Project: Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

Project #1: Jefferson Parish-St. Charles Parish Return Levee and Reach 1

Return Levee:

Reference Drawings:
1. Jefferson Parish-St. Charles Parish Return Levee, Airport to West Esplanade Floodwall, USACE, 1988
3. Jefferson Parish-St. Charles Parish Return Levee, I-10 and Lkft B/L 0+86 to 9+00 Floodwalls and Return Levee Landscaping, USACE, 1993

- Existing T-wall @ El. +13.5 from W/L 2+00 to 65+57.95
- Existing T-wall @ El. +14 from W/L 65+87.95 to 92+72.95
- Existing T-wall @ El. +14 from W/L 94+40 to 125+00
- Existing T-wall @ El. +15 from W/L 125+00 to 140+99.62
- Existing T-wall @ El. +14.5 from W/L 140+99.62 to 173+36.62
- Existing T-wall @ 1V to 100H from W/L 173+36.63 to 175+86.62
- Existing T-wall @ El. +17 from W/L 175+86.62 to 180+91.62
- Existing Sheet Pile @ El. +17.5 from 181+19.62 to 182+14.47
- I-10 Floodwall, Existing T-wall @ El. +13.5 from 28+50 to 29+30 and 31+89.3 to 33+09.3
- I-10 Floodwall, Existing I-wall from 29+30 to 31+89.3, El. varies from +13.5 to +11.5 when crossing under highway
- Existing Pedestrian Gate @ El. +14 @ W/L C/L 92+12.95
- Existing Swing Gate @ El. +17 @ W/L C/L 181+05.62

**Surveyor Combined Project 1 – 4 and recorded El. from Lakefront to Airport of all things Structural. Recent (NAVD) Survey, Conducted 10/30/01
No Reference Drawing

Top Concrete Floodwall:

<table>
<thead>
<tr>
<th>Beginning Sta.</th>
<th>End Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0+00</td>
<td>4+00</td>
<td>+=17.30</td>
<td>+=16.50</td>
<td>Top Conc. Floodwall</td>
</tr>
<tr>
<td>8+00</td>
<td>38+00</td>
<td>+=14.80</td>
<td>+=14.00</td>
<td>&quot; &quot; &quot;</td>
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<tr>
<td>38+34</td>
<td>40+00</td>
<td>+=14.55</td>
<td>+=13.75</td>
<td>Angle in Wall</td>
</tr>
<tr>
<td>40+42</td>
<td>42+00</td>
<td>+=13.55</td>
<td>+=12.75</td>
<td>Sag in Wall</td>
</tr>
<tr>
<td>Top of Gate Structure:</td>
<td></td>
<td>+=14.61, 14.57</td>
<td>+13.81,+13.77</td>
<td>Gate No. W8</td>
</tr>
</tbody>
</table>

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Designed By: _AJV_ Date: _01/22/02_  
Checked By: ___________ Date: ___________
**COMPUTATION SHEET**

