Hafslund

Administration system for street lighting and Client service application for street lighting

Tender document

Norconsult

Summary

Hafslund Nett AS is requesting tender offer on complete solutions for street tlighting administrative tools. The solutions in the tender document are divided in two parts;
I) Administration system for street lighting (called administration system) and II) Client-service application for street lighting (called client service).

It is possible to give offer on the complete solution, or only part I or part II.

Administration system for street lighting
The Administration system for street lighting shall consist of an administration database for street lighting, communication channels to surrounding system, and an own user application with construction record, task list with job orders, plus history and informative function (reporting).

The administration database is to be implemented as a normal relation database with a data model adjusted to the data delivered from the functional controlled street lighting in Hafslund's Nett AS operation range. The administration database shall store construction structures and all the basis data with attributes for both the functional controlled street lighting and the conventional street lighting. It shall also store data from the user application in the administration system.

Client-service application for street lighting

The Client-service application for street lighting shall handle reception and following-up of customer messages (inquirers) for street lightings.

The application shall have a web-based map interface for visualization of street lighting with accompanying attribute/quality data. The application will relate to a "living" map. It means that the map will be updated frequently. Therefore it is a premise that the application can relate directly to the primary data source without converting to a proprietor format.

The client service application shall present data from the administration database for street lighting in a way that supports the operators conceding. It will be given access to general construction data, status information, overview of ongoing tasks and history etc. from the administration database.

The application shall have a communication channel/integration to the administration database and Hafslund Nett's grid information solution GeoNis.

General
The bidders understanding of the requirement and the capability to visual thought-through solutions for street lighting administration and customer tasks is important in the evaluation of tenders. A complete solution for street lighting administration will be preferred.

INNHOLDSFORTEGNELSE

1 REQUEREMENT SPECIFICATION

1.1 General information

Hafslund Nett has the responsibility for some 90 000 street lights in Oslo, Asker and Bærum.
Due to the introduction of intelligent street lighting with two-way communication and the possibility for control and energy metering from different suppliers, Hafslund is dependent of an effective coordination of the administration of the streetlights.
This will be favourable for the customer-center through an effective and accurate feed-back to the public on errors in the street lighting, and an improvement of the economic system due to better control with the different suppliers. In connection with the PCB/Energy Efficiency project in Oslo, Asker and Bærum 30.000 fixtures will be retrofitted. The new fixtures shall be able to communicate two-ways. The chosen solutions require an automatic administration system for technical and economical reporting.

The system shall be integrated with the existing IT solutions in Hafslund. The process will be gradually.
Phase 1: Implementing of a new administration system for street lighting and a client service solution with a communication channel to GeoNIS. Hafslund ASA has chosen BEA-WebLogic as an intermediate solution. These document covers just phase 1.
In phase 2 and 3 the solution will be developed through the integration of more systems and functions. Phase 2 will most likely include an active control of street light, integration to the client system and energy metering. Phase 3 will imply integration to the order system and a fully developed CRM-system.

1.2 Introduction

Hafslund Nett AS is requesting tender offer on complete solutions for streetlight administrative tools. The solutions in the tender document is divided in two parts; Administration system for street lighting and Client-service application for street lighting.
It is possible to offer:

a) A complete system for street lighting administration

b) Administration system for street lighting

c) Client-service application for street lighting

It shall be made clear from the offer letter which of the alternatives that is offered.

The offer shall consist of software with necessary adjustment, integration, testing, commissioning, documentation and training. For the client-service application the offer shall also include a web/internet portal adjusted to non-professional user (public) for access and directly reporting of errors etc.

The different communication channels/integrations to the surrounding systems shall be based on open solutions. Hafslund ASA has chosen BEA-WebLogic as an intermediate solution for their systems.

