



# **ELECTRIC BICYCLE FOR BIKE-SHARE**

## **APPENDIX 1: REQUIREMENT SPECIFICATION**

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## **1. Background**

This document specifies requirements for development and delivery of a new electrical bicycle for the eBike Share system for Bysykkelen AS, and is used for the tender for new bicycle hardware.

### **1.1. Purpose**

The purpose of the document is to serve as a requirement specification. Where description of features exists, it is described as feature requirements. It shall not be interpreted as requirements to how the features should be implemented.

### **1.2. Requirements to bike and parts**

The requirements specified must be understood as minimum requirements.

### **1.3. Order of importance of appendices**

Bysykkelen AS has to its best ability ensured that there should not be conflicting requirements in the documents. However, if it, at a later state, is recognized that there are conflicts, then the document hierarchy is as follows:

- Avtaledokument – (Agreement document)\*
- Standardbestemmelser for rammeavtaler om varekjøp – (Standard Terms for Product Purchase Framework Agreements)\*
- Appendix 1: Requirement specification – THIS DOCUMENT
  - Appendix 1 Annex A1: Bicycle specification
  - Appendix 1 Annex A2: BikePcb – Bike share interface
  - Appendix 1 Annex A3: Description of IT solution
  - Appendix 1 Annex A4: Open interface - Docking point with appendix
  - Appendix 1 Annex A5: Description of Drawing packages
  - Appendix 1 Annex A6: Drawings
  - Appendix 1 Annex A7: BOM – Bill of Material
  - Appendix 1 Annex A8: Warranty, service and spare parts handling
- Appendix 2: Supplier's description the offered solution
  - Annex 2 Annex B1: Compliance list
- Appendix 3: Prices and administrative requirements
  - Appendix 3 Annex C1: Suppliers prices on bicycles and spare parts
  - Appendix 3 Annex C2: Project plan
- Appendix 4: Amendments to the standard terms
- Appendix 5: Code of conduct

\* Documents only available in Norwegian.

#### 1.4. Readers guide

This specification outlines the requirements for the entire project. At the end of this section (In section 2, below), you will find the requirements for the prototype delivery. Section 3 outlines, how the prototype phase and delivery, will be validated and approved by Bysykkelen AS. Section 4 contains a short description of the appendices to the specification.

#### 1.5. Definitions and translation

The definitions may be used in the document and in the appendices (Annex) to this document.

Assist level	The eBike has a number of assist levels. The higher assist level the higher power is provided to the motor.
Bikes available for rent	Bikes available for rent are bikes that are sufficiently charged and not currently being repaired.  A bike might be available for rent also outside a docking area, provided the user has ended the trip (locked outside station).
BikePCB	Interface board developed by iCsys. The BikePCB provides the interface between the IT platform and the electric bicycle. The requirement to the BCD is found in Appendix 1 – Annex A2 BikePCB .
BOM	Bill of Material aka part list.
Docking point	A docking point is the charging station for one bike
Docking Station	A docking station is a location with two or more docking points.
eBike	Electric bicycle
HJH	Acronym for <u>HjemJobbHjem</u> ; a subscription service that provides the user access to public transport and eBikes share.
Operation area	The operation area is the area defined in user terms and conditions where the bike share service is offered and where the bikes may be used.
Period length	Used when the subscription is a period subscription. E.g. 1 day, 7 days, 1 Month, 3 months.

User	The system has several user categories and user roles. When the term user is used it refers to the end-user. The customer in the bike share system.
Validity period	The time period a subscription is valid. E.g.: all days 8:00-18:00 Only Saturday and Sunday etc.
Walk assist	eBike function that turn the motor on as long as the walk assist button is pushed. The motor force is adjusted to run at max. 6 Km/h according to EN regulation.

## 1.6. References

[1] Data Protection Directive [Directive \(EU\) 2016/680 of the European Parliament](#) implemented the [Regulation \(EU\) 2016/679](#) This regulation will enter into force on 24 May 2016, it shall apply from 25 May 2018. Also referred to as General Data Protection Regulation (GDPR) or Protection of personal data regulation.

[2] [EPAC UART COMMUNICATION PROTOCOL version 5.8](#) (Bafang Communication Protocol-V5.8-20161017.pdf).