**Project:** Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study  
**Labor No.:** L62212

<table>
<thead>
<tr>
<th>Concrete Floodwall:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>46+00</td>
<td>86+00</td>
<td>≈+14.30</td>
<td>≈+13.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top of Gate Structure:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>87+51</td>
<td>87+59</td>
<td>≈+14.22, 14.27</td>
<td>+13.42,+13.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top Concrete Floodwall:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>90+00</td>
<td>132+00</td>
<td>≈+13.80</td>
<td>≈+13.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pumping Station:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>132+48</td>
<td>≈+14.22</td>
<td>+13.42</td>
<td>TCF @ Angle in Wall # Fence line to Pump Station, North Side</td>
</tr>
<tr>
<td>132+95</td>
<td>≈+14.13</td>
<td>+13.33</td>
<td>TCF @ Fence line, South Side Pump. Sta.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top Concrete Floodwall:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>133+00</td>
<td>148+00</td>
<td>≈+13.80</td>
<td>≈+13.00</td>
</tr>
<tr>
<td>148+29</td>
<td>≈+13.34</td>
<td>+12.54</td>
<td>TCF @ North Edge I-10 West</td>
</tr>
<tr>
<td>148+97</td>
<td>≈+13.11</td>
<td>+12.31</td>
<td>TCF @ South Edge I-10 West</td>
</tr>
<tr>
<td>149+52</td>
<td>≈+13.14</td>
<td>+12.34</td>
<td>TCF @ North Edge I-10 East</td>
</tr>
<tr>
<td>150+21</td>
<td>≈+12.73</td>
<td>+11.93</td>
<td>TCF @ South Edge I-10 East</td>
</tr>
<tr>
<td>156+00</td>
<td>≈+13.76</td>
<td>+12.96</td>
<td>TCF @ Veterans Blvd.</td>
</tr>
<tr>
<td>177+93</td>
<td>≈+13.81</td>
<td>+13.01</td>
<td>TCF @ South End</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top of Sheet Pile:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>177+93</td>
<td>≈+12.79</td>
<td>+11.99</td>
<td>Top Edge Sheet Piling</td>
</tr>
<tr>
<td>182+46</td>
<td>≈+11.30</td>
<td>+10.50</td>
<td>West Top Edge Sheet Pile, North of East-West Runway on West Side @Airport</td>
</tr>
<tr>
<td>0+50</td>
<td>≈+13.15</td>
<td>+12.35</td>
<td>West Top Edge Sheet Pile, South of East-West Runway on West Side</td>
</tr>
<tr>
<td>17+00</td>
<td>≈+11.52</td>
<td>+10.72</td>
<td>Top of Sheet Pile</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Railroad Track:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17+44</td>
<td>≈+11.21</td>
<td>+10.41</td>
<td>TSP @ South End RxR track</td>
</tr>
<tr>
<td>17+86</td>
<td>≈+11.08</td>
<td>+10.28</td>
<td>TSP @ North End RxR track</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top of Sheet Pile:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18+00</td>
<td>27+62</td>
<td>≈+11.55</td>
<td>≈+10.75</td>
</tr>
</tbody>
</table>

**Reach-1:**

Recent (1988 NAVD) Survey, Conducted 10/18/01:  
Reference Drawing: from USACE

- File No. H-8-44822
- Lake Pontchartrain La and Vicinity  
  Jefferson Parish Lakefront Levee  
  Lakeside Runoff Control  
  Reach 1  
  Right of Way  
  Jefferson Parish, LA.
- Date: Aug 1997
- Dwg. 1 of 4

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Date: 01/22/02  
Checked By:  
Date: 

Page 2 of 17

U.S. ARMY CORPS OF ENGINEERS, New Orleans District
** Surveyor plotted 3 Elevations in 1988 NAVD along Floodwall using B/L Stations on reference drawing.

Top of Floodwall:

<table>
<thead>
<tr>
<th>Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+17.36</td>
<td>+16.56</td>
</tr>
<tr>
<td>2</td>
<td>+17.12</td>
<td>+16.32</td>
</tr>
<tr>
<td>3</td>
<td>+16.04</td>
<td>+15.24</td>
</tr>
</tbody>
</table>
3" of existing top of floodwall to be removed

1/4" amplitude for floodwall extension bonding

1" sawcut to both sides of floodwall

#6 rebar embedded @ 1/2" 12" spacing

Typical "T"-wall section

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Page 4 of 17

U.S. ARMY CORPS OF ENGINEERS, New Orleans District
COMPUTATION SHEET

Project: Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

Labor No. L62212

TYPICAL "T"-WALL SECTION

Flood Side

Protected Side

Designed By: AJV Date: 01/22/02

Checked By: Date: 

Page 5 of 17

U.S. ARMY CORPS OF ENGINEERS, New Orleans District
# Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

**Labor No. L62212**

**Project:** Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

**Designed By:** AJV

**Date:** 01/22/02

**Checked By:**

**Date:**

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**COMPUTATION SHEET**

**TYPICAL REINFORCEMENT**

**RE-ENTRANT CURVE FLOODWALL**

**Scale:** 1/4" = 1'-0"
COMPUTATION SHEET

Project: Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study  Labor No. L62212