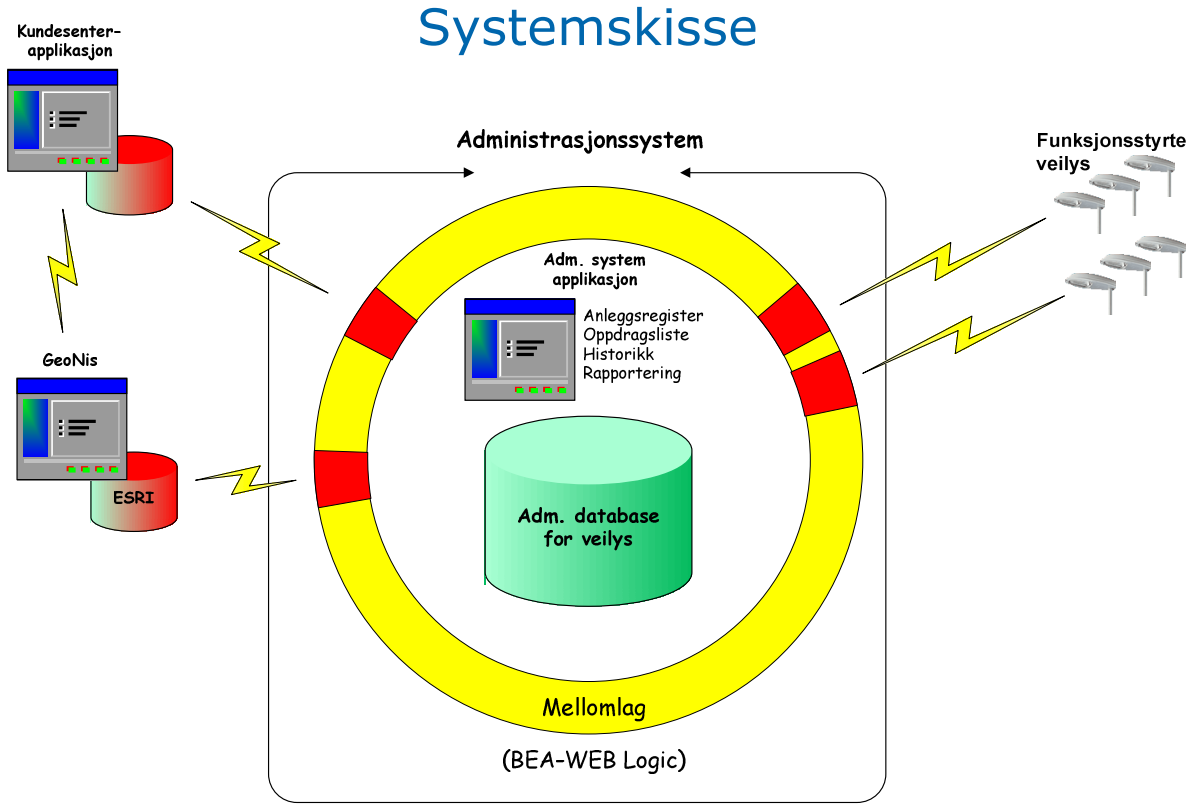
It is important that the supplier clarify his suggestion to the functional solutions with a description of the work process for the client's service and administration, operation and maintenance of the street lights. The offer shall consist of an attachment "The supplier's solution".

Hafslund Nett AS wants to use standard solutions when ever possible, hence detailed requirements have not been made, but the suppliers are invited to offer a suggestion to a solution. The system shall be adjusted for expansion and development over time. The supplier shall make a suggestion for a plan on how this can be implemented.

The bidders understanding of the requirement and the capability to visual thought-through solutions for street lighting administration and customer tasks is important in the evaluation of tenders. Relevant references will be of the utmost importance.

1.3 Principal description

Below find a principal system sketch with adjoining system where communication channels/integrations are to be established. The communication channels is in the sketch shown in red in a "common" intermediate layer solution.



The communication channels will be a part of the administration system in an implemented solution, but for this delivery it will be included as a part of both the administration system and the client service application. It means that the integration between the client service application and the Administration database, together with the integration between the client service application and GeoNIS is to be delivered as a part of the delivery "Client service application". The integration between the Administration database and the functional controlled street light, together with the integration between the Administration database and GeoNIS is to be delivered as part of the delivery "Administration system".

1.3.1 Administration system for street lights

The administration system shall consist of an administration database for street lighting, communication channels to surrounding systems (intermediate layer), an own user applications with construction record, task list with job orders, plus history and informative function (reporting).

The administration database shall be implemented as a normal relation database with a data model adjusted to the data delivered from the functional controlled street lighting in Haflsunds Nett AS operation range. Available data from the traditional street lighting is also to be stored in the database. The administration database shall handle construction structure and all the basis data with attributes for both the functional controlled and the conventional street lighting. Data from the user application in the administration system shall also be stored in the database.

1.3.2 Client service application

The Client service application shall handle reception and following-up of customer messages for street lighting. The application shall be the case handler's tool for reception and following-up of customer inquires.

The application shall have a web-based map interface for visualization of street lighting with accompanying attribute/quality data (as errors, dimming etc). The solution shall use the standard formats Shape, SOSO and Oracle Spatial as data source for the map presentation.

