

Translated English of Chinese Standard: NB/T33004-2013

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

NB

ENERGY INDUSTRY STANDARD OF
THE PEOPLE'S REPUBLIC OF CHINA

ICS 29.200

K 81

Registration number: 43504-2014

P

NB/T 33004-2013

**Code for construction and completion acceptance of
electric vehicle charging/battery swap infrastructure**

电动汽车充换电设施工程施工和竣工验收规范

Issued on: November 28, 2013

Implemented on: April 01, 2014

Issued by: State Energy Administration

Table of Contents

Foreword	4
1 General provisions	6
2 Basic requirement	7
2.1 Construction.....	7
2.2 Completion acceptance	9
3 Power-supply system	12
3.1 Construction.....	12
3.2 Completion acceptance	12
4 Charging system	14
4.1 Construction.....	14
4.2 Completion acceptance	14
5 Battery swap system	17
5.1 Construction.....	17
5.2 Completion acceptance	17
6 Monitoring system	19
6.1 Construction.....	19
6.2 Completion acceptance	19
7 Civil and other auxiliary infrastructures	21
7.1 Construction.....	21
7.2 Completion acceptance	21
8 Acceptance of documentation	23
8.1 Application documents	23
8.2 Technical documents.....	23
8.3 Report documents	23
9 Acceptance evaluation	25
Appendix A Report documents for the completion acceptance of charging/battery swap infrastructures	26
Appendix B Outlines for the completion acceptance of charging/battery swap infrastructures.....	29
Explanation of wording in this standard.....	39
List of reference standards	40

2 Basic requirement

2.1 Construction

2.1.1 The organizations engaged in the construction of electric vehicle charging/swap facilities shall have the corresponding qualifications for the construction of electric power facilities; the construction personnel shall have corresponding qualifications. The construction and quality management of charging/swap facilities shall have corresponding technical levels.

2.1.2 The construction organization shall establish and improve the management system of construction technology, quality, safety production; formulate various construction management regulations; implement them.

2.1.3 The construction organization shall, according to the contract documents, design documents and relevant standards and norms, based on the underground pipelines and other structures (construction) and construction materials and engineering and hydrogeological data provided by the construction organization, organize the relevant construction technology management personnel to make a fact-finding trip to the site to grasp the actual site conditions, thereby doing well in construction preparation work.

2.1.4 The construction organization shall familiarize with and review the construction drawings; master the design intent and requirements; implement self-audit, joint review (disclosure) and sign-off system; propose opinions and recommendations when finding doubt or error of the construction drawing; if design change is required, follow the corresponding procedure to apply for review and sign-for-approval before implementation.

2.1.5 The construction organization shall prepare the construction program before starting construction. The construction program must be implemented after approval according to the prescribed procedures. If there is any change, the change approval shall be handled.

2.1.6 Temporary facilities for construction shall be reasonably arranged according to the characteristics of the project and have a general layout plan. For projects that are not suitable for intermittent construction, there shall be backup power and equipment.

2.1.7 Pipes, cables, members (fittings) and equipment used in the project must be inspected and properly kept when they are mobilized into the construction site. During mobilization acceptance, it shall check the order contract, quality certificate, performance inspection report, instruction manual, commodity inspection report and certificate of imported products. Follow relevant national

2.2 Completion acceptance

2.2.1 Completion acceptance of charging/swap facilities must comply with the relevant requirements of electric power construction, acceptance and quality inspection and evaluation standards and specifications, to ensure stable, safe and reliable operation of the charging/swap facilities after commissioning.

2.2.2 The model, configuration, quantity, function, performance indicators of all equipment and other related facilities such as AC charging pile, DC charger, battery swap equipment, cable, etc. shall meet the requirements of technical documents such as project contract and liaison meeting minutes, meanwhile comply with the requirements of the relevant national standards and technical specifications.

2.2.3 Completion acceptance of charging/swap facilities includes three aspects: construction quality acceptance, non-energized equipment quality acceptance, energized equipment operation acceptance.

