



Facilities Management Handbook

Policy Handbook - Release 2 June 16, 2016





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SECTION 1: INTRODUCTION (LAST REVISED 10/10/12)

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1.1 PURPOSE

Facility management (FM) is critical to Los Angeles World Airports' (LAWA) ongoing success as a major international gateway. Facilities management is being called on to effectively sustain the value of LAWA's capital investment. This will be accomplished through strategic use of engineering and maintenance resources. At LAWA, facilities management involves groups responsible for planning, construction, operation and maintenance.

LAWA facilities management standards and practices are the subject of this handbook. As such, it contains LAWA's approved facilities management policies, conventions and guidelines. Policies provide processes and procedures that must be followed by all personnel involved in facilities management. Conventions define best practices for naming and registry facilities. Guidelines are processes and procedures that for regulatory or accounting constraints will not be performed as an official policy of LAWA.

Performance measures for tracking goals and objective are an essential element of these policies. Each section of the handbook defines key performance indicators (KPIs). Section 1.3 provides a summary of all KPIs.

1.2 DOCUMENT OVERVIEW

The Facilities Management Handbook contains the following sections.

Facility Registry Management - Section 3

Section 3 explains the facilities, systems and components (F/S/C) hierarchy, the processes that affect F/S/C registry change and the procedures used to develop and maintain the registry.

Facility Naming Convention – Section 4

Section 4 defines the naming convention for LAWA's F/S/C.

Building Space Naming Convention – Section 5

Section 5 defines the building space naming convention and procedures used to develop a rooms and columns names.

Work Management - Section 6

Section 6 defines the facilities management workflow processes and procedures for planning and performing maintenance work.

Condition Assessment – Section 7

Section 7 describes LAWA's business functions supported by condition assessments and defines the procedures used for inspecting and assessing buildings and grounds.

Facility Fixed Asset Capitalization - Section 8

Section 8 contains guidelines for the consistent and uniform capitalization of fixed facility assets.

Total Cost of Ownership – Section 9 Under development



F/S/C Transition to Operations and Maintenance – Section 10

Section 10 defines the process and procedures to manage the transition of facilities systems and components (F/S/C as defined in FM Handbook Section 3) from construction or acquisition to operations and maintenance.

Information Technology Change - Section 11

Section 11 defines the communication procedures used to facilitate the Facilities Management Group's acquisition of new or replacement of old information management tools.

Reference Material – Section 12

Section 12 is a compilation of electronic forms needed to perform various FM procedures and all reference materials called out in other sections.

Sections 3 through 10 of this handbook are related as shown in Figure 1.1. This collection of processes and procedures is used to sustain high performance throughout the operational life of an F/S/C.



Figure 1.1 Relationship between Handbook Sections



1.3 KEY PERFORMANCE INDICATORS SUMMARY

KPIs are business success metrics. Facilities management KPIs align with LAWA's mission and core values for sustaining safe and high-performing facilities and for maximizing customer satisfaction.

Table 1.1 summaries the facilities management KPIs from each section of the handbook. Each handbook section contains detailed KPI descriptions. Facilities management KPIs measure either adherence to a policy or performance relative to established management objective.

Facility Management Business Objective	Key Performance Indicator	Measurement	Frequency Monitored
Facility Registry Management	All work performed complies with the Facility Registry Management Policy	Number of work orders that were completed without a specific F/S/C. If no F/S/C exists on the work record then a review of the work is required to determine if a F/S/C is missing.	Every 6 months
Facility Registry Management	Registry database validation	Report that determines whether data exists in a field for those registry records that are medium or high priority. Missing data will require record updating.	Every 6 months
Facility Registry Management	Facility Registry is current and up to date	Report that looks at the date difference between last update and the last date the record was used. If the record has not been updated in over a year then a survey is recommended.	Annually
Facility Naming Convention	All F/S/C's are properly named in the Facility Registry.	Compares the F/S/C type to the prefix of the ID. Validates the correct use of the prefix and validates that the suffix is unique within a hierarchy.	Every 6 months
Building Space Naming	All building space naming is done accurately.	Audit of sample area to compare database information against drawing information and the physical space to determine if there are any discrepancies.	Annually

Table 1.1 Summary of Facilities Management KPIs



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Facility Management Business Objective	Key Performance Indicator	Measurement	Frequency Monitored
Building Space Naming	Unique space names within a facility	Validates that space names are unique within a facility.	Every 6 months
Work Management	Repeat Maintenance Report	All systems and components trend to the average failure rate for the similar type of system or component.	Quarterly
Work Management	Mean Time To Repair (MTTR) and Mean Time To Failure (MTTF)	All systems and components trend to the average MTTR and MTBF for the similar type of system or component. Outliers are reviewed for improvement.	Quarterly
Work Management	Volume of service requests	Report on the ratio of service requests to work orders with a goal of 20% service requests.	Monthly
Condition Assessment	Facility Condition Index (FCI)	A comparative indicator of the relative condition of facilities. Provides a facility manager a corresponding rule of thumb for the annual reinvestment rate (funding percentage) to prevent deferred maintenance accumulation.	Every 5 years
Condition Assessment	Component Renewal Index (CRI)	Indicates the relative funding required to address identified component renewal and renovation/modernization needs.	Every 5 years
Condition Assessment	Condition Index (CI)	The CIs is a baseline index for evaluating the actual physical condition of a facility.	Every 2 years
Fixed Asset Capitalization	Fixed Asset Capitalization Compliance Report	All new assets acquired by LAWA be capitalized using the Fixed Asset Capitalization Accounting Form.	Annually



Facility Management Business Objective	Key Performance Indicator	Measurement	Frequency Monitored
Fixed Asset Capitalization	Fixed Asset Capitalization Compliance Report	All groups within LAWA capitalize new assets using the Fixed Asset Capitalization Form.	Annually
Total Cost of Ownership	Total Cost of Ownership Compliance Report	Total Cost of Ownership costs are calculated when new assets are acquired by LAWA.	Annually
F/S/C Transition to Operations and Maintenance	Data Import	Ensures there are no import errors for validated fields when data is imported from the E-Form into FMS	Every data import
F/S/C Transition to Operations and Maintenance	Registry Database Validation	Report that determines whether data exists in a field for those registry records that are medium or high priority. Missing data will require record updating.	Every 6 months
Information Technology Change	Complete Participation in Assessments	Number of requests completed within 30 calendar days with input from all divisions	Every 6 months

1.4 ACKNOWLEDGEMENTS

Facilities management is a complex business that relies on and impacts all areas of LAWA organization. The FM Handbook is, and will continue to evolve as, LAWA's single "how-to" knowledge source for sustaining high performing facilities.

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Facilities Management Group: Including the Engineering and Facilities Management Division: Central Utilities Plant, Facilities Information Resources, Facilities Maintenance (Building and Mechanical Systems: Air Conditioning Shop, Mechanical Repair, Plumbing Shop; the Electrical and Conveyance: Electrical Shop, Elevator/Escalator Shop and Technical Support).

The Maintenance Services Division: Custodial, Facilities / Field Services and Field Repair.

Airports Development Group

Administration Group: Including the Office of the Comptroller and Procurement Services.

Commercial Development Group

Facilities Planning Group: Including Landside Improvements and Terminal Improvements.

Finance & Budget Group

Information Management & Technology Group

Law Enforcement & Homeland Security Group

Operations and Emergency Management Group: LAX Operations, including Airport Response Coordination Center, Airside and Landside.

Consultant Team: Including Jacobs, Creelman and Associates and AME, Inc.



1.5 RELEASE HISTORY

Handbook Release	Description	Author	Date
1	Initial Release	FMG	February 29, 2012
2	First Update, Issuance of F/S/C Policy, and Renumbering of IT Policy	FMG	August 31, 2012



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SECTION 2: GLOSSARY (LAST REVISED 8/31/12)



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2.1 GLOSSARY OF TERMS

Acquisition:	The process by which Los Angeles World Airports (LAWA) comes into possession and ownership of a fixed asset, e.g., purchase, donation, construction, eminent domain or foreclosure.
Airport Property:	All property owned by the Airport, whether purchased, leased, confiscated, donated received by eminent domain, constructed or annexed. Airport property may include supplies, real property, police property, capital assets and controlled items.
Area:	LAWA subdivides each airport campus into areas. The combination of campus designation and area designation defines the general location of a facility.
As-Built Documents:	Final documents and records of the facility, system or component as installed.
Asset:	Capital investments maintained by LAWA's Finance and Accounting Management Information System (FAMIS).
Attribute:	A characteristic or feature of a facility, system or component.
Backlog and Funding Projections:	Model scenarios that can estimate the future backlog of deferred maintenance based on current funding strategies and collected data. Also can determine the levels of funding required to obtain a future FCI or backlog level. A backlog projection models the level of deferred maintenance that may be obtained when applying a certain funding level. A funding projection models the level of M&R budget needed to achieve or maintain a certain deferred maintenance backlog.
Building:	A facility that has a roof, walls and a defined location.
Building Automation System (BAS):	This is a general term to describe a system used to monitor and control individual room temperatures, lighting and/or security. The system optimizes the start-up and performance of HVAC equipment and alarm systems. A BAS greatly increases the interaction between the mechanical systems of a building, improves occupant comfort, lowers energy use and allows off-site building control.
Building System Scorecard (BSS):	Assessment tool used to grade building systems based on established criteria.
Campus:	Los Angeles International Airport (LAX), Ontario International Airport (ONT), Van Nuys Airport (VNY) or Palmdale Regional Airport (PMD), are referred to as campuses.



Campus Code:	Los Angeles International Airport (LAX), Ontario International Airport (ONT), Van Nuys Airport (VNY) or Palmdale Regional Airport (PMD) are referred to as campuses.
Column Names:	Location referencing names applied to building's structural columns. This definition does not consider column labels used with building design or asbuilt documents.
Component:	Element of a system that is managed, monitored or maintained separate from the system.
Component Code or System Code:	Derived from the system or component codes found in Section 12B.1 – Facility Data Dictionary of the Facility Registry Management Policy (FM Handbook Section 3) and a unique suffix determined by the data dictionary rules.
Component Renewal:	Component renewal is the financial requirement associated with the replacement or renewal of a system or component that has reached the end of serviceable life and with an intended design life less than the design life of the entire facility. The capital/component renewal cost includes the deconstruction of the existing system or system components and replacement with a new system of equal capability and performance.
Component Renewal Index (CRI):	Indicates the relative funding required for identified component renewal and renovation/modernization needs. CRI is derived by dividing projected component renewal by current replacement value (CRV).
Condition Assessments:	Represents the current physical state of the facility, system or component. It is used to compare the conditions of facilities, systems or components to determine the effectiveness of maintenance practices, and compare the long-term functionality of specific facilities, systems and components.
Condition Index (CI):	An indicator of the actual physical condition of a facility, system or component (F/S/C). Each building system is scored based on a five-tier condition scale (i.e. Excellent, Good, Average, Poor, and Fail) with a coordinating numerical scale and is totaled to determine the building's overall CI.
Corridor:	An interior or exterior passageway connecting sections of a building. Corridors provide access to rooms and sometimes other corridors.
Cubicle:	Partially enclosed workspace, separated from neighboring workspaces by partitions.
Current Replacement Value:	The total expenditure in current dollars required to replace any facility, including construction costs, design costs, project management costs and project administrative costs.



Data Dictionary:	A centralized repository of information about data such as meaning, relationships to other data, origin, usage and format.
Data Type:	A category of data. Typical data types are logical (true/false), numeric, alphanumeric (character) and dates. When data are assigned a type, they cannot be treated like another type. For example, alphanumeric data cannot be calculated and digits within numeric data cannot be isolated. Date types can only contain valid dates.
Deferred Maintenance:	Deferred maintenance represents curable physical deficiencies that are present on an existing facility, system or component and that have been deferred from the time frame that they were intended to be accomplished; denotes the need for immediate expenditures.
Demolition:	Removal of a facility, system or component that has been determined to be unsafe or no longer meets, or is not required to meet, mission goals.
Depreciation:	The allocation of the cost of assets to periods is determined by the Comptroller.
Design Life:	Period for which a facility, system or component is expected to function at its designated capacity without major repairs.
Disposition:	The process by which the airport relinquishes possession and ownership of an asset or a facility, system or component.
Domain:	A domain is the set of possible data values of an attribute, which have a standard set of characteristics.
Emergency Maintenance:	A maintenance task carried out in order to avert an immediate hazard or to correct an unexpected failure.
Energy Upgrade:	Planned replacement of facility systems or components to achieve energy conservation. Energy Upgrades identify the repair and replacement costs to implement the energy conservation measures.
Facility:	A structure or installation serving a specific function. A facility is a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant, or structure; built, established or installed for the performance of one or more specific activities or functions.
Facility Condition:	Represents the current physical state of the facility, system or component. It is used to evaluate the conditions facilities, systems or components to determine the effectiveness of maintenance practices, and compare the long-term functionality of specific facilities, systems and components.



Facility Code:	Derived from Facility Group code and a unique suffix determined by the data dictionary rules. The Facility Group code is found in Section 12B.1 – Facility Data Dictionary of the Facility Registry Management Policy (Facility Management Handbook Section 3), Table 12B.1-1: Facility Groups, Types and Codes.	
Facility Condition Assessment (FCA):	An inspection and assessment of facilities producing a complete account of system and component deficiencies and a list of remediation scenarios. FCA results inform maintenance and capital renewal planning.	
Facility Condition Index (FCI):	A comparative indicator of the relative condition of facilities expressed as a ratio of the cost of remediating maintenance and repair backlog to the CRV.	
Facility Fixed Asset:	Any fixed asset with an original cost of \$50,000 or greater. These items have significant value and will be capitalized. A "Facility Fixed Asset" can be a single facility or groups of facilities, a system or group of systems, a component or group of components.	
Facility Fixed Asset Capitalization Form (FFAC):	The format used to collect facility, system or component data necessary for asset capitalization. The form in Appendix 8A has been developed for the facility type "building," since this facility type is typically the most complex (i.e. consists of the most distinct systems and components). The form can be built to suit any facility, system or component.	
Facility Group:	The common features or characteristics by which a facility and its subordinate systems and components are categorized. Facility groups are currently defined as:	
	Grounds	Fencing, Gates, Landscaping
	Transportation Infrastructure	Aprons, Bridges, Parking Lots, Roads, Runway, Taxiway, Tunnels
	Building	Central Utility Plant, Cargo, Office, Parking Structure, Terminal
	Utility Infrastructure	Communication, Fuel, Natural Gas, Storm Water, Sanitary Sewer, Water, Compressed Air, Industrial Waste, Electrical, Heat / Cool Distribution
Facility Hierarchical Levels:	A facility management best practice is to organize and maintain a hierarchical relationship between facility, system and component, sometimes called a parent–child relationship. Facilities have systems and systems have components. In LAWA's facility registry a facility can exist without related system records but a system cannot exist without a related facility. Likewise, a system can exist without components, but a component cannot exist without a parent system. See graphic below for a visual on these levels.	



Facility Groups / Classes	Facility Component
Facility Management System (FMS):	The software system used by LAWA staff and approved contractors to plan, schedule, track maintenance and repair work and to record performance statistics.
Facility Registry:	The database of information about LAWA facilities, systems and components and their location, attributes, characteristics and condition.
Facility/System /Component (F/S/C) Criticality:	Ranked importance of a facility, system or component to LAWA's mission.
F/S/C Identity:	The F/S/C identity is a unique universal identifier that is sequentially generated for each F/S/C. The identity stays with the F/S/C regardless of where the F/S/C is located.
F/S/C Name:	The F/S/C name is constructed using the F/S/C hierarchy and convention. The F/S/C name will change if relocated to another facility. The F/S/C name is unique to the Facility.
F/S/C Electronic Form (E-Form):	A pre-populated form used to validate and/or collect data regarding the F/S/C constructed or acquired through LAWA and tenant projects. The F/S/C E-Form includes information regarding: F/S/C attributes, Job Plans, preventive maintenance tasks (PMs) and instructions for use.
First Cost:	The cost to acquire (construct or purchase) a facility, system or component.
Incident Report:	An emergency service request that must be addressed immediately. An incident report is entered into FMS as a high priority service request.
IT Governance Committee:	The IT Governance Committee makes funding recommendations, provides strategic direction, sets priority of competing IT projects and initiatives, and makes decisions on major IT investment. The Committee approves major IT policies and technical standards that impact business and operations. Divisions may not purchase major hardware or software (>\$250K) without IT Governance Committee approval.
Job Plans:	Documents used to plan work. These documents include a list of work steps (tasks) and the typical resources (labor, material, equipment) needed to perform the work steps.



Legislatively Mandated:	Deficiencies that must be corrected in response to regulatory or code requirements. These activities include retrofitting for code compliance, accessibility and removing hazardous materials such as asbestos and underground storage tanks.
Level:	The position of a floor within a building.
Location:	Any coordinate, name or address that uniquely locates an F/S/C.
Los Angeles World Airports (LAWA):	LAWA owns and operates three airports in Southern California, Los Angeles International Airport (LAX), Van Nuys Airport (VNY), Palmdale Regional Airport (PMD) and LA/Ontario International Airport (ONT).
Mission Critical:	Activity, component, service or system whose failure or disruption will result in the failure of business operations.
Mean Time Between Failures (MTBF):	The predicted elapsed time between inherent failures of a system or component during operation. MTBF can be calculated as the arithmetic mean (average) time between failures of a system.
Mean Time To Repair (MTTR):	A basic measure of the maintainability of repairable items. It represents the average (mean) time required to repair a failed component or system.
Metadata:	Information about data; for example, a text document's metadata may contain information such as: document length, author, creation date and summary.
New Construction:	Construction that adds to an existing footprint or creates a new facility, system or component.
Physical Deficiencies:	The presence of conspicuous defects or deferred maintenance of F/S/C as observed during the field observer's walk-through survey. Physical deficiencies specifically exclude deficiencies that may be remedied with routine maintenance, miscellaneous minor repairs or normal operating maintenance.
Preventive Maintenance (PM):	Regularly scheduled maintenance activities on selected equipment F/S/C. Typically PM includes inspection, testing, lubrication and minor adjustments.
Project Record Documents:	Also known as As-Built Documents, these are the final installed and/or acquired F/S/C construction records, including, but not limited to: record drawings and specifications, product data, samples, spare parts and tools, technical manuals, permits, certificate of occupancy, miscellaneous record submittals, F/S/C electronic form (E-Form) and F/S/C transition documents check list.



Property Condition Assessment (PCA):	Architectural and engineering due diligence assessment of an existing building and site that informs the property acquisition process. PCA evaluates physical condition, general code compliance, capacities/adequacies, repair and maintenance issues, recommended replacements, capital expenditures, and provides corrective action probable costs opinions.
Property Condition Report (PCR):	The work product resulting from completing a PCA in accordance to the Condition Assessment Policy. The PCR incorporates the information obtained during the walk-through survey, the document review and interview portions of the PCA, and includes opinions of probable costs for remediating the physical deficiencies identified.
Range of Values:	The range specifies the lower and upper boundaries of the values that an attribute may legally have.
Remaining Useful Life:	An estimate made by a qualified inspector, based upon observations and experience, on the number of remaining years that an F/S/C will be functional before needing replacement.
Recurring Maintenance:	Work activities that recur, based on normal wear patterns, on a periodic cycle of greater than 1 year and less than 10 years. Typical work includes painting, caulking, sealing, carpet replacements, tree trimming, sprinkler head replacements, curb painting, etc.
Room:	A space that can be accessed by a door and is enclosed by a floor, walls and a ceiling.
Service Request:	A request for work to be performed. A high priority service request is also known as an Incident Report. Service requests are used to track requests for work that comes into the Airport Response Coordination Center. If the request for service requires cannot be resolved on the first response and requires additional resources, then a work order is created.
Shop Work Order:	A work order that is created ad hoc by a shop for a discovered problem, as opposed to being created as a result of a service request or planned maintenance.
Sub-Room:	Rooms that can only be accessed from another room and have no doors directly off of a corridor (i.e. a room within a room).
Sustainment Cost:	The total of costs required to operate, maintain, preserve and renew the facility, system or component on an annualized basis.
System:	A collection of components performing a specific function for a facility. Systems are logical elements of a facility that are unique in their life-cycle and/or function.



