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NOTE FOR ALTERNATIVE 2A:

1. MAJOR REHABILITATION OF THE EXISTING FLOODGATES IS EXPECTED TO INCLUDE THE FOLLOWING MANAGEMENT MEASURES:
   - MR - MAJOR REHAB OF THE FLOODGATES (INCLUDES REPAIR/REPLACEMENT OF DAMAGED COMPONENTS, REPAINTING, AND REPLACEMENT OF CATHODIC PROTECTION)
   - RO - RAISE/RELOCATE GATE OPERATOR BUILDINGS
   - MP - MODIFY (RAISE) GATE MACHINERY PIT LOCATION
   - MG - MODIFY GUIDEWALLS
   - CS - CHANNEL MAINTENANCE STRUCTURES

2. MAJOR REHABILITATION OF GATES AND FACILITY (SEE NOTE 1: MR, RO, MP, MG)

3. MODIFY SHORELINE AND RIVER BATHYMETRY TO IMPROVE NAVIGABILITY AND SEDIMENT TRANSPORT

4. GIWW CHANNEL

5. BRAGG RIVER

6. DOLPHIN ALIGNMENT STRUCTURE AT RIVER SIDE OF EACH GATE (SEE NOTE 1: CS)

7. MAJOR REHABILITATION OF GATES AND FACILITY (SEE NOTE 1: MR, RO, MP, MG)

8. BARGE

9. MAJOR REHABILITATION OF GATES AND FACILITY (SEE NOTE 1: MR, RO, MP, MG)

10. MODIFY SHORELINE AND RIVER BATHYMETRY TO IMPROVE NAVIGABILITY AND SEDIMENT TRANSPORT

PLAN - ALTERNATIVE 2A - MAJOR REHAB EXISTING STRUCTURE
NEW SECTOR GATE, 125' MINIMUM

REMOVE EXISTING GATE AND WIDEN CHANNEL PASSAGE THROUGH AREA BY USING BYPASS CHANNEL DURING CONSTRUCTION

PROPOSED BYPASS CHANNEL

GUIDEWALL ON EACH SIDE OF GATE (TYP) (SEE S-401, S-402)
NEW SECTOR GATE, 125' MINIMUM

REMOVE EXISTING GATE AND WIDEN CHANNEL PASSAGE THROUGH AREA BY USING BYPASS CHANNEL DURING CONSTRUCTION

PLAN - ALTERNATIVE 3A.1 - EAST SIDE 3A, WEST SIDE OPEN

9/28/2017

CONCEPT DRAWING

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US Army Corps of Engineers
BRAZOS RIVER FLOODGATES
FEASIBILITY STUDY
BRAZORIA COUNTY, TX
GALVESTON DISTRICT
PO BOX 1229
GALVESTON, TX 77553-1229
TETRA TECH
400 112TH AVENUE NE
SUITE 400
BELLEVUE, WA 98004

SCALE:
1" = 300'-0"
PLAN - ALTERNATIVE 9A - NEW CROSSING ON ALIGNMENT C WITHOUT GATES

SCALE: 1"=300'

- REMOVE EXISTING GATES AND FILL IN EXISTING CHANNEL, OR INSTALL FLOW CONTROL STRUCTURES
- EXCAVATE NEW CHANNEL ALONG ALIGNMENT C WITH CROSSING STRAIGHT ACROSS RIVER

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US Army Corps of Engineers

ALTERNATIVE 9A
PLAN

GIWW CHANNEL

BRAZOS RIVER
NEW RIVER-SIDE APPROACHES SIZE AND SHAPE TO BE DETERMINED BY HYDRAULIC MODELING

REMOVE EXISTING GATE MONOLITHS AND WIDEN APPROACHES ON EACH SIDE OF RIVER

RELOCATE EXISTING CANAL OUTFALL AWAY FROM NEW GATE LOCATION

CONSIDER CONSTRUCTION AT INTERSECTION WITH NEW APPROACH CHANNEL TO BETTER CONTAIN SEDIMENT AND INCREASE EFFECTIVENESS OF TRAPS FOR SEDIMENT IN GIWW

NEW FLOW CONTROL STRUCTURE ON WEST SIDE OF RIVER. NUMBER AND SIZE OF GATES TO BE DETERMINED BASED ON REQUIRED FLOW RATE TO REDUCE FLOW VELOCITY THROUGH NAVIGATION GATES TO ACCEPTABLE LEVEL.

