

STRUCTURAL PRECAST OBSERVATION REPORT

Report Number: 20161098.0038
Service Date: 03/06/17
Report Date: 03/07/17
Task: Reinforcing Steel Inspections at Precast Facility for CBC

Terracon

1901 Sharp Point Dr Ste C
Fort Collins, CO 80525-4429
970-484-0359

Client

Colorado State University
Attn: Tony Flores
251 Edison Drive
Campus Delivery 6030
Fort Collins, CO 80526

Project

Shields and Elizabeth Pedestrian Underpass and Lane
Intersection of S. Shields Street and West Elizabeth Street
Fort Collins, CO

Project Number: 20161098

A site visit was made by Terracon personnel on March 6, 2017 to the Forterra Precast Concepts production plant in Henderson, CO in order to perform pre-pour visual observations for large, reinforced box culverts (RCB's) as requested. Time was spent walking thru the plant area to perform a pre-pour visual observation of the Special #2 RCB prior to contractor closing the forms and performing post-pour visual observations of (7) completed RCB's with Mr. Derek Grissom of Forterra. Time was spent observing the overall condition, dimensions, clearances, welded wire reinforcing, lift points, concrete reinforcing (rebar) and the continuous 1/2" steel weld plate with 3/8"x3" Grade 5 Hex Head Bolts for the Special #2 RCB. Overall construction of the Special #2 appears satisfactory and in general accordance with the contractor provided production drawings.

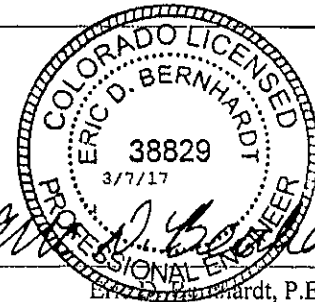
During the post-pour observation walk-thru, it was observed that several of the continuous 1/2" steel plate welds had not been re-welded (inside face) prior to moving the RCB's to the yard. Derek stated that he would have the welder complete these welds as required prior to shipping RCB's to CSU.

Services:

Terracon Rep.: Joseph Radosevich
Reported To: Derek with Forterra
Contractor: Connell Resources, Inc.
Report Distribution:

(1) Colorado State University, Tony Flores
(1) Ditesco, Erika Rasmussen
(1) Connell Resources Inc, Aaron Pacholek

Reviewed By:



Eric D. Bernhardt, P.E.
Senior Project Manager

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GENERAL OBSERVATION REPORT

Report Number: 20161098.0022
Service Date: 02/01/17
Report Date: 02/02/17
Task: Reinforcing Steel Inspections at Precast Facility for CBC

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Fort Collins, CO 80526

Project

Shields and Elizabeth Pedestrian Underpass and Lane
Intersection of S. Shields Street and West Elizabeth Street
Fort Collins, CO

Project Number: 20161098

A site visit was made by Terracon personnel on February 1, 2017 to the Forterra Precast Concepts production plant in Henderson, CO in order to perform pre-pour visual observations for large, reinforced box culverts (RCB's) as requested. Time was spent walking thru the plant area and performing visual observations of the completed RCB's with Mr. Derek Grissom of Forterra. It was observed that the precast contractor had completed approximately (8) of the 14'x9'x7' RCB's and the Special #1 RCB. A ninth 14'x9'x7' RCB was made accessible for a pre-pour observation by the contractor. Time was spent observing the overall condition, dimensions, clearances, welded wire reinforcing, lift points and the continuous 1/2" steel weld plate with 3/8"x3" Grade 5 Hex Head Bolts (see photo). Overall construction appears satisfactory with the following exception:

1. Observed that several of the 3/8" x 3" Grade 5 Hex Head Bolts were missing. Contractor was observed installing the bolts as required.

Contractor stated that production would continue for the next 12 days and requests an additional site visit next week.