System Code or Component Code:	Derived from the system or component codes found in Section 12B.1 – Facility Data Dictionary of the Facility Registry Management Policy (FM Handbook Section 3) and a unique suffix determined by the data dictionary rules.
Total Cost of Ownership (TCoO):	The sum of the expenditures required to construct, operate, maintain, preserve and renew the facility, system or component over its intended design-life with acceptable functionality.
Total Cost per Acre (or Square Foot):	A benchmark per grounds (for acre) or facility (for Square Foot) to track total expenditures relative to the size of the facility. It is the ratio of total maintenance, repair and replacement costs divided by total gross acre or square footage, respectively, of the facility.
TCoO Ratio:	The ratio of first cost to sustainment cost.
UNIFORMAT II Code:	UNIFORMAT II is a format for classifying building elements and related site work. Elements are major building components that perform a given function, regardless of the design specification, construction method or materials used. Section 12B.2 lists the UNIFORMAT II codes used to by LAWA for facilities management.
Unit:	A unit (of measurement) is a definite magnitude of a physical quantity that is used as a standard for measurement of the same physical quantity.
Work Inspections:	Either a situational review of the work site during preparation for an existing work order, or performance of a scheduled inspection as a work order.
Work Order:	An instruction with the accompanying details and information needed to perform a defined scope of work. Work Orders are created when a service request cannot be resolved on the first response, or are created automatically for planned maintenance.
Work Order Criticality:	Work order importance rating based on the sum of F/S/C criticality and work type criticality.
Work Order Priority:	Ranking of a work order based on allowable work initiation time.
Work Type:	Classification of work based on business need, such as legislatively mandated or unplanned corrective work.
Work Type Criticality:	The importance of the work in maintaining functioning facilities, systems and components.

2.2 ACRONYMS

Los Angeles World Airports

ADA:	American Disabilities Act
ADG:	Airports Development Group
AHU:	Air Handling Unit
ARCC:	Airport Response Coordination Center
ARF:	Aircraft Rescue Fire Fighting
ASTM:	American Society of Testing Materials
BAS:	Building Automation System
BIM:	Building Information Modeling
BSS:	Building System Scorecard
CA:	Condition Assessment
CADD:	Computer Aided Design and Drafting
CC:	Century Cargo
CDG:	Commercial Development Group
CI:	Condition Index
CRG:	Cargo
CRI:	Component Renewal Index
CRV:	Current Replacement Value
EFMD:	Engineering and Facility Management Division
F/S/C:	Facility, System or Component
FAMIS:	Finance and Accounting Management Information System
FASB:	Financial Accounting Standards Board
FCA:	Facility Condition Assessment



FCI:

FCI:	Facility Condition Index
FFAC:	Facility Fixed Asset Capitalization
FM:	Facilities Management
FMG:	Facilities Management Group
FIMPPP:	Facility Information Management Policy, Procedures and Products
FMS:	Facility Management System
FMU:	Facilities Management Unit
FPD:	Facility Planning Division
GAAP:	Generally Accepted Accounting Principles
GASB:	Governmental Accounting Standards Board
GFOA:	Government Finance Officers Association
GIS:	Geographic Information System
GPS:	Global Positioning System
IMTG:	Information Management and Technology Group
IS:	Imperial Service
IT:	Information Technology
JOC:	Job Order Contracting
KPIs:	Key Performance Indicators
LAWA:	Los Angeles World Airports
LAX:	Los Angeles International Airport
M&R:	Maintenance and Repair
MSD:	Maintenance Services Division
MTBF:	Mean Time Between Failures



MTTR:	Mean Time to Repair
OFF:	Office
ONT:	LA/Ontario International Airport
PCA:	Property Condition Assessment
PCR:	Property Condition Report
PdM:	Predictive Maintenance
PM:	Preventative Maintenance
PMD:	Palmdale Regional Airport
RFID:	Radio Frequency Identification
RFP:	Request For Proposal(s)
RM:	Recurring Maintenance
QOH:	Quantity On-Hand
SAP:	Systems, Applications and Products in data processing. In this document, any SAP reference is to the software.
SR:	Service Request
TER:	Terminal
URR:	User Requirements Request
VNY:	Van Nuys Airport
WBS:	Work Breakdown Structure
WO:	Work Order



2.3 HISTORY

Revision	Description	Author	Date
1	Addition of various definitions and acronyms added as a result of updates to policies, guidelines and conventions.	FMG	August 31, 2012

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SECTION 3: FACILITY REGISTRY MANAGEMENT (LAST REVISED 8/31/12)



Section Contents

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Facilities Management Handbook FACILITY REGISTRY MANAGEMENT

LAWA Facilities Management Handbook Policy

Title: Facility Registry Management

Los Angeles World Airports

Section 2.3-1

Authority: Deputy Executive Director, FMG

3.1 POLICY

Los Angeles World Airports (LAWA) will maintain a comprehensive registry of facilities, systems and components (F/S/C). Use this policy to create and update F/S/C information.

3.2 DEFINITIONS AND CONVENTIONS

3.2.1 Definitions

Attribute: A characteristic or feature of an F/S/C.

Component: Element of a system that is managed, monitored or maintained separate from the system.

- Data Dictionary: A centralized repository of information about data such as meaning, relationships to other data, origin, usage and format.
- Design Life: Period for which an F/S/C is expected to function at its designated capacity without major repairs.
- Facility: A structure or installation serving a specific function. A facility is a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant, or structure; built, established, or installed for the performance of one or more specific activities or functions.
- Facility Hierarchical Levels: A facility management best practice is to organize and maintain a hierarchical relationship between facility, system and component, sometimes called a parent–child relationship. Facilities have systems and systems have components. In LAWA's facility registry a facility can exist without related system records but a system cannot exist without a related facility. Likewise, a system can exist without components, but a component cannot exist without a parent system.



Figure 3.1 Facility Hierarchy

Facility Management System (FMS): The software system used by LAWA staff and approved contractors to plan, schedule, track maintenance and repair work and record performance statistics.



- Facility Registry: The database of information about LAWA F/S/C and their locations, attributes, characteristics and condition.
- LAWA: Los Angeles World Airports LAWA owns and operates four airports in Southern California, Los Angeles International Airport (LAX), Van Nuys Airport (VNY), Palmdale Regional Airport (PMD) and LA/Ontario International Airport (ONT).

Location: Any coordinate, name or address that uniquely locates an F/S/C.

- Mission Critical: Activity, component, service or system whose failure or disruption will result in the failure of business operations.
- Remaining Useful Life: An estimate made by a qualified inspector, based upon observations and experience, on the number of remaining years that an F/S/C will be functional before needing replacement.
- SAP: Systems, Applications and Products in Data Processing. In this document, any SAP reference is to the software.
- System: A collection of components performing a specific function or service for a facility. Systems are logical elements of a facility that are unique in their life-cycle and/or function.
- UNIFORMAT II Code: UNIFORMAT II is a format for classifying building elements and related site work. Elements are major building components that perform a given function, regardless of the design specification, construction method or materials used. Section 12B.2 lists the UNIFORMAT II codes used to by LAWA for facilities management.

3.2.2 Registry Convention

The facility registry is a database of information needed to support maintenance and life-cycle management of the F/S/C.

A record in the registry is part of a hierarchical collection of LAWA F/S/C. Systems (electrical, plumbing, roof, ventilation, etc.) are recorded as members of a facility and components (distribution panels, pumps, compressors, etc.) are members of a system. Figure 3.2 shows the examples for two different facility groups.



Figure 3.2 Facility Hierarchy Examples

Section 12.B.1 provides a complete data dictionary of LAWA's facility registry. LAWA must register the facilities according to the collection of facility types provided in Table 12B.1-1. System and component



registry entries are not mandatory unless required by life safety regulation or are mission critical. The Facilities Management Unit (FMU) determines the priority by using the method outlined in this policy.

The procedure for developing registry names can be found in the Facility Naming Convention policy (Facility Management [FM] Handbook Section 4). The location referencing for the registry can be found in the Building Space Naming Convention policy (FM Handbook Section 5).

3.3 ROLES AND RESPONSIBILITIES

Administrator – The facility registry is managed and maintained by the FMU of Engineering and Facilities Management Division (EFMD). FMU is responsible for the facility registry, including identifying and entering new F/S/C registry records, collecting and validating F/S/C attributes, updating the registry when F/S/C are modified, and validating registry accuracy and completeness.

Contributors – EFMD and Maintenance Services Division (MSD) staff performing inspection, condition assessment or maintenance work access and update the registry. They are responsible for collecting information on F/S/C modified as a result of maintenance and component renewal activities. Airports Development Group (ADG) is responsible for collecting and delivering registry compliant F/S/C information. Commercial Development Group (CDG) is responsible for informing EFMD when LAWA acquires or disposes of F/S/C. Planning and IMTG are responsible for identifying F/S/C that should be included in the Registry and collecting the F/S/C information needed.

All facility registry users are responsible for identifying and reporting inaccuracies, gaps or other issues.

3.4 PROCESSES AND PROCEDURES

The Facility Registry Management policy establishes processes and procedures to consistently identify and maintain information about LAWA F/S/C. The facility registry is designed to support condition assessments, work management and facility planning by recording data about each F/S/C including the following:

- Unique identification
- Description
- Location
- Condition attributes
- Original installation date
- Warranty information
- Legacy name
- Other related attributes and characteristics that describe the F/S/C

3.4.1 Process for Maintaining the Facility Registry

The facility registry is a repository of information that is continually being accessed and modified. At any time, the facility registry reflects the current record of LAWA's F/S/C. The following activities will cause changes to the facility registry:

- 1. Design of a new F/S/C
- 2. Renovation, expansion or modification of existing F/S/C
- 3. Purchase, transfer or demolition of existing F/S/C
- 4. Maintenance of any F/S/C

Figure 3.3 shows the process flow. The numbered items above are referenced in the process figure.




Figure 3.3 Registry Maintenance



There are six basic processes for maintenance of the Facility Registry that will be detailed:

- 1. Setting registry records level of detail
- 2. Adding new registry records
- 3. Updating existing registry records
- 4. Use of facility registry for renovations
- 5. Archiving existing registry records and
- 6. Validating the registry records.

3.4.1.1 Setting Registry Records Level of Detail

Each F/S/C has a specific importance to LAWA. Collecting and maintaining information has a cost and a value to LAWA. Establishing a priority for each registry record assists in providing the appropriate value to LAWA for each record.

The priority is established for the facility, the systems within the facility and the components of the systems. In determining the priority for a specific record, FMU will consult with the facility stakeholders. A decision tree has been provided in Figure 3.4 to assist in determining the appropriate importance level.

Once the priority for each record is established, Table 3.1: Registry Level of Importance is used to determine the level of detail to which data must be collected. The registry criticality is presented to show the relationship between the priority determined in this policy and the initial registry criticality that will be determined when the work management policy is implemented.

Table 3.1 Registry Level of Importance

Levels of Importance	Facility	System	Component	Registry Criticality
High	Detail	Detail	Detail	5
Medium	Detail	Detail / General	General	3
Low	General	General	None	1

Initially, registry priorities of 5, 3 and 1 are used to correspond to Levels of Importance; High, Medium and Low, respectively. Once the F/S/C is put into service the criticality may be modified to reflect other criteria than what is identified in Figure 3.4.

The data dictionary in Section 12B.1 includes all of the information that can possibly be collected for each registry record. The data dictionary can be used as a checklist in developing surveys for and audits of the registry. Table 3.2 indicates the types of data needed for a detail template and a general template.

Table 3.2 Template Characteristics



Detail Template	General Template
Unique ID	Unique ID
Description	Description
Uniformat Code	Uniformat Code
Location	Location
Physical Characteristics	
Nameplate data	
Performance data	
Condition rating	



In evaluating whether a record has a high, medium or low importance the decision tree in Figure 3.4 can be used to determine the appropriate importance.





Figure 3.4 F/S/C Level of Importance Decision Tree

3.4.1.2 Adding New Registry Records Procedure

FMU will provide unique identifiers for an F/S/C that will be added to the registry during the design phase. The attribute data will be collected for the registry records during the commissioning and activation phase of a project. The registry records and information to be collected are determined using the priority process in this policy.

Contractors and commissioning agents will be required, according to the Transition Management Policy (FM Section 10), to provide registry data to FMU. The data dictionary in Section 12B.1 can be used as a checklist to identify the registry records required and the data needed for each type of registry record. The registry will be updated by FMU from the information provided for registry items installed and performance measurements taken by the commissioning agent.

For a purchase or change in ownership the unique ID's are to be assigned by FMU after the conclusion of the transaction. Upon notification of the need for registry additions the following steps will be performed:

- 1. Initially obtain any relevant information regarding the facility such as drawings, specifications, maintenance records or other information that can assist in identifying registry records needed. Assemble a list of the systems and components within the facility that should be included in the registry.
- 2. Identify the registry template requirements based upon the level of importance using the process in this policy. The priorities are established by EFMD in consultation with CDG, any tenants, Facility Maintenance, MSD and ADG.
- 3. Prepare data collection sheets based upon the registry records needed and the details to be obtained using the data dictionary as a template.
- 4. Prepare bar codes for applying to the systems and components that are included in the registry.
- 5. Contact the facility stakeholders to setup a time for conducting a field survey.
- 6. Conduct the field survey to collect the information needed for the registry. Apply the bar codes to each system and component that is added to the registry.
- 7. If information is collected manually, then the data collection sheets are used to enter the information into the registry in FMS. If information has been collected electronically, then the data is uploaded into the registry in FMS.
- 8. FMU will perform a review of the newly entered registry items to ensure accuracy of the information. The review is done using the validation process in this policy.

3.4.1.3 Updating Existing Registry Records Process

When an existing record needs to change, complete a Facility Change Control Document provided in Section 12A. Accompanying the change document should be the F/S/C attributes for the F/S/C that changed. For processes involving the maintenance of an existing F/S/C, Facilities Maintenance or MSD identify the changes and submit the change control document. The data dictionary in Section 12B.1 is to be used as a checklist for the specific registry item to be added or modified.

3.4.1.4 Use of Facility Registry for Renovations

Use the registry to identify F/S/C located in areas scheduled for part of a renovation. The F/S/C in the affected area can be targeted for removal based upon the information in the registry or alternatively may be retained and/or re-purposed. The change modification document in Section 12A can be used to list the F/S/C that will be affected.



3.4.1.5 Archiving Existing Registry Records Procedure

When an F/S/C is replaced, the registry record for the old item needs to be archived and the replacement needs to be added to the registry. As maintenance is performed on F/S/C, the performance measurements are collected and associated to that record. The new item installed to replace the old item will build its own history, specific to its use.

Since databases are relational, removing a record will orphan associated records. Registry records for items retired or removed from service are not removed from the database. The automatic generation of recurring, predictive and preventive maintenance work orders is stopped. EFMD is responsible for archiving the old registry record. Specific procedures for archiving in FMS will be developed with its implementation.

The new item that is installed as a replacement will have a new ID assigned according to the Facility Naming Convention policy. Data for the record will be collected in accordance with the new registry record process in this policy.

3.4.1.6 Validating Registry Records

Maintaining a current, accurate and complete facility registry requires a process that accounts for all possible change agents. LAWA groups that support corporate data repositories (i.e., FMS, Geospatial System, Property Management System, Document Management System and Project Management, CDG and IMTG) must participate and contribute to the validity of the facility registry. To keep the registry current, accurate and valuable, EFMD is required to conduct periodic audits of the registry. EFMD will perform audits using the Key Performance Indicators (KPIs) in this policy on the frequency recommended, with the goal of meeting or exceeding the performance goal.



3.5 KEY PERFORMANCE INDICATORS

The following reports are Key Performance Indicators (KPIs) that are used to assist in evaluating the integrity of the database.

Table 3.3 Key Performance Indicators

Key Performance Indicator	KPI Description	What it Measures	Why This is Important	Frequency (F) and Performance Goal (G)
Work completed without an F/S/C	Analyzes work orders that were completed without a specific F/S/C	Determines if an F/S/C is present. If not, provides the work order number and a description of the work performed	Indicates problems either in selecting the correct F/S/C for work or the non- existence of a registry record	F: 6 months G1: Compliance with Facility Registry Management policy G2: No work orders without a registry item
Registry database validation	Analyzes the population of the attribute fields based upon the priority of the Registry record	Determines whether data exists in a field for those registry records that are medium or high priority	Identifies where there are gaps in information	F: 6 months G: No missing information for high priority registry records
Registry is current and up to date	Analyzes the last time the record was updated against the last time the record was used	Determines the date difference between last update and the last date the record was used	A large date difference of more than one year may suggest that a field survey is required to ensure the data is current	F: Annually G: Every registry record is confirmed annually

3.6 HISTORY

Revision	Description	Author	Date
1	Updates to the following Sections: Definitions and Conventions; Roles and Responsibilities	FMG	August 31, 2012



Page: 4-1 Date: 08/31/12

SECTION 4: FACILITY NAMING CONVENTION (LAST REVISED 8/31/12)



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Facilities Management Handbook
FACILITY NAMING CONVENTION

LAWA Facilities Management Handbook Policy

Title: Facility Naming Convention

Los Angeles World Airports

Section 2.4-1

Authority: Deputy Executive Director, FMG

4.1 POLICY

Los Angeles World Airports (LAWA) will establish and maintain a consistent convention for naming its facilities, systems and components (F/S/C).

4.2 DEFINITIONS AND CONVENTIONS

4.2.1 Definitions

As-Built: Final documents and records of the F/S/C as installed.

Attribute: A characteristic of an F/S/C maintained in the Facility Registry.

Campus Code – Los Angeles International Airport (LAX), Ontario International Airport (ONT), Van Nuys Airport (VNY) or Palmdale Regional Airport (PMD) are referred to as campuses.

Component: Element of a system that is managed, monitored or maintained separate from the system.

- Data Dictionary: A centralized repository of information about data such as meaning, relationships to other data, origin, usage and format.
- Facility: A structure or installation serving a specific function. A facility is a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant or structure; built, established, or installed for the performance of one or more specific activities or functions.
- Facility Code Derived from Facility Group code and a unique suffix determined by the data dictionary rules. The Facility Group code is found in Section 12B.1 – Facility Data Dictionary of the Facility Registry Management Policy (Facility Management Handbook Section 3), Table 12B.1-1: Facility Groups, Types and Codes
- Facility Group: The common features or characteristics by which a facility and its subordinate systems and components are categorized. Facility groups are currently defined as:

Grounds	Fencing, Gates, Landscaping
Transportation Infrastructure	Aprons, Bridges, Parking Lots, Roads, Runway, Taxiway, Tunnels
Building	Central Utility Plant, Cargo, Office, Parking Structure, Terminal
Utility Infrastructure	Communication, Fuel, Natural Gas, Storm Water, Sanitary Sewer, Water, Compressed Air, Industrial Waste, Electrical, Heat / Cool Distribution



Facility Hierarchical Levels: A facility management best practice is to organize and maintain a hierarchical relationship between an F/S/C, sometimes called a parent–child relationship. Facilities have systems and systems have components. In LAWA's facility registry a facility can exist without related system records but a system cannot exist without a related facility. Likewise, a system can exist without components, but a component cannot exist without a parent system.



Figure 4.1 Facility Hierarchy

Facility Registry: The database of information about LAWA F/S/C and their location, attributes, characteristics and condition.

F/S/C Unique ID: The F/S/C unique identifier is sequentially generated for each F/S/C. The identity stays with the F/S/C regardless of where the F/S/C is located.

F/S/C Name: The F/S/C identity is constructed using the F/S/C hierarchy and convention. The F/S/C name will change if relocated to another facility. The F/S/C name is unique to the Facility.

F/S/C Criticality: Ranked importance of a facility, system or component to LAWA's mission.

- System: A collection of components performing a specific function for a facility. Systems are logical elements of a facility that are unique in their life-cycle and/or function.
- System Code or Component Code Derived from the system or component codes found in Section 12B.1 – Facility Data Dictionary of the Facility Registry Management Policy (FM Handbook Section 3) and a unique suffix determined by the data dictionary rules.

