GALVESTON COUNTY ENGINEERING DEPARTMENT

Change Order No. 01
Bacliff Drainage Improvements

Owner: Galveston County
Contractor: Lucas Construction Co.
Engineer: Gannett Fleming Transystems

Contract Number: CM25015
Purchase Order Number: F502913
Bid Number: 24-025

Work Being Changed

Adjusting the bid items to accommodate the increase in Item 19 – CL A Concrete (Channel Lining) (8") SY, and to include the addition of four concrete pads over existing storm pipes in lieu of grates with Item 18 - CL A Concrete (Channel Lining) (6") SY.

CHANGE IN CONTRACT PRICE

Original Contract Price: **$1,698,700.00**
Net Change From Previous Change Orders: **$0**
Contract Price Prior To This Change Order: **$1,698,700.00**
Net Increase/Decrease Of This Change Order: **$0**
Contract Price With All Approved Change Orders: **$1,698,700.00**

CHANGE IN CONTRACT TIME

Original Contract Time: **360 Days**
Net Change From Previous Change Orders: **0 Days**
Contract Time Prior To This Change Order: **360 Days**
Net Increase/Decrease Of This Change Order: **0 Days**
Contract Time With All Approved Change Orders: **360 Days**

RECOMMENDED:

By: Ryan Ramirez Rmz Date: 04/17/2025
Engineer (Consultant)

By: Date: 4/17/2025
Engineer (County Engineer)

APPROVED:
County Of Galveston

By: Date:
Mark Henry, County Judge

Attest:
Dwight Sullivan, County Clerk

ACCEPTED:
Contractor

By: Date: 4/17/2025
Contractor (Authorized Signature)

Jimmy McGinnis
Printed Name

GALVESTON COUNTY ENGINEERING DEPARTMENT

Change Order No. 01
Bacliff Drainage Improvement

Pay Item No.	Spec Item No.	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	ITEM COST	OVERRUN/UNDERRUN
19		CL A CONC(CHANNEL LINING)(8")	SY	$260.00	90.00	$23,400.00	380.00	$98,800.00	-$75,400.00
9		STEEL GRATING	LF	$600.00	85.00	$51,000.00	0.00	$0.00	$51,000.00
28		Port CTB(FUR and INST)(Low Profile)(TY 1)	LF	$200.00	40.00	$8,000.00	0.00	$0.00	$8,000.00
29		Port CTB(FUR and INST)(Low Profile)(TY 2)	LF	$200.00	40.00	$8,000.00	0.00	$0.00	$8,000.00
30		Port CTB(Remove)(Low Profile)(TY 1)	LF	$100.00	40.00	$4,000.00	0.00	$0.00	$4,000.00
35		Rock Filter Dams(Install)(TY 2)	LF	$30.00	150.00	$4,500.00	0.00	$0.00	$4,500.00
36		Rock Filter Dams(Remove)	LF	$30.00	150.00	$4,500.00	0.00	$0.00	$4,500.00
18		CL A CONC(CHANNEL LINING)(6")	SY	$200.00	440.00	$88,000.00	463.00	$92,600.00	-$4,600.00
		TOTAL							$0.00

March 26, 2025
Gannett Fleming
3100 Alabama St
Houston, TX 77098
ATTN: Ryan Ramirez
RE: Bacliff Drainage CPR #1 – RFI 01 Low Water Crossing

Mr. Ramirez,

In response to the answer to RFI 01, Lucas Construction Company, Inc. proposes to provide labor, materials, equipment, layout, supervision, and insurance to accomplish the additional work for the following lump sum amount:

-Increase quantity to line 19 by 290 SY for a revised total of 380 SY	$260/SY	$75,400
-Remove bid item 9		($51,000)
-Add (4) concrete pads over existing storm pipes in lieu of grates	$1,150/EA	$4,600
-Remove bid items 28-30 (not needed)		($20,000)
-Remove bid items 35 and 36 (we can use silt fence if needed)		($9,000)

Net Increase in Base Bid = $0.00

Exclusions: Engineering, permitting, materials testing, well-pointing, and any utility adjustments/relocations that may be necessary.

Please feel free to call me at 281-316-9990 with any questions or concerns.

Sincerely,

Jimmy McGinnis
Vice President
Lucas Construction

Galveston County
Bacliff Drainage Improvements REQUEST FOR INFORMATION

REQUEST FOR INFORMATION

1. RFI No.: 01

2. Project Name: **Bacliff Drainage Improvements**

3. Contractor: **Lucas Construction Company, Inc.**

4. Specification No.: Low Water Crossing Concrete Quantity

5. Drawing No.: Sheet 29

6. Response Code: ( ) CRITICAL (X) ROUTINE

7. Date Response Required: **01/22/2024**

8. Information Required:

Items 17-19 of the bid form are for (3) different concrete linings. Item 17 has 160 SY of 5" concrete, which we believe is for the concrete floor between the FW and SW walls. The TXDOT detail shows the floor to be 5" thick. That is the only area of the project we can find 5" concrete. Item 18 has 440 SY of 6" concrete, which we believe is for the concrete channel at the Bayshore outfall. The detail for that concrete on sheet 31 shows 6" concrete and the quantity is very close. That leaves item 19 for the low water crossing shown on sheet 29. Item 19 only has 90 SY of 8" concrete, but if I scale the layout on sheet 29 and take into consideration the 5:1 slope, I get 380 SY of concrete. I cannot locate a detail for the low water crossing, I'm only assuming it is 8" thick because that's the only concrete bid item left that could account for this work. Please advise if this is correct and if we are to overrun bid item 19 or if this will need to be paid differently.

9. _____ Vice President 01/15/2024
Contractor Signature Title Date

10. RESPONSE:
See below in attached Gannett Fleming document for response.

11. Rmz 01/21/2025
Project Manager Signature Date

12. **If Contractor believes the response given in Item 10 requires an adjustment in Contract Price or Contract Time, Contractor shall submit a timely proposal so as not to delay Contractor's Work.**

END OF DOCUMENT

Gannett Fleming

REQUEST FOR INFORMATION CONSTRUCTION PHASE

RFI Number: 01

To:	Jimmy McGinnis (Lucas Construction)	**Project:**	Galveston County ARPA BacliffS Drainage Improvements
	Tim Morrow (Lucas Construction) , Nancy Baher (Galveston County), Lisa Butler (Galveston County)		
		Contract:	Project: No. ITB 24-025
From:	Donald Stephanik (Gannett Fleming TranSystems)	**Reference:**	Channel Lining
	Ryan Ramirez (Gannett Fleming TranSystems)	**Spec. Section:**	
Date:	01/21/2025	**Drawing No:**	

Request:

Items 17-19 of the bid form are for (3) different concrete linings. Item 17 has 160 SY of 5" concrete, which we believe is for the concrete floor between the FW and SW walls. The TXDOT detail shows the floor to be 5" thick. That is the only area of the project we can find 5" concrete. Item 18 has 440 SY of 6" concrete, which we believe is for the concrete channel at the Bayshore outfall. The detail for that concrete on sheet 31 shows 6" concrete and the quantity is very close. That leaves item 19 for the low water crossing shown on sheet 29. Item 19 only has 90 SY of 8" concrete, but if I scale the layout on sheet 29 and take into consideration the 5:1 slope, I get 380 SY of concrete. I cannot locate a detail for the low water crossing, I'm only assuming it is 8" thick because that's the only concrete bid item left that could account for this work. Please advise if this is correct and if we are to overrun bid item 19 or if this will need to be paid differently.

Attachments: RFI PDF

Requested By: Jimmy Mcginnis

Date: 01/15/25

Please Respond By: Ryan Ramirez

Response:

After reviewing the design documents, Item 19 CL A CONC(CHANNEL LINING)(8") is the correct item for the low water crossing. The crossing will have 8-inch concrete on the main driving surface and the channel bottom just upstream and downstream of the crossing, and 6-inch on the side slopes. The original estimate shows the low water crossing quantities in the 5-inch and 8-inch rows; the total was 250 SY. The total area needs to be 415 SY instead of the 250 SY, with 157 SY of 6-inch concrete and 258 SY of 8-inch concrete. The contractor's fee will increase by $35,080. The 5-inch concrete quantity does not include the headwall apron, as estimated by the contractor. The bid tab shows the headwall as an individual unit and does not require additional estimation of concrete items. This will cause for a change order.

Responded By: Ryan Ramirez

Signed: Rmz

Response/Return Date: 01/21/2025

Copies To: **RFI Log**

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1 2. INDEX OF DRAWINGS
3. LEGEND & ABBREVIATIONS
4. CONSTRUCTION NOTES

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5. SURVEY CONTROL – OVERALL
6. SURVEY CONTROL DETAIL SHEET
7. SURVEY CONTROL DETAIL SHEET
1 8. PROJECT LAYOUT (SHEET 1 OF 2)
9. PROJECT LAYOUT (SHEET 2 OF 2)

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10. DEMO SHEETS (SHEET 1 OF 5)
11. DEMO SHEETS (SHEET 2 OF 5)
12. DEMO SHEETS (SHEET 3 OF 5)
13. DEMO SHEETS (SHEET 4 OF 5)
14. DEMO SHEETS (SHEET 5 OF 5)

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16. N–16 EAST DITCH (SHEET 2 OF 7) STA 5+00 TO STA 10+00
17. N–16 EAST DITCH (SHEET 3 OF 7) STA 10+00 TO STA 15+00
18. N–16 EAST DITCH (SHEET 4 OF 7) STA 15+00 TO 20+00
1 19. N–16 EAST DITCH (SHEET 5 OF 7) STA 20+00 TO 25+00
20. N–16 EAST DITCH (SHEET 6 OF 7) STA 25+00 TO STA 30+00
21. N–16 EAST DITCH (SHEET 7 OF 7) STA 30+00 TO END
22. N–16 WEST DITCH (SHEET 1 OF 7) BEGIN TO STA 36+00
23. N–16 WEST DITCH (SHEET 2 OF 7) STA 36+00 TO STA 41+00
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27. N–16 WEST DITCH (SHEET 6 OF 7) STA 56+00 TO STA 61+00
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1 29. 10TH STREET CHANNEL (SHEET 1 OF 1) STA 66+00 TO END
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1 37. N–16 EAST DITCH COORDINATE LAYOUT (SHEET 2 OF 2)
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DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-0570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