Services:

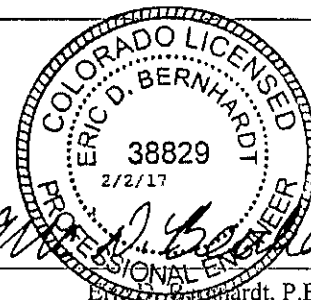
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Reported To: Derek with Forterra
Contractor: Connell Resources, Inc.

Report Distribution:

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January 30, 2017

Mr. Aaron Pacholek
Site Manager
Connell Resources
7785 Highland Meadow Parkway #100
Fort Collins, CO 80528

Mr. Pacholek,

Forterra Precast Concepts has reviewed the Structural Precast Observation Report prepared by Mr. Joseph Radosevich of Terracon dated January 26, 2017 (report number: 20161098.0017) and we would like the opportunity to make the following comments:

First: Mr. Radosevich identified an issue we had where the welded wire reinforcing interfering with the embedded anchor stud locations. We agree to implement the solution suggested by Mr. Radosevich in the observation report. We will, if and where necessary, move the location of an anchor stud to clear the wire reinforcing. The anchor bolt will be welded to the steel plate near the original location. If the bolt is turned head-in, then we will attach a steel nut to provide similar anchorage to the approved anchor stud configuration.

Second: It is our understanding that the primary purpose of the embedded weld plates is to facilitate a watertight joint. Unless directed otherwise, we will continue to fabricate weld plates and produce precast reinforced box culvert joints per the approved shop drawings.

If you have any questions or would like further information please feel free to contact us at any time.

Respectfully,

Jerry Cech

Jerome K. Cech
Senior Engineer



January 30, 2017

Mr. Aaron Pacholek
Site Manager
Connell Resources
7785 Highland Meadow Parkway #100
Fort Collins, CO 80528

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If you have any questions or would like further information please feel free to contact us at any time.

Respectfully,

Jerome K. Cech

Jerome K. Cech
Senior Engineer

STRUCTURAL PRECAST OBSERVATION REPORT

Report Number: 20161098.0017
Service Date: 01/24/17
Report Date: 02/08/17 Revision 1 - Include Response
Task: Reinforcing Steel Inspections at Precast Facility for CBC

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO 80525-4429
970-484-0359

Client

Colorado State University
Attn: Tony Flores
251 Edison Drive
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Fort Collins, CO 80526

Project

Shields and Elizabeth Pedestrian Underpass and Lane
Intersection of S. Shields Street and West Elizabeth Street
Fort Collins, CO

Project Number: 20161098

A site visit was made by Terracon personnel on January 24, 2017 to the Forterra Precast Concepts production plant in Henderson, CO in order to perform pre-pour visual observations for large, reinforced box culverts (RCB's) as requested. Time was spent walking thru the plant area and performing visual observations of the completed RCB's with Mr. Erik Sauer, Mr. Jerry Cech and Mr. Derek Grissom of Forterra. It was observed that the precast contractor had completed two (2) of the 14'x9'x7' RCB's and the Special #1 RCB. A third 14'x9'x7' RCB was made accessible for a pre-pour observation by the contractor. Time was spent observing the overall condition, dimensions, wire-reinforcing, lift points and the continuous 1/2" steel weld plate with 3/8"x3" Grade 5 Hex Head Bolts. Overall construction appears satisfactory with the following exception:

1. Observed that the 1/2" steel weld plate had nuts tack welded in place by the steel fabricator that supplied the plates. According to details on sheet 6 of 6 (Forterra Shop Drawings dated 11-3-16), the precast contractor was to screw the 3/8" bolts into the nuts to complete the connection. However, it was observed that 10-15% of the bolts could not be installed as the wire reinforcing hindered the nuts. It was further observed that the precast contractor tack welded the bolt head to the steel plate leaving threads exposed (see photos on page 2) in order to ensure proper spacing or quantity of the 3/8" bolts. It was suggested to Mr. Jerry Cech of Forterra that they could install nuts on the threaded ends of the bolts and that this may be an acceptable fix but the EOR should be consulted. Time was also spent discussing the condition of the observed welded connections that Forterra is performing in their shop area. If these welds are considered structural as opposed to "just for water-proofing" then all welds should be performed by a certified welder and according AWS D1.1. The welding rods must not be left out and on top of the welding machine but should be kept in a welding rod oven. Finally, proper welding symbols and details would enable the precast contractor to complete connections as required and this would assist in future observations.

