KCS RR CROSSING COMPRESSIVE
PILE CAPACITIES
### IE QMS - Americas
#### Independent Technical Review

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Lake Maurepas Diversion</th>
<th>Client</th>
<th>CPRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location</td>
<td>St. John the Baptist</td>
<td>PM</td>
<td>Naveen Chilliara</td>
</tr>
<tr>
<td>Project Number</td>
<td>10001876</td>
<td>PIC</td>
<td>Mike Patorno</td>
</tr>
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(This section is to be completed by the Project Manager or the PM's Designee.)

**Assigned Reviewer:** Dwayne Smith  
**Comments Required by:** June 18, 2013

<table>
<thead>
<tr>
<th>Work Product Originator</th>
<th>Ignacio Harrouch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Product to be Reviewed</td>
<td>Pile capacities</td>
</tr>
<tr>
<td>Review Scope:</td>
<td>Check for technical completeness and applicability</td>
</tr>
<tr>
<td>Specific Instructions:</td>
<td>Check for proper pile types, lengths, applicability, and report adequacy, validity and completeness</td>
</tr>
</tbody>
</table>

**Submitted by:** [Signature]  
**Date:** 9/30/13

#### Project Manager Signature

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>9/30/13</td>
</tr>
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</table>

(This Section is to be completed by the Reviewer.)

**Select:**

- **A.** Reviewer has no comments.
- **B.** Comments have been provided on:
  - [ ] Marked directly on work product
  - [ ] Comment and Disposition Form 3-5
  - [ ] Other; Specify: [Click to enter text.]

**Reviewer Signature**  
**Date:** 6/18/2013

(This section is to be completed by the Reviewer after verification of comment incorporation, if box B is checked off above.)

**Select:**

- **C.** Verification of comment incorporation has been performed by Reviewer. There are no outstanding issues.
- **D.** Verification of comment incorporation has been performed by Reviewer. Unresolved issues have been submitted to the Project Manager or Designee for resolution.
- **E.** Reviewer asserts that the work product ITR is complete.

**Reviewer Signature**  
**Date**

### APPROVAL and DISTRIBUTION

- [x] ITR is complete.  
  
  **[Signature]**  
  **Date:** 9/30/13

**Project Manager or Designee Signature**  
**Date**

### Distribution:

- Project Central File - Quality File Folder
- Other - Specify: [Enter names here.]

Page 1 of 1
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(This section is to be completed by the Project Manager or the PM's Designee.)

Assigned Checker: Graham Forsythe
Comments Required by: June 18, 2013

Work Product Originator: Ignacio Harrouch
Work Product to be Checked: Pile capacities

☑ This Detail Check is a check for correctness, completeness and technical accuracy.
☐ This Detail Check is only a technical edit for format, spelling, grammar, pagination and readability.

Specific Instructions: Enter specific instructions for the work product.

Submitted by: [Signature]

Project Manager Signature: [Signature] 9/30/13

(This Section is to be completed by the Checker.)

Select:

A. ☐ Checker has no comments.

or

B. ☐ Comments have been provided on:
   - ☐ Marked directly on work product
   - ☐ Comment and Disposition Form 3-5
   - ☐ Other; Specify: Discussed with originator

Checker Signature: [Signature] 6/18/2013

(This section is to be completed by the Checker after verification of comment incorporation, if box B is checked off above.)

Select:

C. ☐ Verification of comment incorporation has been performed by Checker. There are no outstanding issues.

or

D. ☐ Verification of comment incorporation has been performed by Checker. Unresolved issues have been submitted to the Project Manager or Designee for final resolution.

and

E. ☐ Checker asserts that the work product review is complete.

Checker Signature: [Signature] Date

APPROVAL and DISTRIBUTION

☑ Detail Check is complete.

Project Manager or Designee Signature: [Signature] 9/30/13

Click here to enter a date.

Distribution:
- Project Central File – Quality File Folder
- Other – Specify: Enter names here.
**Project Name**: Lake Maurepas Diversion  
**Client**: CPRA  
**Project Location**: St. John the Baptist, LA  
**PM**: Naveen Chiliara  
**PIC**: Mike Patorno

**Assign Reviewer**: Dwayne Smith  
**Comments Required by**: August 23, 2013

**Work Product Originator**: Mahendra Shewalla  
**Work Product to be Reviewed**: Settlement Analyses  
**Review Scope**: Review for technical accuracy and applicability

**Specific Instructions**: Enter specific instructions for the work product.

**Submitted by**:  
**Project Manager Signature**:  
**Date**:  

**Comments**

<table>
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<tr>
<th>Select</th>
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| B. Comments have been provided on:  
  - Marked directly on work product  
  - Comment and Disposition Form 3-5  
  - Other; Specify: Click to enter text. |

