABLE B: Contract Items (Continued)

				ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
620 6009	ELEC CONDR (NO.6) BARE	LF	\$1.50	340.00	\$510.00	(180.00)	160.00	\$240.00	(\$270.00)
620 6010	ELEC CONDR (NO.6) INSULATED	LF	\$1.70	680.00	\$1,156.00	(360.00)	320.00	\$544.00	(\$612.00)
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	\$0.20	4,119.00	\$823.80	(9.00)	4,110.00	\$822.00	(\$1.80)
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	\$0.30	7,189.00	\$2,156.70	14.00	7,203.00	\$2,160.90	\$4.20
666 6184	REFL PAV MRK TY II (W) (ARROW)	EA	\$70.00	35.00	\$2,450.00	2.00	37.00	\$2,590.00	\$140.00
666 6192	REFL PAV MRK TY II (W) (WORD)	EA	\$90.00	33.00	\$2,970.00	2.00	35.00	\$3,150.00	\$180.00
666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	\$1.00	4,119.00	\$4,119.00	(9.00)	4,110.00	\$4,110.00	(\$9.00)
672 6010	ELIM EXT PAV MRK & MRKS (TPL ARROW)	EA	\$4.00	458.00	\$1,832.00	1.00	459.00	\$1,836.00	\$4.00
684 6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	\$2.00	2,394.00	\$4,788.00	(90.00)	2,304.00	\$4,608.00	(\$180.00)
684 6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	\$5.20	1,810.00	\$9,412.00	370.00	2,180.00	\$11,336.00	\$1,924.00
684 6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	\$1.20	2,290.00	\$2,748.00	(90.00)	2,200.00	\$2,640.00	(\$108.00)
WC-9015	OPTICOM CABLE - GTT MODEL 138	LF	\$2.50	1,795.00	\$4,487.50	40.00	1,835.00	\$4,587.50	\$100.00
The "Totals" from Table B of the previous work sheet:					\$1,531,479.10			\$1,579,763.90	\$48,284.80
TOTALS					\$1,568,932.10			\$1,618,388.30	\$49,456.20

CHANGE ORDER REASON(S) CODE CHART

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

Williamson County Road Bond Program

RM 620 Phase 2 Williamson County Project No. 1608-108

Change Order No. 2

Reason for Change

This Change Order revises the signal conduits and drainage inlets along Oaklands Drive and RM 620.

The Contractor (Cox Commercial) proposed the realignment of the traffic signal conduit runs. The City of Round Rock reviewed and requested additional conduit runs for the Oaklands Drive and the Hospital entrance signals.

The Contractor (Cox Commercial) proposed to relocate the proposed signal controller foundation at Oaklands Drive from the southeast corner of the intersection to the northwest corner, to give better access to service the signals and cabinet. The southeast corner of the intersection is crowded with temp poles, guy wires, box culvert that prevents the installation of the permanent foundation.

The plans details show inlets C1 and C1-A to be Type IIR, however a pay item does not exist for this type of inlet. A price proposal was submitted by the Contractor and accepted.

The plans show installation of curb inlet in the median at Oaklands Drive, however the survey confirmed that the roadway drains to the outside curb line. The inlet in the median is not needed, but a linear grated inlet was proposed to be installed along the outside curb line to accommodate the existing flow. A price proposal was submitted by the Contractor and accepted.

Following is a summary of the new item required for this Change Order.

ITEM	DESCRIPTION	QTY	UNIT
465 6239	INLET (COMPL) (TY AD) (MOD)	1	EA
465-WC01	INLET (COMPL)(CURB)(TY IIR)(15')	2	EA
474 6021	CAST-IN-PLACE TRENCH DRAIN	24	LF

This Change Order results in an increase of \$49,456.20 to the Contract amount, for an adjusted Contract total of \$6,139,177.70. The original Contract amount was \$6,082,225.70. Because of this Change Order, \$56,952.00 has been added to the Contract, resulting in a 0.94% net increase in the Contract cost. No additional days will be added to or deducted from the Contract as a result of this Change Order.

HNTB Corporation
James Klotz, P.E.

new item 465-6239
INLET (COMPL)(TY AD)(MOD)

PROJECT: RM 620 PH. II
ITEM NUMBER/DESC.: INLET (COMPL)(TY AD)(MOD)
ESTIMATED QUANTITY: 1 EA
Date Prepared: 9/26/2017

ITEM DESCRIPTION	QTY	UNIT COSTS						TOTAL COSTS				
		UNIT	LABOR	EQUIP	MATERIAL	SUBCT.	O.T.Factor	LABOR	EQUIP	MATERIAL	SUBCT.	MISC.
LABOR	#											
FOREMAN	1	HR	\$ 24.00				1.00	\$ 144.00				
EXC. OPERATOR	1	HR	\$ 19.00				1.00	\$ 114.00				
LOADER OPERATOR	1	HR	\$ 16.50				1.00	\$ 99.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 96.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 96.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 96.00				
MATERIAL												
INLET	1.00	EA			\$ 942.00					\$ 942.00		
BEDDING	4.00	TON			\$ 14.65					\$ 58.60		
EQUIPMENT												
JD 210 EXC.	6.00	HR		\$ 59.06					\$ 354.36			
JD 544 LOADER	6.00	HR		\$ 28.69					\$ 172.14			
PICKUP TRUCK	6.00	HR		\$ 19.45					\$ 116.70			
SUBCONTRACT												
TOTALS								\$ 645.00	\$ 643.20	\$1,000.60	\$ -	\$ -

TOTAL LABOR \$ 645.00
TOTAL MATERIAL \$ 1,000.60
TOTAL SUBCONTRACT \$ -
TOTAL EQUIPMENT \$ 643.20
MARKUPS
LABOR BURDENS \$ 645.00 @ 55% \$ 354.75
LABOR MARK-UP \$ 645.00 @ 25% \$ 161.25
MATERIAL MARK-UP \$ 1,000.60 @ 25% \$ 250.15
EQUIPMENT MARK-UP \$ 643.20 @ 15% \$ 96.48
SUBCONTRACT MARK-UP \$ - @ 5% \$ -
PERFORMANCE BOND \$ 3,151.43 @ 1% \$ 31.51

TOTAL \$ 3,182.94
QUANTITY 1 EA
UNIT COST \$ 3,183.00 / EA

new item 465-WC01
INLET (COMPL)(CURB)(TY IIR)(15')

PROJECT: RM 620 PH. II
ITEM NUMBER/DESC.: INLET (COMPL)(TY IIR)(15')
ESTIMATED QUANTITY: 2 EA
Date Prepared: 10/12/2017

ITEM DESCRIPTION	QTY	UNIT COSTS						TOTAL COSTS				
		UNIT	LABOR	EQUIP	MATERIAL	SUBCT.	O.T.Factor	LABOR	EQUIP	MATERIAL	SUBCT.	MISC.
LABOR	#											
FOREMAN	1	HR	\$ 24.00				1.00	\$ 240.00				
EXC. OPERATOR	1	HR	\$ 19.00				1.00	\$ 190.00				
LOADER OPERATOR	1	HR	\$ 16.50				1.00	\$ 165.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 160.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 160.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 160.00				
MATERIAL												
INLET (STAGE 1)	2.00	EA			\$ 2,130.50					\$ 4,261.00		
BEDDING	8.00	TON			\$ 14.65					\$ 117.20		
EQUIPMENT												
JD 210 EXC.	10.00	HR		\$ 59.06				\$ 590.60				
JD 290 EXC.	10.00	HR		\$ 80.65				\$ 806.50				
JD 544 LOADER	10.00	HR		\$ 28.69				\$ 286.90				
PICKUP TRUCK	10.00	HR		\$ 19.45				\$ 194.50				
SUBCONTRACT												
TANDEM	10.00	HR				\$ 50.00					\$ 500.00	
CIP STAGE 2 SECTION	2.00	EA				\$ 7,400.00					\$ 14,800.00	
TOTALS								\$ 1,075.00	\$ 1,878.50	\$ 4,378.20	\$ 15,300.00	\$ -

TOTAL LABOR \$ 1,075.00
TOTAL MATERIAL \$ 4,378.20
TOTAL SUBCONTRACT \$ 15,300.00
TOTAL EQUIPMENT \$ 1,878.50

MARKUPS
LABOR BURDENS \$ 1,075.00 @ 55% \$ 591.25
LABOR MARK-UP \$ 1,075.00 @ 25% \$ 268.75
MATERIAL MARK-UP \$ 4,378.20 @ 25% \$ 1,094.55
EQUIPMENT MARK-UP \$ 1,878.50 @ 15% \$ 281.78
SUBCONTRACT MARK-UP \$ 15,300.00 @ 5% \$ 765.00
PERFORMANCE BOND \$ 25,633.03 @ 1% \$ 256.33

TOTAL \$ 25,889.36

QUANTITY 2 EA
UNIT COST \$ 12,945.00 / EA



PRICE BREAKDOWN SHEET

new item 465-WC01
INLET (COMPL)(CURB)(TY IIR)(15')

6/23/2017

RM-620 CIP STAGE 2 OF TY-IIR INLETS

LABOR	Hours					EQUIPMENT				
Description/Name	Regular	Over Time	Days	Hourly Rate	Total	Description	Qty	Unit	Rate	Total
SUPERVISOR	32			\$25.00	\$800.00	Truck/Trailer/tools	32	HR	\$19.50	\$624.00
LABORER	224			\$18.00	\$4,032.00					
		Labor Burden		55.0%	\$2,657.60					
		Markup		25.0%	\$1,208.00		Markup		15.0%	\$93.60
		Sub-Total		\$8,697.60	Sub-Total		\$717.60			
SUBCONTRACT						MATERIALS				
Description		Quantity	Unit	Unit Price	Total	Description	Quantity	Unit	Unit Price	Total
						CONCRETE	16.50	CY	\$93.00	\$1,534.50
						ENVIRONMENTAL FEE	2.00	EA	\$15.00	\$30.00
						SHORT LOAD FEE	1.00	EA	\$150.00	\$150.00
						REBAR	4,896.00	LB	\$0.38	\$1,860.48
						RING/COVER	2.00	EA	\$180.00	\$360.00
						FORMS & MISC	1.00	EA	\$400.00	\$400.00
		Markup		5.0%			Markup		25.0%	\$1,083.75
		Sub-Total			Sub-Total		\$5,418.73			

SUMMARY	Labor	Equipment	Subcontract	Materials	Bond @ 1%	Total	Quantity	Unit	Unit Price
	\$8,697.60	\$717.60		\$5,418.73		\$14,833.93			

NOTES :

new item 474-6021
CAST-IN-PLACE TRENCH DRAIN

PROJECT: RM 620 PH. II
ITEM NUMBER/DESC.: CIP TRENCH DRAIN
ESTIMATED QUANTITY: 24 LF
Date Prepared: 11/7/2017

ITEM DESCRIPTION	QTY	UNIT COSTS						TOTAL COSTS				
		UNIT	LABOR	EQUIP	MATERIAL	SUBCT.	O.T.Factor	LABOR	EQUIP	MATERIAL	SUBCT.	MISC.
LABOR	#											
FOREMAN	1	HR	\$ 24.00				1.00	\$ 192.00				
EXC. OPERATOR	1	HR	\$ 19.00				1.00	\$ 152.00				
LOADER OPERATOR	1	HR	\$ 16.50				1.00	\$ 132.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 128.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 128.00				
LABORER	1	HR	\$ 16.00				1.00	\$ 128.00				
MATERIAL												
BEDDING	8.00	TON			\$ 14.65					\$ 117.20		
EQUIPMENT												
JD 290 EXC.	8.00	HR	\$ 80.65					\$ 645.20				
JD 544 LOADER	8.00	HR	\$ 28.69					\$ 229.52				
PICKUP TRUCK	8.00	HR	\$ 19.45					\$ 155.60				
SUBCONTRACT												
TANDEM	8.00	HR				\$ 50.00					\$ 400.00	
CIP TRENCH DRAIN	24.00	LF				\$ 340.00					\$ 8,160.00	
TOTALS								\$ 860.00	\$ 1,030.32	\$ 117.20	\$ 8,560.00	\$ -

TOTAL LABOR \$ 860.00
TOTAL MATERIAL \$ 117.20
TOTAL SUBCONTRACT \$ 8,560.00
TOTAL EQUIPMENT \$ 1,030.32
MARKUPS
LABOR BURDENS \$ 860.00 @ 55% \$ 473.00
LABOR MARK-UP \$ 860.00 @ 25% \$ 215.00
MATERIAL MARK-UP \$ 117.20 @ 25% \$ 29.30
EQUIPMENT MARK-UP \$ 1,030.32 @ 15% \$ 154.55
SUBCONTRACT MARK-UP \$ 8,560.00 @ 5% \$ 428.00
PERFORMANCE BOND \$ 11,867.37 @ 1% \$ 118.67

TOTAL \$ 11,986.04

QUANTITY 24 LF
UNIT COST \$ 499.00 / LF

Previous Change Order, item 464-6017
RC PIPE (CL IV)(18 IN)

PROJECT: RM 620 PH. II
ITEM NUMBER/DESC.: CL IV 18" RCP
ESTIMATED QUANTITY: 28 LF
Date Prepared: 1/30/2017

ITEM DESCRIPTION	QTY	UNIT COSTS						TOTAL COSTS				
		UNIT	LABOR	EQUIP	MATERIAL	SUBCT.	O.T.Factor	LABOR	EQUIP	MATERIAL	SUBCT.	MISC.
LABOR	#											
MATERIAL												
CL III 18" RCP	-32.00	LF			\$ 32.00					\$ (1,024.00)		
CL IV 18" RCP	32.00	LF			\$ 34.00					\$ 1,088.00		
EQUIPMENT												
SUBCONTRACT												
TOTALS								\$ -	\$ -	\$ 64.00	\$ -	\$ -

TOTAL LABOR				\$ -	
TOTAL MATERIAL				\$ 64.00	
TOTAL SUBCONTRACT				\$ -	
TOTAL EQUIPMENT				\$ -	
MARKUPS					
LABOR BURDENS	\$ -	@	55%	\$ -	
LABOR MARK-UP	\$ -	@	25%	\$ -	
MATERIAL MARK-UP	\$ 64.00	@	25%	\$ 16.00	
EQUIPMENT MARK-UP	\$ -	@	15%	\$ -	
SUBCONTRACT MARK-UP	\$ -	@	5%	\$ -	
PERFORMANCE BOND	\$ 80.00	@	1%	\$ 0.80	
			TOTAL	\$ 80.80	
			QUANTITY	28 LF	
			UNIT COST	\$ 3.00 / LF	ADDITIONAL
				\$ 65.00 / LF	CL III 18" RCP
				\$ 68.00 / LF	CL IV 18" RCP



REQUEST FOR INFORMATION FORM

RFI NO.: 6 DATE: 4/11/17
PROJECT: RM 620 PHASE 2 RESPONSE REQUESTED BY
DATE: 4/18/17
TO: CLAYTON WEBER, CONSTRUCTION MANAGER

REFERENCE: Conduit Realignment at Oaklands Dr.

PROBLEM:

The electrical subcontractor for the Contractor (Cox Commercial) is proposing the realignment of the conduit runs at Oaklands Drive (sketch is attached). Please review & let us know if the adjustments are acceptable.

RECOMMENDED SOLUTION:

Please advise.

DARREN OKRUHLIK
Originator

4/11/2017
Date

RESPONSE:

Yes, the proposed adjustments are acceptable. The City of Round Rock also reviewed and requested additional conduit runs. See the descriptions below and also the attached redlines.

Oaklands Drive Intersection: Add one more 3" to the #15 conduit run. This would be a total of 3 - 3" & 2 - 2" conduits 125' ea. Add one more 3" conduit to the #1 run at the cabinet.

Hospital Drive Intersection: Add one 3" conduit to the #8 run.

Eddie Church
Responder

4/19/2017
Date

Sign, Date & Return to HNTB via e-mail or fax.

Mail original to: HNTB Corporation
101 E. Old Settlers Blvd.
Round Rock, Texas 78664

Attachments to RFI:

Cc:

Eddie R. Church

From: Bobby Mercer <bmercer@roundrocktexas.gov>
Sent: Monday, April 17, 2017 11:47 AM
To: Eddie R. Church
Cc: 62811_1608-108_RM620Ph2; Clayton Weber
Subject: RE: 1608-108 RM 620 Ph 2 - RFI #6

Eddie,

It's always best to add conduit capacity for any future signal equipment that might be added. I also noticed that #1 run to the cabinet only shows 2 -3" conduits. This will be a very tight fit for all the cables. Please add one more 3". This would be consistent to what the plans show for the Hospital cabinet.

The Hospital added conduit would be for future SB leg.

Feel free to call for any questions.

Bobby
Office: 512-341-3309

-----Original Message-----

From: Eddie R. Church [mailto:erchurch@HNTB.com]
Sent: Monday, April 17, 2017 10:42 AM
To: Bobby Mercer <bmercer@roundrocktexas.gov>
Cc: 62811_1608-108_RM620Ph2 <RM620Ph2_P235@hntb.com>; Clayton Weber <cweber@HNTB.com>
Subject: RE: 1608-108 RM 620 Ph 2 - RFI #6

Bobby,

We can have the Contractor add another 3" conduit, if necessary. What would be the purpose of the extra 3" run? Is this something that the City needs? Just asking, because I will need to provide an explanation. Feel free to call me, if you would like to discuss.

Thank you,

Eddie Church, P.E.

HNTB Corporation
Main (512) 744-9082x16723 Direct (512) 527-6723 Cell (512) 297-0524 Fax (512) 218-9940
101 East Old Settlers Blvd. Suite 100, Round Rock, TX 78664 | www.hntb.com ■ 100+ YEARS OF INFRASTRUCTURE SOLUTIONS

-----Original Message-----

From: Bobby Mercer [mailto:bmercer@roundrocktexas.gov]
Sent: Monday, April 17, 2017 9:36 AM
To: Eddie R. Church <erchurch@HNTB.com>; Ratzman, Eric (eRatzman@Halff.com) <eRatzman@Halff.com>

Cc: 62811_1608-108_RM620Ph2 <RM620Ph2_P235@hntb.com>; Clayton Weber <cweber@HNTB.com>; James Klotz <jklotz@HNTB.com>; Christen Eschberger <ceschberger@HNTB.com>; Dawn Haggard <dhaggard@HNTB.com>; 'Dutton, Andy' <aDutton@Halff.com>; Lewis, Ryan (RLewis@Halff.com) <RLewis@Halff.com>; Todd Keltgen <toddk@roundrocktexas.gov>; Leah Collier <lcollier@roundrocktexas.gov>
Subject: RE: 1608-108 RM 620 Ph 2 - RFI #6

Eddie,

This would be totally acceptable at Oakland's. I would recommend adding one more 3" to the #15 conduit run. This would be a total of 3 - 3" & 2 - 2" conduits 125' ea

It would also be acceptable at the Hospital if it needs to be changed. I would recommend adding one 3' to the #8 conduit run. The conduit run #11 would be good if needing to go north & south on the east side of intersection.

Bobby

-----Original Message-----

From: Eddie R. Church [mailto:erchurch@HNTB.com]

Sent: Friday, April 14, 2017 11:03 AM

To: Bobby Mercer <bmercer@roundrocktexas.gov>; Ratzman, Eric (eRatzman@Halff.com) <eRatzman@Halff.com>

Cc: 62811_1608-108_RM620Ph2 <RM620Ph2_P235@hntb.com>; Clayton Weber <cweber@HNTB.com>; James Klotz <jklotz@HNTB.com>; Christen Eschberger <ceschberger@HNTB.com>; Dawn Haggard <dhaggard@HNTB.com>; 'Dutton, Andy' <aDutton@Halff.com>; Lewis, Ryan (RLewis@Halff.com) <RLewis@Halff.com>

Subject: 1608-108 RM 620 Ph 2 - RFI #6

Bobby,

Please see the attached RFI #6 for the RM620 Phase 2 project. The Contractor has proposed to relocate a lanned bore at the Oaklands Drive intersection. There are utilities along the north right of way and across Oaklands Drive and there is a risk of hitting those utilities during the installation of the conduit, so the contractor is requesting to relocate the crossing to the south right of way. Since the City will be maintaining these signals, is this proposal acceptable to you?

To be proactive, would a similar proposal be acceptable at the Hospital Driveway intersection? The Contractor has not proposed yet, but we expect that to be a future RFI.

Thank you,

Eddie Church, P.E.

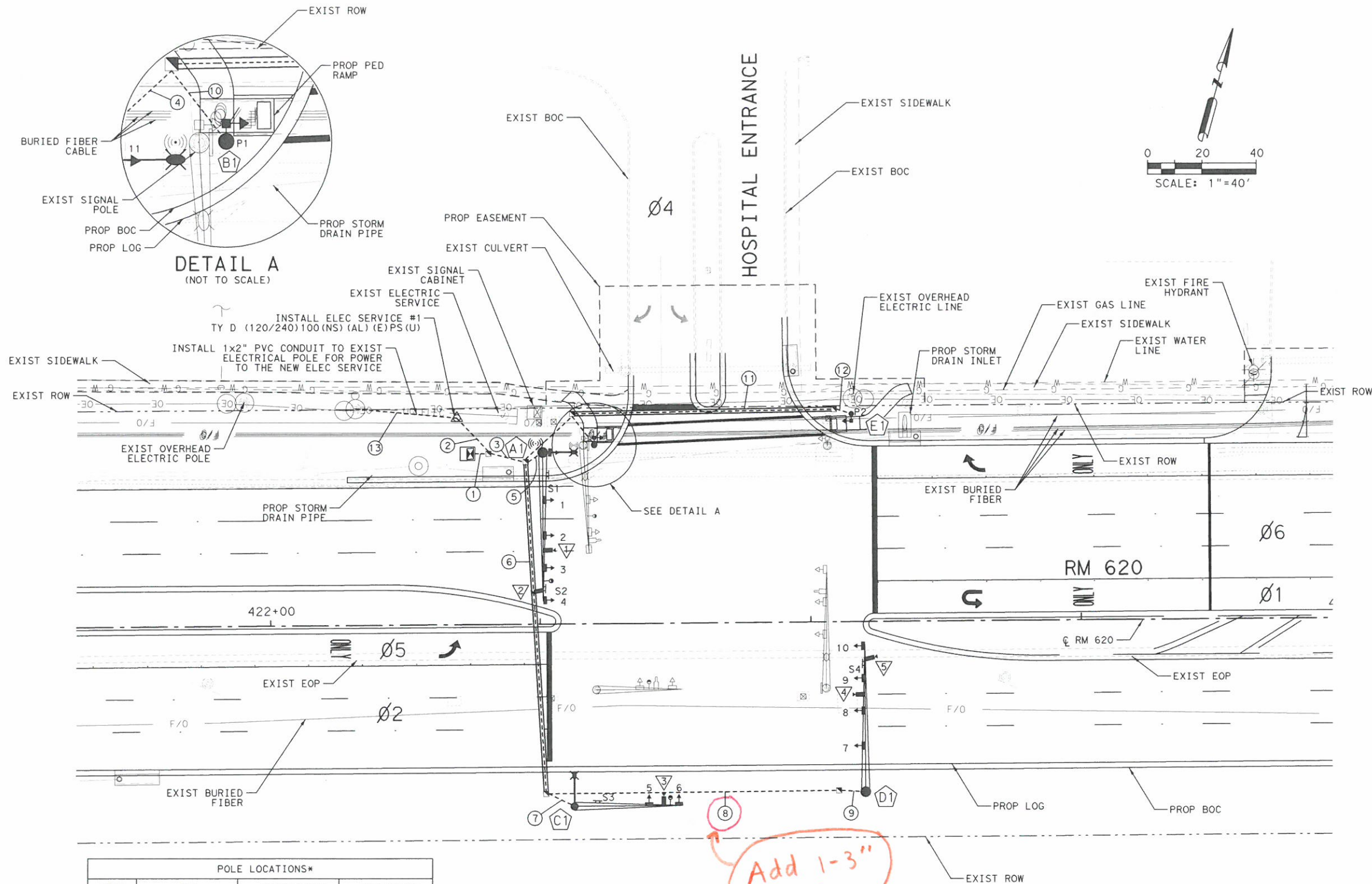
HNTB Corporation

Main (512) 744-9082x16723 Direct (512) 527-6723 Cell (512) 297-0524 Fax (512) 218-9940

101 East Old Settlers Blvd. Suite 100, Round Rock, TX 78664 | www.hntb.com ■ 100+ YEARS OF INFRASTRUCTURE SOLUTIONS

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

6/14/2016 2:40:27 PM K:\AUS\TPT\063428009 - RM 620 Signal PH 2\CADD\RM620PH2sig102.dgn



POLE LOCATIONS*			
POLE	STA	OFFSET (ft)	DIRECTION
A1	423+01	63.5	LEFT
B1	423+20	66	LEFT
C1	423+12.5	67.5	RIGHT
D1	424+20	63	RIGHT
E1	424+15.5	77	LEFT

* POLE LOCATIONS IN REFERENCE TO RM 620 CENTERLINE

Add 1-3"
= 110'

- NOTES:
1. LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CALL "TEXAS ONE CALL" (800-245-4545) PRIOR TO EXCAVATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID DAMAGE TO EXISTING UNDERGROUND UTILITIES.
 2. EXACT LOCATION OF POLES WILL BE DETERMINED IN THE FIELD SUBJECT TO FINAL APPROVAL BY INSPECTING ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION WITH THE INSPECTING ENGINEER PRIOR TO DRILLING OR EXCAVATION.
 3. HAND DIG FOUNDATIONS FOR POLES B1 AND E1 DUE TO PROXIMITY TO UNDERGROUND FIBER.
- SEQUENCE OF CONSTRUCTION:
1. INSTALL PERMANENT SIGNAL EQUIPMENT WHILE TEMPORARY SIGNALS ARE OPERATIONAL.
 2. SALVAGE AND RETURN EXISTING SIGNAL CABINET, RADIOS, BATTERY BACK-UP UNITS, CAMERAS, OPTICOM DETECTORS, AND 4-SECTION HEADS WITH FLASHING YELLOW ARROWS TO CITY OF ROUND ROCK.
 3. SALVAGE EXISTING SIGNAL POLES, LUMINAIRES, AND REMAINING SIGNAL HEADS.