GALVESTON COUNTY
ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

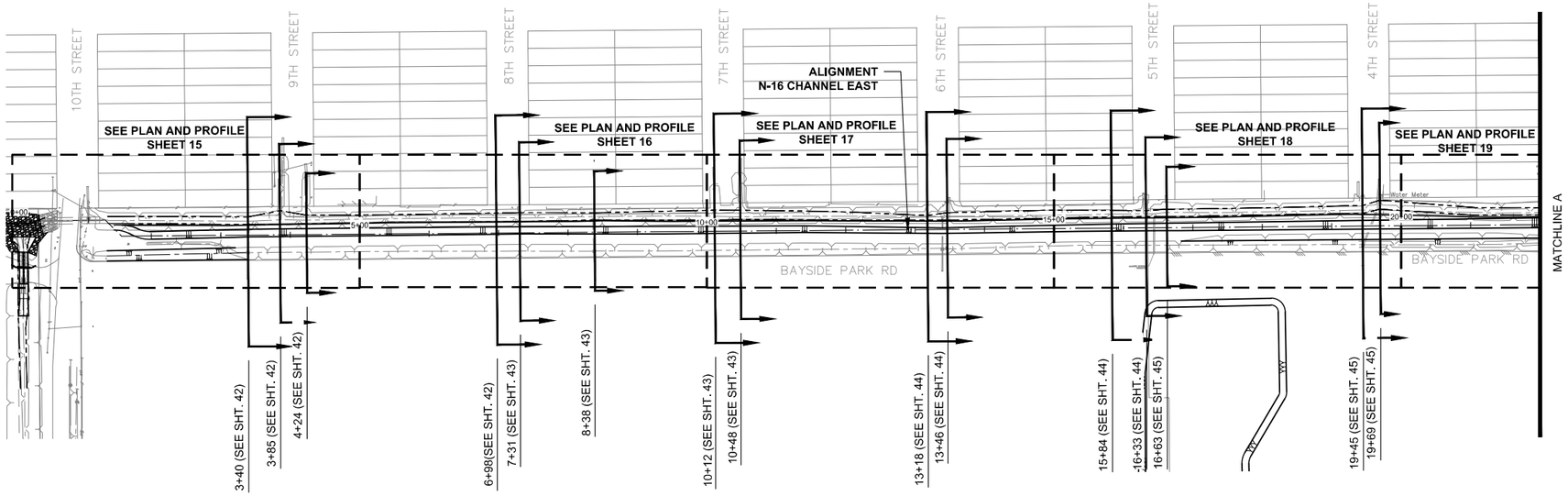
INDEX OF DRAWINGS

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 2 OF 86
DRAWN BY: JKC		
APPROVED: MJ	SCALE: N.T.S	JOB No. 5370–01

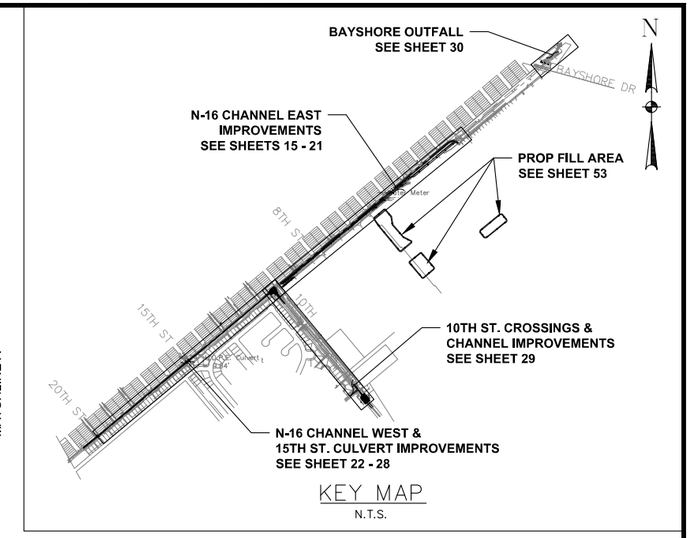
Wednesday, February 12, 2025 10:59:20 AM

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS
0 1 2 3

G:\1180\5370–01 GALVESTON COUNTY ARPA – BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\002–INDEX OF DRAWINGS.DWG

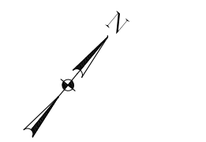


N–16 CHANNEL EAST IMPROVEMENTS



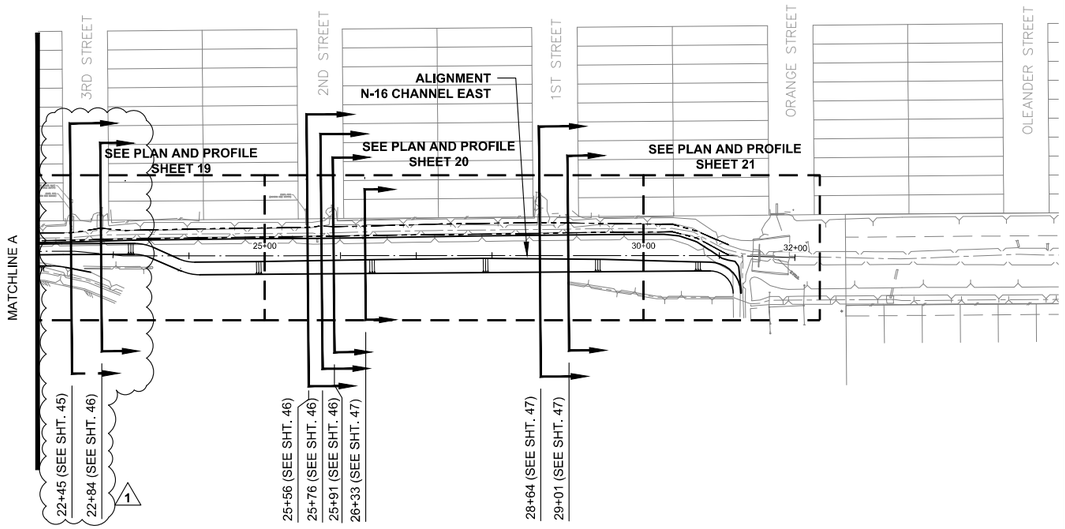
KEY MAP

N.T.S.

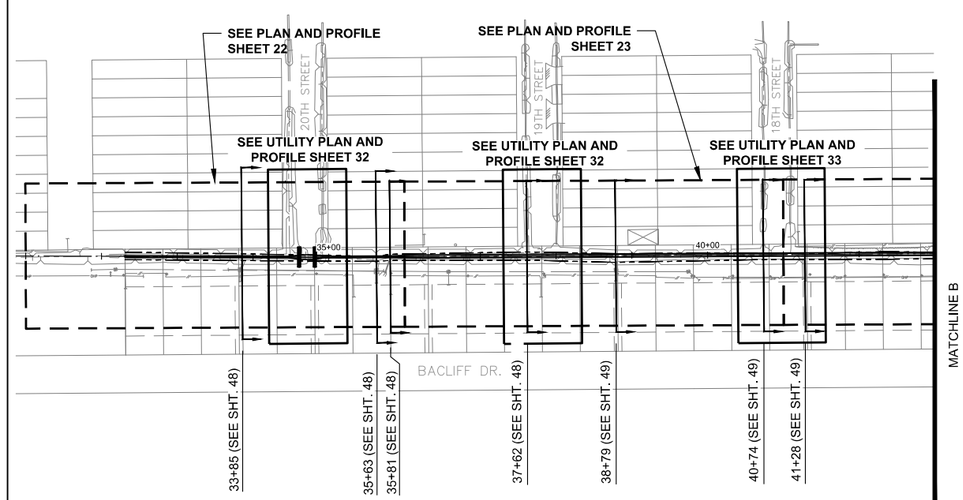


100' 0 100' 100'

SCALE: 1" = 100'



N–16 CHANNEL EAST IMPROVEMENTS



N–16 CHANNEL WEST IMPROVEMENTS

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-9570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

THE STATE OF TEXAS COUNTY OF GALVESTON

GALVESTON COUNTY
ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

PROJECT LAYOUT
(SHEET 1 OF 2)

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 8 OF 86
DRAWN BY: JKC	SCALE: 1" = 100'	JOB No. 5370–01
APPROVED: MJ		

Wednesday, February 12, 2025 11:00:10 AM

0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

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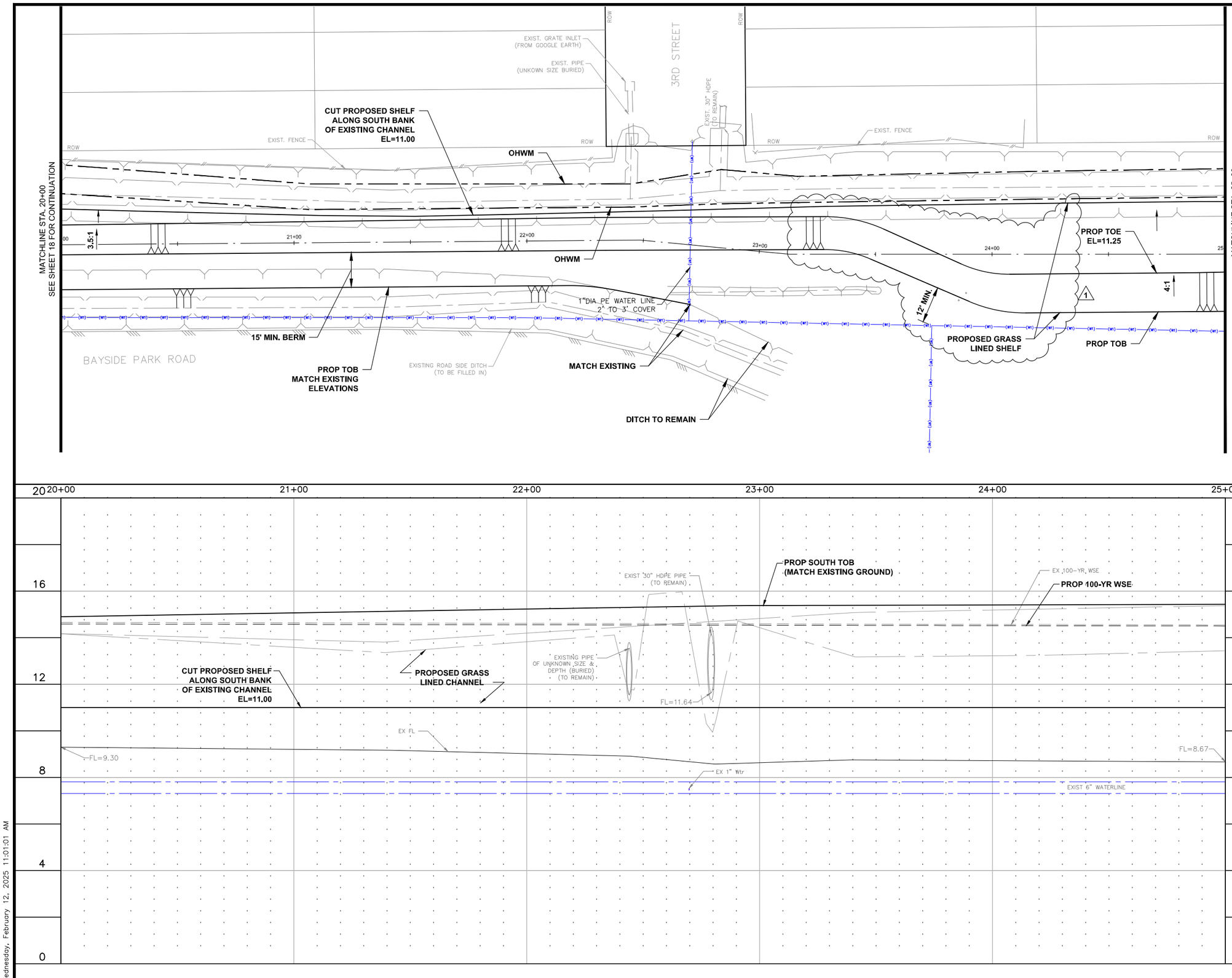

HORZ. SCALE: 1" = 20'

VERT. SCALE: 1" = 2'

APPROXIMATE LOCATIONS ARE SHOWN FOR UTILITIES, CONTRACTOR TO VERIFY LOCATIONS OF ALL EXISTING UTILITIES AND TO COORDINATE RELOCATION OF ANY EXISTING UTILITIES THAT CONFLICT WITH CONSTRUCTION. NOTIFY ENGINEER'S OFFICE OF ALL CONFLICTS.

