

Tata Steel Technical Standard

S1310100 **Ordering, execution and testing / inspection for new construction, repair or modification of storage tanks**

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Information

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Introduction

1 Scope of the standard

This standard covers the manufacture, supply, repair and modification of storage tanks within the scope of the Tata Steel IJmuiden policy regulation Quality Health Safety and Environment (QHSE) 5.24: Tank Inspection Regime.

This standard describes the procedure according to which manufacturing, supplies, repairs and modifications must be carried out and applies to the following persons:

- the Tata Steel IJmuiden client from a work unit and / or supporting service unit that is responsible for preparing the application specification
- the manufacturer or contractor accepting the order.

In the field of storage tanks, the following also applies within Tata Steel:

- Tata Steel IJmuiden policy regulation Quality Health Safety and Environment (QHSE) 5.20: Integrity management of installations,
- Tata Steel technical Standard S1300401 Ordering, execution and inspection for new construction, repair or modification of pressure equipment.

2 Organization

For all matters within the framework of these regulations, please contact:

The regime: Tank Inspection Regime (TIR), Tel: +31 (0) 251 4 99728,

Postal address: Tata Steel IJmuiden, PTC CTY KDT TIR, PO Box 10 000, 1970 CA IJmuiden.

E-mail address: KDT-TIR@tatasteelurope.com

In relation to this Standard, TIR is responsible for:

- Offering consultancy to the client during the development of the application specification, whereby attention is paid to, among other things, material choice, possible corrosion surcharges, design choices and support in the formulation of the client's requirements(work unit).
- Evaluation of a drawn-up request specification for an order for a new storage tank,
- Execution of quality assurance during the manufacture of a new-built storage tank on the TSIJ company site in accordance with the agreed Inspection Test Plan (ITP),
- Execution of the Pre-Commissioning Inspection (PCI, IVI in Dutch),
- In case of repairs and changes, the assesment of the design and declaration / verification of inspection requirements,
- Managing the original worksheets per registered storage tank classified under category 1A / B and 3A according to the QHSE5.24 TIR.

3 Newly built storage tanks

For new-built storage tanks, (harmonized) standards shall be used; such as NEN-EN 14015 in combination with Eurocode 3 NEN-EN 1993-4-2, NEN-EN 12285, NEN EN 13445, NEN-EN 13121 and NEN-EN 13341. Use of other design standards such as AD-merkblatter, ASME, etc. is only permitted after consultation with the integrity regime manager and written approval. Depending on the design parameters and geometry the design standard shall be selected.

This standard obliges the manufacturer to:

- Carrying out a risk inventory;
- Providing identification marking (name plate);
- Delivery of a manufacturing book including applicable documents, such as the new construction certificate, tank conformity certificate, certification of applied leak detection system, certificate of applied safety device. The manufacturer must provide the manufacturing book according to the table of contents included in document KDT-FORM-048 "Contents of manufacturing book Storage tanks". This document is available via the [Asset Integrity page](#) of the KDT department, TIR new construction, and must be added as an appendix to the request for tender. Depending on the applicable legal directive, the involvement of a NL Conformity Assessment Body (NL-CBI) is required to a certain extent;
- Providing instructions for use in the Dutch language or other agreed language;
- Providing the Declaration of Conformity (DOC);
- Affixing a CE marking (if applicable).

The order must state:

- If the new-built storage tank is equipped with designated pressure equipment (for example a heating coil), the order shall state which party is considered as "manufacturer according to the Pressure Equipment Directive (PED)"

If Tata Steel is the manufacturer, the procedure as laid down in Tata Steel Technical Guideline R1300401 must be used for the piping that is included in the application specification. In that case, Tata provides the "EU Declaration of Conformity" as laid down in the PED, supported if necessary by the underlying declarations "Declaration of Conformity for manufacturing and installation of pressure equipment" and "Declaration of conformity for pressure equipment design" (see R1300401).

Upon delivery of an assembly, the declaration of conformity and other documents must be submitted for each component subject to registration, in accordance with Tata Steel Technical Standard S1300401.

If preconditions or exclusions with regard to use are set in the instructions for use (for example, compulsory performance of NDT examinations during the use phase, which must be included in a KDT inspection plan), this must be discussed in advance with the client.

The following design parameters regarding pressure and temperature apply to TIR:

- The design pressure of a storage tank is greater than or equal to -20 mbar(g) and less than or equal to 500 mbar(g).
- Design temperature in accordance with applicable design standard and / or Tata Steel Directive.

3.1 Design standards / assessment guidelines

The table below contains the prescribed design standards / assessment guidelines and the Tata Steel Technical Guidelines that relate to new-built storage tanks. Depending on the purposes of the new-built storage tank, the client must adhere to one of the following design standards / assessment guidelines and the Tata Steel Technical Guideline.

TIR category	Legal directive	Description type of storage tank	design standard / assessment guideline Tata Steel Technical Guideline	Type of medium storage
1A	PGS29	Vertical cylindrical above-ground steel tank, with bottom resting on a foundation	NEN-EN 14015 in combination with Eurocode 3 NEN-EN 1993-4-2	BTX
1B	NRB2012	Vertical cylindrical above-ground steel tank, with bottom resting on a foundation	NEN-EN 14015 in combination with Eurocode 3 NEN-EN 1993-4-2	Tar, Emulsion, A-water
		Vertical cylindrical above-ground steel tank with a coned bottom.	NEN-EN 14015 and Eurocode EN1993-1-4 (cone)	
2A	PGS30	Aboveground horizontal cylindrical steel tanks up to 150 m ³	NEN EN-12285-2 BRL-K796	Diesel oil, gasoline, Waste oil, Home heating oil
		Aboveground rotation molded polyethylene (PE) tanks up to 10 m ³	NEN-EN 13341 BRL-K21002	
		Steel horizontal single- and double-walled non-cylindrical tanks up to 3 m ³	BRL-K798	
		Above-ground metal non-stationary and mobile storage and delivery installations of no more than 3 m ³	BRL-K744	
		Above ground Polyethylene tanks with collection tray for non-stationary / mobile storage 1,2m ³	BRL-K580	
2B	PGS28	Underground horizontal cylindrical steel tanks up to 150 m ³	NEN EN-12285-1 BRL-K747	Diesel oil, Gasoline, gas oil
		Underground horizontal cylindrical glass fiber reinforced thermoset plastics with a content of up to 100 m ³	BRL-K548	
		Underground thermoplastic non-movable tanks up to 10 m ³	NEN-EN 13341 BRL-K21002	
3A	PGS31	Aboveground horizontal cylindrical steel tanks up to 150 m ³	NEN EN-12285-2 BRL-K796	Sulfuric acid, sodium hydroxide solution, hydrochloric acid, chlorine bleach
		Above ground single and double walled vertical cylindrical steel tanks up to 150 m ³	NEN-EN 13445 BRL-K756	
		Aboveground vertical cylindrical steel tanks of no more than 5 m ³	BRL-K797	