NEW SECTOR GATE, USE MINIMUM IN NEW MONOLITH EACH SIDE OF RIVER

NEW EAST APPROACH CHANNEL ALONG ALIGNMENT C

FILL EXISTING MOORING SLIP

NEW SECTOR GATE, USE MINIMUM IN NEW MONOLITH EACH SIDE OF RIVER

NEW EAST APPROACH CHANNEL ALONG ALIGNMENT C

NEW FLOW CONTROL STRUCTURE ON WEST SIDE OF RIVER. NUMBER AND SIZE OF GATES TO BE DETERMINED BASED ON REQUIRED FLOW RATE TO REDUCE FLOW VELOCITY THROUGH NAVIGATION GATES TO ACCEPTABLE LEVEL.

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NEW SECTOR GATE, USE MINIMUM IN NEW MONOLITH EACH SIDE OF RIVER

NEW EAST APPROACH CHANNEL ALONG ALIGNMENT C

FILL EXISTING MOORING SLIP

NEW SECTOR GATE, USE MINIMUM IN NEW MONOLITH EACH SIDE OF RIVER

NEW EAST APPROACH CHANNEL ALONG ALIGNMENT C

FILL EXISTING MOORING SLIP

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NEW EAST APPROACH CHANNEL ALONG ALIGNMENT C

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NEW EAST APPROACH CHANNEL ALONG ALIGNMENT C

FILL EXISTING MOORING SLIP

NEW SECTOR GATE, USE MINIMUM IN NEW MONOLITH EACH SIDE OF RIVER

NEW E
ELEVATION - CHANNEL TRUSS

PIPE

WT SHAPE

W SHAPE TYP

3,3('
ELEVATION - RECESS TRUSS

HINGE - PINTLE

PIPE 24" Ø

STIFF PLATE

SILL EL - 16.00 NAVD88

TOP OF WALL EL - 16.00 NAVD88

BTM OF STEEL

FACE OF SKIN PLATE

TOP OF GATE EL +16.00 NAVD88

TOP OF WALL EL +16.00 NAVD88

HINGE & PINTLE

STIFF PLATE

W SHAPE

WT SHAPE

PIPE 24" Ø

PIPE

PIPE

PIPE

PIPE 24" Ø

PINTLE ASSEMBLY

HINGE ASSEMBLY

ELEVATION - RECESS TRUSS

SCALE: N:1/3"
8" MIN FROM INTERCOSTAL CL
LOCATION OF VERTICAL PLATE SPLICES AT CONTRACTOR'S OPTION
INTERCOSTAL WT SHAPE, TYP
SEE SECTION ABOVE FOR BRACING LOCATIONS
CL RECESS TRUSS
CL CHANNEL TRUSS
CL CHANNEL TRUSS
CL RECESS TRUSS
SKIN PLATE SPLICES (TYP)
INTERCOSTALS
W SHAPE HORIZONTAL CURVED GIRDER
SKINPLATE EXTENSION
FOR OPERATOR RACK

A

SECTION
SCALE: NTS
INTERCOSTAL WT SHAPE, TYP
SEE SECTION ABOVE FOR BRACING LOCATIONS
W SHAPE HORIZONTAL CURVED GIRDER

A

ELEVATION - SKIN PLATE DEVELOPED
SCALE: NTS
LOCATION OF VERTICAL PLATE SPLICES AT CONTRACTOR'S OPTION

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V. ROUSE
G. KATZENBERGER

9/28/2017
CONCEPT DRAWING

S-204
NOTES:
1. THE CONCEPT GUIDEWALL DETAIL SHOWN IS FROM THE EXISTING WEST GATE NORTHEAST WALL SECTION.
2. RUB FACING SHALL BE UHMW PANELS W/STEEL PLATE BACKING, IF HEIGHT (TYP).
NOTES:

1. The UHMW panel rub facing shall be 2-3/4" thick with steel plate 5/8" thick backing fastened to the sheet pile wall. The required rub facing height is estimated to be 9 feet tall.

2. The typical guidewall section shown offers the following advantages over a cast-in-place concrete wall supported on steel pipe piles:
   A. In-the-wet construction reduces time and cost.
   B. Much smaller cofferdam required.
   C. Reduces dewatering needs during construction.
PLAN CLOSED - RACK AND PINION