LEGEND

- SIGNAL HEAD & LABEL
- SIGNAL POLE & MAST ARM
- VIVDS CAMERA
- ILSN SIGN
- PED-POLE
- PED RAMP
- ELECTRICAL SERVICE
- SIGNAL CABINET W/ BBU
- TYPE A GROUND BOX
- TYPE D GROUND BOX
- CONDUIT-TRENCHED
- CONDUIT-BORED
- LUMINAIRE
- RADIO
- PREEMPTION (OPTICOM)
- SIGNAL POLE LABEL
- VIVDS LABEL
- CONDUIT LABEL
- RAISED PVMT MARKER
- EXIST GAS LINE
- EXIST OVERHEAD ELECTRIC
- EXIST FIBER OPTIC CABLE
- EXIST STORM DRAIN
- EXIST WATER LINE
- EXIST WASTE WATER LINE
- FIRE HYDRANT
- VALVE
- RIGHT OF WAY
- FENCE LINE
- EXISTING SIGN
- EXISTING CONDUIT
- PTZ CAMERA



06/14/2016

NO.	REVISION	BY	DATE

Kimley»Horn

F-928

©2016 Texas Department of Transportation



RM 620

PROPOSED SIGNAL LAYOUT RM 620 AND HOSPITAL ENTRANCE

SCALE: 1"=40'				SHEET 2 OF 11			
Designed: VD	Rev: No.	STATE	FEDERAL AID PROJECT NO.	Highway			
Checked: SA	X	TEXAS	XXX XX (XX)XX	RM 620			
Drawn: SA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked: VD	AUS	WILLIAMSON	0683	01	090	232	

RUN ID	TOTAL QTY		1	2	3	4	5	6	7	8	9	10	11	12	13
RUN LENGTH	580	2" PVC	10	20	20	30	10	125	15	110	15	20	100	10	45
CONDUIT SIZE	975	3" PVC	3		2	1	2	3	2	23	2		2		1
		CIRCUIT													
		TRENCH/BORE	T	T	T	T	T	B	T	T	T	T	T	T	T
#12 3 CNDR IMSA CABLE	230	ILSN		2	2		1	1	1						
#14 20 CNDR IMSA CABLE	490	SIGNAL	3		3		1	2	1	1	1				
#14 4 CNDR IMSA CABLE*		SIGNAL													
		PHASE 1					1								
		PHASE 2									3				
		PHASE 4							2						
		PHASE 5									1				
		PHASE 6					3								
#14 7 CNDR IMSA CABLE*		PHASE 8													
		SIGNAL													
#14 7 CNDR IMSA CABLE	250	OVERLAP C					1								
#14 7 CNDR IMSA CABLE		PED HEADS	2		2	2						1	1	1	
#14 4 CNDR IMSA CABLE*		PED HEADS													
		PHASE 6										1		1	
#12 2 CNDR IMSA CABLE	250	PUSH BUTTONS	2		2	2						1	1	1	
#6 INSULATED	60	POWER	2	2											
#6 BARE	30	GROUND	1	1											
#8 INSULATED	460	LUM POWER		4	4		2	2	2						
#8 BARE	1355	GROUND	3	1	3	2	3	3	3	3	3	2	3	2	
OPTICOM CABLE	40	SIGNAL													
		PHASE 2/6	1		1		1								
	170	PHASE 4	1		1			1	1						
COAX & #16 3 CNDR SIAMESE CABLE		VIVDS CAMERA													
	320	PHASE 2/5	2		2		1	1		1	1				
	170	PHASE 4	1		1			1	1						
	320	PHASE 6	2		2		1	1		1	1				
CAT5 ETHERNET	40	RADIO	1		1		1								

* INSIDE SIGNAL POLE & THE MAST ARM

INSIDE POLES	NO. 8 INSULATED	14 AWG		12 AWG	VIVDS		COMM		ILSN
		4/C	7/C	2/C	COAX	3/C	OPTICOM	ETHERNET	
A1	60	80	20	-	40	40	20	30	25
B1		10	-	5	-	-	-	-	-
C1	60	40	-	-	20	20	20	-	25
D1		80	-	-	40	40	-	-	-
E1		10	-	5	-	-	-	-	-
TOTAL	120	220	20	10	100	100	40	30	50

INSIDE ARMS	VIVDS			
	4/C	COAX	3/C	OPTICOM
A1	148	87	87	48
B1				
C1	68	33	33	35
D1	148	85	85	-
E1				
TOTAL	364	205	205	83

CABLE TERMINATION CHART								
CNRD. NO.	CONDUCTOR COLOR	CABLE 1 20 CNDR.	CABLE 2 7 CNDR.	CABLE 3 2 CNDR.	CABLE 4 20 CNDR.	CABLE 5 20 CNDR.	CABLE 6 7 CNDR.	CABLE 7 2 CNDR.
		FROM A1 TO CNTRL.	FROM B1 TO CNTRL.	FROM B1 TO CNTRL.	FROM C1 TO CNTRL.	FROM D1 TO CNTRL.	FROM E1 TO CNTRL.	FROM E1 TO CNTRL.
1	BLACK	SPARE	SPARE	PHASE 06 PED CALL	SPARE	SPARE	SPARE	PHASE 06 PED CALL
2	WHITE	SH COM	PED COM	PHASE 06 APS COM	SH COM	SH COM	PED COM	PHASE 06 APS COM
3	RED	SH 4 - R ARW PHASE 01	P1 DW PHASE 06	N/A	SPARE	SH 10 - R ARW PHASE 05	P2 DW PHASE 06	N/A
4	GREEN	SH 4 - G ARW PHASE 01	P1 W PHASE 06	N/A	SPARE	SH 10 - G ARW PHASE 05	P2 W PHASE 06	N/A
5	ORANGE	SH 4 - Y ARW PHASE 01	SPARE	N/A	SPARE	SH 10 - Y ARW PHASE 05	SPARE	N/A
6	BLUE	SPARE	SPARE	N/A	SPARE	SPARE	SPARE	N/A
7	WHITE/BLACK	SH 11 - Y ARW OVL C	SPARE	N/A	SPARE	SPARE	SPARE	N/A
8	RED/BLACK	SH 11 - G ARW OVL C	N/A	N/A	SPARE	SPARE	N/A	N/A
9	GREEN/BLACK	SPARE	N/A	N/A	SPARE	SPARE	N/A	N/A
10	ORANGE/BLACK	SPARE	N/A	N/A	SPARE	SPARE	N/A	N/A
11	BLUE/BLACK	SPARE	N/A	N/A	SPARE	SPARE	N/A	N/A
12	BLACK/WHITE	SPARE	N/A	N/A	SPARE	SPARE	N/A	N/A
13	RED/WHITE	SH 1, 2, 3 - R PHASE 06	N/A	N/A	SH 5, 6 - R PHASE 04	SH 7, 8, 9 - R PHASE 02	N/A	N/A
14	GREEN/WHITE	SH 1, 2, 3 - G PHASE 06	N/A	N/A	SH 5, 6 - G PHASE 04	SH 7, 8, 9 - G PHASE 02	N/A	N/A
15	BLUE/WHITE	SH 1, 2, 3 - Y PHASE 06	N/A	N/A	SH 5, 6 - Y PHASE 04	SH 7, 8, 9 - Y PHASE 02	N/A	N/A
16	BLACK/RED	SPARE	N/A	N/A	SPARE	SPARE	N/A	N/A
17	WHITE/RED	SPARE	N/A	N/A	SPARE	SPARE	N/A	N/A
18	ORANGE/RED	SH 11 - Y OVL C	N/A	N/A	SPARE	SPARE	N/A	N/A
19	BLUE/RED	SH 11 - G OVL C	N/A	N/A	SPARE	SPARE	N/A	N/A
20	RED/GREEN	SH 11 - R OVL C	N/A	N/A	SPARE	SPARE	N/A	N/A

STATE OF TEXAS VIVEK DESHPANDE 105960 PROFESSIONAL ENGINEER 06/14/2016			
NO.	REVISION	BY	DATE
Kimley»Horn F-928			
©2016 Texas Department of Transportation			
WILLIAMSON COUNTY			
RM 620			
ELECTRICAL WIRING			
RM 620 AND HOSPITAL ENTRANCE			
SCALE: SHEET 4 OF 11			
Designed: VD	BY: RD	STATE	FEDERAL AID PROJECT NO.
Checked: SA	X	TEXAS	XXX XX (XX) XX
Drawn: SA	DIST.	COUNTY	CONTROL SECTION JOB SHEET
Checked: VD	AUS	WILLIAMSON	0683 01 090 234

INSTALL 1x2" PVC CONDUIT TO EXIST ELECTRICAL POLE FOR POWER TO THE NEW ELEC SERVICE
INSTALL ELEC SERVICE #2
TY D (120/240) 100(NS)AL(E)PS(U)

EXIST BURIED TELEPHONE/FIBER LINES

PROP STORM DRAIN

DETAIL A
(NOT TO SCALE)

EXIST FENCE
EXIST ROW
EXIST OVERHEAD ELEC

EXIST BURIED FIBER OPTIC
EXIST EOP

PROP LOG
PROP BOC
PROP STORM DRAIN

440+00

Ø5

Ø2

PROP BOC
PROP STORM DRAIN

POLE LOCATIONS*			
POLE	STA	OFFSET (ft)	DIRECTION
A2	440+99.5	64	LEFT
B2	441+34	65.5	LEFT
C2	441+40	69	LEFT
D2	441+42	64	RIGHT
E2	442+61	64	RIGHT
F2	442+44.5	76.5	LEFT

* POLE LOCATIONS IN REFERENCE TO PROP RM 620 CENTERLINE

EXIST ROW
EXIST ELECTRIC POLE WITH LUMINAIRE
EXIST ROW
EXIST ROW
EXIST DRAINAGE CULVERT TO BE REMOVED

OAKLANDS DR

EXIST ROW

EXIST BURIED TELEPHONE LINE

EXIST BURIED FIBER OPTIC

EXIST SIGN

EXIST BURIED TELEPHONE LINE

EXIST ELECTRIC POLE

EXIST ROW

EXIST EOP

EXIST DRAINAGE CULVERT

PROP STORM DRAIN

RM 620 Ø1 444+00

EXIST EOP

EXIST SIGNAL CABINET

PROP BOC

SEQUENCE OF CONSTRUCTION:
1. SALVAGE & RETURN EXISTING SIGNAL CABINET, RADIO, ILSN SIGNS, BATTERY BACK-UP UNITS, CAMERAS, OPTICOM DETECTORS, & 4-SECTION HEADS WITH FLASHING YELLOW ARROW TO CITY OF ROUND ROCK.
2. SALVAGE EXISTING SIGNAL POLES, LUMINAIRES, & REMAINING SIGNAL HEADS.
3. INSTALL PERMANENT SIGNAL EQUIPMENT WHILE TEMPORARY SIGNALS ARE OPERATIONAL.

NOTES:
1. INSTALL PED POLE B2 FOR FUTURE USE.
2. INSTALL PED HEADS AS SHOWN ON POLES B2, C2, D2, & F2. COVER P1 & P3 PED HEADS FOR FUTURE USE.
3. LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CALL "TEXAS ONE CALL" (800-245-4545) PRIOR TO EXCAVATION. TRENCHING IN THE VICINITY OF UNDERGROUND UTILITIES SHALL BE HAND DUG TO AVOID DAMAGE.
4. EXACT LOCATION OF POLES WILL BE DETERMINED IN THE FIELD SUBJECT TO FINAL APPROVAL BY INSPECTING ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION WITH THE INSPECTING ENGINEER PRIOR TO DRILLING OR EXCAVATION.

LEGEND

- SIGNAL HEAD & LABEL
- SIGNAL POLE & MAST ARM
- VIVDS CAMERA
- ILSN SIGN
- PED-POLE
- PED RAMP
- ELECTRICAL SERVICE
- SIGNAL CABINET W/ BBU
- TYPE A GROUND BOX
- TYPE D GROUND BOX
- CONDUIT-TRENCHED
- CONDUIT-BORED
- LUMINAIRE
- RADIO
- PREEMPTION (OPTICOM)
- SIGNAL POLE LABEL
- VIVDS LABEL
- CONDUIT LABEL
- RAISED PYMT MARKER
- EXIST GAS LINE
- EXIST OVERHEAD ELECTRIC
- EXIST FIBER OPTIC CABLE
- EXIST STORM DRAIN
- EXIST WATER LINE
- EXIST WASTE WATER LINE
- FIRE HYDRANT
- VALVE
- RIGHT OF WAY
- FENCE LINE
- EXISTING SIGN
- EXISTING CONDUIT
- PTZ CAMERA

Kimley»Horn

PROPOSED SIGNAL LAYOUT
RM 620 AND OAKLANDS DR

SCALE: 1"=40' SHEET 2 OF 11

Designed: VD	State: TEXAS	FEDERAL AID PROJECT NO.	RIGHTWAY NO.
Checked: SA	STATE: TEXAS	XXX XX (XX) XX	RM 620
Drawn: SA	DIST. COUNTY	CONTROL SECTION	JOB NO.
Checked: VD	AUS WILLIAMSON	0683 01	090 243

RUN ID	TOTAL QTY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RUN LENGTH	845	10	10	10	145	15	25	85	15	30	15	10	35	10	10	125	10
CONDUIT SIZE	990	2" PVC	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1
		3" PVC	23	2	2	2										23	
		CIRCUIT															
		TRENCH/BORE															
#12 3 CNDR IMSA CABLE	505	ILSN	T	T	T	B	T	T	B	T	T	T	T	T	T	T	T
#14 20 CNDR IMSA CABLE	525	SIGNAL	3	2	1	1		1	1		1		1	1	1	1	
#14 4 CNDR IMSA CABLE*		SIGNAL															
		PHASE 2			3												
		PHASE 4													3		
		PHASE 5			1												
		PHASE 6												3			
#14 7 CNDR IMSA CABLE*		SIGNAL															
		OVL C											1				
#14 7 CNDR IMSA CABLE	960	PED HEADS	4	3		3	1	2	2		2	1	1		1	1	
#14 4 CNDR IMSA CABLE*		PED HEADS															
		PHASE 4					1				1				1		
		PHASE 6															
#12 2 CNDR IMSA CABLE	960	PUSH BUTTONS	4	3		3	1	2	2		2	1	1		1	1	
#6 INSULATED	580	POWER	2	2		2		2	2	2							
#6 BARE	290	GROUND	1	1		1		1	1	1							
#8 INSULATED	1390	LUM POWER		2	2	4		4	4	4					2	2	
#8 BARE	1535	GROUND	2	2	3	3	2	2	3	1	3	2	2	3	3	3	
OPTICOM CABLE	145	SIGNAL															
	350	PHASE 4	1												1	1	
		PHASE 2/6	1	1		1		1	1		1		1	1			
COAX & #16 3 CNDR SIAMESE CABLE	380	VIVDS CAMERA	2	2	1	1		1	1		1		1	1			
	145	PHASE 2/5	1														
	380	PHASE 4	1												1	1	
		PHASE 6/1	2	2	1	1		1	1		1		1	1			
CAT5 ETHERNET	30	RADIO	1	1	1												

* INSIDE SIGNAL POLE & THE MAST ARM

INSIDE POLES	NO. 8 INSULATED	14 AWG		12 AWG	VIVDS		COMM		ILSN
		7/C	4/C	2/C	COAX	3/C	OPTICOM	ETHERNET	
A2		20	100	-	40	40	20	-	24
B2	-	-	10	10	-	-	-	-	-
C2	-	-	10	10	-	-	-	-	-
D2	60	-	70	10	20	20	20	-	24
E2	60	-	80	-	40	40	20	30	-
F2	-	-	10	10	-	-	-	-	-
TOTAL	120	20	280	40	100	100	60	30	48

INSIDE ARMS	4/C	COAX	3/C	OPTICOM
A2	152	110	110	110
B2	PED POLE			
C2	PED POLE			
D2	99	44	44	44
E2	147	110	110	55
F2	PED POLE			
TOTAL	398	264	264	209

CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 20 CNDR.	CABLE 2 7 CNDR. (FUTURE)	CABLE 3 2 CNDR.	CABLE 4 7 CNDR.	CABLE 5 2 CNDR.	CABLE 6 20 CNDR.	CABLE 7 7 CNDR. (FUTURE)	CABLE 8 2 CNDR.	CABLE 9 20 CNDR.	CABLE 10 7 CNDR.	CABLE 11 2 CNDR.
		FROM A2 TO CNTRL.	FROM B2 TO CNTRL.	FROM B2 TO CNTRL.	FROM C2 TO CNTRL.	FROM C2 TO CNTRL.	FROM D2 TO CNTRL.	FROM D2 TO CNTRL.	FROM D2 TO CNTRL.	FROM E2 TO CNTRL.	FROM F2 TO CNTRL.	FROM F2 TO CNTRL.
1	BLACK	SPARE	SPARE	PHASE 04 PED CALL	SPARE	PHASE 06 PED CALL	SPARE	SPARE	PHASE 04 PED CALL	SPARE	SPARE	PHASE 06 PED CALL
2	WHITE	SH COM	PED COM	PHASE 04 APS COM	PED COM	PHASE 06 APS COM	SH COM	PED COM	PHASE 04 APS COM	SH COM	PED COM	PHASE 06 APS COM
3	RED	SH 5 - R ARW PHASE 01	P1 - DW PHASE 04	N/A	P2 - DW PHASE 06	N/A	SPARE	P3 - DW PHASE 04 (FUTURE)	N/A	SH 12 - R ARW PHASE 05	P4 - DW PHASE 06	N/A
4	GREEN	SH 5 - G ARW PHASE 01	P1 - W PHASE 04 (FUTURE)	N/A	P2 - W PHASE 06	N/A	SPARE	P3 - W PHASE 04 (FUTURE)	N/A	SH 12 - G ARW PHASE 05	P4 - W PHASE 06	N/A
5	ORANGE	SH 5 - Y ARW PHASE 01	SPARE	N/A	SPARE	N/A	SPARE	SPARE	N/A	SH 12 - Y ARW PHASE 05	SPARE	N/A
6	BLUE	SPARE	SPARE	N/A	SPARE	N/A	SPARE	SPARE	N/A	SPARE	SPARE	N/A
7	WHITE/BLACK	SH 1 - Y ARW OVL C	SPARE	N/A	SPARE	N/A	SPARE	SPARE	N/A	SPARE	SPARE	N/A
8	RED/BLACK	SH 1 - G ARW OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
9	GREEN/BLACK	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
10	ORANGE/BLACK	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
11	BLUE/BLACK	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
12	BLACK/WHITE	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
13	RED/WHITE	SH 2, 3, 4 - R PHASE 06	N/A	N/A	N/A	N/A	SH 6, 7, 8 - R PHASE 04	N/A	N/A	SH 9, 10, 11 - R PHASE 02,	N/A	N/A
14	GREEN/WHITE	SH 2, 3, 4 - Y PHASE 06	N/A	N/A	N/A	N/A	SH 6, 7, 8 - Y PHASE 04	N/A	N/A	SH 9, 10, 11 - Y PHASE 02,	N/A	N/A
15	BLUE/WHITE	SH 2, 3, 4 - G PHASE 06	N/A	N/A	N/A	N/A	SH 6, 7, 8 - G PHASE 04	N/A	N/A	SH 9, 10, 11 - G PHASE 02,	N/A	N/A
16	BLACK/RED	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
17	WHITE/RED	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
18	ORANGE/RED	SH 1 - Y OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
19	BLUE/RED	SH 1 - G OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
20	RED/GREEN	SH 1 - R OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A



06/14/2016

NO. REVISION BY DATE

Kimley»Horn

F-928

©2016 Texas Department of Transportation



RM 620

ELECTRICAL WIRING
RM 620 AND OAKLANDS DR

SCALE:			SHEET 4 OF 11		
Designed: VD	REV. NO.	STATE	FEDERAL AID PROJECT NO.		HIGHWAY NO.
Checked: SA	X	TEXAS	XXX XX (XX)XX		RM 620
Drawn: SA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	SHEET NO.
Checked: VD	AUS	WILLIAMSON	0683	01 090	245



REQUEST FOR INFORMATION FORM

RFI NO.: 16 DATE: 7/5/17
PROJECT: RM 620 PHASE 2 RESPONSE REQUESTED BY
DATE: 7/11/17
TO: Eric Ratzman, P.E., Halff Associates

REFERENCE: RFI #8 and plan sheet 243, proposed location of signal controller/foundation.

PROBLEM:

This is in reference to previously submitted RFI #8 and plan sheet 243. The subcontractor, Austin Traffic Signal has requested to relocate the proposed signal foundation from the south east corner of the intersection to the northwest corner. The southeast corner of the intersection is crowded with temp poles, guy wires, box culvert that prevents the installation of the permanent foundation. Also in the event of service, a vehicle would not have a place to pull off of the roadway and park due to the slopes. The northwest corner would offer a flatter area to park, if not in the adjacent business parking lot. After the existing utilities were located, we have found a clear location for the controller. The proposed control foundation location is immediately west of the pole A2 on the layout.

RECOMMENDED SOLUTION:

Clayton Weber
Originator

7/5/2017
Date

RESPONSE:

The cabinet may be relocated to the northwest corner. The County will coordinate with the Contractor and Signal Subcontractor, to determine the specific location for foundation that is clear of existing utilities.

Eddie Church
Responder

7/11/2017
Date

Sign, Date & Return to HNTB via e-mail or fax.

Mail original to: HNTB Corporation
101 E. Old Settlers Blvd.
Round Rock, Texas 78664

Attachments to RFI:
Cc:

						ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		OVERRUN/ UNDERRUN
	ITEM		DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	
45	464	6003	RC PIPE (CL III) (18IN)	LF	\$65.00	2403	\$156,195.00	22.00	2425.00	\$157,625.00	\$1,430.00
	465	6239	INLET (COMPL) (TY AD) (MOD)	EA		0	\$0.00	1.00	1.00	\$0.00	\$0.00
88	618	6046	CONDT (PVC) (SCH 80) (2")	LF	\$11.00	1455	\$16,005.00	20.00	1475.00	\$16,225.00	\$220.00
90	618	6053	CONDT (PVC) (SCH 80) (3")	LF	\$15.00	1600	\$24,000.00	40.00	1640.00	\$24,600.00	\$600.00
92	620	6007	ELEC CONDR (NO.8) BARE	LF	\$1.00	4720	\$4,720.00	250.00	4970.00	\$4,970.00	\$250.00
94	620	6009	ELEC CONDR (NO.6) BARE	LF	\$1.50	340	\$510.00	(180.00)	160.00	\$240.00	(\$270.00)
95	620	6010	ELEC CONDR (NO.6) INSULATED	LF	\$1.70	680	\$1,156.00	(360.00)	320.00	\$544.00	(\$612.00)
154	684	6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	\$2.00	2394	\$4,788.00	(90.00)	2304.00	\$4,608.00	(\$180.00)
155	684	6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	\$5.20	1810	\$9,412.00	370.00	2180.00	\$11,336.00	\$1,924.00
156	684	6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	\$1.20	2290	\$2,748.00	(90.00)	2200.00	\$2,640.00	(\$108.00)
174	6002	6005	VIVDS COMMUNICATION CABLE (COAXIAL)	LF	\$3.10	3931	\$12,186.10	390.00	4321.00	\$13,395.10	\$1,209.00
175	6089	6001	ETHERNET CABLE AND CONNECTORS	LF	\$8.00	310	\$2,480.00	4.00	314.00	\$2,512.00	\$32.00
189	WC-9015		OPTICOM CABLE - GTT MODEL 138	LF	\$2.50	1795	\$4,487.50	40.00	1835.00	\$4,587.50	\$100.00
TOTALS							\$238,687.60			\$243,282.60	\$4,595.00

* Engineer's estimate; items noted with asterisk are new items not in the original bid, so contractor will have to provide price

PDF 2D_MON_HW_MIR_150.plt

Design

9/15/2017 12:02:41 PM ah2378 TXDOT I:\3000s\30302\CADD\Sheets\30302-SUM-02.dgn

SUMMARY OF PAVEMENT PLAN																									
PAVE SHEET NO.	STA TO STA	100 6002	110 6001	132 6003	247 6366	310 6027	316 6005	316 6193	340 6011	341 6008	341 6040	341 6062	347 6003	347 6006	351 6008	354 6069	432 6002	450 6048	529 6007	529 6008	530 6004	531 6004	531 6010	531 6002	WC-9010
		PREPARING ROW	EXCAVATION (RDWY)	EMBANKMENT (FINAL)(ORD COMP)(TY B)	FL BS (CMP IN PLC) (TYA GR5) (FINAL POS)	PRIME COAT (MC-30 OR AE-P)	ASPH (TIER II)	AGGR(TY-D GR-5 SAC-B)	D-GR HMA (SQ) TY-B PG64-22	D-GR HMA TY-B PG64-22	D-GR HMA TY-D PG64-22	D-GR HMA TY-D PG64-22(LEVE L-UP)	TOM (ASPHALT) PG 70-22	TOM - C (AGGREGATE) SAC - B	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12"	PLANE ASPH CONC PAV (0"- 2 1/2")	RIPRAP (CONC) (5 IN)	RAIL (HANDRAIL) (TY B)	CONC CURB & GUTTER (TY I)	CONC CURB & GUTTER (TY II)	DRIVEWAYS (CONC)	CURB RAMPS (TY 1)	CURB RAMPS (TY 7)	CONC SIDEWALKS (5')	NEIGHBORHOOD SIGN RELOCATION
		STA	CY	CY	CY	GAL	GAL	CY	TON	TON	TON	TON	TON	TON	SY	SY	CY	LF	LF	LF	SY	EA	EA	SY	LS
RM 620																									
1 OF 8	BEGIN - 420+00	7	501	111	208	91		3		125	38		2	23	23	0	10	86		459	151		2	400	
2 OF 8	420+00 - 426+00	6	907	1,105	1,299	722	476	34	22	993	421	245	20	260	255	1,487	38		134	1,747	124		2	25	
3 OF 8	426+00 - 432+00	6	537	2,289	1,355	633	992	42	81	871	517	511	25	320	313	3,099	80			2,419	324	1	1	129	
4 OF 8	432+00 - 438+00	6	1,746	576	1,280	689	951	43	59	948	530	491	25	328	321	2,973	28			2,192	307			4	
5 OF 8	438+00 - 444+00	6	756	1,641	1,204	661	1,287	49	105	909	604	663	29	374	366	4,021	21			2,428	86		2	110	1
6 OF 8	444+00 - 450+00	6	516	3,469	1,724	966	380	40	49	1,329	497	196	24	307	301	1,189	195			2,287	200			187	
7 OF 8	450+00 - 456+00	6	3,063	483	1,293	712	866	42	48	980	517	447	25	320	313	2,707	61			2,136	246				
8 OF 8	456+00 - END	4	971	217	607	381	275	18		524	228	142	11	141	138	859	23			433			2	27	
TOTALS		47	8,997	9,891	8,969	4,856	5,228	271	365	6,677	3,351	2,696	161	2,074	2,031	16,335	455	86	134	14,101	1,438	1	9	882	1

SUMMARY OF DRAINAGE PLAN																														
DRAINAGE SHEET NO.	STA TO STA	400 6005	401 6001	402 6001	432 6033	462 6001	462 6003	462 6004	462 6006	464 6003	464 6005	465 6003	465 6013	465 6014	465 6015	465 6016	465 6028	465 6070	465 6076	465 6077	465 6126	465 6180	465 6181	465 6181	466 6180	467 6105	467 6171	467 6356	467 6358	
		CEM STABIL BKFL	FLOWABLE BACKFILL	TRENCH EXCAVATION PROTECTION	RIPRAP (STONE PROTECTION) (18 IN)	CONC BOX CULV (3 FT X 2 FT)	CONC BOX CULV (4 FT X 2 FT)	CONC BOX CULV (4 FT X 3 FT)	CONC BOX CULV (5 FT X 2 FT)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	MANH (COMPL) (PRM) (60IN)	INLET (COMPL) (PCO) (3FT) (NONE)	INLET (COMPL) (PCO) (3FT) (LEFT)	INLET (COMPL) (PCO) (3FT) (RIGHT)	INLET (COMPL) (PCO) (3FT) (BOTH)	INLET (COMPL) (PSL) (RC) (3FTX3FT)	INLET (COMPL) (PSL) (RC) (6FTX8FT)	INLET (COMPL) (PSL) (RC) (8FTX8FT)	INLET (COMPL) (PSL) (FG) (3FTX3FT)	INLET (COMPL) (TYII) (10 FT)	INLET (COMPL) (TYII) (15 FT)	INLET (COMPL) (TYII-R) (15 FT)	WINGWALL (PW) (HW=5)	SET (TY I) (S=3 FT) (HW=3 FT) (3:1) (C)	SET (TY I) (S=5 FT) (HW=3 FT) (3:1) (C)	SET (TY II) (18 IN) (RCP) (3:1) (C)	SET (TY II) (18 IN) (RCP) (4:1) (C)		
		CY	CY	LF	CY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
RM 620																														
1 OF 5	BEGIN - 426+00	26								644	63				1							4	1							1
2 OF 5	426+00 - 438+00			578	23		32			873	721			1	7	1	1				2	1						1		1
3 OF 5	438+00 - 450+00	15	202	255		8	299	197	493	387	1078		1	1	1	3		1	1				1	2	1	1	1	1		
4 OF 5	450+00 - END			42						155	97				1								1							
5 OF 5	OAKWOOD AND OAKLANDS	34		108						50	178	1		1								2	2							
TOTALS		75	202	983	23	8	331	197	493	2109	2137	1	1	2	3	11	1	2	1	1	2	7	5	2	1	1	1	2		2

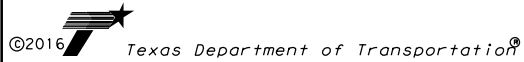
SUMMARY OF DRAINAGE PLAN						
DRAINAGE SHEET NO.	STA TO STA	467 6363	467 6395	WC-9009	464 6014	465 6239
		SET (TY II) (18 IN) (RCP) (6:1) (P)	SET (TY II) (24 IN) (RCP) (6:1) (P)	STORMTROOPER SWAQ-70-BYPASS	RC PIPE (CL IV) (18 IN)	INLET (COMPL) TY AD) (MOD)
		EA	EA	EA	LF	EA
RM 620						
1 OF 5	BEGIN - 426+00	2		1		
2 OF 5	426+00 - 438+00	2				
3 OF 5	438+00 - 450+00	1		2		1
4 OF 5	450+00 - END		1			
5 OF 5	OAKWOOD AND OAKLANDS				32	
TOTALS		5	1	3	32	1

SUMMARY OF RETAINING WALLS				
RW NO.	423 6004	432 6045	450 6048	556 6006
	RETAINING WALL (CONC BLOCK)	RIPRAP (MOW STRIP) (4 IN)	RAIL (HANDRAIL) (TY B)	PIPE UNDERDRAINS (TY 6) (4")
	SF	CY	LF	LF
1	1028	8	305	317
2	1529	8		
TOTALS		2,557	16	305

