3.1

Dawe, Nick - Huntly Project

From: Shane Wilton
Sent: Friday, 3 June 2016 10:40 a.m.
To: Dickens, Tony - Huntly Project; Adams, Tony - Huntly Project
Subject: Casing Testing History

Gents

Summary history of casing testing as below:

2 December 2015 – Casing shipment 1 (60 x 932mm OD x 16mm WT + 60 x 711mm OD x 16mm WT – all from Heat number 1540980) started arriving on site.
10 December 2015 – Gus emailed SGS "Just want to check that your lab in Auckland received the sample piece of pile casing OK on Tuesday morning".
1[illegible]ecember 2015 – SGS confirmed receipt of casing sample.
17 December 2015 – Gus followed up with SGS "Just wondered if you might be able to give me a rough idea when you think you might have all these tests done by please?".
7 January 2016 – Gus followed up with SGS again "Any update on progress of the tests you are doing on our steel?".
7 January 2016 – SGS responded "we are in the middle of moving so have no update for you at this stage, I'm hoping we will have the workshop up again next week".
15 January 2016 – Commenced pile casing installation it Mangawara Stream Bridge, Pier B (7 (shallow founding) piles or 130 total piles on the project).
19 January 2016 – Gus to SGS "What is the status of the tests on the casing material? Are we able to get these ASAP?"
22 January 2016 – Mangawara pier B piles set and PDA testing carried out.
25 January 2016 – SGS advised they had been moving their lab and workshop facilities, so testing not done yet.
26 January 2016 – SGS Charpy test results received. Noted testing done at 0 degrees instead of -15 degrees, but still not meeting spec.
28 January 2016 – Tensile, yield and chemical composition test results received.
28 January 2016 – Two further samples sent to SGS with request to test at -15 degrees. Note code requires two further tests if initial test does not meet requirements.
28 January 2016 – Two samples sent to MTL for testing (Charpy, tensile, yield and chemical composition). Decided to u[illegible]nd lab to verify results from 1st lab.
2 February 2016 – Piling crew move to Mangawara pier C and commence pile casing installation.
3 February 2016 – All test results received from MTL. Charpy results well below spec.
4 February 2016 – Charpy results received from SGS. Charpy results well below spec, and very similar to MTL results.
4 February 2016 – Notified Steel & Tube of non-conforming results (NTSC0001).
5 February 2016 – Notified Designer of non-conforming results (NTD0045).

The decision to test the casings was instructed by me. The PR's and specifications do not require independent testing of casings. Only mill certificates were required.

The testing process was thoroughly followed, including the issuing 2 further samples after receiving the initial non-compliant result. We then exceeded normal testing requirements by engaging a 2nd IANZ accredited lab on top of the initial IANZ lab we were using.

I will continue later with more dates and details around our decision to continue piling, discussions with designers, decision to redesign, when the second casing shipment arrived, when these were tested, etc.

Regards

Shane Wilton
Structures Construction Manager

Fulton Hogan HEB Joint Venture
Waikato Expressway Huntly Section

McVie Road, PO Box 3, Huntly 3740

s 9(2)(a)

4.2

Dawe, Nick - Huntly Project

From: Dickens, Tony - Huntly Project
Sent: Friday, 2 December 2016 5:56 p.m.
To: Shane Wilton
Subject: FW: Huntly Pile statement

Email to NZTA

From: Dickens, Tony - Huntly Project
Sent: Thursday, 9 June 2016 3:34 p.m.
To: andrew.knackstedt@nzta.govt.nz
Cc: Derrick Adams; Brian Kirtlan; Sam Jack
Subject: RE: Huntly Pile statement

Hi Andrew

Here are answers to your questions

1) **How long would test results 'normally' take to be provided? They refer to delays due to Christmas and lab relocation**

We would normally expect the results to be given to us within one week by email with a formal report taking maybe two weeks.
Unfortunately it is a real "Murphy's law " event when we initially were not pressuring the lab before christmas because we had plenty of time, then no result by the christmas holiday was annoying and to find that after christmas they were moving the laboratory is really annoying.