SECTOR GATE SHOWN IN CLOSED POSITION

HINGE & PINTLE WP, TYP

PROTECTED SIDE

CL CHANNEL GAWW / FLOODGATES

CHAMBER WALL, TYP

MACHINERY PIT

RIVER SIDE

FOR OPERATOR

TYP 2 PLACES

HYDRAULIC AND ELECTRIC

CONDUIT TRENCH, TRENCH

COVERS NOT SHOWN

HPU BUILDING

MACHINERY PIT
HINGE BILL OF MATERIALS - QTY PER LEAF

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>QTY</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HINGE PIN</td>
<td>1</td>
<td>ASTM A276 TYPE XM-28</td>
</tr>
<tr>
<td>UPPER HINGE PLATE</td>
<td>1</td>
<td>ASTM A709-50</td>
</tr>
<tr>
<td>LOWER HINGE PLATE</td>
<td>1</td>
<td>ASTM A709-50</td>
</tr>
<tr>
<td>HINGE EMBED ANCHOR</td>
<td>1</td>
<td>ASTM A148 GR 80-50</td>
</tr>
<tr>
<td>HINGE BASE</td>
<td>1</td>
<td>ASTM A148 GR 80-50</td>
</tr>
<tr>
<td>HINGE BRUSHING</td>
<td>1</td>
<td>ASTM B148 C93200 LINED WITH KORON K OR TENMAT 814</td>
</tr>
<tr>
<td>HINGE BALL</td>
<td>1</td>
<td>ASTM A709-50</td>
</tr>
<tr>
<td>HINGE CASTING</td>
<td>1</td>
<td>ASTM A148 GR 80-50</td>
</tr>
<tr>
<td>HINGE BALL KEY</td>
<td>1</td>
<td>BOLT TYPE 432 HBQ ENCRUSHED, TEMPERED 450 F</td>
</tr>
</tbody>
</table>

SHIM PACK FOR ADJUSTING HINGE INTO PLACE

ANCHOR BOLTS WITH EMBED PLATE

ADJUSTING BOLTS

HINGE BLOCKOUT

ANCHOR BOLTS WITH EMBED PLATE

HINGE EMBED ANCHOR

CHAMBER WALL
BRAZOS RIVER FLOODGATES
FEASIBILITY STUDY
BRAZORIA COUNTY, TX
GALVESTON DISTRICT
PO BOX 1229
GALVESTON, TX 77553-1229
TETRA TECH
400 112TH AVENUE NE
SUITE 400
BELLEVUE, WA 98004

M-004

SECTION
GATE SHOWN IN CLOSED POSITION
WEST SIDE SHOWN

DISTANCE THAT PINTLE BASE PLATE PROTRUDES INTO CHAMBER

FACE OF CONCRETE WITHIN GATE RECESS

CHAMBER WALL

HINGE/PINTLE CENTER

HINGE/PINTLE

KEY BOLT

PINTLE CASTING

PINTLE BASE PLATE

SEAL RETAINER PLATE

PREH 28/2017

CONCEPT DRAWING

E. LUNDBERG
J. KIKUTA
V. ROUSE

PINTLE BILL OF MATERIALS- QNTY PER LEAF

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<tr>
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<td>1</td>
<td>ASTM A148 GR 80-50</td>
</tr>
<tr>
<td>PINTLE BUSHING</td>
<td>1</td>
<td>ASTM A705 TYPE 630 H900</td>
</tr>
<tr>
<td>PINTLE BASE PLATE</td>
<td>1</td>
<td>ASTM A148 GR 80-50</td>
</tr>
<tr>
<td>PINTLE SEAL RETAINER PLATE</td>
<td>1</td>
<td>ASTM B148, C93200 LINED WITH KARON V OR TENMAT 814</td>
</tr>
</tbody>
</table>

SCALE: 3/4"=1'-0"

SECTION A

SCALE: 1"=1'-0"

SECTION B

PINTLE BASE PLATE

SEAL RETAINER PLATE

EL

LOWER BRACE LEVEL

CHAMBER FLOOR

FACE OF CONCRETE WITHIN GATE RECESS

HINGE/PINTLE CENTER

HINGE/PINTLE

KEY BOLT

PINTLE CASTING

PINTLE BASE PLATE

SEAL RETAINER PLATE

PREH 28/2017

CONCEPT DRAWING

E. LUNDBERG
J. KIKUTA
V. ROUSE

PINTLE BILL OF MATERIALS- QNTY PER LEAF

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<td>ASTM B148, C93200 LINED WITH KARON V OR TENMAT 814</td>
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SCALE: 3/4"=1'-0"

SECTION A

SCALE: 1"=1'-0"