SUMMARY OF REMOVAL PLAN													
RMVL SHEET NO.	STA TO STA	104 6009	104 6015	104 6017	104 6022	105 6094	105 6021	401 6001	496 6002	496 6004	496 6007	677 6008	644 6076
		REMOVE CONC (RIPRAP)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVING STAB BASE & ASPH PAV(12"-27")	REMOVING STAB BASE AND ASPH PAV (0-4")	FLOWABLE BACKFILL	REMOV STR (INLET)	REMOV STR (SET)	REMOV STR (PIPE)	ELIM EXT PAV MRK & MRKS (ARROW)	REMOVE SM RD SN SUP & AM
		SY	SY	SY	LF	SY	SY	CY	EA	EA	LF	EA	EA
RM 620													
1 OF 5	BEGIN - 426+00		82		703	2,905	1,638		1	3	133		2
2 OF 5	426+00 - 438+00	30	24	526	285	3,906	5,753			9	499		1
3 OF 5	438+00 - 450+00	49	58	252	54	5,288	4,257	51		4	960		5
4 OF 5	450+00 - END		42	268	17	3,628	3,707					1	3
5 OF 5	OAKLANDS DRIVE				490		825						
TOTALS		79	206	1,046	1,549	15,727	16,180	51	1	16	1,592	1	11

1	OAKLANDS LATERAL RECONFIGURATION	AD	1/12/17
2	RFI 16	AD	9/15/17
NO.	REVISION	BY	DATE

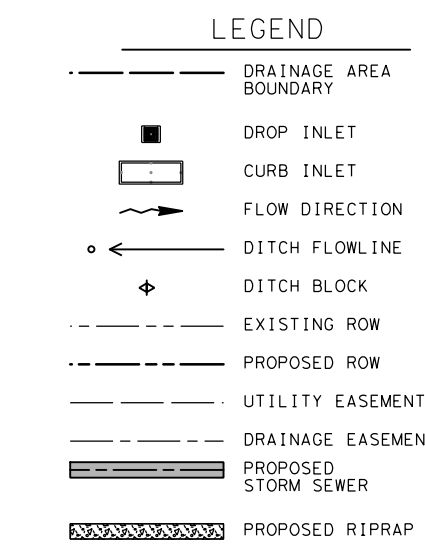
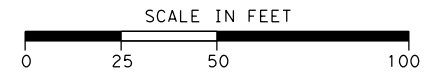
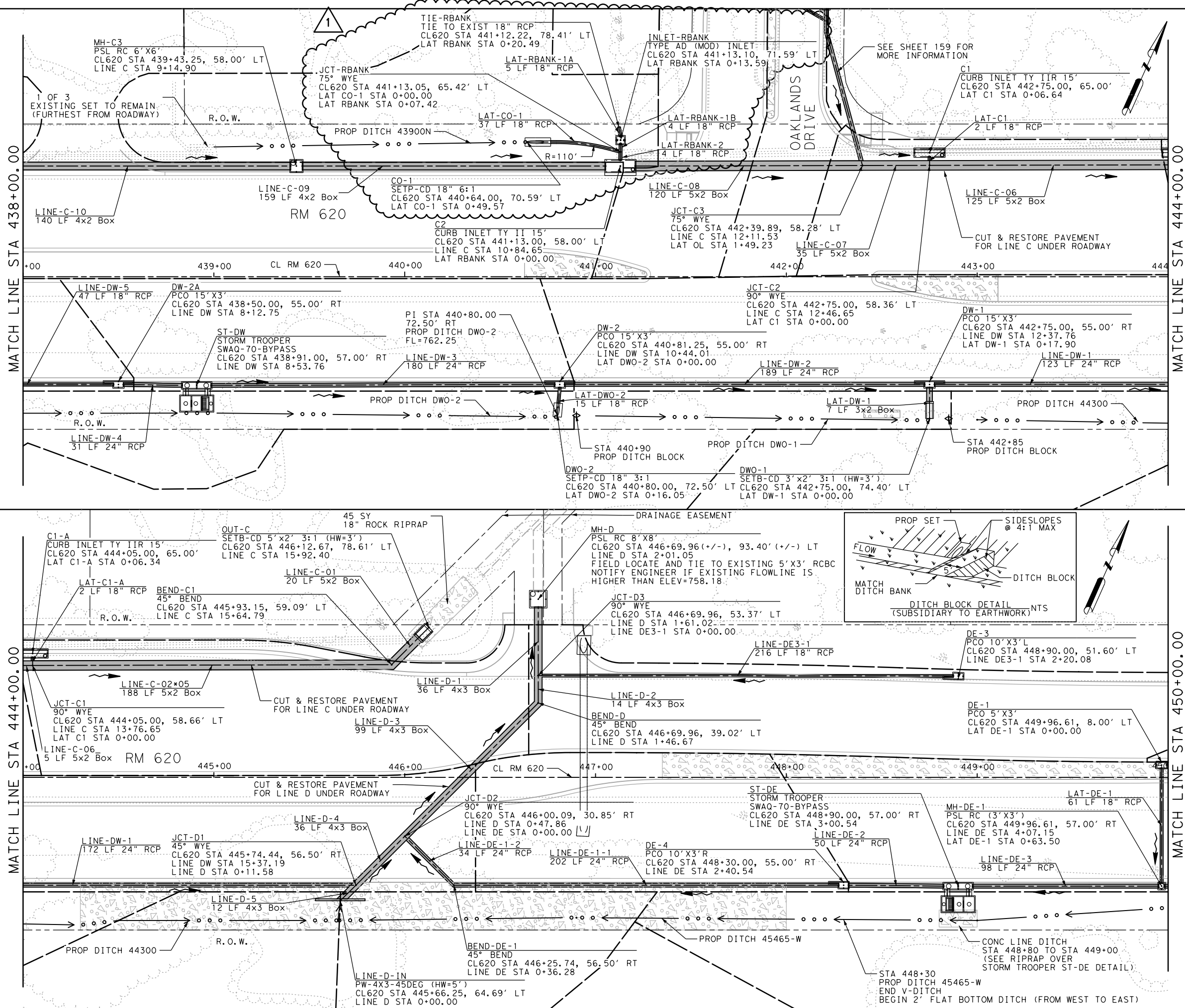
4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBPE FIRM NO. F-312



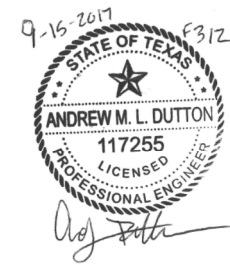
RM 620
SUMMARY OF
PAVEMENT, DRAINAGE,
REMOVAL AND RETAINING WALL

SCALE: SHEET 3 OF 4

Designed: ER	FED. RD. DIV. NO.:	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: ER	X	TEXAS		RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked: ER	AUS	WILLIAMSON	0683	01 090



- NOTES:**
1. SEE DRAINAGE PROFILES FOR STORM SEWER INFORMATION.
 2. ALL PIPES ARE CLASS III UNLESS OTHERWISE NOTED.
 3. SEE HYDRAULIC DATA SHEETS FOR ADDITIONAL INFORMATION.
 4. REFER TO EXISTING UTILITY PLANS AND FIELD VERIFY LOCATION OF NEARBY UTILITIES BEFORE CONSTRUCTION. NOTIFY THE CONSTRUCTION OBSERVER IF CONFLICTS EXISTS.
 5. PIPE LENGTHS ARE FOR THE PAY LIMITS OF THE ENTIRE SEGMENT.
 6. SEE DRAINAGE DETAILS FOR STRUCTURE STATIONING AND OFFSET CALLOUT LOCATIONS.

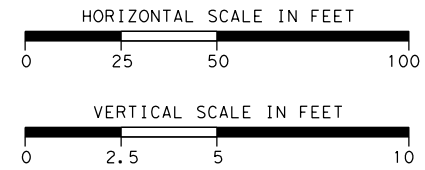


1	RFI 16	AD	9/15/17
NO.	REVISION	BY	DATE

HALFF 4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5355
TEL (512) 252-8184
FAX (512) 252-8141
TBE FIRM NO. F-312

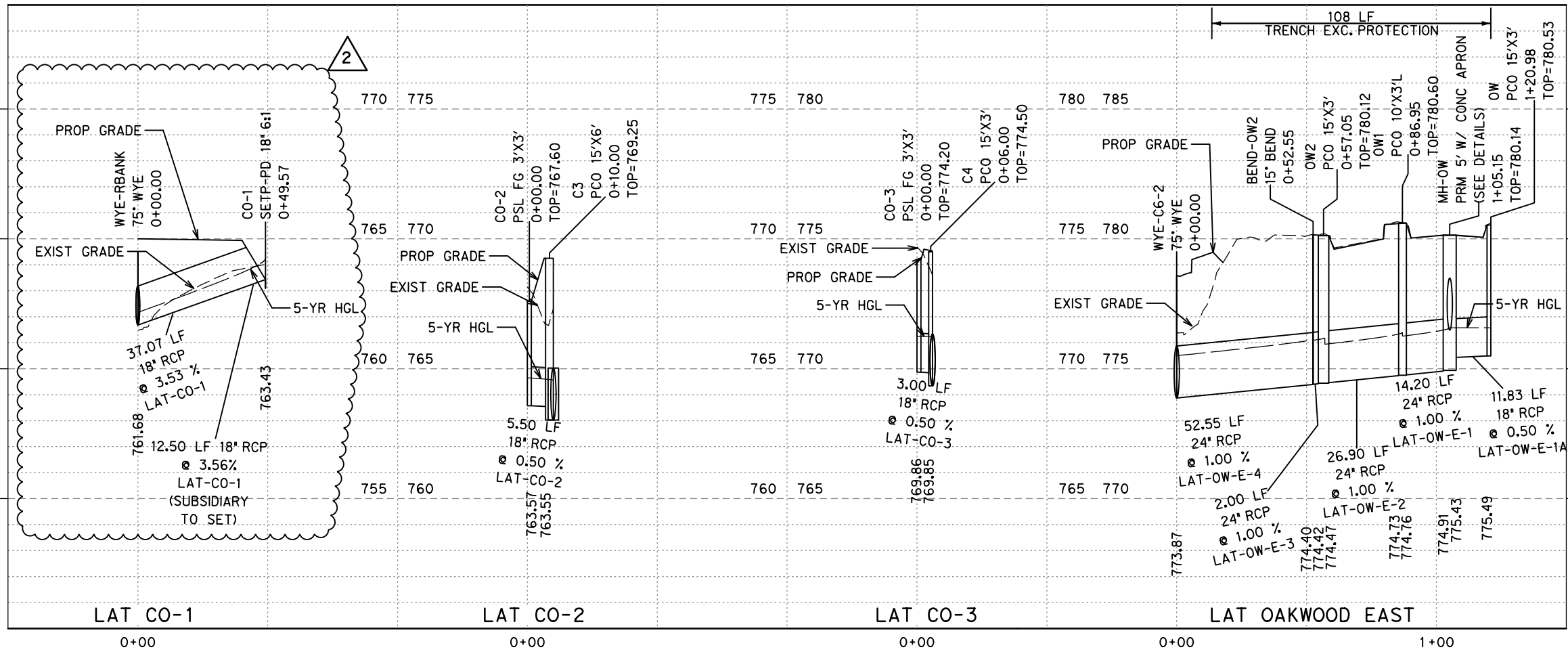
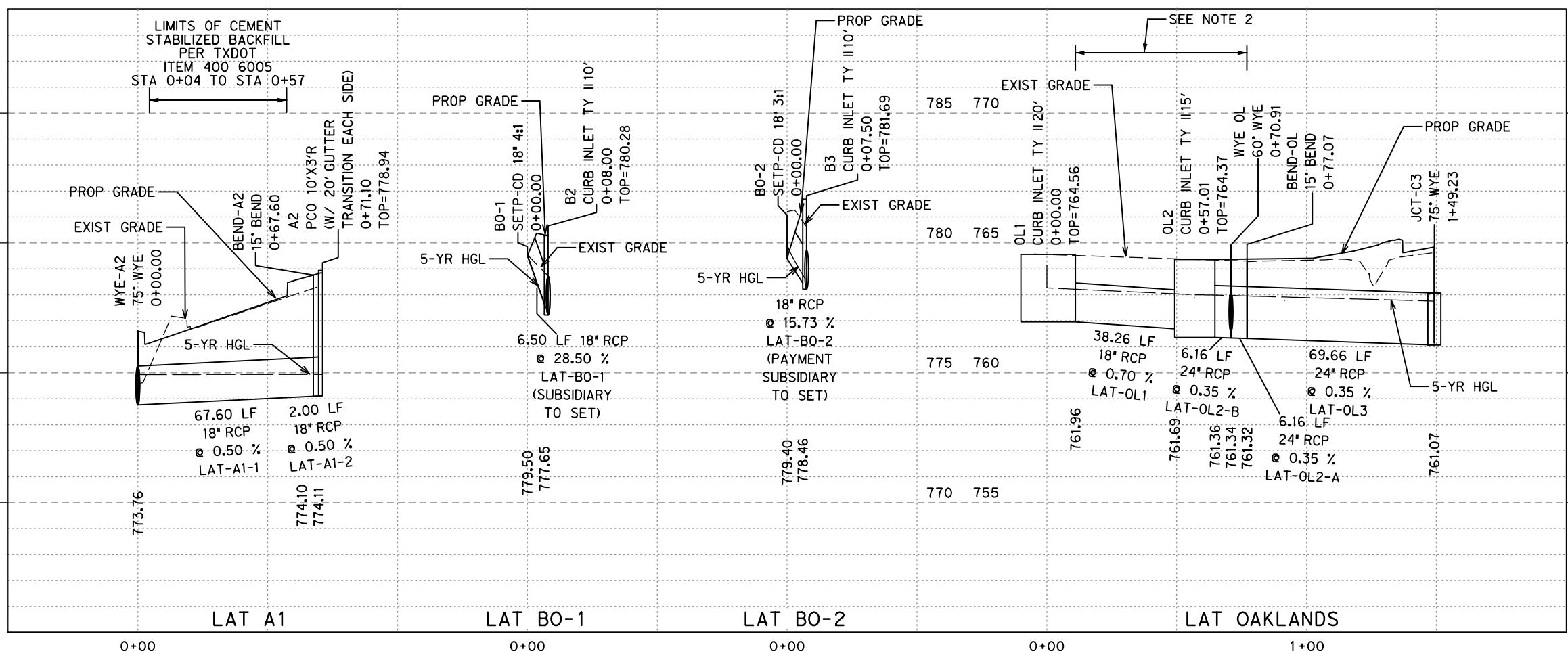


RM 620					
DRAINAGE PLAN					
STA 438+00 TO STA 450+00					
SCALE: 1"=50'					
SHEET 3 OF 5					
Designed: ER	ED. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.	
Checked: ER	X	TEXAS		RM 620	
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.	SHEET NO.
Checked: ER	AUS	WILLIAMSON	0683	01	090



LEGEND	
	PROPOSED GRADE
	EXISTING GROUND

NOTES:
1. REFER TO EXISTING UTILITY PLANS AND FIELD VERIFY LOCATION OF NEARBY UTILITIES BEFORE CONSTRUCTION. NOTIFY THE CONSTRUCTION OBSERVER IF CONFLICTS EXISTS.
2. PLACE ROADWAY FLEX BASE WITH HAND COMPACTION IF REQUIRED TO PROTECT PIPE. TOP OF RCP MAY EXTEND INTO FLEX BASE.

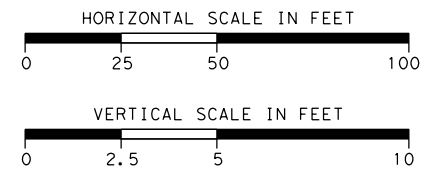
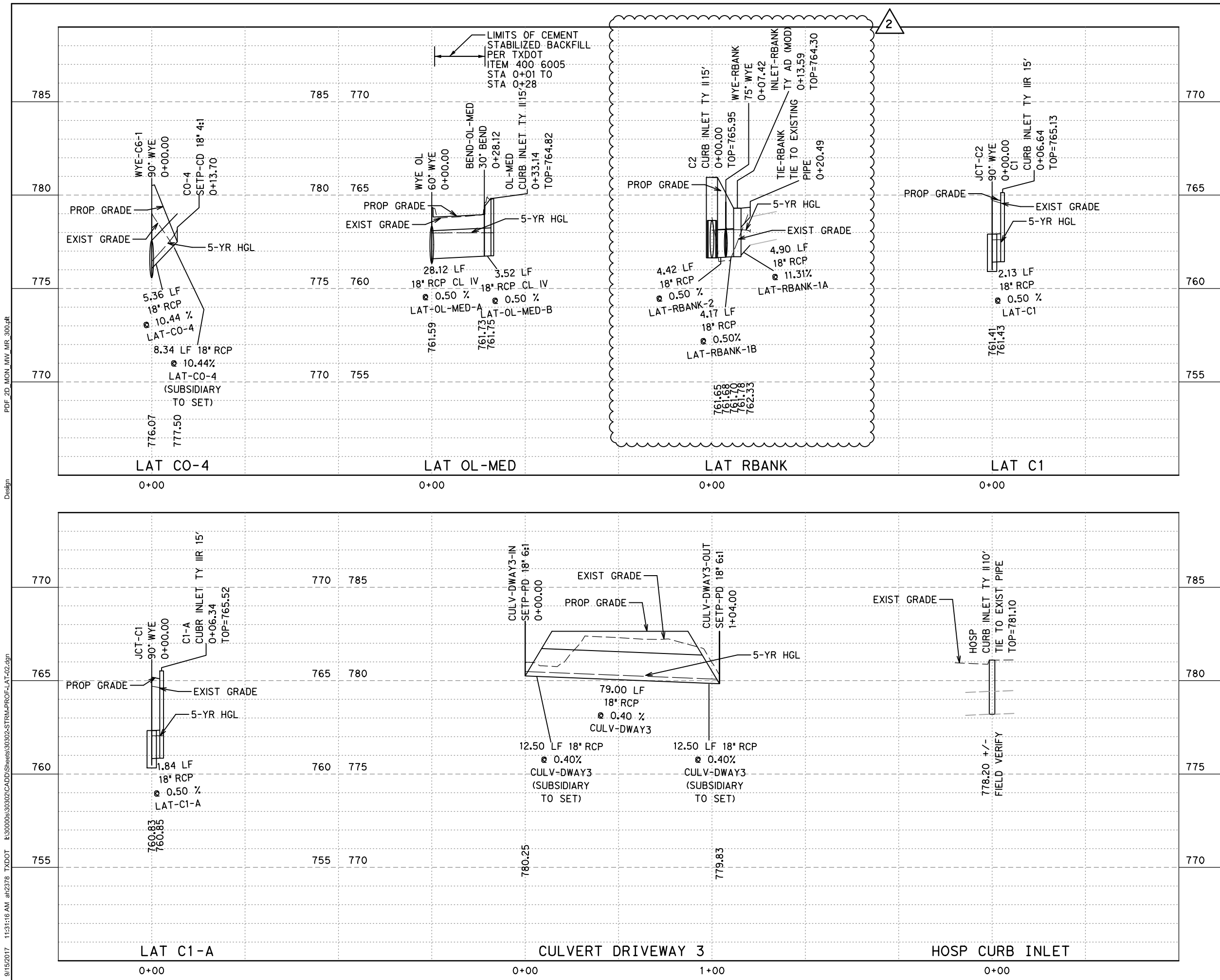


1	OAKLANDS LATERAL RECONFIGURATION	AD	1/12/17
2	RFI 16	AD	9/15/17
NO.	REVISION	BY	DATE

HALFF 4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBPE FIRM NO. F-312



RM 620			
DRAINAGE PROFILES			
SCALE: H: 1"=50' V: 1"=5'		SHEET 1 OF 3	
Designed: ER	Div. NO. 1	STATE TEXAS	FEDERAL AID PROJECT NO.
Checked: ER	X	TEXAS	HIGHWAY RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO. SECTION NO. JOB NO. SHEET NO.
Checked: ER	AUS	WILLIAMSON	0683 01 090 167



LEGEND	
	PROPOSED GRADE
	EXISTING GROUND

NOTES:
1. REFER TO EXISTING UTILITY PLANS AND FIELD VERIFY LOCATION OF NEARBY UTILITIES BEFORE CONSTRUCTION. NOTIFY THE CONSTRUCTION OBSERVER IF CONFLICTS EXISTS.



NO.	REVISION	BY	DATE
1	OAKLANDS LATERAL RECONFIGURATION	AD	1/12/17
2	RFI 16	AD	9/15/17



RM 620
DRAINAGE PROFILES

SCALE: H: 1"=50' V: 1"=5'		SHEET 2 OF 3	
Designed: ER	Div. NO.	STATE	FEDERAL AID PROJECT NO.
Checked: ER	X	TEXAS	RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.
Checked: ER	AUS	WILLIAMSON	0683
		SECTION NO.	01
		JOB NO.	090
		SHEET NO.	168

PDF 2D MON MW MR 300.dft

Design

E:\30000s\30302\CADD\Sheets\30302-STRM-CALC-03.dgn

9/15/2017 11:31:17 AM ah2378 TXDOT

PIPE ID	U/S NODE	D/S NODE	U/S HGL	D/S HGL	U/S FL	D/S FL	ACCUM. COMBINED C	FREQ. (YR)	ACCUM. TC (MIN)	I (IN/HR)	ACCUM. AREA (AC)	ACCUM. DISCHARGE (CFS)	SHAPE	RISE/DIA. (FT)	SPAN (FT)	N	LENGTH (FT)	SLOPE (%)	ACTUAL DEPTH (FT)	ACTUAL VEL. (FT/S)	PIPE CAP. (CFS)
LINE-A-1	ST-A	STUB-EX-P1	774.70	774.67	772.87	772.74	0.82	5	10.00	7.01	1.84	10.63	Circular	2.0	n/a	0.012	19.26	0.50%	1.93	3.42	17.33
LINE-A-2	A1	ST-A	774.76	774.70	773.15	772.87	0.82	5	10.00	7.01	1.84	10.63	Circular	2.0	n/a	0.012	43.82	0.50%	1.83	3.52	17.33
LINE-A-3	WYE-A2	A1	774.93	774.76	773.76	773.65	0.85	5	10.00	7.01	1.32	7.85	Circular	1.5	n/a	0.012	17.23	0.50%	1.11	5.62	8.05
LINE-A-4	A3	WYE-A2	776.02	774.63	774.70	773.76	0.84	5	10.00	7.01	0.88	5.17	Circular	1.5	n/a	0.012	179.39	0.50%	0.87	4.87	8.05
LAT-A1-1	BEND-A2	WYE-A2	774.94	774.93	774.10	773.76	0.88	5	10.00	7.01	0.44	2.68	Circular	1.5	n/a	0.012	67.60	0.50%	1.17	1.81	8.05
LAT-A1-2	A2	BEND-A2	775.00	774.94	774.12	774.10	0.88	5	10.00	7.01	0.44	2.68	Circular	1.5	n/a	0.012	2.00	0.50%	0.84	2.65	8.05
CULV-A	CULV-A-IN	CULV-A-OUT	777.82	777.82	776.53	776.32	0.40	5	10.00	7.01	0.27	0.75	Circular	1.5	n/a	0.012	41.34	0.51%	1.50	0.42	8.11
LINE-B-01*02	B1	EX-P2	777.89	777.63	776.47	776.11	0.83	5	11.45	6.60	0.90	7.28	Circular	1.5	n/a	0.012	61.00	0.50%	1.50	4.12	8.05
LINE-B-3	B2	B1	778.15	777.89	777.22	776.47	0.80	5	10.80	6.78	0.61	5.67	Circular	1.5	n/a	0.012	140.51	0.50%	1.42	3.27	8.05
LINE-B-4	B3	B2	778.94	777.92	778.22	777.22	0.79	5	10.02	7.00	0.22	3.58	Circular	1.5	n/a	0.012	189.50	0.50%	0.70	4.40	8.05
LAT-BO-1	BO-1	B2	779.67	777.27	779.50	777.22	0.35	5	10.00	7.01	0.04	0.10	Circular	1.5	n/a	0.012	6.50	28.50%	0.05	6.37	60.75
LAT-BO-2	BO-2	B3	780.00	778.53	779.40	778.22	0.43	5	10.00	7.01	0.03	2.50+	Circular	1.5	n/a	0.012	6.00	15.73%	0.31	9.64	45.14
LINE-C-01	BEND-C1	OUT-C	761.25	761.35	759.48	759.35	0.65	5	19.04	5.14	14.94	65.14	Box	2.0	5.0	0.012	27.61	0.45%	2.00	6.51	66.32
LINE-C-02*05	JCT-C1	BEND-C1	762.07	761.08	760.33	759.48	0.65	5	19.04	5.14	14.94	65.14	Box	2.0	5.0	0.012	188.15	0.45%	1.60	8.16	66.39
LINE-C-06	JCT-C2	JCT-C1	762.62	761.90	760.91	760.33	0.64	5	18.76	5.18	14.54	63.66	Box	2.0	5.0	0.012	130.00	0.45%	1.58	8.07	66.38
LINE-C-07	JCT-C3	JCT-C2	762.76	762.48	760.91	760.33	0.63	5	18.69	5.19	14.23	62.33	Box	2.0	5.0	0.012	35.11	0.45%	1.57	7.93	66.38
LINE-C-08	C2	JCT-C3	763.12	762.42	761.64	761.07	0.68	5	16.37	5.56	9.38	51.13	Box	2.0	5.0	0.012	119.14	0.45%	1.35	7.59	66.38
LINE-C-09	MH-C3	C2	763.84	763.16	762.32	761.64	0.69	5	15.56	5.71	8.51	42.75	Box	2.0	4.0	0.012	159.00	0.40%	1.52	7.05	47.82
LINE-C-10	C3	MH-C3	764.55	763.84	763.03	762.32	0.69	5	15.56	5.71	8.51	42.75	Box	2.0	4.0	0.012	170.75	0.40%	1.52	7.05	47.82
LINE-C-11	MH-C4	C3	768.20	764.66	766.30	763.02	0.68	5	15.09	5.80	7.80	33.52	Circular	2.0	n/a	0.012	168.30	1.90%	1.64	12.16	33.78
LINE-C-12	C4	MH-C4	771.24	767.94	769.34	766.30	0.68	5	15.09	5.80	7.80	33.52	Circular	2.0	n/a	0.012	156.00	1.90%	1.64	12.14	33.78
LINE-C-13	C5	C4	774.52	770.97	772.64	769.34	0.69	5	14.80	5.85	7.23	31.77	Circular	2.0	n/a	0.012	189.00	1.70%	1.64	11.54	31.95
LINE-C-14	WYE-C6-2	C5	775.73	774.28	773.87	772.64	0.68	5	14.66	5.88	6.86	29.55	Circular	2.0	n/a	0.012	80.06	1.50%	1.65	10.69	30.01
LINE-C-15	WYE-C6-1	WYE-C6-2	776.41	774.47	775.57	773.87	0.63	5	12.06	6.45	0.75	5.70	Circular	2.0	n/a	0.012	113.06	1.50%	0.59	7.30	30.02
LINE-C-16	C6	WYE-C6-1	776.52	775.98	775.82	775.57	0.86	5	10.00	7.01	0.40	2.41	Circular	2.0	n/a	0.012	14.23	1.50%	0.41	5.21	30.02
LAT-C1	C1	JCT-C2	762.63	762.62	761.44	761.41	0.90	5	10.00	7.01	0.31	1.93	Circular	1.5	n/a	0.012	4.64	0.50%	1.21	1.26	8.05
LAT-C1-A	C1-A	JCT-C1	762.07	762.07	760.86	760.83	0.90	5	10.00	7.01	0.40	2.52	Circular	1.5	n/a	0.012	4.34	0.50%	1.24	1.61	8.05
LAT-CO-1	CO-1	WYE-RBANK	764.25	762.17	763.43	761.68	0.35	5	10.00	7.01	0.36	4.58****	Circular	1.5	n/a	0.012	49.57	3.53%	0.49	9.16	21.38
LAT-CO-2	CO-2	C3	764.65	764.56	763.58	763.53	0.35	5	10.00	7.01	0.12	7.01****	Circular	1.5	n/a	0.012	5.50	0.50%	1.03	5.45	8.05
LAT-CO-3	CO-3	C4	771.25	771.24	769.87	769.84	0.35	5	10.00	7.01	0.28	0.68	Circular	1.5	n/a	0.012	3.00	0.50%	1.40	0.40	8.05
LAT-CO-4	CO-4	WYE-C6-1	778.21	776.44	777.50	776.07	0.38	5	12.04	6.46	0.35	3.48**	Circular	1.5	n/a	0.012	13.70	10.44%	0.37	10.21	36.77
LAT-OW-E-1A	OW	MH-OW	776.58	776.58	775.50	775.42	0.82	5	10.00	7.01	0.58	2.86	Circular	1.5	n/a	0.012	11.83	0.50%	1.16	1.96	8.05
LAT-OW-E-1	MH-OW	OW1	776.58	776.58	774.93	774.75	0.67	5	14.45	5.92	5.38	21.02	Circular	2.0	n/a	0.012	14.20	1.00%	1.50	8.30	24.51
LAT-OW-E-2	OW1	OW2	776.40	775.94	774.75	774.45	0.68	5	14.49	5.92	5.43	21.22	Circular	2.0	n/a	0.012	26.90	1.00%	1.49	8.46	24.51
LAT-OW-E-3	OW2	BEND-OW2	776.19	776.09	774.45	774.40	0.69	5	14.55	5.90	6.10	24.22	Circular	2.0	n/a	0.012	2.00	1.00%	1.69	8.54	24.51
LAT-OW-E-4	BEND-OW2	WYE-C6-2	776.14	775.50	774.40	773.87	0.69	5	14.55	5.90	6.10	24.22	Circular	2.0	n/a	0.012	52.55	1.00%	1.63	8.83	24.51
LAT-RBANK-1A	TIE-RBANK	INLET-RBANK	763.18	763.15	762.33	761.55	*****	5	*****	*****	*****	2.50*****	Circular	1.5	n/a	0.012	4.90	11.31%	1.50	1.42	38.27
LAT-RBANK-1B	INLET-RBANK	WYE-RBANK	763.15	763.15	761.71	761.68	*****	5	*****	*****	*****	2.50*****	Circular	1.5	n/a	0.012	4.17	0.50%	1.47	1.42	8.05
LAT-RBANK-2	WYE-RBANK	C2	763.15	763.12	761.68	761.64	0.35	5	10.29	6.92	0.36	7.07	Circular	1.5	n/a	0.012	4.42	0.50%	1.48	4.01	8.05
LAT-OL1	OL1	OL2	764.14	763.02	762.04	761.64	0.51	5	18.20	5.26	4.33	9.29	Circular	1.5	n/a	0.012	38.26	0.70%	1.38	5.47	9.52
LAT-OL2-A	WYE OL	BEND-OL	762.98	762.96	761.34	761.32	0.54	5	18.42	5.23	4.85	13.69	Circular	2.0	n/a	0.012	6.16	35.00%	1.64	4.97	14.50
LAT-OL2-B	OL2	WYE OL	763.01	762.98	761.39	761.34	0.53	5	18.37	5.24	4.50	12.44	Circular	2.0	n/a	0.012	6.16	35.00%	1.64	4.52	14.50
LAT-OL3	BEND-OL	JCT-C3	762.96	762.76	761.32	761.07	0.54	5	18.37	5.24	4.85	13.71	Circular	2.0	n/a	0.012	72.16	0.35%	1.69	4.85	14.50
LAT-OL-MED-A	BEND-OL-MED	WYE OL	762.98	762.98	761.73	761.59	0.70	5	10.00	7.01	0.35	1.71	Circular	1.5	n/a	0.012	28.12	50.00%	1.39	1.00	8.05
LAT-OL-MED-B	OL-MED	BEND-OL-MED	762.98	762.98	761.76	761.73	0.70	5	10.00	7.01	0.35	1.71	Circular	1.5	n/a	0.012	3.52	50.00%	1.25	1.09	8.05
LINE-D-1	JCT-D3	MH-D-OUT	759.80	759.49	758.36	758.16	0.44	5	37.57	3.44	25.95	39.36	Box	3.0	4.0	0.012	36.03	0.50%	1.33	7.41	94.81
LINE-D-2	BEND-D	JCT-D3	759.85	759.69	758.43	758.36	0.44	5	37.32	3.46	25.55	38.38	Box	3.0	4.0	0.012	14.35	0.50%	1.33	7.21	94.81
LINE-D-3	JCT-D2	BEND-D	760.35	759.72	758.93	758.43	0.44	5	37.32	3.46	25.55	38.38	Box	3.0	4.0	0.012	98.81	0.50%	1.29	7.43	94.81
LINE-D-4	JCT-D1	JCT-D2	760.35	760.06	759.11	758.93	0.39	5	37.22	3.46	23.20	31.51	Box	3.0	4.0	0.012	36.28	0.50%	1.14	6.93	94.81
LINE-D-5	LINE-D-IN	JCT-D1	760.27	760.35	759.21	759.11	0.35	5	24.50	4.46	13.44	21.17	Box	3.0	4.0	0.012	11.58	0.90%	1.25	4.25	127.05
LINE-DW-1	DW-1	JCT-D1	761.92	760.52	760.30	759.11	0.45	5	36.35	3.51	9.76	15.32	Circular	2.0	n/a	0.012	296.94	0.40%	1.41	6.47	15.50
LINE-DW-2	DW-2	DW-1	762.11	761.92	761.08	760.30	0.70	5	21.60	4.79	2.42	8.10	Circular	2.0	n/a	0.012	188.75	0.40%	1.61	2.98	15.50
LINE-DW-3	ST-DW	DW-2	762.91	762.13	761.84	761.08	0.79	5	10.00	7.01	1.57	8.65	Circular	2.0	n/a	0.012	180.25	0.40%	1.05	5.18	15.50
LINE-DW-4	DW-2A	ST-DW	763.08	762.91	762.00	761.84	0.79	5	10.00	7.01	1.57	8.65	Circular	2.0	n/a	0.012	31.00	0.40%	1.07	5.05	15.50
LINE-DW-5	DW-3	DW-2A	768.43	763.19	767.46	762.50	0.81	5	10.00	7.01	1.11	6.28	Circular	1.5	n/a	0.012	305.00	1.60%	0.69	7.87	14.39
LINE-DW-6	DW-4	DW-3	773.13	767.98	772.40	767.46	0.82	5	10.00	7.01	0.64	3.66	Circular	1.5	n/a	0.012	304.00	1.60%	0.52	6.81	14.39
LINE-DW-7	DW-5	DW-4	776.21	772.77	775.50	772.40	0.85	5	10.00	7.01	0.34	1.89	Circular	1.5	n/a	0.012	188.75	1.60%	0.37	5.62	14.39
LAT-DWO-2	DWO-2	DW-2	762.68	761.79	762.25	761.58	0.33	5	21.60	4.79	0.53	0.85	Circular	1.5	n/a	0.012	14.55	4.17%	0.21	5.85	23.25
LAT-DW-1	DWO-1	DW-1	761.97	761.92	761.00	760.30	0.31	5	36.20	3.52	6.56	7.22	Box	2.0	3.0	0.012					