FOR LOCATIONS OF CHANNEL CROSS SECTIONS REFER TO SHEET 8 - 9 "PROJECT LAYOUT".

NOTES:.

1. FOR CHANNEL IMPROVEMENT COORDINATES AND ELEVATIONS SEE SHEETS 37 AND 41

LEGEND

- EXISTING COMCAST OVERHEAD COMMUNICATION LINE
- EXISTING COMCAST COMMUNICATION LINE
- EXISTING FRONTIER OVERHEAD COMMUNICATIONS LINE
- EXISTING FRONTIER COMMUNICATIONS LINE
- EXISTING CENTERPOINT OVERHEAD ELECTRIC LINE
- EXISTING CENTERPOINT ELECTRIC LINE
- EXISTING CENTERPOINT ENERGY GAS LINE
- EXISTING LINDE GAS LINE
- EXISTING BACLIFF MUD WASTEWATER LINE
- EXISTING BACLIFF MUD WATER LINES

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA, HOUSTON, TEXAS 77098 (713) 520-9570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

THE STATE OF TEXAS
COUNTY OF GALVESTON

GALVESTON COUNTY
ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

DRAINAGE
PLAN & PROFILE
N-16 EAST DITCH (SHEET 5 OF 7)
STA 20+00 TO 25+00

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 19 OF 86
DRAWN BY: JKC	SCALE: HORZ: 1" = 20' VERT: 1" = 2'	JOB No. 5370-01
APPROVED: MJ		

Wednesday, February 12, 2025 11:01:01 AM

0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

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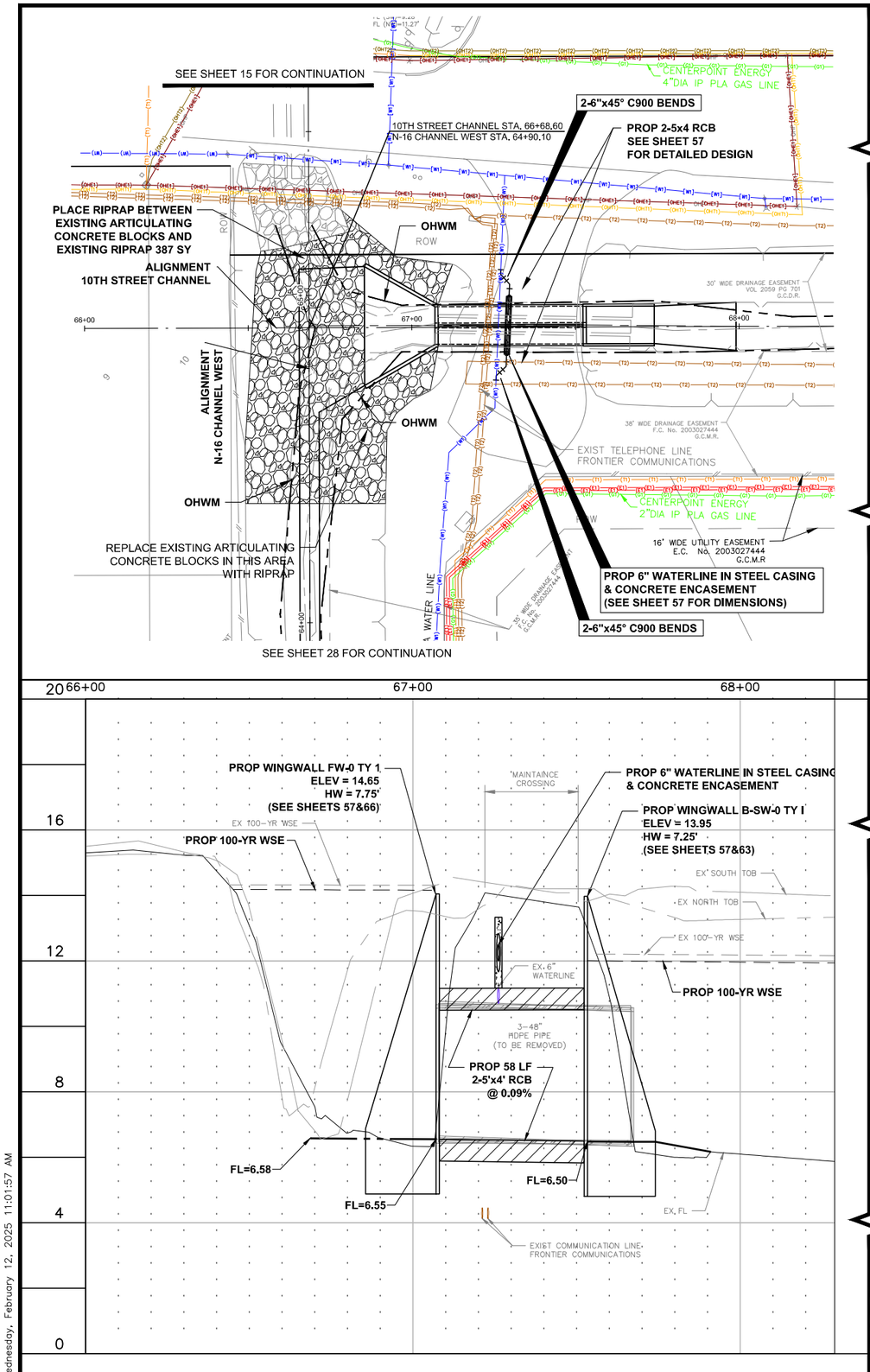

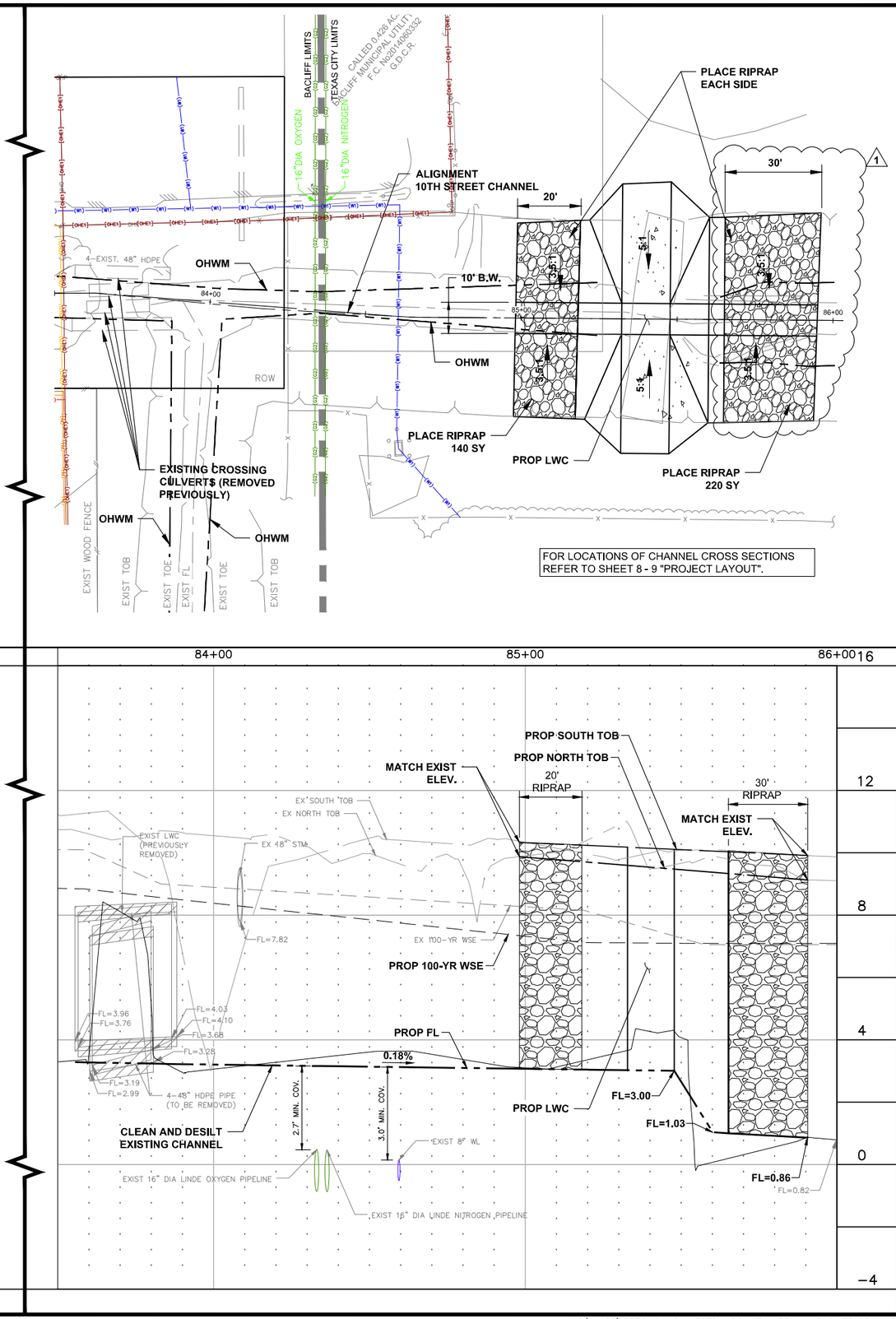

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VERT. SCALE: 1" = 2'

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NOTES:.