4.2.2 F/S/C Unique ID

Each F/S/C will have a unique ID assigned by the FMS system. The unique ID is a sequentially generated number that exists in the database and is used to track all F/S/C through the life cycle from acquisition through decommissioning and removal.

4.2.3 F/S/C Naming Convention

Each F/S/C name is made up of a prefix (P) and a suffix (s) as follows: PPPsss

- Prefix Facilities, systems and components are named using an alphabetic code constructed as a threecharacter string. (See Facility Registry Management policy, Table 12B.1-1: Facility, System and Component Codes).
- Suffix consists of a two or three character string. This is typically a numeric value when used as a sequential number but may be a character if necessary and particularly when the suffix is based on a pre-existing name.

As examples: The facility, Terminal 3, is named TER03. A baggage handling system could be BHS001. Within the F/S/C hierarchy, each baggage handling system retains a unique name.

A facility name must be unique to the campus.





Figure 4.2 Facility Name Example

For a system or component name to be unique it must contain the facility code and the system or component code (Figures 4.3 and 4.4). To be unique, a name does not require both system and component codes. By convention, system and component names must be unique to the facility.



Figure 4.3 Sequential Name - Component Example



Figure 4.4 Non-Sequential Name - System Example

4.3 ROLES AND RESPONSIBILITIES

Administrator – Compliance to facility naming convention is defined, assigned, monitored and validated by Engineering and Facilities Management Division (EFMD).

Users – Facility Planning Division (FPD), Airports Development Group (ADG) and their contractors and consultants use this convention to name F/S/C. Commercial Development Group (CDG) will use this policy to identify F/S/C that are being acquired by LAWA. ARCC/PS&S are users of the system and to identify modifications or inconsistencies in the application of this policy.



No other user may create or modify an F/S/C name without coordinating with the Facilities Management Unit (FMU).

4.4 PROCESSES AND PROCEDURES

4.4.1 Allocation, Assignment and Retention

4.4.1.1 New Construction and Renovation of an F/S/C

F/S/C candidates for registration are identified by the design team using the process outlined in the Facility Registry Management Policy. FMU will provide the design team with a range of values for the F/S/C identified. The initial unique F/S/C Identity assignment is made by the design team using the range of values provided by the FMU. Initial identities must be annotated on the design documents. FMU will review and approve the registry candidates and the unique ID assignments, along with the F/S/C names applied. FMU will use the as-built documents and enter the F/S/C into the facility registry following the Facility Registry Management Policy (FM Handbook Section 3). This procedure is depicted in Figure 4.5. As built data delivery formats and standards are defined in the F/S/C Transition Management Policy (FM Handbook Section 10).



Figure 4.5 New Construction and Renovation of F/S/C

4.4.1.2 Acquisition of Facilities





Prior to LAWA assuming maintenance responsibility, FMU will use available facility documents to assign a unique identification and enter the F/S/C into the facility registry. Optionally, if the



documents obtained are not sufficient to provide a complete catalog of the F/S/C, FMU will conduct an initial audit and inventory of the F/S/C. The F/S/C identified during the inventory will be entered into the facility registry as detailed in the Facility Registry Management Policy (FM Handbook Section 3). This procedure is depicted in Figure 4.6.

4.4.1.3 Maintenance of an Existing F/S/C

During maintenance a component may be replaced. This procedure is depicted in Figure 4.7. New components are assigned a new identity by FMU in cooperation with Facilities Maintenance or MSD. Reused components keep the identity assigned when originally installed but may have a new F/S/C name applied based upon the convention rules.

New components are assigned a new identity by FMU in cooperation with Facilities Maintenance or MSD. Reused components keep the identity assigned when originally installed but may have a new F/S/C name applied based upon the convention rules.



Figure 4.7 Maintenance of an Existing F/S/C

4.4.1.4 Using an Existing F/S/C in a New Location

F/S/C may be pulled from service, refurbished and re-installed in a new location. The naming convention includes location information, specifically the facility. The FMS maintains a unique identity for each F/S/C that is independent of but directly related to the F/S/C name. Therefore, should the F/S/C be relocated, the name of the F/S/C will need to change to reference the campus and facility of installation and then follow the data dictionary rules found in Section 12B.1 – Facility Data Dictionary of the Facility Registry Management Policy (FM Handbook Section 3) for the system or component.

4.4.1.5 Applying and Using the ID

Bar codes will be used to assist in the identification of F/S/C. The codes used by these devices will be entered at the time the system or component is entered into the facility registry to create a relationship between the bar code and the registry record. The bar code is the F/S/C identity.

The identity of the F/S/C will be retained during the installed life of the object. Components retain identity during their operational life whether installed or in storage. Upon retirement, the record of maintenance and unique identity for components will be archived in the facility registry.

4.4.1.6 Auditing and Validating

FMU will conduct periodic audits using the key performance indicator report. These audits will apply to both systems and components to ensure unique identities for each Campus/Facility combination and consistency with the installed object and the facility registry record.

Exceptions found will be repaired by correcting the facility registry to match the installed component.



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If a uniqueness conflict exists, the most recently acquired component will be assigned a new identity.

In each case for which an incorrect identity is determined, the record of installation, either the work order or the as-built document must be reviewed to determine the source of the error. Errors must be corrected using the information from the source document.

4.5 KEY PERFORMANCE INDICATORS

The following report is a Key Performance Indicator (KPI) that is used to evaluate the integrity of the database.

Table 4.1 Key Performance Indicator

Key Performance Indicator	KPI Description	What it Measures	Why This is Important	Frequency (F) and Performance Goal (G)
Registry Naming Convention Validation	Analyzes registry database to ensure that F/S/C are properly named and uniqueness constraints are honored	Compares the F/S/C type to the prefix of the name; validates that the suffix is unique within a hierarchy, or is unique for components	Ensures data are secure from loss of critical identities resulting in loss of maintenance histories	F: 6 months G: No out of compliance F/S/C

4.6 HISTORY

Revision	Description	Author	Date
1	Updates to the following Sections: Definitions and Conventions; Roles and Responsibilities	FMG	August 31, 2012



SECTION 5: BUILDING SPACE NAMING CONVENTION (LAST REVISED 6/16/16)



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LAWA Facilities Management Handbook Policy

Title: Building Space Naming Convention

Los Angeles World Airports

Section 2.5-1

Authority: Deputy Executive Director, FMG

5.1 POLICY

Los Angeles World Airports (LAWA) will establish and maintain a consistent and uniform naming convention for building spaces.

LAWA's building space naming convention supports way-finding and locating facilities, systems and components inside buildings. It aids in emergency response functions.

This policy does not address developing and maintaining building floor plans and the standards for space classifications and measurement. Floor plans are the subject of LAWA's Terminal Measurement Standard.

5.2 DEFINITIONS AND CONVENTIONS

5.2.1 Definitions

Area: LAWA subdivides each airport campus into areas. The combination of campus designation and area designation defines the general location of a facility.

Building: A facility that has a roof, walls and a defined location.

Campus: Los Angeles International Airport (LAX), Ontario International Airport (ONT), Van Nuys Airport (VNY) and Palmdale Regional Airport (PMD) are referred to as campuses

Column Names: Location referencing names applied to building's structural columns. This definition does not consider column labels used with building design drawings or as-built documents.

Cubicle: Partially enclosed workspace, separated from neighboring workspaces by partitions.

Level: The position of a floor within a building.

Passageway: An interior or exterior passageway connecting sections of a building. Passageways provide access to rooms and sometimes other passageways.

Room: A space that can be accessed by a door and is enclosed by a floor, walls and a ceiling.

Sub-Room: Rooms that can only be accessed from another room and have no doors directly off of a passageway (i.e. a room within a room)

Zone: Major segments of buildings defined by common circulation or use criteria.

5.2.2 Conventions Room Naming Guidelines

- o Facility
 - Facility names are obtained from the Buildings layer in LAGIS (structure_existing_site entity type) from the FM-Name field.
- o Level
 - L01 level 1
 - LB1 1st level of basement
 - LN0 Exception. Interstitial level in TBIT
- o Zone
 - Terminal:
 - C Connector (Terminals 1 8)
 - C Core (TBIT)
 - N North Concourse (TBIT)
 - S Satellite (Terminals 1 8)
 - S South Concourse (TBIT)
 - T Ticketing (All terminals)
 - Cargo and Hangar Buildings:
 - B Building
 - Z Exterior
- Passageway (corridor)
 - Numbering starts with letter "A" from the rightmost main entrance on the ground level and increases incrementally in a clockwise direction. Rightmost is established by facing the building.

EXCEPTION: Sterile corridors are numbered with double letters "SA", "SB", etc. starting from the main entrance of a corridor increasing incrementally in a clockwise direction.

Main entrance to upper levels is the access from the first elevator or stairwell.

EXCEPTION: Main entrance to ticketing level of LAX Terminal buildings is the rightmost entrance from the Second Level Roadway.

- Main passageways do NOT have room numbers, while small vestibules do.
 - U = Outside baggage make-up area with no walls or doors.
 - Z = Outside, with no door from an inside passageway.
 - X = Outside for exterior pedestrian bridges, stairwells, and stairways only.
- Room and Sub-Room
 - Room numbering starts from 003 for each Zone and Passageway from the main entrance to the passageway increasing incrementally in a clockwise direction with the increment of three (003, 006, 009, etc.).
 - When a room has one or more sub-rooms, sub-room numbering starts from 01 increasing incrementally in a clockwise direction by an increment of one (01, 02, 03, etc.).

• In cases where the levels of sub-rooms exceed three, the sub-rooms have to be assigned to a different passageway with the exception that the sub-rooms have only one entrance.

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- o 003 primary room
- 003.01 one levels of sub-room
- o 003.01.01 two levels of sub-rooms
- Planters have room numbers
- Holding rooms with rooms, are Sub-rooms
- o Room Name
 - Concatenation of Facility, Level, Zone, Passageway, and Room and Sub-Room values.

Feature Type	Facility	Divider	Level	Zone	Passageway	Room & Sub- Room(s)
Passageway	TER03	•	L02	Т	Α	
Room	TER03		L02	Т	Α	003.01.01.01.03

Rooms with Special Naming Schema

Considering the holistic approach in the room numbering schema, and the construction recurrence at LAWA terminals, some room types have been taken out from the regular numbering sequence to prevent their renumbering.

- Restrooms
 - Naming format:
- RRMN001 Restroom Men
- RRWN002 Restroom Women
- RRUN003 Restroom Unisex
- o RRNS004 Nursery
- RRPS005 Pet Service
- There is only one restroom number 001 per building regardless the restroom use prefix.
- Begins with 001 from the main entrance to the building on Level 1 (if a building does not have basement), increasing incrementally in a clockwise direction by an increment of one.
 - If a building has basement level, the numbering starts from the basement up.
- Numbering continues to Level 2 and up starting with n+1 from the main entrance in a clockwise direction.

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- Electrical, Mechanical, Communications, and Control Rooms
 - Naming format:
- ELEC001 Electrical room
- MECH001 Mechanical room
- o CTRL001 Control room (fire safety, and elevator/escalator)
- o COMM001 –Communications room
 - Communications rooms are given a primary room number even for the sub-rooms.
- Numbering starts from 001 for each building increasing incrementally in a clockwise direction by an increment of one.
- If the room is a subroom, it will get the subroom number except for Comm Rooms.
- Vertical Penetrations Elevators, Escalators, Dumbwaiters, Stairwells, and Ladders
 - Vertical penetrations are uniquely numbered from the ground level, and those numbers extend the length/depth of the platform. Therefore, the number remains constant regardless of building level.
 - Naming format:
- ELEV001 Elevator
- ESCL001 Escalator
- o BELV001 Dumbwaiter
- ESTR001 Interior stairwell Emergency access
- o CSTR101 Interior stairwell Convenience
- XTRW001 Exterior stairwell
- LADR001 Interior ladder
- XLDR001 Exterior ladder
- There is only one number 001 per building for each of those feature types.
- Numbering begins with 001 from the main entrance to the building on Level 1 (if a building does not have basement), increasing incrementally in a clockwise direction by an increment of one.
 - EXCEPTIONS:
 - Interior stairwell Convenience
 - Numbering begins with 101.
 - Interior stairwell Emergency
 - Emergency access stairwells are identified by Fire Department and/or Terminal Planning.
 - Numbering begins with 001 increasing incrementally by an increment of one in a clockwise direction from the main

entrance for the entire building regardless stairwell connecting levels.

- TBIT has special numbering at the gates. Since each gate has a stair one, such as Stair 1 Gate 134 for example. Room number will be ESTR001.134
- Elevators and Escalators
 - Numbers are assigned by the Maintenance Shop.
 - TBIT has special numbering from Maintenance shop. So here is how the room numbers should be for these examples:
 - C14EL01 = ELEV001.C14
 - TBDES01 = ESCL001.TBD
 - TB-ES-CE-01 = ESCL001.CE
 - EL1-G122 = ELEV001.122
 - \circ ES1-N = ESCL001.N
 - \circ ES1-BC = ESCL001.BC

- Ladders
 - Numbering starts from the Basement up.
- Numbering continues to Level 2 and up starting with n+1 from the main entrance in a clockwise direction.
- Stairways (level change within the same floor)
 - Naming format:

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- STWY001 Interior stairway
- XTWY001 Exterior stairway
- Numbering starts from 001 for each Zone and Passageway from the main entrance (if a building does not have basement) to the passageway increasing incrementally in a clockwise direction by an increment of one.
- Stairwells that are blocked by the walls/ceilings due to past construction are classified as stairways.
- Conveyors
 - Naming format:
- o CONV001 Conveyor
- Numbering starts from 001 for each Zone and Passageway from the main entrance to the passageway (if a building does not have basement) increasing incrementally in a clockwise direction by an increment of one.

Special Equipment – Handicap Lifts & Moving Walkways

• Naming format:

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- HCPL001 Handicap lift
- MWKY001 Moving walkway
- Numbers are assigned by the Maintenance Shop.
- Voids (areas with no access, unused spaces)
 - Naming format:
- o VOID003 Void
- All void spaces have to be more than 3 Sq.Ft. Any area smaller than that is merged to the adjacent room. (Excludes Columns, no columns are voids)
- All columns that are adjacent to a room should be merged with the room space, no matter the size.
- Numbering starts from 003 for each Zone and Passageway from the main entrance to the building on Level 1 (if a building does not have basement), to the passageway increasing incrementally in a clockwise direction with the increment of three.
- Void spaces do not include stand-alone columns.
- Adjacent void spaces have to be merged and given a single number.

Open Spaces (unusable spaces that are open to below)

- Naming format:
- OPEN003 Open Space
- Numbering starts from 003 for each Zone and Passageway from the main entrance to the passageway increasing incrementally in a clockwise direction with the increment of three.
- Pedestrian Bridges
 - Naming format:

• PEDB003 – Pedestrian Bridge

- PEDB are Corridor X for Exterior, these are for the ones that connect to another structure/building. Interior PEDB are to get room numbers and zone/corridor it is in.
- Numbering starts from 003 for each building from the main entrance to the passageway increasing incrementally in a clockwise direction with the increment of three.
- Ramps
 - Naming format:

• RAMP003 – Ramps

• Numbering starts from 003 for each building from the main entrance to the building on Level 1 (if a building does not have basement), increasing incrementally in a clockwise direction with the increment of three.

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- Ramps does not matter if interior or exterior when numbering ramps.
- Combine Passengers or vehicle Ramps in the numbering.

- Catwalks

• Naming format:

o CTWK001

• Begins with 001 from the main entrance to the building on Level 1 (if a building does not have basement), increasing incrementally in a clockwise direction with the increment of one.

Door Naming Guidelines

Door Naming Convention Description

Door names must be unique across the facility to facilitate way finding and dispatching. The door name is derived from the room name and contains facility (building), level, zone, passageway, and room information followed by a single letter assigned in alphabetical order.

Conversion of the room number to the door number is performed as follows...

0	Facility – cl	hanges t	o a builc	ling number
	TER03-	3		
	TERTB	-	В	

- Level changes to a level number
 L02 02
- Zone and Passageway kept the same as in the room name
 TA TA

Door Naming Rules

- Passageway doors
- The first door / main entrance to a building is the rightmost main entrance on the ground level.
 - Main entrance is...
 - The far-right door when facing a building front;

• Access door from another corridor that is higher in a sequence in ascending order;

• Main access to an upper floor from a floor below

(Elevator #1, or, if a building has no elevators, Stairwell #1).

• Numbering starts with letter "A" increasing incrementally in a clockwise direction. Exceptions apply to terminal main entrances from World Way, and to the doors that take to jet bridges.

• Door numbers are separated from the corridor number with a divider.

• Room and Sub-Room doors

• Numbering starts with letter "A" from the passageway's main entrance, and increases incrementally in a clockwise direction.

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- All single-digit sub-room numbers do not include zeroes before the number.
- Each sub-room number is separated from its access room with a divider.

012 012.01	-	012A 012.1A
012.01.01 (2 doors)	-	012.1.1A
012.01.02	-	012.1.1D

- o Dividers
 - Building number/code is separated from the level number with the hyphen symbol;
 - Level number is separated from the rest of the information with the hyphen symbol;
 - Passageway access door names are separated from the building zone and corridor names with the hyphen symbol;
 - All sub-room names are separated with the dot symbol.

Passageway and Room Door Naming Convention

Passageway Door Naming Convention

Feature Type	Facility	Divider	Level	Divider	Zone	Passageway	Divider	Door
Room Name	TER03	•	L02		Т	А		
Door Number	3	-	02	-	Т	А	-	A B

Room/Sub-room Door Naming Convention

Feature Type	Facility	Divider	Level	Divider	Zone	Passageway	Room	Divider	Sub-Room(s)	Door
Room Name	TER03	•	L02		Т	A	003	•	01.01.01.03	
Door Number	3	-	02	-	Т	А	003		1.1.1.3	A B



Room to Door Name Conversion Examples

Room Type	Room Name	Door Number		
Baagagaway Entranco*		3-02-TA-A		
Passageway Entrance	TER03.L02TA	3-02-TA-B		
Briman, Baam		3-02-TA003A		
	TERUS.LUZTAUUS	3-02-TA003B		
		3-02-TA003.1A		
Sub Boom	TER03.L02TA003.0T	3-02-TA003.1B		
Sub-Room		3-02-TA003.1.2A		
	1ER03.L021A003.01.02	3-02-TA003.1.2B		

* Excludes Terminal main entrance doors from World Way Lower and Upper levels, and jet bridge/gate access doors.

Building Entrance Doors



• Numbering starts from the main entrance to a building that is the rightmost entrance when facing a building, and increases incrementally in a clockwise direction.

EXCEPTIONS:

1. Terminal main entrance doors.





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- 2. Jet bridge/gate access doors.
 - Jet bridge access doors are treated as passageway doors. Room and sub-room numbers are dismissed.
 - Door numbers are separated from the passageway numbers with the hyphen symbol.
 - The door number starts with the letter "G" followed by the gate number.

Example (Terminal 3 – Level 3):

Feature Type	Facility	Divider	Level	Divider	Zone	Passageway	Room	Divider	Sub-Room	Door
Room Name	TER03		L03		S	А	003		01	
Door Number	3	-	03	-	S	А		-		G31A





Passageway Access Doors

• Numbering starts from the main entrance increasing incrementally in a clockwise direction.

EXCEPTION: ACAM Doors

REQUIRE SPECIAL NAMING SCHEMA

Primary Room Access Doors

- The main entrance to a room is the first door from a passageway followed in a clockwise direction.
- If a room has two entrances from different passageways, the main entrance will be from the passageway that is first in alphabetical order.
- Other door numbers are assigned in increasing incrementally order in a clockwise direction from the main entrance.



Sub-room access doors

- The main entrance to a sub-room is the first door from a room the sub-room is accessed from in a clockwise direction.
- If a sub-room is between two passageways, door numbers must follow the Zone and Passageway numbers used in the Room name.





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5.3 ROLES AND RESPONSIBILITIES

Applying and sustaining the space naming convention requires three organization roles.