Project #2: Swing Gate, Duncan Canal Pumping Station No.4 and Williams Blvd. Roller Gate

Swing Gate and Pump Station:

2—Floodwall at Pumping Station No.4 and Williams Blvd., USACE, 1992

- Existing Sheet Pile @ El. +17.5 from W/L 100+45.0 to 101+01.88, W/L 103+01.88 to 104+08.27
- Existing T-wall @ El. +17.5 from W/L 101+01.88 to 103+01.88
- Existing Swing Gate 22' wide @ El. +17 with C/L @ W/L 104+23.27
- Existing I-wall slopes from El. +17.5 to +20 from W/L 104+38.27 to 104+61.98
- Existing T-wall @ El. +19.5 from 104+61.98 to 106+56.31, slopes up to El. +22.5 from W/L 106+56.31 to 108+06.31, then levels @ El. 22.5 from W/L 108+06.31 to 108+56.31
- Existing Pumping Station No. 4 b/w W/L 108+56.31 and 111+46.85
- Existing T-wall @ El. +22.5 slopes down to El. +19.5 from W/L 111+46.85 to 112+96.85, then levels @ El. +19.5 from 112+96.85 to 120+98.85
- Existing I-wall @ El. +19.5 from W/L 120+98.85 to 122+42.81
- Existing Sheet Pile @ El. +19 from W/L 122+42.81 to 122+86.5

Recent (1988 NAVD) Survey, Conducted 10/18/01:
Reference Drawing: from USACE
- File No. H-8-44822
- Lake Pontchartrain La and Vicinity
  Jefferson Parish Lakefront Levee
  Lakeside Runoff Control
  Reach 1
  Right of Way
  Jefferson Parish, L.A.
- Date: Aug 1997
- Dwg. 4 of 4

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Designed By: ____AJV____ Date: __01/22/02__
Checked By: _______ Date: _______

U.S. ARMY CORPS OF ENGINEERS, New Orleans District

<table>
<thead>
<tr>
<th>Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+17.78</td>
<td>+16.98</td>
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<tr>
<td>2</td>
<td>+17.39</td>
<td>+16.59</td>
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<tr>
<td>3</td>
<td>+17.37</td>
<td>+16.57</td>
</tr>
<tr>
<td>4</td>
<td>+17.36</td>
<td>+16.56</td>
</tr>
<tr>
<td>5</td>
<td>+17.59</td>
<td>+16.79</td>
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<td>6</td>
<td>+17.77</td>
<td>+16.97</td>
</tr>
<tr>
<td>7</td>
<td>+18.19</td>
<td>+17.39</td>
</tr>
<tr>
<td>8</td>
<td>+18.17</td>
<td>+17.37</td>
</tr>
<tr>
<td>9</td>
<td>+20.02</td>
<td>+19.22</td>
</tr>
<tr>
<td>10</td>
<td>+23.01</td>
<td>+22.21</td>
</tr>
<tr>
<td>11</td>
<td>+23.01</td>
<td>+22.21</td>
</tr>
<tr>
<td>12</td>
<td>+22.83</td>
<td>+22.03</td>
</tr>
<tr>
<td>13</td>
<td>+23.07</td>
<td>+22.27</td>
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<tr>
<td>14</td>
<td>+23.05</td>
<td>+22.25</td>
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<tr>
<td>15</td>
<td>+21.81</td>
<td>+21.01</td>
</tr>
<tr>
<td>16</td>
<td>+20.04</td>
<td>+19.24</td>
</tr>
<tr>
<td>17</td>
<td>+19.96</td>
<td>+19.16</td>
</tr>
<tr>
<td>18</td>
<td>+19.94</td>
<td>+19.14</td>
</tr>
<tr>
<td>19</td>
<td>+20.00</td>
<td>+18.20</td>
</tr>
<tr>
<td>20</td>
<td>+19.51</td>
<td>+18.71</td>
</tr>
<tr>
<td>21</td>
<td>+19.35</td>
<td>+18.55</td>
</tr>
<tr>
<td>22</td>
<td>+19.16</td>
<td>+18.36</td>
</tr>
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</table>