DITCH NAME	OUTFALL	RM620 STATION	LEFT/RIGHT	OFFSET	FLOWLINE ELEVATION	DISTANCE	CHANNEL SLOPE (%)	BOTTOM WIDTH	FORESLOPE (X:1)	BACKSLOPE (X:1)	N-VALUE	MAX DEPTH	CAPACITY (CFS)	5-YR DISCHARGE	ACTUAL DEPTH	VELOCITY (FT/S)
42550	BO-1	424+37	LEFT	76.50	779.50											
		424+50	LEFT	76.44	779.57	13.00	-0.50%	0.00	5.1	3.0	0.033	0.41	0.74	0.10	0.19	0.66
		425+00	LEFT	76.22	779.82	50.00	-0.50%	0.00	4.4	21.0	0.033	0.21	0.40	0.10	0.13	0.50
		425+50	LEFT	76.00	780.07	50.00	-0.50%	0.00	4.0	6.0	0.033	0.64	3.01	0.10	0.18	0.63
42670-W	BO-2	426+37	LEFT	76.00	779.40											
		426+50	LEFT	76.00	780.03	13.00	-4.85%	0.00	3.0	3.0	0.033	1.23	31.43	0.10	0.14	1.65
		426+70	LEFT	76.00	781.00	20.00	-4.85%	0.00	4.0	17.5	0.033	0.22	1.18	0.10	0.09	1.22
42670-E		426+70	LEFT	76.00	781.00											
		427+00	LEFT	76.00	780.65	30.00	1.17%	0.00	4.4	3.0	0.033	0.46	1.40	0.39	0.28	1.30
		427+50	LEFT	71.00	780.40	50.25	0.50%	0.00	5.0	3.0	0.033	0.93	6.47	0.39	0.32	0.93
	CULV-DWAY3-IN	427+80	LEFT	68.00	780.25	30.15	0.50%	0.00	5.0	3.0	0.033	1.64	29.37	0.39	0.32	0.93
42884		428+84	LEFT	68.00	779.83											
		429+00	LEFT	68.30	779.60	16.00	1.44%	0.00	3.6	3.0	0.033	1.68	43.50	0.92	0.40	1.78
		429+50	LEFT	69.23	778.87	50.01	1.46%	0.00	3.6	3.0	0.033	1.75	48.84	0.92	0.39	1.79
		430+00	LEFT	70.16	778.15	50.01	1.44%	0.00	3.6	3.0	0.033	2.02	71.11	0.92	0.40	1.78
	CO-4	430+45	LEFT	71.00	777.50	45.01	1.44%	0.00	3.6	3.0	0.033	1.25	19.77	0.92	0.40	1.78
43200		432+00	LEFT	75.00	777.99											
		432+50	LEFT	74.89	777.18	50.00	1.62%	0.00	6.1	3.0	0.033	0.48	2.28	0.68	0.30	1.61
		433+00	LEFT	74.79	776.37	50.00	1.62%	0.00	6.0	3.0	0.033	0.47	2.13	0.68	0.31	1.61
		433+50	LEFT	76.16	775.55	50.02	1.64%	0.00	5.9	3.0	0.033	0.46	2.00	0.68	0.31	1.62
		434+00	LEFT	74.57	774.74	50.03	1.62%	0.00	5.8	3.0	0.033	0.44	1.76	0.68	0.31	1.63
	CO-3	434+33	LEFT	74.50	774.20	33.00	1.64%	0.00	6.0	3.0	0.033	0.43	1.69	0.68	0.31	1.62
DWO-2		433+00	RIGHT	72.00	773.77											
		433+40	RIGHT	72.00	772.97	40.00	2.00%	2.00	3.9	4.0	0.033	0.73	13.30	0.85	0.18	1.73
		433+50	RIGHT	72.00	772.92	10.00	0.50%	2.00	4.1	4.0	0.033	0.51	3.16	0.85	0.26	1.06
		434+00	RIGHT	72.00	772.67	50.00	0.50%	2.00	5.1	4.0	0.033	1.15	19.95	0.85	0.26	1.04
		434+50	RIGHT	71.95	771.90	50.00	1.54%	2.00	5.1	4.0	0.033	1.41	56.36	0.85	0.19	1.54
		435+00	RIGHT	71.90	771.14	50.00	1.52%	2.00	5.1	4.0	0.033	1.72	89.86	0.85	0.19	1.54
		435+50	RIGHT	71.85	770.37	50.00	1.54%	2.00	5.0	4.0	0.033	1.32	47.89	0.85	0.19	1.55
		436+00	RIGHT	71.80	769.60	50.00	1.54%	2.00	5.0	4.0	0.033	1.54	68.89	0.85	0.19	1.55
		436+50	RIGHT	71.75	768.83	50.00	1.54%	2.00	5.0	4.0	0.033	1.38	53.16	0.85	0.19	1.55
		437+00	RIGHT	71.70	768.07	50.00	1.52%	2.00	5.0	4.0	0.033	1.04	27.42	0.85	0.19	1.54
		437+50	RIGHT	71.65	767.30	50.00	1.54%	2.00	5.0	4.0	0.033	0.59	7.90	0.85	0.19	1.55
		438+00	RIGHT	71.60	766.53	50.00	1.54%	2.00	5.0	4.0	0.033	1.23	40.62	0.85	0.19	1.55
		438+50	RIGHT	71.55	765.77	50.00	1.52%	2.00	5.0	4.0	0.033	1.34	49.61	0.85	0.19	1.55
		439+00	RIGHT	71.50	765.00	50.00	1.54%	2.00	4.7	4.0	0.033	1.49	63.29	0.85	0.19	1.54
		439+50	RIGHT	72.06	764.24	50.00	1.52%	2.00	4.4	4.0	0.033	1.28	42.23	0.85	0.19	1.56
		440+00	RIGHT	72.61	763.47	50.00	1.54%	2.00	3.9	4.0	0.033	1.24	37.92	0.85	0.19	1.58
		440+50	RIGHT	73.17	762.71	50.00	1.52%	2.00	3.4	4.0	0.033	1.31	40.91	0.85	0.20	1.59
	DWO-2	440+80	RIGHT	74.50	762.25	30.03	1.53%	2.00	3.4	4.0	0.033	0.95	19.93	0.85	0.20	1.59
43680		436+80	LEFT	66.00	770.00											
		437+00	LEFT	66.47	769.44	20.01	2.80%	0.00	6.3	6.0	0.033	1.02	30.51	7.05	0.59	3.31
		437+50	LEFT	67.65	768.02	50.01	2.84%	0.00	4.0	3.0	0.033	1.61	58.01	7.05	0.73	3.78
	CO-2	437+65	LEFT	68.00	767.60	15.00	2.80%	0.00	4.0	3.0	0.033	1.44	42.77	7.05	0.73	3.76
43900N		439+00	LEFT	68.00	765.50											
		439+50	LEFT	68.79	764.87	50.01	1.26%	0.00	4.5	3.0	0.033	1.58	39.49	4.58	0.70	2.46
		440+00	LEFT	69.58	764.24	50.01	1.26%	0.00	4.3	3.0	0.033	1.19	18.03	4.58	0.71	2.48
		440+50	LEFT	70.37	763.61	50.01	1.26%	0.00	3.9	3.0	0.033	1.11	14.12	4.58	0.73	2.51
DWO-1	CO-1	440+64	LEFT	70.59	763.43	14.00	1.29%	0.00	3.9	3.0	0.033	1.05	12.32	4.58	0.72	2.53
		441+00	RIGHT	72.99	762.04											
		441+50	RIGHT	73.66	761.75	50.00	0.58%	2.00	3.1	4.0	0.033	0.84	9.17	7.22	0.75	2.06
		442+00	RIGHT	74.31	761.45	50.00	0.60%	2.00	3.2	3.0	0.033	1.28	21.78	7.22	0.77	2.14
		442+50	RIGHT	74.97	761.15	50.00	0.60%	2.00	3.2	3.0	0.033	1.19	18.51	7.22	0.77	2.14
44300	DWO-1	442+75	RIGHT	74.16	761.00	25.01	0.60%	2.00	3.2	3.0	0.033	1.14	13.48	7.22	0.77	2.14
		443+00	RIGHT	75.00	761.28											
		443+50	RIGHT	75.90	760.98	50.01	0.60%	2.00	3.2	4.0	0.033	0.56	5.88	1.71	0.37	1.41
		444+00	RIGHT	76.81	760.68	50.01	0.60%	2.00	3.1	3.0	0.033	0.58	4.01	1.71	0.38	1.45
		444+30	RIGHT	77.37	760.50	30.01	0.60%	2.00	3.0	3.0	0.033	0.50	2.97	1.71	0.38	1.45
		444+50	RIGHT	75.00	760.11	20.14	1.94%	2.00	2.4	4.0	0.015	0.83	21.94	16.98	0.59	7.32
		445+00	RIGHT	75.00	759.81	50.00	0.60%	2.00	2.2	3.0	0.015	1.16	34.76	16.98	0.83	4.95
	LINE-D-IN	445+50	RIGHT	75.00	759.51	50.00	0.60%	2.00	2.0	2.0	0.015	1.86	83.32	16.98	0.87	5.18
		445+65	RIGHT	76.00	759.42	15.03	0.60%	2.00	2.0	2.0	0.015	1.94	91.48	16.98	0.87	5.18

- NOTES:
- HYDRAULIC COMPUTATIONS ARE BASED ON TXDOT HYDRAULIC MANUAL FOR WILLIAMSON COUNTY. RAINFALL COEFFICIENTS WERE USED BASED ON THE FOLLOWING DESIGN CRITERIA:
INLETS - 10 YEAR STORM EVENT
STORM SEWER - 5 YEAR STORM EVENT
DITCH CAPACITY - 5 YEAR STORM EVENT
 - HYDRAULIC COMPUTATIONS FOR STORM SEWER WERE PERFORMED USING GEOPAK DRAINAGE.
HYDRAULIC COMPUTATIONS FOR DITCHES WERE PERFORMED USING FLOWMASTER.
 - RATIONAL METHOD WAS USED TO COMPUTE PEAK FLOWS.
 - TAILWATER IS ASSUMED TO BE AT THE SOFFIT AT THE ULTIMATE OUTFALL OF THE SYSTEM.
 - THE SYSTEM DOES NOT ADVERSELY AFFECT THE 1% AEP EVENT.



1	RF1 16	AD	9/15/17
NO.	REVISION	BY	DATE



4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBPE FIRM NO. F-312

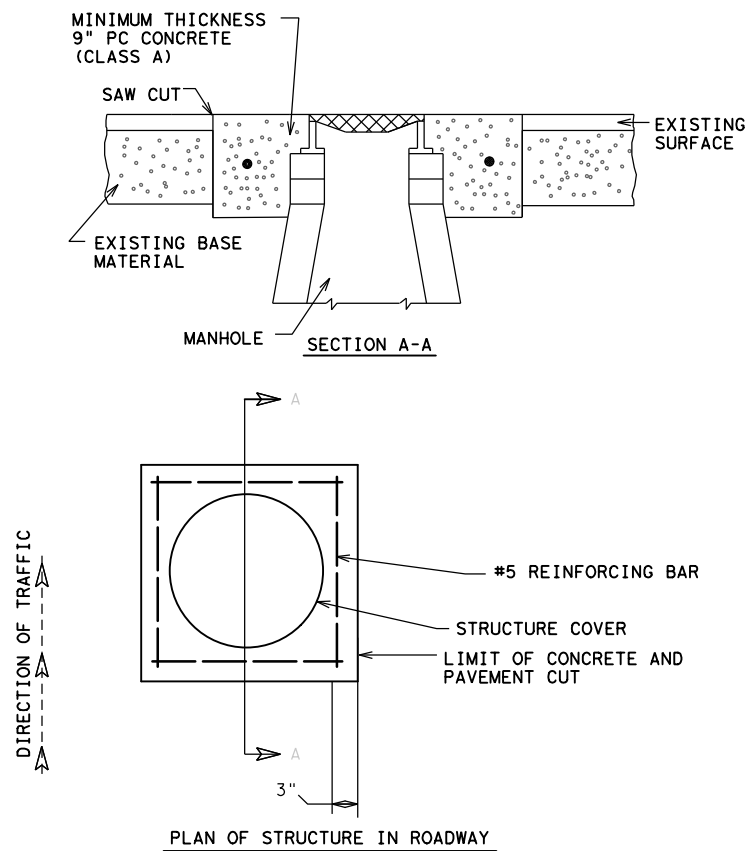


RM 620

DRAINAGE CALCULATIONS

DITCH TABLES

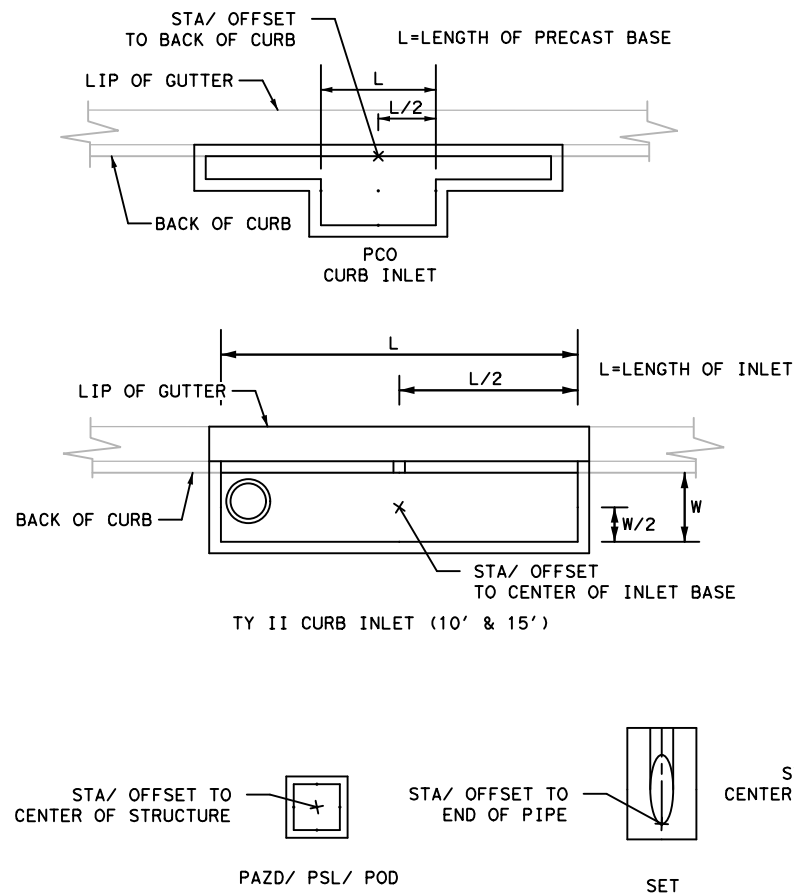
SCALE:		SHEET 4 OF 5	
Designed: ER	FED. RD. DIST. NO. X	STATE TEXAS	FEDERAL AID PROJECT NO.
Checked: ER	DIST. COUNTY	CONTROL NO. 0683	SECTION NO. 01
Drawn: ND	JOB NO. 090	SHEET NO. 173	



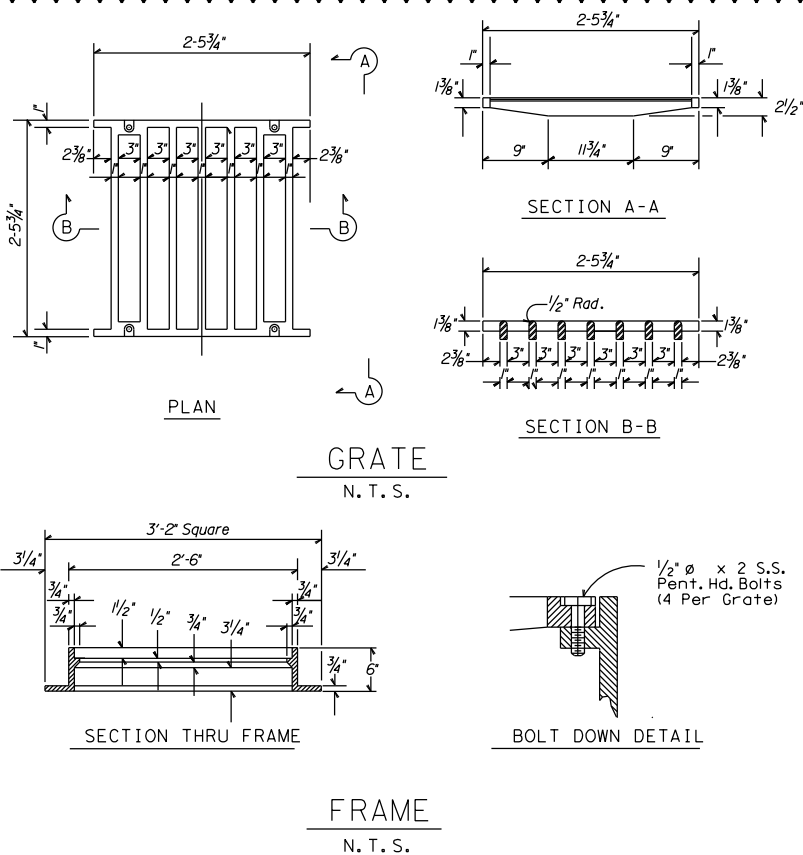
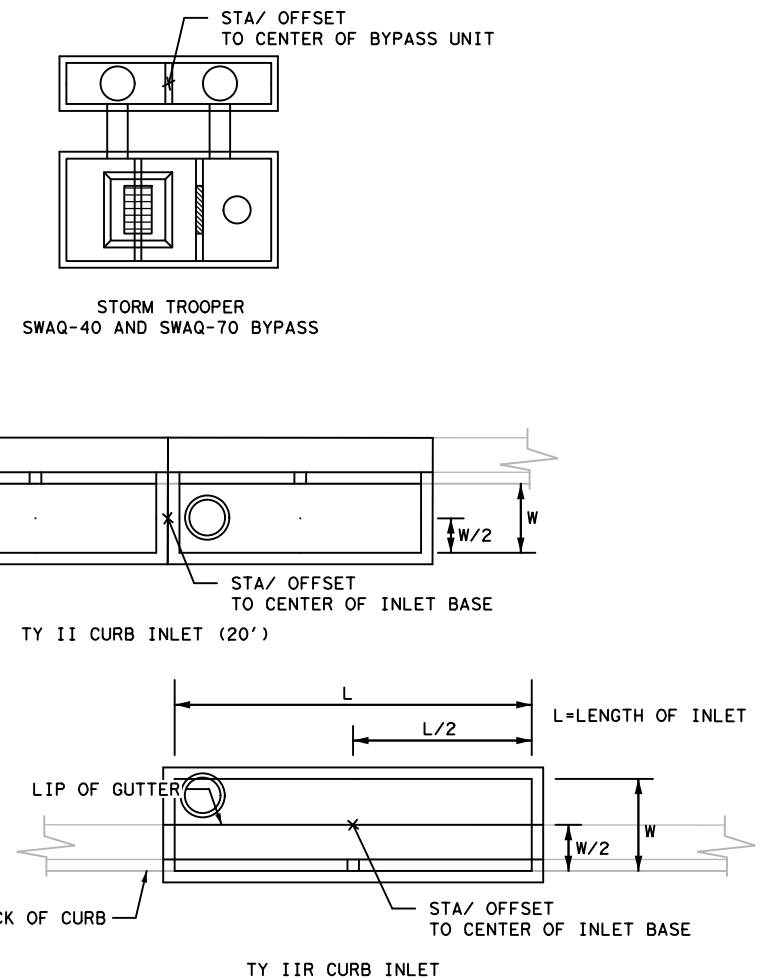
NOTES:

1. THE CONCRETE SHALL BE REINFORCED WITH #5 BARS AS SHOWN. THE CONCRETE SHALL EXTEND TO EDGE OF SAW CUT PAVEMENT EDGE.

CONCRETE APRON FOR MANHOLE

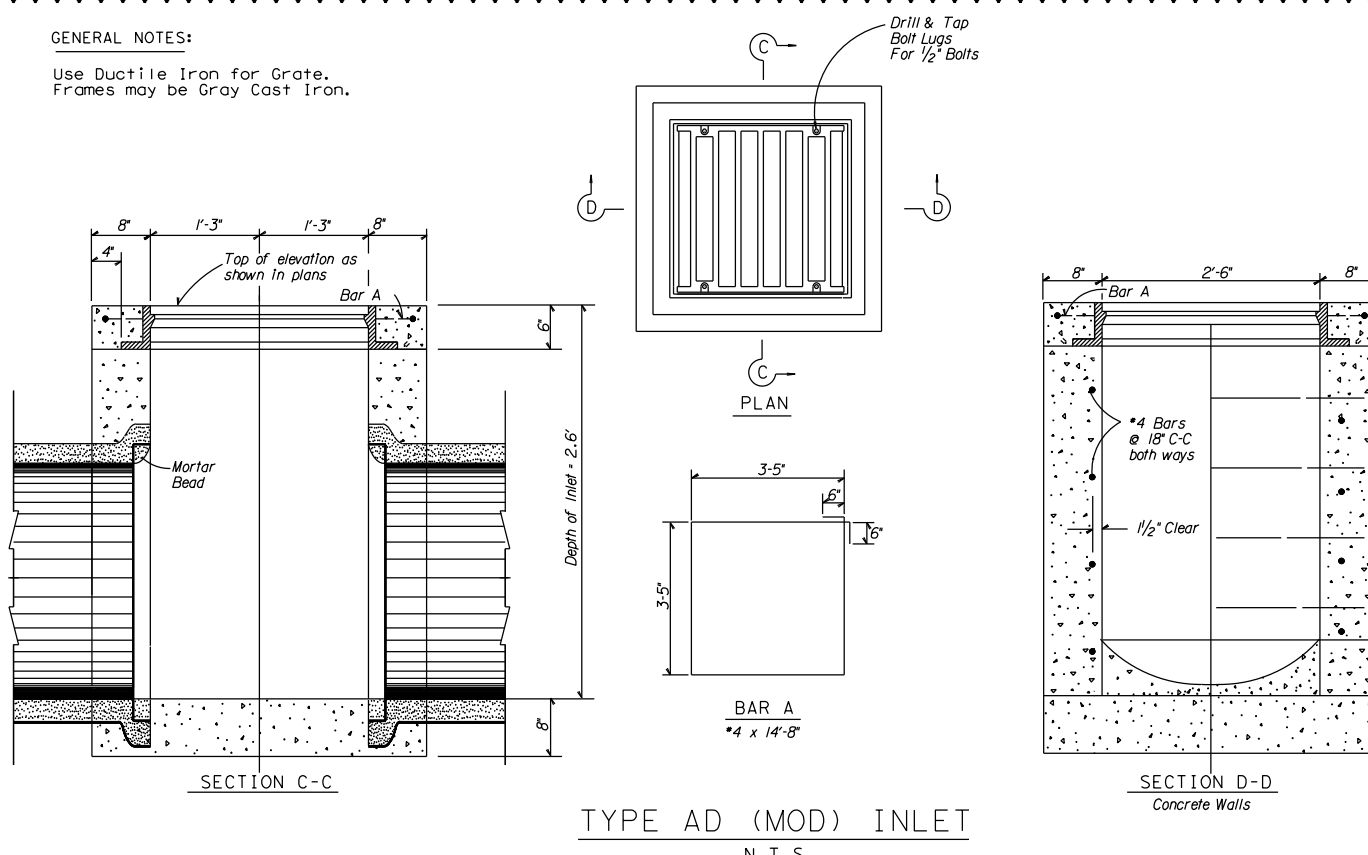


STRUCTURE STATIONING AND OFFSET
CALLOUT LOCATIONS



GENERAL NOTES:

- Use Ductile Iron for Grate. Frames may be Gray Cast Iron.