2) **Was there any indication prior to the results being received that the steel was not up to standard – i.e. did the steel 'balloon at the ground' as reported by Radio NZ:**

"But RNZ News has been told it was only when workers began pounding the tubes into the ground, and the steel ballooned on the ends, that tests were done by an accredited laboratory."

is is a load of rubbish statement by RNZ that I think they simply made up. When you hit any steel pile with a 13 tonne hydraulic hammer and the ground provides resistance as it is meant to do you will often get some deformation of the steel top of the pile. It is normal. It can range from no deformation to quite a lot of deformation.
I have asked my staff if there was any extraordinary deformation during our pile driving and no one can remember any in particular. Having said that our steel is actually more brittle than the specification allows not more ductile. This means that any fault connected with the steel defect would show up as bits breaking of the top of the steel pile not soft deformation that looks like the steel has ballooned.
But even that is unlikely to occur. The reality of the steel non-conformance is that we have a technical defect that would only show up as a brittle failure of the pile during a very large earthquake.

It was good being able to get that off my chest.....

Regards

Tony Dickens | Project Director-Huntly Section | Fulton Hogan HEB JV | PO Box 3, Huntly 3740 | tony.dickens@fultonhogan.com | s 9(2)(a)

FULTON HOGAN | HEB | JOINT VENTURE
WAIKATO EXPRESSWAY | HUNTLY SECTION

From: Derrick Adams [mailto:Derrick.Adams@heb.co.nz]
Sent: Thursday, 9 June 2016 2:13 p.m.
To: Dickens, Tony - Huntly Project
Subject: FW: Huntly Piles
Importance: High

Hi Tony,

See the two further questions below. Can you please come back to me on these as soon as possible.

Thanks

Derrick Adams
CEO, HEB Construction Ltd
s 9(2)(a)

HEB Construction Ltd
Cnr Firth St and Norrie Rd
PO Box 226 Drury, Auckland 2247

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From: Kevin Reid [mailto:Kevin.Reid@nzta.govt.nz]
Sent: Thursday, 9 June 2016 1:49 p.m.
To: Derrick Adams <Derrick.Adams@heb.co.nz>
Cc: Tommy Parker <Tommy.Parker@nzta.govt.nz>
Subject: FW: Huntly Piles
Importance: High

Hi Derrick,

Can you please clarify Andrew's questions below.

Thanks,

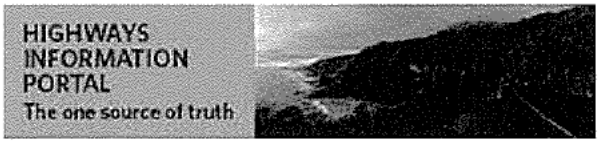
Kevin

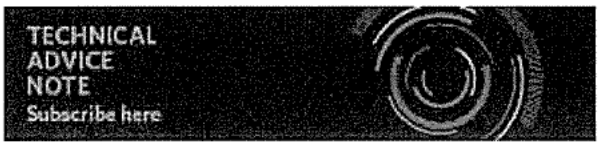
Kevin Reid /National Manager Network Outcomes
Highways and Network Operations

s 9(2)(a)

E Kevin.reid@nzta.govt.nz / W nzta.govt.nz

National Office / Victoria Arcade, 50 Victoria Street,
Private Bag 6995, Wellington 6141, New Zealand





NZ TRANSPORT AGENCY WAKA KOTAHI

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om: Andrew Knackstedt
Sent: Thursday, 9 June 2016 1:32 p.m.
To: Kevin Reid; Tommy Parker
Subject: FW: Huntly Piles
Importance: High

Hi Kevin and Tommy,

Would one of you be able to go back to Derrick to confirm a couple of things with respect to the timeline:

1) How long would test results 'normally' take to be provided? They refer to delays due to Christmas and lab relocation
2) Was there any indication prior to the results being received that the steel was not up to standard – i.e. did the steel 'balloon at the ground' as reported by Radio NZ:

> "But RNZ News has been told it was only when workers began pounding the tubes into the ground, and the steel ballooned on the ends, that tests were done by an accredited laboratory."