Top of Sheet Pile @ East End of Pumping Station:

<table>
<thead>
<tr>
<th>Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>+19.16</td>
<td>+18.36</td>
</tr>
</tbody>
</table>

(End of Sheet Pile Wall @ B/L 125+68)
COMPUTATION SHEET

Project: Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

Williams Blvd. Bottom Roller Gate:

Reference Drawings: Floodwall at Pumping Station No. 4 and Williams Blvd., USACE, 1992

- Existing I-wall @ El. +15 from W/L 200+00 to 200+27.13 and 200+99.13 to 201+84.13 for support of 60’ wide Bottom Roller Gate
- Existing 60’ wide Bottom Roller Gate b/w W/L 200+33.13 and 200+93.13

Recent (NAVD) Survey, Conducted 10/29/01:
No Reference Drawing.

** Survey Sta. Points 1-10 not plotted but El. recorded.

Top of Concrete Wall:

<table>
<thead>
<tr>
<th>Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+15.26</td>
<td>+14.46</td>
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<td>2</td>
<td>+15.26</td>
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<tr>
<td>3</td>
<td>+15.35</td>
<td>+14.55</td>
</tr>
<tr>
<td>4</td>
<td>+15.37</td>
<td>+14.57</td>
</tr>
<tr>
<td>5</td>
<td>+14.96</td>
<td>+14.16</td>
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<td>6</td>
<td>+14.93</td>
<td>+14.13</td>
</tr>
<tr>
<td>7</td>
<td>+15.40</td>
<td>+14.60</td>
</tr>
<tr>
<td>8</td>
<td>+15.36</td>
<td>+14.56</td>
</tr>
<tr>
<td>9</td>
<td>+15.37</td>
<td>+14.57</td>
</tr>
<tr>
<td>10</td>
<td>+15.26</td>
<td>+14.46</td>
</tr>
</tbody>
</table>

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Checked By: __________ Date: __________

U.S. ARMY CORPS OF ENGINEERS, New Orleans District
Project #3: Elmwood Pumping Station No. 3


- Existing I-wall @ (EL +19 for (170') to support East Side of Pumping Station
- Existing Pumping Station
- Existing I-wall on West Side of Pumping Station—no info. found from reference drawings.

Recent (1988 NAVD) Survey, Conducted 10/18/01:
Reference Drawing: from URS Greiner
- File No. H-4-45030
- Southeast Louisiana Urban Flood Control Project
  Jefferson Parish, Louisiana
  Elmwood Pumping Station No. 3
  SITE PLAN
- Date: 02/22/99
- Dwg. C-1 of 159

** Survey Sta. Points 1, 4, 5, 6, 10, 11, 12, 13, and 15 are plotted on the reference drawing with recent El. in 1988 NAVD.

Concrete Wall on Pumping Station:

<table>
<thead>
<tr>
<th>Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+15.13</td>
<td>+14.32</td>
</tr>
<tr>
<td>4</td>
<td>+18.59</td>
<td>+17.79</td>
</tr>
<tr>
<td>5</td>
<td>+18.59</td>
<td>+17.79</td>
</tr>
<tr>
<td>6</td>
<td>+18.79</td>
<td>+17.79</td>
</tr>
<tr>
<td>10</td>
<td>+14.97</td>
<td>+14.17</td>
</tr>
</tbody>
</table>

Top of Sheet Pile @ West End of Pumping Station:

| 11   | +14.39 +13.59 |
| 12   | +14.89 +14.09 |

Top of Sheet Pile @ East End of Pumping Station:

| 13   | +14.49 +13.69 |
| 15   | +14.54 +13.74 |
COMPUTATION SHEET

Project: Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

Labor No. L62212

Project #4: Suburban Canal Pumping Station No. 2

Reference Drawings:

- Existing T-wall (Not much info. found on this structure.)
- Existing Pumping Station

Recent (1988 NAVD) Survey, Conducted 10/18/01:
Reference Drawing: from Frederic R. Harris, Inc.
- File No. H-2-44957
- Southeast Louisiana Urban Flood Control Project
  Jefferson Parish, Louisiana
  Pumping Station No. 2-Suburban Canal
- SITE PLAN
  - Date: June 1999
  - Dwg. C02 of C38