The application will be related to a "living" map. It means that the map will be updated/changed frequently. Therefore it is a premise that the client service application can relate directly to the primary data source without converting to a proprietor format.

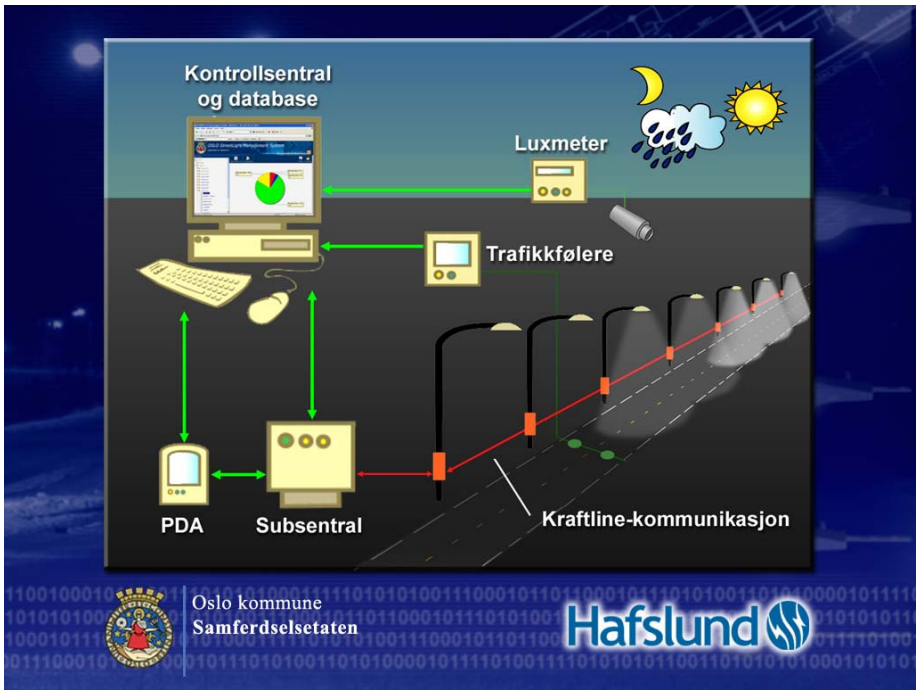
The client service application shall present data from the administration database for street lighting in a way that supports the operators conceding. It will be given access to general construction data, status information, overview of ongoing tasks and history etc. from the administration database.

The application shall have a communication channel/integration to the administration database and Haflsund Nett's grid information solution GeoNis.

1.4 Data collection from street light

Functional controlled street lighting
Hafslund Nett AS have today some 6.500 functional controlled road lighting fixtures from two different suppliers. Both of the suppliers use LNS-database (a database solution from Echelon) for exchange and storage of data. In connection with the introduction of a common administration system, the existing street lighting databases will be used as a data source. In the next phase, the existing system will be omitted, and the administration system will be related directly to each fixture, but still via a concentrator (subcentral).

Today's structure is based on two-way communication of data through the fixture's power supply , so called "power line communication" The information to and from the different fixtures are transferred to a concentrator located in the fixture's electrical supply (switch cabinet). The concentrators then communicate, individually for the two systems, via telephone (GPRS with MDA Mobil Data Access) with the central database.



Both of the suppliers use LON as a protocol for data communication with a LNS database licensed from Echelon. The LON protocol is defined through the LON-Mark organization and is an open protocol. The two suppliers have different user interface for their systems. For further information please visit (*http://www.lonmark.org/products/snvtfile.htm*), CEN/ EN 14908 and IEC 61508.