From: Fergus Gammie
Sent: Thursday, 9 June 2016 1:12 p.m.
To: Tommy Parker; Kevin Reid
Cc: Robyn Fisher; Andrew Knackstedt
Subject: FW: Huntly Piles

FYI & action

Fergus

From: Derrick Adams <Derrick.Adams@heb.co.nz>
Date: Thursday, 9 June 2016 at 10:00 AM
To: Fergus Gammie <Fergus.Gammie@nzta.govt.nz>
Cc: "Kirtlan, Brian - FH Auckland" <Brian.Kirtlan@fultonhogan.com>, "Dickens, Tony - Huntly Project" <Tony.Dickens@fultonhogan.com>
Subject: Huntly Piles

Hi Fergus,

Further to our conversation this morning, attached is a copy of the media statement that the FH / HEB JV have issued on the subject.

We have prepared a timeline for the testing and pile driving. It can be summarised as samples sent in for testing 8th December. Pile driving commenced 15th January
However as always the real answer is complicated by the fact that the test results were delayed and we started driving piles before we knew that the steel had failed and kept driving them with our plan B in mind.
Just a normal risk based decision to keep resources busy.

Wednesday 2nd December Pile deliveries to site commenced.
Tues 8th December samples delivered to independent Lab for testing. Naturally we expected a compliant result.
All December pile driving crew working on temporary staging, using other piles owned by HEB.
Thursday 14th January Still waiting on test results. Delay caused by Christmas and Lab physically shifting premises.
Friday 15th January. Piling crew finished staging so are available to commence bridge piles. We started based on the fact that the piles are only 25 metres deep and can be vibrated out easily if required.
Tues 26th Jan Test results finally available with a massive failure on Charpy results.
Thursday 28th Jan. additional samples sent to two Laboratories for verification testing to confirm surprising results
Tuesday 2nd February carried on piling with the plan B to turn the piles into reinforced concrete if required..
Thursday 4th February Second lot of test results available and they confirmed the steel non-conformance. Designer and Steel & Tube notified of problem.
February Plan B implemented and redesign of piles into reinforced concrete piles commenced. It was a six week process.

We have been asked two further questions as follows:

1. The names of the mill and the fabricator of the failed 1600 tonnes of steel from China. Or allow RNZ escorted access to the worksite to check the Grade 350 steel for the traceable mark on it from the manufacturer

2. The name of the ILAC-accredited laboratory that Steel and Tube says tested the steel pre-export

We believe that the answers to these two questions are commercially sensitive and FH HEB JV should notify NZ Transport Agency that the JV will not be providing that information at this time as "there is a good reason to withhold it under section 9 of the Official Information Act – to avoid unreasonable prejudice to the commercial position of the person who supplied the information or who is the subject of the information".

We would be very happy to issue a joint press statement with NZTA and I have spoken with Brian Kirtlan who confirms that FH are also comfortable with this approach.

I hope you are comfortable with our approach and I look forward to seeing the draft media statement in due course. Please let me know if you have any further issues.

Regards

Derrick Adams
CEO, HEB Construction Ltd
s 9(2)(a)

s 9(2)(a)

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A3

Dawe, Nick - Huntly Project

From: Dickens, Tony - Huntly Project
Sent: Friday, 2 December 2016 5:54 p.m.
To: Shane Wilton
Subject: FW: Huntly bypass steel - further information on testing

Here is another email to add to the list

From: Dickens, Tony - Huntly Project
Sent: Friday, 10 June 2016 5:10 p.m.
To: Andrew Knackstedt
Subject: RE: Huntly bypass steel - further information on testing

Hi Andrew

...e laboratory that we sent the steel samples to for testing in December is **SGS New Zealand Ltd** in Auckland.

Regards

Tony Dickens | Project Director-Huntly Section | Fulton Hogan HEB JV | PO Box 3, Huntly 3740 |
tony.dickens@fultonhogan.com s 9(2)(a)

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4.4

Dawe, Nick - Huntly Project

From: Dickens, Tony - Huntly Project
Sent: Friday, 2 December 2016 5:51 p.m.
To: Shane Wilton
Subject: FW: Summary of Steel specifications-Huntly
Attachments: Summary of Steel specifications-Huntly.docx

Is this the one?