2.2.4 Before the energized equipment is energized and accepted, the insulation inspection of each circuit shall be carried out and recorded. The insulation resistance value shall comply with the design requirements and relevant standard specifications. When measuring insulation resistance, it shall take measures to prevent damage to weak electrical equipment and electronic components. When measuring the electrical insulation resistance value, the voltage level of the insulation resistance meter used for measurement shall comply with the relevant provisions of the current national standard GB 50150 Electric equipment installation engineering-standard for hand-over test of electric equipment.

2.2.5 Before the energized equipment is energized and accepted, the reliability of the grounding protection line connection of the equipment shall be checked. The circuit with the residual current protection device shall be tested for simulated action and recorded.

2.2.6 The items that cannot be tested at the time of completion acceptance may be inspected via the inspection report as issued by the inspection & testing institute as approved by the national authority as provided by the manufacturer or the type test report.

2.2.7 The completion acceptance of electric vehicle charging/swap facilities shall be carried out on the basis of the self-inspection by the construction organization and shall meet the following requirements:

1 The construction quality of the project shall comply with the requirements of this standard and relevant professional acceptance specifications;

3 Power-supply system

3.1 Construction

3.1.1 The power-supply system shall be installed and constructed in accordance with the design drawings.

3.1.2 The installation of power-supply equipment shall be firm and reliable, with clear identification and clean inside and outside.

3.1.3 The installation height of similar electrical equipment shall be consistent when not specified by design.

3.1.4 The laying of cables shall be neatly arranged, firmly bundled, clearly marked. The length of the terminations shall be left with a suitable margin, there shall be no such phenomena as twisting, flattening and breakage of the protective layer. When the cable is connected into the power-supply and the electrical equipment cabinet, it shall be bundled and fixed; they shall not generate additional stress to terminal or connector in the cabinet.

3.2 Completion acceptance

3.2.1 The type, main wiring and installation method of the transformer shall comply with the relevant provisions of the current national standard GB 50053 Code for design of 10 kV and under electric substation and GB 50255 Code for construction and acceptance of power conversion equipment electric equipment installation engineering.

3.2.2 The installation of cabinets such as converter cabinets and control cabinets shall comply with the relevant provisions of the current national standard GB 50171 Code for construction and acceptance of switchboard outfit complete cubicle and secondary circuit electric equipment installation engineering.

3.2.3 The installation of the busbar device shall comply with the relevant provisions of the current national standard GBJ 149 Erection works of electrical installations - Code for construction and acceptance of bus-bar device.

3.2.4 The wiring and phase sequence of low-voltage wiring shall comply with the relevant provisions of the current national standard GB 50575 Code for construction and acceptance of 1kV and below wiring work.

3.2.5 The selection of low-voltage isolating appliances and conductors, the layout of power distribution equipment, the protection of power distribution lines,

4 Charging system

4.1 Construction

4.1.1 The installation and construction of the charging equipment shall meet the design requirements. It shall strictly follow the work drawing to perform installation and wiring.

4.1.2 The charging equipment shall be grounded reliably.

4.1.3 After the charging equipment is installed, the cable trench (tube) shall be reliably sealed.

4.2 Completion acceptance

4.2.1 The completion acceptance of AC charging piles shall meet the following requirements:

- 1** The basic composition, appearance and structure shall comply with the relevant provisions of the current industry standard NB/T 33002 Specification for electric vehicle AC charging point;
- 2** The pile shall identify the explanatory text and graphics of the relevant operation in a conspicuous position;
- 3** Human-computer interaction, card-swiping payment, communication, security protection and self-checking functions shall comply with the relevant provisions of the current industry standard NB/T 33002 Specification for electric vehicle AC charging point;
- 4** Environmental conditions, power requirements, environmental performance, electric shock protection, clearance and creepage distance, electrical insulation performance, electromagnetic compatibility performance, mean time between failure, other performance parameters shall comply with the current industry standard NB/T 33002 Specification for electric vehicle AC charging point;
- 5** Charging sockets shall comply with the current national standard GB/T 20234. Connection set for conductive charging of electric vehicles - Part 1: General requirements and GB/T 20234.2 Connection set for conductive charging of electric vehicles - Part 2: AC charging coupler;
- 6** The electric energy measurement of AC charging piles shall comply with the relevant provisions of the current national standard GB/T 28569 Electric

7 The energy measurement of the off-board charger shall comply with the relevant provisions of the current national standard GB/T 29318 Electric energy metering for electric vehicle off-board charger.