TIR category	Legal directive	Description type of storage tank	Design standard / assessment guideline Tata Steel Technical Guideline	Type of medium storage
3A		Aboveground horizontal single and double-walled non-cylindrical steel tanks up to 3 m ³	BRL-K798	
		Aboveground GRP tank with or without liner	NEN-EN 13121-1 to -4 BRL-K21011	
		Aboveground stationary, non-pressurized, welded, single-walled or double-walled thermoplastic plastic tanks up to a maximum of 100 m ³	BRL-K21009 DVS-2205-1 to DVS-2205-5	
		Aboveground rotation cast polyethylene (PE) tanks from 0.45 to a maximum of 10m ³	BRL-K21008	
		Underground horizontal cylindrical steel tanks up to 150 m ³	NEN EN-12285-1 BRL-K747	
3B	NRB2012	Above ground single-walled flexible plastic storage tank in an integrated steel collection tray up to 150 m ³	BRL-K21028	Waste oil, Lubricants, Hydraulic oil, rolling oil
		Aboveground rotation molded polyethylene (PE) tanks up to 10 m ³	NEN-EN 13341 BRL-21002	
		Aboveground steel tanks for hydraulic installations	R1420102 R1420104	
4A		Depending on the purposes, one of the above mentioned design standards must be applied		A-water, Leakage water, extinguishing water

If a new-built storage tank is not ordered in accordance with one of the above design standards and / or assessment guidelines, the client must first agree with the integrity regime manager of KDT. The client must then describe or supply all of the following product requirements and determination methods in the PTC request specification:

- Design drawings and calculations;
- Requirements and test methods for material properties;
- Requirements and test methods connection techniques to storage tanks and drip trays;
- Additional requirements for storage tanks and drip trays manufactured on site;
- A Management of Change (MoC) must be drawn up in connection with deviations from this standard.

PTC request specification

The client must apply the PTC Template Standard Request Specification for ordering a new storage tank. The application specification must also include a completed data sheet, see example of a Data sheet in Appendix 1. The data sheet must at least include the following aspects:

- Design and process parameters of the new-built storage tank,
- Design and process parameters of the new built heating coil (if applicable),
- Design and process parameters of the new construction of internal pipework (if applicable),
- Prescribed NDT techniques,

- Prescribed preservation system and repair system (coating system and surface treatment) per object according to Standard S3105601 Corrosion control by use of protective coatings ,
- Nozzle item list,
- Setup views of the new-built storage tank with the main dimensions and nozzle positions indicated.

Integrated Project Approach for new construction projects

Prior to drawing up an application specification, the client must contact the PTC-ADM department regarding the provision and support of the Integrated Project Approach (IPA). During the new-built project, the PTC-ADM department will focus on, among other things, the technical documentation provided by the manufacturer/fabricator and setting up the maintenance management system (SAP). The PTC-ADM department will also focus on existing drawings that may need to be revised and / or canceled.

Inspection Test Plan (ITP) Mechanical new built tank

The client must add the document KDT-FORM 053 Inspection & Test Plan new construction storage tank as an example as a separate appendix to the application specification. This ITP contains the minimum amount of activity descriptions that the manufacturer must adopt in his own ITP. The manufacturer must submit his own ITP to KDT-TIR for assessment. The document is downloadable from the [Asset Integrity page](#), KDT department, TIR new building.

3.2 Accessories

New construction heating coil

For a new-built storage tank that is equipped with an internal heating coil, the obligation applies that the client must report this to the KDT Pressure vessel inspection service (DTD) department to have it tested whether the heating coil complies with the Technical Tata Steel S1300401 falls. This check must be carried out based on the fact, that the heating coil is regarded as a pressure vessel. This means volume (liters) x design pressure, volume is calculated by the total spiral length x inner diameter.

The following points of attention must be observed by the client:

- There are manufacturers/fabricators who have a PED certified quality system to design, manufacture & test pressure equipment (heating coil) and issue a declaration of conformity in accordance with PED. (KVI is not provided by the manufacturer, the DTD does this with NL-CBI)
- If a manufacturer/fabricator does not have a PED certified quality system, the manufacturer/fabricator must involve a Conformity Assessment Body (EU-CBI) in the entire manufacturing process (design assessment, supervision of manufacture, final acceptance). (KVI is not provided by the manufacturer, the DTD does this with NL-CBI)
- While determining the design data to be used for a new-built heating coil, the client must consult the existing steam system (P&ID). Specific attention must be paid here to: the presence of reducing stations, the presence of safety devices, including the applicable certificates.

Inspection of pressure equipment before commissioning (KVI)

Before a pressure equipment (duty of registration) may be put into service, an inspection prior to commissioning must be carried out. This is carried out by DTD (user inspection service) & NL-CBI (Supervisor). It is important that all data of the pressure equipment is available and that the set-up conforms and that the pressure safety device and its certificate has been checked before the device is subjected to an KVI.

The client must contact the DTD at least 2 weeks ahead of the KVI IPC to plan the date.

New construction safety devices

Newly ordered safety devices (under- and overpressure safety devices) that protect storage tanks must comply with the 2014/68/CE directive. Standard S1300401 describes the procedure with regard to the purchase, registration (unique safety number, VH number), re-inspection periods and periodic revision and validation (in conjunction with KDT-TIR) of the safety devices .

New construction pipework

The technical requirements that the new-built piping must meet, including any internal piping, can be found in the following Tata Steel IJmuiden Technical Standards and Guidelines:

- Selection of piping material, design standard according to the pipe specification. If it concerns duty of registration pressure equipment, it is obligatory to report this to the KDT-DTD department in accordance with Tata Steel Technical Standard S1300401. In case of a change to existing pipework, the owner must follow the MoC procedure;
- Selection of medium code according to Tata Steel Technical Standard S1471201 Media definitions; descriptions and design principles of media and energy carriers in use at Tata Steel;
- Manufacture pipework according to Tata Steel Technical Standard S1450401 Execution and inspection of welding (for plastic pipework the same principles apply) Material with 3.1 certificate, pressure test, dimensions and materials according to pipe class.
- Pressure test pipework according to the relevant design standard and Tata Steel Technical Standard S1474001 General requirements for pressure testing of piping systems;

The client must observe the following for pipework:

In the case of a new-built tank, the new pipework to be connected shall only be lose of measuring after the hydrostatic test of the tank, because height differences (settlement) may arise during the hydrostatic test.