Administrator – Information Management and Technology Group – GIS Support Services Division (IMTG-GISSD) will administer the convention and oversee the application of processes and procedures.

Users – Facilities Management Group (FMG), Planning & Development Group (PDG) and Commercial Development Group (CDG) play significant application roles. PDG and the contractors designing and building or renovating space must follow this convention. CDG must update room names that result from acquiring tenant controlled buildings. IMTG-GISSD is responsible for naming existing space and columns.

Reviewers and Approvers – IMTG-GISSD is responsible for accepting and validating intermediate and final building space naming results.



5.4 PROCESS AND PROCEDURE

Space naming is initiated by one of three LAWA business processes: new construction and renovation, building acquisition or for an existing building.

5.4.1 New Construction and Renovation

Renovation and new building construction requests originate with PDG and in most cases the design/construction contractor is responsible for establishing space names. The design team and IMTG-GISSD coordinate to assure that the convention is properly applied. Coordination includes, but is not limited to, reviewing the convention, sharing existing information and jointly making key naming decisions. IMTG-GISSD must review and approve the space names during design submittal and again validate naming at project close-out.

If renovation requires renaming adjacent, unaltered spaces, the legacy door, room and space names and signage must not be removed. Design and as-built drawings will be annotated with the existing names and the new names.

Following the facility, system or component (F/S/C) transition processes (Facilities Management [FM] Handbook Section 11), LAWA's Geospatial and Facilities Management Systems (FMS) are updated to record new space names.

5.4.2 Building Acquisition

Prior to LAWA assuming maintenance responsibility, the IMTG-GISSD will assign new space and column names to the acquired building. IMTG-GISSD will assess the new space and leverage all available information to plan and develop names.

Facilities Management will maintain legacy room and column names until all LAWA business units agree and are prepared to accept the exclusive use of the new names.

5.4.3 Existing Building

IMTG-GISSD and Facilities Management are responsible for naming the spaces in existing buildings. Naming the existing space is typically initiated by the need to develop a building F/S/C registry.

Space and column naming compliance checks are part of the procedure. Appendix 5A provides a checklist of key decision points and compliance consideration. The FMU sequence for establishing names is stated below:

- Designate naming initiation location for each level
- Establish, validate and approve corridors
- For existing buildings, walk entire space and validate the floor plan drawings. Submit floor layout change request to EFMD
- Assign room and column names to drawings (for new construction and renovation design submittals must include room and column numbering review)
- Submit Space Naming results to the FMU (<u>FM-Unit@lawa.org</u>) for final review and approval



5.4.7.1 Applying and Using the Name

Once the space and column names have been established they will be applied to door frames and columns. A bar code will be generated from the room name, printed and applied. The bar codes will be entered into the GIS database; this database is updated to establish the relationship between the bar code and space record.

5.4.7.2 Auditing and Validating

FMU will conduct periodic performance audits. Audits ensure that:

- Space names in combination with campus and facility are unique, and
- Names and or legacy names databases conform to the convention and are inagreement with door and column tags.

IMTG-GISSD will correct exceptions in the Geospatial database and reconcile locations with the Facilities Management System database records.

5.5 KEY PERFORMANCE INDICATORS

The following report is a Key Performance Indicator (KPI) that is used to evaluate the integrity of the database.

Key Performance Indicator	KPI Description	What it Measures	Why This is Important	Frequency (F) and Performance Goal (G)	
Space and Column Naming Validation	Random sample of data records to analyze space and column name uniqueness, conformance to convention and match to actual space	Checks name for duplicates Assesses name pattern and application LAWA staff verifies name against data record	To avoid mission critical location reference errors	F: 6 months G: No out of compliance space/column names	

Table 5.1 Key Performance Indicator

5.6 REVISION HISTORY

Revision	Summary of Changes	Author	Date
1	Update to Definitions and Conventions, Process and Procedures	FMG	August 31, 2012
2	Update to IMTG – GISSD Conventions	FMG and IMTG - GISSD	June 16, 2016



APPENDIX 5A: SPACE NAMING PROCEDURE CHECKLIST

Refer to Section 12A Electronic Forms and Reference Materials for the interactive version of the checklist. See below for an image of the form.

Building Space Naming P	rocedure Checklist
Building ID:	Description:
Building Name:	
Building Address:	
Requested by:	
Naming Authorized by:	Naming Objective(s):
Facilities Management Coordinator:	Existing Space
Naming Performed by:	New or Remodeled Space
Reviewer List.	Establish Column Name

Procedure Checks	Yes	No	NA
 For existing building and acquisition process, have the floor plans for subject areas been processed into the LAWA Geospatial System (GIS)? 			
1.1. If No, Initiate a request to have the GIS database updated			
2. For existing building and acquisition process, are the most recent floor plans available in CADD or another suitable electronic format?			
2.1. If No, stop the evaluation and coordinate with requestor to develop a plan to get floor plans processed into a format suitable for the naming process			
3. Has Facilities Management coordinator reviewed and approved floor plans and is there stakeholder consensus regarding designation of zones and/or levels?			
4. Completed corridor layout review and acceptance?			
5. Completed space name review and acceptance?			
6. Completed review and acceptance complete?			
7. Completed space walk-through validation of naming results?			
 Final naming review and documentation complete and submitted to FMS and GIS data team. 			



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Los Angeles World Airports

LAWA Facilities Management Handbook Policy

Title: Work Management

Section 2.6-1

Authority: Deputy Executive Director, FMG

6.1 POLICY

Los Angeles World Airports (LAWA) will use consistent and uniform processes for identifying, categorizing, managing and completing facility management and maintenance work on LAWA maintained facilities, systems and components (F/S/C).

6.2 DEFINITIONS

- Building Automation System (BAS): This is a general term to describe a system used to monitor and control individual room temperatures, lighting and/or security. The system optimizes the start-up and performance of HVAC equipment and alarm systems. A BAS greatly increases the interaction between the mechanical systems of a building, improves occupant comfort, lowers energy use and allows off-site building control.
- Condition Assessments: Represents the current physical state of the facility, system or component. It is used to compare the conditions of facilities, systems or components to determine the effectiveness of maintenance practices, and compare the long-term functionality of specific facilities, systems and components.
- Facility Management System (FMS): The software system used by LAWA staff and approved contractors to plan, schedule, track maintenance and repair work and to record performance statistics.

Facility/System/Component Criticality: Ranked importance of an F/S/C to LAWA's mission.

- Job Plans: Documents used to plan work. These documents include a list of work steps (tasks) and the typical resources (labor, material, equipment) needed to perform the work steps.
- Job Order Contracting (JOC): TO COME
- Mean Time Between Failures (MTBF): The predicted elapsed time between inherent failures of a system or component during operation. MTBF can be calculated as the arithmetic mean (average) time between failures of a system.
- Mean Time to Repair (MTTR): A basic measure of the maintainability of repairable items. It represents the average (mean) time required to repair a failed component or system.

New Construction: Construction that adds to an existing footprint or creates a new F/S/C.

- SAP: Systems, Applications and Products in Data Processing. In this document any SAP reference is to the software.
- Service Request: A request for work to be performed. A high-priority service request is also known as an Incident Report. Service requests are used to track requests for work that comes into the Airport



Response Coordination Center (ARCC). If the request for service cannot be resolved on the first response and requires additional resources, then a work order is created.

- Shop Work Order: A work order that is created ad hoc by a shop for a discovered problem, as opposed to being created as a result of a service request or planned maintenance.
- Work Inspection: Either a situational review of the work site during preparation for an existing work order, or performance of a scheduled inspection as a work order.
- Work Order: An instruction with the accompanying details and information needed to perform a defined scope of work. Work Orders are created when a service request cannot be resolved on the first response, or are created automatically for planned maintenance.
- Work Order Criticality: Work order importance rating based on the sum of F/S/C criticality and work type criticality.
- Work Order Priority: Ranking of a work order based on allowable work initiation time.
- Work Type: Classification of work based on business need, such as legislatively mandated or unplanned corrective work.
- Work Type Criticality: The importance of the work in maintaining functioning facilities, systems and components.

6.3 ROLES AND RESPONSIBILITIES

Administrator: As administrator of work management processes, the Engineering Facilities Management Division (EFMD)

- · Maintains and disseminates the content of the work management policy,
- Audits the work performed for compliance with the work management policy,
- Defines, reviews and recommends procedure enhancements,
- Implements work management processes and procedures, and
- Supports FMS users and produces reports.

Users: LAWA staff and contractors responsible for the operation and maintenance of facilities. EFMD and Maintenance Services Division (MSD) use the processes and procedures to plan and record performance of work. The Airport Response Coordination Center (ARCC) users process incident calls and service request . LAWA contractors (JOC contractors, service contractors, etc.) use the processes and procedures to plan and record performance of work.

6.4 PROCESSES AND PROCEDURES

Work management processes enable, define and coordinate facility management tasks and interdepartmental collaboration needed to maintain F/S/C in a sustainable, efficient and serviceable condition at a reasonable cost. Effective work management requires a commitment to common processes and procedures. A key element of success is communication and a common use of terminology.

6.4.1 Work Types

Work is the collection of decisions and actions performed to recognize a need, respond to a request or order, restore customer service, and maintain or repair an F/S/C. Work is classified by type and criticality.


Work type criticality rankings are shown for each work type in parentheses after the work type name. This is on a scale of 1 to 5, with 5 being most critical.

- 1. Un-Planned F/S/C Work
 - A. Emergency (5) (EM) Work with a high priority. This will normally be the result of a highpriority service request (incident).
 - B. Corrective (3) (CM) Un-anticipated reactive repairs that would not be estimated and planned, but accomplished by LAWA staff or maintenance contract.
- 2. Planned F/S/C Work
 - A. Capital Renewal (2) (CAPTL) An alteration that changes the interior arrangements or other physical characteristics of an existing facility. It can also be an installation of equipment in an existing facility so that the facility can be used more effectively or efficiently for its current designated purpose or adapted to a new use. Alterations may include work referred to as improvements, upgrades, conversions, or remodeling and modernization. Alterations are not maintenance or new construction that adds to the existing footprint or creates a new system or component.
 - B. Component Renewal (3) (COMPN) Planned replacement of an F/S/C that has reached or will reach the end of useful life based on condition and life cycle analysis within the lifetime of the F/S/C.
 - C. Deferred Maintenance (2) (DFRDM) Existing deficiencies that are a result of unaccomplished past maintenance, repairs or replacements.
 - D. Demolition (1) (DEMO) Removal of an F/S/C that has been determined to no longer meet, or is not required to meet, mission goals.
 - E. Energy Upgrade (3) (ENRGY) Planned replacement of an F/S/C to achieve energy conservation. Energy upgrades identify the repair and replacement costs to implement the energy conservation measures.
 - F. Legislatively Mandated (4) (LEGAL) Deficiencies that must be corrected in response to regulatory or code requirements.
 - G. Predictive Maintenance (4) (PDM) Work resulting from proactive anticipation of service to an F/S/C, to achieve the best life at the most reasonable cost. Predictive maintenance techniques help to determine the condition of an in-service F/S/C, in order to predict when maintenance should be performed. For example, work orders can be initiated by reliability centered maintenance technologies, such as vibration sensors on machinery, and BAS alarms or sensors.
 - H. Preventive Maintenance (3) (PM) Includes scheduled maintenance activities on selected F/S/C. PM tasks include inspection, testing, lubrication and minor adjustments.
 - I. Recurring Maintenance (2) (RECM) Work activities that recur based on normal wear patterns on a periodic cycle of greater than 1 year and less than 10 years. Typical work includes painting, caulking, sealing, carpet replacements, etc.
- 3. Planned Maintenance Services
 - A. Custodial (3) (CSTDL) Standard custodial tasks such as sweeping, mopping, trash collection and restroom cleaning that are performed at various frequencies (daily, weekly, monthly, etc.) for functional spaces within a given facility. Standards may vary by facility type.
 - B. Grounds Care (3) (GRDNS) Mowing, trimming, ground treatments, litter and debris removal, landscaping, sprinkler systems, etc.
 - C. Pest Control (3) (PEST) Periodic treatments or actions that eliminate or protect facilities from pests.
 - D. Utility Maintenance (3) (UTILT) Work performed to maintain infrastructure services and commodities such as sewer, water, electrical, natural gas and propane. These include utilities generated or treated onsite, purchased from a municipal system or purchased from a private supplier.



- 4. Administrative Maintenance (1)
 - A. Standing work orders for leave time (i.e. vacation, sick, holidays, etc.)
 - B. Standing work orders for staff development (i.e. safety, training, etc.)
 - C. Standing work orders for administrative duties (i.e. meetings, supervisory, time card approval, etc.)
- 5. Inspections
 - A. Airfield Safety Inspections (5) (ASI): FAA airfield safety inspections to comply with Part 139

6.4.2 Work Processes

LAWA will use interdependent and collaborative process to maintain F/S/C. Figure 6.1 depicts LAWA's work management process.



Facilities Management Handbook

WORK MANAGEMENT



Figure 6.1 Work Management Process for FMG (refer to work type section for codes)

Note 1: Approval required for Work Types – 1B, 2A, 2B, 2C, 2D, 2E, 2F, 3D

Note 2: No approval required for Work Types – 1A, 2G, 2H, 2I, 3A, 3B, 3C, 4A, 4B, 4C

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6.4.2.1 Service Requests

Service requests are incident or non-emergency work request calls recieved at the ARCC. When a request has been made, the ARCC dispatches the most appropriate responder. If the request can be satisfied by the initial responder, then the service request is closed. If further work is required, then a work order is opened for Facilities Maintenance and MSD to plan, schedule and execute the work. Refer to Appendix 6A: Service Requests for procedures on how to develop and use service requests.

6.4.2.2 Work Orders

Work orders are either generated from service requests, requests for work submitted directly to FMG, work planned into the FMS, or a need observed by shops. Work orders are used to review, approve and manage work on an F/S/C. Each work order must specify tasks, labor, materials, services and tools needed. Managing work orders also involves recording resource usage and communicating the work status.

Work may require multiple related work orders, such as follow-up work or a complex project that aggregates work orders into a master work order.

Refer to Appendix 6B: Work Orders for procedures on how to develop and use work orders.

6.4.2.3 Planning and Scheduling

The backlog of work must be reviewed to determine work order sequencing. Two factors that control the sequence are work order criticality and priority. Refer to Appendix 6B for instructions on how to assign criticality and priority.

Once the sequence has been determined, work can be scheduled based upon logistic criteria such as:

- availability of resources (labor, materials, equipment, special tools),
- access restrictions and
- coordination with other work such as capital projects.

Refer to Appendix 6C: Planning and Scheduling for procedures on how to plan and schedule work.

Planning and Scheduling also involves setting up job plans and preventive maintenance schedules. Job plans are applied to work orders and provide details for how work should be performed. Job plans are created using a different template for each type of job, including: preventive maintenance, repairs, inspections, etc. Job plan templates include:

- steps that must be performed to complete the work, or inspection steps,
- number of workers needed to complete the work and the job skills they must have,
- supplies and parts that will be needed,
- services required to complete the work, and
- tools that must be available to complete the work.

After a job plan is created, it will be used to plan labor schedules, inventory stocks and prepare budgets. A job plan can be applied to an unlimited number of work orders. After a job plan is applied to a work order, the job plan resource estimates and tasks are copied to the work order. Refer to Appendix 6D: Job Plans for procedures on how to create job plans.

Preventive Maintenance (PM) templates are used to identify and schedule routine work. The PM templates can be associated to job plans to provide a task list and resource information. Refer to



Appendix 6E: Preventive Maintenance for procedures on the creation and scheduling of PM work orders.

6.4.2.4 Material Requisition

Material requisition is an integral part of work management. Materials are consumed in the execution of work and are a significant expenditure for LAWA. Materials need to be managed and accounted for as part of the work management process.

Credit card purchases of materials and use of material contract suppliers (i.e. McMaster Carr, Grainger, etc.) will continue to be supported by FMS. For planned work, materials can be preordered based on information provided in the work order. This allows materials to be available from material contract suppliers or LAWA warehouse when the work is scheduled. Materials will continue to be requisitioned from the inventory for use on work orders. Refer to Appendix 6F: Material Requisition for procedures on material management.

6.4.2.5 Work Execution

Open work orders are planned and scheduled based upon the procedures in Appendix 6C: Planning and Scheduling. Shop staff complete the work and record statistics and circumstances of the work order, e.g., problems encountered, materials used, safety practices exercised, time spent and condition or status characteristics of the F/S/C being serviced. Refer to Appendix 6G: Work Reporting for procedures on reporting work and changing work status.

6.4.2.6 Close-out and Reconciliation

When a work order has been completed, the work status is changed to complete, which prevents additional cost charges. A satisfaction survey is completed against applicable service requests and their related work orders. If the work was the result of a request, then the requestor is notified about completion of the work. Final close out of a work order will be done upon receipt of a satisfactory response to the satisfaction survey by the original requestor. For work performed without a requestor, the work order can be closed based upon a review by the lead shop supervisor.

If the work resulted in a change of F/S/C, or addition of a new F/S/C then the Facility Management policy (Section 3 of the Facility Management Handbook) is to be executed to ensure that the registry is updated appropriately.

6.5 KEY PERFORMANCE INDICATORS

6.5.1 Performance Reports

The following reports are Key Performance Indicators (KPIs) that are used to assist in evaluating performance.



Table 6.1 Key Performance Indicators

Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency (F) and Performance Goal (G)
Repeat Maintenance (Bad Actors)	Identifies systems or components that require more maintenance than the normal population	Compares individual frequency of failure of a system or component to the industry average and/or LAWA failure rate for a similar system	Identifies specific systems or components that require more maintenance, indicating manufacturer quality issues with components or replacement parts	F: Quarterly G: All systems and components trend to the average failure rate for the similar type of system or component
MTTR and MTBF	Reports on Mean Time Between Failures (MTBF) for components and the Mean Time To Repair (MTTR) for components	Compares individual system or component MTBF and MTTR to the industry average and/or LAWA averages for a similar system	Identifies specific systems or components that require more maintenance; indicating manufacturer issues or other situational issues	F: Quarterly G: All systems and components trend to the average for the similar type of system or component
Service Request / Work Order Ratio	Compares the number of service requests to the number of work orders	Calculates the ratio between the number of service requests and the number of work orders	Should be a smaller portion of the work than work orders, are un-planned work and are more disruptive to the organization	F: Monthly G: 80% work orders to 20% service requests

6.5.2 Reporting & Analysis

Work management data entered daily on work orders will make real-time information easily available for reporting and analysis. Reports will be developed for management, financial, administrative and performance monitoring. Dashboard displays and data extractions will be supported. FMG will establish standards for custom reports and presentations and provide support for data requests and new report requests. Reporting suggestions have been included in this document in the section above and in the specific appendices attached.



6.6 HISTORY

Revision	Description	Author	Date
1	Updates to the following Sections: Roles and Responsibilities; Processes and Procedures; Appendices	FMG	August 31, 2012



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APPENDIX 6A: SERVICE REQUEST PROCEDURE

Introduction

Service requests (SRs) are used by the ARCC to track requests for work from various sources that may or may not result in actual work being scheduled and completed. The work can be an incident report (emergency service request), a request for an inspection, or a request for maintenance work. If the person dispatched by the ARCC confirms additional follow-on work is required, a work order will be created.

Service Request Procedure

Entering a service request requires a minimum of ten data elements (FMS fields) to be completed. The remaining five data elements are not required but assist in providing additional details about the work.

When a service request is made, the call taker will need to enter the following information.