** Survey Sta. Points 1-10 are plotted on the reference drawing with recent El. in 1988 NAVD

Top of Sheet Pile @ West End of Pumping Station:

<table>
<thead>
<tr>
<th>Sta.</th>
<th>El. (NGVD)</th>
<th>El. (NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12.66</td>
<td>+11.86</td>
</tr>
<tr>
<td>2</td>
<td>+13.13</td>
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<td>3</td>
<td>+12.85</td>
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<td>4</td>
<td>+12.70</td>
<td>+11.90</td>
</tr>
<tr>
<td>5</td>
<td>+13.74</td>
<td>+12.94</td>
</tr>
</tbody>
</table>

Concrete Wall on Pump Station:

| 6    | +14.16     | +13.36     |
| 7    | +14.31     | +13.51     |
| 8    | +14.31     | +13.51     |
| 9    | +14.39     | +13.59     |

Concrete Wall East Side of Pump Station @ Discharge Canal:

| 10   | +14.26     | +13.46     |

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Designed By: AJV Date: 01/22/02
Checked By: Date: 

U.S. ARMY CORPS OF ENGINEERS, New Orleans District
Project #5: Reach 4 (Causeway Blvd Floodwall) and Bonnabel Pumping Station No.1

**Causeway Blvd Floodwall:**

Recent (1988 NAVD) Survey, Conducted:
Reference Drawing: from USACE
- File No. H-4-40400
- Lake Pontchartrain, Louisiana and Vicinity
  High Level Plan
  Causeway Boulevard Floodwall
  Jefferson Parish Lakefront Levee
  Jefferson Parish, Louisiana
SITE PLAN
- Date: June 1995
- Dwg. 3 of 23

** Survey Sta. Points 1-7 are not plotted on the reference drawing but on a separate sketch paper with recent El. in 1988 NAVD.

<table>
<thead>
<tr>
<th>WEST: Sheet Pile</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sta.</td>
<td>El. (NGVD)</td>
<td>El. (NAVD)</td>
</tr>
<tr>
<td>1</td>
<td>+17.14</td>
<td>+16.34</td>
</tr>
<tr>
<td>2</td>
<td>+17.18</td>
<td>+16.38</td>
</tr>
<tr>
<td>3</td>
<td>+14.26</td>
<td>+13.46</td>
</tr>
<tr>
<td>4</td>
<td>+14.36</td>
<td>+13.56</td>
</tr>
<tr>
<td>Concrete Wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4A</td>
<td>+16.81</td>
<td>+16.01</td>
</tr>
<tr>
<td>5</td>
<td>+16.64</td>
<td>+15.84</td>
</tr>
<tr>
<td>6</td>
<td>+16.66</td>
<td>+15.86</td>
</tr>
<tr>
<td>7</td>
<td>+16.68</td>
<td>+15.88</td>
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<table>
<thead>
<tr>
<th>EAST: Sheet Pile</th>
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<tbody>
<tr>
<td>Sta.</td>
<td>El. (NGVD)</td>
<td>El. (NAVD)</td>
</tr>
<tr>
<td>1</td>
<td>+17.30</td>
<td>+16.50</td>
</tr>
<tr>
<td>2</td>
<td>+17.36</td>
<td>+16.56</td>
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<tr>
<td>3</td>
<td>+17.35</td>
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<tr>
<td>4</td>
<td>+17.46</td>
<td>+16.66</td>
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</table>
Bonnabel Pumping Station No. 1:

**Reference Drawing: Floodwall at Pumping Station No. 1, USACE, 1994**

- Existing Uncapped Sheet Pile @ El. +16.5 from W/L 0+00 to 0+55
- Existing I-wall @ El. +16.5 from W/L 0+55 to 1+61.00 and slopes up to El. +18.5 @ +85.50
- Existing T-wall slopes up @ El. +18 on a 1V to 50H slope to +22.5 from W/L 1+90 to 4+61.21 for support of Pumping Station
- Existing Pumping Station b/w W/L 4+61.21 to 6+21.21
- Existing T-wall slopes down @ El. +22.5 on a 50H to 1V slope to +17 from W/L 6+21.21 to 9+35.13
- Existing I-wall @ El. +17.5 slopes down to El. +16.5 from W/L 9+35.13 to 9+64.13 and levels @ El. +16.5 to W/L 10+37.13
- Existing Uncapped Sheet Pile @ El. +16.5 from W/L 10+37.13 to 10+69.01

Recent (1988 NAVD) Survey, Conducted 10/29/01:
Reference Drawing: No reference dwg.

