ENGINEERING APPENDIX A

APPENDIX 3

PLATES – RECOMMENDED PLAN
GULF INTRACOASTAL WATERWAY
BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS SYSTEMS, FEASIBILITY STUDY
ENGINEERING APPENDIX DRAWINGS
CONSTRUCTION SEQUENCE

1. PILE TEST
2. DREDGE ACCESS CHANNEL ON GIWW SIDE OF EACH STRUCTURE FOR CRANE ACCESS
3. DRIVE PRODUCTION PILING FOR GATE STRUCTURE IN WET
4. PLACE COFFERDAM
5. CONSTRUCT GATE STRUCTURE
6. REMOVE COFFERDAM
7. CONSTRUCT GUIDE WALLS AND END CELLS (SOME CONCURRENT WITH GATE CONSTRUCTION)
8. CONSTRUCT ROCK TRAINING WALL
9. COMPLETE DREDGING OF NEW CHANNEL
10. TRANSFER NAVIGATION TO NEW STRUCTURE
11. COMPLETE DEMOLITION/BUILD ACCESS LEVELS
**CONCEPT DRAWING**

**PLAN - TSP ALTERNATIVE 3A.1 - SOUTH SHIFT OF ALIGNMENT**

**G.SUGGESTED CONSTRUCTION SEQUENCE NO.:**

1. **EXISTING FLOOD GATES ON THE EAST AND WEST SIDES OF THE BRAZOS RIVER REMAIN FULLY OPERATIONAL DURING THE ESTIMATED 2-YEAR CONSTRUCTION PERIOD FOR THE NEW 125-FOOT GATE AND CHANNEL.**
2. **PILE TEST (CONTRACT PRIOR TO MAIN CONSTRUCTION CONTRACT).**
3. **PLACE COFFERDAM.**
4. **CONSTRUCT GATE STRUCTURE.**
5. **REMOVE COFFERDAM AND END CELL (SOME COULD BE CONCURRENT WITH GATE CONSTRUCTION).**
6. **REMOVE PLUG AT RIVER ON BOTH SIDES OF RIVER AND COMPLETE DREDGING OF NEW CHANNEL. (7 AND 8 COULD BE CONCURRENT.)**
7. **TRANSFER NAVIGATION TRAFFIC TO NEW STRUCTURE AND NEW GIWW CHANNEL.**
8. **COMPLETE DEMOLITION/DECOMMISSIONING OF SOUTHERN EXISTING STRUCTURE AND BUILDS LEVEE ACCESS TO NEW STRUCTURE (NOTE BOAT ACCESS ONLY FOR NEW GATE OPERATORS UNTIL THIS IS UNDER CONSTRUCTION).**

**NOTE:**

- 1. THE EXISTING FLOOD GATES ON THE EAST AND WEST SIDES OF THE BRAZOS RIVER REMAIN FULLY OPERATIONAL DURING THE ESTIMATED 2-YEAR CONSTRUCTION PERIOD FOR THE NEW 125-FOOT GATE AND CHANNEL.
- 2. PILE TEST (CONTRACT PRIOR TO MAIN CONSTRUCTION CONTRACT).
- 3. PLACE COFFERDAM.
- 4. CONSTRUCT GATE STRUCTURE.
- 5. REMOVE COFFERDAM AND END CELL (SOME COULD BE CONCURRENT WITH GATE CONSTRUCTION).
- 6. REMOVE PLUG AT RIVER ON BOTH SIDES OF RIVER AND COMPLETE DREDGING OF NEW CHANNEL. (7 AND 8 COULD BE CONCURRENT.)
- 7. TRANSFER NAVIGATION TRAFFIC TO NEW STRUCTURE AND NEW GIWW CHANNEL.
- 8. COMPLETE DEMOLITION/DECOMMISSIONING OF SOUTHERN EXISTING STRUCTURE AND BUILDS LEVEE ACCESS TO NEW STRUCTURE (NOTE BOAT ACCESS ONLY FOR NEW GATE OPERATORS UNTIL THIS IS UNDER CONSTRUCTION).

