SMART TUNNEL MAINTENANCE MANAGEMENT SYSTEM

Overview and control over assets, task and economy – with documentation

Ramboll has created the web based asset management system SMART as a modern IT tool to facilitate a systematic, organised and well documented maintenance management system.

SMART provides users and decision makers on all levels of the organisation with the necessary tools and information for an efficient management, which provide:

- Overview of assets and their technical properties
- Overview of condition
- Overview of maintenance needs
- Overview and management of requested, on-going and finalised activities
- Overview of short and long term
- Budget needs
- Overview of documents
- History of condition and activities
- Easy access to information

Manage different structures differently—but together

Tunnel assets are very different in composition, complexity and size, but the sound principles for maintenance management are universal.

The definition of the assets, on which the maintenance is to be managed by SMART, is based on a unique prototype concept that allows the user to apply the condition registration, activity management, budgeting, monitoring, and document management to very different structures.

All structures managed by the same organisation can be registered among each other in the same installation to give the complete overview.

Overviews and reports can be drawn from the whole installation or from a selection of structure types. The user administration controls which structures and data the individual user can see, and which operations he can make.

The basis of any management system is the inventory of structures. In SMART the structures and their components are organised in a flexible hierarchy. Prototypes define the types of structures that can be registered in SMART, and how they can be divided into components and subcomponents. The prototypes also define which technical data can be registered on the individual structure types and component types.

Manage activities and budgets from request to archive

SMART controls and documents all activities – jobs – of the maintenance management.

In the normal situation a job passes through five stages from request to archive. The user administration defines which status and changes each individual user can make. The short and long term budget needs for performing the requested activities can be shown as illustrative bar charts. The charts can show the distribution among job types, job priority, or job status, and for the current year the actual cost can be shown in relation to the original cost estimate.
Be SMART in the field

The SMART installation can be extended with a handheld wireless solution, SMART Mobile. SMART Mobile is a mobile version of the central job management and checklist modules. The program is installed on a handheld unit, communicating with the central SMART database through mobile phone data net-works or wireless LAN.

SMART Mobile can be supplemented with identification of assets in the field by means of “RFID tags” (RFID = Radio Frequency IDentification) mounted on the components on which maintenance action is to be performed. The tag transmits a unique identification that can be read by a RFID reader mounted on the PDA on which SMART Mobile is installed.

Keep track of the condition

In the principal inspection module, all inspected elements are assigned a condition rating and, if relevant, a damage description and photos documenting the findings. Needs for corrective actions or further investigations are registered through shortcuts to the Activity Management module.

The Principal Inspection Report provides a complete record of the individual structure, combining inventory data with actual condition registration, historic development of condition ratings, history of previously performed activities, and requested future actions – illustrated by photos.

The module also provides statistics on condition ratings of similar elements, i.e. elements created on the same prototype.
Manage Continuous Measurements

In the optional Monitoring Module, monitoring data, e.g., from built-in probes, are stored, analyzed, and presented as data lists or charts.

SMART Monitoring can be set up to automatically receive and process data as they arrive from the probes/data loggers.

Asset management of M&E

The checklist function of SMART can be used to control and document recurrent activities, like routine inspections and routine maintenance. SMART controls that checks are performed and reported with the specified time intervals.

The main difference between the checklists and the principal inspection function is that the user in the checklists can define in detail which data to register at the check.

Checklists will often be operated by means of SMART Mobile, possibly combined with RFID technology for identifying the physical assets to check.

Manage your documents

SMART is your digital archive.

Any kind of documents – understood in the broadest sense as anything stored as a digital file – can be attached to all inventory elements, to jobs, to principal inspection records, and to checklists.

Documents – e.g., containing instructions on how to collect and register data – can also be attached to inventory data fields and to checklist definitions as online help.

Documents follow the objects they are attached to, so e.g., as-built drawings will automatically be archived together with the project data.

There are facilities for creating multiple links to the same document, links to external documents, and to web pages.

Comprehensive search facilities make it simple to locate documents, regardless of which module they were attached in.

Locate your assets with Google Maps®

Google Maps can be used for geographical navigation. I.e., one can select elements by locating and clicking on them in Google Maps. Thereby, the user does not need to know the structure of the hierarchy of elements to find the items he wants.

Search results can also be displayed in Google Maps. E.g., one can make a Google Maps view containing structures with specific technical properties, or structures on which jobs have been or are to be performed.

The Google Maps display including search results can be saved as a file, whereby it can be saved and sent to others. It is not a precondition that the recipient has access to SMART to review the search results.

For further information:

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