4.2.3 The completion acceptance of the charger for the battery swap station shall meet the following requirements:

- 1** The technical parameters of the charger shall match the battery box being charged;
- 2** The cable connection between the charger and the charging rack shall be fixed;
- 3** The charger shall have status indications such as standby, charging, full, as well as operating parameter display functions such as output voltage and output current;
- 4** The charger shall have the protective functions of input over/under voltage, input over current, output over voltage, output over current, over temperature, etc. It has the ability to judge the abnormal state of the battery box and automatically adjust the working mode;
- 5** The environmental conditions, power requirements, environmental performance, electric shock protection, clearance and creepage distance, electrical insulation performance, electromagnetic compatibility performance, mean time between failures, other performance parameters of the charger can be referred to the current industry standard NB/T 33001 Specification for electric vehicle off-board conductive charger;
- 6** The charger shall have the function of communicating with the monitoring system and communicating with the battery management system through the charging rack. The communication protocol with the monitoring system shall comply with the current industry standard NB/T 33007 Communication protocol between monitoring system in electric vehicle charging station/battery swap station and charging/battery swap equipment;
- 7** The charger shall be properly arranged in the station to facilitate ventilation and heat dissipation.

4.2.4 The lightning protection grounding of charging equipment shall comply with the relevant provisions of the current national standard GBJ 65 Specifications for the design of grounding (earthing) of industrial and civil electric system.

6 Monitoring system

6.1 Construction

6.1.1 Equipment such as computers, networks and communications shall be installed and constructed in accordance with the construction drawings.

6.1.2 The pre-burial, installation, joint, sealing and bridging of the pipe trough shall comply with the relevant provisions of the current national standard GB 50303 Code for acceptance of construction quality of building electrical engineering and GB 50093 Code for construction and quality acceptance of automation instrumentation engineering.

6.2 Completion acceptance

6.2.1 The monitoring system shall have the following functions:

- 1** Monitor and control the power-supply status, power quality, operating status of the power-supply equipment;
- 2** Monitor and control the charging process of the charging equipment;
- 3** Monitor and control the operation process of the battery swap equipment;
- 4** Perform video surveillance, access control, etc. for charging/swap facilities;
- 5** Communicate with the superior monitoring management system and accept the instructions of the superior monitoring management system;
- 6** Store and manage the operating data of subsystems and equipment such as power-supply, charging, battery swap; upload them to the superior monitoring management system as needed.

6.2.2 The communication protocol between the monitoring system and the charging/swap equipment shall comply with the relevant provisions of the current industry standard NB/T 33007 Communication protocol between monitoring system in electric vehicle charging station/battery swap station and charging/battery swap equipment.

6.2.3 The laying, leading in, connection of cables of the monitoring system shall comply with the relevant provisions of the current national standard GB 50093 Code for construction and quality acceptance of automation instrumentation engineering and GB 50312 Code for engineering acceptance of generic cabling system.

7 Civil and other auxiliary infrastructures

7.1 Construction

7.1.1 Engineering survey shall comply with the relevant provisions of the current national standard GB 50026 Code for engineering surveying.

7.1.2 The construction of earthwork shall comply with the relevant provisions of the current national standard GB 50202 Standard for acceptance of construction quality of building foundation.

7.1.3 The construction of the concrete floor in the station area shall comply with the relevant provisions of the current industry standard JTJ 033 Technical specification for construction of highway subgrades and JTJ 034 Technical specifications for construction of highway road-bases.

7.1.4 The foundation, structural column, ring beam, formwork, steel bar and concrete of the station building and other ancillary buildings shall conform to the current national standard GB 50202 Standard for acceptance of construction quality of building foundation and GB 50204 Code for quality acceptance of concrete structure construction.

7.1.5 The construction of anti-seepage concrete shall comply with the relevant provisions of the current national standard GB 50108 Technical code for waterproofing of underground works.

7.1.6 The construction of fire protection coatings for buildings and steel structures is to comply with the design documents and product instructions.

7.1.7 The fabrication and installation of steel structures shall comply with the relevant provisions of the current national standard GB 50205 Code for acceptance of construction quality of steel structures.