**EXISTING GATES AND FACILITY TO REMAIN DURING CONSTRUCTION - NOTE 1**

**NEW SECTOR GATE**

**125' WIDTH - NOTE 5**

**CLR 125'**

**EDGE OF NEW BANK**

**EDGE OF EXISTING BANK**

**NEW SECTOR GATE**

**125' WIDTH - NOTE 5**

**CLR 125'**

**EDGE OF NEW BANK**

**EDGE OF EXISTING BANK**

**PROPOSED NEW ALIGNMENT OF GIWW CHANNEL (OFFSET 300' FROM EXISTING CHANNEL) - NOTE 9**

**EDGE OF EXCAVATION FOR NEW GIWW ALIGNMENT**

**LAST EXCAVATION @ PLUG BEFORE NEW CHANNEL BECOMES OPERATIONAL (TOP EACH SIDE OF RIVER) - NOTE 5**

**EXISTING GATES AND FACILITY TO REMAIN DURING CONSTRUCTION - NOTE 7**

**EXISTING GATE LEAF ISLAND AFTER NAVIGATION TRAFFIC IS TRANSFERRED TO NEW GIWW CHANNEL - NOTE 2**

**REMOVE SOUTH GATE LEAF ISLAND AFTER NAVIGATION TRAFFIC IS TRANSFERRED TO NEW GIWW CHANNEL - NOTE 2**

**ADD LEVEE FIL A AREA ACCESS TO EXISTING FLOODGATE AFTER NEW GATE IS OPERATIONAL - SEE C-601 FOR DETAILS - NOTE 4**

**EDGE OF COFFERDAM DURING CONSTRUCTION - NOTE 3**

**EDGE OF COFFERDAM DURING CONSTRUCTION - NOTE 3**

**EXISTING GIWW CHANNEL (EXISTING) - NOTE 1**

**EDGE OF EXISTING BANK**

**ADD LEVEE FILL AREA ACCESS TO FLOODGATE AFTER NEW GATE IS OPERATIONAL - SEE C-601 FOR DETAILS - NOTE 10**

**ADD LEVEE FILL AREA ACCESS TO FLOODGATE AFTER NEW GATE IS OPERATIONAL - SEE C-601 FOR DETAILS - NOTE 10**

**EXISTING GIWW CHANNEL (EXISTING) - NOTE 1**

**EDGE OF COFFERDAM DURING CONSTRUCTION - NOTE 3**

**EDGE OF EXISTING BANK**

**EDGE OF NEW BANK**

**NEW SECTOR GATE**

**125' WIDTH - NOTE 5**

**CLR 125'**

**EDGE OF NEW BANK**

**EDGE OF EXISTING BANK**

**PROPOSED NEW ALIGNMENT OF GIWW CHANNEL (OFFSET 300' FROM EXISTING CHANNEL) - NOTE 9**

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**ADD LEVEE FILL AREA ACCESS TO FLOODGATE AFTER NEW GATE IS OPERATIONAL - SEE C-601 FOR DETAILS - NOTE 10**

**EXISTING GIWW CHANNEL (EXISTING) - NOTE 1**

**EDGE OF COFFERDAM DURING CONSTRUCTION - NOTE 3**

**EDGE OF EXISTING BANK**

**EDGE OF NEW BANK**

**NEW SECTOR GATE**

**125' WIDTH - NOTE 5**

**CLR 125'**

**EDGE OF NEW BANK**

**EDGE OF EXISTING BANK**

**PROPOSED NEW ALIGNMENT OF GIWW CHANNEL (OFFSET 300' FROM EXISTING CHANNEL) - NOTE 9**

**EDGE OF EXCAVATION FOR NEW GIWW ALIGNMENT**

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**ADD LEVEE FILL AREA ACCESS TO FLOODGATE AFTER NEW GATE IS OPERATIONAL - SEE C-601 FOR DETAILS - NOTE 10**

**EXISTING GIWW CHANNEL (EXISTING) - NOTE 1**
BRASOS RIVER FLOODGATES
FEASIBILITY STUDY
BRAZORIA COUNTY, TX
PO BOX 1229
GALVESTON, TX 77553-1229
TETRA TECH
400 112TH AVENUE NE
SUITE 300
BELLEVUE, WA 98004

SCALE: 1"=100'-0"

EXISTING ADMINISTRATION BUILDING
EXISTING GENERATOR BUILDING
EXISTING CONTROL BUILDING
EXISTING WAREHOUSE
EXISTING BOAT HOUSE

NEW ADMINISTRATION BUILDING (APPROX 14'x14')
NEW GENERATOR BUILDING (APPROX 14'x14')
NEW LEVEE FULL AREA INSTALLED AFTER NEW GATE AND CHANNEL ARE OPERATIONAL
NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND CHANNEL ARE OPERATIONAL
NEW CONTROL BUILDING (APPROX 16'x18', 2 STORY)
NEW 20'x40' STEEL BLDG WAREHOUSE
NEW 50'x50' BOAT HOUSE

