GENERAL NOTES


2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NAVIGATING FROM A NAVIGABLE WATER BODY TO THE SITE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR NAVIGATING WITHIN THE LIMITS OF THE PROJECT SITE AND DREDGING ONLY WITHIN THE LIMITS OF THE FLATTON AND ACCESS CHANNELS. THE LINQ PROJECT ENGINEER OR INSPECTOR SHALL MONITOR EQUIPMENT OPERATIONS DURING CONSTRUCTION.

3. ALL EQUIPMENT SHALL BE FLOATING AT ALL TIMES DURING TRANSIT TO AND FROM THE PROJECT SITE.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL THE LANDOWNERS, UTILITIES AND PIPELINE COMPANIES IDENTIFIED IN THE SPECIFICATIONS AT LEAST 3 WORKING DAYS PRIOR TO MOBILIZATION. ALL UNDERGROUND PIPELINES AND UTILITIES SHALL BE MARKED WITH BIYYS BY THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN BIYYS DURING CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE CLEARANCES FROM THE PIPELINES SET FORTH IN THE PLAN DRAWINGS OR THE BIYYS. NO EXCAVATION IS ALLOWED WITHIN ANY AREA RESTRICTED BY THE PIPELINE COMPANIES AND SET FORTH ON THE PLANS. PIPELINE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. THE OWNER IS NOT RESPONSIBLE FOR ANY EXACT LOCATIONS. THE CONTRACTOR MUST CALL LOUISIANA ONE CALL AT 1-800-272-3302 AT LEAST 5 WORKING DAYS PRIOR TO MOBILIZATION.

5. THE PLANS AND BID DOCUMENTS ARE COMPLIMENTARY. WHAT IS REQUIRED IN ONE IS AS BINDING AS IF REQUIRED BY ALL CLARIFICATIONS, INTERPRETATIONS, OR NOTIFICATIONS OF MINOR VARIATIONS AND DEVIATIONS IN THE CONTRACT DOCUMENTS WILL BE ISSUED BY THE ENGINEER, IF NECESSARY.

6. THE ELEVATIONS SHOWN ON PLANS ARE BASED ON SURVEYS PERFORMED BETWEEN 10/2003 AND 3/2105 BY B.F.M. CORPORATION, LLC. AND SIAM CONSULTING, INC., RESPECTIVELY. FOR LFDR.

7. THE ALIGNMENT FOR THE ROCK BREAKWATERS AND BACK-TO-BACK SHEET PILE STRUCTURE MAY BE REVISED BY THE ENGINEER BEFORE CONSTRUCTION TO REFLECT CHANGES IN FIELD CONDITIONS.

8. ANY DAMAGE TO EXISTING U.S. COAST GUARD NAVIGATION AIDS OR PRIVATE NAVIGATION AIDS SHALL BE REPAIRED BY THE CONTRACTOR TO U.S. COAST GUARD STANDARDS AT THE EXPENSE OF THE CONTRACTOR.

9. THE ESTIMATED ROCK QUANTITIES SHOWN IN THIS SUMMARY OF ESTIMATED QUANTITIES ARE FOR BIDDING PURPOSES ONLY AND CALCULATED ACCORDING TO THE CONDITIONS SURVEYED FROM 12/2703 TO 3/2105. THE ROCK QUANTITIES WERE CALCULATED USING THE END AREA METHOD OF SECTION AT THE BEGINNING, END, AND EVERY SURVEY TRANSECT ALONG THE ROCK BREAKWATER ALIGNMENT. THE ROCK QUANTITIES ASSUMED VARYING RATES OF SETTLMENT FOR THE BREAKWATERS AS SHOWN IN THE FINAL DESIGN REPORT. THE QUANTITIES REQUIRED FOR CAPING OFF THE SHEET PILE STRUCTURE WERE CALCULATED ASSUMING AN UNIFORM 2.5 FOOT LAYER OF STONE OVER THE ENTIRE STRUCTURE. AN IN-PLACE WEIGHT 15 TONS CYL/ YD. WAS ASSUMED FOR THE ROCK. ACTUAL QUANTITIES WILL BE BASED ON LARGE DISPLACEMENT MEASUREMENTS. CHECKS THE TECHNICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. THE OWNER RESERVES THE RIGHT TO ADJUST QUANTITIES HIGHER OR LOWER WITHOUT ADJUSTMENT OF THE UNIT PRICE.