7.1.8 The installation and construction of electrical lighting devices shall comply with the relevant provisions of the current national standard GB 50259 Code for construction and acceptance of electric lighting device electric equipment installation engineering.

7.2 Completion acceptance

7.2.1 The masonry work of the station building and other ancillary buildings shall comply with the relevant provisions of the current national standard GB 50203 Code for acceptance of constructional quality of masonry structures.

8 Acceptance of documentation

8.1 Application documents

The application documents shall include the following documents:

- 1** Technical documents such as product specifications, commissioning outlines, test methods, test records, certificates of conformity, installation drawings as provided by the manufacturer;
- 2** Exit-factory acceptance report of relevant equipment (including exit-factory certificate and quality certificate, etc.);
- 3** Installation records;
- 4** On-site installation and commissioning report;
- 5** List of spare parts provided under the contract;
- 6** Acceptance application.

8.2 Technical documents

The technical documents shall include the following documents:

- 1** Minutes of meeting of design liaison;
- 2** Design documents and design change (effective in case of design changes, submitted by the design organization);
- 3** Project as-built drawings;
- 4** Disclosure records of installation technology;
- 5** Adjustment test record.

8.3 Report documents

The report documents shall include the following:

- 1** Acceptance conclusions;
- 2** Acceptance test records (including test outline);
- 3** Acceptance test statistics and analysis report;

Appendix B

Outlines for the completion acceptance of charging/battery swap infrastructures

B.1 Overview

In order to further standardize the construction of electric vehicle charging/swap facilities, ensure the construction quality of charging/swap facilities, comprehensively improve the construction and management level of charging/swap facilities, the Outlines for the completion acceptance of charging/battery swap infrastructures are hereby compiled.

After the completion of the construction of the charging/swap facilities project, the construction management organization shall organize the relevant supervision department, the project construction organization and the equipment supplier to jointly undertake the completion acceptance of the project, follow the Code for construction and completion acceptance of electric vehicle charging/battery swap infrastructure and this Outline to compile the site acceptance report. It can only be put into operation after passing the acceptance.

The preparation of this Outline is mainly based on the Code for construction and completion acceptance of electric vehicle charging/battery swap infrastructure as well as the references in this Code.

B.2 Basis of acceptance

GBJ 65 Specifications for the design of grounding (earthing) of industrial and civil electric system

GBJ 149 Erection works of electrical installations - Code for construction and acceptance of bus-bar device

GB/T 3811 Design rules for cranes

GB 6067 Safety rules for lifting appliances

GB 17945 Fire emergency lighting and evacuate indicating system

GB/T 20234.1 Connection set for conductive charging of electric vehicles - Part 1: General requirements

GB/T 20234.2 Connection set for conductive charging of electric vehicles - Part 2: AC charging coupler

GB 50205 Code for acceptance of construction quality of steel structures

GB 50207 Code for acceptance of construction quality of roof

GB 50209 Code for acceptance of construction quality of building ground

GB 50210 Standard for construction quality acceptance of building decoration

GB 50242 Code for acceptance of construction quality of water supply drainage and heating works

GB 50255 Code for construction and acceptance of power conversion equipment electric equipment installation engineering

GB 50259 Code for construction and acceptance of electric lighting device electric equipment installation engineering

GB 50303 Code for acceptance of construction quality of building electrical engineering

GB 50312 Code for engineering acceptance of generic cabling system

GB 50575 Code for construction and acceptance of 1kV and below wiring work

GB/T 29317 Terminology of electric vehicle charging/battery swap infrastructure

DL/T 448 Technical administrative code of electric energy metering

DL/T 621 Grounding for AC electrical installations

DL 5027 Typical extinguishing and protection regulation of electrical equipment

JTJ 033 Technical specification for construction of highway subgrades

JTJ 034 Technical specifications for construction of highway road-bases

NB/T 33001 Specification for electric vehicle off-board conductive charger

NB/T 33002 Specification for electric vehicle AC charging point

NB/T 33007 Communication protocol between monitoring system in electric vehicle charging station/battery swap station and charging/battery swap equipment

B.3 Acceptance items and acceptance methods

B.3.1 Acceptance of power-supply system (see Table B.1)

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----