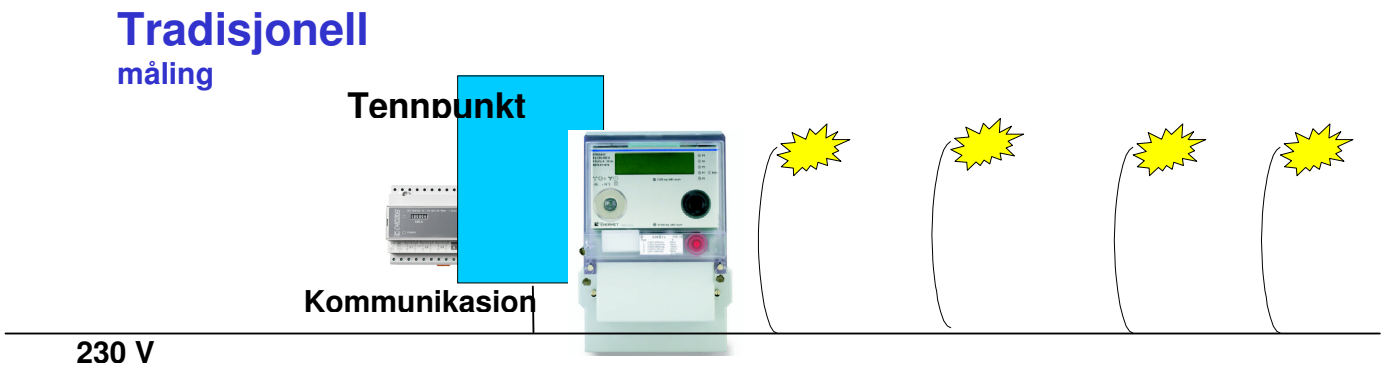
The functional controlled lights are data logged and are controlled from the two central databases. In Phase 1, the administration system **shall not** control the lights, but the system has to be able to report updated status for the functional controlled light.

Traditional street lighting

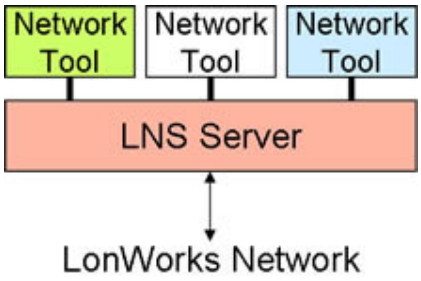
Hafslund Nett has different map and data foundations for the three municipalities Asker, Bærum and Oslo. In Asker and Bærum, the fixtures and the attributes is registered in the cartographic information, but not in Oslo.

The traditional street lighting is for now to be handled simplified, but over time new attributes will be added.

Further, data from some energy meters for traditional street lighting is to be collected. Here, an energy meter which is connected to the same type of concentrator as for the functional controlled light is used. This way the collection of data will be similar, but with limited data size on the concentrator.



Data manipulation for the functional controlled light and energy metering
The concentrator (ILON 100), with integrated internet server, handles information from both the functional controlled lighting and the energy meters. All information is transferred and stored in the Echelon LNS database. For safe data transfer between the LNS database and iLon, RC4 encryption of Lon Talk identifications keys is used.



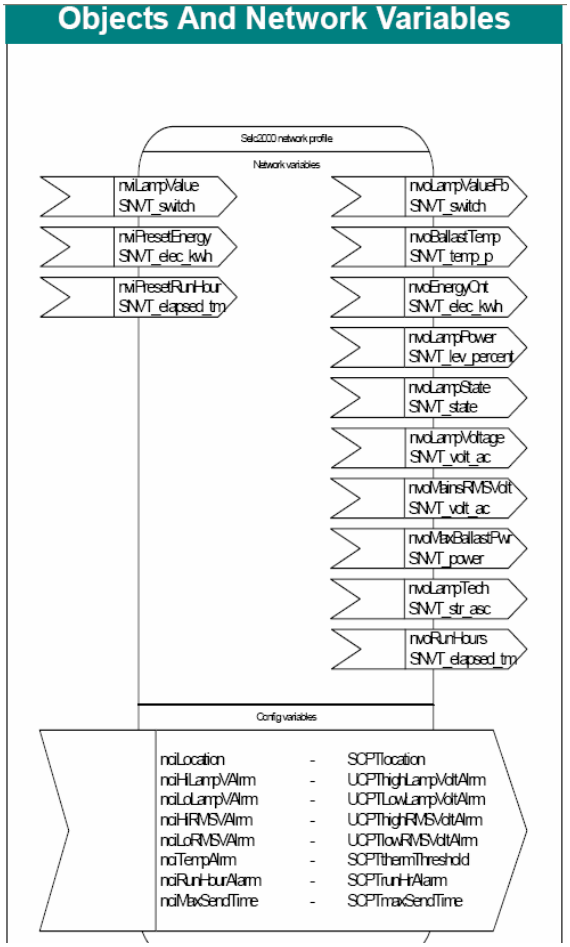
Philips – Unilon Starsense System

Philips uses a superior system with the fabric name “Starsense” Starsense is based on the building automation solution “Unilon” which is build on the LNS database.