GIWW CHANNEL (EXISTING)
GIWW CHANNEL (NEW ALIGNMENT)

NEW 12'x14' WAREHOUSE
NEW 50'x50' BOAT HOUSE

MAINTENANCE Dewatering Needle Girders Storage Platform (see S-045 and S-046
ONE SET OF NEEDLE GIRDERS AND NEEDLES FOR ONE GATE TO BE
USED FOR BOTH BRFG & CRL SITES)

EXISTING ADMINISTRATION BUILDING REMOVED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
EXISTING E FLOODGATE RD EXTENSION
EXISTING WAREHOUSE
EXISTING BOAT HOUSE

NEW 125' SHORELINE (APPROX.)
NEW 300' SHORELINE (APPROX.)
NEW 12.0' EL +12.0

PERCENTAGE OF COMPLETE:

NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL

NEW 12'x14' WAREHOUSE
NEW 50'x50' BOAT HOUSE

MAINTENANCE Dewatering Needle Girders Storage Platform (see S-045 and S-046
ONE SET OF NEEDLE GIRDERS AND NEEDLES FOR ONE GATE TO BE
USED FOR BOTH BRFG & CRL SITES)

EXISTING ADMINISTRATION BUILDING REMOVED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
EXISTING E FLOODGATE RD EXTENSION
EXISTING WAREHOUSE
EXISTING BOAT HOUSE

NEW 125' SHORELINE (APPROX.)
NEW 300' SHORELINE (APPROX.)
NEW 12.0' EL +12.0

PERCENTAGE OF COMPLETE:

NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL

NEW 12'x14' WAREHOUSE
NEW 50'x50' BOAT HOUSE

MAINTENANCE Dewatering Needle Girders Storage Platform (see S-045 and S-046
ONE SET OF NEEDLE GIRDERS AND NEEDLES FOR ONE GATE TO BE
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EXISTING ADMINISTRATION BUILDING REMOVED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
EXISTING E FLOODGATE RD EXTENSION
EXISTING WAREHOUSE
EXISTING BOAT HOUSE

NEW 125' SHORELINE (APPROX.)
NEW 300' SHORELINE (APPROX.)
NEW 12.0' EL +12.0

PERCENTAGE OF COMPLETE:

NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
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NEW 12'x14' WAREHOUSE
NEW 50'x50' BOAT HOUSE

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CHANNEL ARE OPERATIONAL
EXISTING E FLOODGATE RD EXTENSION
EXISTING WAREHOUSE
EXISTING BOAT HOUSE

NEW 125' SHORELINE (APPROX.)
NEW 300' SHORELINE (APPROX.)
NEW 12.0' EL +12.0

PERCENTAGE OF COMPLETE:

NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
NEW LEVEE FILL AREA INSTALLED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL

NEW 12'x14' WAREHOUSE
NEW 50'x50' BOAT HOUSE

MAINTENANCE Dewatering Needle Girders Storage Platform (see S-045 and S-046
ONE SET OF NEEDLE GIRDERS AND NEEDLES FOR ONE GATE TO BE
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EXISTING ADMINISTRATION BUILDING REMOVED AFTER NEW GATE AND
CHANNEL ARE OPERATIONAL
EXISTING E FLOODGATE RD EXTENSION
EXISTING WAREHOUSE
EXISTING BOAT HOUSE

NEW 125' SHORELINE (APPROX.)
NEW 300' SHORELINE (APPROX.)
NEW 12.0' EL +12.0

PERCENTAGE OF COMPLETE:
TYPICAL SECTION - ACCESS ROAD

SCALE: 1"=10'-0"

EXISTING GROUND

SEMI-COMPACTED FILL

6" BASE COURSE 6" ASPHALT ATOP SEPARATOR GEOTEXTILE

TYPICAL SECTION - ROCK TRAINING WALL

SCALE: 1"=10'-0"

EXISTING GROUND

POLE SHEETPILING CUTOFF PANT TOP 10' OF PILE

TYPICAL SECTION - ACCESS ROAD AT STRUCTURE

SCALE: 1"=10'-0"