Coating application

All coating applications of products to be preserved must be in accordance with Tata Steel Standard S3105601 Corrosion control by use of protective coatings. The colors to be used must be in accordance with Tata Steel Technical Standard S1917301 Application of colors and safety colors. The pre-treatment and preservation system (s) to be used that are included in the application specification must be assessed in advance by an expert from the KDT-COR department.

The following must be observed by the client, namely:

- In the case of repair work on existing tanks, the client must have the coating tested whether it contains chromium-6 and / or lead-based coating layers;
- In the case of new construction, the client must clearly specify in the application specification at which location the new-built tank will be manufactured, due to the climate conditions where the surface preparation and coating work will take place. The choice should be made in consultation with an expert from the KDT-COR department.

If the client states in the application specification that a new-built tank should be lined internally with a rubber lining, the following must be taken into account:

- Surface preparation according to Technical Tata Steel Standard S3105601 (S-01);
- Application of hard (ebonite) / soft rubber according to manufacturer standard;
- The type of ebonite or rubber lining material to be used that is referred in the request for tender, must be approved in advance by an expert from the KDT-COR department.
- Inspection and Test Plan of the contractor must be submitted in advance to KDT-COR for approval..

Lifting lugs (temporary / permanent)

All welding of lifting lugs to be installed must be performed according to Tata Steel Technical Standard S1450401 Execution and inspection of welding, and subjected to 100% NDT.

Insulation

A new-built storage tank that shall be provided with insulation must meet the requirements included in the Tata Steel Technical Guideline R1327301 Manual thermal insulation according to CINI. The following points for attention must be taken into account by the client and be included as a requirement in the request for tender:

- A specific description of which CINI regulations apply that cope with the tank design to be used;
- Keep the manhole (s) free or have them completely insulated;
- The installation of inspection hatches for inspection, to allow inspection during the use phase, in agreement with KDT-TIR;
- If in a new construction, vertical cylindrical above-ground steel tank of which the bottom rests on a foundation, and the tankshell needs to be isolated, then the bottom-wall connection must be kept free of insulation (keep approximately 150 mm from the bottom edge), to prevent the phenomenon of corrosion under insulation, see photo. ;



- If the insulated tank roof is entered during the use phase due to operation and / or maintenance of accessories, the request for tender must state that the insulation must allow pedestrian access, so that no water ingress occurs;
- If the hull is finished with corrugated plate, specific designs for access must be included in the request for tender. The images below show different access designs, these relate to access hatches level with inspection hatches, nozzles, manholes, pipe supports and supports for an access staircase.



Earthing

Newly built steel storage tanks must be provided with earthing according to Tata Steel Technical Standard S2173201 Power systems, earthing and protection provisions for low voltage installations. The amount is at least 1 or more according to the applicable legal directive. In the case of new-built plastic storage tanks, it depends on the applicable legal directive whether the tank must be provided with earthing. An example drawing of an earth ridge is included in Appendix 2.

Identification marking

Newly built storage tanks and pipework must be provided with an identification marking in accordance with Tata Steel Technical Standard S1768101 Marking of medium carriers. The tank identification number must be placed large on the tank wall or wall insulation applied in at least 1 wind direction.

Foundation

In the case of a new-built project, the client must assess whether the existing or new-built foundation meets the applicable prescribed design specifications. The following practical situations may apply:

- New-built foundation in accordance with the applicable prescribed new-built design specification;
- Restore existing foundation in accordance with the applicable prescribed new-built design specification;
- Have an existing foundation that complies with current design regulations repaired.

The client must observe the following points for attention and include them as a requirement in the application specification:

- Which laws and regulations apply;
- Which design standard should be applied;
- Which prevention facility (s) should be included in the design to prevent water ingress, if the new-built storage tank has a bottom that rests on the foundation. Appendix 3 includes an example of a concrete foundation designed in such a way that no water ingress can occur (using a drip edge) and the design is also equipped with a soil leak detection system. If there is a sand bed mound, the example in Appendix 4 applies.
- Which prevention facility(ies) should be included in the design to prevent a new-built storage tank from coming into contact with a liquid that is collected in a collection facility during its lifespan;
- Which prevention facility (s) should be included in the design in order to minimize the soil contamination risk, if the new-built single-walled storage tank has a bottom that rests on the foundation.

The prescribed design, the manufacturing process and the commissioning must be assessed / supervised by an expert from the PTC-MCE-CIV department in consultation with the KDT integrity regime manager.

Catch facility

In the case of a new-built project, the client must have it assessed whether the existing or new-built catch facility meets the applicable prescribed design specifications. The following practical situations may apply:

- New construction of catch facility in accordance with the applicable prescribed new construction design specification;
- Restore existing catch facility to the applicable prescribed new-built design specification
- Have existing catch facility that complies with current design regulations repaired.

The client must observe the following points for attention and include them as a requirement in the request for tender:

- The collection capacity of the existing or new-built catch facility must comply with the applicable directive, whereby the surrounding (in case of several storage tanks) in the catch facility is decisive;
- An assessment must be carried out as to whether the existing or new-built catch facility must be a retaining or a tight physical barrier;
- The existing or new-built catch facility must be resistant to the stored medium.

Stairs - ladders - steps and railings

If a new-built tank is fitted with new-built stairs, platforms, railings and possibly a cage ladder, the Technical Tata Steel Standard S3298001 Straight steel stairs - ladders - platforms and railings must be used for the design.

Assembly of flange connections

- An important point for attention is that the assembly contractor uses the correct materials and adheres to the prescribed tightening torques.

The assembly must be carried out according to the method described in EN1591-4.

- The materials and tightening torques must be stated on the assembly drawing of the new-built storage tank, which are determined by the tank builder.
- The tightening torques for a plastic tank & flanges are particularly important. Due to the properties of plastic, the tightening torques will be many times lower than with steel.