Kongsberg Analogic – Candelon System
Multilux/Kongsberg Analogic uses a superior system with the fabricname ”Candelon System”.
The communication unit S2000 has the following specification:
http://www.analogic.no/dokumenter/975-0021-04%20Candelon%20S2000%20Datasheet.pdf

Kongsberg Analogic – Candelon System
Multilux/Kongsberg Analogic benytter et overordnet system under fabrikknavn ”Candelon System”.
Kommunikasjonsenheten S2000 har følgende spesifikasjon (basert på følgende kilde):

http://www.analogic.no/dokumenter/975-0021-04%20Candelon%20S2000%20Datasheet.pdf



For further information, please visit the link above.

Energy metering

Data for the energy metering is available on the formats shown below:

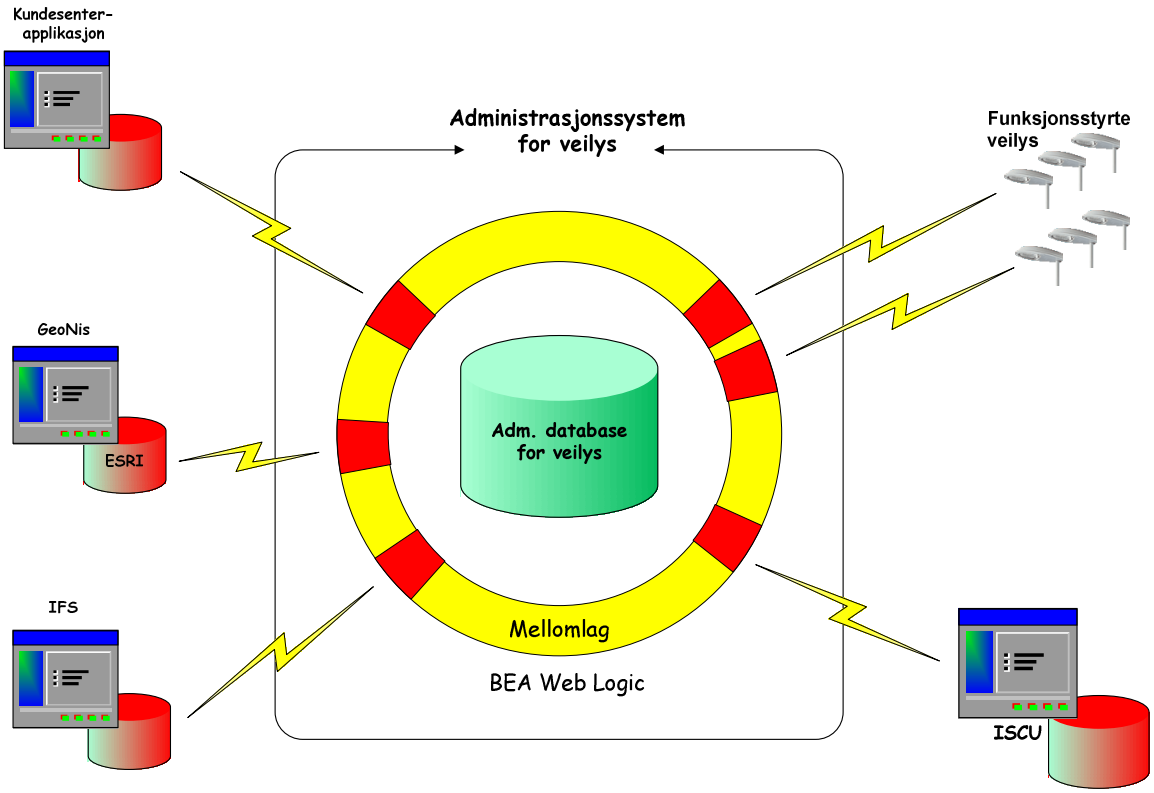
```
##Time-series
#Start=2005-12-17.00:00:00
#Stop=2005-12-17.24:00:00
#Step=0000-00-00.01:00:00
#Unit=kWh
#Direction-of-flow=out
#Installation=021230005
#Plant=999
#Meter-location=1
#Value=<20 20 0 20 20 20 20 40 20 60 100 40 0 40 20 40 0 20 20 0 20 0 20 20>
#No-of-values=24
#Sum=580
#Description=4041 "ENERGI"
```

Data from the meter box is given on the following format:

```
##
#Meter = PG7060018F
#Channel = 1
#Start = 2006-05-01.00:00:00
#Value = 6065390
```

1.4.1 Rammekrav

The administration system and the client service application is to be integrated with the existing operation solution in Hafslund.



This tender is the first of three phases in a superior project for control and operation of street lighting.