1	RFI 16	AD	9/15/17
NO.	REVISION	BY	DATE

HALFF 4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBPE FIRM NO. F-312

©2016 **Texas Department of Transportation**

WILLIAMSON COUNTY

RM 620
MISCELLANEOUS DRAINAGE
DETAILS

SCALE:			SHEET 1 OF 2			
Designed: ER	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ER	X	TEXAS				RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: ER	AUS	WILLIAMSON	0683	01	090	176

INSTALL 1x2" PVC CONDUIT TO EXIST ELECTRICAL POLE FOR POWER TO THE NEW ELEC SERVICE

INSTALL ELEC SERVICE #2 TY D (120/240) 100 (NS) AL (E) PS (U)

EXIST BURIED TELEPHONE/FIBER LINES

PROP STORM DRAIN

DETAIL A
(NOT TO SCALE)

EXIST FENCE
EXIST ROW
EXIST OVERHEAD ELEC

EXIST BURIED FIBER OPTIC

EXIST EOP

PROP LOG

PROP BOC

PROP STORM DRAIN

SEE DETAIL A

440+00

442+00

444+00

Ø5

Ø2

EXIST EOP

F/O

F/O

F/O

PROP STORM DRAIN

PROP BOC

EXIST ROW

POLE LOCATIONS*			
POLE	STA	OFFSET (ft)	DIRECTION
A2	440+99.5	64	LEFT
B2	441+34	65.5	LEFT
C2	441+40	69	LEFT
D2	441+42	64	RIGHT
E2	442+61	64	RIGHT
F2	442+44.5	76.5	LEFT

* POLE LOCATIONS IN REFERENCE TO PROP RM 620 CENTERLINE

SEQUENCE OF CONSTRUCTION:

1. SALVAGE & RETURN EXISTING SIGNAL CABINET, RADIO, ILSN SIGNS, BATTERY BACK-UP UNITS, CAMERAS, OPTICOM DETECTORS, & 4-SECTION HEADS WITH FLASHING YELLOW ARROW TO CITY OF ROUND ROCK.
2. SALVAGE EXISTING SIGNAL POLES, LUMINAIRES, & REMAINING SIGNAL HEADS.
3. INSTALL PERMANENT SIGNAL EQUIPMENT WHILE TEMPORARY SIGNALS ARE OPERATIONAL.

NOTES:

1. INSTALL PED POLE B2 FOR FUTURE USE.
2. INSTALL PED HEADS AS SHOWN ON POLES B2, C2, D2, & F2. COVER P1 & P3 PED HEADS FOR FUTURE USE.
3. LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CALL "TEXAS ONE CALL" (800-245-4545) PRIOR TO EXCAVATION. TRENCHING IN THE VICINITY OF UNDERGROUND UTILITIES SHALL BE HAND DUG TO AVOID DAMAGE.
4. EXACT LOCATION OF POLES WILL BE DETERMINED IN THE FIELD SUBJECT TO FINAL APPROVAL BY INSPECTING ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION WITH THE INSPECTING ENGINEER PRIOR TO DRILLING OR EXCAVATION.
5. SIGNAL CABINET FOUNDATION TO BE MODIFIED FROM STANDARD. SEE TS-CF-04 (MOD) (SHEET 269A) FOR DETAILS.

LEGEND

- SIGNAL HEAD & LABEL
- SIGNAL POLE & MAST ARM
- VIVDS CAMERA
- ILSN SIGN
- PED-POLE
- PED RAMP
- ELECTRICAL SERVICE
- SIGNAL CABINET W/ BBU
- TYPE A GROUND BOX
- TYPE D GROUND BOX
- CONDUIT-TRENCHED
- CONDUIT-BORED
- LUMINAIRE
- RADIO
- PREEMPTION (OPTICOM)
- SIGNAL POLE LABEL
- VIVDS LABEL
- CONDUIT LABEL
- RAISED PYMT MARKER
- EXIST GAS LINE
- EXIST OVERHEAD ELECTRIC
- EXIST FIBER OPTIC CABLE
- EXIST STORM DRAIN
- EXIST WATER LINE
- EXIST WASTE WATER LINE
- FIRE HYDRANT
- VALVE
- RIGHT OF WAY
- FENCE LINE
- EXISTING SIGN
- EXISTING CONDUIT
- PTZ CAMERA



1	SIGNAL CABINET RELOCATION	VMD	9/19/17
NO.	REVISION	BY	DATE

Kimley»Horn

©2016 Texas Department of Transportation

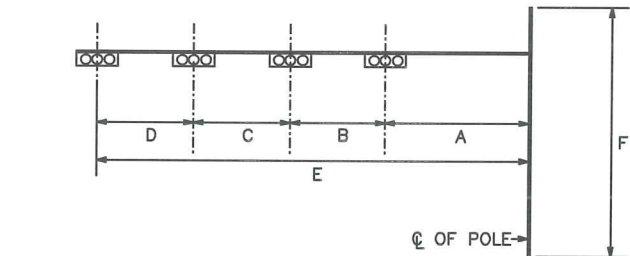
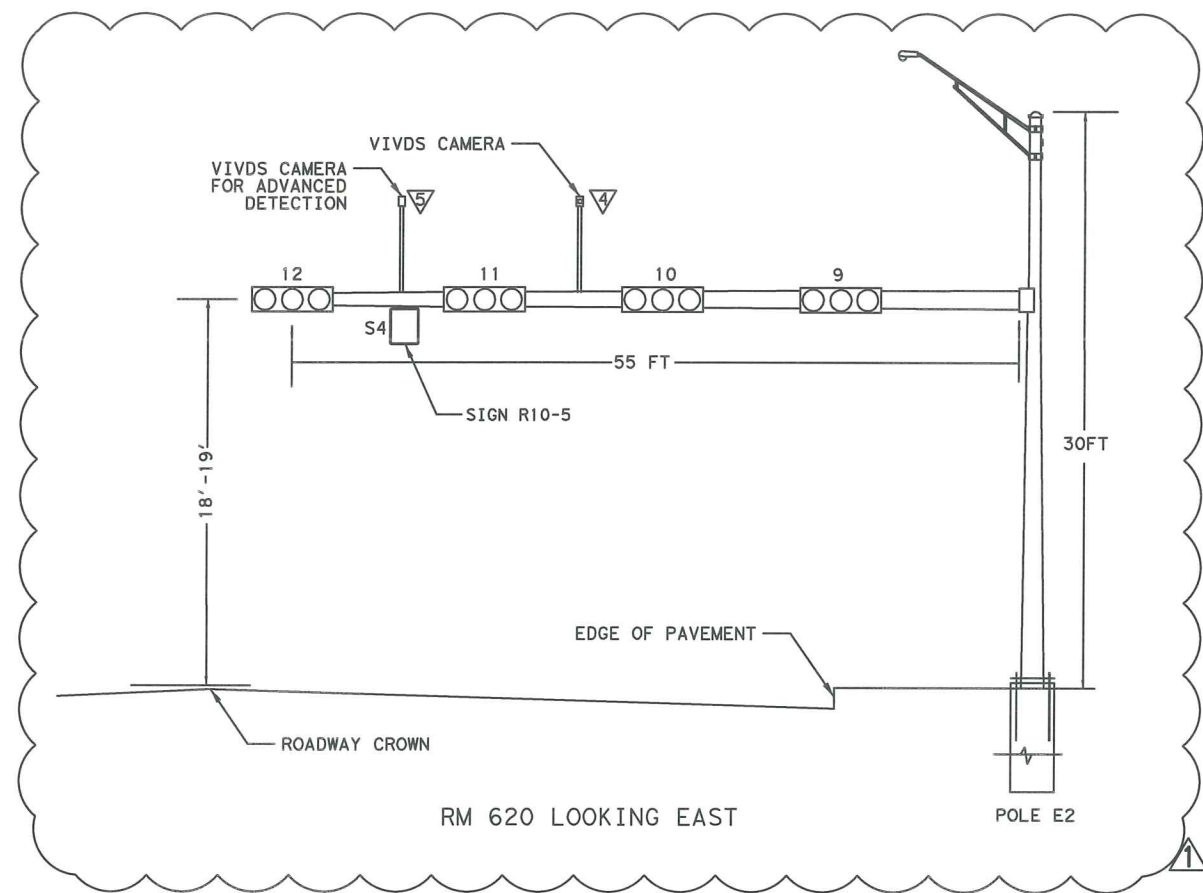


RM 620

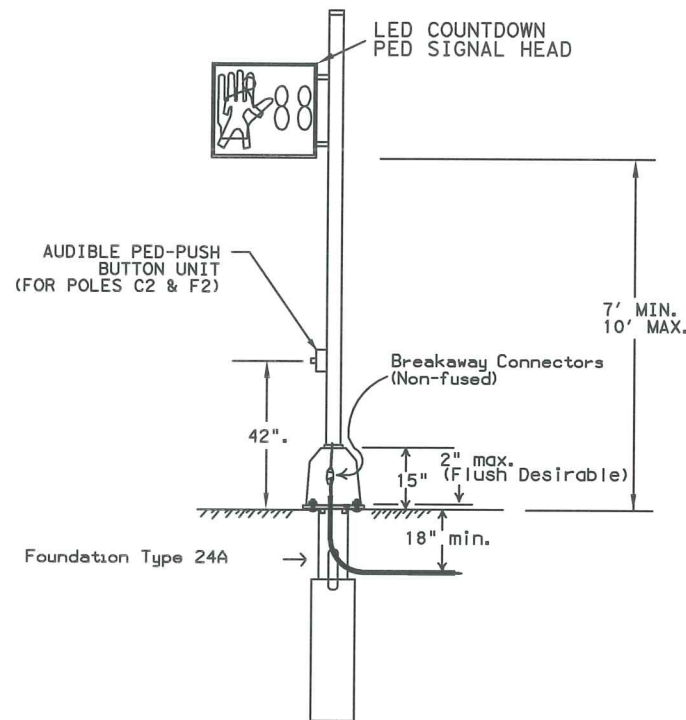
PROPOSED SIGNAL LAYOUT
RM 620 AND OAKLANDS DR

SCALE: 1"=40'		SHEET 2 OF 11	
Designed: V.D.	STATE: TEXAS	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: SA	TX	XXX XX (XX) XX	RM 620
Drawn: SA	DIST. COUNTY	CONTROL NO.	SECTION NO.
Checked: V.D.	AUS WILLIAMSON	0683	01 090
		243	

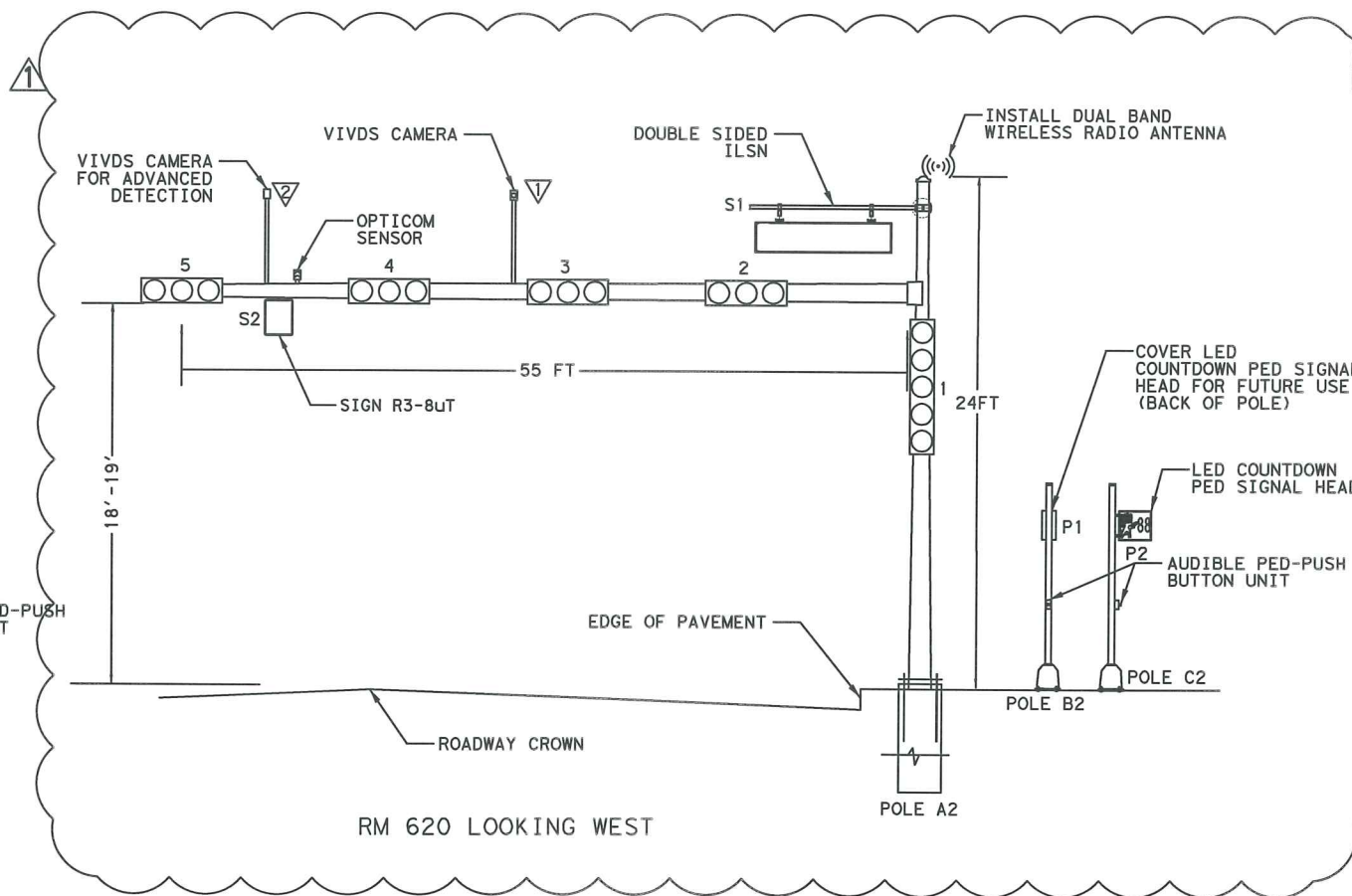
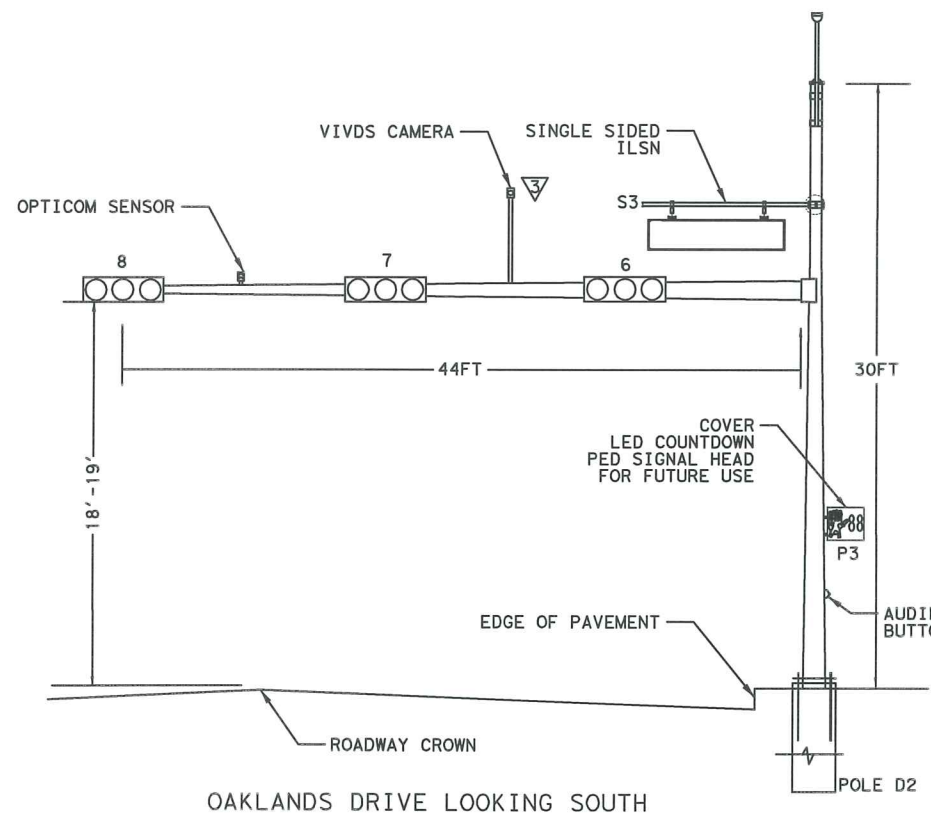
9/19/2017 12:36:08 PM K:\AUS\TPTO\063428009 - RM 620 Signal PH 2\CADD\RM620PH2s1g203.dgn



POLE	TYPE	MAST ARM	FOUNDATION	A	B	C	D	E	F
A2	55L-80	55 IV-80	48-A	17	12	12	12	55	24
D2	44L-80	44 III-80	36-A	22	11	11	-	44	30
E2	55L-80	55 III-80	48-A	31	12	12	-	55	30



PEDESTRIAN POLE DETAILS
POLES (P1)B2, (P2)C2, (P4)F2



- NOTES:
1. ALL PED-HEADS & PUSH BUTTONS SHALL BE AUDIBLE PED SIGNAL UNITS WITH LED COUNTDOWN DISPLAYS.
 2. ADJUST TOP OF SIGNAL POLE FOUNDATIONS TO BE LEVEL WITH CROWN OF ROADWAY.
 3. PRE-WIRE POLE B2&D2 FOR FUTURE AUDIBLE PED PUSH BUTTON UNIT.

NOT TO SCALE

Signature: *Michael Deshpande*

STATE OF TEXAS
VIVEK DESHPANDE
105960
LICENSED PROFESSIONAL ENGINEER
09/19/17

1	SIGNAL CABINET RELOCATION	VMD	9/19/17
NO.	REVISION	BY	DATE

Kimley»Horn F-928

©2016 Texas Department of Transportation

WILLIAMSON COUNTY

RM 620

SIGNAL ELEVATION
RM 620 AND OAKLANDS DR

SCALE: SHEET 3 OF 11

Designed: VDI	By: SA	State: TEXAS	Federal Aid Project No. XXX XX (XX) XX	Highway: RM 620
Checked: VDI	SA	DIST. COUNTY	CONTROL NO. 0683	SECTION NO. 01
Drawn: SA	AUS	WILLIAMSON	0683	01
Checked: VDI	AUS	WILLIAMSON	0683	01

244

9/19/2017 12:46:58 PM K:\AUS\TPT\063428009 - RM 620 Signal PH 2\CADD\RM620PH2s1.q204.dgn

RUN ID	TOTAL QTY		1	1A	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RUN LENGTH	865	2" PVC	15	15	10	10	145	15	25	85	15	30	15	10	35	10	10	125	10
CONDUIT SIZE	1030	3" PVC	1	1	1	1	2	2	1	2	2	1	2	2	1	1	1	1	1
			2	2	2	2	2		2	2		2			2	2	2	2	
		CIRCUIT	NUMBER OF WIRES																
		TRENCH/BORE	T	T	T	T	B	T	T	B	T	T	T	T	T	T	T	T	T
		ILSN			1		1		1	1	2	1			1	1	1	1	
#12 3 CNDR IMSA CABLE	505																		
#14 20 CNDR IMSA CABLE	895	SIGNAL	3	3	1	1	2		2	2		2			2	1	1	1	
#14 4 CNDR IMSA CABLE*		SIGNAL																	
		PHASE 2				3											3		
		PHASE 4																	
		PHASE 5				1													
		PHASE 6														4			
#14 7 CNDR IMSA CABLE*		SIGNAL														1			
		OVL C																	
#14 7 CNDR IMSA CABLE	870	PED HEADS	4	4	1		1	1	2	2		2	1	1	4		1	1	
#14 4 CNDR IMSA CABLE*		PED HEADS																	
		PHASE 4											1				1		
		PHASE 6						1					1						
#12 2 CNDR IMSA CABLE	870	PUSH BUTTONS	4	4	1		1	1	2	2		2	1	1	4		1	1	
#6 INSULATED	220	POWER	2	2							2	2			2				
#6 BARE	110	GROUND	1	1							1	1			1				
#8 INSULATED	1390	LUM POWER			2	2	4		4	4	4						2	2	
#8 BARE	1785	GROUND	2	2	3	3	4	2	3	4	1	2	2	2	2	3	3	3	1
OPTICOM CABLE	495	SIGNAL																	
	40	PHASE 4	1	1	1		1		1	1		1			1		1	1	
		PHASE 2/6	1	1												1			
COAX & #16 3 CNDR SIAMESE CABLE	400	VIVDS CAMERA																	
	495	PHASE 2/5	2	2		1	1		1	1		1			1	1			
	400	PHASE 4	1	1	1		1		1	1		1			1		1	1	
	400	PHASE 6/1	2	2		1	1		1	1		1			1	1			
CAT5 ETHERNET	40	RADIO	1	1												1			

* INSIDE SIGNAL POLE & THE MAST ARM

INSIDE POLES	NO. 8 INSULATED	14 AWG		12 AWG	VIVDS		COMM		ILSN
		7/C	4/C	2/C	COAX	3/C	OPTICOM	ETHERNET	
A2		20	100	-	40	40	20	24	24
B2	-	-	10	10	-	-	-	-	-
C2	-	-	10	10	-	-	-	-	-
D2	60	-	70	10	20	20	20	-	24
E2	60	-	80	-	40	40	20	-	-
F2	-	-	10	10	-	-	-	-	-
TOTAL	120	20	280	40	100	100	60	24	48

INSIDE ARMS	VIVDS		COMM	
	4/C	COAX	3/C	OPTICOM
A2	152	110	110	110
B2	PED POLE			
C2	PED POLE			
D2	99	44	44	44
E2	147	110	110	55
F2	PED POLE			
TOTAL	398	264	264	209

CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 20 CNDR.	CABLE 2 7 CNDR. (FUTURE)	CABLE 3 2 CNDR.	CABLE 4 7 CNDR.	CABLE 5 2 CNDR.	CABLE 6 20 CNDR.	CABLE 7 7 CNDR. (FUTURE)	CABLE 8 2 CNDR.	CABLE 9 20 CNDR.	CABLE 10 7 CNDR.	CABLE 11 2 CNDR.
		FROM A2 TO CNTRL.	FROM B2 TO CNTRL.	FROM B2 TO CNTRL.	FROM C2 TO CNTRL.	FROM C2 TO CNTRL.	FROM D2 TO CNTRL.	FROM D2 TO CNTRL.	FROM D2 TO CNTRL.	FROM E2 TO CNTRL.	FROM F2 TO CNTRL.	FROM F2 TO CNTRL.
1	BLACK	SPARE	SPARE	PHASE 04 PED CALL	SPARE	PHASE 06 PED CALL	SPARE	SPARE	PHASE 04 APS COM	SPARE	SPARE	PHASE 06 PED CALL
2	WHITE	SH COM	PED COM	PHASE 04 APS COM	PED COM	PHASE 06 APS COM	SH COM	PED COM	PHASE 04 APS COM	SH COM	PED COM	PHASE 06 APS COM
3	RED	SH 5 - R ARW PHASE 01	P1 - DW PHASE 04	N/A	P2 - DW PHASE 06	N/A	SPARE	P3 - DW PHASE 04 (FUTURE)	N/A	SH 12 - R ARW PHASE 05	P4 - DW PHASE 06	N/A
4	GREEN	SH 5 - G ARW PHASE 01	P1 - W PHASE 04 (FUTURE)	N/A	P2 - W PHASE 06	N/A	SPARE	P3 - W PHASE 04 (FUTURE)	N/A	SH 12 - G ARW PHASE 05	P4 - W PHASE 06	N/A
5	ORANGE	SH 5 - Y ARW PHASE 01	SPARE	N/A	SPARE	N/A	SPARE	SPARE	N/A	SH 12 - Y ARW PHASE 05	SPARE	N/A
6	BLUE	SPARE	SPARE	N/A	SPARE	N/A	SPARE	SPARE	N/A	SPARE	SPARE	N/A
7	WHITE/BLACK	SH 1 - Y ARW OVL C	SPARE	N/A	SPARE	N/A	SPARE	SPARE	N/A	SPARE	SPARE	N/A
8	RED/BLACK	SH 1 - G ARW OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
9	GREEN/BLACK	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
10	ORANGE/BLACK	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
11	BLUE/BLACK	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
12	BLACK/WHITE	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
13	RED/WHITE	SH 2, 3, 4 - R PHASE 06	N/A	N/A	N/A	N/A	SH 6, 7, 8 - R PHASE 04	N/A	N/A	SH 9, 10, 11 - R PHASE 02,	N/A	N/A
14	GREEN/WHITE	SH 2, 3, 4 - Y PHASE 06	N/A	N/A	N/A	N/A	SH 6, 7, 8 - Y PHASE 04	N/A	N/A	SH 9, 10, 11 - Y PHASE 02,	N/A	N/A
15	BLUE/WHITE	SH 2, 3, 4 - G PHASE 06	N/A	N/A	N/A	N/A	SH 6, 7, 8 - G PHASE 04	N/A	N/A	SH 9, 10, 11 - G PHASE 02,	N/A	N/A
16	BLACK/RED	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
17	WHITE/RED	SPARE	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
18	ORANGE/RED	SH 1 - Y OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
19	BLUE/RED	SH 1 - G OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A
20	RED/GREEN	SH 1 - R OVL C	N/A	N/A	N/A	N/A	SPARE	N/A	N/A	SPARE	N/A	N/A

Vivek Deshpande

STATE OF TEXAS
VIVEK DESHPANDE
105960
LICENSED PROFESSIONAL ENGINEER
09/19/2012

1	SIGNAL CABINET RELOCATION	VMD	9/19/17
NO.	REVISION	BY	DATE

Kimley»Horn F-928

©2016 Texas Department of Transportation

WILLIAMSON COUNTY TEXAS

RM 620

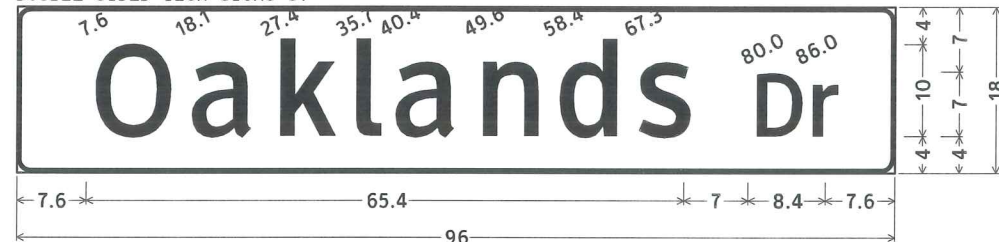
ELECTRICAL WIRING
RM 620 AND OAKLANDS DR

SCALE: SHEET 4 OF 11

Designed: VD	By: SA	State: TEXAS	Federal Aid Project No.	Highway No.
Checked: SA	X	TEXAS	XXX XX (XX)XX	RM 620
Drawn: SA	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked: VD	AUS	WILLIAMSON	0683	01
			090	245

(BACKPLATES & HANGERS NOT SHOWN)

DOUBLE SIDED ILSN SIGNS S1



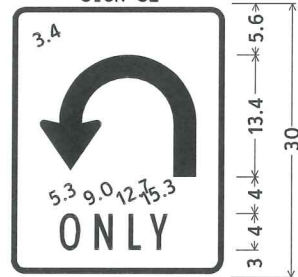
1-2c 6in; 1.5" Radius, 0.5" Border, White on Green;
[Oaklands] ClearviewHwy-3-W; [Dr] ClearviewHwy-2-W;

SINGLE SIDED ILSN SIGN S3



1-2c 6in; 1.5" Radius, 0.5" Border, White on Green;
[RM 620] ClearviewHwy-3-W;

SIGN S2



R3-8U_24X30;
1.9" Radius, 0.6" Border, 0.4" Indent, Black on White;
UL Ir=5, s=2.5;
[ONLY] D;

SIGN S4



R10-5_24X30;
1.5" Radius, 0.6" Border, 0.4" Indent, Black on White;
[LEFT ON] C; [GREEN] D;
[ARROW] D; [ONLY] D;



HEAD 1



HEADS 2, 3, 4, 6, 7, 8, 9, 10, 11

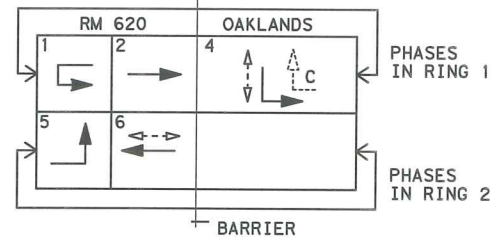


HEAD 5, 12



LED COUNTDOWN
PED SIGNAL HEAD

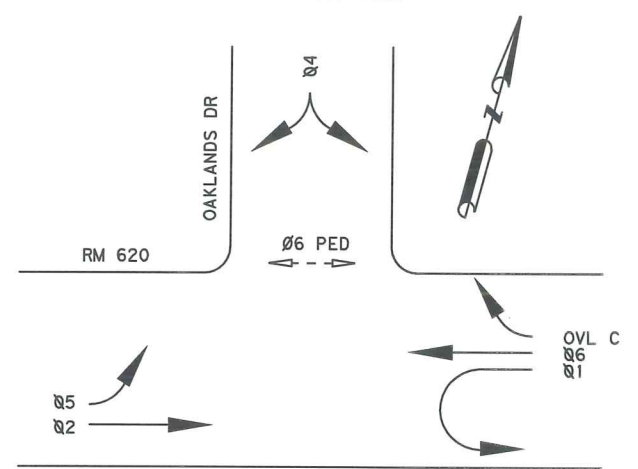
PHASING DIAGRAM



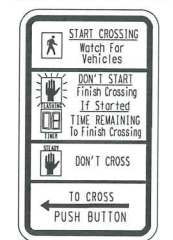
1. SIGNAL PHASING TO BE MONITORED AND ADJUSTED IN THE FIELD AS NECESSARY.
2. OVERLAP C IS THE RIGHT- TURN GREEN ARROW DISPLAY, DRIVEN BY PHASE 4.