4 Pre-commissioning inspection (IVI) of newly built storage tanks

The pre-commissioning inspection (IVI) includes:

- Check for the presence of the required documents, including the tank certificate of conformity and the manufacturing book issued by the manufacturer;
- A statement from the owner that the integration of the storage tank into the system is in accordance with its intended purpose, is set up safely, functions safely and can be safely filled and emptied. This declaration concerns the form KDT-FORM-049 Tata Steel User declaration of conformity. This document is available from the [Asset Integrity page](#) from the KDT department under TIR new construction.
- An initial inspection performed by the KDT department as the basis for the inspections in the use phase.

Newly built storage tanks according to TIR category 1A must be subjected to an pre-commissioning inspection, to be carried out by a NL-CBIT, prior to start of operation. .

Newly built storage tanks according to TIR category group 2A / B must be subjected to a visual initial inspection, to be executed in coöperation with the Integrity Regime Manager of KDT.

The NL-CBI / DTD performs a pre-commissioning inspection (KVI) for new built pressure equipment subject to registration (for example a heating coil). In that case, the manufacturer and / or owner must inform the DTD in advance, so that after the implementation of the pressure equipment, the KVI can be carried out in collaboration with the NL-CBI.

5 Modification and repair of storage tanks

In the purchase order, the client must indicate whether the storage tank requires duty of registration. If this is unclear to the contractor (subcontractor), he must inquire about this with the client or the KDT-TIR. In the overview below, the procedure for (temporary or permanent) repair or change is indicated for the notifiable and non-notifiable storage tank

Repair / change notifiable storage tanks (with TIR involvement) in accordance with QHSE5.24 TIR

- Owner reports repairs / changes to the KDT-TIR in advance;
- Owner records the (temporary) repair / change in a Management of Change (MoC) report and the risk inventory is a part of the MoC;
- Owner / contractor submits repair / change proposal to KDT-TIR and / or NL-CBI;
- Proposal must be in accordance with the relevant design standard, see Tata Steel Technical Guideline R1350101 Prescribed repairs to pipework, tanks and vessels;
- KDT-TIR and / or NL-CBI assesses repair / change proposal;
- KDT-TIR and / or NL-CBI assesses Inspection & Test Plan (ITP) based on approved repair / change proposal;
- KDT-TIR and / or NL-CBI monitors repair / change based on ITP
- Contractor sends as-built data and repair / change documents to KDT-TIR and / or NL-CBI for verification;
- KDT records the findings on the notes sheet and informs the owner;
- If repair / change affects the manner of use, the equipment or the set-up, a commissioning inspection by the KDT-TIR and / or NL-CBI will be executed.

Repair / change of non-duty of registration storage tanks according to QHSE5.24 TIR

- Contractor carries out the repair / change, taking into account the recognized standards, see also Tata Steel Technical Guideline R1350101 Prescribed repairs to piping, tanks and vessels and Tata Steel Standard S1450401 Execution and inspection of welding work is in force.
- If the intended change (for example as a result of other medium conditions, increased volume) results in the storage tank becomes subjected to duty of registration, then the steps mentioned above must be followed. The TIR classification in SAP must also be changed.

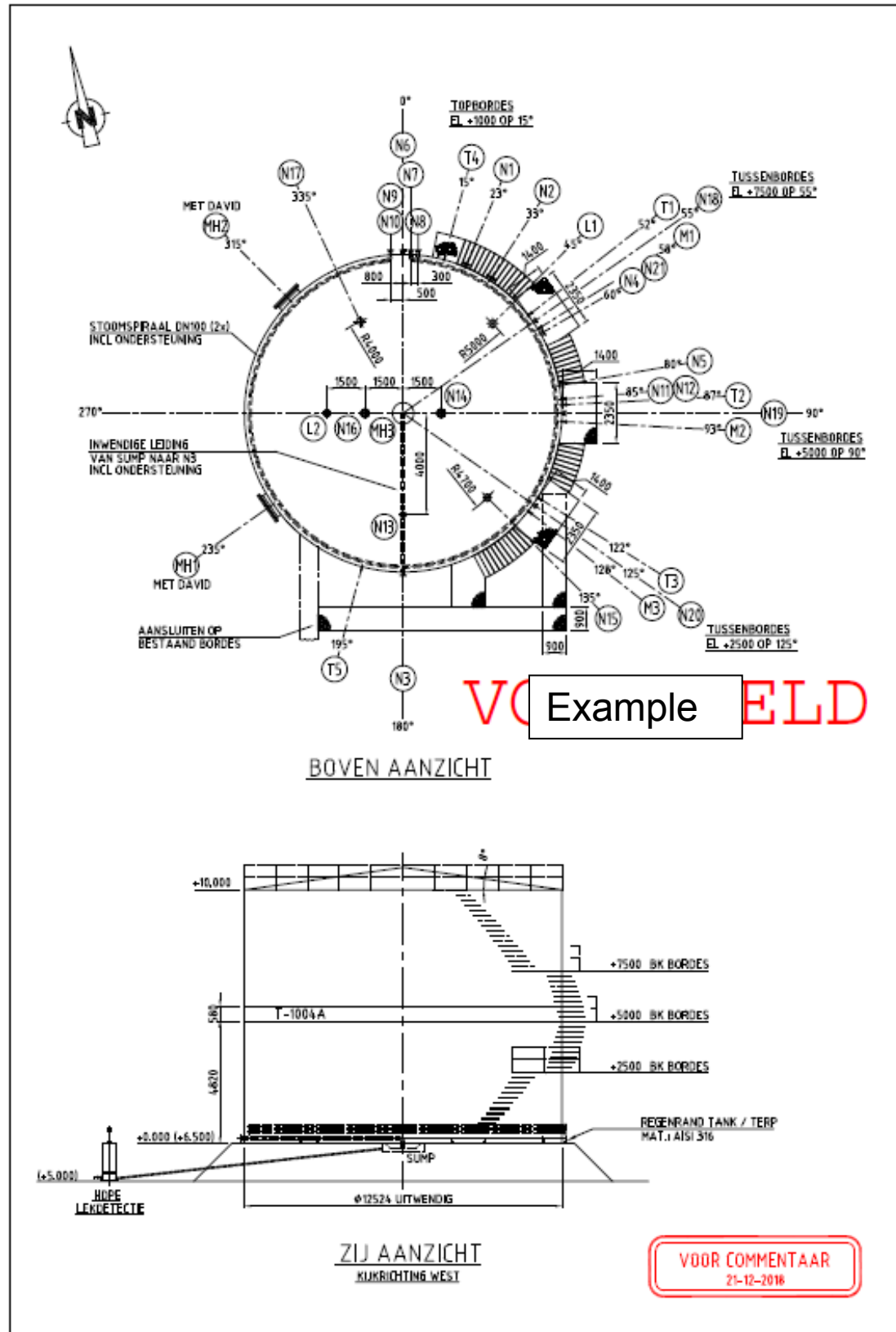
6 References

This standard refers to:

Directive 2014/68/EU PED (previously 97 / 23EC)	Directive of the European Parliament and of the Council of 15 May 2014 on the harmonization of the laws of the Member States concerning the making available of pressure equipment on the market.
RTOD	Rules for Appliances Under Pressure
EEMUA159	Engineering Equipment and Materials Users Association - Guideline inspection, maintenance and repairs for above-ground flat-bottomed storage tanks.
PGS28	Publication series on Dangerous Substances - Guideline for liquid fuels - underground tank installations and delivery installations.
PGS29	Publication Series on Dangerous Substances - Guideline for above-ground storage of flammable liquids in vertical cylindrical tanks.
PGS30	Publication series on Dangerous Substances - Guideline for liquid fuels - above-ground refueling installations and delivery installations.
PGS31	Publication Series on Dangerous Substances - Guideline for other liquids - storage in underground and aboveground tank installations.
NRB2012	Dutch Soil Protection Directive 2012, the NRB supports the assessment procedures for possible forms of soil protection soil-threatening business activities within establishments, in order to achieve a negligible risk.
QHSE 5.20	Integrity management of installations.
QHSE 5.24	Tank inspection Regime
Tata Steel Technical Standard S1917301	Application of colors and safety colors
Tata Steel Technical Standard S1300401	Ordering, execution and inspection for new construction, repair or modification of pressure equipment
Tata Steel Technical Standard S1450401	Execution and inspection of welding in steel
Tata Steel Technical Standard S3105601	Corrosion control through preservation
Tata Steel Technical Standard S1471201	Media definitions
Tata Steel Technical Standard S1474001	General requirements for testing piping systems
Tata Steel Technical Standard S3298001	Straight steel stairs - ladders - landings and railings
Tata Steel Technical Standard S1768101	Marking of media carriers
Tata Steel Technical Standard S2173201	Power systems, earthing and protection devices for low voltage installations

Tata Steel Technical Guideline R1300401	Pressure equipment decision manu
Tata Steel Technical Guideline R1327301	Thermal insulation manual according to CINI
Tata Steel Technical Guideline R1350101	Prescribed repairs to pipework, tanks and vessels
NEN standards	
EN 1591-4	Flanges and their connections - Design rules for flange connections with round flanges and gaskets - Part 4: Qualification of personnel installing bolted connections in critical pressure systems

Appendix 1 - Example completed data sheet for request for tender.



DATA - STOOM SPIRAAL		DATA - TANK T-1004A	
PROCESS DATA		PROCESS DATA	
OPERATING TEMP. Min./Max.	+290 °C	OPERATING TEMP. Min./Max.	0 / +60 °C
OPERATING PRESS Min./Max.	10 barg	OPERATING PRESS Min./Max.	mbarg
DESIGN TEMP. Min./Max.	-10 / +350 °C	DESIGN TEMP. Min./Max.	-20 / +120 °C
DESIGN PRESSURE	17 barg	DESIGN PRESSURE	-5 / +10 barg
TEST PRESSURE	VLGS EN 13480 barg	TEST PRESSURE	VLGS EN 14015 barg
VOLUME	N.T.B. m³	VOLUME	1200 m³
LIQUID VOLUME	N.T.B. m³	LIQUID VOLUME	m³
MEDIUM	STOOM / CONDENS	MEDIUM	EMULSIE
DENSITY	KG/m³	DENSITY	KG/m³
CORROSION ALLOWANCE	1 mm	CORROSION ALLOWANCE	VLGS EN 14015 mm
WGHT EMPTY	KG	WGHT EMPTY	N.T.B. KG
FACTORY NO.		FACTORY NO.	
VESSEL NO.		VESSEL NO.	T-1004A
DANGER CLASS		DANGER CLASS	

MATERIAAL		MATERIAAL	
PLIP	VLGS PIPE CLASS A270	PLATEN BODEM ANGULAR RING	3.1 (EN 10204) P265GH (EN 10028)
FITTINGEN	VLGS PIPE CLASS A270	PLATEN BODEM MIDDENVELD	3.1 (EN 10204) P265GH (EN 10028)
FLENZEN	VLGS PIPE CLASS A270	PLATEN ROMP EN DAK	3.1 (EN 10204) P265GH (EN 10028)
LEDINGEN DIENEN TE VOLDOEN AAN	EN 13480 & TATA STEEL PIPE CLASS A270	PROFIELEN TANK CONSTRUCTIE	2.2 (EN 10204) S235JR (EN 10025)
		PROFIELEN BODEM DRUIPRAND	- AISI 316 (EN 10088)
		PROFIELEN OVERIGE	- S235JR (EN 10025)
		BUIZEN STOMP/MANGAT t = 10 mm	3.1 (EN 10204) ASTM A106 GRADE B
		BUIZEN STOMP/MANGAT t = 10 mm	3.1 (EN 10204) ASTM A333 GRADE 6
		FLENZEN STOMPEN	3.1 (EN 10204) P250GH (EN 10028)
		FLENZEN MANGATEN	3.1 (EN 10204) S355J2+N (EN 10025)
		LEDINGWERK	3.1 (EN 10204) P235GH (EN 10216)
		BOUWEN EN HOEREN	- 8,8 / 8
		PAKKINGEN	- KLINGERSIL C-4430
		CORROSE TOESLAG VLGS EN 14015	DAK 1MM EXTRA

ONDERZOEK EN TESTEN T-1004A	
INSPECTIE DOOR	TANK LEVERANDEUR
RADIOGRAFSCH ONDERZOEK	BODEM: 25% VAN DE STUKKEN IN ANNULAR RING ROMP: 75% VAN DE KRUISPUNTEN PER RONDNAAD ROMP: 1% VAN DE HORIZONTALE LASNADEN ONDERSTE RING: 5% VAN DE VERTICALE LASNADEN
	VOLGENDE ROMPRINGEN: 1% VAN DE VERTICALE LASNADEN
MACHNETSCH ONDERZOEK	BODEM/ROMP VERBINDINGEN & WANDDOORVOERINGEN: IN-/UITWENDIG DUBBELINGSPLATEN, LAS SUMP AAN BODEM, CLIPS STUKKEN ANNULAR PLATES INWENDIG
	BODEMTEST : LASNADEN INZEPEN EN VACUUMBOXEN MET 350 MBAR ONDERDRUK
	HYDRASTATISCHE TEST : GEVULD MET WATER TOT AAN BOVENZIJDE ROMP
	DAK TEST : LASNADEN INZEPEN BIJ EEN INWENDE DRIJK VAN 11 MBAR
	VACUUM TEST : VLGS EN 14015