10. MATERIAL STOCKPILED LANDWARD OF FLOTATION AND ACCESS CHANNELS SHALL BE DEPOSITED IN THE AREAS SHOWN ON THE PLANS AND PLACED SUCH THAT IT IS READILY AVAILABLE TO BE BACKHOELED. ONLY MATERIAL DREDGED FROM THE ACCESS AND FLOTATION CHANNELS SHALL BE BACKHOELED INTO THE CHANNELS.

11. MEAN HIGH WATER (MHW) AND MEAN LOW WATER (MLW) WERE CALCULATED FROM THE NOAA BUOY STATION 42007 LOCATED SOUTHEAST OF BILOXI USING 1993 TO 2002 DATA.

12. THE CONTRACTOR SHALL PERFORM A MAGNETIC SURVEY OF THE ACCESS CHANNELS, FLOTATION CHANNELS, AND SHEET PILE STRUCTURE. MAGNETOMETER LINES SHALL BE RUN ALONG THE ALIGNMENT OF THE ACCESS CHANNELS, FLOTATION CHANNELS, AND SHEET PILE STRUCTURE. ADDITIONAL MAGNETOMETER LINES SHALL BE RUN PERPENDICULAR TO THE ALIGNMENT OF THE ACCESS CHANNELS, FLOTATION CHANNELS, AND SHEET PILE STRUCTURE. THESE LINES SHALL EXTEND OUT 25 FEET FROM THE EDGE OF THE TEMPORARY SPOIL PLACEMENT AND BE SPACED A MAXIMUM OF 500 FEET. DRAWINGS SHOWING THE TRACK LINES, MAGNETOMETER HZ COORDINATES, AMPERAGE, MAGNETIC TYPE, AND SIGNATURE OF ALL MAGNETOMETER HZS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO MOBILIZATION. THE DRAWINGS SHALL BE STAMPED BY A REGISTERED PROFESSIONAL SURVEYOR LICENSED IN LOUISIANA. SEE SECTION "TECHNICAL SPECIFICATIONS" FOR ADDITIONAL REQUIREMENTS.

13. THE ROCK BREAKWATERS NEAR THE FORMER NAVAL FACILITY AT OLD SHELL BEACH SHALL BE CONSTRUCTED USING END-ON-CONSTRUCTION TECHNIQUES AS SPECIFIED IN THE END-ON-CONSTRUCTION DETAIL PROVIDED IN THESE PLANS.

14. ANY REFERENCES TO MAINTENANCE OF THE ROCK BREAKWATERS FOR INFORMATIONAL PURPOSES AND ARE NOT INCLUDED FOR CONSTRUCTION AT THIS TIME.