Contractor stated that production would continue for the next 20 days and requests an additional site visit next week.

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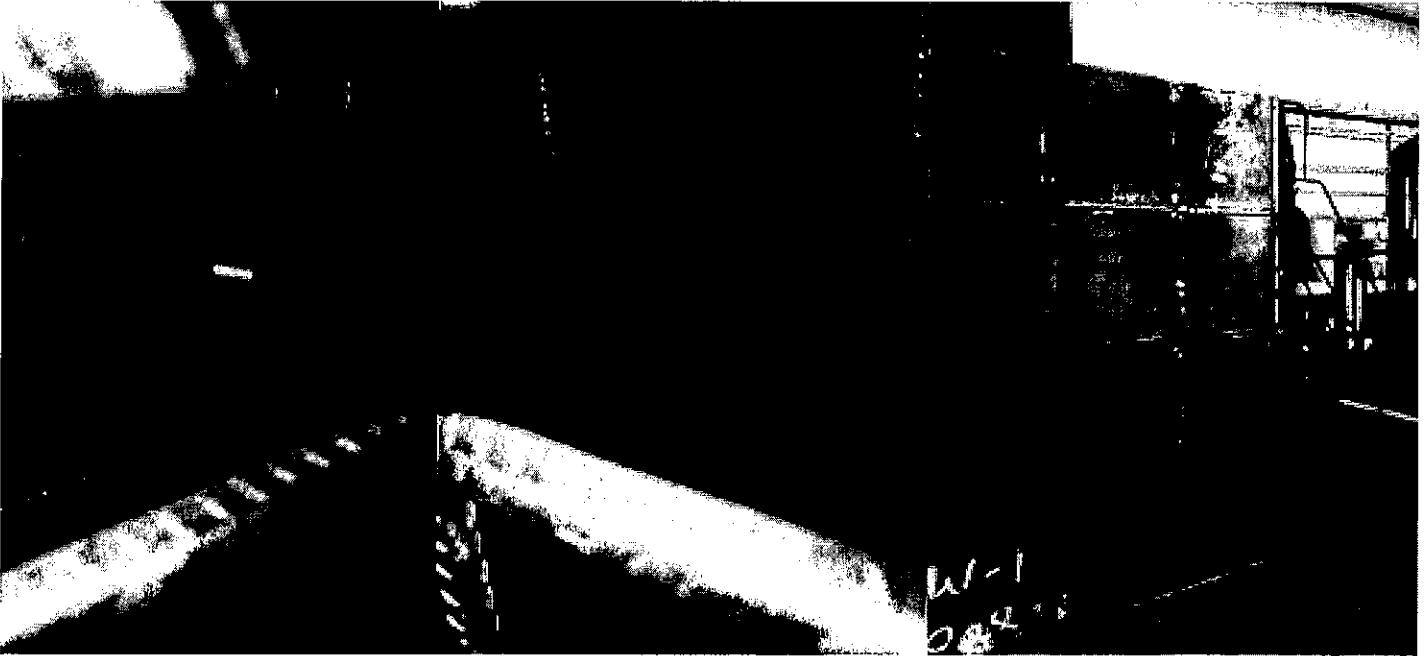
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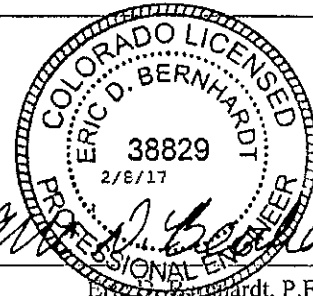
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STRUCTURAL PRECAST OBSERVATION REPORT