1. FOR CHANNEL IMPROVEMENT COORDINATES AND ELEVATIONS SEE SHEETS 40 AND 41

CAUTION! UNDER GROUND POWER LINES IN THE AREA

CAUTION! UNDER GROUND TELEPHONE LINES IN THE AREA

CAUTION! GAS LINES IN THE AREA

CAUTION! OVERHEAD POWER LINES IN THE AREA

LEGEND

- EXISTING COMCAST OVERHEAD COMMUNICATION LINE
- EXISTING COMCAST COMMUNICATION LINE
- EXISTING FRONTIER OVERHEAD COMMUNICATIONS LINE
- EXISTING FRONTIER COMMUNICATIONS LINE
- EXISTING CENTERPOINT OVERHEAD ELECTRIC LINE
- EXISTING CENTERPOINT ELECTRIC LINE
- EXISTING CENTERPOINT ENERGY GAS LINE
- EXISTING LINDE GAS LINE
- EXISTING BACLIFF MUD WASTEWATER LINE
- EXISTING BACLIFF MUD WATER LINES

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-0570

SEAL: STATE OF TEXAS — MOUNIKA JELLA — 146004 — LICENSED PROFESSIONAL ENGINEER — 2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

GALVESTON COUNTY ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

DRAINAGE
PLAN & PROFILE
10TH STREET CHANNEL (SHEET 1 OF 1)
STA 66+00 TO END

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 29 OF 86
DRAWN BY: JKC	SCALE: HORZ: 1" = 20' VERT: 1" = 2'	JOB No. 5370-01
APPROVED: MJ		

Wednesday, February 12, 2025 11:01:57 AM

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

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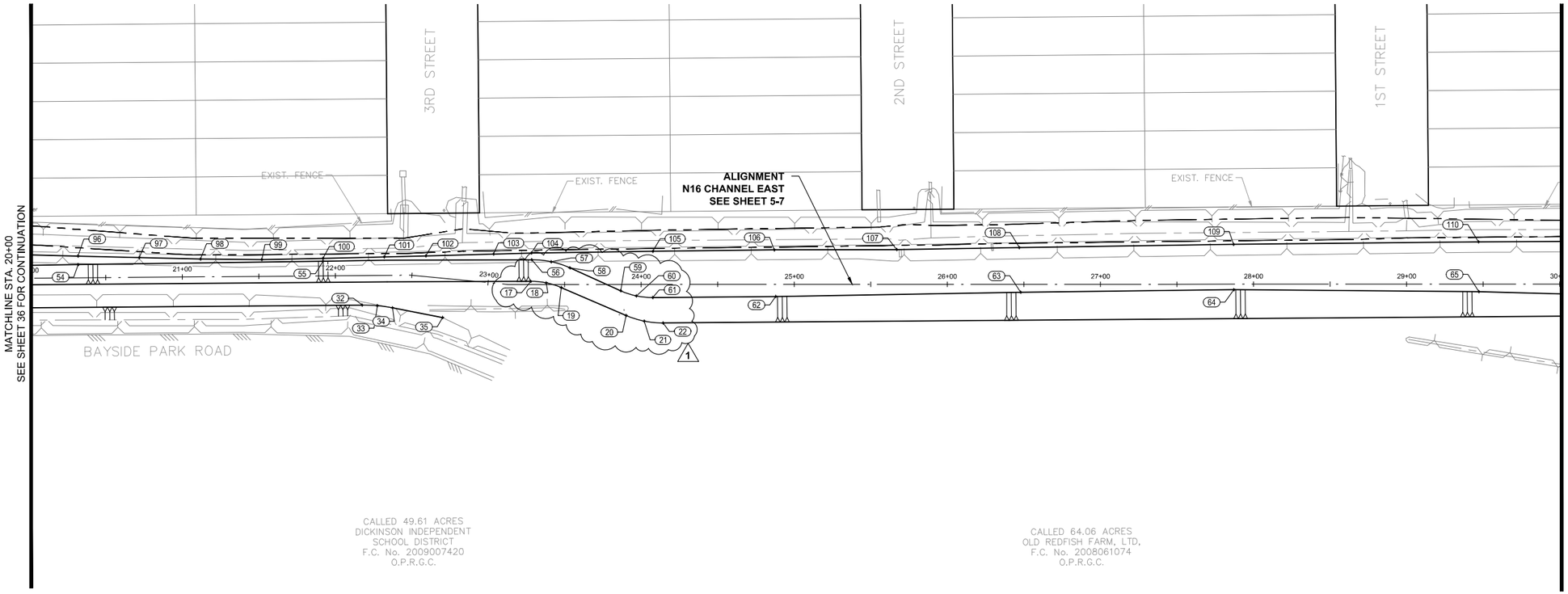
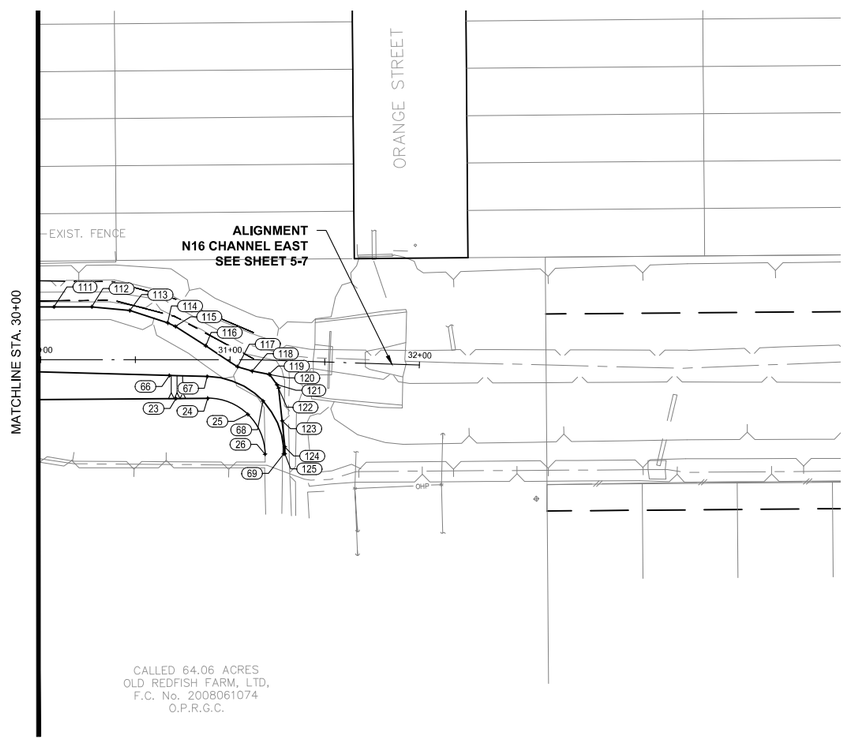
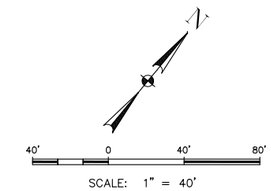






NOTES:.

1. FOR CHANNEL IMPROVEMENT COORDINATES AND ELEVATIONS SEE SHEET 41

CAUTION!

OVERHEAD POWER LINES IN THE AREA

THE COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND MAY BE BROUGHT TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99987064.

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA, HOUSTON, TEXAS 77098 (713) 520-0570

SEAL

STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER

2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

THE STATE OF TEXAS
COUNTY OF GALVESTON

GALVESTON COUNTY
ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

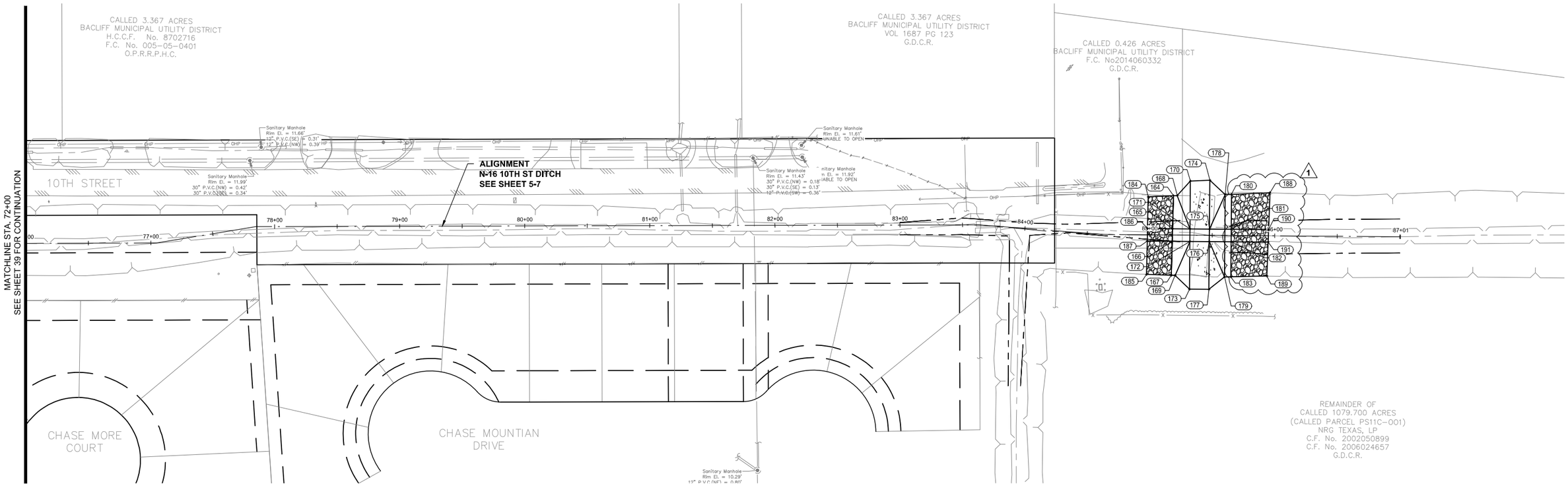
N-16 EAST DITCH COORDINATE
LAYOUT (SHEET 2 OF 2)

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 37 OF 86
DRAWN BY: JKC	SCALE: 1" = 40'	JOB No. 5370-01
APPROVED: MJ		

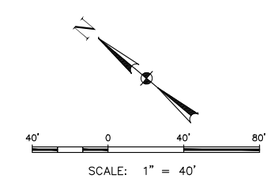
Wednesday, February 12, 2025 11:02:21 AM

0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

G:\1180\5370-01 GALVESTON COUNTY ARPA - BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\036-041-CHANNEL COORDINATE LAYOUT.DWG



THE COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND MAY BE BROUGHT TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99987064.



NOTES:.

1. FOR CHANNEL IMPROVEMENT COORDINATES AND ELEVATIONS SEE SHEET 41

CAUTION! UNDER GROUND POWER LINES IN THE AREA

CAUTION! UNDER GROUND TELEPHONE LINES IN THE AREA

CAUTION! OVERHEAD POWER LINES IN THE AREA

CAUTION! GAS LINES IN THE AREA

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-9570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

GALVESTON COUNTY
ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

10TH STREET CHANNEL
COORDINATE LAYOUT

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 40 OF 86
DRAWN BY: JKC	SCALE: 1" = 40'	JOB No. 5370-01
APPROVED: MJ		

Wednesday, February 12, 2025 11:02:24 AM

0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

G:\1180\5370-01 GALVESTON COUNTY ARPA - BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\036-041-CHANNEL COORDINATE LAYOUT.DWG

