APPENDIX K1

2016 Facility Model Maintenance Management Plan (Vol 1)

Procedure Revision History			
Revision	**Date**	**Approval**	**Reason**
0	01/25/10		Original
1	12/13/16	R. Michaels	• Updated responsible organizational units and technology
2	9/25/2017	R. Michaels	• Changed name from CMMS to Enterprise Asset Management System (EAMS), updated Project Manager role.
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2016

VOLUME I
Facility Model Maintenance Management Plan

Orange County Sanitation District

12/13/2016

HISTORY OF CHANGE

Version	Author	Date	Description
A	Marc Brown	2005	Initial release of document
B	Doug Rulison	Feb. 2010	Revised language
C	Rob Michaels	Dec. 2016	Update responsible organizational units and technology
D	Rob Michaels	Sep. 2017	Changed name from CMMS to Enterprise Asset Management System (EAMS), updated Project Manager role.

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SECTION 1   EXECUTIVE OVERVIEW

The Vision Statement for the Orange County Sanitation District is to maintain world-class leadership in wastewater and water resource management. This vision also applies to the way the Sanitation District manages its assets and facilities-world-class. To this end, the District and more specifically the Information Technology-Enterprise Information Management (EIM) group has expended significant resources—time and money—to create, manage, and share systems, or facility models, that record the **as-is state of the assets and facilities**. In order to manage these systems, which are in a constant state of change, a process has been developed to ensure the data contained in the facility models reflects the actual conditions in the field. This document describes the procedures, standards and tools used in the process.

1.0   General Overview

1.0.1   Document Mission

The purpose of the facility model Maintenance Management Plan is to document the process used to create, manage, and share the data contained within the facility models. It also provides a high level understanding of the change management process and provides a detailed understanding of the procedures, standards and tools used by EIM staff. Not covered in this document are the processes of adding new elements or features to the existing facility models or creating new models.

1.0.2   Audience

The audience for this document consists of three distinct groups: regulators, management, and editors. Regulators will see that there is a clearly documented process, complete with procedures and standards, which ensure the Sanitation District will remain in compliance with regulations. Management is assured that a defined process is in place and is consistently applied. The editors will use the document to follow the prescribed procedures, using the defined tools and standards for day to day maintenance of the systems.

1.0.3   Assumptions

The process detailed in this document assumes the field staff personnel are the ones who directly observe the accuracy and the correlation between the data in the facility models and the actual observable conditions of OCSD facilities. When the field staff submits discrepancy reports, the reports are accepted as the as-is condition of the actual condition of the facility. However, if additional information is required, the field staff may need to return to the location to collect the necessary data.

1.1   Document Organization

This is Volume I of a 3 volume set of Information Technology Department, Enterprise Information Management (EIM group) data maintenance process documentation. The purpose of the documentation is to clearly detail the processes used by the EIM group to maintain the facility models. The purpose of Volume I is to provide a general overview and background on the EIM group and

the facility model concept. Volumes II and III address the specific procedures and standards for the each facility model.

SECTION 2   FACILITY MODEL CONCEPT

A facility model is a complete and seamless representation of the current site conditions, stored in a single location and intended for a particular use. These facility models are used by OCSD staff, contractors and consultants to support the completion of work activities, in support of the OCSD mission.

The facility model concept was developed to address the difficulties of managing a growing volume of facilities information. A facility model provides a unique view of the facilities for a specific purpose. As an example, the "Facility Atlas" (FA) facility model is used to represent the physical location of process piping, equipment, and structures for use in construction design and planning. The purpose of the "Plant Design System" (PDS) facility model is to present schematic piping and instrumentation information for use in process control and analysis.

2.0   Descriptions of Facility Models

2.0.1   Sewer Atlas/Electronic Map Book (EMB)

The Sewer Atlas Facility Model (SA) was completed in 2004 through Capital Improvement Program project number 1-98. The SA is an electronic facility model that includes all of the sewer lines, manholes, diversion structures, force mains, siphons, force main valves and pump stations known to comprise the OCSD sewer collection system. Data from the SA was used to populate the current OCSD Enterprise Asset Management System (EAMS). These systems are expected to remain synchronized.

The SA data can be viewed in a variety of methods. The SA is a GIS based tool that is accessible through two web based applications, the Enterprise GIS and the Electronic Map Book (EMB). The Enterprise GIS data used in the SA provides read-only access to the assets for display and query purposes. The SA is a seamless dataset; therefore tabular data on all stored assets is available as needed. In addition, Record Drawings and Diversion Structures details are linked and viewable directly from the assets.

The Map Books are a four-volume set of printed maps showing information contained in the SA. These books are distributed to key locations and staff at both plants and made available to crews working in the collection system.

The EMB is an online version of the printed map book with a means to link directly to adjacent maps, Record Drawings and diversion structure details. The EMB is also available in an offline format to be used on laptops not connected to the District network.

2.0.2   Facility Atlas/Drawing Access System

The Facility Atlas (FA) is a powerful GIS-based tool for accessing "as-is" facility information for both Plant 1 and Plant 2 through a map-based user interface. The FA contains planimetric data; aerial photographs; design and construction areas; and buried, above-ground, and in-tunnel utilities, and equipment.

The Drawing Access System (DAS) provides a means to link a map based application directly to project information in the Electronic Document Management System (EDMS). Users are able to select structures in either Plant,

and then query projects that built or affected that structure. Project details, such as title and contract amount, and scanned engineering drawings may be viewed.

2.0.3   Electronic Document Management System (EDMS)

The Electronic Document Management System (EDMS) is a central repository for all project-related documents including Record Drawings.

2.1   Change Management Approach

In general terms, there are two types of events that will trigger the Change Management process: Capital Improvement Program (CIP) projects, and discrepancies. The following is a high level description of the processes followed.