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Report Date: 01/26/17
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1. Observed that the ½" steel weld plate had nuts tack welded in place by the steel fabricator that supplied the plates. According to details on sheet 6 of 6 (Forterra Shop Drawings dated 11-3-16), the precast contractor was to screw the 3/8" bolts into the nuts to complete the connection. However, it was observed that 10-15% of the bolts could not be installed as the wire reinforcing hindered the nuts. It was further observed that the precast contractor tack welded the bolt head to the steel plate leaving threads exposed (see photos on page 2) in order to ensure proper spacing or quantity of the 3/8" bolts. It was suggested to Mr. Jerry Cech of Forterra that they could install nuts on the threaded ends of the bolts and that this may be an acceptable fix but the EOR should be consulted. Time was also spent discussing the condition of the observed welded connections that Forterra is performing in their shop area. If these welds are considered structural as opposed to "just for water-proofing" then all welds should be performed by a certified welder and according AWS D1.1. The welding rods must not be left out and on top of the welding machine but should be kept in a welding rod oven. Finally, proper welding symbols and details would enable the precast contractor to complete connections as required and this would assist in future observations.

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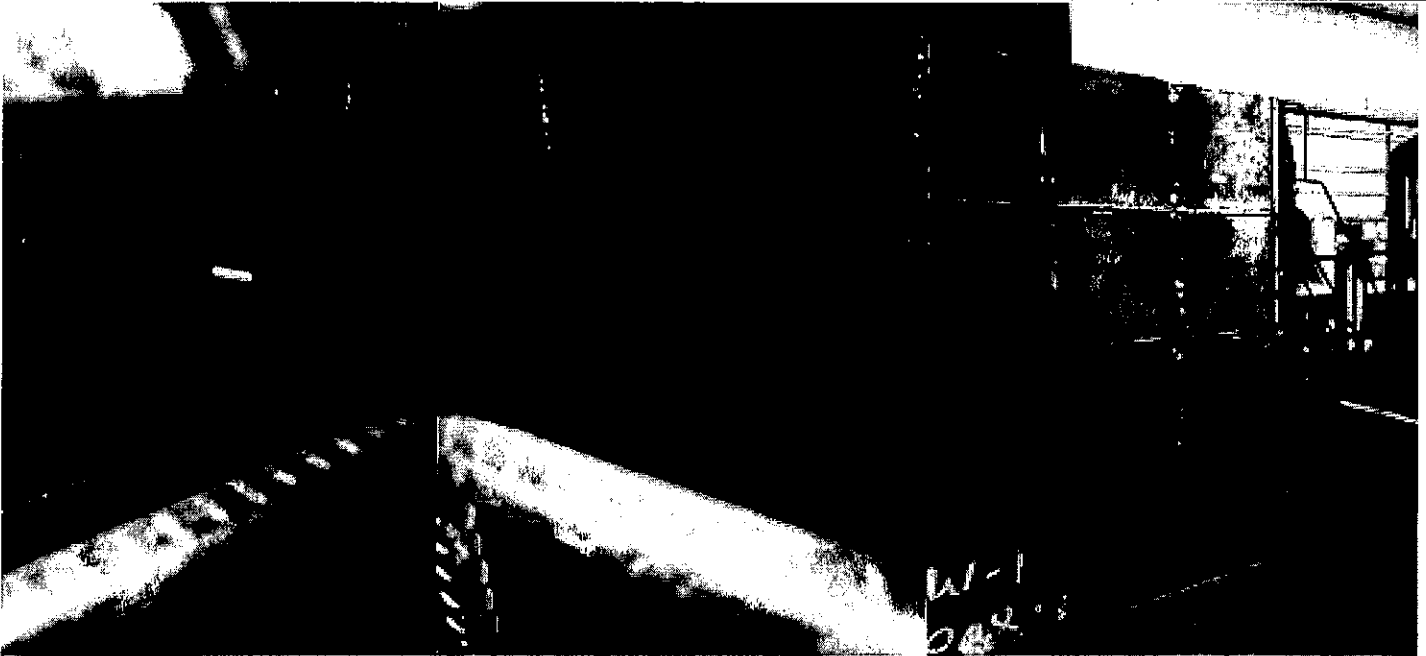
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