**Reviewer Signature**:  
**Date**: 8/22/13

**Verification**

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<tbody>
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<tr>
<td>E. Reviewer asserts that the work product ITR is complete.</td>
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</tbody>
</table>

**Reviewer Signature**:  
**Date**: 

**APPROVAL and DISTRIBUTION**

- ITR is complete.  
  **Project Manager or Designee Signature**:  
  **Date**: 9/30/15

**Distribution**:  
- Project Central File – Quality File Folder  
- Other – Specify: Enter names here.
### Detail Check

**Project Name:** Lake Maurepas Diversion  
**Client:** CPRA  
**Project Location:** St. John the Baptist, LA  
**PM:** Naveen Chillara  
**PIC:** Mike Patorno  

**Assigned Checker:** Chris LaFoschia  
**Comments Required by:** August 21, 2013

- **Work Product Originator:** Mahendra Shewalla  
- **Work Product to be Checked:** Settlement Analyses  
- **Specific Instructions:** Enter specific instructions for the work product.

**Identifying Information**

**Submitted by:**  
Signature: [Signature]  
Date: 6/30/13

**Checker Signature**

Signature: [Signature]  
Date: 8-22-13

**Verification**

- **Select:**  
  - C. Verification of comment incorporation has been performed by Checker. There are no outstanding issues.  
  - D. Verification of comment incorporation has been performed by Checker. Unresolved issues have been submitted to the Project Manager or Designee for final resolution.  
  - E. Checker asserts that the work product review is complete.

**APPROVAL and DISTRIBUTION**

**Detail Check is complete.**

Signature: [Signature]  
Date: 9/30/13

**Distribution:**  
Project Central File – Quality File Folder  
Other – Specify: Enter names here.
Shear Strength Plot - Kansas City Railroad

**Shear Strength (psf)**

- Old Boring B-6 (80')
- New Boring B-6 (155')
- Strength Line
- $\gamma = 107$ pcf; CH
- $\gamma = 92$ pcf; OH
- $\gamma = 103$ pcf; CH
- $\gamma = 115$ pcf; CH
- $\gamma = 124$ pcf; CL
- $\gamma = 108$ pcf; CH
- $\gamma = 122$ pcf; CL
- $\gamma = 110$ pcf; CH
- $\gamma = 125$pcf; $\psi=32^\circ$; SP-SM
Notes:
1. Pile capacity curves represent axial resistance for a single pile and do not consider group effects.
2. Curves indicate Ultimate Capacity; the appropriate safety factors should be applied to arrive at the Allowable Capacity.
3. Pile Top Elevation: +3.0

Required Safety Factors are:
- 3.0 for tension and compression w/o load test
- 2.0 for tension and compression with load test.

Pile Capacities: Lake Maurepas KCS Rail Road - PIPE PILE - 18 inch
Notes:
1. Pile capacity curves represent axial resistance for a single pile and do not consider group effects.
2. Curves indicate Ultimate Capacity; the appropriate safety factors should be applied to arrive at the Allowable Capacity.
3. Pile Top Elevation: +3.0

Required Safety Factors are:
- 3.0 for tension and compression w/o load test
- 2.0 for tension and compression with load test.

Required Safety Factors are:
- 1.5 for tension and compression w/o load test
- 1.5 for tension and compression with load test.
Notes:
1. Pile capacity curves represent axial resistance for a single pile and do not consider group effects.
2. Curves indicate Ultimate Capacity; the appropriate safety factors should be applied to arrive at the Allowable Capacity.
3. Pile Top Elevation: +3.0

Required Safety Factors are:
- 3.0 for tension and compression w/o load test
- 2.0 for tension and compression with load test.

Undrained Strength Case with PIPE PILE - 24 inch

Drained Strength Case with PIPE PILE - 24 inch
Geometry of Embankment Section

Project No.: 10001863  August 2013  Project: Lake Maurepas - KCS Railroad Settlement Analysis

Appendix H
Ultimate Consolidation Settlement and Time Rate Settlement of Embankment 1

Project No.: 10001863   August 2013   Lake Maurepas - KCS Railroad Settlement Analysis   Appendix H
Difference in Ultimate Consolidation Settlement and Time Rate Settlement of Embankment 1 and Embankment 2

Horizontal Distance (ft)

Vertical Settlement (in)

Time Rate Settlement
- 3.0
- 4.0
- 5.0
- 6.0
- 7.0
- 8.0
- 20.0
- 0.5
- 2.0

Total Delta(Embank2-Embank1)

Second Embankment Geometry

First Embankment Geometry

Project No.: 10001863  August 2013  Lake Maurepas - KCS Railroad Settlement Analysis

Appendix H