** Survey Sta. Points 1, 2, 14, 21, 24, 31-35, 44, 47, 54, 55, 62-64 are plotted on a sketch paper with recent El. in 1988 NAVD.

| Top of Sheet Pile @ West End of Pumping Station: |     |     |
| Sta. | El. (NGVD) | El. (NAVD) |
| 1    | +15.94     | +15.14     |
| 2    | +16.40     | +15.60     |

| Concrete Wall @ West End of Pumping Station: |     |     |
| 3    | +16.44     | +15.64     |
| 14   | +18.09     | +17.29     |
| 21   | +20.35     | +19.55     |
| 24   | +21.61     | +20.81     |
| 31   | +22.92     | +22.12     |
COMPUTATION SHEET

Project: Hurricane Protection, Jefferson Parish, Louisiana Reconnaissance Study

Concrete Wall around Pump Station:

<table>
<thead>
<tr>
<th>Station</th>
<th>Elevation</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>32</td>
<td>+22.91</td>
<td>+22.11</td>
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<tr>
<td>33</td>
<td>+22.82</td>
<td>+22.02</td>
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<tr>
<td>34</td>
<td>+22.81</td>
<td>+22.01</td>
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</tbody>
</table>

Concrete Wall @ East End of Pumping Station:

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<thead>
<tr>
<th>Station</th>
<th>Elevation</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>35</td>
<td>+22.81</td>
<td>+22.01</td>
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<tr>
<td>44</td>
<td>+20.87</td>
<td>+20.07</td>
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<tr>
<td>47</td>
<td>+19.60</td>
<td>+18.80</td>
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<tr>
<td>54</td>
<td>+17.01</td>
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<td>55</td>
<td>+17.48</td>
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<tr>
<td>62</td>
<td>+16.41</td>
<td>+15.61</td>
</tr>
<tr>
<td>64</td>
<td>+16.46</td>
<td>+15.66</td>
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Designed By: AJV Date: 01/22/02
Checked By: Date: 

U.S. ARMY CORPS OF ENGINEERS, New Orleans District
Reference: No drawings were found for this structure.
Consult with Sami Mosrie for any info. on this structure

- Butterfly Gate
DESIGN MEMORANDUM NO. 20
GENERAL DESIGN
ORLEANS PARISH
JEFFERSON PARISH
17th. St. Outfall Canal
(Metairie Relief)
IN TWO VOLUMES
VOLUME 1

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
MARCH 1990

SERIAL NO.
OTHER PLAN CONSIDERED

45. Butterfly Valve Structure Alternative. A butterfly valve structure was considered for providing hurricane protection at the 17th Street Outfall Canal. The proposed structure would consist of reinforced concrete components and steel butterfly valves (gates). Operation of the structure is based on the theory of vertical self-operating, eccentrically pinned, butterfly valves. Under normal circumstances, the valves would be maintained in a passive, open position to allow pumping of interior drainage into Lake Pontchartrain. When a hurricane approaches, the valves would be placed in the active (automatic) mode. In this case, the valves would remain open when the water level in the outfall canal exceeds that on the lake side of the structure but would close when the water level on the lake side of the structure is greater than that in the outfall canal. Closure of this type would normally be in response to the lake side water level rising due to a hurricane driven surge. In the open (trimmed) position, the axis of each valve would be rotated 12 degrees from the center line of its gate bay. During a surge flow, the eccentricity of the pin and the 12 degree offset (trim) would induce closure. This self-operating feature would permit continuous operation of the pumping station during a hurricane. This would be possible because the valves would prevent surge flows from entering the outfall canal and would automatically reopen when the water level on the lakeside of the control structure recedes to a level below that in the outfall canal. When the threat of further hurricane induced surge has passed, the valves would be returned to their passive, open condition. Along with the above described self-operating feature, machinery would be provided to permit manual operation of the valves. This would only be required in the event of a malfunction of the proposed automatic operating system.

