

Surveillance Report

Package / Item:	Bascule span to the Railway bridge "Jernbanebroen over Limfjorden"
Supplier:	MT Højgaard
Purpose of visit:	Production & Quality Surveillance – Steel structure
Location / Address:	Tarcon Tarnobrzeg Poland

Date of Visit / Review: 2011-09-15 to 2011-09-16

Inspector: SISj/MHO/ID
Checked: ID
Approved: SDU

Date issued: 2012-07-20

Distribution: SISJ/ID Rambøll

Copy to:

Torben Ulrik Jaller	Banedanmark
Bent Jensen	Banedanmark
Kenneth Sørensen	Banedanmark
Knud V Christensen	Banedanmark
Finn Juel Hansen	MT Højgaard
Per Gehlert	MT Højgaard
Jesper Lawaetz	MT Højgaard
Mogens Højen Olsen	Rambøll
Simon Sterndorff Jessen	Rambøll
Søren Duus	Rambøll
Inge Damsgaard	Rambøll

Introduction

This report is the result from the first visit of the client's supervision and control (performed by Rambøll) at Tarcon in Poland in the period of the 18-19th July 2012. The purpose of the visit was to follow up on the quality documentation and quality plan for steel structure that is required in connection with execution of the new bascule span to the Railway bridge "Jernbanebroen over Limfjorden". For further details concerning the subject and content please refer to the document LF00011-1-ID dated 2012-06-21 concerning QA-STEEL MANUFACTURING.

Summary

Overall the impression is that Tarcon is capable to perform large and complicated steel structures. The shop seemed well organized and with competent staff.

During the inspection Rambøll observed, that the standard for execution of steelworks EN 1090-2 was reasonably used and implemented in the shop. Furthermore the standard EN/ISO 3834-2 for "Comprehensive Quality Requirements" was reasonably implemented for the welding of steel structures.

Tarcon has several welding engineers IWE or EWE to perform the daily welding coordination in the shop.

Rambøll had a few major comments to some missing verification of the WPS` and the missing QA plan. These items are very urgent and need to be corrected as soon as possible.

Total time for the inspection was 6 hours at the shop.

Report

Participants from Tarcon

Romuald Pawelet	Chief of project engineering
Karol Vdjicki	Project manager
Gregour Panek	Welding engineer
Marcin Koscielniak	Production manager
Piotr Kopei	QA-responsible

Information of the subcontractor Tarcon

Number of metal workers, welders and painter:
400 in total, 100 welders, 20 painters, 4 sandblasters

Production per year in tons steel:
500-800 T per month.

Production facilities:
Approximately 100x100m shop with several travelling crane, own paint shop and sandblasting shop.





Shops with several travelling crane

Materials

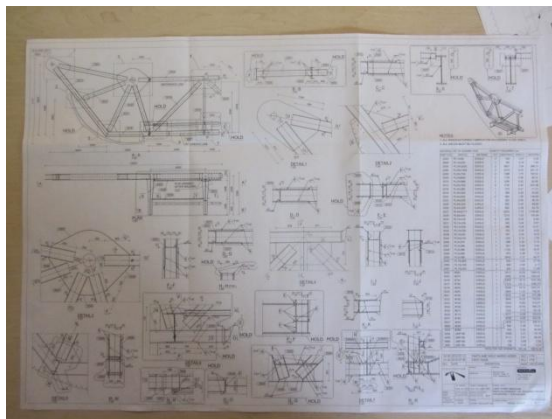
Delivery requirements:

MT Højgaard has forwarded inspection documents according to EN10204 before the meeting. Based upon a trial test, Rambøll has no comments, the steel qualities are S355J2N according to EN10025 and technical delivery conditions EN 10163 for surface conditions are mentioned.

Shop drawings and construction

Shop drawings:

Examples of shop drawings from MT Højgaard Vietnam and cutting drawings from Tarcon were shown at the meeting. On the drawing note Rambøll shall be changed to MT Højgaard Vietnam. Based upon a trial test, Rambøll has no further comments.



Shop drawings from MT Højgaard Vietnam

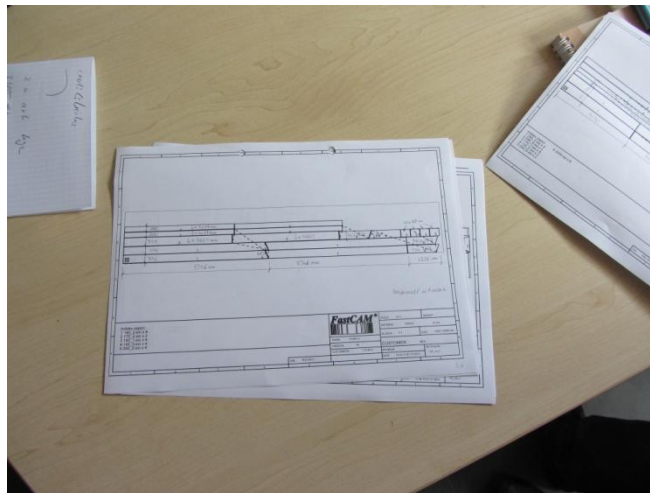
Time schedule for production

Time schedule for:

Stage of progress - approximately 5 % cutting is finished.