15. CONDITIONS TO AVOID MANATEES: ALL CONTRACT PERSONNEL ASSOCIATED WITH THE PROJECT WILL BE INFORMED OF THE POTENTIAL PRESENCE OF MANATEES AND THE NEED TO AVOID COLLISIONS WITH MANATEES, WHICH ARE PROTECTED UNDER THE MARINE MAMMAL PROTECTION ACT OF 1972 AND THE ENDANGERED SPECIES ACT OF 1972. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF MANATEES. TEMPORARY SIGNS WILL BE POSTED PRIOR TO AND DURING ALL CONSTRUCTION/RECREATIONAL ACTIVITIES TO REMIND PERSONNEL TO BE DIESSENTWEX FOR MANATEES DURING ACTIVE CONSTRUCTION/RECREATIONAL ACTIVITIES OR WITHIN VESSEL MOVEMENT ZONES (IE, WORK AREA), AND AT LEAST ONE SIGN WILL BE PLACED WHERE IT IS VISIBLE TO THE VESSEL OPERATOR, SITATION BARRIERS, IF USED, WILL BE MADE OF MATERIAL IN WHICH MANATEES COULD NOT BECOME ENTRAPPED, AND WILL BE PROPERLY SECURED AND MONITORED. IF A MANATEE IS SIGHTED WITHIN 100 YARDS OF THE ACTIVE WORK ZONE, SPECIAL OPERATIONS CONDITIONS WILL BE IMPLEMENTED, INCLUDING, NO OPERATION OF MOVING EQUIPMENT WITHIN 50 FEET OF MANATEE; ALL VESSELS WILL OPERATE AT NO WAKE SPEEDS WITHIN 100 YARDS OF THE WORK AREA, AND SITATION BARRIERS, IF USED, WILL BE RE-SECURED AND MONITORED. ONCE THE MANATEE HAS LEFT THE 100-YARD BUFFER ZONE ALONG THE WORK AREA ON ITS OWN ACCORD, SPECIAL OPERATIONS CONDITIONS ARE NO LONGER NECESSARY. BUT CAREFUL OBSERVATION WOULD BE RESUMED. ANY MANATEE SIGHTING WILL BE IMMEDIATELY REPORTED TO THE U.S. FISH AND WILDLIFE SERVICE (337-524-3100) AND THE LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES, NATURE HERITAGE PROGRAM (225-765-2821).

16. CONDITIONS TO DISCOURAGE GULF STURGEON FROM ENTERING OR REMAINING IN THE WORK AREA (NO DEPLOYMENT LIMITATIONS) PRIOR TO DREDGING, THE BUS必须 BE DROPPED INTO THE WATER AND REMOVED BEFORE THE BUCKET IS RETRIEVED EMPTY. A ONE-MINUTE-LONG, NO-RECODING PERIOD MUST BE OBSERVED. DURING NO-RECODING PERIOD, PERSONNEL SHOULD CAREFULLY OBSERVE THE WORK AREA IN AN EFFORT TO DETECT GULF STURGEON. IF STURGEON ARE SIGHTED, THE U.S. FISH AND WILDLIFE SERVICE (337-524-3100) AND THE LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES, NATURE HERITAGE PROGRAM (225-765-2821) SHOULD BE NOTIFIED AND NO DREDGING SHOULD OCCUR UNTIL THE STURGEON HAVE LEFT THE WORK AREA ON THEIR OWN. ANY ALARMS, SIGNALS, OR CALLS TO ACTION MUST BE MADE SUCH THAT THE BUS IS NOT DROPPED INTO THE WATER OUTSIDE THE NO-RECODING PERIOD. IF MORE THAN FIFTEEN MINUTES ELAPSES WITH NO DREDGING, THEN THE ABOVE EMERGENCY/RETRIEVAL PROCESS SHALL THEN BE AGAIN BE CONDUCTED PRIOR TO DREDGING.

17. AVOID IMPACT TO EXISTING VEGETATION. ACCESS TO OR MOVEMENT OUTSIDE OF THE DEFINED PROJECT SITE SHALL BE PROHIBITED FOR PROTECTION OF EXISTING VEGETATION. ACCESS TO ALL PERSONNEL OR ACCESS STORAGE.