OPPERVLAKTE BEHANDELING T-1004A	
VOORBEHANDELING	PLATEN EN UITWENDIGE CONSTRUCTIEDIENEN: -ALZIJDIG STRALEN SA 2 1/2 -BUITENZIJDE 20 MICRON SIGMAWELD MC SHOPPRIMER
UITWENDIGE CONSERVERING	ROMP, DAK EN UITWENDIGE CONSTRUCTIEDIENEN IS-01 & T-01 -GEHELE OPPERVLAK STRALEN SA 2 1/2 -1 VOLLE LAAG 50 MICRON D.L.D. INTERZINC 52 -1 VOLLE LAAG 125 MICRON D.L.D. INTERGUARD 475 MD -1 VOLLE LAAG 100 MICRON D.L.D. INTERGUARD 475 -1 VOLLE LAAG 75 MICRON D.L.D. INTERTHANE 990 SG (RAL 7037)
	BELETERING EN MARKERING -TANKWAND VOORZIEN VAN LICHTGRUIZE BAAN (RAL 7035) -OP DEZE BAAN DONKERGRUIZE TEKST "EMULSIE T-1004A" (RAL 7037)
	UITWENDIGE CONSERVERING : -TRAPPEN, HEKWERKEN EN LADDERS (S-02 & T-02) -STRALEN SA 1 -1 VOLLE LAAG 50 MICRON D.L.D. INTERGUARD 269 -1 VOLLE LAAG 125 MICRON D.L.D. INTERGUARD 475 MD LIGHT GREY -1 VOLLE LAAG 100 MICRON D.L.D. INTERGUARD 475 OFF WHITE -1 VOLLE LAAG 60 MICRON D.L.D. INTERTHANE 990 SG (RAL 1018)
	INWENDIGE COATING : - THERMISCH VERZINKT : BOUWEN EN HOEREN, TRAPPEN, HEKWERKEN, TREDEN EN ROOSTERS ONBEHANDELD : SPANTEN EN INTERNALS

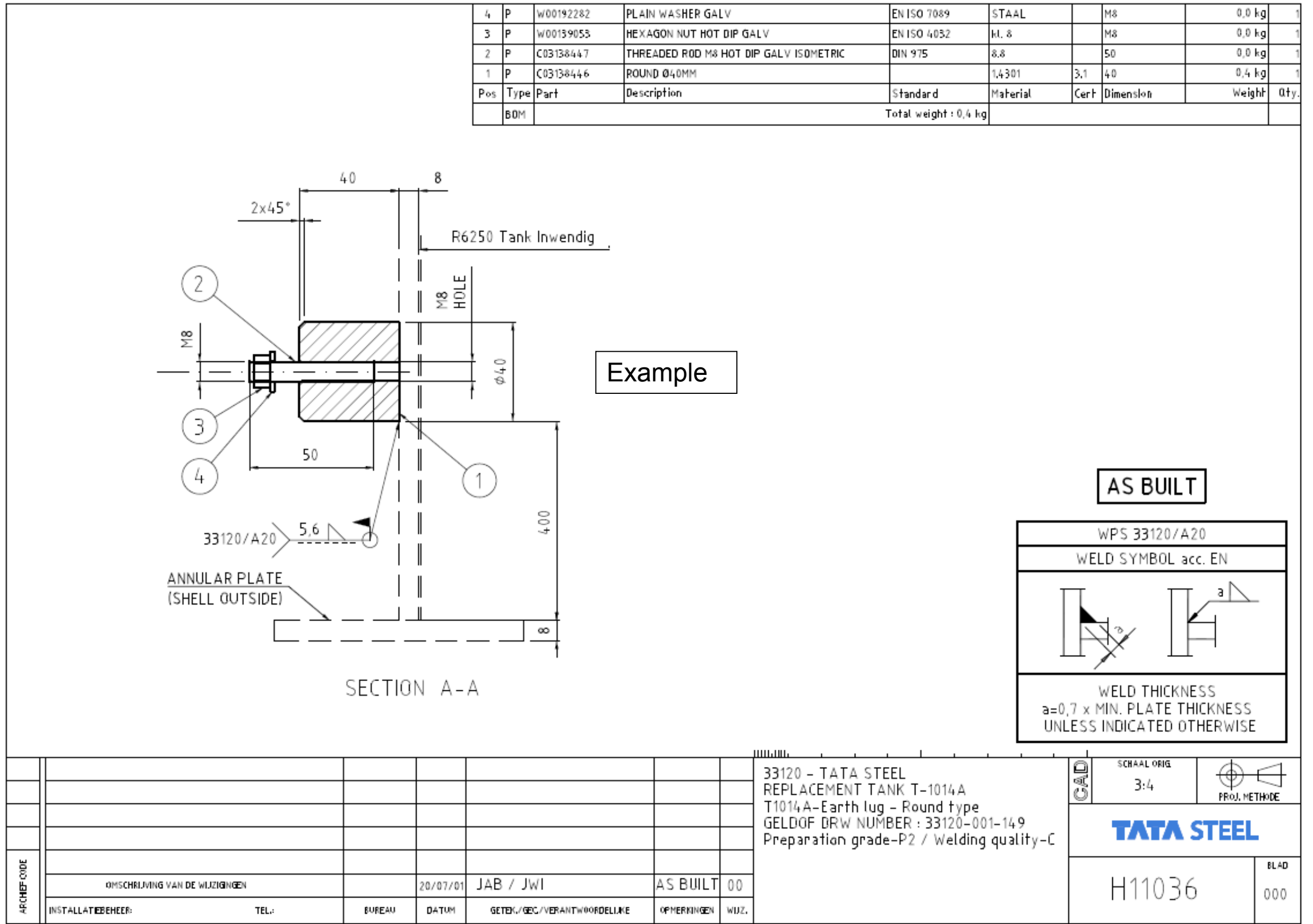
NOZZLE LIST T-1004A															
MARK NO.	DESCRIPTION	POS.	ELEVATE	SIZE	RATING	REMARKS	OPM.	MARK NO.	DESCRIPTION	POS.	ELEVATE	SIZE	RATING	REMARKS	OPM.
N1	TOEVOER	23°	+1000	DN150	PN16	EN 1092-1 TYP11		N19	UITLAAT NAAR LOSPLAATS	90°	+5700	DN100	PN16	EN 1092-1 TYP11	
N2	UITLAAT	33°	+500	DN250	PN16	EN 1092-1 TYP11		N20	UITLAAT NAAR LOSPLAATS	125°	+3700	DN100	PN16	EN 1092-1 TYP11	
N3	UITLAAT	180°	+200	DN150	PN16	EN 1092-1 TYP11	INW. LEIDING SUMP	N21	RESERVE	60°	+2000	DN150	PN16	EN 1092-1 TYP11	BLFL.
N4	TOEVOER	60°	+200	DN150	PN16	EN 1092-1 TYP11		MH1	MANGAT ROMP	235°	+800	DN800			DAVID
N5	DRAIN	80°	+500	DN100	PN16	EN 1092-1 TYP11	BLFL.	MH2	MANGAT ROMP	315°	+800	DN800			DAVID
N6	UITLAAT	0°	+200	DN100	PN16	EN 1092-1 TYP11		MH3	MANGAT DAK	0°	DAK	DN600			
N7	STOOM INLAAT	-	+650	DN180	PN25	EN 1092-1 TYP11		L1	NIVO HETING RH	45°	DAK	DN150	PN16	EN 1092-1 TYP11	LIQUIPHANT
N8	STOOM INLAAT	-	+450	DN180	PN25	EN 1092-1 TYP11		L2	NIVO HETING	270°	DAK	DN100	PN16	EN 1092-1 TYP11	
N9	COND. UITLAAT	-	+470	DN180	PN25	EN 1092-1 TYP11		T1	TEMP HETING	52°	+7700	DN50	PN16	EN 1092-1 TYP11	
N10	COND. UITLAAT	-	+250	DN180	PN25	EN 1092-1 TYP11		T2	TEMP HETING	87°	+5700	DN50	PN16	EN 1092-1 TYP11	
N11	DRAIN	85°	+500	DN25	PN16	EN 1092-1 TYP11		T3	TEMP HETING	122°	+3700	DN50	PN16	EN 1092-1 TYP11	
N12	DRAIN	85°	+1000	DN25	PN16	EN 1092-1 TYP11		T4	TEMP TRANSMITTER	15°	+750	DN50	DRAAD	EN 1092-1 TYP11	
N13	RESERVE / BLIND	180°	DAK	DN150	PN16	EN 1092-1 TYP11	BLFL.	T5	TEMP TRANSMITTER	195°	+750	DN50	DRAAD	EN 1092-1 TYP11	
N14	ONTLUCHTING	90°	DAK	DN200	PN16	EN 1092-1 TYP11		M1	MONSTERNAME	58°	+7700	DN25	PN16	EN 1092-1 TYP11	
N15	TOEVOER VAN LOSPLAATS	35°	DAK	DN100	PN16	EN 1092-1 TYP11	LIPS TBV PFFING	M2	MONSTERNAME	93°	+5700	DN25	PN16	EN 1092-1 TYP11	
N16	ONTLUCHTING	270°	DAK	DN200	PN16	EN 1092-1 TYP11		M3	MONSTERNAME	128°	+3700	DN25	PN16	EN 1092-1 TYP11	
N17	RESERVE / BLIND	335°	DAK	DN150	PN16	EN 1092-1 TYP11	BLFL.	2	AARDNOEK						
N18	UITLAAT NAAR LOSPLAATS	55°	+7700	DN100	PN16	EN 1092-1 TYP11		1	NAAMPLAAT						