N16 EAST CHANNEL COORDINATE AND ELEVATIONS

Point #	Elevation	Northing	Easting	Description	
1	14.48	13753649.51	3246095.31	TOB	*
2	14.46	13753655.60	3246104.44	TOB	*
3	14.46	13753659.54	3246114.68	TOB	*
4	14.46	13753662.05	3246124.16	TOB	*
5	14.45	13753666.63	3246135.59	TOB	*
6	14.42	13753673.85	3246145.58	TOB	*
7	14.30	13753752.64	3246236.71	TOB	*
8	14.37	13753764.56	3246250.26	TOB	*
9	14.52	13753893.12	3246402.52	TOB	*
10	14.67	13754023.26	3246556.83	TOB	*
11	14.33	13754150.54	3246711.14	TOB	*
12	13.76	13754279.62	3246864.41	TOB	*
13	13.28	13754405.03	3247018.62	TOB	*
14	14.37	13754534.71	3247170.82	TOB	*
15	14.49	13754607.38	3247257.63	TOB	*
16	14.48	13754627.31	3247281.34	TOB	*
17	15.51	13755041.28	3247775.42	TOB	*
18	15.94	13755046.98	3247783.91	TOB	*
19	15.70	13755050.83	3247793.38	TOB	*
20	15.94	13755063.76	3247837.71	TOB	*
21	15.79	13755068.44	3247849.19	TOB	*
22	15.72	13755075.37	3247859.45	TOB	*
23	14.21	13755497.35	3248363.07	TOB	*
24	13.94	13755508.16	3248375.97	TOB	*
25	13.79	13755515.06	3248397.73	TOB	*
26	13.72	13755504.65	3248418.05	TOB	*
27	14.66	13753620.59	3246106.92	TOB	*
28	13.94	13753741.30	3246246.52	TOB	*
29	14.90	13753609.25	3246116.19	TOB	*
30	14.37	13753739.82	3246271.42	TOB	*
31	14.86	13754615.87	3247291.05	TOB	*
32	15.25	13754959.25	3247700.31	TOB	*
33	15.27	13754965.28	3247708.27	TOB	*
34	15.28	13754970.48	3247716.79	TOB	*
35	15.10	13754986.41	3247746.07	TOB	*
36	14.23	13753614.89	3246111.56	TOE	
37	12.74	13753745.66	3246263.02	TOE	
38	11.00	13753655.18	3246090.57	TOE	
39	11.21	13753665.60	3246104.29	TOE	
40	11.25	13753671.10	3246114.22	TOE	
41	11.26	13753676.61	3246130.38	TOE	
42	11.25	13753681.07	3246136.70	TOE	
43	11.25	13753807.55	3246283.96	TOE	
44	11.25	13753901.51	3246395.43	TOE	
45	11.25	13753987.96	3246498.10	TOE	
46	11.25	13754103.03	3246636.67	TOE	
47	11.25	13754192.36	3246744.32	TOE	
48	11.25	13754286.98	3246858.21	TOE	
49	11.25	13754382.09	3246976.92	TOE	
50	11.25	13754472.23	3247083.76	TOE	

N16 EAST CHANNEL COORDINATE AND ELEVATIONS

Point #	Elevation	Northing	Easting	Description
51	11.25	13754576.63	3247205.13	TOE
52	11.25	13754680.35	3247326.94	TOE
53	11.25	13754770.96	3247433.67	TOE
54	11.25	13754861.56	3247540.40	TOE
55	11.25	13754965.11	3247662.38	TOE
56	11.25	13755052.61	3247766.99	TOE
57	11.25	13755059.69	3247777.64	TOE
58	11.25	13755064.36	3247789.56	TOE
59	11.25	13755073.93	3247824.69	TOE
60	11.25	13755077.88	3247834.72	TOE
61	11.25	13755083.88	3247843.68	TOE
62	11.25	13755135.51	3247905.20	TOE
63	11.25	13755239.49	3248026.82	TOE
64	11.25	13755329.45	3248133.19	TOE
65	11.25	13755430.31	3248257.42	TOE
66	11.25	13755504.56	3248352.66	TOE
67	11.25	13755516.87	3248368.44	TOE
68	11.25	13755525.62	3248399.35	TOE
69	11.25	13755511.07	3248425.55	TOE
70	11.00	13753662.88	3246100.01	SHELF
71	11.00	13753696.06	3246140.71	SHELF
72	11.00	13753721.33	3246171.74	SHELF
73	11.00	13753759.28	3246218.25	SHELF
74	11.00	13753798.77	3246263.76	SHELF
75	11.00	13753811.72	3246279.00	SHELF
76	11.00	13753863.54	3246339.95	SHELF
77	11.00	13753907.04	3246390.84	SHELF
78	11.00	13753992.48	3246492.86	SHELF
79	11.00	13754030.97	3246538.88	SHELF
80	11.00	13754043.98	3246554.39	SHELF
81	11.00	13754108.63	3246630.70	SHELF
82	11.00	13754146.43	3246677.29	SHELF
83	11.00	13754171.59	3246708.09	SHELF
84	11.00	13754197.19	3246738.82	SHELF
85	11.00	13754292.61	3246853.55	SHELF
86	11.00	13754350.52	3246923.96	SHELF
87	11.00	13754388.54	3246970.37	SHELF
88	11.00	13754418.51	3247007.14	SHELF
89	11.00	13754479.11	3247077.90	SHELF
90	11.00	13754531.24	3247138.58	SHELF
91	11.00	13754583.18	3247199.64	SHELF
92	11.00	13754673.23	3247306.81	SHELF
93	11.00	13754777.83	3247427.91	SHELF
94	11.00	13754803.92	3247458.23	SHELF
95	11.00	13754828.87	3247489.51	SHELF
96	11.00	13754865.81	3247536.84	SHELF
97	11.00	13754890.51	3247568.33	SHELF
98	11.00	13754915.25	3247599.79	SHELF
99	11.00	13754940.46	3247630.85	SHELF
100	11.00	13754966.54	3247661.18	SHELF

N16 EAST CHANNEL COORDINATE AND ELEVATIONS

Point #	Elevation	Northing	Easting	Description
101	11.00	13754992.71	3247691.44	SHELF
102	11.00	13755010.55	3247712.03	SHELF
103	11.00	13755039.59	3247745.33	SHELF
104	11.00	13755055.87	3247764.00	SHELF
105	11.00	13755107.25	3247824.50	SHELF
106	11.00	13755158.43	3247885.09	SHELF
107	11.00	13755209.49	3247946.69	SHELF
108	11.00	13755261.39	3248007.57	SHELF
109	11.00	13755352.11	3248114.20	SHELF
110	11.00	13755455.21	3248236.56	SHELF
111	11.00	13755493.66	3248282.62	SHELF
112	11.00	13755506.41	3248298.03	SHELF
113	11.00	13755517.64	3248314.72	SHELF
114	11.00	13755525.39	3248334.31	SHELF
115	11.00	13755526.53	3248338.62	SHELF
116	11.00	13755528.84	3248357.51	SHELF
117	11.00	13755530.95	3248377.44	SHELF
118	11.00	13755534.10	3248384.94	SHELF
119	11.00	13755538.50	3248392.89	SHELF
120	11.00	13755538.56	3248393.27	SHELF
121	11.00	13755536.95	3248399.55	SHELF
122	11.00	13755536.11	3248401.35	SHELF
123	11.00	13755523.99	3248413.81	SHELF
124	11.00	13755514.28	3248423.63	SHELF
125	11.00	13755511.46	3248426.00	SHELF

N16 WEST CHANNEL COORDINATE AND ELEVATIONS

Point #	Elevation	Northing	Easting	Description
126	9.49	13751489.46	3243482.54	DESILT
127	9.49	13751487.92	3243483.82	DESILT
128	9.24	13751627.16	3243650.70	DESILT
129	9.24	13751625.61	3243651.96	DESILT
130	9.97	13751635.93	3243659.04	DESILT
131	9.84	13751632.06	3243662.21	DESILT
132	9.55	13751649.93	3243676.13	DESILT
133	9.48	13751646.06	3243679.30	DESILT
134	8.77	13751654.85	3243684.47	DESILT
135	8.77	13751653.31	3243685.75	DESILT
136	8.70	13751707.71	3243747.79	DESILT
137	8.70	13751706.17	3243749.07	DESILT
138	8.66	13751740.52	3243785.53	DESILT
139	8.66	13751737.45	3243788.09	DESILT
140	8.10	13752173.48	3244304.17	DESILT
141	8.10	13752170.41	3244306.73	DESILT
142	7.54	13752603.46	3244822.89	DESILT
143	7.54	13752600.38	3244825.44	DESILT
144	7.52	13752622.28	3244839.80	DESILT
145	7.52	13752613.46	3244847.19	DESILT
146	7.50	13752648.40	3244870.95	DESILT
147	7.50	13752639.59	3244878.34	DESILT
148	7.50	13752660.30	3244893.78	DESILT
149	7.48	13752655.61	3244897.52	DESILT
150	7.47	13753588.45	3246005.33	DESILT
151	6.60	13753549.45	3245968.17	DESILT
152	6.57	13753573.64	3246018.74	DESILT
153	6.57	13753543.97	3245983.37	DESILT
154	6.47	13753497.92	3246066.19	DESILT
155	6.47	13753484.20	3246049.84	DESILT
156	7.69	13753476.29	3246079.30	DESILT
157	7.57	13753466.85	3246068.06	DESILT
158	9.23	13751634.00	3243660.62	WINGWALL
159	8.78	13751648.00	3243677.71	WINGWALL
160	7.52	13752617.87	3244843.50	WINGWALL
161	7.50	13752641.43	3244876.79	WINGWALL
162	6.55	13753542.40	3246014.94	WINGWALL
163	6.48	13753506.96	3246044.68	WINGWALL

N16 10TH ST. CHANNEL COORDINATE AND ELEVATIONS

Point #	Elevation	Northing	Easting	Description
164	9.52	13752177.52	3247205.28	CONC
165	3.05	13752161.12	3247184.51	CONC
166	3.05	13752154.92	3247176.66	CONC
167	10.03	13752138.06	3247155.31	CONC
168	9.53	13752175.29	3247207.30	CONC
169	10.03	13752135.69	3247157.14	CONC
170	10.94	13752174.59	3247222.94	CONC
171	3.03	13752150.31	3247193.36	CONC
172	3.03	13752143.97	3247185.63	CONC
173	10.29	13752119.76	3247156.12	CONC
174	10.26	13752163.03	3247233.39	CONC
175	3.01	13752138.31	3247203.19	CONC
176	3.01	13752131.98	3247195.45	CONC
177	10.23	13752107.81	3247165.91	CONC
178	9.73	13752146.32	3247232.50	CONC
179	10.04	13752104.55	3247181.60	CONC
180	9.88	13752142.53	3247235.77	CONC
181	1.02	13752124.85	3247214.21	CONC
182	1.02	13752118.51	3247206.48	CONC
183	10.07	13752100.73	3247184.82	CONC
184	9.35	13752192.47	3247191.69	RIPRAP
185	10.34	13752153.77	3247143.19	RIPRAP
186	3.08	13752176.61	3247171.82	RIPRAP
187	3.07	13752170.38	3247164.00	RIPRAP
188	9.75	13752119.74	3247256.56	RIPRAP
189	9.86	13752079.00	3247203.78	RIPRAP
190	1.30	13752101.69	3247233.18	RIPRAP
191	1.31	13752095.58	3247225.26	RIPRAP

LEGEND

TOB	TOP OF BANK
TOE	TOE OF SLOPE
SHELF	DAY LIGHT LINE AT EXISTING CHANNEL
DESILT	ELEVATION OF CHANNEL CLEANING
*	MATCH NG

THE COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND MAY BE BROUGHT TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99987064.