[3] Open interface - Docking point: [Appendix 1 Annex A4: Open interface - Docking point with appendix](#)

[4] Void

[5] [Axa lock documentation](#).pdf

## 1.7. Project wiki

The project has established a wiki (Media wiki). All expert users, help desk and service staff will use and update this Wiki during the project life. Furthermore, it is expected that back office help pages are implemented using this wiki.

The project wiki is managed by Bysykkelen AS. However, it is expected that the supplier maintains the wiki as the main technical documentation channel.

Service manuals and reparation guide, as well as contact info that allows technical personnel to get technical assistance, shall be maintained on this wiki. Text and images must be entered directly or uploaded in PDF format.

## 1.8. Project process

The expected project process after contract signature is:

- A. Delivery of test equipment (See: Appendix 1 - Annex A1 section 6.1)

- B. Delivery of eBike kit documentation (See: Appendix 1 - Annex A1 section 6.2)
- C. Delivery of updated drawing and BOM list for approval (See: Section 3 below).
- D. Approval of documentation by Bysykkelen AS (See: Section 3 below).
- E. Delivery of 6 0-series bikes for approval (See: Section 2.1 Below).
- F. Approval of 0-Series by Bysykkelen AS (See: Section 3 below).
- G. Delivery of EN and CE marking documentation (See: Section 3.1)
- H. Shipment and delivery of first batch of eBikes (See: Appendix 1 - Annex A1, Section 3.1)
- I. Shipment and delivery of second batch of eBikes (See: Appendix 1-A1, Section 3.1)

The delivery process outlined above covers only the first delivery. Further deliveries include only ordering and step I, except in case of product changes.

Only key elements are listed above. The supplier shall include all required activities in the project plan (Appendix 3 Annex C2: Project plan).

## 2. Prototype

The prototype phase has three purposes:

- To validate the bike design, and to make necessary adjustments to ensure full usability, maintainability and compliance to international standards. The requirements to the bicycle are found in [Appendix 1 Annex A1: Bicycle specification](#)
- To validate the bike design compatibility with the BikePCB designed by iCsys, Stavanger. The requirements to the BikePCB is described in [Appendix 1 Annex A2: BikePcb – Bike share interface](#)
- To validate the bike design compatibility with the physical hardware interface to the existing docking point infrastructure. The Interface is described in [Appendix 1 Annex A4: Open interface - Docking point with appendix](#)

### 2.1. Prototype production

Prior to the production of the electric bicycle, a prototype must be provided including approval of this in accordance with public procedures and guidelines (CE marking and EN test). It will also include completion of existing 2D drawings and elaboration 3D drawings for prototype production.

A 0 series / pre-production must be used. The series shall include 6 bikes to be delivered as part of the first order for Bysykkelen.

All costs associated with prototype work shall be included in the offered unit prices for bicycles. The costs the supplier has for CE marking and EN shall be covered by the supplier, including but not limited to complete bike and bicycle parts required for testing, validation and production preparation.

Risk of tooling is the responsibility of the supplier.

The tools and moulds developed in the prototype process become Bysykkelen AS's property. A license agreement may be entered into and allow further use of the tools and moulds i.e. delivery of bike to other cities.

### 2.2. Validate the bike design

Validation of the bike design is the responsibility of the bike supplier.

The bike supplier must execute and document appropriate tests to demonstrate that the bicycle is:

- Suitable for the purpose

- May be maintained and serviced in a proper way (maintainability).
- CE marking and compliant to EN 15194:2017 and other relevant standards.

Furthermore, the Supplier must:

- Produce necessary drawings and update all drawings whenever required.
- Update production BOM

The supplier must therefore, validate and correct the provided bike design prior to the prototype production in order to achieve the best possible design and solutions.

### **2.3. Validate the bike design compatibility with BikePCB**

Validation of the compliance to the BikePCB shall be a joint effort between the bicycle provider and iCsys, the BikePCB provider. The two areas of compatibility include:

- Hardware compatibility: That the bikePCB may be installed into the frame as demonstrated in the drawings.
- CE marking and EN testing (Electromagnetic compatibility).

### **2.4. Validate the bike design compatibility to existing docking point**

Validation of the bike hardware design is the responsibility of the bicycle supplier.

This is to ensure that the bike fits into the docking point.

### **2.5. Validate the bikePCB design compatibility to docking point**

The electrical compatibility and to demonstrate that the eBike share functionality is in place.