Tony

From: Dickens, Tony - Huntly Project
Sent: Friday, 10 June 2016 5:00 p.m.
To: Peter Simcock; Kaye Clark
Cc: Kevin Johnson; Raj Rajagopal
Subject: Summary of Steel specifications-Huntly

I have attached a summary of every reference to the steel specifications on the project prepared by Shane Wilton.

- A few references are from the Principals requirements and the bridge manual.
- Some are from standard specifications
- The above documents only refer to "Mill certificates" and in our case these are from China.

- the majority of the references are from the project specification as you would expect in a design and construct contract.
- Our specifications are the only documents that contain references to NZ testing.

I hope this meets your needs

Regards

Tony Dickens | Project Director-Huntly Section | Fulton Hogan HEB JV | PO Box 3, Huntly 3740 |
tony.dickens@fultonhogan.com | s 9(2)(a)

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Summary of Steel Specification- Huntly

Testing requirements structural steel and pile casings from the PR, Project Specifications, Bridge Manual and other referenced Standards and Specifications as below.
Please note that Structural Steel refers to the bridge beams and other steel bridge components. Steel pile casings are not structural steel.

As Listed in the Principal Requirements

- Clause 7.5.3 requires the Construction Report to include mill certificates for all structural steel.
- PR appendix clause A5.9.1 requires structural steel to comply with materials/production/workmanship requirements in the NZTA Bridge Manual.
- PR appendix clause A5.30.2 requires us to have "appropriately skilled, experienced and qualified specialist inspectors to provide independent certification of all construction-stage activities" including structural steel fabrication and detailing.
- PR appendix A17 table of Testing and Inspections for Steelwork refers to NZS3404 and the NZTA Bridge Manual with the frequency of testing "as required by the Standards and the Contractors Designer".
- PR appendix clause A17.1.2 requires "manufacturers test results and/or such other tests as are required to verify that the materials and products incorporated into the works are as required by the relevant standards and the design" including for "steel members".

So, the PR has no specific testing requirements, but refers to other documents as noted above.

As listed in the Project Specification HUN-4-S-SP-5715 Specification for Piling

- Clause 3.2.2 states "the supply of temporary or permanent steel pile casings or pile tubes shall be in accordance with the Specification for Structural Steelwork HUN-4-S-SP-5710".
- Clause 3.2.2 also states certified mill test reports shall be provided for each consignment in accordance with clause 2.2.2 of NZS 3404.
- Clause 3.2.4.1 outlines the requirements for weld inspection and testing. All welds to be visually scanned and visually examined by the steel fabricator. All full strength butt welds are to be tested by ultrasonic or radiographic techniques. A minimum of 10% of all fillet welds are to be tested by magnetic particle techniques.

Auckland Structural Group Piling Specification (appended to HUN-4-S-SP-5715)

- Clause 2.2.2 refers to AS/NZS 1554 for welding requirements, BS3100 Specification for Steel Castings and NZS 3404 Steel Structures Standard, stating all materials and workmanship shall comply with these documents.
- Clause 2.2.4 requires the Contractor to provide the Engineer (Designer, as amended by HUN-4-S-SP-5715) with test certificates, analyses, mill certificates, tube manufacturers certificates and a record of all tests and inspections carried out.
- Clause 2.2.5 covers weld testing and inspection, similar to clause 3.2.4.1 of HUN-4-S-SP-5715 as noted above.

As listed in the Project Specification HUN-4-S-SP-5710 Specification for Structural Steelwork

- Clause 1.3.1 requires that "the Contractors and structural steelwork manufacturer's quality assurance procedures shall encompass all aspects of the structural steel construction including, but not necessarily limited to compliance for materials with relevant codes".

- Clause 1.3.2 requires that relevant quality assurance records including material test certificates are provided prior to issue of the Construction Review Producer Statement by the Designer.
- Clause 1.3.4 requires the Constructor to make available upon request mill test certificates.
- Clause 4.1 covers the requirements for testing and inspection, as detailed below.
- Clause 4.1.1 requires steel manufactured outside Australia, NZ, Japan, Canada, UK or USA to be tested for notch ductility, mechanical properties and chemical composition. Testing shall be evidenced by mill certificates.
- Clause 4.1.1 also requires that, in addition to the mill test certification, representative testing shall be undertaken in NZ by an IANZ accredited laboratory. The samples may be taken at source or on arrival in NZ.
- Clause 4.2 requires certified mill test reports to be provided in accordance with clause 2.2.2 of NZS 3404.
- Clause 4.3 covers weld inspection and testing, similar to the requirements of HUN-4-S-SP-5715.