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-9570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

THE STATE OF TEXAS COUNTY OF GALVESTON

GALVESTON COUNTY ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

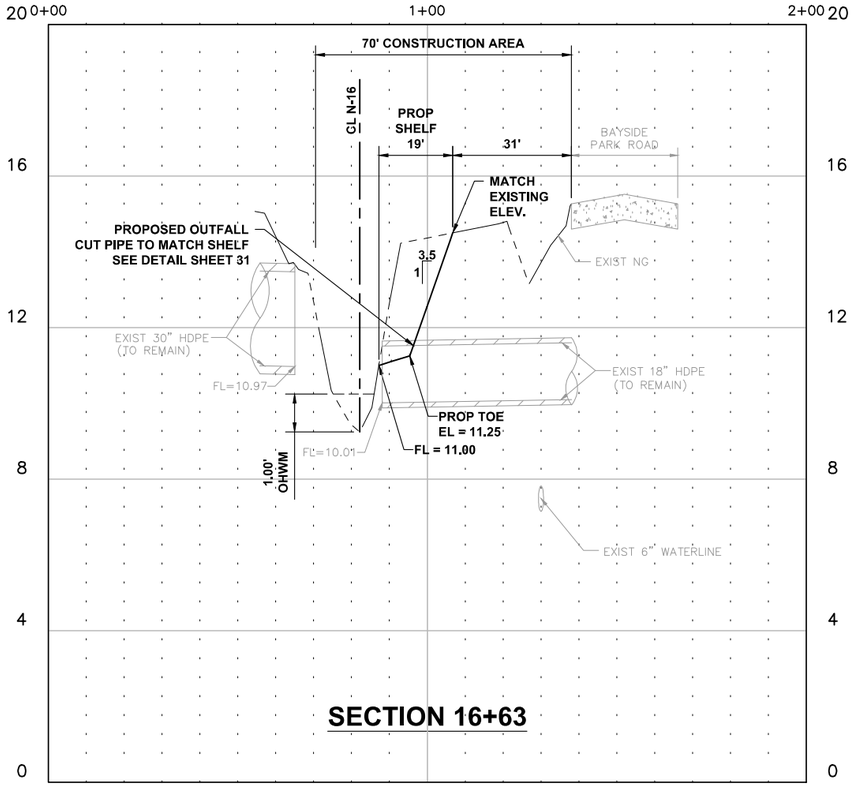
COORDINATE AND ELEVATION TABLES

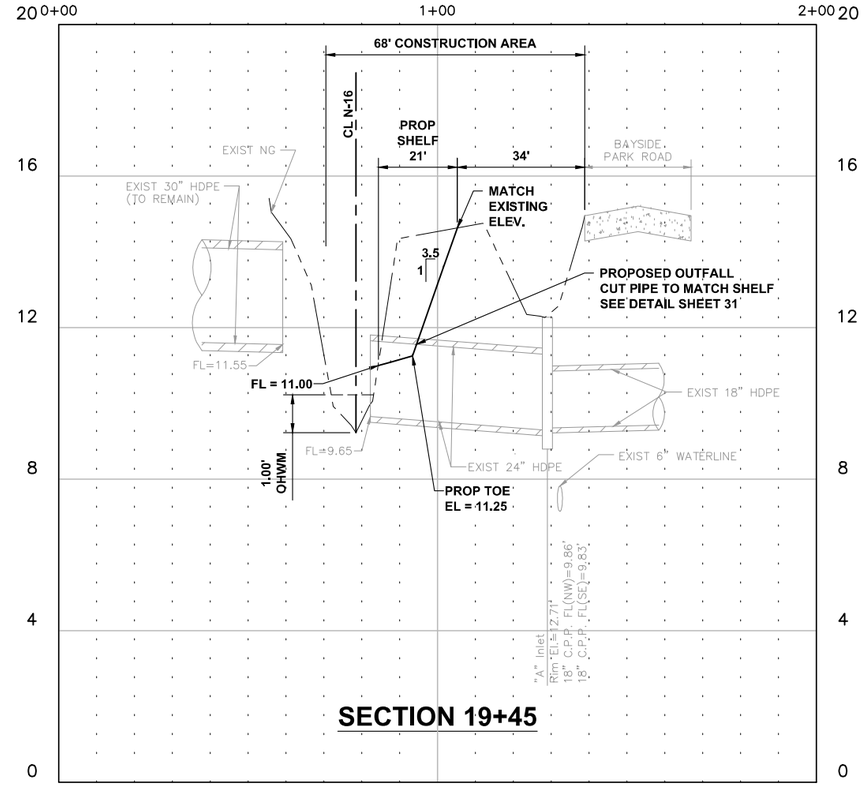
DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 41 OF 86
DRAWN BY: JKC		
APPROVED: MJ	SCALE: N.T.S.	JOB No. 5370-01

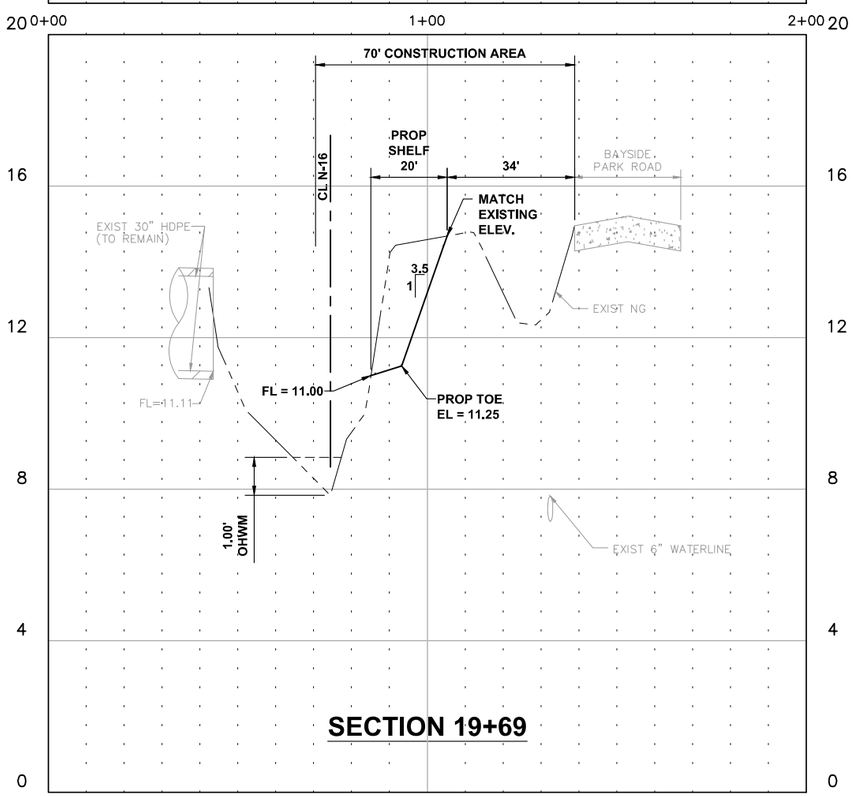
Wednesday, February 12, 2025 11:02:30 AM

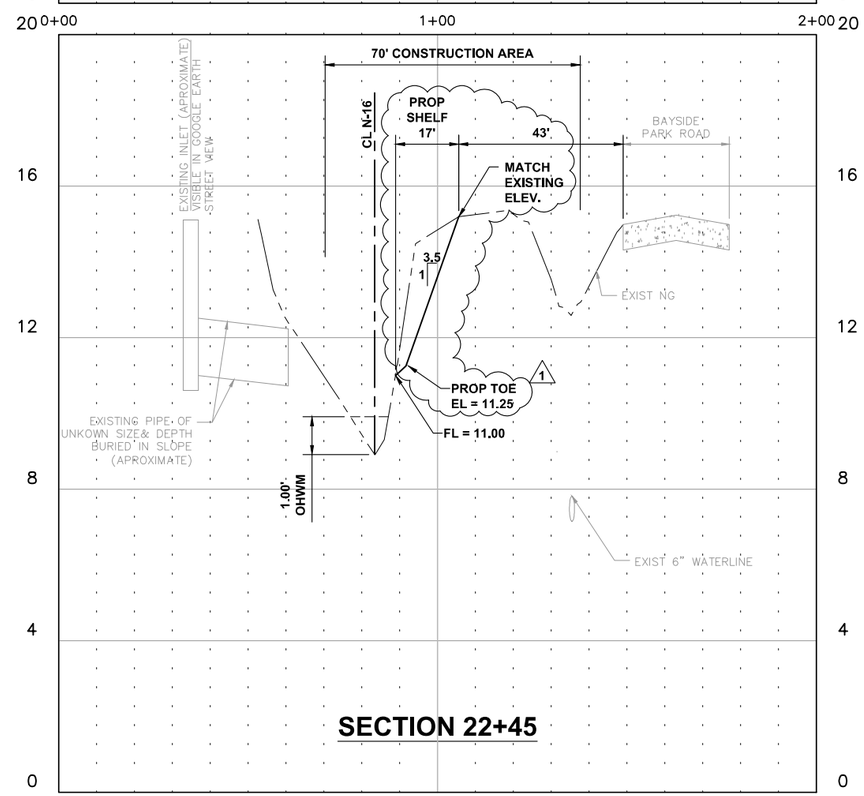
0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

G:\1180\5370-01 GALVESTON COUNTY ARPA - BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\036-041-CHANNEL COORDINATE LAYOUT.DWG









HORZ. SCALE: 1" = 20'

VERT. SCALE: 1" = 2'

NOTES:
1. FOR MH DETAILS SEE SHEET 58

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-9570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
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PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

THE STATE OF TEXAS COUNTY OF GALVESTON

GALVESTON COUNTY ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

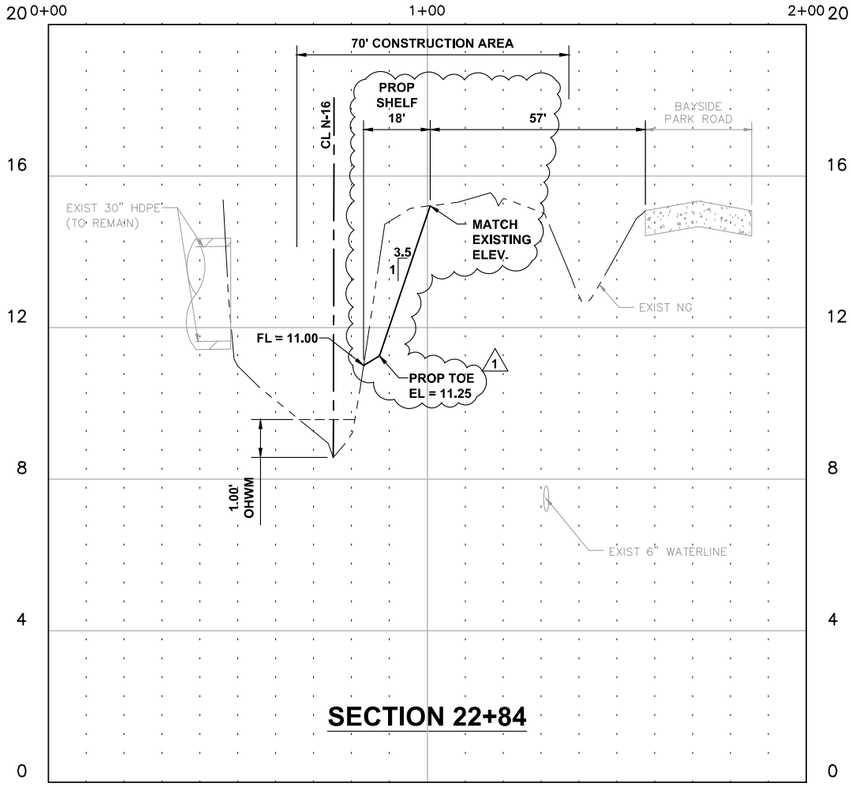
N-16 EAST
CROSS-SECTIONS
(SHEET 4 OF 6)