Table UA. I Service Request Data Litting	Table 6A.1	Service	Request	Data	Entry
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Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
How do I track this work?	Service Request ID	Yes	FMS will automatically generate this unique ID	Track the work from initial request to completion
Who took the call?	Call Taker	Yes	FMS will enter this automatically	Ask additional questions if the problem is not clear
When was the request made?	Request date – time	Yes	FMS will enter this automatically	Document when the request was made
Does the caller want to be contacted?	Call-back	No	Call taker will need to enter yes or no	To identify if the caller wants to be informed of work status
Who is requesting the work?	Requestor	No unless call-back is Yes	Entered by call taker the first time; this may be selected from a list if the Requestor has called before	Contact the requestor for more information on the problem, inform the requestor on the work status and receive feedback on performance
How can we contact the Requestor?	Contact information	No unless call-back is Yes	Entered by call taker the first time; this may be selected from a list if the Requestor has called before	Contact the requestor for more information on the problem, inform the requestor on the work status and to complete a satisfaction survey



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Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason	
Does the requestor have a tracking number?	Customer Work ID	No	Entered by the call taker	Cross-reference to the Requestor's (customer's) reference number	
What is the problem?	Problem	Yes	Call taker selects from a list of identified problems	Route the request to the right person and keep track of recurring	

a tracking number?				(customer's) reference number
What is the problem?	Problem	Yes	Call taker selects from a list of identified problems	Route the request to the right person and keep track of recurring problems
Where is the problem?	Location	Yes	Call taker selects from a list of identified locations	Route the request to the right person and keep track of problems at locations
Where is the work in the process?	Status	Yes	FMS automatically enters a status of New when initially entered; status is updated by workers or the call taker as work progresses	Identify where the work is in the process i.e. New; Dispatched; Resolved; Work Order Created; In Progress; Complete; Close/Cancel
When was the information last updated?	Update	Yes	FMS automatically enters new date and time when status is changed	Identify when last update was made
Who is going to take care of this request?	Referred to	Yes	FMS automatically makes recommendation on who should be sent to look at the problem based upon the problem and the location; this can be updated by the call taker or the responder	Know who is responsible for the work
Additional information	Additional information	No	Call taker can enter additional information about the request and the location if needed	Provide additional information to work team on what is needed
Was an injury involved?	Personal Injury	Yes	Call taker enters yes or no; yes, then FMS can automatically route a copy of request to emergency responders	Identify whether a personal injury happened for reporting purposes



Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
How important is this work?	Priority	Yes	FMS will automatically enter a priority of Urgent; Call taker can update to other priorities	Identify the urgency of the work to set priorities for response i.e. Emergency (response 2 hours), Urgent (response 8 hours), Routine (response 7 days)

Measurement of Results and Benchmarks

The following reports use the data entered above to provide information to make decisions to manage the process.

Table 6A.2	Service	Request K	ev Performanc	e Indicators
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Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency (F) and Performance Goal (G)
Response Time Report	Compares response time to service requests	Elapsed time it takes to investigate the problem	Determines if workforce response is within service level agreements and acceptable LAWA standards	F: Weekly G1: Response times for Emergency work within 2 hours. G2: Response times for Urgent work within 8 hours.
Service Request Issue Report	Summarizes service requests by type and location	Determines number of types of service requests and the ability to isolate personal injury incidents by type of problem	Incident reporting requirement	F: Weekly



APPENDIX 6B: WORK ORDER PROCEDURE

Introduction

Work orders (WOs) are used to track and manage work in the organization. The work can be generated from many sources including a service request, an e-mail to EFMD, system generated work for preventive or recurring maintenance, a work order created by system monitoring (Building Automation System), work resulting from a condition assessment (CA), work created from a building inspection or work from a capital project.

Work requires a work order with a unique ID for tracking purposes. The work order must have an explanation of the work required, the work location and the F/S/C being worked on.

Work Order Procedure

The following information is needed to issue a work order.

Table 6B.1	Work Order Data Entry
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Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
How is work tracked?	Work Order (FMG) ID	Yes	FMS will automatically generate this unique ID	Track the work from initial request to completion
Who entered the work order?	User	Yes	FMS will enter this automatically	Ask additional questions if the work is not clear
When was the order created?	Date - Time	Yes	FMS will enter this automatically	Document when the work order was created
Does the requestor have a tracking number?	Customer Work ID	No	Automatically entered if the work order is from a service request, otherwise entered by the work order creator	Cross-reference to the Requestor's (customer's) reference number
Where is the work?	Location	Yes	Automatically entered if the work order is from an SR, PM, PdM or CA ¹ , otherwise entered by the work order creator	Locate the work for the F/S/C
What is being worked on?	F/S/C	Yes	Entered by the work order creator from a hierarchy drop down list of F/S/C	Track work to an F/S/C so that work analysis can be performed

¹ SR – Service Request PM – Preventive Maintenance PdM – Predictive Maintenance (BAS) CA – Condition Assessment



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Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
What is the status of the work?	Status	Yes	FMS automatically enters a status of New when initially entered; can be manually updated by workers or the call taker	Identify where the work is in the process i.e. New; Rejected; Approved; In Progress; Waiting for Materials; Complete; etc.
When was the information last updated?	Status Date	Yes	FMS automatically enters the new date and time when status is changed	Identify when the last update was made
What is the problem?	Problem Code	Yes	Automatically entered if the work order is from an SR, PM, PdM, CA or entered by the work order creator	Route work to the right person and keep track of recurring problems
Additional information	Additional information	No	Work order creator can enter additional information about the work details if needed	Provide additional information to the work team on what is needed
What type of work is this?	Work Type	Yes	Automatically entered if the work order is from an SR, PM, PdM, CA or entered by the work order creator	Categorize work for setting an initial priority, for classifying the work for analysis and to quickly find specific types of work
How quickly does the work need to be done?	Work Priority	Yes	FMS will automatically enter a priority of Routine; creator can modify	Identify urgency of work to set priorities for response
How important is the work?	Work order type criticality	Yes	Automatically entered by FMS based upon the work type selected; creator can modify	Criticality is determined by the work type and is used to calculate an overall work criticality
How important is the F/S/C?	F/S/C Criticality	Yes	Automatically entered by FMS based upon the F/S/C selected; cannot be changed on the work order	Criticality is determined from the F/S/C and is used to calculate an overall work criticality
How important is this work order?	Work Order Criticality	Yes	Calculated criticality value based upon the work type criticality and the F/S/C criticality	Criteria used to schedule the work



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Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
Who will work on this?	Shop / Crew	Yes	Automatically entered by FMS based upon the problem, location and F/S/C or by a PM, PdM or CA; creator can modify	Select the resources needed to perform the work
Who is in charge of this?	Supervisor	No	Selected from a drop down list of shop supervisors	Identify who will manage the work
What are we supposed to do?	Job Plan	No	Job plan is created for the most frequent activities; outlines the steps in the work, resource types typically needed and special procedures	Provide consistency in work execution; provide a standard for work performance and resources
Do we do this on a regular basis?	РМ	Yes for a PM schedule.	Automatically entered by FMS for PM; used to tie the work to the PM scheduler for scheduling the work	Schedule future PM based upon the current work execution
Is this work approved?	Status Field and Approver	Yes if work needs approval prior to proceeding	Work order status is set to waiting for approval and is routed to an approver; once electronically approved work order is assigned	Track approvals and rejections for work orders



Work Order Status

Work Order (WO) status drives the flow of work through the work process and informs FMS users and customers on where the work is in the process. The following table shows the example status and a brief description of that status and how it can used.

Table 6B.2 Work Order Status

Status	Description	Typical Actions		
WORK REQUEST	Initial work status for new work orders	WOs with New status are presented to whoever is planning, scheduling and/or approving the work. The next step in the process is determined by the person this new work order was routed to.		
WAPPR	Work Order submitted for approval	If it is determined that the new work order requires approval, the status is changed to WAPPR, which routes the WO to the WO Approver.		
WAFI	Request for work is waiting for additional information	If the WO Approver requires additional information on the WO, the originator is contacted to provide additional details and the WO is resubmitted for approval or the WO is cancelled.		
APPR	Work Order approved	All WOs that are approved are assigned to the person responsible for the work, whether planning and scheduling the work or a specific shop.		
WSCH	Work is waiting for scheduling	All Planned Maintenance of an F/S/C and Planned Maintenance Services work types will be planned and scheduled.		
ASSGND	Work Order assigned	All WOs that are ASSGND are routed to the technicians.		
WMAT	Waiting for materials	Work orders may need special order materials and cannot proceed until they are received.		
INPRG	Work is in progress	When the technician begins work on an ASSGND WO, they change the status to INPRG.		
DFRD	Work is deferred	When external conditions such as weather or an event require the work to be postponed.		
HOLD	Work is on hold	The work has been placed on hold for a number of reasons: waiting for tenant access, waiting for funding, etc. It may be preferred to have individual status that are more descriptive such as WMAT.		
COMP	Work is complete	When the technician completes work on an INPRG WO, they change the status to COMP.		
REWORK	More work is required on this Work Order	COMPLT WOs are routed to the supervisor, who evaluates the work and if incomplete changes the status to REWORK. Work orders with a REWORK Status are routed back to the technicians.		



Status	Description	Typical Actions
CLOSE	Work Order is closed	COMP WOs are routed to the supervisor, who evaluates the work and if complete changes the status to CLOSE.
CAN	Work Order is cancelled	This could be due to work that is no longer required, or parts are not available and the work needs to change from repair to replace.



Work Order Priority

The work order has a priority with specified response times as shown in the table below.

Table 6B.3 Work Order Priority

Work Rating	Response Objective	Description
Level A	8 hours	Work is needed to prevent shut down of a facility's operation but does not present a threat of damage to the system or component and is not a threat to human safety.
Level B	7 days	Work is pending and can be scheduled normally based on the F/S/C criticality.
Level C	15 days	Work with a repeating and established schedule such as recurring maintenance and preventive maintenance work types.
Level D	30+ days	Work with long lead times as defined for planned maintenance to include: legislatively mandated, deferred maintenance, demolition, component renewal, energy upgrade, and capital improvements.

Work Order Criticality

The work order criticality is derived from two separate components: the system or component criticality and the work type criticality. The system or component criticality is a rating developed specific to the registry record. It is used on the work order to provide an indication of the importance of the registry record to ongoing LAWA operations. Each F/S/C has a rating from 0 to 5 with 5 being the most critical.

The work criticality is derived from the type of work. Preventive maintenance work is more important than deferred maintenance for example. Each work type has a criticality rating from 0 to 5 with 5 being the most critical to complete.

When these two numbers are combined (added together) the work order has a criticality rating from 0 to 10 with 10 being the most critical. This criterion should be used to schedule critical work ahead of less critical work.



Measurement of Results and Benchmarks

The following reports use the data entered to manage the work.



Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency (F) and Performance Goal (G)
Maintenance Backlog	Quantifies outstanding work that is planned	Determines amount of work that is outstanding and is required to be performed within a specified timeframe	Justifies workforce requirements and determines if backlog is increasing or decreasing over time	F: Weekly G1: 2 weeks of backlog.
PMs Late	Identifies PM work orders that were not completed on schedule	Compares actual completion date to scheduled and target completion dates	Determines systemic problems to getting PM work orders completed	F: Weekly G1: No late PM Work orders
Critical PMs Past 50% Grace Period	Shows open PM work orders that have not started when either scheduled or targeted. Typically a PM work order will have a scheduled start and a period of performance (i.e. a monthly PM could be scheduled to start on the 15th of the month and have a window of 1 week)	Compares the actual start date, or no start date, to the scheduled and target start date	Determines systemic problems to getting PM work orders started	F: Weekly G1: PM work orders start within the period targeted
Total WO's by Work Type	Trends where the maintenance effort is focused	Measures the maintenance effort over a rolling 6 months; determine if any one category of work is overwhelming the workforce	Forecasts if maintenance plan for the year will be achieved; cost of planned work is 1/3 the cost of un- planned work	F: Monthly G1: To be determined

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Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency (F) and Performance Goal (G)
Maintenance Cost Trends	Compares overall maintenance expenditures against prorated budget	Measures the cost expenditures of work orders	Determines if maintenance expenditures will be within the established budget for the year	F: Monthly G1: Monthly maintenance costs are tracking to a prorated monthly budget
Spatial Analysis of Work	Determines work order counts by problem using location referencing	Identifies problems by type in a specific location	Determines if there are issues that need to be addressed with engineering measures	F: monthly
Open Work Orders	Report of open work orders by type, priority, age and shop	Assists in expediting work	Provides an indication of issues that need to be addressed	F: Weekly
Two-week Look Ahead	Identifies scheduled work two weeks ahead and identifies un- scheduled work orders by shop and priority.	Provides information on upcoming work to improve scheduling and adjust priorities	Assists in planning work	F: Weekly



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APPENDIX 6C: PLANNING AND SCHEDULING PROCEDURE

Introduction

Work orders contain a description of the work required, the work steps or a checklist of actions that need to be completed and are used to track and manage work in the organization. Resources (labor, materials, equipment, special tools and contractors) are identified to execute the work. Job plans facilitate the entry of this information and provide a consistent standard of work performance when planning work. If a job plan is not developed, then a task list is to be developed to assist in planning and scheduling.

Work orders have target start and completion dates, scheduled start and completion dates, and actual start and completion dates. These six date fields can be used to schedule the work. The target dates are the desired dates for work start and completion. These dates are used for planning the work. Once the pre-requisites for starting the work (resources, access, etc.) have been confirmed, scheduled dates are entered for when the work is scheduled to start and be completed. These scheduled date fields are used for scheduling the work. The actual start and completion dates can be compared to the target and scheduled dates for analysis purposes.

Planning and Scheduling Procedure

Once a work order has been created, resources can be identified and the work will be planned and scheduled. A number of factors should be considered when planning and scheduling the work:

- work order priority (see Appendix 6B),
- work order criticality (see Appendix 6B),
- access to the work site,
- availability of labor, materials, equipment, and special tools (any items that are needed to complete the work are to be ordered during the planning phase), and
- coordination with other work, such as capital projects.

The above information is used to determine target start and completion dates and scheduled start and completion dates. Tools in FMS can assist in suggesting the earliest scheduled start dates. All of the scheduled work should be reviewed on a regular basis to ensure that work is being completed as required. Additional information may need to be collected, evaluated and entered on the work order if applicable for planning and scheduling. Table 6C.1 summarizes the information to be entered for planning and scheduling.

Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
Find the work	Work Order ID	Yes	Search for the work using the work order ID or other criteria such as location or priority	Finds the existing work order to be planned and scheduled
Target Start Date	Target Start Date	No	Enter the target start date	Date on which it is desired that work be started

Table 6C.1 Planning and Scheduling Data Entry



Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented?	Reason
Target End Date	Target End Date	No	Enter target end date	Date on which it is desired that work be completed
Scheduled Start Date	Scheduled Start Date	No	Enter scheduled start date	Specify a specific start date
Scheduled End Date	Scheduled End Date	No	Enter scheduled end date	Specify end date

Measurement of Results and Benchmarks

The following reports use the data entered to manage the process.

Table 6C.2	Planning and	Schedulina k	Kev Performance	Indicators

Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency (F) and Performance Goal (G)
PM Deferrals	Identifies PM work orders that were re- scheduled	Compares the target date to the scheduled date for PM work orders	Determines systemic problems to getting PM work orders completed	F: Weekly G1: No deferrals
Work Week Schedule Adherence	Identifies all work scheduled for the week and if work was started or completed as scheduled	Compares the actual start and actual finish to the scheduled start and scheduled finish; lists work orders that are non-compliant	Determines if planning and scheduling is realistic and if the workforce is performing work as required	F: Weekly G1: All work started and completed as scheduled
Work Week Schedule Stability	Trends Work Week Schedule Adherence report over a period of 6 months	Trends the number of work orders that are non-compliant in the Work Week Schedule Adherence report	Determines systemic issues to be addressed if work schedules are consistently not being maintained	F: Monthly G1: All work started and completed as scheduled



Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency (F) and Performance Goal (G)
Compliance Training Time	Identifies the amount of compliance training delivered to the maintenance staff	Determines the number of training hours by category of training (i.e. safety, legislated) and overall	Ensures that all compliance training is completed	F: Quarterly G1: All compliance training is current G2: Training is 1% - 2% of total workforce hours
% Planned work order type scheduled vs. un-scheduled	Identifies the number of work orders with a scheduled / target start and finish date to the total number of work orders	Compares scheduled and targeted start and finish dates	Identifies if work orders are planned and if customer expectations are met	F: Quarterly G1: All planned work orders have a scheduled / targeted start and finish G2: Alignment of target to schedule
Wrench Time – Booked vs. Available	Compares how much time is being spent performing work against available hours.	Measures the effort to complete work from the work orders to the available hours in a shop	Determines systemic impediments to performing work	F: Monthly G1: 60% - 80%



APPENDIX 6D: JOB PLAN PROCEDURE

Introduction

A member of the work planning team is normally responsible for preparing a job plan with the work steps and quantity of labor, tools and materials required to execute the work. Alternatively, shop supervisors can develop job plans.

Job Plan Procedure

Job plans are a detailed description of how a job is to be performed. Job plans are created using a different template for each type of job, including: preventive maintenance; repairs; inspections; and, other work types and activities. Job plan templates include:

steps that must be performed to complete the work, number of workers needed to complete the work and the job skills they must have, supplies and parts that will be needed, services required to complete the work, and tools that must be available to complete the work.

Job Plans and Work Orders

When a job plan is associated to a work order, its resource estimates and tasks are copied into that work order. The job plan can be modified so that the order can be tailored to the work without affecting the original job plan template. A job plan that does not have a campus (i.e. LAX) specified may be used on any work order. If the job plan has a campus specified, then it can only be used for work orders for that campus.

Job Plan Template

The job plan template below is used to prepare the information needed for entry into FMS. The entry process involves several screens. The task sections (fields starting with a T) are repeatable based on the number of tasks. The sections for labor or craft (fields starting with LC), materials (fields starting with M), services (fields starting with S), and tools (fields starting with TI) are also repeatable.