SUMMARY OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>ESTIMATED QUANTITY</th>
<th>ACTUAL QUANTITY</th>
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<td>SURVEYING</td>
<td>LUMP SUM</td>
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<td>ACCESS AND FLOTATION CHANNELS</td>
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<td>SAND FILL</td>
<td>CUBIC YARDS</td>
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QUANTITIES SHOWN ARE FOR BID PURPOSES ONLY AND WERE CALCULATED ACCORDING TO CONDITIONS SURVEYED FROM 2/12/02 TO 3/21/05. THE OWNER RESERVES THE RIGHT TO ADJUST QUANTITIES HIGHER OR LOWER WITHOUT ADJUSTMENT OF THE UNIT PRICE.
TYPICAL SECTION C-C'
TYPICAL ROCK BREAKWATER BY END-ON-CONSTRUCTION
FOR ALIGNMENT COORDINATES 620-530 (REACH 3)
NOT TO SCALE

TYPICAL SECTION D-D'
TYPICAL ACCESS CHANNEL
NOT TO SCALE

NOTES:
1. ROCK SHALL MEET LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT CLASS 250 POUND STONE, OR OWNER APPROVED EQUIVALENT. GRADATION TESTS OF REPRESENTATIVE STONE (15 TON MIN. SAMPLE SIZE) SHALL BE MADE AT THE QUARRY, CERTIFIED TEST RESULTS MUST BE SUBMITTED AND APPROVED BY ENGINEER PRIOR TO PLACEMENT. THE ROCK PLACEMENT METHOD SHALL PRODUCE A REASONABLY WELL GRACED ROCK MASS WITH REGULAR MINIMIZED AND A VERTICAL TOLERANCE OF 6 INCHES ABOVE FINAL GRADE. ROCK SHALL BE PLACED TO FULL THICKNESS IN ONE LIFT WITH A MAXIMUM DROP OF 1 FOOT TO AVOID DAMAGING THE GEOGRID COMPOSITE FOLLOWING THE INSPECTIONS AND SURVEYS ON DAYS 1 AND 30. ADDITIONS OF ROCK MAY BE REQUIRED FOR ISOLATED SECTIONS OF THE BREAKWATER AS DIRECTED BY THE ENGINEER. FLOATATION CHANNELS SHALL NOT BE BACK FILLED UNTIL THE BREAKWATER HAS BEEN ACCEPTED BY THE ENGINEER.
2. ANY REFERENCES TO MAINTENANCE LIFTS ARE FOR INFORMATIONAL PURPOSES ONLY AND NOT IN THE CURRENT SCOPE.
3. THE CENTERLINE OF THE ROCK BREAKWATERS SHALL BE CONSTRUCTED ALONG THE ALIGNMENT SHOWN ON SHEETS 4 AND 14. THE ACTUAL ALIGNMENT MAY BE ADJUSTED BY THE ENGINEER PRIOR TO CONSTRUCTION IN ORDER TO MEET CHANGING FIELD CONDITIONS. IF ADDITIONAL QUANTITIES FOR ROCK AND GEOGRID COMPOSITE ARE NECESSARY, THEY WILL BE PAID FOR AT THE UNIT PRICE BID FOR THE ITEM.
4. DUE TO THE PRESENCE OF EXISTING STRUCTURES AND DEBRIS, THE ROCK BREAKWATERS NEAR THE FORMER NAVAL FACILITY AT OLD SHELL BEACH SHALL BE CONSTRUCTED USING THE END-ON-CONSTRUCTION TECHNIQUE. THIS TECHNIQUE SHALL EMPLOY LAND BASED EQUIPMENT (I.E. TRUCK, TRACK Hoe, ETC.) TO CONSTRUCT THE BREAKWATER WHILE PROGRESSING ALONG THE ALIGNMENT. ACCESS TO THIS PORTION OF THE BREAKWATERS SHALL BE RESTRICTED TO THE ADJACENT FLOATATION CHANNELS AND ROCK BREAKWATERS. THE CREATION OF ADDITIONAL FLOATATION CHANNELS NOT INCLUDED IN THESE PLANS IS STRICTLY PROHIBITED. CONSTRUCTION ACTIVITIES SHALL BE RESTRICTED WITHIN THE WIDTH SPECIFIED IN THE END-ON-CONSTRUCTION DETAIL ON THIS SHEET.
5. THE MAXIMUM RADIUS ON ALL ACCESS CHANNELS COMING INTO THE FLOATATION CHANNELS ARE EQUAL TO 250'.