This task is the responsibility of iCsys, hence outside the scope of the bicycle provider.

## **3. Documentation and approval**

All documentation, 3D CAD drawings (Full bike and parts drawings and drawings for moulds and tooling), BOM list etc. shall be delivered to Bysykkelen AS for approval.

The prototype bikes shall also be delivered to Bysykkelen AS for approval.

Bysykkelen AS has 15 working days to approve, comment or reject the documentation and the prototype bikes.

When the documentation and prototype has been approved then the series production can be started. The approval of the documentation and prototype bikes do not exempt the supplier of technical responsibility for the following production.



### **3.1. EN 15194 and CE marking documentation**

Delivery of the EN 15194 and CE marking documentation is seen as a deliverable. Bysykkelen will validate that the delivery is according to the agreement only.

The responsibility for the CE marking remains the responsibility of the supplier.

## **4. Component selection**

The requirement to the bike and components are defined in Appendix 1 Annex A1: Bicycle specification. The supplier shall, in the answer, complete all lists / sheets in Appendix 2 Annex B1 Compliance list.

Appendix 1 Annex A7: BOM list contains a list of suggested parts for the bike. However, the supplier is free to select other parts (except for frame and front fork) as long as the requirements in Appendix 1 Annex A1: Bicycle specification are fulfilled.

In Appendix 2 Annex B1 Compliance list: A7 the supplier must add the selected parts in column C and D (Supplier and Part reference). A7 must be completed also if the supplier selects to use the components specified in Appendix 1 Annex A7: BOM list.

### **4.1. Frame and front fork**

The supplier may choose purchase the frame and front fork from the supplier listed OR use the 2D drawings to produce the equivalent parts using own facilities or sub-supplier.

In any case all used 2D and 3D drawings must be delivered to Bysykkelen AS. Furthermore, the rights to the design and the drawings remains with Bysykkelen AS.

Refer. To licencing option described in Tender document – main document section 1.2.2 License Agreement (Licensavtale).

## **5. Production**

The Supplier shall deliver the bicycles fully assembled. This also includes the BikePCB.

### **5.1. Partly assembled bicycles**

If the supplier decides to transport the bicycles partly assembled, then the supplier must organize the final assembly locally, prior to final delivery.

### **5.2. Production - Final test**

All bikes must be tested mechanically and functionally at the end of production.

This test must be repeated, if the final assembly carried out after transportation to Norway and the final assembly includes important functional elements as e.g. battery or BikePCB.

## 6. Appendices

- Appendix 1 Annex A1: Bicycle specification

This is the main requirement document for the bicycle to be delivered.

- Appendix 1 Annex A2: BikePcb – Bike share interface

This is the requirement specification for the BikePCB. This document is enclosed as a reference only.

- Appendix 1 Annex A3: Description of IT-Solution

This is a short description of the software solution developed for the eBike share solution. The winner of the tender will get access to the full specification. This document is enclosed as a reference only.

- Appendix 1 Annex A4: Open interface - Docking point with appendix

This document contains all required information to interface to the existing docking point infrastructure.

- Appendix 1 Annex A5: Description of Drawing packages

This document describes the results of the design project and lists the drawings enclosed in Annex A6 and the BOM list in Annex A7

- Appendix 1 Annex A6: Drawings 2D and 3D Drawings

- Appendix 1 Annex A7: BOM list

- Appendix 1 Annex A8: Warranty, service and spare parts handling

This document contains requirements to warranty and spare part management.

## 7. Document information

Version	Date	Issued by	Status	Purpose of update
1.0	11. Mar 18	PSA	Final	Based on NS-RS version 1.1
2.0	13. Mar 18	PSA	Final	Review comments from EF incorporated.
2.1	22 Mar 18	PSA	Final	Spelling errors corrected.
2.2	23 Mar 18	EF	Final	Spelling errors corrected.
3.0	28. May 18	PSA	Final	New tender process.
4.0	04. June 18	PSA	Final	Market dialog and internal comments implemented.
5.0	20. June 18	PSA	Final	Update due to English version of main document.
5.1	21 June 18	PSA	Final	2.2 Expected changed to Must. Section 5. Production added Vedlegg and Bilag added to definitions.
5.2	24 June 18	EF	Final	Minor adjustments