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 45 OF 86
DRAWN BY: JKC	SCALE: HORZ: 1" = 20' VERT: 1" = 2'	JOB No. 5370-01
APPROVED: MJ		

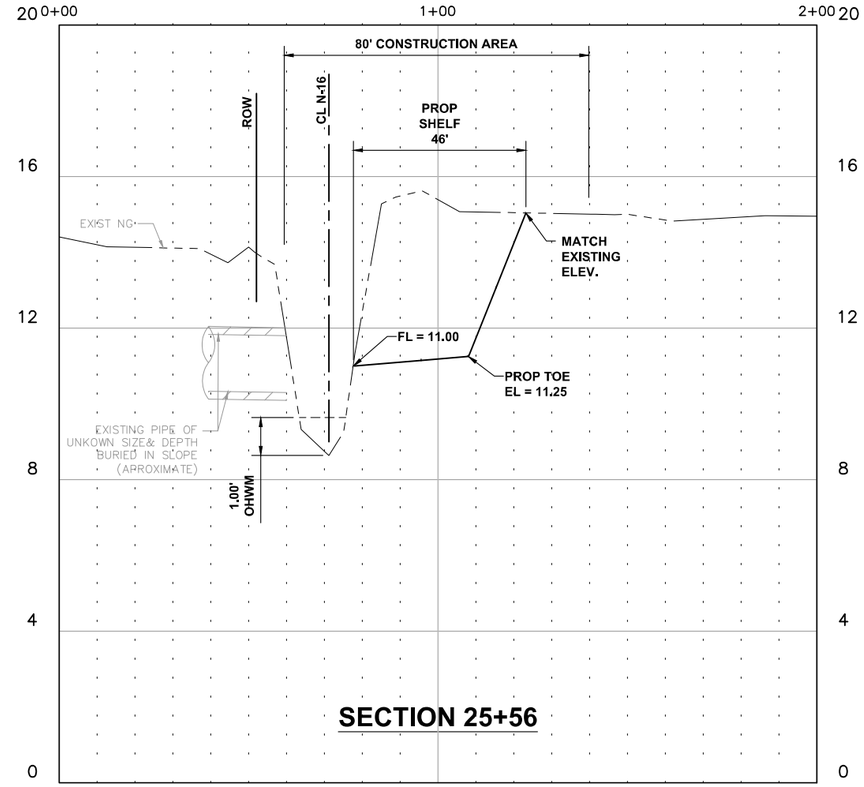
Wednesday, February 12, 2025 11:03:26 AM

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

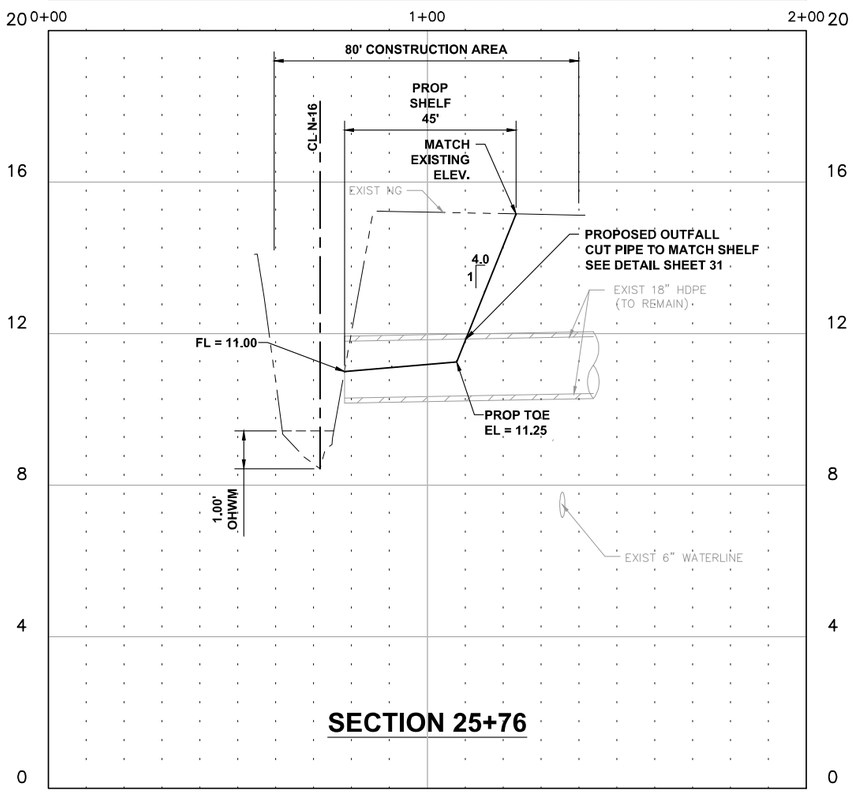
G:\1180\5370-01 GALVESTON COUNTY ARPA - BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\042-047-N-16 EAST CROSS-SECTIONS.DWG



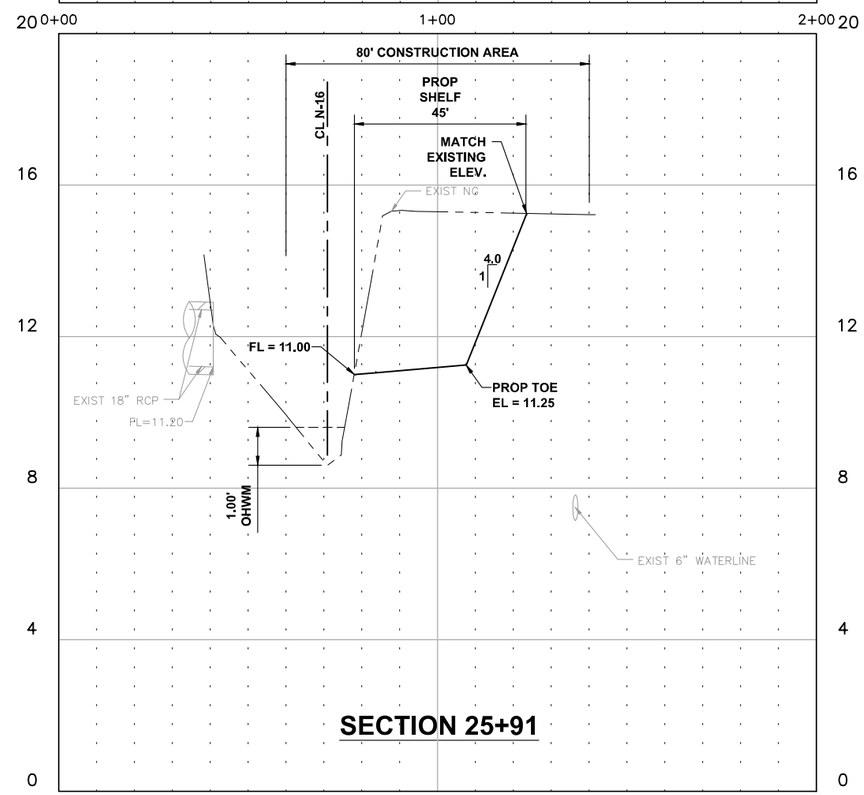
SECTION 22+84



SECTION 25+56



SECTION 25+76



SECTION 25+91

20' 0 20' 40'
HORZ. SCALE: 1" = 20'

2' 0 2' 4'
VERT. SCALE: 1" = 2'

NOTES:
1. FOR MH DETAILS SEE SHEET 58

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-9570

SEAL
STATE OF TEXAS
MOUNIKA JELLA
146004
LICENSED
PROFESSIONAL ENGINEER
2/12/25

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

THE STATE OF TEXAS COUNTY OF GALVESTON

GALVESTON COUNTY
ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

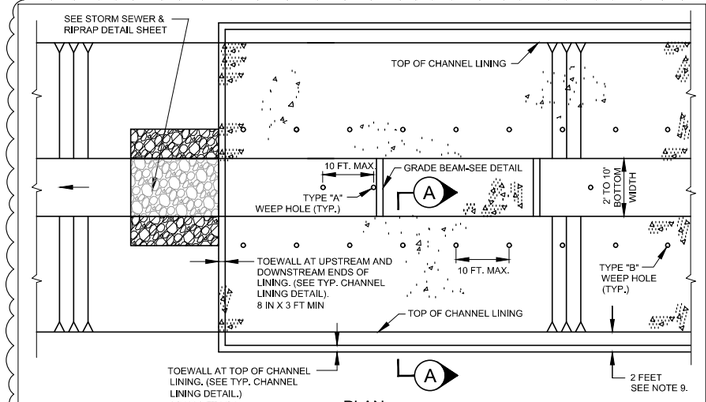
N-16 EAST
CROSS-SECTIONS
(SHEET 5 OF 6)

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 46 OF 86
DRAWN BY: JKC	SCALE: HORZ: 1" = 20' VERT: 1" = 2'	JOB No. 5370-01
APPROVED: MJ		

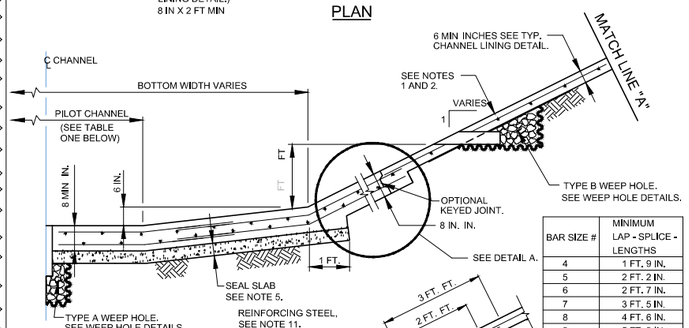
Wednesday, February 12, 2025 11:03:54 AM

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

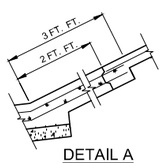
G:\1180\5370-01 GALVESTON COUNTY ARPA - BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\042-047-N-16 EAST CROSS-SECTIONS.DWG



PLAN



A HALF SECTION

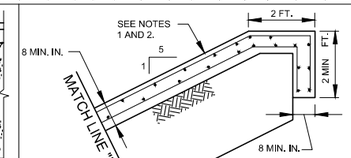


DETAIL A

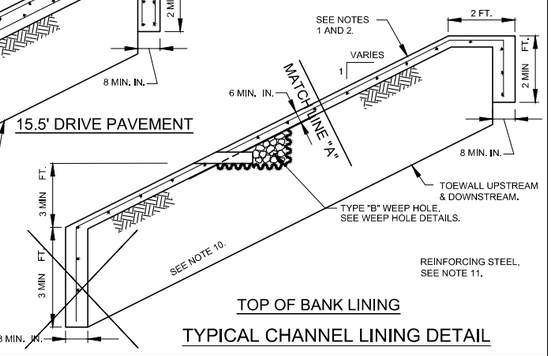
BOTTOM WIDTH	PILOT CHANNEL WIDTH
BW < 12 FT	FLAT BOTTOM
BW = 12 FT - 20 FT	6 FT
BW > 20 FT	8 FT

BAR SIZE #	MINIMUM LAP - SPLICE - LENGTHS
4	1 FT, 9 IN.
5	2 FT. 2 IN.
6	2 FT. 7 IN.
7	3 FT. 5 IN.
8	4 FT. 6 IN.
9	5 FT. 8 IN.
10	7 FT. 3 IN.