2.1.1   Capital Improvement Program (CIP) Projects[DR1]

OCSD contracts with consultants and construction contractors to design and build new facilities. These projects produce a set of construction drawings, referred to as Conformed Drawings. Upon completion of the work described in the drawings, Record Drawings are produced. The Record Drawings depict any changes to the drawing set that occurred during construction. Those Record Drawings are considered to be the final record of the work performed and the current as-is condition of the facilities.

The Record Drawings have been deemed vital and historic documents and are therefore maintained for the life of the facilities they constructed or modified. The EIM group is responsible for their maintenance in both electronic and hardcopy formats.

Upon completion of a project, Record Drawings are generally produced by the design consultant. The plans are provided as electronic files in Portable Document Format (PDF) and forwarded to the Engineering librarian. There they are indexed and imported into the EDMS.

Copies of the Record Drawings are then distributed to key individuals to determine if changes or updates are required of the facility models. This starts the change management process.

For users of the data management applications, it is important to determine if changes to facility models occur after Record Drawings are produced (occasional exceptions have been made). This may, at times, result in data appearing to be missing from the model. Many times this is because the construction work was completed several months or years before the completions of the contractual project and the production of the Record Drawings.

2.1.2   Field Discrepancies/Modifications to Existing Systems

The second type of classification of changes is referred to as "discrepancies". These occur when the field condition does not agree with the facility model.

Examples include: manholes not shown on the Sewer Atlas; project data not shown correctly, etc. These errors or omissions occur for many reasons: oversights when extracting data for Record Drawings; incomplete or inaccurate Record Drawings or undocumented field staff modifications.

Regardless of the reason, discrepancies detract from the accuracy of the model and are therefore given high priority in regards to the change management

process. In short, the process consists of the OCSD staff filling out and submitting a field discrepancy form. This form indicates the model in which the discrepancy exists, and a description of the problem. This completed form, along with any supporting information, Record Drawings, photos or sketches, etc. is forwarded to the EIM group.

The discrepancy is logged, and evaluated. If the discrepancy meets the deviation guidelines, it is processed and changes to the model are made. The final outcome of the change is then forwarded to the requester to ensure we have captured the discrepancy correctly as was seen in the field.

SECTION 3   STAFF ROLES AND RESPONSIBILITIES

3.0   Overview

The Information Technology's Enterprise Information Management (EIM) group was established to be a centralized group of personnel who perform various administrative, technical, design, and program functions in support of the Engineering Department. The EIM group is responsible for maintaining certain features in the facility models. The mission statement of this group is recording the "as-is" state of OCSD facilities by capturing, maintaining, updating and sharing various engineering data sources.

Description of Staff Positions

3.0.1   GIS Administrator

The GIS Administrator will initiate and monitor the status of data versions and perform quality assurance checks on work being performed by the GIS/CAD Technicians. This staff member will also be responsible for posting final changes to the Enterprise GIS, assisting in the resolution of data conflicts and upkeep of the GIS based applications.

3.0.2   GIS Technician

The main function of the GIS Technician is to prepare data to be incorporated into a facility models. The GIS Technician will work under the direction of the GIS Administrator and/or EIM Lead. The tools used by this staff member may include both CAD and GIS applications.

3.0.3   CAD Technician

The main function of the CAD Technician is to prepare data to be incorporated into a facility model. The CAD Technician will work under the direction of the GIS Administrator. The tool used by this staff member will primarily be CAD applications.

3.0.4   Librarian

The Librarian is the individual responsible for the storage and safety of original documents. In most cases these documents have been deemed vital and historical and must be maintained in accordance with the Sanitation District's records retention policies. The Librarian will be the primary recipient of incoming Conformed and/or Record Drawings, specifications, reports, and final electronic files.

3.0.5   Project Manager

The District Project Manager initiates requests for project data at the beginning design project. The District Project Manager must coordinate with Consultants, District Staff and Contractors as necessary to ensure that CAD files returned to EIM during the design phases of the project, comply with the District CAD Manual.

3.0.6   Consultant

Project consultants receive a district baseline model file to begin all CIP projects. A data request is made through the PM for baseline model files and project

record drawing in the District EDMS. During the design phase of any project, there are CAD standards reviews that must be completed in order to ensure correct project data transfer. The consultant is to provide CAD files and hard copy prints for review. CAD standards are enforced in order to assist in data transfer and capture. Design data is converted from a CAD format to a GIS format to be included in the facility models, which are then reused for future project data requests.

SECTION 4   SOFTWARE CONFIGURATION

A variety of software is used to implement and manage the Sewer Atlas/EMB and the FA/DAS. The data for these systems is stored in a SQL Server database and a file based system that can be accessed by a variety of CAD and GIS client software packages.

4.0   Geographic Information Systems (GIS)

ArcGIS is the primary GIS client software used at the District and is distributed to desktop viewers and editors. The GIS client application that publishes the FA, SA and DAS on the District Intranet is called ArcGIS Server. ArcGIS Server sends data request to the SQL Server database. It is also possible to connect directly to the SQL Server database using ArcGIS desktop applications (which includes ArcMAP and ArcCATALOG).

4.1   Computer Aided Drafting (CAD)

Autodesk CAD applications are the standard CAD design software at the District. AutoCAD Map3D, Raster Design and Design Reviewer are a few of the software's that are used for capturing and editing engineering data. Feature Data Object (FDO) is a "middle-ware" that is used to allow CAD users to interface and edit GIS formatted data.

4.2   Engineering Document Management Systems (EDMS)

The Districts EDMS, SharePoint, is a software application that is the central repository for engineering project related documents. EDMS is an application that manages and stores documents that are linked or accessed through either the FA/DAS or SA/EMB.