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION

STATE PROJECT NUMBER: PD-36
FEDERAL PROJECT NUMBER: PD-36
APPROVED BY: LEATHER REECE
DATE: MARCH 2007
SHEET 41 OF 51
1. THE GEOGRID COMPOSITE SHALL OVERLAP THE TOE OF THE BREAKWATER BY A MINIMUM OF 3' ON EACH SIDE. THE OVERLAP AT THE PANEL ENDS SHALL BE A MINIMUM OF FIVE (5) FEET WIDE AND PARALLEL TO THE BREAKWATER CENTERLINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

2. EACH PANEL SHALL CONSIST OF GEOTEXTILE STRIPS THAT ARE FASTENED BY KEVLAR THREADS (OR EQUIVALENT) AND OVERLAIN BY GEOGRID THAT IS MECHANICALLY CONNECTED BY DOUBLE STITCHED SEAMS. THE COLOR OF THE THREADS SHALL BE IN CONTRAST TO THE GEOGRID AND GEOTEXTILE.

3. EACH ROW OF STITCHING SHALL BE LOCATED A MINIMUM OF TWO (2) INCHES FROM THE GEOTEXTILE EDGE.

4. SEAMS IN GEOGRID WERE MADE IN THE FIELD USING 3/8" DIAMETER POLYETHYLENE BUCKING BARS

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
817 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

STATE PROJECT NUMBER: PO-32
FEDERAL PROJECT NUMBER: PO-32
DATE: MARCH 2009

DRAWN BY: SHANNON BAXTER
DESIGNED BY: SHANNON BAXTER
APPROVED BY: LEE LE BAL, P.E.

SHEET 44 OF 11
120.0' LONG, 1½" Ø A36 GALVANIZED STEEL TIE ROD THROUGH CENTERLINE OF WALER SPACED AT 3.0' INTERVALS (TYP. 2 PER TIE ROD CONNECTION) SEE DETAIL F

6½" GALVANIZED STEEL TUBE VALER (TYP.) SEE DETAIL E

7.0' LONG, 3" Ø PVC PIPE (TYP. 1 PER TIE ROD CONNECTION AT BOTH ENDS OF STRUCTURE) SEE DETAIL F

10.0' LONG, 1½" Ø A36 GALVANIZED STEEL TIE ROD THROUGH CENTERLINE OF WALER (TYP. 1 FOR EACH TIE ROD CONNECTION AT BOTH ENDS OF STRUCTURE) SEE DETAIL F

14.0' LONG, 2" Ø PVC PIPE (TYP. 1 PER TIE ROD CONNECTION) SEE DETAIL F

2.0" THICK 250 LB CLASS ROCK LAYER PLACED ON GEOGRID COMPOSITE AND 2-0" SAND LAYER

STEEL SHEETPILE (TYP.) SEE DETAIL G

17.0' (TYP.)

5.0' (TYP.)

5.0' (TYP.)

4.0' (TYP.)

2½" SLOPE

2½" SLOPE

2½" SLOPE

2½" SLOPE

2½" SLOPE

2½" SLOPE

2½" SLOPE

EXISTING BREAKWATER CROWN EL VARIES BREAKWATER CROWN EL VARIES SEE SECTIONS A-A AND B-B'

EXISTING BREAKWATER TO BE EXTENDED TO SHEETPILE STRUCTURE

GALVANIZED STEEL WALER SPlice (TYP.) SEE DETAIL G

10.0' 10.0'

20.0' (TYP.)

28.0' (TYP.)

250 LB. CLASS ROCK SCOUR PROTECTION BERM (TYP. BOTH SIDES)

NOT TO SCALE

TYPICAL SECTION G-G'

TOP VIEW

ROCK BREAKWATER AND SHEET PILE STRUCTURE INTERFACE FOR ALIGNMENT COORDINATES 125, 9-11, & 126 (REACHES 1 AND 2). NOT TO SCALE

NOTE:

1. SEE SHEET 40 FOR SECTIONS A-A' AND B-B'.

2. SEE SHEET 41 FOR DETAIL C.

3. SEE SHEET 11 FOR DETAILS D, E, F, G, AND H.

4. 2" WEEP HOLES SHALL BE DRILLED AT ELEVATION +0.5' NAVD88 SPACED ON 8' CENTERS. GEOGRID COMPOSITE LAYER SHALL OVERLAP EACH HOLE.