Even if integration to i.e IFS or ISCu is not to be implemented in Phase 1, the system shall be arranged for those integrations later. In Phase 1, the integration to GeoNIS Hafslund ASA is to be implemented. Hafslund ASA has chosen BEA-WebLogic as an intermediate layer solution for their operations solution.

1.5 Functional and technical demands

1.5.1 Introduction

To describe the system, the supplier is asked to fill in his description in this document. The bidder shall specify whether he fulfills the different demands, if he offers more, and whether he can offer further function for an additional charge. The bidder is to tick off in the column **Yes** or **No** with red font whether he fulfills the demands.

1.5.2 Generally

Demands	*Specification*	*Yes*	*No*	*Consultant's evaluation*
K1.6.2-1	The system is to be a general solution for the street lighting administration and the customer-center services. Common database tables in a normalized relation database are to be used for the modules or the "part-function" which the solution is compound on. All the communication channels that need to be established to satisfy the functions described in the requirement specification or in the supplier's solutions are to be included. The communication channels are to be implemented as "real time"- communication channels/integrations, and not as "batch driving" or similar.			
K1.6.2-2	It is important that the supplier clarify his suggestion to functional solutions with a description of the work process for the customer-center service and administration, operation and maintenance of the street lights. The offer shall consist of an attachment "The supplier's solution".			
K1.6.2-3	The system is to be delivered cutover with functionalities which cover the specifications in the requirement specification and the supplier's suggestion for solutions.			
K1.6.2-4	The system shall be in norwegain.			
K1.6.2-5	The delivery shall include software with all the necessary adjustment, integration, cutover, testing, training and documentation.			
K1.6.2-6	The different communication channels/integrations to the surrounding systems shall be based on open solutions. Hafslund ASA has chosen BEA-WebLogic as an intermediate solution for their systems.			

K1.6.2-7	The system shall be adjusted for expansion and development over time. The supplier shall make a suggestion for a plan on how this can be executed.			

Access control

	Specification	*Yes*	*No*	*Consultant's evaluation*
K1.6.3-1	The system shall have functionalities to control the user access. Control of the rights shall be implemented on a table level. The system is to control the access for named and not named users. Named users are internal users and users at the contractors and the street lights owners. Not named users can i.e. be the public who reports error via the internet portal.			
K1.6.3-2	The user access is to be differentiated.Different users shall have various rights (read, right) in the systems.			
K1.6.3-3	When logging in; Named users shall be identified with user name and pass word.			

1.5.3 Adm. system application, common

	Specification	*Yes*	*No*	*Consultant's evaluation*
K1.6.4-1	The integration between the Administration database and the functional controlled street lighting, together with the integration between the Administration database and GeoNIS is to be delivered as part of the delivery "Administration system".			
K1.6.4-2	The administration system shall consist of an administration database for street lighting, communication channels to surrounding systems (intermediate layer), an own user application with construction record, task list with job orders, plus history and informative function (reporting).			

Adm. system application, Construction register (anleggsregister)

Demands	*Specification*	*Yes*	*No*	*Consultant's evaluation*
K1.6.5-1	The construction register is to have control over when lamp change has been carried out.			
K1.6.5-2	Fixed data for light point/fixtures is to be registered and updated.			
K1.6.5-3	Fixed data for light point/fixtures from GeoNIS is to be shown in the administration system.			
K1.6.5-4	The data elements listed below are registered as actual attributes for a lamp point. These are to be included in the construction register in the administration system. The attributes, which have GeoNis as a primary data source, shall be collected/assembled via the communication channel to GeoNis. Other attributes are registered and updated in the Adm. system application. The list will be updated, as it is a part of the delivery to identified further requirements. This will be done in connection with an internal project group in Hafslund. **Attributes:** — **Primary datasource:** MUNICIPALITY — GeoNIS OWNER — GeoNIS SUBTYPECD — GeoNIS OPERATING LABELING FIX. A OR FIX. B — GeoNIS SWITCHING POINT NO. — GeoNIS CONTROLL ID — GeoNIS FIXTURES — GeoNIS SCREEN — Adm sys FIXTURE — GeoNIS DIMMING — Adm sys LAMP MANUFACTURE — Adm sys LAMPETYPE — Adm sys LAMP EFFECT — Adm sys NO. OF LAMPS — GeoNIS LIGHT POINT HEIGHT — GeoNIS FUSE CIRCUIT — GeoNIS SWITHCING CODE — Adm sys CUSTOMER — GeoNIS APOINTMENT NUMBER — GeoNIS ROAD TYPE/CLASS — GeoNIS SERVICE SONE — GeoNIS SERVICE GRAD — GeoNIS METER — GeoNIS PLANSTATUS — GeoNIS VTP MUNICIPALITY — GeoNIS VTP OWNER — GeoNIS VTP SUB TYPE CD — GeoNIS VTP OPERATING LABELLING — GeoNIS VTP TYPE — GeoNIS VTP FABRICATION YEAR — GeoNIS VTP SWITCHING PRINCIPAL — GeoNIS VTP CONTROL — GeoNIS VTP CONTROLED FROM — GeoNIS VTP NO. OF CIRCUITS — GeoNIS VTP OPERATING VOLTAGE — GeoNIS VTP PLACING — GeoNIS VTP SWITCHING POINT ADRESS — GeoNIS			