OPM.: 1 - ALLEEN VOOR AANVRAAG
ALLE MATEN EN NOZZLES TIJDENS
DETAIL ENGINEERING DEFINITIEF BEPALEN
2 - NIEUWE NOZZLE NUMMERS TOEGEPAST

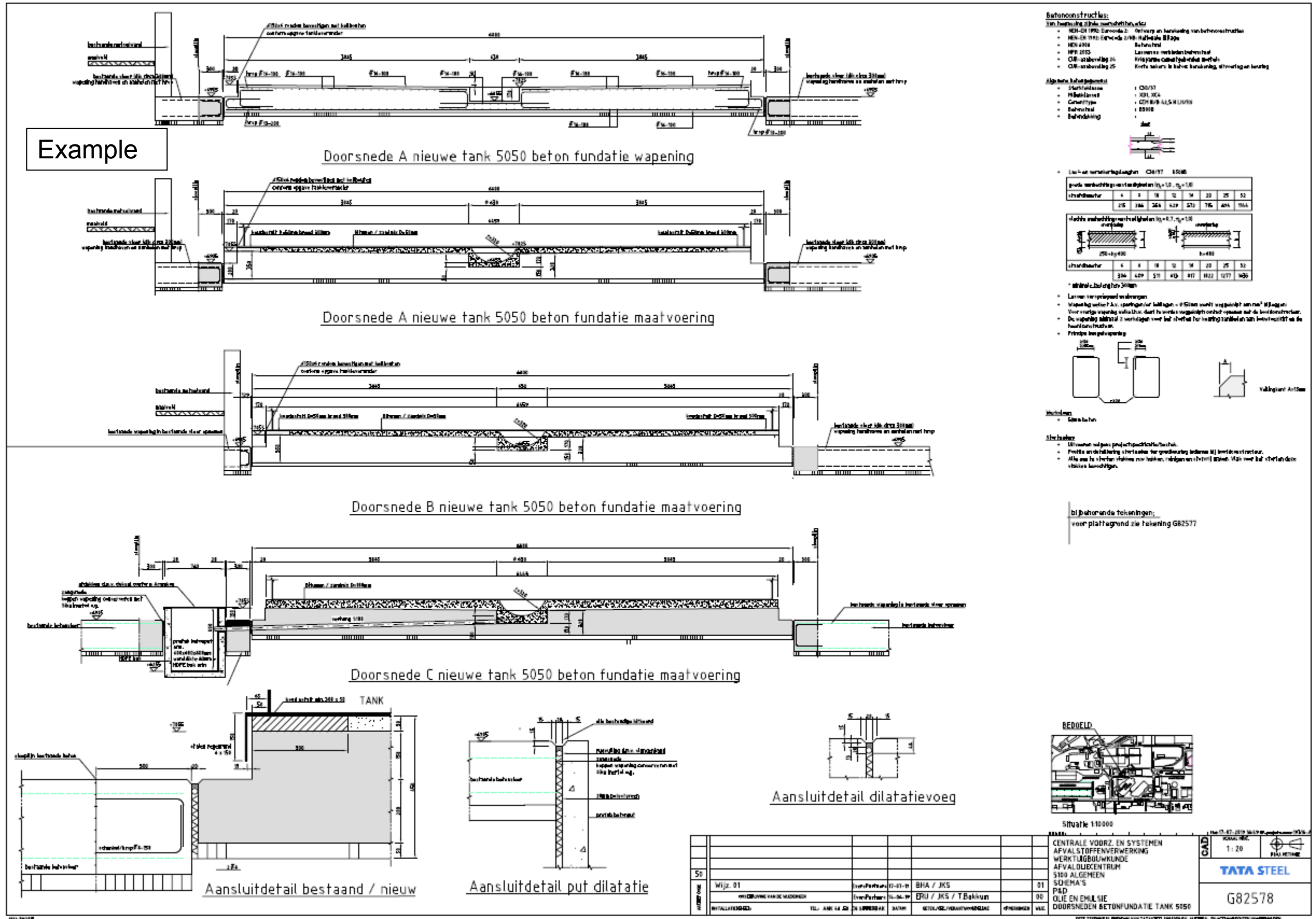
05	SF TECHNISCHE TEKENINGEN	
04	ADRESCODE - GEBOUWEN	
03	ADRESCODE 03	
02	ADRESCODE 30	
01	WERKTUIGBOUWKUNDE	
00	1000-2000 EMULSIECENTRUM	
00	OVERZICHTEN EN SAMENSTELLINGEN	
00	T-1004A DATA SHEET	