PEDESTRIAN SIGN DETAILS	
PED HEAD	SIGN
P1	5"X7" - L
P2	5"X7" - L
P3	9"X15" - L
P4	5"X7" - L

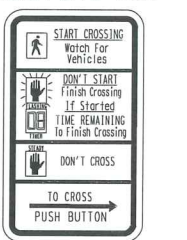
ORIENTATION VIEW



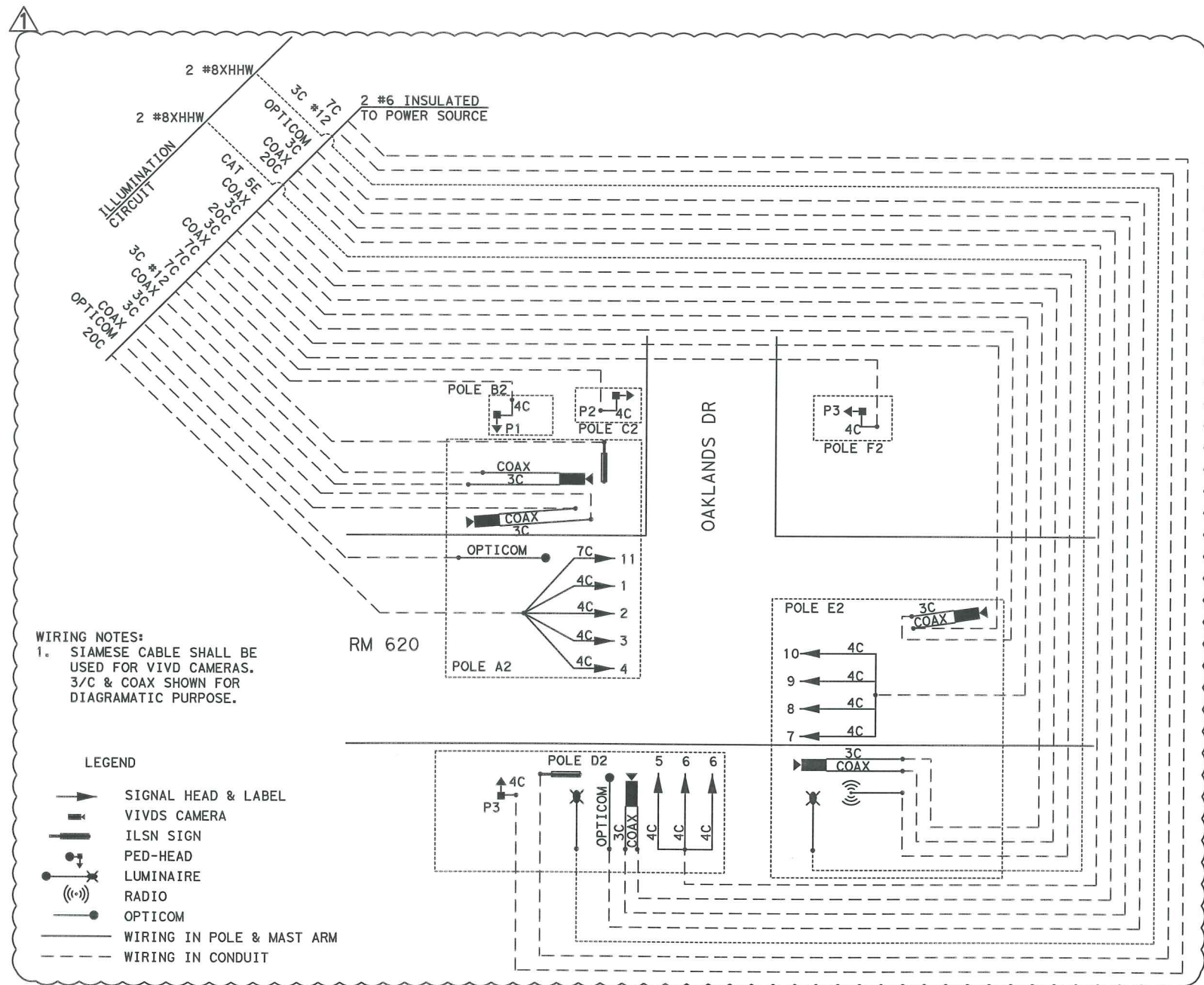
SIGN R10-3eL



SIGN R10-3eR



5"X7" FOR PED-POLES
9"X15" FOR SIGNAL POLES
COUNTDOWN PEDESTRIAN
PUSH BUTTON SIGN DETAILS



WIRING NOTES:
1. SIAMESE CABLE SHALL BE USED FOR VIVD CAMERAS.
3/C & COAX SHOWN FOR DIAGRAMATIC PURPOSE.

LEGEND

- SIGNAL HEAD & LABEL
- VIVDS CAMERA
- ILSN SIGN
- PED-HEAD
- LUMINAIRE
- RADIO
- OPTICOM
- WIRING IN POLE & MAST ARM
- WIRING IN CONDUIT

Vivek Deshpande
STATE OF TEXAS
VIVEK DESHPANDE
105960
LICENSED PROFESSIONAL ENGINEER
09/19/17

1	SIGNAL CABINET RELOCATION	VMD	9/19/17
NO.	REVISION	BY	DATE

Kimley»Horn
F-928

©2016 Texas Department of Transportation

WILLIAMSON
COUNTY
JULY

RM 620

WIRING AND PHASING
RM 620 AND OAKLANDS DR

SCALE:		SHEET 5 OF 11	
Designed: VD	BY: NO.	STATE	FEDERAL AID PROJECT NO.
Checked: SA	X	TEXAS	XXX XX (XX) XX
Drawn: SA	DIST.	COUNTY	CONTROL NO.
Checked: VD	AUS	WILLIAMSON	0683 01 090

1

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0416	6030	DRILL SHAFT (TRF SIG POLE) (24 IN) +	LF	18 +
0416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	14
0416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	44
0618	6046	CONDT (PVC) (SCH 80) (2")	LF	405
0618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	460
0618	6053	CONDT (PVC) (SCH 80) (3")	LF	570
0618	6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	460
0620	6007	ELEC CONDR (NO. 8) BARE	LF	1,785
0620	6008	ELEC CONDR (NO. 8) INSULATED	LF	1,510
0620	6009	ELEC CONDR (NO. 6) BARE	LF	110
0620	6010	ELEC CONDR (NO. 6) INSULATED	LF	220
0624	6010	GROUND BOX TY D (162922)W/APRON	EA	8
0628	6213	ELC SRV TY D 120/240 100(NS)AL(E)PS(U)	EA	1
0680	6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1
0680	6004	REMOVING TRAFFIC SIGNALS	EA	1
0681	6001	TEMP TRAF SIGNALS	EA	1
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	3
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	3
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	2
0682	6018	PED SIG SEC (LED) (COUNTDOWN)	EA	4
0682	6023	BACK PLATE (12") (3 SEC)	EA	11
0682	6025	BACK PLATE (12") (5 SEC)	EA	1
0684	6008	TRF SIG CBL (TY A) (12 AWG) (3 CONDR)	LF	553
0684	6030	TRF SIG CBL (TY A) (14 AWG) (4 CONDR)	LF	678
0684	6033	TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	LF	890
0684	6046	TRF SIG CBL (TY A) (14 AWG) (20 CONDR)	LF	895
0684	6079	TRF SIG CBL (TY C) (12 AWG) (2 CONDR)	LF	910
0686	6048	INS TRF SIG PL AM(S)1 ARM(44')LUM&ILSN	EA	1
0686	6058	INS TRF SIG PL AM(S)1 ARM(55')ILSN	EA	1
0686	6059	INS TRF SIG PL AM(S)1 ARM(55')LUM	EA	1
0687	6001	PED POLE ASSEMBLY	EA	3
0688	6001	PED DETECT PUSH BUTTON (APS)	EA	4
0688	6003	PED DETECTOR CONTROLLER UNIT	EA	1
6002	6001	VIVDS PROCESSOR SYSTEM	EA	1
6002	6002	VIVDS CAMERA ASSEMBLY	EA	5
6002	6003	VIVDS SET-UP SYSTEM	EA	1
6002	6004	VIVDS CENTRAL CONTROL	EA	1
6002	6005	VIVDS COMMUNICATION CABLE (COAXIAL)	LF	1,659
6089	6001	ETHERNET CABLE AND CONNECTORS	LF	64
6090	6001	ILSN (LED) (6S)	EA	1
6090	0	ILSN (LED) (8D)	EA	1
WC9012		OPTICOM DETECTOR - GTT MODEL 722	EA	2
WC9013		OPTICOM PHASE SELECTOR - GTT MODEL 764	EA	1
WC9014		OPTICOM CARD RACK - GTT MODEL 760	EA	1
WC9015		OPTICOM CABLE - GTT MODEL 138	LF	804
WC9016		DUAL BAND (2.4/5.8) WIRELESS ETHERNET RADIO	EA	1
WC9017		HARDENED ETHERNET SWITCH	EA	1
WC9010		BATTERY BACK-UP SYSTEM*	EA	1*

+ INCLUDED FOR INFORMATION ONLY, SUBSIDIARY TO ITEM 687.
* TO BE SUPPLIED & INSTALLED BY CITY OF ROUND ROCK

1	SIGNAL CABINET RELOCATION	VMD	9/19/17
NO.	REVISION	BY	DATE

Kimley»Horn

F-928

©2016

Texas Department of Transportation®

WILLIAMSON COUNTY, TX

RM 620

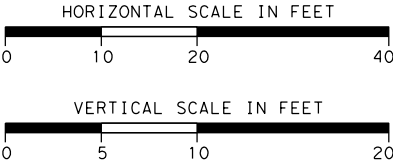
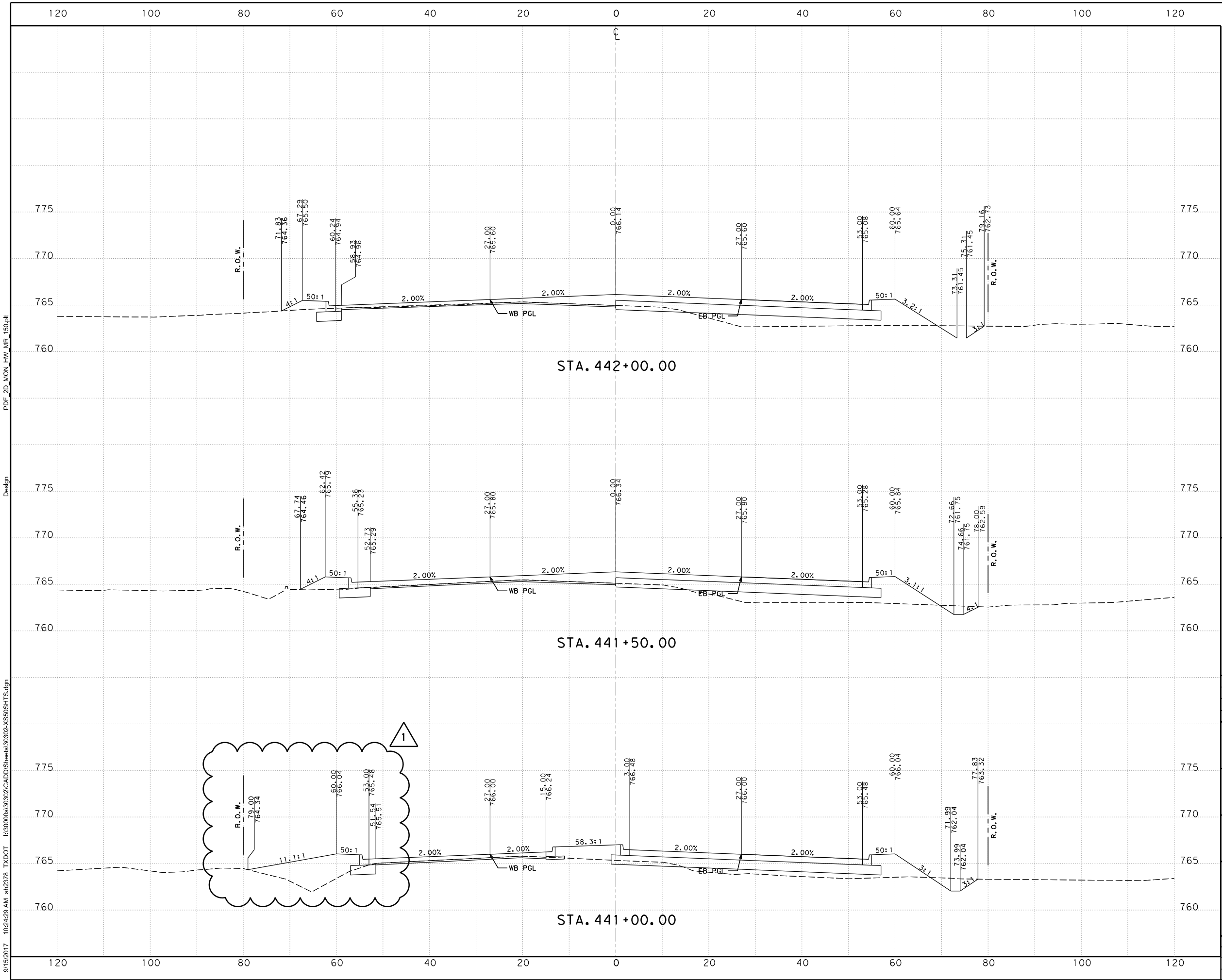
SIGNAL QUANTITY SUMMARY

RM 620 AND OAKLANDS DR

SCALE:

SHEET 7 OF 11

Designed: VDI	By: BFP	No.:	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: SA	X	TEXAS	XXX XX (XX)XX		RM 620
Drawn: SA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
Checked: VDI	AUS	WILLIAMSON	0683	01	090
					248



NOTES:
1. CROSS SECTIONS ARE PROVIDED FOR THE CONTRACTOR'S INFORMATION AS A BASIS OF ESTIMATE FOR EARTHWORK QUANTITIES. DRIVEWAYS ARE NOT SHOWN AND ANY WORK RELATED TO DRIVEWAY CONSTRUCTION SHALL BE SUBSIDIARY TO ITEM 530
2. CROSS SECTIONS SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. REFER TO INFORMATION IN CONSTRUCTION PLANS.

1	RFI 16	AD	9/15/17
NO.	REVISION	BY	DATE

4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBPE FIRM NO. F-312

Texas Department of Transportation

WILLIAMSON COUNTY

RM 620
CROSS SECTIONS

SCALE: H=1"=20' V:1"=10'				SHEET 17 OF 29			
Designed: ER	Div. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.			
Checked: ER	X	TEXAS		RM 620			
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked: ER	AUS	WILLIAMSON	0683	01	090	18	



REQUEST FOR INFORMATION FORM

RFI NO.: 22 REV DATE: 10/11/17
PROJECT: RM 620 PHASE 2 RESPONSE REQUESTED BY
DATE: 10/12/17
TO: CLAYTON WEBER, CONSTRUCTION MANAGER

REFERENCE: TY IIR Inlets (sheets 198 & 199)

PROBLEM:

The plans show inlets C1 & C1-A to be TY IIR. A pay item does not exist for this type of inlet. Can one be established so that we may provide pricing for & bill under? Thanks.

RECOMMENDED SOLUTION:

DARREN OKRUHLIK

Originator

10/11/2017

Date

RESPONSE:

The proposed unit rate from the Contractor of \$12,945 per EACH is accepted. The existing 465-6181 item described as "INLET (COMPL) (TYII) (15 FT)" in the Bid Tab for \$7,200/EA will be removed via Change Order and replaced with 465-WC01 described as "INLET (COMPL)(CURB)(TY IIR)(15)" for the new price of \$12,945/EA. Contractor to provide materials and construct the Type 2R inlets, per the details shown in the plans.

Eddie Church

Responder

10/20/2017

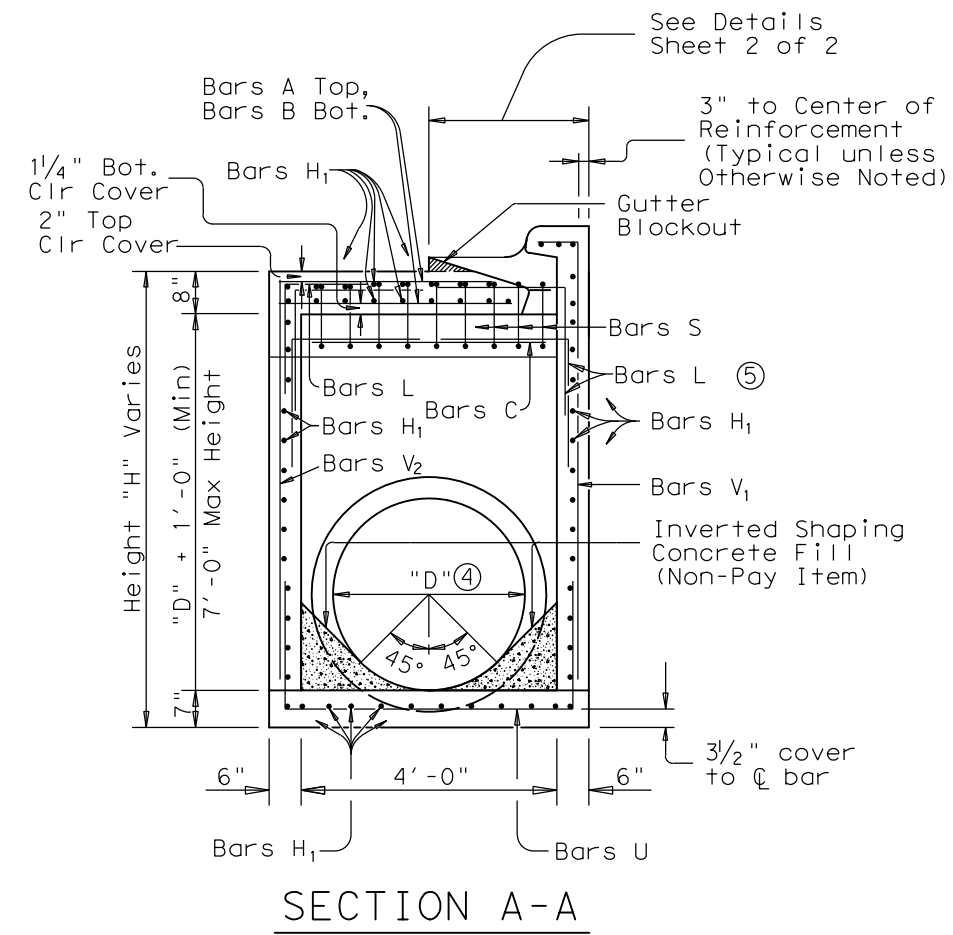
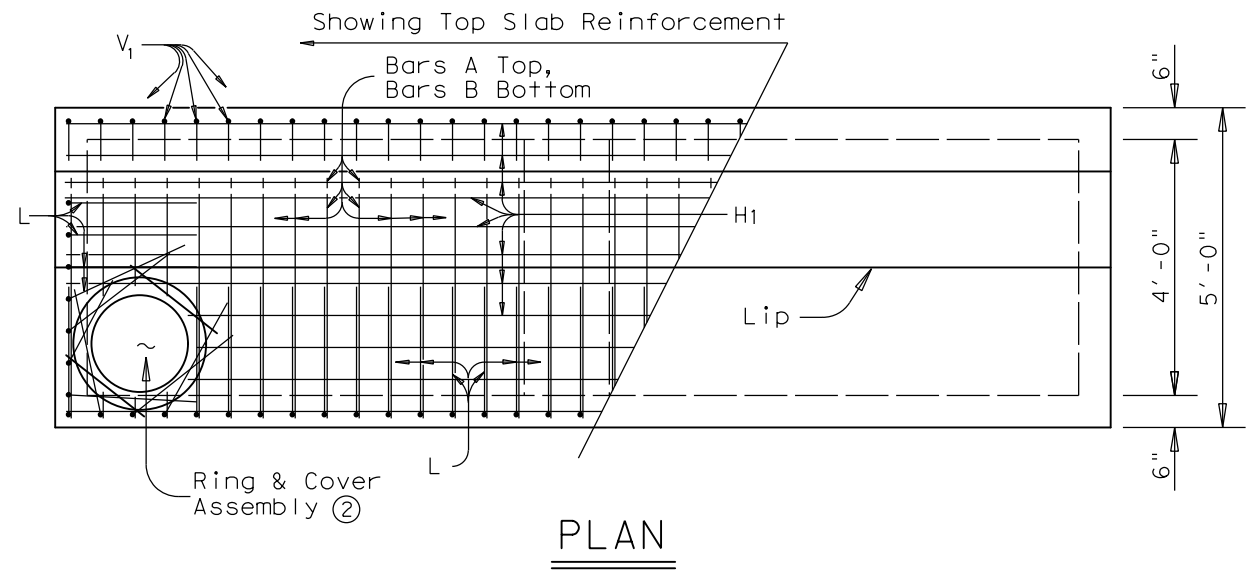
Date

Sign, Date & Return to HNTB via e-mail or fax.

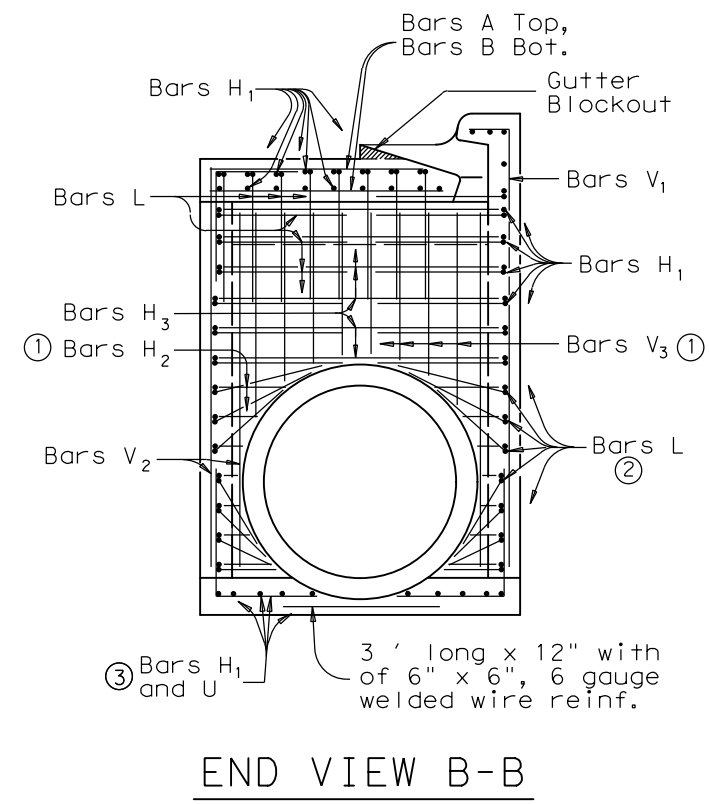
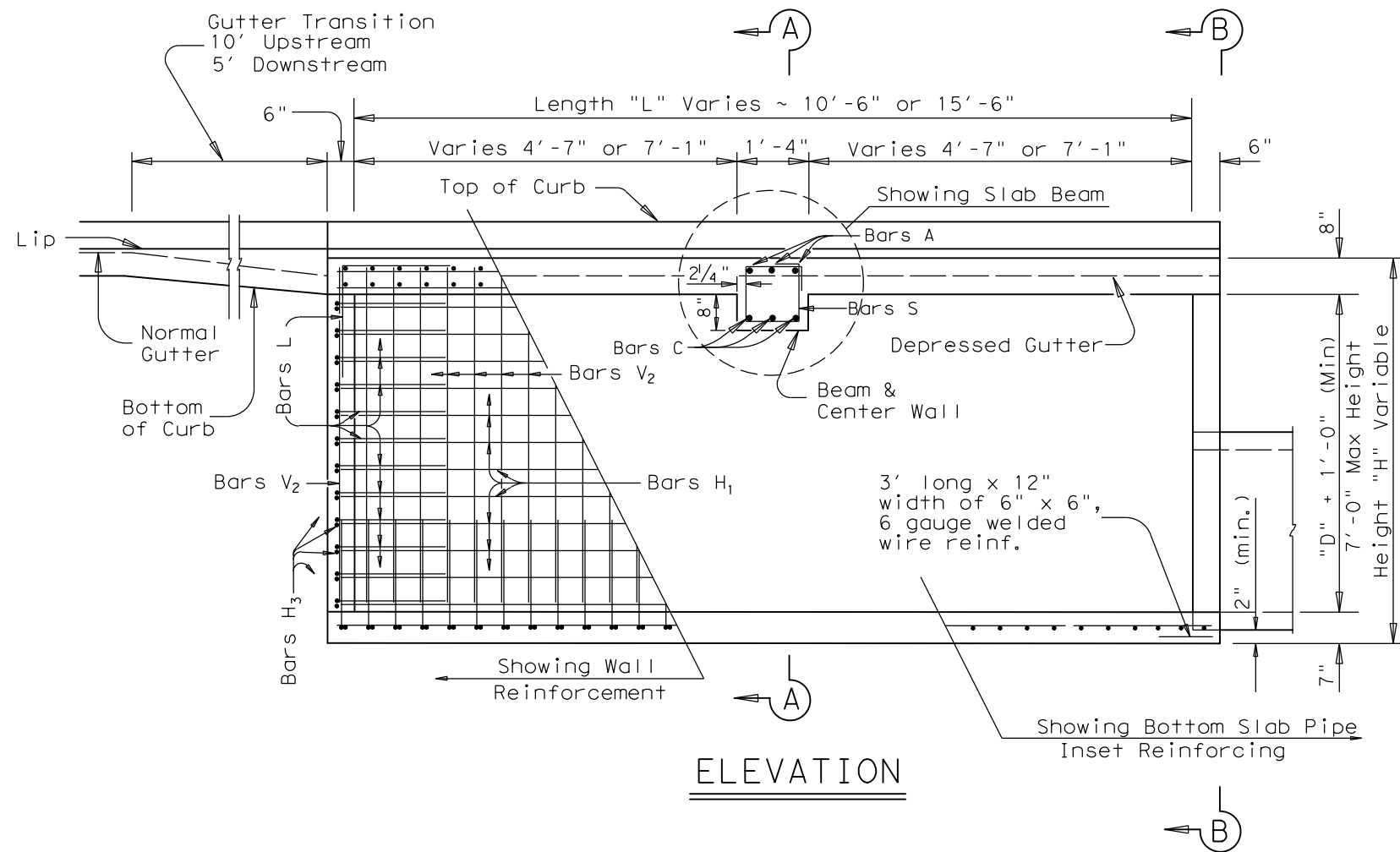
Mail original to: HNTB Corporation
101 E. Old Settlers Blvd.
Round Rock, Texas 78664

Attachments to RFI:

Cc:



- ① Cut bars H₂ & V₃ as shown. ② Allow 3" for End Cover (Typical).
- ② Place bars L with Bars A, H, and V as shown at RCP, corners and Manhole Assembly. Place Manhole ring such that interior opening aligns with inside faces of two corner walls. Place 4 ~ #4 Bars as shown in Plan View around Ring Assembly to engage cut slab Bars A, B & H₁.
- ③ Cut bars H₁ and end bar U as Required to accommodate pipe inset in Bottom Slab.
- ④ "D" = Pipe Diameter
- ⑤ Align Bars L with Beam Reinforcement Bars C and Top Slab Reinforcement Bars A (12 Bars L Total) at ends of transverse slab beam.