	VTP STATUS GeoNIS			
K1.6.5-5	The solutions shall be flexible regarding which attributes that is to be available for the different types of construction components. The component types and the quality pictures (with attributes) are to be defined by Hafslund without use of programming.			
K1.6.5-6	The solution shall handle use of pre defined codes withch is to be established in own code screen pictures.			
K1.6.5-7	The solution is to be configured depended on which attributes that are compulsory for complementing.			
K1.6.5-8	The system has to be flexible regarding the construction of the code structure for the construction components.			
K1.6.5-9	The system has to handle both functional and geographical relation between the construction components.			
K1.6.5-10	The construction components in the system shall be presented in an hierarchy exploring structure if appropriate.			
K1.6.5-11	The attributes have to be searchable.			

1.5.4 Adm. system application, Task list

Demands	*Specification*	*Yes*	*No*	*Consultant's evaluation*
K1.6.6-1	An order functionality with a task register (a list of job orders).			
K1.6.6-2	A list over customer information for the fixture identities is to be generated.			
K1.6.6-3	Predefined templates for different tasks shall be available. .			
K1.6.6-4	The solution is to contain a calendar- function with a display of job orders.			
K1.6.6-5	A given constructor shall be limited only to see his own tasks.			

K1.6.6-6	The job orders are to be given mutual priority.			
K1.6.6-7	The purchaser of tasks shall be able to see the status and the progress for his orders.			
K1.6.6-8	Orders have to be related to individuals or groups in the construction register (i.e. switch cabinet).			
K1.6.6-9	The service supplier must be able to print out finished tasks with the date and the failure cause.			
K1.6.6-10	The service supplier must be able to print out a prioritized list for correction of errors for the fixtures.			

1.5.5 Adm. system application, History

	Specification	*Yes*	*No*	*Conultant's evaluation*
K1.6.7-1	The administration system has to handle reporting of condition reports from the service suppliers, with the following-up of remarks. The remarks are to be categorized depending on the error.			
K1.6.7-2	The task registers must report back with a joint history. It shall also be possible to register special history for individual orders in the task register.			
K1.6.7-3	The history from completed job lists is to be related to the fixture identity.			
K1.6.7-4	The adm. system shall present the history generated from the functional controllet street lighting.			

1.5.6 Adm. system application, Reporting

Demands	*Specification*	*Yes*	*No*	*Consultant's evaluation*
K1.6.8-1	The system shall generate an error report.			

K1.6.8-2	The system shall generate a report with a list over errors that have not been corrected according to the service proclamation. When the service proclamation has been exceeded**,** the system shall be configured for automatic warning via email or sms.			
K1.6.8-3	A report that shows the operating margin for the service proclamation shall be generated.			
K1.6.8-4	The system shall generate a report that shows the debriefing of errors from the service provider.			
K 1.6.8-5	Each switch board will have an own consumption meter for the switching point, hence the kWh on an hourly basis can be measured.			
K 1.6.8-6	A report, with an overview of the power consumption in each switch board, based on the hourly consumption, is to be generated.			
K 1.6.8-7	A report, with an overview of the percentage dimming for given points in time and for given areas/switch boards, is to be generated.			
K 1.6.8-8	A report on historical data such as when maintenance has been carried out is to be generated.			
K 1.6.8-8	A report on registered/identified HSE related errors is to be generated.			
K1.6.8-5	The data elements or the variables listed below have been identified and is to be included in the reports from the system. • Energy consumption pr lamp- measured in kWh • The lamp effect- measured in watt (W) • Burnning hours for the lamp- measured in hours (h) • High RMS voltage alarm threshold • High Temperature alarm threshold. • Run hour alarm threshold. • Runup timer is active or passive • Mains voltage is too low. • Mains voltage is too high. • Load current is too low. • Load current is too high. • Load current is normal.			