Cut plates for this project



Cutting/single part drawing from Tarcon

Number of metal workers, welders and painter on the job:
Approximately 5 persons.

Erection, installation transport

Way of transport:

By truck from Tarcon to Aalborg, the bridge will be divided in 6 parts with maximums of 4.5x3x17m, brackets are under consideration.

Joints

Field welded joints:

Tarcon/MT Højgaard shall forward a verified WPS for site welds. This shall include necessary weather protection suitable for the decided weld process. Tarcon informed Rambøll that joint preparation including sandblasting will be finished at shop. The steel profiles will be covered by adhesive plastic. The description of an appropriate treatment of the field weld zone will be forwarded.

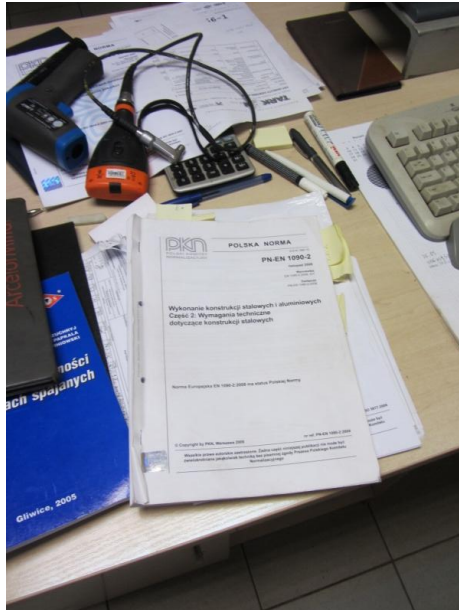
Bolted joints:

If bolted joints are chosen at transversal beams under track, Rambøll was informed that Tarcon delivers the plates and MT Højgaard delivers the bolts.

QA and execution in shop

Implementation of EN 1090-2:

The standard seems to be well implemented and known in the shop.



EN 1090-2 on the QA inspectors table, it seemed well used

Suitability of equipment for thermal cutting:

Gas cutting with propane gas is used; the quality seems to be acceptable. Plates thinner than 12 mm are cut by shearing and additionally grinded. Tarcon were aware of the risk of hardening when cutting thick plates. Rambøll was informed that water cutting at a subcontractor is used at thick plates to avoid preheat at gas cutting.

Comment after the meeting: According to VD-AAB-Steel work section 3.2.4 shearing is only permitted for 8 mm plates and minor plate thicknesses. I.e. shearing is not permitted on this project.

Traceability – principle of marking of items:

Rambøll was informed of the procedure for traceability, and find it acceptable.

Hard stamps are not allowed according to VD, AAB Steelworks section 3.2.1. Pen markers shall be used for welder's signature on the steel surfaces. Rambøll was informed that welders ID additionally will be noted on the production drawings.



Examples of items numbers on plates.



Hard stamps used on another projects

Sharp edges to be rounded to radius 2 mm:

Rambøll was informed that Tarcon is aware of this requirement. This will be checked at next inspection.

Pressure test:

Pipes and box profiles shall be closed and pressure tested, according to BD-SAB section 2.1.

Procedure for flame straightening:

Rambøll received a procedure for flame straightening. Tarcon needs to perform inspection report for each flame straightening according to EN1090-2 section 6.5.3. Rambøll has no further comment based on a trial test.

Contractors plan of QA:

Rambøll was informed that a QA plan will be forwarded at the end of week 30. After the meeting Rambøll has the following comment: Tarcons QA plan should have been forwarded before the start of the production, urgent.

NDT:

NDT will be performed according to EN/ISO 17635. Certificates for level 2 and 3 inspectors have been forwarded to Rambøll. Tarcon informed that the examination organization is independent of the production. Examination methods, extent of NDT, test methods; MT, UT and VT at butt welds, test methods MT and VT at fillet welds. The NDT personal are aware of necessity of inspection lots. Extend of NDT shall be according to EN 1090-2 table 24.

NDT-plan

Rambøll received a copy of the NDT plan. Rambøll has no comment based on a trial test.

NDT-reports

Will be checked at next inspection.

Minimum hold times before execution of NDT

Rambøll was informed that NDT will be executed minimum 24 hours after welding.

Tension force perpendicular to surface:

UL-examination according EN 10160, where shown on the project drawings from Niras, class S2 is required. This will be checked at next inspection.