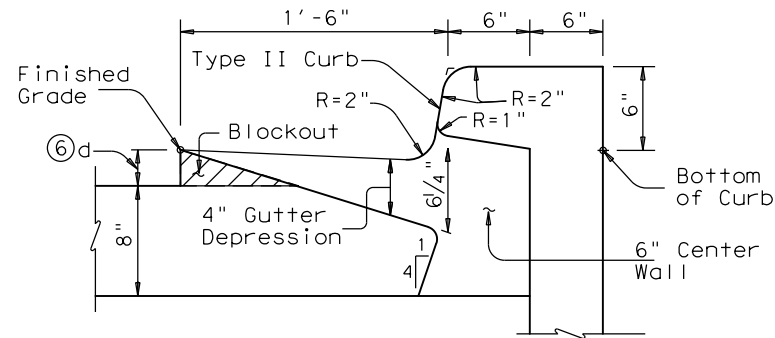
HALFF 4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBP# FIRM NO. F-312

©2016 **Texas Department of Transportation**



RM 620
CURB INLET TYPE IIR

SCALE:		SHEET 1 OF 2	
Designed: ER	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.
Checked: ER	X	TEXAS	RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.
Checked: ER	AUS	WILLIAMSON	0683
			SECTION NO.
			JOB NO.
			SHEET NO.
			198



THROAT DETAILS TYPE IIR INLETS

⑥ "d" = Depth of Overlay.

BAR TABLE		
BAR	SIZE	MAX. SPA.
A	#5	5"
B	#5	5"
C	#8	As Shown
H ₁	#5	6"
H ₂	#5	6"
H ₃	#5	6"
L	#5	6"
S	#4	5"
U	#5	6"
V ₁	#5	6"
V ₂	#5	6"
V ₃	#5	6"
W	#5	6"

GENERAL NOTES:

Use Class "C" concrete for inlet box bottom and walls; use Class "S" concrete for inlet box top.

Ring and cover must meet requirements of AASHTO M306, "Standard Specification for Drainage Structure Castings". Materials shall conform to ASTM A48, Class 35B for gray iron castings or ASTM A536, Grade 65-45-12 for ductile iron castings. Aluminum alloy castings will not be permitted. Consider ring and cover subsidiary to the pertinent Item.

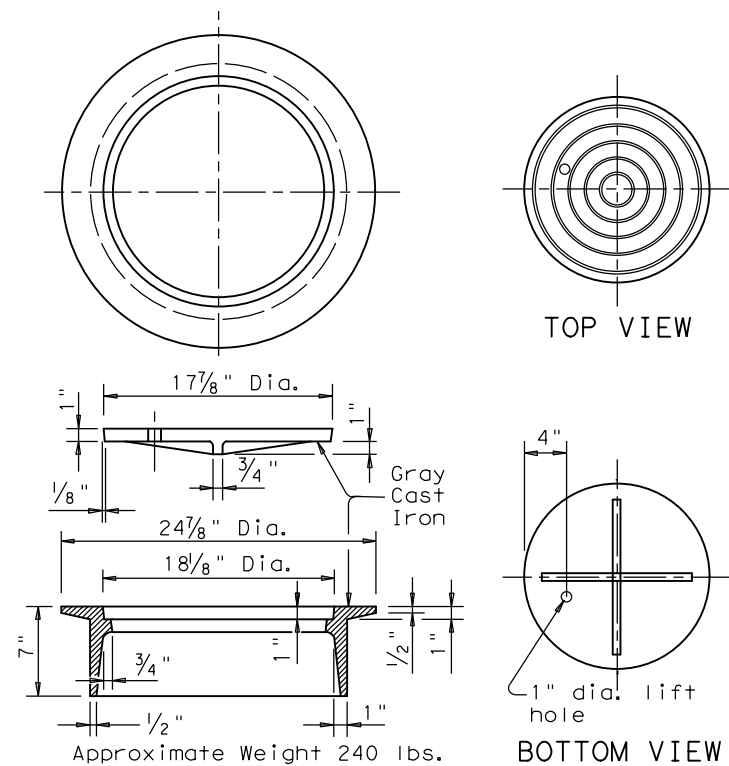
If two inlets are to be installed end to end, install equivalent opening or pipe segment in end walls between boxes. Each end wall between inlet boxes will be reinforced as shown for single box.

Build inlets in stages so that base laying operations may be continuous over the top of the inlet. Backfill any additional excavation required below finished base grade within roadway limits with Class "B" Conc (Riprap).

Consider work or materials involved for inlet stage construction subsidiary to the pertinent Items.

Ensure connecting pipes enter within 10 degrees of normal to inlet wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.

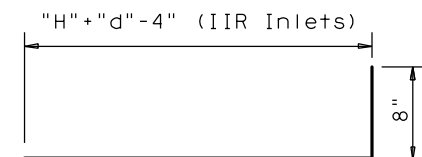
Provide gutter blockout(s) for the length of each inlet for temporary drainage. Fill blockout(s) after final roadway paving. Consider this work subsidiary to pertinent Item.



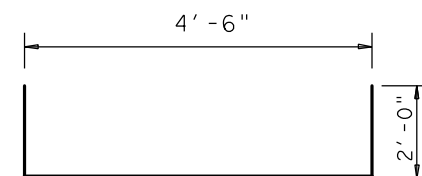
RING AND COVER DETAILS

A ~ 3'-0"
B ~ 3'-7"
C ~ 3'-8"
H ₁ ~ "L" + 6"
H ₂ ~ Cut to Fit
H ₃ ~ 4'-6"
V ₂ ~ "H" - 1'-3"
V ₃ ~ Cut to Fit

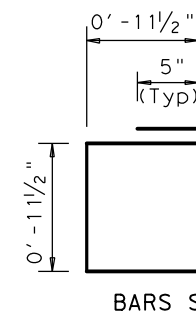
BARS A, B, C, H₁, H₂, H₃, V₂, & V₃



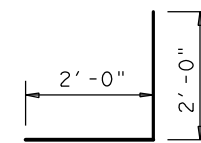
BARS V₁



BARS U



BARS S



BARS L

F-312 6/16/2015

NO.	REVISION	BY	DATE

4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBPE FIRM NO. F-312

©2016 Texas Department of Transportation

WILLIAMSON COUNTY
1846

RM 620

CURB INLET TYPE IIR

SCALE:

SHEET 2 OF 2

Designed: ER	FED. RD. DIV. NO. X	STATE TEXAS	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: ER				RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked: ER	AUS	WILLIAMSON	0683	01 090

SHEET NO. 199



REQUEST FOR INFORMATION FORM

RFI NO.: 23 DATE: 10/17/17
PROJECT: RM 620 PHASE 2 RESPONSE REQUESTED BY
TO: Eric Ratzman, P. E., Halff Associates DATE: 10/12/17

REFERENCE: Oaklands Drive drainage layout: Plan sheets 132, 159, 168.

PROBLEM:

Plans show installation of curb inlet OL-MED at Sta. 2+48 along the center median. We have confirmed with survey that the existing roadway does not drain to the center median, it drains to the outside curb line. The inlet proposed for the center median will not catch any runoff.

RECOMMENDED SOLUTION:

We are reviewing location of existing utilities along west (outside) curb line to determine if there is space for a curb line to be installed.

Clayton Weber
Originator

10/17/2017
Date

RESPONSE:

We agree that the inlet in the median is not needed, but gutter flow on the outside curb needs to be handled (the TIN and contours provided by TxDOT were not accurate in this area). After meeting in the field to view marked utilities, it is clear that the curb inlet can't be installed on the outside (west) curb without conflicting with utilities and causing delay. So we are deleting the curb inlet and adding a new linear grate inlet (new detail sheet 199A) on the outside curb. Revised sheet are attached and the related quantity changes will follow in a separate response tomorrow.

Eric Ratzman
Responder

10/26/2017
Date

Sign, Date & Return to HNTB via e-mail or fax.

Mail original to: HNTB Corporation
101 E. Old Settlers Blvd.
Round Rock, Texas 78664

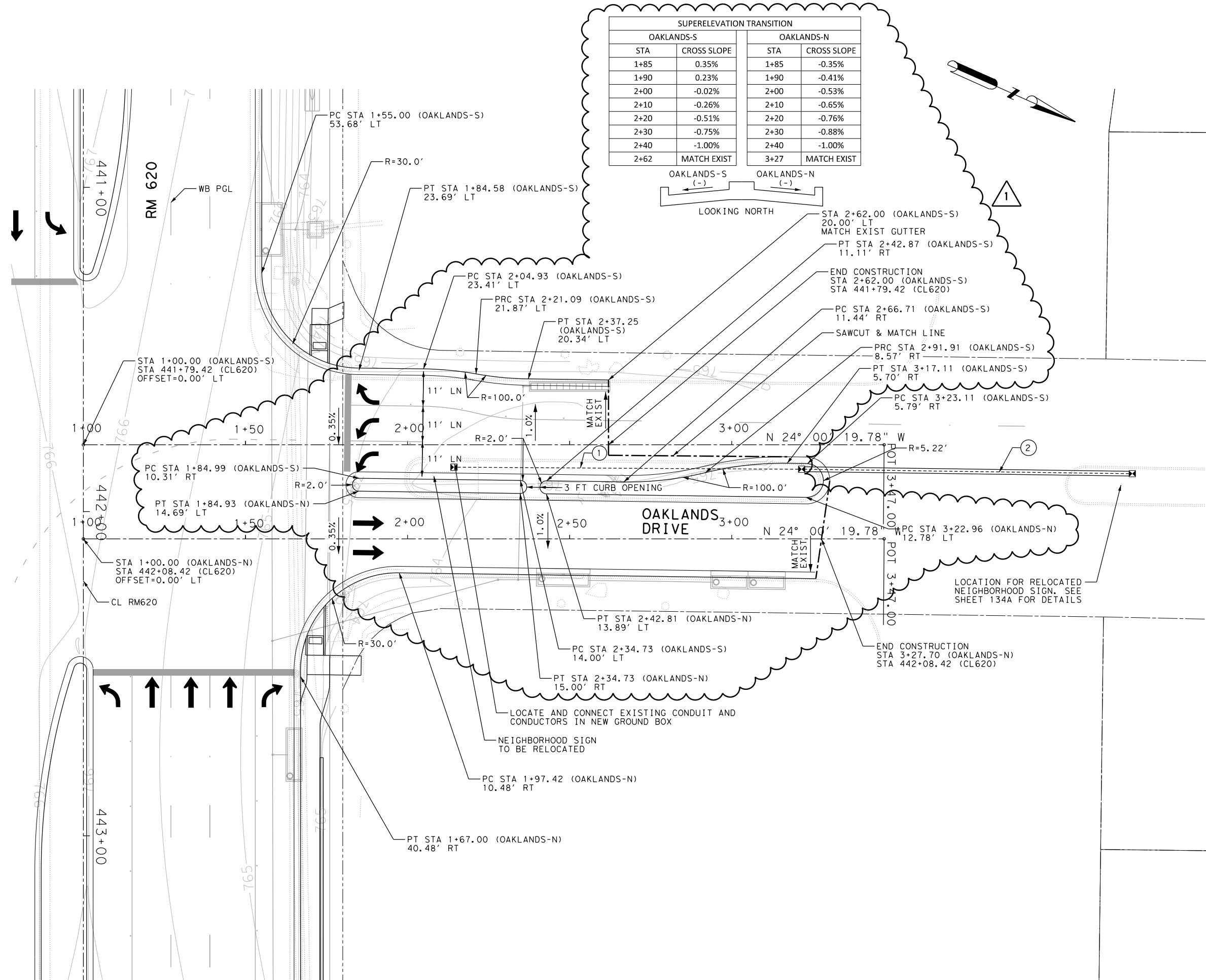
Attachments to RFI: Revised Plan sheets 132, 133, 159, 168, 199A, and 217.

Cc:

						ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		
	ITEM		DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
21	340	6011	D-GR HMA(SQ) TY-B PG64-22	TON	\$100.00			18.3	18.30	\$1,830.00	\$1,830.00
23	341	6040	D-GR HMA TY-D PG64-22	TON	\$70.00			3.7	3.70	\$259.00	\$259.00
24	341	6062	D-GR HMA TY-D PG64-22(LEVEL-UP)	TON	\$70.00			76.7	76.70	\$5,369.00	\$5,369.00
25	347	6003	TOM (ASPHALT) PG 70-22	TON	\$90.00			0.2	0.20	\$18.00	\$18.00
26	347	6006	TOM - C (AGGREGATE) SAC - B	TON	\$90.00			2.3	2.30	\$207.00	\$207.00
28	354	6069	PLANE ASPH CONC PAV (0"- 2 1/2")	SY	\$2.20			19.0	19.00	\$41.80	\$41.80
29	400	6005	CEM STABIL BKFL	CY	\$110.00			13.10	13.10	\$1,441.00	\$1,441.00
37	432	6002	RIPRAP (CONC)(5 IN)	CY	\$475.00			(2.2)	-2.20	-\$1,045.00	(\$1,045.00)
46.5	464	6017	RC PIPE (CL IV)(18 IN)	LF	\$68.00			26.0	26.00	\$1,768.00	\$1,768.00
	474	6021	CAST-IN-PLACE TRENCH DRAIN	LF				24.0	24.00	\$0.00	\$0.00
82	529	6008	CONC CURB & GUTTER (TY II)	LF	\$20.00			5.0	5.00	\$100.00	\$100.00
122	666	6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	\$0.30			14.0	14.00	\$4.20	\$4.20
127	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	\$0.20			(9.0)	-9.00	-\$1.80	(\$1.80)
129	666	6184	REFL PAV MRK TY II (W) (ARROW)	EA	\$70.00			2.0	2.00	\$140.00	\$140.00
130	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	\$90.00			2.0	2.00	\$180.00	\$180.00
132	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL	LF	\$1.00			(9.0)	-9.00	-\$9.00	(\$9.00)
135	672	6010	REFL PAV MRKR TY II-C-R	EA	\$4.00			1.0	1.00	\$4.00	\$4.00
TOTALS							\$0.00			\$8,476.20	\$8,476.20

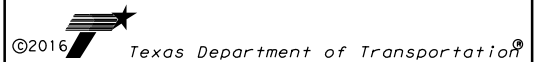
* Engineer's estimate; items noted with asterisk are new items not in the original bid, so contractor will have to provide price

From RFI #2
*



1	RFI 23	AD	10/26/17
NO.	REVISION	BY	DATE

HALFF 4030 WEST BRAKER LANE, SUITE 450
AUSTIN, TEXAS 78759-5356
TEL (512) 252-8184
FAX (512) 252-8141
TBP FIRM NO. F-312



RM 620

PLAN PROFILE

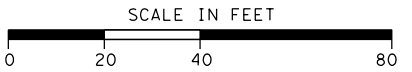
DRIVEWAYS AND SIDE ROADS

SCALE: 1"=30'				SHEET 8 OF 9		
Designed: ER	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ER	X	TEXAS				RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: ER	AUS	WILLIAMSON	0683	01	090	132

PDF 2D MON HW MR 150.plt

Design

10/26/2017 5:08:51 PM ah2378 TXDOT I:\30000s\30302\CADD\Sheets\30302-PDW-09.dgn

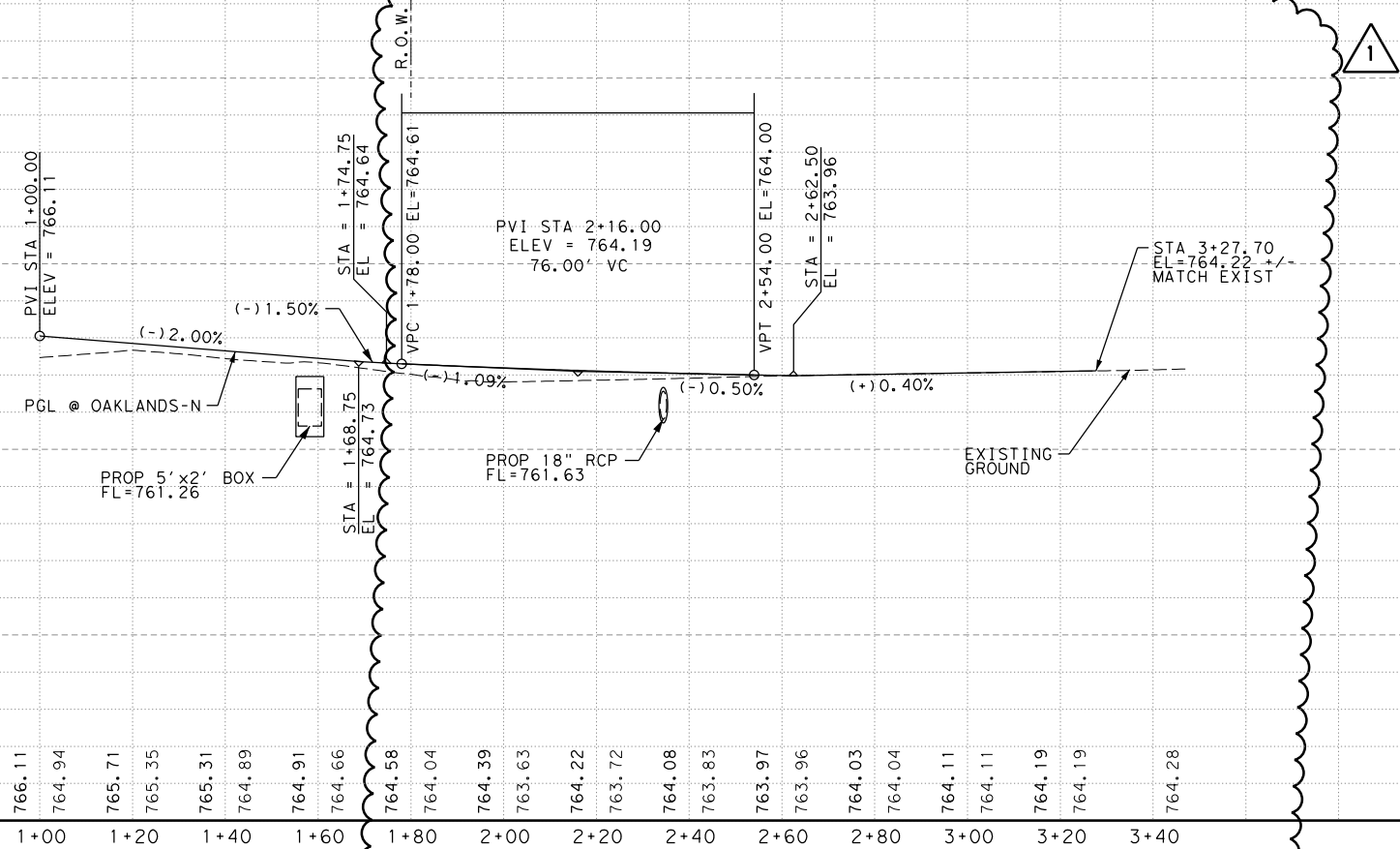


LEGEND

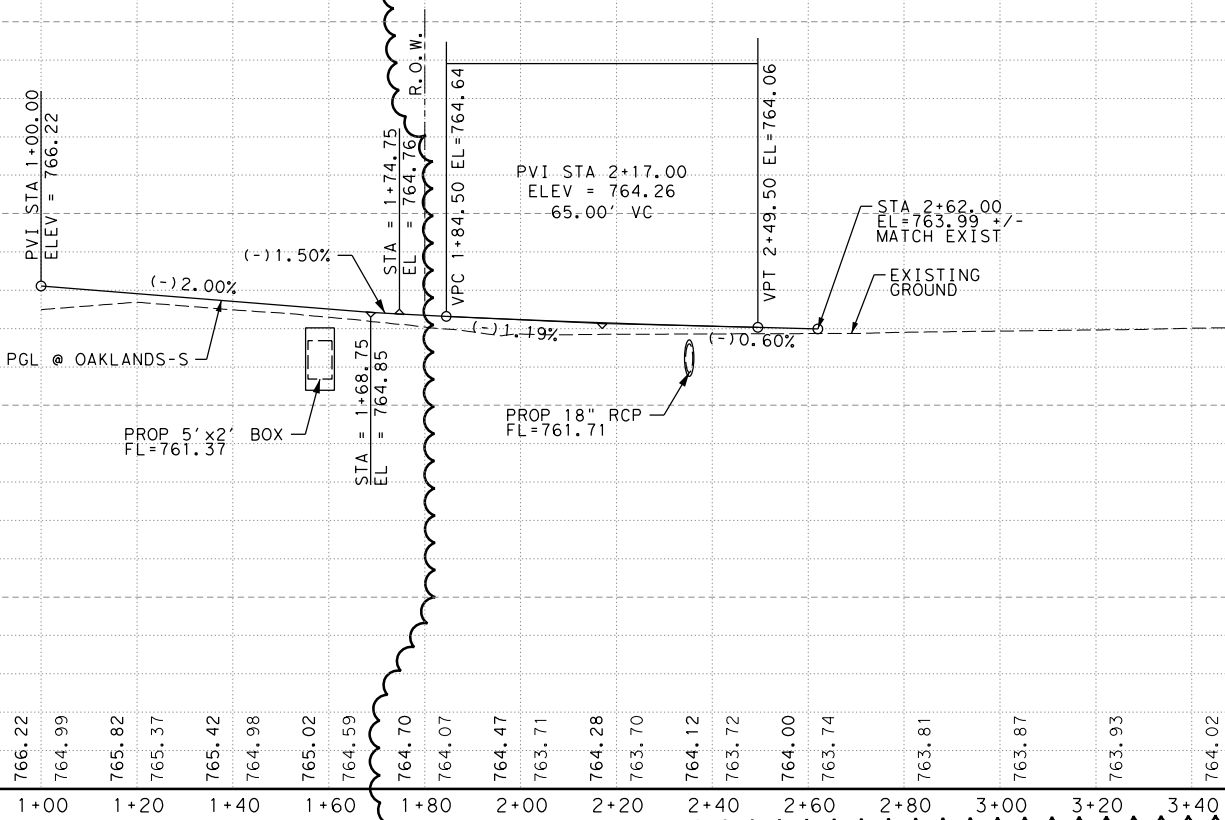
----- EXISTING R.O.W.
----- TEMPORARY CONSTRUCTION EASEMENT

- NOTES:
1. TAPER CURB AT SIDEWALK AS SHOWN ON PED-12A(3) 'SETBACK SIDEWALK.'
 2. CONSTRUCT DRIVEWAY PER CONCRETE DRIVEWAY DETAIL UNLESS NOTED OTHERWISE.
 3. CONSTRUCT DRIVEWAY 1/2 AT A TIME OR COORDINATE CLOSURE WITH PROPERTY OWNER IF MULTIPLE DRIVEWAYS SERVE SITE

OAKLANDS-N

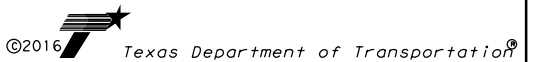


OAKLANDS-S



10/26/2017

1	RF 1 23	AD	10/26/17
NO.	REVISION	BY	DATE



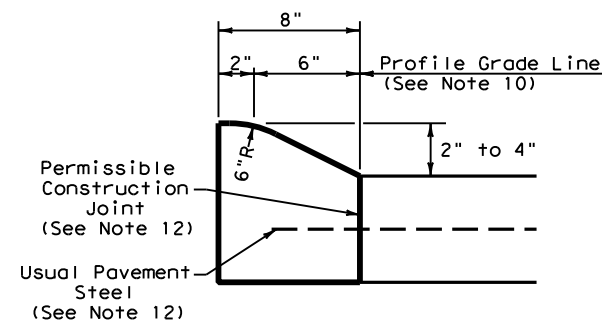
RM 620

PLAN PROFILE
DRIVEWAYS AND SIDE ROADS

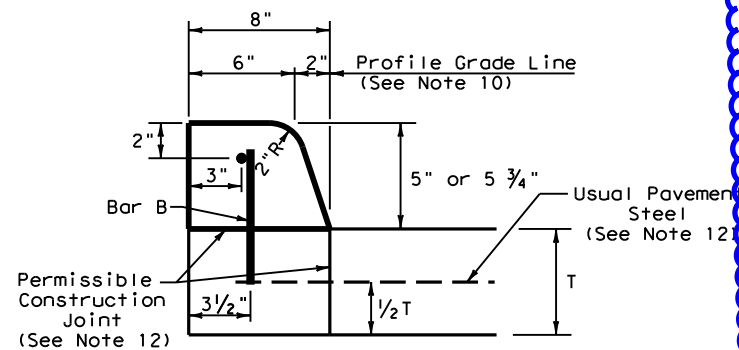
SCALE: H:1"=40' V:1"=10'			SHEET 9 OF 9		
Designed: ER	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.		HIGHWAY NO.
Checked: ER	X	TEXAS			RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
Checked: ER	AUS	WILLIAMSON	0683	01	090
					133

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

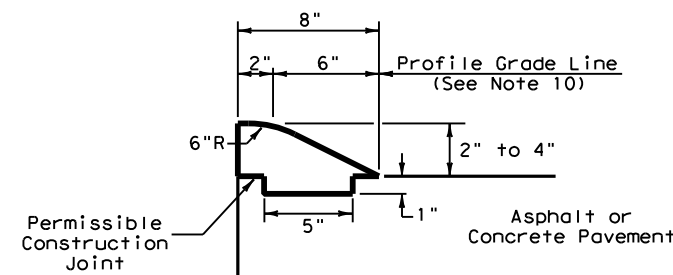
DATE: FILE:



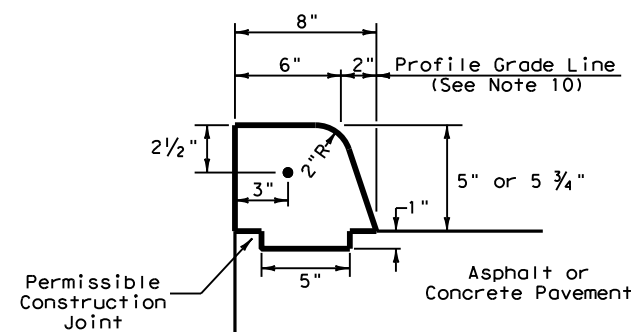
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



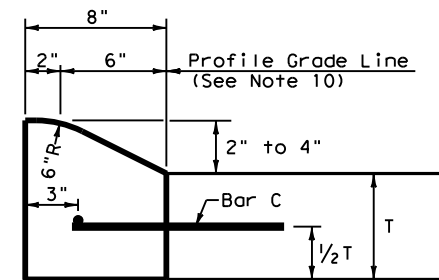
TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT



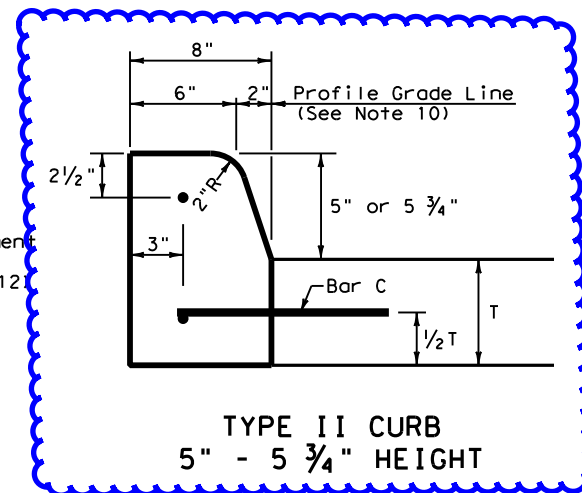
TYPE III CURB (KEYED)
2" - 4" HEIGHT



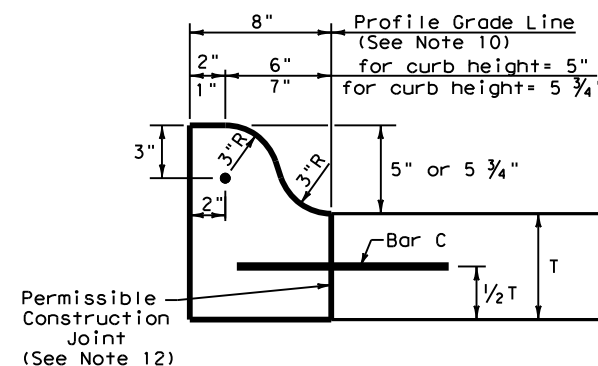
TYPE IV CURB (KEYED)
5" - 5 3/4" HEIGHT



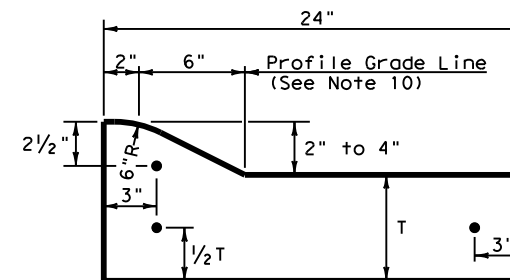
TYPE I CURB
2" - 4" HEIGHT



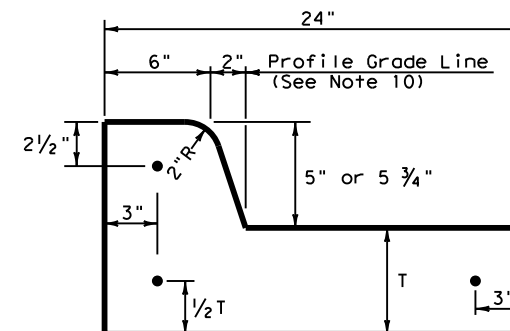
TYPE II CURB
5" - 5 3/4" HEIGHT



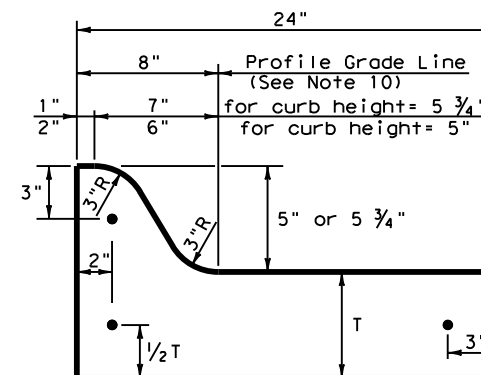
TYPE IIa CURB
5" - 5 3/4" HEIGHT



TYPE I CURB AND GUTTER
2" - 4" HEIGHT

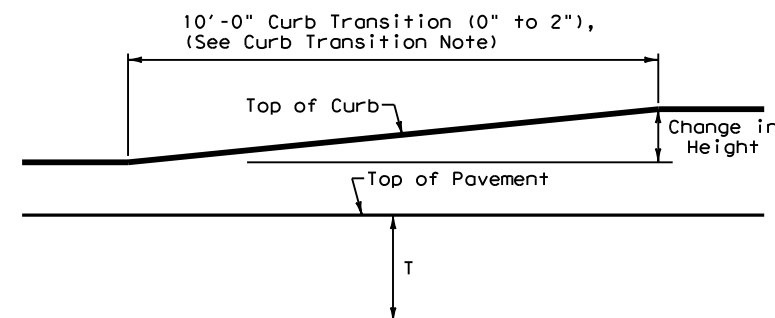


TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT



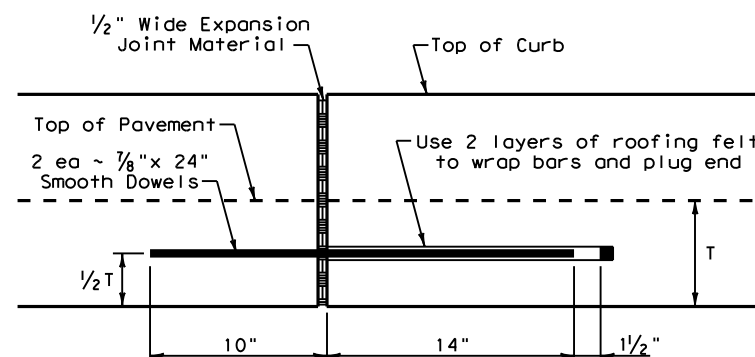
TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT

Curb Transition Note:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION

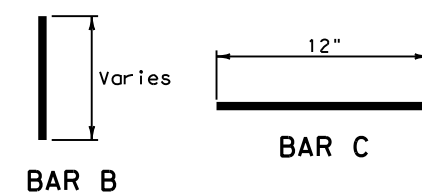
Note: To be paid for as Highest Curb



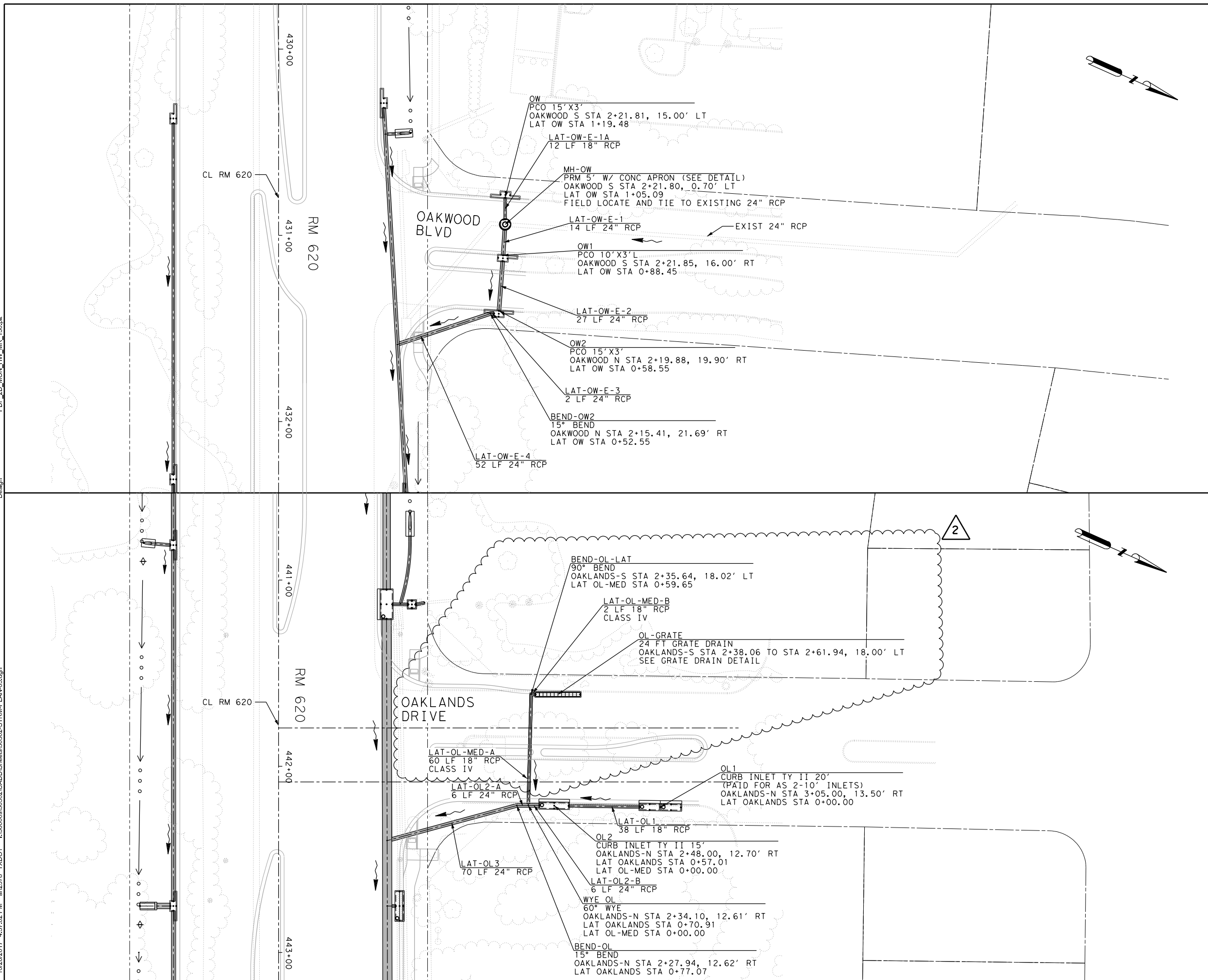
EXPANSION JOINT DETAIL

General Notes

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.



		Design Division Standard	
CONCRETE CURB AND GUTTER			
CCCCG-12			
FILE: ccccg12.dgn	DN: TxDOT	CK: AM	DW: VP
© TxDOT: 1995	CONT	SECT	JOB
UPDATED 2012 - VP	DIST	COUNTY	SHEET NO.
			135

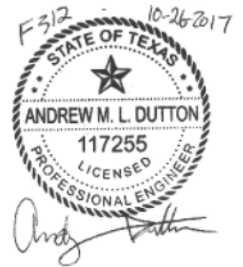
SCALE IN FEET
0 25 50 100

LEGEND

- DRAINAGE AREA BOUNDARY
- DROP INLET
- CURB INLET
- FLOW DIRECTION
- ← DITCH FLOWLINE
- ◆ DITCH BLOCK
- EXISTING ROW
- PROPOSED ROW
- UTILITY EASEMENT
- DRAINAGE EASEMENT
- PROPOSED STORM SEWER
- PROPOSED RIPRAP

NOTES:

1. SEE DRAINAGE PROFILES FOR STORM SEWER INFORMATION.
2. ALL PIPES ARE CLASS III UNLESS OTHERWISE NOTED.
3. SEE HYDRAULIC DATA SHEETS FOR ADDITIONAL INFORMATION.
4. REFER TO EXISTING UTILITY PLANS AND FIELD VERIFY LOCATION OF NEARBY UTILITIES BEFORE CONSTRUCTION. NOTIFY THE CONSTRUCTION OBSERVER IF CONFLICTS EXISTS.
5. PIPE LENGTHS ARE FOR THE PAY LIMITS OF THE ENTIRE SEGMENT.
6. SEE DRAINAGE DETAILS FOR STRUCTURE STATIONING AND OFFSET CALLOUT LOCATIONS.



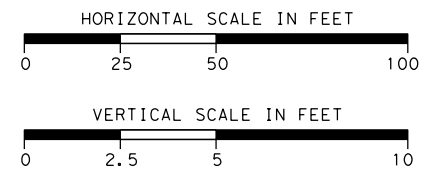
1	OAKLANDS LATERAL RECONFIGURATION	AD	1/12/17
2	RFI 23	AD	10/26/17
NO.	REVISION	BY	DATE



RM 620
DRAINAGE PLAN
OAKWOOD BLVD & OAKLANDS DR

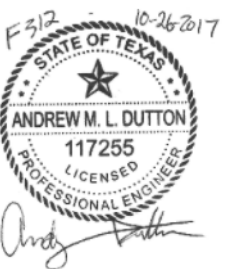
SCALE: 1"=50' SHEET 5 OF 5

Designed: ER	CD: NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: ER	X	TEXAS		RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked: ER	AUS	WILLIAMSON	0683	01 090
				SHEET NO. 159



LEGEND	
	PROPOSED GRADE
	EXISTING GROUND

NOTES:
1. REFER TO EXISTING
UTILITY PLANS AND
FIELD VERIFY LOCATION
OF NEARBY UTILITIES
BEFORE CONSTRUCTION.
NOTIFY THE
CONSTRUCTION OBSERVER
IF CONFLICTS EXISTS.

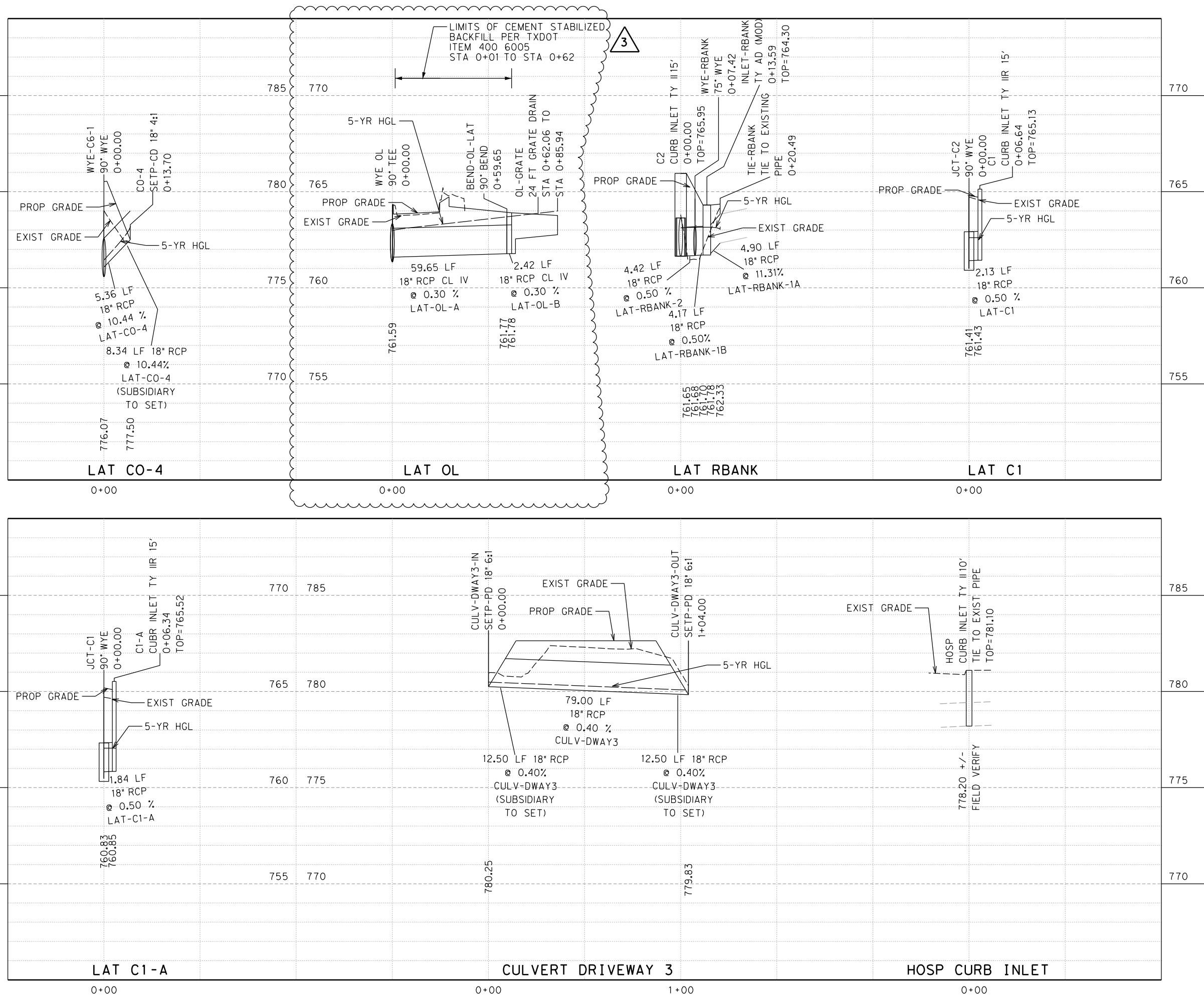


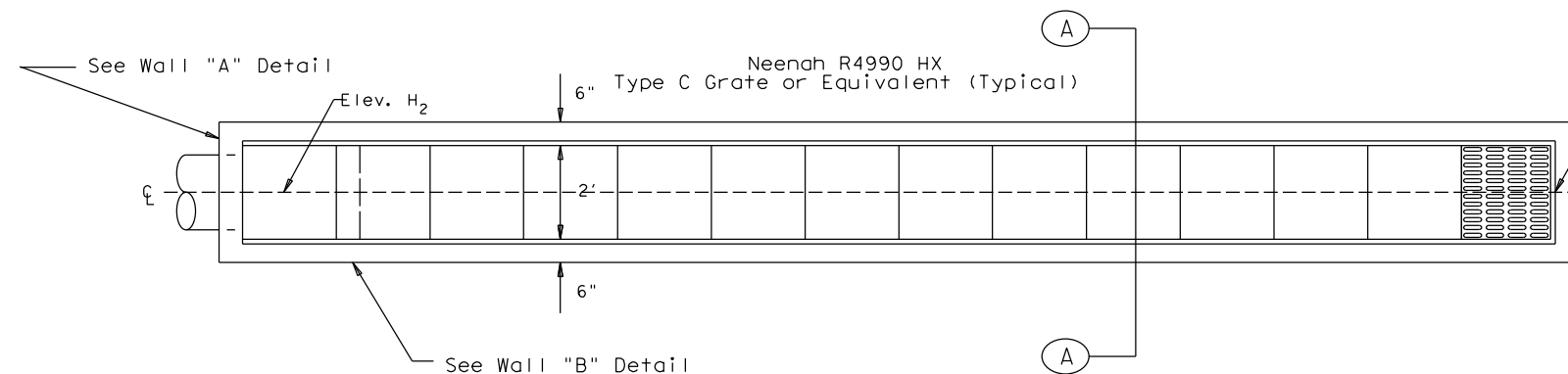
1	OAKLANDS LATERAL RECONFIGURATION	AD	1/12/17
2	RFI 16	AD	9/15/17
3	RFI 23	AD	10/26/17
NO.	REVISION	BY	DATE



RM 620
DRAINAGE PROFILES

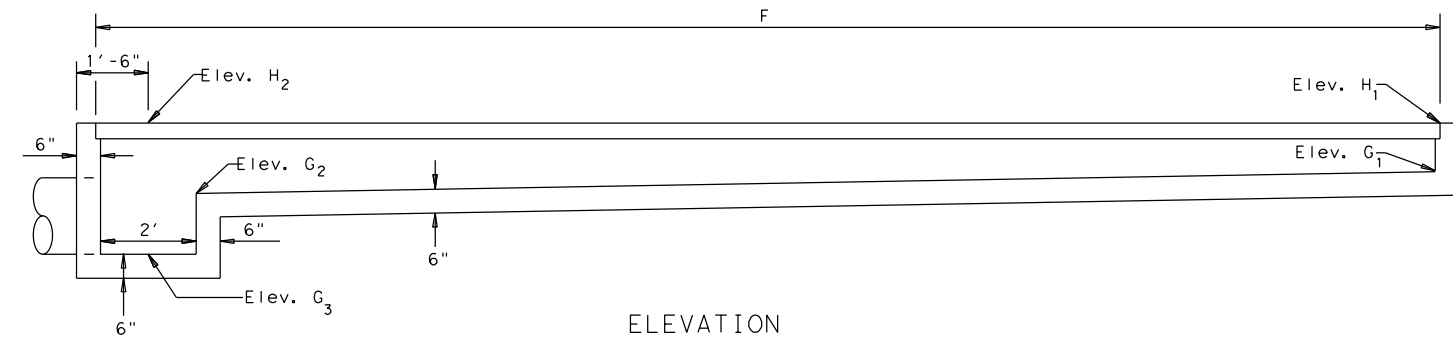
SCALE: H: 1"=50' V: 1"=5'		SHEET 2 OF 3	
Designed: ER	CD: NO.	STATE	FEDERAL AID PROJECT NO.
Checked: ER	X	TEXAS	RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO. SECTION NO. JOB NO. SHEET NO.
Checked: ER	AUS	WILLIAMSON	0683 01 090 168





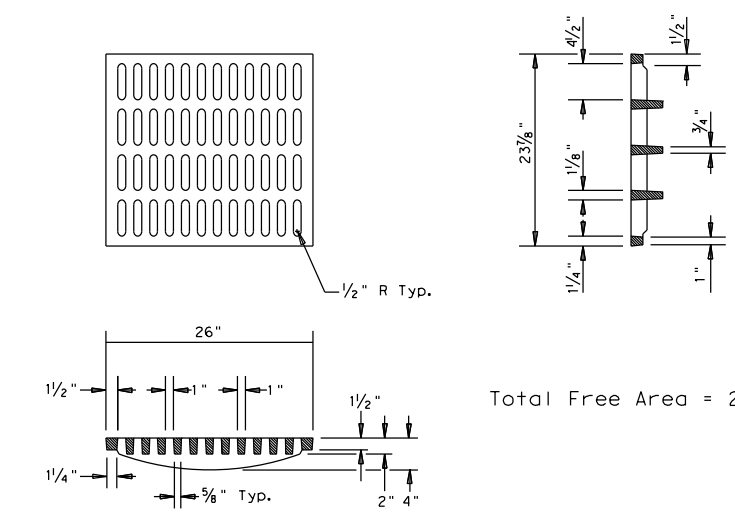
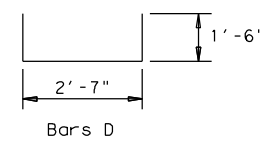
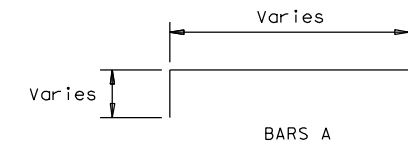
PLAN

LOCATION AND ELEVATION TABLE						
INLET DESIGNATION	STATION/OFFSET @ H ₁	STATION/OFFSET @ H ₂	F	H ₁	H ₂	G ₁
OL-GRATE	OAKLANDS-S STA 2+38.06, 18.00' LT	OAKLANDS-S STA 2+61.94, 18.00' LT	23'-10.5"	763.76	763.90	762.76



ELEVATION

REINFORCING STEEL		
BAR	SIZE	SPACING
A	#4	16" ±
B	#4	12" ±
C	#4	9"
D	#4	9"



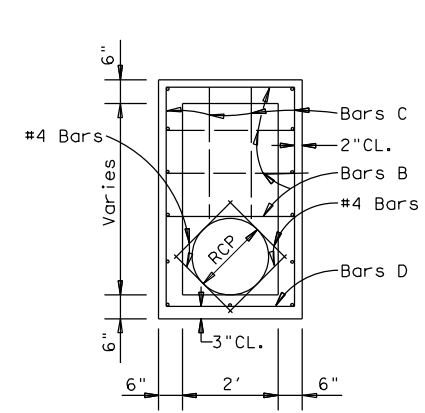
Total Free Area = 208 Sq. In./Grate

GRATE DETAILS

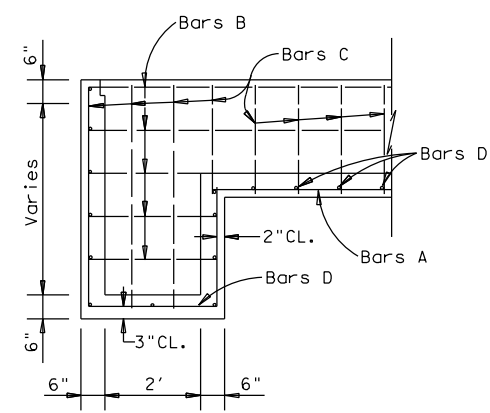
Type II curb

GENERAL NOTES:

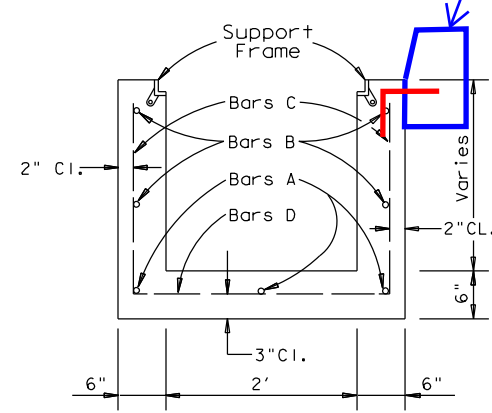
- Use Neenah R-4990-HX Type "C" Grate or equivalent for Drain as approved by the Engineer.
- Consider Excavation, Backfill, Frames and Grates subsidiary to pertinent Item.
- Furnish Class A concrete unless otherwise shown elsewhere in the plans.



WALL "A" DETAIL



WALL "B" DETAIL

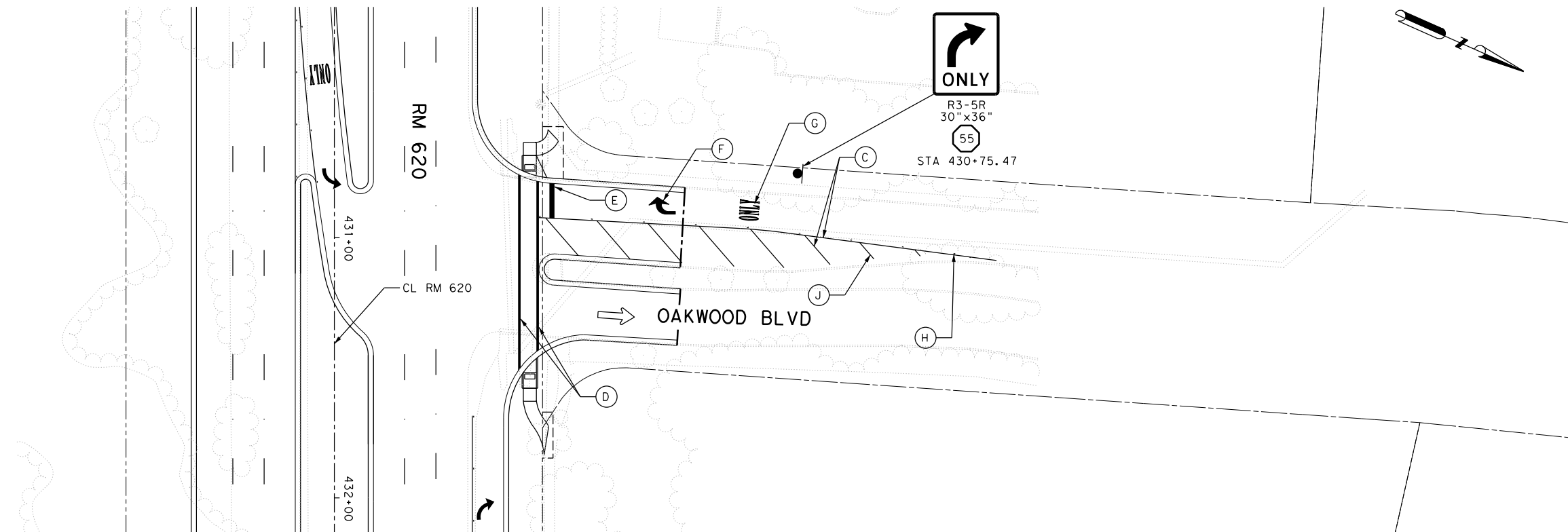


SECTION A - A



GRATE DRAIN

OAKWOOD BOULEVARD

SCALE IN FEET
0 25 50 100

LEGEND

- (A) REFL PAV MRK TYP I (W) (BRK) (4")
- (B) REFL PAV MRK TYP I (W) (SLD) (4")
- (C) REFL PAV MRK TYP I (W) (SLD) (8")
- (D) REFL PAV MRK TYP I (W) (SLD) (12")
- (E) REFL PAV MRK TYP I (W) (SLD) (24")
- (F) REFL PAV MRK TYP I (W) (ARROW)
- (G) REFL PAV MRK TYP I (W) (WORD)
- (H) RAIS PAV MRKR TYP II-C-R
- (I) RAIS PAV MRK TYP I (W) (DOT) (4")
- (J) REFL PAV MRK TYP II (Y) (SLD) (4")
- (K) REFL PAV MRK TYP II-A-A
- (L) INSTL DEL ASSM (D-SW) SZ1 (FLX) SRF

← DIRECTION OF TRAFFIC

● EXISTING SIGN

● PROPOSED SIGN

— RELOCATE/REMOVE EXISTING SIGN

- - - EXISTING FEATURES

- - - PROPOSED ROW

- - - EXISTING ROW

- - - TEMPORARY CONSTRUCTION EASEMENT

NOTES:

- 1) THE LOCATION AND ORIENTATION OF THE PROPOSED SIGNS, PAVEMENT MARKINGS, PAVEMENT MARKERS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED HEREIN AND THE TEXAS MUTCD.



1	RFI 23	ND	10/26/17
NO.	REVISION	BY	DATE



RM 620
SIGNING & PAVEMENT
MARKING LAYOUTS

OAKWOOD BLVD & OAKLANDS DR

SCALE: 1"=50' SHEET 6 OF 6

Designed: ER	ED: ND	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: ER	X	TEXAS		RM 620
Drawn: ND	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked: ER	AUS	WILLIAMSON	0683	01 090
				SHEET NO. 217