EXISTING GROUND

SEMI-COMPACTED FILL

6" BASE COURSE 6" ASPHALT AT TOP SEPARATOR GEOTEXTILE

TYPICAL SECTION - CHANNEL

SCALE: 1"=10'-0"

EXISTING GROUND

C.L. OF CHANNEL

BOTTOM OF CHANNEL EL. -15

TYPICAL SECTION - ACCESS ROAD

SCALE: 1"=10'-0"
EXIST
GIWW
EL 0.0
NEW
GIWW
EL -12.0
(REQUIRED
DEPTH)
EXIST
CHANNEL
BOTTOM
NEW
CHANNEL
EL -15.0

EXIST
GIWW
EL 0.0
NEW
GIWW
EL -12.0
(REQUIRED
DEPTH)
EXIST
CHANNEL
BOTTOM
NEW
CHANNEL
EL -15.0

EXIST
GIWW
EL 0.0
NEW
GIWW
EL -12.0
(REQUIRED
DEPTH)
EXIST
CHANNEL
BOTTOM
NEW
CHANNEL
EL -15.0

AFTER TRAFFIC
MOVES TO NEW
GIWW, REMOVE
SOUTH ISLAND TO
EL -15.00
TOP OF EXIST
SHEET PILE
GUIDEWALL

NEW LEVEE
FILL AREA

NEW GUIDEWALL
NEW LEVEE
FILL AREA

NEW GUIDEWALL
NEW LEVEE
FILL AREA

NEW CHANNEL
EL +12.0
NEW CHANNEL
EL +12.0

NEW CHANNEL
EL +12.0
NEW CHANNEL
EL +12.0

NEW GUIDEWALL
NEW GUIDEWALL

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NOTES:
1. ALL PILES SHALL RECEIVE TENSION ANCHORS.
2. ALL PIPE PILES SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X 52.
3. SHEET PILING SHALL MEET THE REQUIREMENTS OF ASTM A572, GRADE 50.

LEGEND
- PIPE PILE
  BATTERED 1:4 ON 4V
  INDICATES DIRECTION OF BATTERY

<table>
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<tr>
<th>LOCATION</th>
<th>PILE CUTOFF EL.</th>
<th>PILE TIP EL.</th>
<th>PILE LENGTH</th>
<th>SHEET PILE CUTOFF EL.</th>
<th>SHEET PILE TIP EL.</th>
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<td>-115.0</td>
<td>68</td>
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</tbody>
</table>

FOUNDATION PLAN

FLOOD SIDE

PROTECTED SIDE

SCALE: 1/16 = 1'-0"
125' SECTOR GATE MASONRY PLAN

SCALE: 1" = 1'-0"
NOTES:
1. ALL PILES SHALL RECEIVE TENSION ANCHORS.
2. ALL PIPE PILES SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X 52.
3. SHEET PILING SHALL MEET THE REQUIREMENTS OF ASTM A572, GRADE 50.

LEGEND

<table>
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<tr>
<th>LOCATION</th>
<th>PILE CUTOFF EL.</th>
<th>PILE TIP EL.</th>
<th>PILE LENGTH</th>
<th>SHEET PILE CUTOFF EL.</th>
<th>SHEET PILE TIP EL.</th>
</tr>
</thead>
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</table>

FOUNDATION PLAN

SCALE: 1/2" = 1'-0"

NOTES:
1. ALL PILES SHALL RECEIVE TENSION ANCHORS.
2. ALL PIPE PILES SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X 52.
3. SHEET PILING SHALL MEET THE REQUIREMENTS OF ASTM A572, GRADE 50.
NOTE:
1.) ALL PIPE SECTION SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X52
2.) ALL PLATE AND INTERCOSTALS SHALL MEET THE REQUIREMENTS OF ASTM A709, GRADE 50.
3.) ALL STEEL SHALL BE PAINTED W/ SYSTEM 6AZ, COAL TAR EPOXY WITH ZINC RICH PRIMER.
NOTE:
1.) ALL PIPE SECTIONS SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X52
2.) ALL PLATE AND INTERCOSTALS SHALL MEET THE REQUIREMENTS OF ASTM A709, GRADE 50.
3.) ALL STEEL SHALL BE PAINTED W/ SYSTEM 6AZ, COAL TAR EPOXY WITH ZINC RICH Primer.
NOTE:
1.) ALL PIPE SECTION SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X52
2.) ALL PLATE AND INTERCOSTALS SHALL MEET THE REQUIREMENTS OF ASTM A709, GRADE 50.
3.) ALL STEEL SHALL BE PAINTED WITH SYSTEM 6AZ, COAL TAR EPOXY WITH ZINC RICH PRIMER.
NEEDLE GIRDER STORAGE MASONRY PLAN

SCALE: 1" = 1'-0"

3 SPACES @ 22'-0" = 66'-0"

132'-0"

14 SPACES @ 9'-0" = 126'-0"

3'-0"

8' 0"

4' 0"

16' 0"

CONCRETE BEAM (TYP.)