TYPICAL TRAPEZOIDAL CHANNEL LINING
(TRANSITION TO UTILITY DRIVE PAVEMENT)

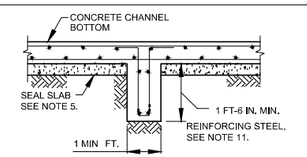


15.5' DRIVE PAVEMENT

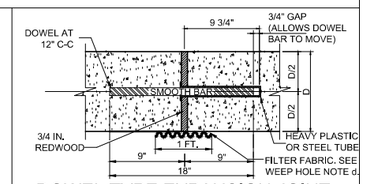


TOP OF BANK LINING

TYPICAL CHANNEL LINING DETAIL



GRADE BEAM DETAIL
(SEE NOTE 6)

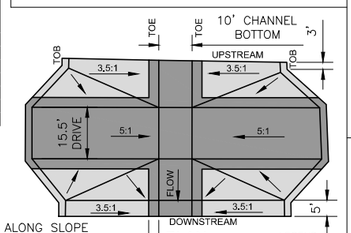


DOWEL TYPE EXPANSION JOINT

1. CENTER DOWEL HORIZONTALLY ON JOINT.
2. EXPANSION JOINT BARS SHALL BE HELD PARALLEL TO THE FINISHED CONCRETE SURFACE.

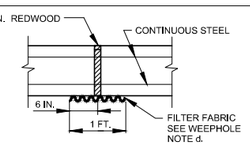
SMOOTH EXPANSION JOINT DOWELS

CONCRETE THICKNESS (D)	DOWEL DIA.
5" - 6"	3/4"
7" - 8"	1"
9" AND UP	1 1/4"

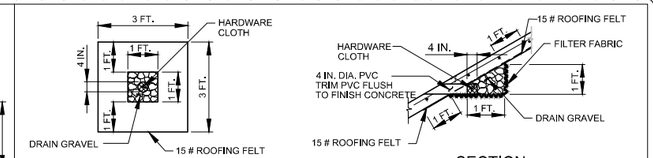


PLAN

UTILITY CROSSING CONCRETE THICKNESS

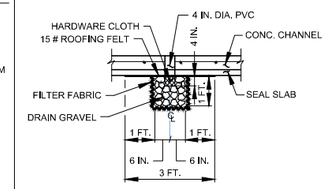


CONSTRUCTION JOINT



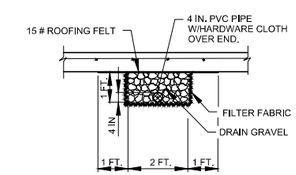
PLAN

SECTION



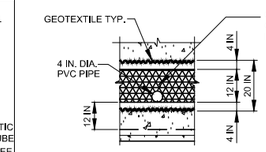
SECTION

TYPE "A" WEEP HOLE

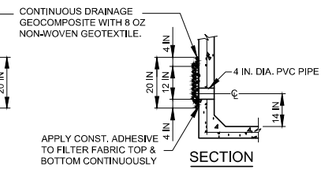


SECTION

TYPE "B" WEEP HOLE



ELEVATION



SECTION

TYPE "C" WEEP HOLE

WEEP HOLE NOTES:

1. MATERIALS:
   a. PIPE: 4 INCH DIA. SCH. 40 PVC
   b. DRAIN GRAVEL: SEE NOTE 14

SIEVE SIZE	% FINER
1 IN	100
3/4 IN	70 - 100
3/8 IN	20 - 90
NO. 4	0 - 60
NO. 8	0

   c. HARDWARE CLOTH: MIN. OPEN 1/8 IN; MAX. OPEN 1/4 IN
   d. FILTER FABRIC: NON-WOVEN GEOTEXTILE

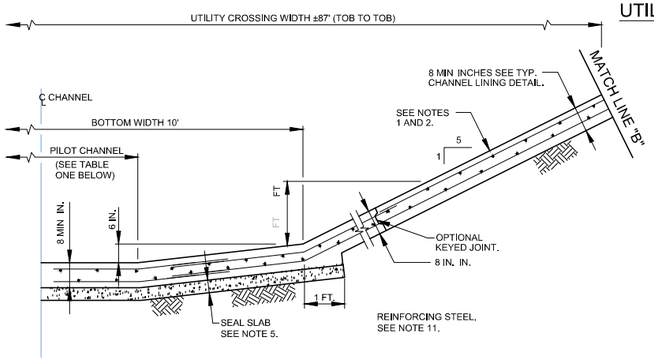
MIN. AOS	SIEVE NO.	100 MIN
MAX. AOS	SIEVE NO.	70 MAX
WEIGHT	OZ/SY	6 OZ. MIN

2. CUT WEEP HOLE PIPE FLUSH WITH CONCRETE SURFACE.
3. TYPE "A" AND "C" WEEP HOLES FOR TYPICAL RECTANGULAR CONCRETE CHANNEL LINING. TO BE STAGGERED.

WEEP HOLE DETAILS

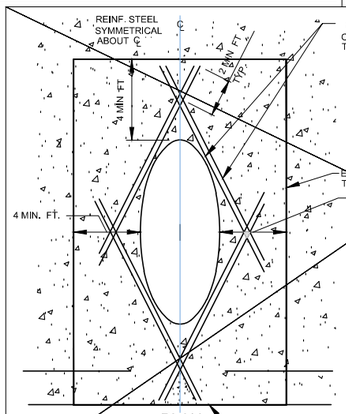
NOTES:

1. STRUCTURAL CONCRETE FOR CONCRETE CHANNEL LINING AND NONSTRUCTURAL CONCRETE FOR SEAL SLAB SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
2. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
3. EXCAVATION AND BACKFILL FOR CONCRETE CHANNEL LINING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02316-STRUCTURAL EXCAVATING AND BACKFILLING.
4. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
5. A NON-REINFORCED 4 INCH MINIMUM NONSTRUCTURAL CONCRETE SEAL SLAB IS REQUIRED BENEATH THE BOTTOM OF CONCRETE CHANNELS.
6. STRUCTURAL CONCRETE GRADE BEAMS SHALL BE INSTALLED TRANSVERSELY AT 20 FOOT MAX. CENTERS ON CONCRETE LINED CHANNELS WITH BOTTOM WIDTHS EQUAL TO OR GREATER THAN 20 FEET.
7. JOINTS:
   A. PLACE CONSTRUCTION JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS AND SLOPES AT 20 FOOT MIN., SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
   B. PLACE EXPANSION JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS, AND SLOPES AT 60 FOOT MAX. SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
8. CEMENT STABILIZED SAND SHALL BE PROVIDED AND PLACED IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321 -CEMENT STABILIZED SAND.
9. DELETE 2 FT FLAT EDGE WHEN LINING IS BELOW TOP OF BANK. SEE MID-SLOPE LINING DETAIL.
10. UPSTREAM AND DOWNSTREAM TOE WALL 3 FOOT MIN. DEPTH AT BOTTOM OF SLOPE AND 8 INCHES THICK.
11. MINIMUM #4 BARS (GRADE 60) AT 12 INCHES ON CENTER EACH WAY.
12. VARIES BASED ON SIDE SLOPE. MINIMUM 1 FOOT VERTICAL AT TOE OF SLOPE.
13. FOR RCP OUTFALLS 48 INCHES DIA. AND LARGER, USE HEADWALL/WINGWALL DETAIL ON SHEETS 62, 63, 64, 65 & 66
14. FOR STRUCTURAL BACKFILL MATERIAL PER SPECIFICATION SECTION 2316, USE CONCRETE COARSE AGGREGATE ASTM C33 SIZE NO. 467. LIMESTONE AND RECYCLED CONCRETE NOT ALLOWED.



A HALF SECTION

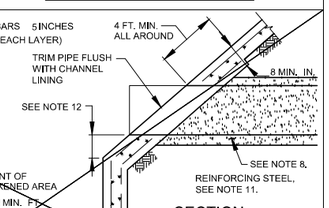
10TH ST. UTILITY CROSSING TRAPEZOIDAL CHANNEL LINING
(15.5' UTILITY DRIVE)



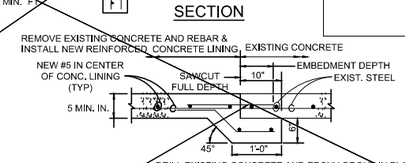
PLAN

WHEN PLACING THROUGH EXISTING CHANNEL LINING, SAW-CUT FULL DEPTH AND REMOVE 4 FEET ALL AROUND.

PIPE OUTFALL DETAILS
(FOR RCP OUTFALLS 42 INCH DIA. AND LESS)



SECTION



DRILL EXISTING CONCRETE AND EPOXY GROUT IN PLACE 24" LONG #5 REBAR DOWELS @ 18" O.C.; EMBEDMENT DEPTH SHALL BE AS PER EPOXY MANUFACTURER TO FULLY DEVELOP THE SIZE/GRADE REBAR. CONTRACTOR TO SUBMIT MANUFACTURER'S PRODUCT DATA FOR EPOXY GROUT PER SPECIFICATION SECTION No. 01330.

★ USE #8 X 12" DOWELS @ 18" O.C. WITH 6" EMBEDMENT AND NO EPOXY @ EXPANSION JOINTS.
★ USE EXPANSION JOINTS IN LIEU OF CONSTRUCTION JOINTS WHERE DIRECTED BY ENGINEER.

CONNECTION TO EXISTING CONCRETE

P.E. SEAL AND SIGNATURE

DEC ENGINEERING EXCELLENCE
T.B.P.E.L.S. FIRM REGISTRATION #392
3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-0670

SEAL
STATE OF TEXAS
DAVID RANKIN
98312
LICENSED
PROFESSIONAL ENGINEER
Digitally signed by David Rankin
Date: 2025.02.12 14:30:43-06'00'

REVISION No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED
1	2/12/25	ADJUST TOB	GT	MJ	DS

GALVESTON COUNTY ENGINEERING DEPARTMENT

GALVESTON COUNTY ARPA
BACLIFF DRAINAGE IMPROVEMENTS

UTLITY CROSSING PAVEMENT AND TRANSITIONS

DESIGN BY: GWT	DATE: 2/12/2025	SHEET No. 73B OF 86
DRAWN BY: JKC	SCALE: HORZ: VERT: NO SCALE	JOB No. 5370-01
APPROVED: MJ		

Wednesday, February 12, 2025 12:59:53 PM

0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

G:\1180\5370-01 GALVESTON COUNTY ARPA - BACLIFF DRAINAGE IMPROVEMENTS\CAD\SHEETS\073B-UTLITY CROSSING PAVEMENT AND TRANSITIONS.DWG