Table 6D.1 Job Plan Data Entry Template

Job Plan Title Campus	IP-2	Duration	Template
JP-1		JP-4	JP-5
Descriptio	JP-6		
Additional Detail	S JP-7		
Additional Responsibilitie	S JP-8		

Task Name	Campus	T-2		Owner		Owner group
T-1				T-4		T-5
Description	T-6					
Sequence		Estimated Duration (hrs)	Classifica	ition	Wo	rk order type
T-7		T-8	T-9		T-10	
Nested job pla	n	T-11	Predecessor	tasks	T-12	

Labor or craft	Campus	LC-2	Site	LC-3		Skill level	Cost
LC-1					LC	C-4	LC-5
Additional inform							

Materials	Campus	М-2			Direct issue
M-1			Storeroom.	Site	Quantity
			M-5	<i>M-6</i>	M-7

Maintenance Contractor	Campus	S-2	Quantity	Unit cost
S-1			S-4	S-5

Tools	Campus	TI-2		Reservation R	equired <u> </u>
TI-1		Quantity	Hours	Rate	Cost
		TI-5	TI-6	TI-7	TI-8



Job Plan Field Descriptions

Identity

Table 6D.2 Job Plan Data Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
JP-1	How is the Job Plan Identified?	Job Plan Title	Yes	Enter the name of the job plan	Provide a unique identity for each job plan
JP-2 T-2 LC-2 M-2 S-2 TI-2	Is the job plan to be specific to a particular campus?	Org (repeat selection for job plan, task, labor, material, service and tool)	No	Select if job plan or component, such as the task, labor, material, service or tool, is limited to a particular organization	Specify that certain tasks on job plan are available only on work orders for a certain organization or site
JP-4	How long is the work going to take?	Duration	No	Enter the estimated duration for the job plan including all tasks and nested job plans	Anticipated elapsed time for the job to determine how to schedule work for an F/S/C
JP-5	How can the job plan be identified to use for other similar job plans?	Template	No	Enter the name of the template as a unique identity to be used for other job plans	Many job plans are similar and configured with minor variations in time, labor, materials or tasking
JP-6	What is the general usage of the Job Plan?	Description	No	Describe the job plan and its usage in lay terms	Explains what the job plan is used for
JP-7	Are there other issues that are important?	Additional Details	No	Enter additional information or special actions should be known to perform the job	Special circumstances may exist that are unique to normal job execution steps



Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
JP-8	Must anything be done in addition to the work identified, and is normally required?	Additional Responsibilities	No	Describe preparatory or follow up activities to ensure successful execution of job plan	Additional tasks might be needed to prepare for the job or to ensure its successful completion



Tasks (Repeatable)

Table 6D.3 Job Plan Task Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
T-1	How is the task known?	Task Name	No – (Yes only if a task is added to the Job Plan)	Enter a unique task name that is descriptive of the work involved	Distinguish each task and avoid confusion
T-4	Who is the party responsible for the management of the work when the job plan is used on a work order, route, or preventive maintenance record?	Owner	No	Identify the person, labor or craft position that is responsible for the task, actions and service quality	Establish lines of responsibility and accountability to ensure quality levels of service
T-5	Who is responsible for the definition, execution, and quality of the task?	Owner Group	No	Identify the organization responsible for the task, actions and service quality	Establish lines of responsibility and accountability to ensure quality levels of service
<i>T-</i> 6	What is the general usage of the Task?	Description	No	Describe the task and its usage in lay terms	Explain what the activity is used for
T-7	When is this task performed relative to other tasks?	Sequence	Yes	Enter a number that sorts the tasks from low to high value to indicate their order of precedence	Tasks have dependence upon each other in the procedure and when they are executed



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Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
<i>T-</i> 8	How long will the task take?	Estimated Duration	No	Provide an estimate of how long the task will take	Determine the allocation of resources and tools
<i>T-</i> 9	How can a task be grouped to a common usage, function or craft?	Classification	No	Provide a classification value to identify tasks with common characteristics	Tasks may have similar factors that help identify how the task can be assigned, worked or resourced
T-10	How is a task identified to a type of work order?	Work Order Type	No	Enter the type of work order normally associated with the task.	Work orders can be a specific type and tasks associated with the work order can be unique for that task
T-11	How is the task associated or related to other job plans?	Nested Job Plan	No	Enter the job plan name this task uses to invoke a subordinate job plan	Use one job plan that includes other job plans to do standard work
T-12	How can task sequence dependencies be managed?	Predecessor Task	No	Identify the task or tasks that may exist in nested job plans and specify their sequence	Job plans and their tasks can be combined to provide a more flexible work flow



Labor or Crafts (Repeatable)

Table 6D.4 Job Plan Labor Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
LC-1	How is the Labor or craft known?	Labor or Craft	No (Yes only if a labor or task is added to the Job Plan)	Provide a unique name for the Labor or Craft to be assigned to the task	Standard values within the labor and craft definitions can be added to a work order and its job plan tasks
LC-4	What level of expertise is needed for the task?	Skill Level	No	Identify the expertise or experience level needed for the task	Tasks have multiple levels of expertise depending upon the complexity and critical nature of the task
LC-5	What is the cost of the labor or craft for the indicated skill level?	Cost	No	Identify the cost per time unit for the labor or craft for the duration of the task	Cost is needed to calculate the expense of performing the task and work order and can be used for preparing budgets
LC-6	What other factors may affect or be needed for the labor or craft?	Additional Responsibilities	No	Identify additional conditions or labor resources required to obtain and assign the resource	Special conditions may apply that require reservation of specialized skills or crafts



Materials (Repeatable)

Table 6D.5 Job Plan Materials Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
M-1	What material is needed for this task?	Materials	No - (Yes only if material is added to the Job Plan.)	Identify the material used for this task or job plan; an item defined in the warehouse or it can be a free entry item if shop materials are needed	Materials needed to support the work order may be planned and allocated prior to the job plan being worked
M-4	Can an item be ordered and purchased to be used on a specific work order?	Direct Issue	No	Indicate the purchase is made and assigned to a job plan to be issued immediately upon receipt	Stocked or non- stocked items that are associated with a job plan can be direct issue items;. they do not need to be warehoused prior to issue
M-5	Can an item be ordered from any storage location?	Storeroom	No	Indicate the storeroom from which to issue the material	Multiple warehouses may be managed along with shop stock to provide flexibility in where a material can be obtained
<i>M</i> -6	Where is the storage location?	Site	No	Indicate the storage site where the material will be issued	Organizations will have multiple storage locations
M-7	How much of the material is needed?	Quantity	No	Indicate the volume, size, number or quantity of the material needed	Various designated materials to complete a job



Maintenance Contracts (Repeatable)

Table 6D.6 Job Plan Maintenance Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
S-1	What is the service needed?	Services	No	Name or description of the service required to augment the labor or craft to perform the task	Services may be required by contractors for specific capabilities or skills not available within LAWA resources
S-4	How much of the service is needed?	Quantity	No	Identify the amount of the service required in terms of hours	Time estimate needed to determine the cost to the work order
S-5	What is the price of the service?	Unit Cost	No	Give the cost per hour of the service.	Unit cost and quantity of the service are used to calculate the cost



Tools (Repeatable)

Table 6D.7 Job Plan Tool Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
TI-1	What tools are needed for the work order and its job plan tasks?	Tools	No	Identify the tools required for performing the job plan's tasks	Depending on the work required various tools may be needed; this can include hand tools, power tools and mechanized tools
TI-4	Must the tool be requested in advance of the work order?	Reservation Required	No	Specify if the tool is to be reserved, or how much lead time is needed to acquire the tool	Depending on the cost and incident of usage, tools may not be immediately available
TI-5	How many of the tool are needed?	Quantity	No	Identify the number of tools that are being requested	Multiple numbers of a tool may be needed to perform a work
TI-6	How long will the tool be required?	Hours	No	Identify the time the tool will be employed for the work order	Tools in high demand may be returned for other work after use; this enables other work orders to proceed that need this tool
TI-7	What is the charge rate for the use of the tool?	Rate	No	Give the cost per hour for the use of the tool	Tools may be leased or contractor furnished
TI-8	What is the estimated cost of the use of the tool?	Cost	No	Calculate the cost of using the tool for the specified duration	Cost of using the tool will add to the overall cost of performing the work order



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APPENDIX 6E: PREVENTIVE MAINTENANCE PROCEDURE

Introduction

Preventive maintenance (PM) is performed either on a time (i.e. every quarter) or meter basis (i.e. every 2,000 run-time hours). On a PM record, job plans which are lists of tasks to be performed, are identified for an F/S/C at a specific time or meter frequency. PMs can be grouped into hierarchies that follow facility hierarchies to generate sequenced work orders.

Parent PM templates are used to create PM records that include an F/S/C, job plan and frequency. Parent PM records are used to create associated (child) PM records for scheduling and creating work orders (see Figure 6E.1).

Associated (child) PM records set the schedule such as calendar dates or meter triggers or both if desired. Work orders are created from associated PM templates only. Work Orders can be generated ahead of the actual schedule for advanced planning and scheduling of the work. The associated PM records have a seasonal schedule so that work orders can be generated for a specific time during the calendar year.

The following PM templates are used to prepare the information needed for entry into FMS. The process of entry will involve several screens.



Figure 6E.1



Preventive Maintenance Parent Template

Table 6E.1 Parent PM Template

Parent PM Title.	Status: DRAFT 🔂 ACTIVE 🔂 INACTIVE				
M-1	M-2 M-3 M-4				
Description					
M-5					
Long Description(Op	tional)				
М-6					
F/S/C					
M-7					
	Title				
Job Plan	M-8				
JUD FIAIT	Sequence				
	M-9				
	Frequency				
	M-10				
Time Read DM	Frequency Units				
Time based Pivi	M-11				
	Alert Leadtime				
	M-12				
	Frequency				
	M-13				
Motor Based PM	Alert Leadtime				
Melei Daseu Fim	M-14				
	Alert Meter Reading				
	M-15				
Lead Time Active M-16					
Seasonal Schedule Active 🗌 M-17					
Fixed schedule Floating schedule M-18					
Create Children PMs for Item's Location 🧾 M-19					
Create Children PMs for Item's Registry M-20					
Override Updates from Parent PM 🧧 M-21					
Update Existing PMs Seasonal Dates M-22					
Update Children PMs / M-23					
Update Job Plan Sequence in Existing PM / M-24					



Field identities in the preventive maintenance parent template are referenced in the table below.

Table 6E.2 Parent PM Data Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
M-1	How is the Parent PM template identified?	Parent PM title	No (Only if the Parent PM template is created.)	Enter the name of the Parent PM into the FMS PM application	Uniquely identify each Parent PM template
M-2	What is the PM template used for?	Description	No	Provide a functional description of the PM template	Basic information on the use of the PM
M-3- 5	Can the status of the PM template be designated?	Draft/Active/Inactive	No	Select the status of the PM template	PM templates are set as draft when being made and can be set as either active or inactive
М-6	Is there additional information to be provided for the PM template?	Long Description	No	Elaborate on the information that adds detail to the description field	More extended information may be needed to provide an adequate description of the PM
M-7	On what F/S/C is the PM template to be used?	F/S/C	No	Identify the F/S/C the PM work order is for	Identify the F/S/C to which the PM template will apply
M-8	What job plan is used for the PM work order?	Job Plan Title	No	Identify the job plan that the PM uses to generate the work order.	PMs will be scheduled to perform work and the job plan defines the tasks and resources needed.



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Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason	
M-9	What is the precedence of execution of the job plans?	Job Plan Sequence	No	Enter a number for ordering the sequencing of the job plans	Multiple job plans may be used on a PM template	
M-10	What is the technique to schedule time based PM work orders?	Time Based PM work order: Frequency	No	Specify a frequency for how often the PM work is performed	Time based PM templates require a	
M-11		Time Based PM work order: Frequency Units	No	Specify the units for the frequency	interval to generate the work order	
M-12		Time Based PM work order: Alert Lead-time	No	Specify the time ahead of the PM at which alerts display before work orders are generated		
M-13	What is the technique to schedule meter based PM work orders?	Meter Based PM work order: Frequency	No	Specify the meter interval for which the PM work must be performed	Meter based PM templates require an elapsed	
M-14		Meter Based PM work order: Alert Lead-time	No	Specify the elapsed interval at which alerts are displayed before work orders are generated	generate the work order for the PM	
M-15		Meter Based PM work order: Alert Meter Reading	No	Specify the meter reading in advance of the PM when the work order is to be generated		
M-16	Should the Lead Time be used?	Lead Time Active	No	Toggle to select if the Lead Time is to be applied to the PM template	Leadtime alerts may be optionally selected	
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Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
M-17	Should a seasonal PM schedule be used?	Seasonal Schedule Active	No	Toggle to select if the seasonal schedule from the Child PM template is used when scheduling work	Season schedules may be optionally selected
M-18	How is scheduling a PM work order related to each previous PM work order for the same work?	Fixed/Floating schedule	No	Toggle the PM template to select either a fixed schedule or a floating schedule	Work is based either on the target start date or the closure date of the previous work
M-19	Should a PM work order be generated for the F/S/C location?	Create Child PM work orders for F/S/C Location	No	Toggle to select the generation of the ChildPM work orders for the item's location	PM work orders may be generated for the location where the item is situated
M-20	Should a PM work order be generated for the F/S/C?	Create ChildPM work orders for the F/S/C	No	Toggle to select the generation of a work order for the F/S/C	PM work orders may be generated for the F/S/C
M-21	Should the Parent PM dictate the selections of the Children PM?	Override Updates from Parent PM	No	Keep the frequency data on the Child PM, select the Override Updates from Parent PM	To avoid modifications to the Child PM being overridden by the Parent PM



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Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
M-22	If the seasonal dates are edited, should these updates be applied to the Child PM templates?	Update Existing PM template Seasonal Dates	No	Toggle to indicate that PM templates associated to the Parent template should be updated with modified seasonal dates	Seasonal dates may vary and it may be useful to apply these updates to the Child PMs
M-23	If the Parent PM template is edited, should these updates be applied to the Child PM templates?	Update Child PM templates	No	Toggle to indicate that Child PM templates should be updated with Parent PM template modifications	PM criteria may change and it may be useful to apply these updates to the Child PMs
M-24	Should the job plan sequencing be applied to Child PM templates?	Update Job Plan Sequence in Existing PM template	No	Toggle to update job plan data on associated PMs	It may be useful to update job plan data on associated PMs



Associated PM Templates

The associated (child) preventive maintenance template is as follows.

Table 6E.3 Associated PM Template

Parent PM Title		Associated PM Title		
A-1				
F/S/C 📃 Locations 📃 A-2	2			
Component /Location	A-3			
Lead Time Active 📃 A-4				
Seasonal Schedule Active	🗌 A-5			
Fixed schedule 📃 Floating	g schedule 📃 A-6			
	Days/Date			
	A-7			
Time Record DM	Frequency Units fields			
Time Based FM	A-8			
	Next Due Date			
	A-9			
	Meter(increment)			
	A-10			
	Frequency			
Motor Based PM	A-11			
Meter Based Fim	First Start Reading			
	A-12			
	Meter Frequency Units			
	A-13			
	Day 📃 A-14			
	Start Month			
	A-15			
	Start Day,			
Seasonal Dates	A-16			
	End Month			
	A-17			
	End Day			
	A-18			



Field identities in the child preventative maintenance template are referenced in the table below.

Table 6E.4 Associated PM Data Entry

Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
A-1	Which Parent PM is the template for this Child PM template?	Parent PM Title	No(Only if the Child PM template is created)	Enter the name of the Parent PM template into the FMS PM application	Identifies the Parent PM template from which the Child PM is generated
A-2	Is the PM to be applied to an F/S/C?	F/S/C	No	Toggle to indicate the PM template is used for an F/S/C	PMs may be applied to either an F/S/C or
	Is the PM template applied to a location?	Locations	No	Toggle to indicate the PM template is used for a location	Locations
A-3	Which F/S/C or location is the subject of the PM template?	F/S/C or Location	No	Identify the F/S/C or location the PM work order will be generated	
A-4	Should the Lead Time be used?	Lead Time Active	No	Toggle to select if the Lead Time is applied to the PM template	Lead Time alerts may be optionally selected
A-5	If the PM template is a seasonal based task, is the season honored?	Seasonal Schedule Active	No	Toggle to select if the seasonal schedule is applied to the PM template	Season schedules may be optionally selected



Field	Information	Label Name	Is this information required	How this is accomplished if FMS is implemented	Reason
A-6	How is the scheduling of the PM work order to be related to each previous PM work order for the same work?	Fixed/Floating schedule	No	Toggle the PM template to select either a fixed schedule or a floating schedule	Work is based on the target start date or the closure date of the previous work
A-7	What is the technique to schedule time based PM work orders?	Time Based PM Days/Date	No	Specify a frequency for how often the PM work is performed; for seasonal PM work orders enter the date	Time based PM work orders require a scheduling interval to generate the
A-8		Time Based PM work order Frequency Units fields	No	Specify the units for the frequency	PM
A-9		Time Based PM work order Next Due Date	No	Specify the next date for which the PM work will be scheduled	1

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Field	Information		information required	accomplished if FMS is implemented	Reason
A-10	What is the technique to schedule meter based	Meter Based PM work order Meter(increment)	No	Specify the meter difference for which the PM work must be performed	Meter based PM work orders require an elapsed measure
A-11	PM work orders?	Meter Based PM work order Frequency	No	Specify the meter interval for which the PM work must be performed	to generate the work order for the PM
A-12		Meter Based PM template First Start Reading	No	Specify the base value for the meter	
A-13		Meter Based PM work order Meter Frequency Units	No	Specify the units for the meter	
A-14	If a seasonal schedule is in effect what are the periods of usage?	Seasonal Dates Day	No	Toggle the selection to indicate a date is to be used	If a seasonal schedule is active these
A-15		Seasonal Dates Start Month	No	Enter the start month	start and end dates of the season
A-16		Seasonal Dates Start Day	No	Enter the start day in the month	
A-17		Seasonal Dates End Month	No	Enter the end month	
A-18		Seasonal Dates End Day	No	Enter the end day in the month	



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APPENDIX 6F: MATERIAL REQUISITION PROCEDURE

Introduction

Material requisition is an integral part of work management. Materials are consumed in the execution of work and are a significant expenditure for LAWA. Materials need to be managed and accounted for as part of the work management process.

Material Requisition Procedure

Credit card purchases of materials and use of material contract suppliers (i.e. McMaster Carr, Grainger, etc.) will continue to be supported by FMS. For planned work, materials can be pre-ordered based on information provided in the work order. This allows materials to be available from material contract suppliers or LAWA warehouse when the work is scheduled. Materials will continue to be requisitioned from the inventory for use on work orders.

When materials are used for work, they are accounted for on work orders. To report material consumption, the following fields need to be entered on the work order.

Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented	Reason
What is the work?	Work Order #	Yes	Work to be scheduled will already exist in the FMS as a work order	Description and location for the work for assignment of materials
What is the material used?	Part Number or material description	Yes	If a job plan was used or if materials were listed on the work order during the planning process then the materials will already be listed on the work order	Accurately account for the materials used; this links the materials to the F/S/C so that you know what materials were used on what F/S/C and when
What is the quantity used?	Quantity	Yes	Enter the quantity of materials that were used for the work	Accurately account for the materials used
When was it used?	Date	Yes	Enter the date that the material was used	Know when the materials were used.

Table 6F.1 Material Requisition Data Entry



Measurement of Results and Benchmarks

The following reports use the data entered to manage the process.



Key Performance Indicator	KPI Description	What it measures	Why this is important	Frequency and Performance Goal
Inventory Turnover	Measures the use of inventory items	Measures the number of times the inventory is consumed during an accounting period; a high number indicates a greater efficiency and a lower risk of loss through un-movable stock	Stock only those items that are used on a frequent basis	F: Quarterly G: TBD
Inventory Audit	Identifies a list of stock items that need to have the quantities validated	Measures the physical Quantity On- Hand (QOH) and compares the physical count with the system calculated QOH	Ensures all inventory is accounted for	F: Monthly G: The physical count matches the QOH calculated by the FMS
Material Receipt	Identifies all materials received whether by credit card or purchase orders, tracked to a work order where they were used which relates to the F/S/C	Identifies all material received into LAWA and tracks the usage of materials	Lists all of the materials purchased and tracks their usage to an F/S/C; provides information on frequency of usage to determine inventory stock	F; Monthly G: Account for all material received to a work order or F/S/C



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APPENDIX 6G: WORK REPORTING PROCEDURE

Introduction

Completion of a work order requires reporting the work accomplished and modifying the information on the work order to be consistent with the work performed, i.e., status, problem descriptions, tasks performed, actual start and completion dates and the remedy that was applied. Reported items will include labor, materials, maintenance contract line items and tools used during the job if appropriate.

Labor

The labor assigned to a job plan or work order is updated to provide the actual hours worked, the tasks performed, crafts used, descriptions and quantities. The information that is added is described in the table below.

Table 6G.1	Work	Order	Updating
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Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented	Reason
What task was performed?	Task Name	No – (Yes only if the labor is to be reported for the task)	Create a labor transaction for each task; Enter a unique name for the task	Each task must be able to be distinguished from other tasks to avoid confusion
Who performed the task?	Employee ID	Yes	Enter either an employee or craft	Track the person that performed the task or the creft
	Name	Yes	If an employee enter their name	
When was the task initiated?	Start Date	No	Enter the date the task was started	Indicate when the task started
When was the task completed?	End Date	No	Enter the date the task was completed	Indicate when the task completed
How many hours were worked by this person or craft?	Regular Hrs	Yes	Enter the number of regular hours worked on this task	Determine the cost of the effort by hours worked at regular rate
Were extra hours used?	Overtime Hrs	No	Enter the number of overtime hours	Overtime hours are tracked for analysis

Information	Label Name	Is this information required?	How this is accomplished if FMS is implemented	Reason
What labor type was used?	Labor Type	No	Enter the labor classification	Labor types: non-work such as sick and vacation; overtime refused; and work including travel time and waiting on material
What is the standardized code for the labor?	Labor Code	No	Enter the Labor Code	Optional usage: this is a standardized list of labor codes that provides uniformity fro reporting
Were the hours approved?	Appr	Yes	Indicate that the hours are approved	Hours need manager approval to be processed

Labor may be transferred to SAP in a subsequent phase through an interface. The current phase of implementation is to begin tracking resource usage on work orders.

Materials, Services and Tools Usage

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The materials, tools, reserved items and an F/S/C's spare parts that were used while performing work are recorded during the work order completion processing. Fields similar to those for labor are available to enter the item, quantity and the time used or cost of the item used on each. A description of materials entry is in Appendix 6F: Material Requisition.