46. Butterfly Valve Structure Features. The butterfly valve structure alternative would contain the following features:

a. Gate Bays. The structure would be located just south of the Hammond Highway Bridge and would have six gate bays. They would be constructed in three monoliths, two abutments and one interior, founded on 14"x14" prestressed concrete piles. Each gate bay would provide a 28' wide x 23' high opening with a sill elevation of -18.4 NGVD. One set of steel sheet pile dewatering bulkheads and structural steel needle girders would be provided and each gate bay would have recesses for their installation to allow dewatering for maintenance and/or repairs. Protection against seepage under the structure would be provided by a steel sheet pile cutoff extending to elevation -35.0. For details see Plates 28, 29 and 32. A dewatering system for construction of the butterfly valve along with pile capacity curves for the structure are contained in Appendix B, Volume 1. See Plates 1 through 3.

b. Approach Aprons. The aprons would be reinforced concrete monoliths extending 25 feet on either side of the gate bay monoliths.
I've str
17th feature:wo hurricane.
flows from a hurricane.
level in the structure
is greater
a hurricane.
levee system on the west bank of the 17th Street Outfall Canal.
structure, a breakwater system would be provided in Lake Pontchartrain near the north end of the 17th Street Outfall Canal where it discharges into Lake Pontchartrain. The details of the breakwater system are shown on Plates 26 and 33. The cantilever wall stability analysis for the breakwater is shown in Appendix B, Volume I Plate 4.

A breakwater system is needed not only to prevent wave action from tunneling up the canal and striking the butterfly valve gates, but is needed to protect the extensive riparian development at the lake end of the canal along with the numerous small boats in the "Ducktown fishing fleet." During the extreme lake levels the buildings located in this area would be inundated and subject to direct wave attack. The buildings and boats would most likely become debris which could lodge against the gates. Therefore, to insure proper operating conditions for the butterfly valve structure, a breakwater system was developed.

e. Operating Machinery. The machinery is designed for automatic and manual gate operation. In the automatic mode the gate is powered by the water hydraulic forces acting on the gate. In this mode the machinery acts as a damper and shock absorber. Damping time would be field adjustable and accomplished with two hydraulic cylinders and a set of parallel adjustable nonpressure compensated and pressure compensated concrete monoliths.
flow control valves. The nonpressure compensated flow control valves would provide for low pressure damping, below 200 psi, while the pressure compensating valves would provide for a control rate of damping above a system pressure of 200 psi.

Manual operation of the gate would be accomplished by powering the damping cylinders with a hydraulic power unit consisting of a hydraulic pump driven by an electric motor. In this manner approximately 417 to 513 kips-ft of torque can be imparted to the gate at the hinge for swinging the gate in either direction.

Incorporated with the machinery is a spring. The spring is designed to assist the gate's closing forces generated by tidal flow from the lake into the canal by providing the gate with preliminary closing torque when the gate is fully open. Lesser torque would be applied as the gate moves towards the closed position. Because the opening forces due to drainage pumping is less than the spring loading the gate will fully open and will not increase the head across the structure.

f. Gate Bearings. The pintle would be a spherical bearing. The ball would be stainless steel and the bearing would be a high lead bronze such as ASTM B584-932. The top bearing or hinge would be a commercially available spherical roller bearing. Plate No. 34 illustrates the proposed machinery layout and the proposed design of the hinge and pintle.