	• (No current through load.) • (Output delay timer is running.) • (Running minutes exceeds threshold.) • Internal failure. • Segment Controller Mains voltage too low. • Segment Controller Mains voltage too high. • Number of lamp failure.			

1.5.7 Adm. database for street lighting

	Specification	*Yes*	*No*	*Consultant's evaluation*
K1.6.9-1	The adm. database is to receive and store all data generated from the functional controlled street lighting in database tables. A normalized relation model for available street lighting data is to be designed and implemented. This applies to the traditional controlled street light, and for the functional controlled street light. The solution is to be implemented in an Oracle database.			
K1.6.9-2	The adm. database will be the data source and the storage unit for the data that will be shared between the different applications.			
K1.6.9-3	The adm. database shall store all the data used by the Adm.system application.			
K1.6.9-4	The administration database is to be implemented as a normalized relation database with data models adjusted to the data delivered from the functional controlled street lighting in Hafslund's operating range. The administration database shall handle construction structure and all the basis data with attributes for both the functional controlled and conventional street lighting.			

1.5.8 Client-service application

Demands	*Specification*	*Yes*	*No*	*Consultan's evaluation*
K1.6.10-1	A map based web/internet portal adjusted to non-professional users for access and directly reporting of errors etc. is to be a part of the client-service application. The registered data is to be shown graphical (in the map).			
K1.6.10-2	The integration between the client service application and the adm. database together with the integration between the client service application and GeoNIS is to be a part of the delivery Client-service application			
K1.6.10-3	The client service application is to handle reception and following-up of customer inquires for street lighting. If an object is not registered in the database, automatically a new object is to be created.			

K1.6.10-4	The application shall be the case handler's tool for reception and following-up of customer inquires.			
K1.6.10-5	The pubclic shall also be able to register error etc and see the status for these without contacting a case handler at Hafslund			
K1.6.10-6	The application shall have a web-based map interface for visualization of the street lighting with accompanying data (such as errors, dimming etc). The solution shall use the standard formats Shape, SOSO and Oracle Spatial as data source for the map presentation. The application will relate to a "living" map. It means that the map will be updated/changed frequently. Therefore it is a premise that the client service application can relate directly to the primary data source without converting to a proprietor format			
K1.6.10-7	The customer center application shall present data from the administration database for street lighting in a way that supports the operators conceding. It will be given access to general construction data, status information, overview of ongoing tasks and history etc. from the administration database.			
K1.6.10-8	The application shall have a communication channel/integration to the administration database and GeoNis.			
K1.6.10-9	The condition of the lamp is to be observed.			
K1.6.10-10	It shall be possible to see earlier former errors on the lamp, that have not been fixed.			
K1.6.10-11	From the map presentation one shall see if the street lighting is functional controlled or not.			
K1.6.10-12	Pre defined choices for reporting of lights that is not turned of during daytime shall be available.			
K1.6.10-13	Pre defined choices for reporting of blinking lights shall be available.			

K1.6.10-14	Pre defined choices for reporting of lights covered with vegetation shall be available.			
K1.6.10-15	Pre defined choiced for reporting of damaged installations shall be available.			
K1.6.10-16	Pre defined choices for reporting of damage caused by a third party shall be available.			
K1.6.10-17	Lamps with reported, but not improved errors shall be visualized in the map.			
K1.6.10-18	The client service application is to present data (on the screen) based on the last registered data on the following parameters: • The value of the lamp- dimming level (in percentage) and on/of status • The temperature in the switching board in Celcius • The lamp effect- measured in percentage • The lamp voltage- measured in voltages • The RMS voltage- measured in voltages • High lamp voltage alarm • Low lamp voltage alarm • Visualisation of lamps with high lamp voltage- alarm • Visualisation of lamps with low lamp voltage- alarm			
K1.6.10-19	An overview of the status for turned of lamps together with information about lamp changes (information from the job register in the Adm. system) is to be available.			
K1.6.10-20	The supplier shall make an overview of what kind of information that can be presented for the functional controlled and for the conventional controlled street lighting			

1.5.9 Functions and performances beyond the demands included in the tender

	Supplemented by the offerer (with red font):	Yes	No	Consultan's evaluation

1.5.10 Functions and performances beyond the demands not included in the tender

	Supplemented by the offerer (with red font)	Yes	No	Consultant's evaluation