SECTION B
NOTES:
1. DREDGE BYPASS CHANNEL IN ACCORDANCE WITH SHEET G-2, BYPASS CHANNEL PLAN.
2. DREDGE NEW CHANNEL IN ACCORDANCE WITH SHEET D-0-2, NEW CHANNEL PLAN.
NOTES:
1) STONE ARMORING AT THE SHOWN LOCATIONS SHALL BE REMOVED AND DISPOSED OF WITHIN THE DISPOSAL AREA PRIOR TO DREDGING.
2) CLEARING AND GRUBBING SHALL BE COMPLETED AT THE LIMITS SHOWN PRIOR TO DREDGING. ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF WITHIN THE DISPOSAL AREA. ALL TREES AND SHRUBS SHALL BE BURIED WITHIN THE DISPOSAL AREA.
3) THE BYPASS CHANNEL SHALL BE DREDGED IN ACCORDANCE WITH THE BYPASS CHANNEL CUT TEMPLATE AND AS SHOWN ON THE BYPASS CHANNEL CROSS SECTIONS.
4) DREDGED MATERIAL SHALL BE DISPOSED WITHIN THE DISPOSAL AREA SHOWN. IT IS ASSUMED THAT THE EXISTING RETENTION DYES ARE SUITABLE FOR DISPOSAL.
NOTES:

1) REMOVE EXISTING STONE ARMORING AND DISPOSE WITHIN DISPOSAL AREA.
2) ONCE THE STRUCTURE IS REMOVED, THE NEW CHANNEL SHALL BE DREDGED IN ACCORDANCE WITH THE NEW CHANNEL CUT TEMPLATE AND AS SHOWN ON THE NEW CHANNEL CROSS SECTIONS.
3) DREDGED MATERIAL SHALL BE DISPOSED WITHIN THE DISPOSAL AREA SHOWN. IT IS ASSUMED THAT THE EXISTING RETENTION Dams (EL. 12.27) ARE SUITABLE FOR DISPOSAL.

NEW CHANNEL CUT TEMPLATE

CHANNEL C5 O&M CUT TEMPLATE

* FOR O&M USE AFTER THE OPEN CHANNEL CONSTRUCTION IS COMPLETE.
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

ANSI D
GULF INTERCOASTAL WATERWAY
MATA GORDA, TEXAS
COLORADO LOCKS

ALTERNATIVE 2 B

HALF PLAN WEST SIDE - REHAB (2b)
(WORK ON EAST LOCKS SIMILAR)
HALF PLAN WEST SIDE - CONVERT LOCKS TO FLOODGATES HYBRID (REFINED) (4b-1)

(WORK ON EAST LOCKS SIMILAR)
NOTES:
1. GATES SHALL BE REMOVED FROM SITE.
2. DAMAGED STEEL MEMBERS SHALL BE REPAIRED.
3. GEAR RACKS SHALL BE INSTALLED ON GATES.
4. GATES SHALL BE SAND BLASTED AND PRIMED.
5. GATES SHALL BE PAINTED WITH COAL TAR EXPOXY, SYSTEM NO. 6.
6. GATES SHALL BE INSTALLED BACK IN PLACE.
HYDRAULIC POWER UNIT (TYPICAL)

NOTE:
1. HPU UNITS ARE TO BE PROVIDED FOR EACH GATE.
2. HPU SET UP IS TO INCLUDE HYDRAULIC HOSES AND FITTINGS.

SCALE: N.T.S
QUANTITY: 2
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

A Meridian St, Grenier St

HAGGLUND VIKING 63 SERIES

CONTINUE TO HPU

ELEVATION SECTION
SCALE 1" = 1'-0"
NO. A4000.2

HIGH TORQUE HYDRAULIC RADIAL MOTOR W/ INTEGRATED BRAKE. EATON MODEL REC-1013 OR APPROVED EQUAL

ADJUSTABLE MOTOR SUPPORT

BASE EMBEDDED IN CONCRETE

NEW ATTACHED GEAR RACK

GATE SHOWN IN THE CLOSED POSITION

TWO 6" CONDUITS

2" CONDUIT FOR LIMIT SWITCHES

2" CONDUIT FOR

HYDRAULIC MOTOR

TOP OF WALL

CONDUIT CONDUITS

HYDRAULIC LINES

PROVIDE 2" CONDUITS FOR HYDRAULIC LINES

NEW ATTACHED GEAR RACK

CENTER OF GEAR ELEVATION

ADJUSTABLE MOTOR SUPPORT

BASE EMBEDDED IN CONCRETE
COLORADO RIVER SIDE APPROACH WALLS
UHMW-PE PANELS

SCALE: 3/4" = 1'-0"

NOTE:
A 1/2" GAP WILL BE MAINTAINED BETWEEN THE PANELS TO ACCOMMODATE 1/2" WELDS OF 5/8" PANEL BACKING PLATE.
HEAVY DUTY GRADE.