5. SEE TECHNICAL SPECIFICATIONS FOR SAND.

6. SAND LAYER SHALL BE MONITORED FOR SETTLEMENT AND BACKFILLED TO MAINTAIN ELEVATION +0.5 NAVD88 FOR A MINIMUM OF 30 DAYS PRIOR TO PLACEMENT OF GEOGRID COMPOSITE AND STONE LAYER.

7. EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.

A  S00107  REVISED TIE RODS & WALTERS  SF

LOUISIANA DEPARTMENT OF NATURAL RESOURCES

COASTAL ENGINEERING DIVISION

43 WILSON STREET

BATON ROUGE, LOUISIANA 70802

LAKE BORBOLE SHORELINE PROTECTION

STATE PROJECT NUMBER: 8961

FEDERAL PROJECT NUMBER: 8209

DATE: MARCH 2008

TYPICAL SHEET PILE STRUCTURE SECTIONS

DESIGNED BY: THOMPSON WATERS, P.E.

APPROVED BY: JUAN LE-BAIL, P.E.

DRAWN BY: SHANE FAUST

REV. DATE DESCRIPTION BY

SHEET 47 OF 51
TYPICAL SECTION G-G'

NOTES:
1. SEE SHEET A FOR SECTIONS A-A' AND B-B'.
2. SEE SHEET B FOR DETAILS C, D, E, F, G, AND H.
3. 2.0' WEED HOLES SHALL BE DRILLED AT ELEVATION +0.5 NAVD88 SPACED ON 6' CENTERS. GEOGRID COMPOSITE LAYER SHALL OVERLAP EACH HOLE.
4. SEE TECHNICAL SPECIFICATIONS FOR SAND.
5. SAND LAYER SHALL BE MONITORED FOR SETTLEMENT AND BACKFILLED TO MAINTAIN ELEVATION 2.0 FOR A MINIMUM OF 30 DAYS PRIOR TO PLACEMENT OF GEOGRID COMPOSITE AND SAND LAYER.
6. EXISTING BREAKWATERS ARE TO BE EXTENDED TO SHEETPILE STRUCTURE USING ADDITIONAL ROCK.

LEGEND
- 250 LB CLASS STONE
- EXISTING SOIL
- SAND

14.0' LONG, 3" Ø PVC PIPE
(TYP. 1 PER TIE ROD CONNECTION)
SEE DETAIL F

6"x6"x2' AS90 OR B GALVANIZED STEEL
TUBE WALER (TYP.) SEE DETAIL E

12.0' LONG, 3-1/2" Ø AS60 GALVANIZED STEEL
TIE ROD SPACED AT 9.0' INTERVALS THROUGH CENTERLINE OF WALER
(TYP. 1 PER TIE ROD CONNECTION)
SEE DETAIL F

2' HIGH, 250 LB CLASS ROCK
SCOUR PROTECTION BERM (TYP.)
BASE EL = MODULINE
CROWN EL = MODULINE + 2.0'

GEOGRID COMPOSITE BETWEEN
ROCK AND SAND LAYERS
SEE DETAIL C

TYPICAL SHEET PILE STRUCTURE INTERFACE
FOR ALIGNMENT COORDINATES 129, 9-17, & 126 (REACHES 1 AND 2)
NOT TO SCALE

A 5/01/07 REVISED TIE RODS & WALERS  SF

REVISIOR BY: SHANNON HAYNE, P.E.

LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL ENGINEERING DIVISION
411 NORTH 3RD STREET
BAYOU ROUGE, LOUISIANA 70802

LAKE BORDEAUX
SHORELINE PROTECTION
STATE PROJECT NUMBER: PO-11
FEDERAL PROJECT NUMBER: N/A
APPROVED BY: LUKE LE BA, P.E.

DATE: MARCH 2009

SHEET 48 OF 41
**NOTES:**
1. GALVANIZED COATING SHALL BE APPLIED AS PER PROJECT SPECIFICATIONS.
2. 2" DIA TUBE WESP HOLE HOLES SHALL BE DRILLED INTO SHEET PILES AT ELEVATION +0.5' NAVD88 USING 3/8 SPACING ON CENTERS.
3. 1-5/16" D TIE ROD HOLES SHALL BE DRILLED INTO SHEET PILES IN CONJUNCTION WITH TIE RODS AND WASHERS.
4. STEEL SHEET PILE SHALL BE 25-27 SECTIONS OR EQUIVALENT WITH THE FOLLOWING PROPERTIES:
   - SECTION MODULUS = 30.2 IN^4 FT
   - MOMENT OF INERTIA = 134.2 IN^4 FT
   - WEB THICKNESS = 0.375".

**DETAIL D**
NOT TO SCALE
STEEL SHEET PILE DETAIL

**NOTES:**
1. FASTEN TIE RODS USING 3/8" X 30 D SINGLE QUALIFIED BOLTS, NUTS, AND WASHERS.
2. TIE RODS SHALL NOT PENETRATE SPACES.
3. SUCCESSIVE WALER TUBES SHALL BE SECURED EVENLY BY BOLT PATTERN.
4. SPACES SHALL BE INSTALLED NO SPAN OF TIE RODS.
5. WALER SPICE IS 3/8" THICK GALVANIZED STEEL.

**DETAIL E**
NOT TO SCALE
STEEL SHEET PILE (TP) TIE ROD (TP)

**NOTES:**
1. SUCCESSIVE TUBES TO BE JOINTED USING WELD IN DETAIL H.
2. TUBES SHALL BE CUT TO PROPER ANGLE IN SHOP TO ACCOMMODATE ALL ANGLES IN THE SHEET PILE ALIGNMENT.
3. ALL WASHERS TO BE FULLY GALVANIZED AFTER FABRICATION AND PRIOR TO INSTALLATION.
4. 2-1/2" SCHEDULE 80 PIPE WELDED INSIDE BOTH SIDES OF WASHER (TP).
5. 1/4" THICK ASSY GALVANIZED STEEL TUBE WASHER (TP).
6. GALVANIZED STEEL WASHER (TP). 2 PER TIE ROD.
7. W2-1/2" D GALVANIZED STEEL WASHER (TP). 2 PER TIE ROD.
8. ADD 45° ANGLE SPACER FOR TIE ROD CONNECTIONS AT TAPERED ENDS OF STRUCTURE.

**DETAIL F**
NOT TO SCALE
STEEL SHEET PILE (TP) TIE ROD (TP)

**NOTES:**
1. TENSION SHALL BE APPLIED TO THE BOLTS ON EITHER END OF THE TIE ROD.
2. 2" Ø PVC PIPES SHALL BE SLEEVED OVER TIE ROD PRIOR TO INSTALLATION OF TUBERCULE. PVC PIPE TO BE EQUALLY DISTRIBUTED OVER TIE ROD AFTER TURNBACK IS TENSIONED.
3. THE TUBING END OF THE STRUCTURE, THE E (2) TIE RODS SHALL BE AT 1/8 X 5" FASTENED WITH 1/2" Ø A36 GALVANIZED STEEL TUBERCULE AND SLEEVED WITH 1/3" Ø PVC PIPES.

**DETAIL H**
NOT TO SCALE
TYPICAL CONNECTION ISOMETRIC DETAIL

**NOTES:**
1. 1-5/16" HOLE THROUGH WASHER AND SHEET PILE AT TIE ROD CONNECTION (TP). SEE DETAIL E.