40" WIDE x 30" DEEP

24" PPC PILE (TYP.)

8" CONCRETE SLAB

8'-6"

71'-0"

2'-6"

3'-0"
1.) ALL PIPE SECTION SHALL MEET THE REQUIREMENTS OF API 5L, GRADE X52
2.) ALL PLATE AND INTERCOSTALS SHALL MEET THE REQUIREMENTS OF ASTM A709, GRADE 50.
3.) ALL STEEL SHALL BE PAINTED W/ SYSTEM 6AZ, COAL TAR EPOXY WITH ZINC RICH PRIMER.
NOTE:
1. All pipe section shall meet the requirements of API 5L, Grade X60.
2. All plate and intercostals shall meet the requirements of ASTM A709, Grade 50.
3. All steel shall be painted w/ System 6AZ, coal tar epoxy with zinc rich primer.

ELEVATION - MIDDLE TRUSS
SCALE: 1" = 1'-0"
NOTE:
1. All pipe sections shall meet the requirements of API 5L, Grade X52.
2. All plate and intercostals shall meet the requirements of ASTM A709, Grade 50.
3. All steel shall be painted with System 6AZ, coal tar epoxy with zinc rich primer.

SCALE: 
3" = 1'-0"
0" = 4'
8" = 16'

1.) All pipe sections shall meet the requirements of API 5L, Grade X52.
2.) All plate and intercostals shall meet the requirements of ASTM A709, Grade 50.
3.) All steel shall be painted with System 6AZ, coal tar epoxy with zinc rich primer.
1. BUILDING SHALL BE 6,000 SF WITH CMU WALLS AND PRE-ENGINEERED STANDING SEAM ROOF.
2. BUILDING SHALL INCLUDE 5, 10'x10' ENCLOSED OFFICES, 20'x20' CONFERENCE ROOM, 10'x20' BREAK ROOM, AND A MINIMUM OF 2 RESTROOMS.
3. 1,500SF OF BUILDING SHALL BE UNFINISHED STORAGE.
METAL ROOF
METAL BUILDING
SHUTTER WITH STORM WINDOW 3'-6"x4'-6"
45' TIMBER PILES
3'x7' DOOR
SLIDING DOOR 12'-0"x10'-0"

2'x2' GRADE BEAM
45' TIMBER PILES
2'x2' GRADE BEAM
45' TIMBER PILES

12'-0"x15'-0" SLIDING DOOR
12'-0"x15'-0" SLIDING DOOR
12'-0"x15'-0" SLIDING DOOR

ELEVATION
ELEVATION
ELEVATION

FLOOR PLAN
SCALE 3" = 1'-0"
1. All plates and shapes shall meet the requirements of ASTM A709, Grade 50.
2. All needle girder components shall be painted with System 6AZ coal tar epoxy with zinc rich primer.
3. One set of needles and girders to be used for Brazos and Colorado River structures.
1. All plates and shapes shall meet the requirements of ASTM A572, Grade 50.
2. All needle girder components shall be painted with System FZ Coat, Tar Guard ZN 70% rich primer.
3. One set of needles and girders to be used for Brazos and Colorado River structures.
**PINTLE ASSEMBLY PLAN**

SCALE: 1" = 1'-0"

1'-11" 5'-0" 6'-0"

**PINTLE ASSEMBLY ELEVATION**

SCALE: 1" = 1'-0"

1'-11" 5'-0" 6'-0"

**PINTLE - PLAN**

SCALE: 1" = 1'-0"

1'-11" 5'-0" 6'-0"

**SECTION**

SCALE: 1" = 1'-0"

1'-11" 5'-0" 6'-0"

**NOTE**

PINTLE SHAFT TO BE COATED WITH LIGHT LUBRICATING OIL IMMEDIATELY PRIOR TO INSTALLATION IN CASTING.
NOTE:
1. USE HAGGLUNDS VIKING SERIES 84 LSHT HYDRAULIC MOTOR.