NZS 3404 Steel Structures Standard

- Clause 2.2.2 states that sufficient evidence of compliance with the relevant material supply standard (AS/NZS 3678 in our case) shall be test reports or test certificates prepared by a laboratory accredited by signatories to the International Accreditation Corporation (ILAC) Mutual Recognition Agreement (MRA) on behalf of the manufacturer.
- The relevant material supply standard in our case is AS/NZS 3678.

AS/NZS 3678 Structural Steel – Hot Rolled Plates, Floorplates and Slabs

- This Standard specifies the requirements for production of these steel elements, including specific properties (chemical composition, yield strength, tensile strength, Charpy, elongation) and acceptance limits for the results of the testing and any imperfections.
- Sections 10 and 11 cover the requirements for obtaining samples for testing and references the various test methods.
- Section 12 covers the specific information to be reported on the test certificates.

NZTA Bridge Manual Third Edition, Amendment 1 – September 2014

- Generally refers to NZS 3404 as above.
- The Huntly structures were designed to the NZTA Bridge Manual, Third Edition, Amendment 1 – September 2014.
- Section 4.3 of the Bridge Manual outlines the analysis and design criteria for structural steel construction.
- Section 4.3.1 of the Bridge Manual states that the design of any seismic load resisting componentry expected to behave inelastically shall comply with NZS3404 Steel structures standard.
- Section 4.3.4 states that the principles set out in section 12 of NZS 3404 shall be followed if steel members are required to provide the ductility and energy dissipating capabilities of the structure, and material design codes other than NZS 3404 have been applied.
- Section 4.3.7 states that NZS 3404.1 gives acceptable compliance standards for structural steel. Evidence of compliance with the specified standards shall be obtained and shall comprise test reports or test certificates prepared by a laboratory recognised by signatories to the International Laboratory Cooperation (ILAC) Mutual Recognition Agreement (MRA) on

behalf of the manufacturer. These documents are to be traceable to the specific batches of materials used.

- Amendment 2 of the Bridge Manual, Third Edition was issued in May, 2016. No changes to the above sections were made in this amendment.

4.3.1 General	Design for the steel componentry of bridge substructures, and any seismic load resisting componentry expected to behave inelastically, shall comply with NZS 3404 *Steel structures standard*[25]. Design for the steel componentry of bridge superstructures, including seismic load resisting components expected to behave elastically, shall be in accordance with AS 5100.6 *Bridge design* part 6 Steel and composite construction[26].
4.3.4 Seismic resistance	Where materials design codes other than NZS 3404[25] are applied, if steel members are required to provide the ductility and energy dissipating capability of the structure, the principles set out in section 12 of NZS 3404[25] shall be followed. The recommendations of the NZNSEE study group on *Seismic design of steel structures*[30] shall also be followed where applicable.
4.3.7 Certification of steel	All steel, bolts, nuts and washers shall comply with the requirements of NZS 3404.1[25] and standards listed therein. Additional acceptable compliance standards to those listed in NZS 3404.1[25], acceptable for compliance to, for specific materials, are: • For nuts: AS 1112 *ISO metric hexagon nuts*[34] • For washers: AS 1237.1 *Plain washers for metric bolts, screws and nuts for general purposes – General plan*[35] • For high tensile bars: BS 4486 *Specification for hot rolled and hot rolled and processed high tensile alloy steel bars for the prestressing of concrete*[36] Evidence of compliance with the specified standards shall be obtained and shall comprise test reports or test certificates prepared by a laboratory recognised by signatories to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Agreement (MRA) on behalf of the manufacturer. These documents are to be traceable to the specific batches of material used. Alternatively for fasteners, an IANZ endorsed proof load and wedge test certificate showing they comply with the specified standard may be provided.