Failure Classes

Failure hierarchies, identified as failure classes, are used to construct accurate histories of the failures that affect an F/S/C's location. This is associated to an F/S/C to report the work done to address the failure, and enable analysis of failure trends. In addition to components and locations, failure classes can be associated with work orders. A failure class uses the following three-level hierarchy:

- PROBLEM is the symptom what appears broken?
- CAUSE creates the problem why did the problem occur?
- REMEDY is the correction what will fix the problem?

Failure Class Codes

Failure classes and their components will be developed over the life of FMS. The failure classes will be populated in the FMS menus for easy selection. Some examples are:

Problem Codes

Too Hot/Too Cold

Damage

Dirt or foreign matter problem

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Light/Power Out	Urinal/toilet not working	Excessive lubrication
No Water	Markings Not Visible	Excessive noise
No air	Liquid on Floor	Excessive vibration
Odor	Graphics Not Visible	Overheating or smoking
Water leak	Debris	Short circuit
Air leak	Alarm or problem indicator	Vandalism
Oil leak	Bearing problem	Will not start

Calibration problem	Equipment jammed	Part of equipment is broken
Equipment adjustment required	Lack of lubrication	Misalignment
Operator error	Loose or broken wire	

Remedy Codes

Cause Codes

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Replaced Thermostat	Replaced breaker	Patched roof
Replaced Flushometer	Pruned/Trimmed Plant/Tree	Turn-off water
Replaced fan belt	Replaced receptacle	Repaired faucet
Repaired Pipe	Replaced Plant Tree/Bush	Pavement Repaired
Reset Thermostat	Removed dead animal	Joints Sealed
Cleaned up Liquid	Painted Markings	Removed Debris
Season Change-over	Cleanup chemical(s)	Pavement Cleaned
Called HazMat for Cleanup	Replaced Sign	Cracks Sealed
Reset breaker	Replaced filter	Replaced transformer
Replaced Faucet	Secured Sign	Replaced Light

Work Order Closeout

The original requestor of the work is notified when a work order is completed. They can be contacted by e-mail or phone. For requestors external to EFMD, a customer satisfaction survey is completed and submitted to the Facilities Management Unit (FMU, <u>FM-Unit@lawa.org</u>) for final close-out or reassignment of the work, if the work was deemed unsatisfactory.



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SECTION 7: CONDITION ASSESSMENT POLICY (LAST REVISED 8/31/12)



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CONDITION ASSESSMENT POLICY

LAWA Facilities Management Handbook Policy

Title: Condition Assessment Policy

Los Angeles World Airports

Section 2.7-1

Authority: Deputy Executive Director, FMG

7.1 POLICY

Los Angeles World Airports (LAWA) will routinely and consistently assess the condition of building and grounds facilities, systems and components (F/S/C). Application of standard assessments procedures will support facility investment planning.

Processes and procedures for assessment of transportation infrastructure and utility infrastructure are not included.

7.2 DEFINITIONS

- Asset: Capital investments maintained by LAWA's Finance and Accounting Management Information System (FAMIS). Assets may be buildings, pavements, infrastructure, utilities, etc. Assets could be a facility or groups of facilities, a system or group of systems, a component or group of components. Assets are currently established by financial value threshold.
- Backlog and Funding Projections: Model scenarios that can estimate the future backlog of deferred maintenance based on current funding strategies and collected data. Also can determine the levels of funding required to obtain a future FCI or backlog level. A backlog projection models the level of deferred maintenance that may be obtained when applying a certain funding level. A funding projection models the level of M&R budget needed to achieve or maintain a certain deferred maintenance backlog.
- Building System Scorecard (BSS): Condition rating criteria for building systems intended to be used by property and building managers.

Component: Element of a system that is managed, monitored, or maintained separate from the system.

- Component Renewal Index (CRI): Indicates the relative funding required for identified component renewal and renovation/modernization needs. CRI is derived by dividing projected component renewal by current replacement value.
- Condition Index (CI): An indicator of the actual physical condition of an F/S/C. Each building system is scored based on a five-tier condition scale (i.e. Excellent, Good, Average, Poor, and Fail) with a coordinating numerical scale and is totaled to determine the building's overall CI.

Current Replacement Value (CRV): The total expenditure in current dollars required to replace any facility, including construction costs, design costs, project management costs and project administrative costs.

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- Facility: A structure or installation serving a specific function. A facility is a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant, or structure that is built, established, or installed for the performance of one or more specific activities or functions.
- Facility Condition: Represents the current condition of a facility, system, or component. It is used to compare condition among facilities, determine the effectiveness of maintenance practices, and compare the long-term functionality of specific facilities, systems, and components.
- Facility Condition Assessment (FCA): An inspection and assessment of facilities producing a complete account of system and component deficiencies and a list of remediation scenarios. FCA results inform maintenance and capital renewal planning.
- Facility Condition Index (FCI): A comparative indicator of the relative condition of facilities expressed as a ratio of the cost of remediating maintenance and repair backlog to the CRV.
- Facility Registry: The database of information about LAWA facilities, systems and components and their location, attributes, characteristics and condition.
- Physical Deficiencies: The presence of conspicuous defects or deferred maintenance of an F/S/C as observed during the field observer's walk-through survey. Physical deficiencies specifically exclude deficiencies that may be remedied with routine maintenance, miscellaneous minor repairs, or normal operating maintenance. Remediation of physical deficiencies are categorized into work types (refer to Work Management Policy section 6.5.2 for definitions of work types).
- Property Condition Assessment (PCA): Architectural and engineering due diligence assessment of existing building and site that informs the property acquisition process. PCA evaluates physical condition, general code compliance, capacities/adequacies, repair and maintenance issues, recommended replacements, capital expenditures, and provides corrective action probable costs opinions.
- Property Condition Report (PCR): The work product resulting from completing a PCA in accordance with this guide. The PCR incorporates the information obtained during the walk-through survey, the document review and interview portions of the PCA, and the probable cost opinions for remediating the physical deficiencies identified.
- System: A collection of components performing a specific function for a facility. Systems are logical elements of a facility that are unique in their life-cycle and/or function (e.g. roof, HVAC, fencing, roads, and sidewalks).
- Total Cost per Acre (or Square Foot): A benchmark per grounds (for acre) or facility (for Square Foot) to track total expenditures relative to the size of the facility. It is the ratio of total maintenance, repair and replacement costs divided by total gross acre or square footage, respectively, of the facility.

7.3 ROLES AND RESPONSIBILITIES

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Applying and sustaining the buildings and grounds condition assessment policy requires three roles.

Administrator – Engineering and Facilities Management Division (EFMD) maintains the standards and tools used to perform condition assessment. As administrator, EFMD develops and updates a master FCA and BSS schedule. EFMD enters assessment results to the registry; creates work orders and creates a PIF for capital planning as appropriate.

Requestor – Commercial Development Group (CDG) commissions assessments for building acquisition due diligence, lease agreement negotiation and property turnover.

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User / Assessor – EFMD and Maintenance Services Division (MSD) perform or oversee facility condition assessments CDG will use the nontechnical facility scoring procedure to support management of leased property.

7.4 PROCESSES AND PROCEDURES

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Condition assessment informs property acquisition and facility reinvestment and maintenance levels of service decisions. LAWA will commission Property Condition Assessments (PCA) for property acquisition. The Facility Condition Assessment (FCA) and Building System Scorecard (BSS) are, respectively, procedures for technical and non-technical assessment of LAWA buildings.

7.4.1 Property Condition Assessment Procedures

A PCA is conducted to support property acquisition due diligence. The PCA procedure collects information needed for a commercial real estate transaction. This kind of assessment does not identify all physical deficiencies and it does not assess the performance of all building systems. A PCA is intended to reduce, but not eliminate, the uncertainty regarding the potential for component or system failure. A PCA does not address economic obsolescence, business entity acquisition or physical deficiencies relating to off-site conditions.

The PCA and PCR must be completed in accordance with the ASTM E2018 Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process.

A third-party consultant must perform the PCA and deliver a PCR in accordance with the *ASTM E2018* guidance. A representative template for a PCR is provided in Section 12B.

7.4.2 Facility Condition Assessment Procedures

An FCA of systems and components yields current remaining life and maintenance and renewal requirements and costs. An FCA may be required for newly acquired property, prior to taking over a leased building or grounds, when the BSS identifies poor or failed systems, and periodically, typically every five years for buildings essential to service delivery.

Results from each FCA are used to update the facility registry, create work orders and develop requests for capital investment. EFMD maintains a copy of every completed FCA report.

If the facility scheduled for an FCA is missing from the F/S/C registry, EFMD will perform an F/S/C inventory per the Facility Registry Management Policy (FM Handbook Section 3).

FCA work includes an initial planning and research phase, followed by a field assessment phase and completed with a data analysis and reporting phase.

In the planning phase, assessor(s) collect existing data from the facility registry, work orders, as-built records, site and building base maps, drawings and interviews with facility stakeholders. After collecting background information, they prepare the data collection forms, mobilize the CA teams and coordinate access and field support with stakeholder groups. Appendix 7B provides instructions for completing the FCA data collection and analysis form.

The planning phase is used to assemble the team and develop a detailed work plan. Use the assessment guides (refer to Section 12B) to determine required skills and size of FCA team. Team composition and sequence of work should be develop to minimize disruption of building operations and allow for knowledge sharing. The planning phase should also identify and schedule any specialty testing requirements.

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In the field assessment phase, record findings use the data collection form. In addition, the CA team must use a floor plan or site map to guide field data collection. Deficiency locations must be recorded either as annotations on the floor plan drawing, by reference to location names on the FCA data collection form or both. FCA assessor teams work collaboratively for comprehensive understanding of the buildings.

The final phase is the analysis of deficiencies, with the results being remediation scenarios, cost estimates, and updates to the estimated remaining life of systems and components. The FCA data are delivered in electronic format suitable for entry into FMS or related database systems. These data include:

• F/S/C registry data (new or updated),

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- Condition assessment results (i.e. physical condition, deficiencies, cost to correct, recommendations for corrective actions, remaining life, etc.),
- Recommended changes to existing maintenance practices,
- Cost estimates in accordance with LAWA standards,
- Priorities for repair and replacement activities,
- Reinvestment/capital investment forecasts, and
- Efficiency/energy savings opportunities.

7.4.3 Building System Assessment Procedure

CDG and EFMD need a tool for rapidly assessing the condition of managed and owned buildings. For this LAWA has developed standardized nontechnical condition scoring criteria. The scoring is used to grade building systems, not individual components. Building system scoring is a maintenance and repair planning tool used to assess building and system performance between FCAs and to support CDG's management of leased property. BSS is not a substitute for FCA. FCAs will be performed periodically to provide essential data about system and component deficiencies and reinvestment.

For mission critical buildings, EFMD assesses condition using the BSS every two years. The results are compared to previous FCA findings (i.e., FCI and remaining life) and reinvestments sense the last FCA. CDG will use this form to monitor leased building per lease agreements. At the end of a lease the BSS will be used to support close-out planning.

Low scores typically trigger requests for a more in-depth engineering assessment:

- If less than two systems score below average, EFMD will perform an FCA on only the systems with below-average scores.
- If three or more systems score below average, EFMD will perform a complete FCA on the building.
- If any system fails (i.e. zero score), EFMD will perform an engineering evaluation for that system and will develop a remediation plan.

Instructions for completing a BSS are provided in Appendix 7A. The scorecard and summary report templates are published in Section 12A.

Similar to the FCA, the planning stage for a BSS should include gathering pertinent facility information, including:

- Facility floor plans
- Site plans
- Listing/status/documentation of any major repair projects underway or planned
- One-year work order history
- Job plans and preventive maintenance schedules
- Equipment list



• Roofing information (install date, warranty, etc.)

The building manager maintenance personnel should be on-site to assist in discussing the performance and maintenance history of the building, as well as providing access to all areas of the facility.



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7.5 KEY PERFORMANCE INDICATORS

FCAs are used to calculate a Facility Condition Index (FCI) and a Component Renewal Index (CRI). BSSs are used to calculate building Condition Index (CI). The following KPIs judge performance of facilities relative to established service level goals. As appropriate, FCI and CRI can be used to relate LAWA F/S/C conditions to peers and <u>best practices</u> from other industries.

Table	7.1	Condition	Assessment	Kev	Performance	Indicators
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Key Performance Indicator	KPI Description	What it Measures	Why This is Important	Frequency (F) and Performance Goal (G)
Facility Condition Index (FCI)	Ratio of Maintenance and Repair Backlog to CRV expressed as a percentage. (see Appendix 7C for detailed explanation)	Maintenance program performance as related to sustaining facilities to an acceptable service level	Indicates the annual reinvestment rate (funding percentage) needed to prevent deferred maintenance accumulation	F: Every 5 Years G: No buildings with FCI less than 5%, Goal may vary based on facility service levels
Component Renewal Index (CRI)	Ratio of forecasted Component Renewal (CR) cost to CRV expressed as a percentage (see Appendix 7C for detailed explanation)	Need for investment and the performance of current level of investment in sustaining an acceptable level of service	Indicates the relative funding required for component renewal and renovation/modernizati on needs	F: Every 5 years G: All buildings have 15%to 25% CRI over a 10-year assessment reporting period.
Condition Index (CI)	Weighted sum of building system condition score (see Appendix 7C for detailed explanation)	A building general condition based regular inspection program	Indicates need performance of building relative to service level goals	F: at least every two years G: Mission critical building scores no worse than good; and no score should be poor or failing

7.6 HISTORY

Revision	Description	Author	Date
1	Updates to the following Sections: Roles and Responsibilities; Processes and Procedures; Appendices	FMG	August 31, 2012



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APPENDIX 7A: USING THE BUILDING SYSTEM SCORECARD (BSS) AND SUMMARY WORKSHEET

Refer to Section 12A for the BSS template.

The BSS template has one scorecard per building system. Each system scorecard explains the system's scoring criteria. Table 7A.1 and Figures 7A.1 provide instruction for complete scorecards

When conducting the BSS, assessors evaluate and score each system via a visual assessment. The assessor observes the major components of each building system and, using the BSS template, circles the rating next to the condition standard that best describes the current condition of the system or component in question. While on site, assessment teams should conduct interviews with personnel familiar with the history and performance of the building in order to fully ascertain the condition of existing components. Conditions are reported based on a five-tier condition scale with a coordinating numerical scale. Possible condition scores are: Excellent (10), Good (7.5), Average (5), Poor (2.5) and Fail (0). The scorecard template provides guidance for assigning building system scores. Any system score of average or below requires an explanation. If the rating of any system is reported as 0, Fail Condition, immediate action must be taken to ensure occupant safety and to repair the system or facility.

Field #	Field Label	Input Value / Domain	Is data required?	Use Description
F-1	Facility / Location	Building Name and Campus Location	Yes	
F-2	Evaluation Performed By	Full name of person leading the BSS evaluation	Yes	
F-3	Evaluation Date	Date that system was evaluation	Yes	
F-4	System Score	Assign a score (0, 2.5, 5, 7.5 or 10)	Yes	Scoring criteria guidance is provide for each system on the scorecard
F-5	Comment	Explanation of reason for score	No	Comment is required if score is average or below

Table 7A.1 Index to BSS Data Fields

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SYSTEM: Component:	B30 Exterior B3010 Roofing B3020 Roof A	Horizontal Enclosures g ppurtenances
RATING	EVALUATION	CONDITION STANDARD
10	Excellent Condition	New or like new with no defects. Pitch line straight, no sign of sagging at ridge line, with good drainage and no ponding. No plugged roof drains or flashing failures.
7.5	Good Condition	Minor membrane cracking on surface with no leakage. Slight sagging in ridge line, minor signs of ponding. Roof drains plugged with gravel or leaves. Any deficiencies can be easily repaired.
5	Average Condition	Visible cracking or blisters in surface sealing with no leakage. Sagging at ridge line, ponding or standing water puddles, loose or displaced flashing. Some isolated roof drain clogs. Minor repairs required.
2.5	Poor Condition	Serious cracking and/or blisters in surface sealing with visible leakage through roof. Sagging and irregular ridge line, ponding and standing bodies of water. Damage or debris-clogged roof drains and damaged flashing are apparent. Spongy or water-soaked surface materials with water damage to underlying structure.
o	Fail Condition	Roof does not prevent rain or moisture entry. Broken ridge or rafters. Roofing materials are water logged and collapsing. Total roof replacement required.
Comments: _		

Figure 7A.1 Sample BSS Form

When the field assessment and the BSS forms are completed, the assessor will input the BSS data into the BSS Building Analysis Worksheet (template provided in Section 12A) and produce a summary BSS report, as illustrated in Figure 7A.2.

The worksheet processes system scores to generate an overall building score. The building score is the sum of weighted system scores. Only scored systems are considered in the overall building score. Building scores are normalized to the same Fail, Poor, Average, Good or Excellent scale used for systems.

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CONDITION ASSESSMENT POLICY

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Systems as Uniformat Levels 1, 2 and 3	System Weight	Adjusted System Weights (as %)	Level 3 Score (from BSS)	Weighted Level 2 Score	Normalized Level 2 Score	Action Item / Comment
A SUBSTRUCTURE	1.4	15%				
A10 Foundations	1.4	15%		7.5	1.1	
A1010 Standard Foundations	1.4	15%	7.5	7.5		
B SHELL	2.7	30%				
B10 Superstructure	0.1	0.0		0.0	0.0	
B1010 Floor Construction B1080 Stairs	0.1	0%	N/A	0.0		
B20 Exterior Vertical Enclosures	1.1	14%		6.9	0.9	
B2010 Exterior Walls	0.9	10%	7.5	5.7		
B2020 Exterior Windows	0.5	10/0	7.0	517		
B2050 Exterior Doors	0.2	3%	5	1.2		
B30 Exterior Horizontal Enclosures	15	16%		75	12	
B3010 Boofing	1.5	10/0		7.5	1.2	
B3020 Roof Appurtenances	1.5	16%	7.5	7.5		
	1.4	0%				
C10 Interior Construction	1.4	0%		0.0	0.0	
C1010 Interior Dartitions	0.5	0%	NI/A	0.0	0.0	
C1010 Interior Windows	0.4	0%	IN/A	0.0		
C1020 Interior Door	0.1	0%	N/A	0.0		
C1030 Interior Doors	0.0	00/			0.0	
C20 Interior Finishes	0.9	0%		0.0	0.0	
C2010 Wall Finishes	0.0	00/	N 1/A			
C2030 Flooring	0.9	0%	N/A	0.0		
C2050 Ceiling Finishes						
D SERVICES	4.5	55%				
D10 Conveying	0.3	4%		5.0	0.2	
D1010 Vertical Conveying D1030 Horizontal Conveying	0.3	4%	5	5.0		
D20 Plumbing	0.8	12%		5.7	0.7	
D2010.40 Domestic Water Piping	0.3	4%	7.5	2.7		
D2010.60 Plumbing Fixtures	0.3	4%	2.5	0.9		
D2020 Sanitary Drainage	0.2	3%	7.5	2.1		
D30 HVAC	1.6	20%		6.2	1.2	
D3020 Heating Systems	0.4	5%	5	1.3		
D3030 Cooling Systems	0.4	5%	5	1.3		
D3050 HVAC Distribution Systems						
D3060 Ventilation	0.8	9%	7.5	3.5		
D40 Fire Protection	0.2	3%		7.5	0.2	
D4010 Fire Suppression	0.2	3%	7.5	7.5		
D50 Electrical	1.3	16%		5.0	0.8	
D5020 Electrical Service and Distribution						
D5030 General Purpose Electric Power	0.7	8%	5	2.7		
D5040 Lighting	0.6	7%	5	23		
D70 Electronic Safety and Security	0.0	0%	,	0.0	0.0	
D7010 Access and Intrusion Control	0.5	070		0.0	0.0	
D7050 Detection and Alarm	0.3	0%	N/A	0.0		
Total Building Score:			Average		6.4	
10			Excellent			
9.9 to 7.5			Good			
7.4 to 5.0			Average			
4.9 to 2.5			Poor			
2.4 to 0			Fail			
			-			

Figure 7A.2 Sample BSS Worksheet

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APPENDIX 7B: USING THE FCA DATA COLLECTION AND ANALYSIS FORM

Refer to Section 12A for the FCA Data Collection and Analysis Form template.