W-180495-01

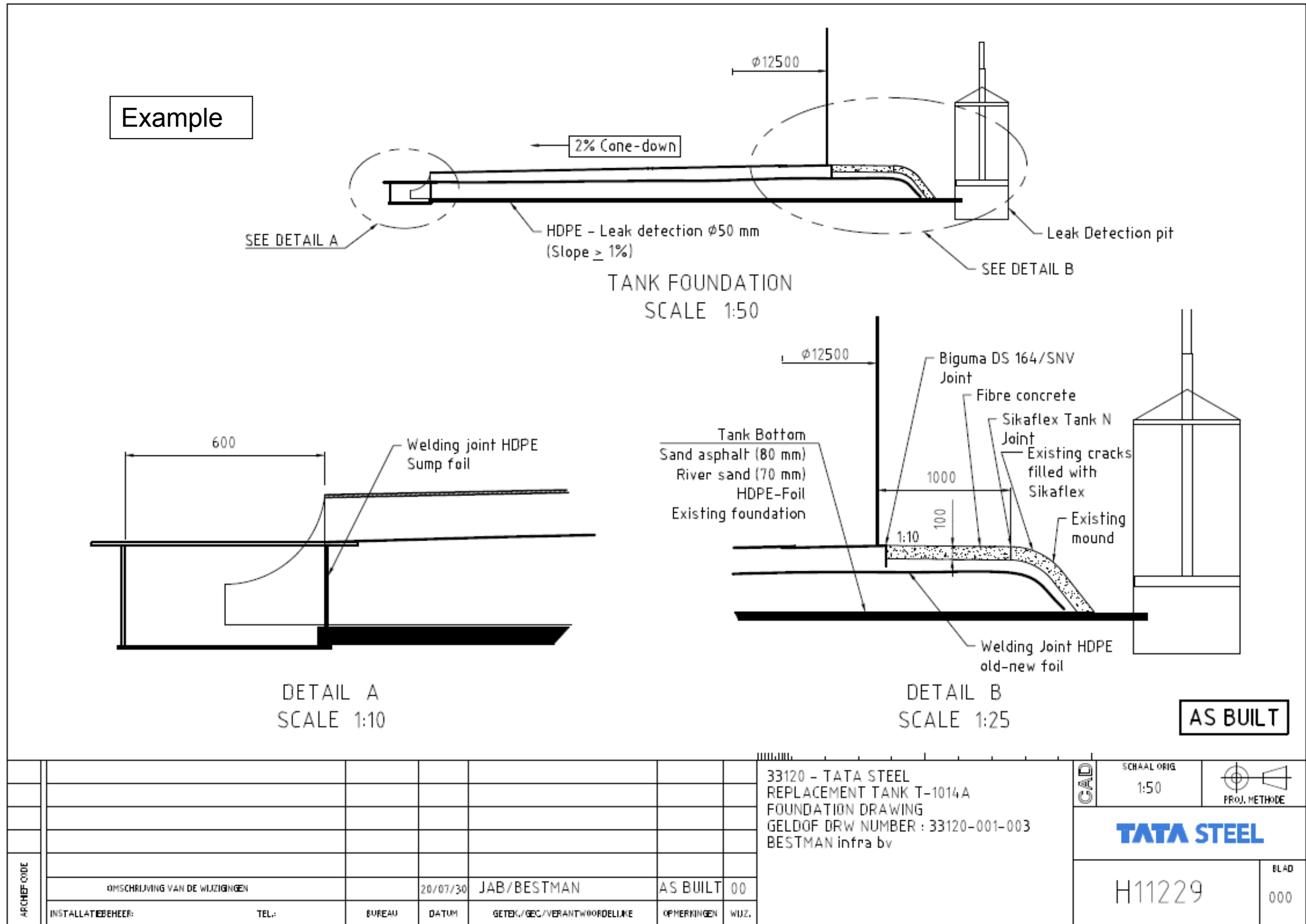
Appendix 2 - Example earthing lug drawing



Appendix 3 - Example cross-section of concrete foundation for a flat-bottomed tank



Appendix 4 - Example cross-section of sand mound foundation for a flat-bottomed tank



							33120 - TATA STEEL REPLACEMENT TANK T-1014A FOUNDATION DRAWING GELDOF DRW NUMBER : 33120-001-003 BESTMAN infra bv		SCHAAL ORIG 1:50	PROJ. METHODE
							TATA STEEL		H11229	
ARCHIEF-CODE	OMSCHRIJVING VAN DE WIJZIGINGEN	INSTALLATIEBEHEER:	TEL.:	BUREAU	DATUM	GETEK./GEC./VERANTWOORDELIJKE	OPMERKINGEN	WIJZ.		
					20/07/30	JAB/BESTMAN	AS BUILT	00		

5120-109/2010

DEZE TEKENING IS EIGENDOM VAN TATASTEEL UMUIDEN BV. AUTEURS- EN OCTROOIRECHTEN VOORBEHOUDEN