ACCESS ROADS

47. Access Roads. Vehicular access to the project site from both the east and west sides of the canal is available via many public roads. The following streets are listed as potential access roads:

East Side Levee
- Conrad Blvd.
- West End Blvd.
- Bellaire Drive
- West Harrison Ave.
- W. Kenilworth Drive
- Academy Drive

West Side Levee
- Hammond Highway
- Lake Ave. and connecting streets
- West Esplanade Ave.
- Bonnabel Blvd.
- Orpheum Ave.
- Veterans Blvd.
- N. Frontage Road
- Canal St. (Metairie)

RELOCATIONS

48. General. Under the authorizing law, local interest are responsible for the accomplishment of " all necessary alteration and relocations to roads, railroads, pipelines, cables, wharves, drainage structures and other facilities made necessary by the construction work . . . ." There are no relocations necessary for the east side
### SUMMARY OF GOM SCOPE COST ESTIMATE FOR BUTTERFLY VALVE STRUCTURE (ALTERNATIVE PLAN)

<table>
<thead>
<tr>
<th>Code</th>
<th>Item</th>
<th>Const. Time</th>
<th>Unit</th>
<th>Amount</th>
<th>Contingencies</th>
<th>Project Cost</th>
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<td>15.----</td>
<td>BUTTERFLY VALVE STRUCTURE</td>
<td>2 ½ yrs</td>
<td></td>
<td>$5,495,000</td>
<td>$1,440,000</td>
<td>$6,935,000</td>
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<tr>
<td>11.----</td>
<td>LEVEES AND FLOODWALLS (EAST SIDE)</td>
<td>10 mths</td>
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<td>$585,000</td>
<td>$88,000</td>
<td>$673,000</td>
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<tr>
<td>11.----</td>
<td>LEVEES AND FLOODWALLS (WEST SIDE)</td>
<td>10 mths</td>
<td></td>
<td>$519,000</td>
<td>$81,000</td>
<td>$600,000</td>
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<tr>
<td>12.----</td>
<td>BREAKWATERS AND SEAWALLS</td>
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<td>$1,607,000</td>
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<tr>
<td>62.----</td>
<td>RELOCATIONS (WEST SIDE)</td>
<td>*yr</td>
<td></td>
<td>$182,000</td>
<td>$20,000</td>
<td>$202,000</td>
</tr>
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* Relocations for the West Side Floodwall to be performed concurrently with floodwall construction.

**TOTS FOR BUTTERFLY STRUCTURE, BREAKWATER, LEVEES & FLOODWALLS:**

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## COST ESTIMATE-LOUISIANA CATEGORY 4 HURRICANE PROTECTION, JEFFERSON PARISH RECON
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**PROJECT #4: SUBURBAN CANAL PUMPING STATION NO. 2 AND BREAKWATER**

Mob and Demob  

P.S. No. 2 Floodwall

- Sawcut 1" each face, 3" below top of floodwall  
  Quantity: 864  
  Unit: LF
- Concrete to be removed leaving 1/4" amplitude  
  Quantity: 4  
  Unit: CY
- Reinforced concrete to be added  
  Quantity: 20  
  Unit: CY
- Rebar needed for doweling #6  
  Quantity: 1476  
  Unit: LF

Breakwater

- Remove Handrail (Undisturbed)  
  Quantity: 1048  
  Unit: LF
- Reinforced concrete to be added  
  Quantity: 78  
  Unit: CY
- Replace Handrail  
  Quantity: 1048  
  Unit: LF

**PROJECT #5: REACH 4 (CAUSEWAY BLVD FLOODWALL) AND BONNABEL PUMPING STATION NO. 1**

Mob and Demob  

Floodwall (P.S. included)

- Sawcut 1" each face, 3" below top of floodwall  
  Quantity: 2002  
  Unit: LF
- Concrete to be removed leaving 1/4" amplitude  
  Quantity: 9  
  Unit: CY
- Reinforced concrete to be added  
  Quantity: 130  
  Unit: CY

Subtotal Page 3
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<th>UNIT</th>
<th>AMOUNT</th>
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**PROJECT #6: 17TH ST. CANAL BUTTERFLY GATE**

**Mob and Demob**

Refer to cost estimate made in:
DM No. 20 General Design
Orleans Parish
Jefferson Parish
17th St. Outfall Canal
(Metairie Relief)
Volume 1

Subtotal Page 4

TOTAL