Welding procedures, welding plan

WPS:

Tarcon showed WPS and WPQR verification tests for the project. Rambøll had the following comments:

- WPS no. KAT 10-707 is verified according to DnV. This differs to the required EN 15614. Tarcon shall perform a deviation report.
- The welding engineer showed a WPS for butt welds in 50 mm plates with a preheating of 150 degrees celcius. The welding engineer informed Rambøll that butt welds in 20-40 mm plates will be performed with preheating of approximately 75 degrees celcius. A WPS for this type of welding was missing. Tarcon shall forward an additional WPS for butt welds in 20-40 mm plates.
- On WPS no. 87/09 and no. 24/09, shall the travel speed, heat input and allowable wearing (maximum width of run) be stated. This shall be according to the WPQR. This comment governs for all WPS where relevant.

During the next visit at the shop, Rambøll will inspect that the welding inspector or the welding engineer from Tarcon will check the essential parameters for the welding process. Reference is made to EN ISO 3834-2 section 14.3 (check of current, arc voltage, travel speed, preheat and welding sequence etc.). Rambøll will furthermore inspect, that the above mentioned check are reported and documented.

Weld plan:

Rambøll received a welding plan from Tarcon. After the meeting Rambøll has the following comments.

- The welding engineer informed Rambøll that an additional drawing will be performed for showing WPS numbers and welding sequences.
- The welding plan shall fulfill the requirement in EN 1090-2 section 7.2.2 and EN ISO 3834-2 section 10.1 and include; Preheat of tack welds, removal of tack welds when performing final welds, minimizing of distortions, sequence of welding, intermediate NDT checking, turning of components during welding, welding positions, avoid of lamellar tearing, acceptance criteria level B+ for welds (highest level)
- Ref. to WPS no. 16/9 shall be changed to WPS no. 138/10 on the welding plan by Tarcon.

During the inspection Rambøll had some serious comments to the WPS's and the WPQR's. At latest the 26. th of July and before proceeding of the weldings on the actual project MT Højgaard / Tarcon shall forward the revised welding plan incl. WPS's and WPQR's. to Rambøll.

Calculation of preheat temperature according to EN 1011-2:

The welding engineer showed DS/EN 1011-2 for calculation of preheat temperature. Rambøll has no comment.

Deformations of plates and profiles caused by weldings, overlength at shopdrawings:

The welding engineer is aware of the necessary compensation for weld creep and welding sequence for minimizing deformation.

Qualification test of welders according to EN 287:

Tarcon has before the meeting forwarded a list of certified welders and examples of welder certificates. Rambøll has no comments for this. Rambøll will follow up on this subject at next inspection.

Tack welds:

Rambøll informed that tack weld shall be removed when performing final welds, this shall be stated on the shop drawings. The length of tack welds shall be minimum 50 mm according to EN 1090-2 section 7.5.7. The tack welds shall be preheated according relevant WPS.

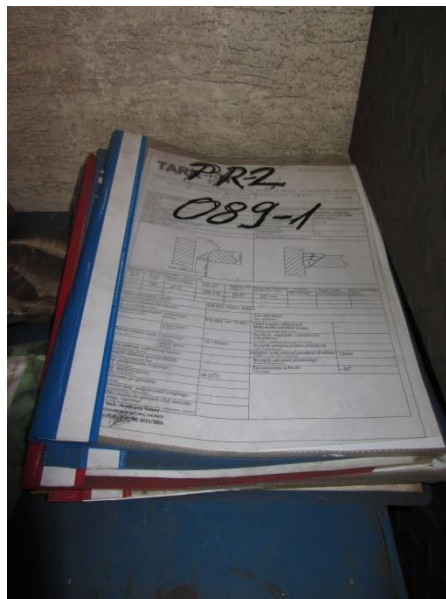


To short tack welds on profiles to another project

Rambøll was informed by the welding engineer that tack welds will be performed by welders certified according to EN 287.

Does the single welder possess the WPS?

The WPS's were shown by the production manager, and were placed on a table in the production shop.



WPS from another project was placed on a table in the production shop

Storage and handling of welding consumables:
Will be checked at next inspection.

Surface irregularities:

The welding engineer showed Rambøll a WPS for weld repair of surface irregularities. Rambøll has no comment based on a trial test.

Stray arches:

Stray arches should be avoided, if they occur they should be grinded and examined by MP and VT according to EN 1090-2 section 7.5.17.



Stray arches on another project

Sub-contractors

Tarcon informed Rambøll that no subcontractors will be used on this project.

Surface treatment

Paint system:

Tarcon showed a proposal for a Hempel paint system, for C5-M high. A project specified system will be forwarded soon. This will include RAL color and gloss.

Rambøll was informed that sandblasting will be performed with cupper slag, SA2½, to a roughness according to the paint system. Each paint layer will have different color and Tarcon was aware of additional brush paint at corners etc. to secure sufficient paint layer.

Test plates according to En 12944 will be forwarded.

Paint shop:

The sandblasting shop and paint shop were inspected at Tarcon, and Rambøll had no comment.



Separate paint shop