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The FCA Data Collection and Analysis Form (Figure7B.1) has two parts: Field Inspection Data and Deficiency Analysis. Table 7B.1 explains how to use each field on the form.

The field inspection part records facility information (Field #s F-1 through F-8); system or component information (Field #s S-1 through S-6) and deficiency data (Field #s D-1 through D-9).

The system or component Information is completed using existing F/S/C data (Field #s S-1, S-2 and S-3), if available, or using type codes (Field #s S-4 and S-5) if no existing F/S/C data are available. Assessor will provide updated estimated of remaining life (Field # S-6).

Deficiency reference numbers are unique to the project; each assessor will be allotted a range of numbers to use. The same deficiency reference number and its corresponding data can apply to multiple locations and/or to multiple registered systems or components. Registered systems and components are in the facility registry and have been tagged with facility IDs.

The Deficiency Analysis part of the form is used to record remediation recommendations and associated cost estimates (Field #s A-1 through A-7).

Field #	Field Label	Input Value / Domain	Required Data (Yes, No or Yes/No)	Use Description
F-1	Campus	LAX, VNY, ONT, PMD	Yes	Registry requirement
F-2	Campus Area	CC-Century Cargo, IS- Imperial Service, etc.	Yes	Registry requirement
F-3	Facility Type	TER (Terminal), OFF (Office), CRG (Cargo), ARF (Aircraft Rescue Fire Fighting), etc.	Yes/No Must complete if adding a new facility to the registry	Registry requirement
F-4	Facility ID	Unique name	Yes/No Must complete field if facility exist in the registry.	To link assessment information to the building
F-5	Legacy Name	Alias or name that does not conform to naming convention	Yes/No Must complete if adding a new facility to the registry	For systems and/or components in Facility Registry use legacy names, where available.

Table 7B.1 Index to FCA Collection and Analysis Form Data Fields

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Field	Field Label	Input Value / Domain	Required Data	Use Description
"			(Yes, No or Yes/No)	
F-6	Inspection Type	Structural, electrical, mechanical, roof, etc.	No	Determine content and scope
F-7	Inspector	First and Last Name of assessor	Yes	To assign responsibility
F-8	Inspection Date	Date Range	Yes	Date stamp reports
S-1	System ID	Unique ID for the system	Yes Use naming convention	To link assessment information to the system
S-2	System Type Code	Conveyance, exterior closure, etc.	Yes/No Must complete if adding a new system in the registry	Registry requirement
S-3	Component ID	Unique ID for the component	Yes Use naming convention	To link assessment information to the component
S-4	Component Type Code	Elevator, moving walkway, etc.	Yes/No Must complete if adding a new components in the registry	Registry requirement
S-5	UNIFORMAT Code	ASTM E1557-05 Standard Classification for Facility Elements	Yes	Summary reporting and registry requirement
S-6	Estimated Remaining Life	Projected years before replacement is required	Yes	Estimated for first time or updated as part of CA
D-1	Deficiency Ref. #	Number relating to a location(s) of a particular facility deficiency	Yes	Used to combine like deficiencies across a facility
D-2	Location ID	Record location name using building space or campus location naming convention	Yes	Record deficiency's specific location name or names for multiple location deficiency. If location name is not available note that location is annotate of floor plan of campus map
D-3	Work Type	Refer to Work Management Policy, section 6.5.2 for list	Yes	Use to report and summarize remedial work required within and across facilities

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Field #	Field Label	Input Value / Domain	Required Data	Use Description			
			Yes/No)				
D-4	Sub-work Description	Describes work in more detail (i.e., American Disabilities Act (ADA) non-compliance, lead based paint, indoor air quality standard (IAQ)).	Yes	Required to report and summarize work within and across facilities.			
D-5	Priority	How long action can be delayed, in years	Yes	Required to report and summarize work within and across buildings			
D-6	Deficiency Description	Describe current or projected problem is based on applicable Assessment Guide protocol	Yes	Informs maintenance/ repair/ replacement scenario development			
D-7	Quantity	Deficiency size or amount	Yes	Informs cost estimating; some quantities may be documented in the office using floor plan take-offs			
D-8	UoM	Quantity unit of measure	Yes	Supports cost estimating			
D-9	Photo #	Photograph number referencing the problem identified	No	Photos are not required, if taken the photo # must tie to the actual photo image or file #			
A-1	UNIFORMAT Code	ASTM E1557-05 List of Codes	Yes	Required to support reporting within and across facilities			
A-2	Maintenance/Repair/ Replacement Scenario	Remediation	Yes	Establishes scope used to complete A-4, A-5, A-6, A-7 and A-8			
A-3	Craft code(s)	Shop or craft (trade classification) to accomplish the work	Yes	Support planning and cost estimating			
A-4	Labor Hours	Work hours required by craft	Yes	Rough order of magnitude labor hours needed to perform work			
A-5	Material costs	Material cost by craft	Yes	Rough order of magnitude material cost			
A-6	Equipment costs	Equipment cost by craft	No	Rough order of magnitude equipment cost			
A-7	Total costs	Calculated sum of A-5 times cost per hour, plus A-6 and A-7	Yes	Used to support capital and maintenance work planning			



FACILTY DATA COLLECTION INFORMATION														
Campus:		F-1						Campus Area:	ea: F-2					
Facility Type:		F-3						Inspection Type:	n Type: F-6					
Facility ID:		F-4						Inspector:	F-7					
Legacy Name:		F-5						Inspection Date:	ction Date: F-8					
	SYSTEM/COMPONENT INFORMATION													
	System Type	Component	Comp. Type	Uniformat	Est. Remaining	Deficiency Ref	Location	Work	Sub Work					
System ID	Code	ID	Code	Code	Life	No.	ID	Туре	Description	Priority	Deficiency Description	Quantity	UoM	Photo #
S-1	S-2	S-3	S-4	S-5	S-6	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9

FACILITY CONDITION ANALYSIS							
Deficiency Ref							
No.							
D-1							
Uniformat Code	Locations (rooms)	Maintenance/Repair/Replacement Scenario	Craft Code (s)	No. Hours	Material Costs	Equipment Costs	Total Cost
	D-2		A-3	A-4	A-5	A-6	
A-1		A-2					A-7

Figure 7B.1 Indexed FCA / Data Collection and Analysis Form



APPENDIX 7C: CONDITION ASSESSMENT KPI EXPLANATIONS

7C.1 Facility Condition Index Calculation and Interpretation

<u>Facility Condition Index (FCI)</u> - A comparative indicator of the relative condition of facilities. FCI is expressed as a ratio of the cost of remediating maintenance and repair backlog to the CRV. It provides a method of measurement to determine the relative condition index of a single facility, group of facilities or an entire portfolio. FCI is a KPI that provides a facility manager a corresponding rule of thumb for the annual reinvestment rate (funding percentage) to prevent deferred maintenance accumulation.

FCI = <u>Maintenance and Repair Backlog</u> Current Replacement Value

The maintenance and repair backlog is defined by the total amount of deferred maintenance, past due component renewal and legislatively-mandated needs as identified in the first three years of the plan. Table 7C.1 lists the industry benchmarks for FCI in ranges.

Best Practices for FCI					
FCI Range	Condition Rating				
Under 0.05 (5%)	Good				
Between 0.05 (5%) – 0.10 (10%)	Fair				
Over 0.1 (10%)	Poor				

Table 7C.1 Best Practices for FCI

Compare the FCI to the facility criticality index below to prioritize projects for execution. A highest criticality (5) facility must receive funding to reduce the deferred maintenance backlog before a moderate criticality (2 or 3) facility. Figure 7C.1 illustrates the relationship between the facility criticality rating and the FCI. Criticality rating rules are defined in the Facility Registry Management Policy (FM Handbook Section 3.4.1.1). Projects in the crimson quadrants have a higher priority over those in red, red over orange, orange over yellow, yellow over green and green over emerald.



Facility Condition Index

Poor

Figure 7C.1 Facility Condition Index

Good

7C.2 Component Renewal Index Calculation and Interpretation

Fair

<u>Component Renewal Index (CRI)</u> – Indicates the relative funding required for identified component renewal and renovation/modernization needs. Component renewal expenditures are those that are over and above facility maintenance operating budget expenditures required to keep the physical plant in reliable operating condition for its present use. This is a separately-funded, uniquely-identified program that renews, replaces or renovates building systems on a schedule by utilizing lifecycle recommendations and assessing expected remaining useful life. Renewal focuses on maintaining the operability, suitability and value of capital F/S/C; it is accomplished by replacing and reworking building components worn out due to inherent wear and tear. CRI is a ratio of the current cost to replace future components at the of the CRV's useful life. CRI is a key performance indicator that provides a facility manager an ongoing metric for the future reinvestment rate replace equipment at the end of its useful life.

CRI = <u>Projected Component Renewal</u> Current Replacement Value

The CRI must be in the range of 0.15 to 0.25 (or 15 percent to 25 percent reinvestment of the CRV over the 10-year assessment reporting period). A CRI below 0.15 indicates that the facility may be in the first five to ten years of its lifecycle. It may also indicate that the facility has just been through a significant renovation and no further planning is required. These relatively new components may cause the next five year FCA to have a significantly higher CRI; the facility manager must note this reason for discrepancy. A CRI above 0.25 indicates that the facility needs renovation, or that it needs an evaluation to determine if keeping this facility operational is financially feasible.



7C.3 BSS Building Summary Calculation and Interpretation

<u>Condition Index (CI)</u> – When using the BSS for assessments, the assessors focus on evaluating the actual physical condition of the facilities as they are currently constructed. Assessors report conditions based on a five-tier condition scale of Excellent, Good, Average, Poor, and Fail with a coordinating numerical scale. Each building system condition is scored using this scale and totaled to identify the building's overall CI. Table 7C.2 lists the condition rates that are given to the ranges in CI.

Table 7C.2 Condition Index (CI) Ratings

Range of Calculated CI Scores	Condition Rating
10	Excellent
9.9 to 7.5	Good
7.4 to 5.0	Average
4.9 to 2.5	Poor
2.4 to 0	Fail

7C.4 Other Metrics

For building facilities, condition assessments information will be used to compare facilities and to plan for the best use of available funds. Two common decision support measures are:

<u>Total Cost per Square Foot</u> – This is the total maintenance, repair and replacement costs divided by total gross square footage of the facility. It can be calculated by year, work type, system, etc. Since this measure is used per facility, only compare it to other facilities of the same size, age and use with the same installed systems and construction materials.

<u>Backlog and Funding Projections</u> – Backlog of deferred maintenance compared to funding strategies. It helps a facility manager answer the question: If annual maintenance and repair (M&R) is funded at \$X for the next "n" years, what kind of deferred maintenance backlog will exist in year "y"?

Funding projection models the level of M&R budget needed to achieve or maintain a certain deferred maintenance backlog. It helps a facility manager answer the question: What level of funding is needed to achieve or maintain an FCI over "t" years?



SECTION 8: FACILITY FIXED ASSET CAPITALIZATION GUIDELINES (LAST REVISED 8/31/12)

Facilities Management Handbook FACILITY FIXED ASSET CAPITALIZATION GUIDELINES Los Angeles World Airports

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Facilities Management Handbook FACILITY FIXED ASSET CAPITALIZATION GUIDELINES Los Angeles World Airports

LAWA Facilities Management Handbook Policy

Title: Facility Fixed Asset Capitalization

Section 2.8-1

Authority: Deputy Executive Director, FMG

8.1 GUIDELINES

Los Angeles World Airports (LAWA) has established consistent and uniform processes for facility fixed asset capitalization (FFAC). These guidelines apply to facilities, systems or components (F/S/C) with a useful life of more than one year and a value equal to or greater than \$50,000.

These guidelines do not replace existing accounting standards such as current Generally Accepted Accounting Principles (GAAP) reporting and disclosure requirements for government entities. This includes pronouncements of the Governmental Accounting Standards Board (GASB), the *Codification of Governmental Accounting and Financial Reporting Standards*, pronouncements of the Financial Accounting Standards Board (FASB), and other authoritative literature codifying governmental accounting principles and methods. This also includes recommendations contained in *Government Accounting*, *Auditing and Financial Reporting* published by the Government Finance Officers Association (GFOA).

8.2 DEFINITIONS AND CONVENTIONS

- Acquisition: The process by which LAWA comes into possession and ownership of a fixed asset (e.g. purchase, donation, construction, eminent domain and foreclosure).
- Asset: Capital investments maintained by LAWA's Finance and Accounting Management Information System (FAMIS).

Component: Element of a system that is managed, monitored or maintained separate from the system.

Depreciation: The allocation of the cost of assets to periods is determined by the Comptroller.

- Facility: A structure or installation serving a specific function. A facility is a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant, or structure; built, established or installed for the performance of one or more specific activities or functions.
- Facility Fixed Asset: Any fixed asset with an original cost of \$50,000 or greater. These items have significant value and will be capitalized. A "Facility Fixed Asset" can be a single facility or groups of facilities, a system or group of systems, a component or group of components.
- Facility Fixed Asset Capitalization Form: The format used to collect F/S/C data necessary for asset capitalization. The form in Appendix 8A has been developed for the facility type "building," since this facility type is typically the most complex (i.e. consists of the most distinct systems and components). The form can be built to suit any F/S/C.
- Facility Registry: The database of information about LAWA F/S/C and their locations, attributes, characteristics and condition.



System: A collection of components performing a specific function for a facility. Systems are logical elements of a facility that are unique in their life-cycle and/or function.

8.3 ROLES AND RESPONSIBILITIES

Applying and sustaining the facility fixed asset capitalization guidelines requires three roles.

Administrator – Facilities Management Unit (FMU) will administer and oversee the process, including coordination with other LAWA stakeholders to ensure that FFAC forms are completed in a timely and accurate fashion.

Acquirers – Divisions using capital funds to procure, design, construct, purchase, or otherwise acquire assets will complete FFAC forms and transfer asset-related documents (including leases, design and construction documents, product specifications, as-built drawings and warranties) to FMU when an asset is turned over to LAWA. Typical acquirers are:

- Airports Development Group
- Airport Operations
- Airport Facilities Planning Division
- Commercial Development Group
- Engineering and Facilities Management Division
- Environmental Services Division
- Information Management and Technology Group
- Maintenance Services Division

Users – The Comptroller Group is responsible for the booking of and accounting for facility fixed assets; they will receive the completed FFAC forms, verify the information, and maintain the asset in FAMIS. The Finance & Budget Division will use the information from the FFAC forms verified by the Comptroller Group to forecast capital renewal projects and verify on-going costs associated with the asset.

8.4 PROCESS AND PROCEDURES

Figure 8.1 outlines the process for facility fixed asset capitalization. The process begins at the project initiation stage and is followed through the planning, design and construction phase through to an asset being booked in FAMIS. The process requires continual updating during the life of the asset, even after it is booked. The process is complete when an asset is disposed of.





Figure 8.1 LAWA's Facility Fixed Asset Capitalization Process

Initiate a FFAC form (see Appendix 8A: Guidance Document) for the asset during the initiation stage of any construction or acquisition project utilizing capital funds. If applicable, capitalize an asset at the facility level. Systems and components may be identified and capitalized and their value rolled up as a part of the total asset value. Update the form at every stage of the project life cycle (Figure 8.2).

Facilities Management Handbook Page: 8-6 FACILITY FIXED ASSET CAPITALIZATION Date: 08/31/12 GUIDELINES Los Angeles World Airports Project Life Cycle – Four Stage Process STAGE IV STAGE I STAGE II STAGE III Design/Construction/ Operation & Project Initiation Project Programming Commissioning Management LEAD ROLE Airports Facilities Facilities Project Development Group Management Group Management Sponsor Group

Figure 8.2 LAWA's Capital Improvement Project Life Cycle

The following sections provide rules for initiating FFAC forms, additions or renovations and asset disposal. Further explanation can be provided by FMU if needed.

8.4.1 Initiating FFAC Forms

At the project initiation stage, the acquirer (a.k.a. project sponsor) must determine an F/S/C's value and physical life expectancy to decide if an FFAC form is necessary. Appendix 8A: Document Guidance contains procedures for completing the form.

8.4.1.1 Asset Valuation

Capitalize assets valued at \$50,000 or greater and having a useful life of more than one year. Assets purchased or otherwise valued at less than \$50,000 may be recorded as a facility fixed asset for inventory purposes, but the FFAC form is not applicable.

When determining whether or not the asset meets the value threshold, the following rules should be applied:

- Assets are recorded at the purchase or total construction cost, which may include: program/project management, architectural/engineering design services, construction support services, damage claims, cost of fixtures, insurance premiums, or interest on construction and related costs incurred during the period of construction.
- If construction costs are not available, value the asset at historical or estimated historical cost (not market or replacement value).
- Do not include capital interest incurred as part of the total cost of the asset.
- Record a donated asset at the appraised market value.
8.4.1.2 Physical Life Expectancy

Each asset system identified on the FFAC form must have a physical life expectancy. FMU can provide guidance on how to determine physical life expectancy if needed.

The Comptroller Group and the Finance & Budget Division may, at their discretion, use an asset's physical life expectancy as a means of depreciation, rather than the typical straight-line deprecation method.

The Comptroller Group and the Finance & Budget Division may, at their discretion, choose not to depreciate the asset if that asset is maintained at a "good" condition level, as substantiated by condition assessment data provided by FMU.

8.4.2 Additions or Renovations

Following receipt of an FFAC form during the initiation stage of an addition or a renovation project, FMU, the Comptroller Group and the Finance & Budget Division determine whether the project will be accounted for as a separate asset or as a part of the existing asset. If the project is accounted for as its own asset, it will receive its own unique asset number.

If it is determined that the addition or renovation is to be part of an existing asset, the FFAC form should be updated and FMU will notify the Comptroller Group to perform the proper accounting.

Do not capitalize repairs, maintenance and replacement parts; they generally do not extend the life expectancy for accounting purposes or increase an asset's value. FMU must approve any exceptions after consulting with the Comptroller Group and the Finance & Budget Division.

If using LAWA funding for a tenant improvement, utilize the FFAC form to track costs and document the acquisition.

8.4.3 Asset Disposal

When disposing of a LAWA-owned asset, the division or group responsible for the disposition will notify FMU, the Comptroller Group and the Finance & Budget Division. If possible, dispose of the asset in the manner that provides the maximum benefit to LAWA. The responsible party, FMU, the Comptroller Group and the Finance & Budget Division all must maintain records of the transaction.

FMU will reconcile capitalized facility fixed assets annually. They will balance the capitalized assets recorded on the facility fixed asset system with the assets recorded on the general ledger. They will research and resolve any discrepancies. FMS will document the reconciliation and keep it on file.



8.5 KEY PERFORMANCE INDICATOR

The following report is a Key Performance Indicator (KPI) that is used to assist in evaluating the integrity of the database.

Table 8.1 Key Performance Indicator

KPI Title	KPI Description	What it Measures	Why This is Important	Frequency and Performance Goal
Asset Synchronization	Compares facilities management data and asset data synchronization	Compares F/S/C meeting capitalization criteria and facilities with SAP IDs in the Facilities Registry	Assures all acquisitions follow the FFAC procedure	F: Quarterly G: 100% of assets in SAP are synchronized

8.6 HISTORY

Revision	Description	Author	Date
1	Updates to the following Section: Roles and Responsibilities	FMG	August 31, 2012



APPENDIX 8A: GUIDANCE DOCUMENT

Complete a LAWA Facility Fixed Asset Capitalization (FFAC) Form for assets with a useful life over one year and a value equal to or greater than \$50,000.

As of this revision, the FFAC form has been developed for the facility type "building," since this facility type is typically the most complex (i.e. consists of the most distinct sub-asset systems and components). The form can be built to suit any facility type. Future revisions of these guidelines may contain examples for other facility types.

The project sponsor or acquirer is responsible for filling out the form and submitting it to FMU. Each field should be addressed where applicable. This document provides the user guidance to address each field. The form itself also contains notes.

The FFAC form is organized into four sections:

- a. Asset information
- b. Asset system /component information
- c. Construction costs
- d. Total cost of ownership information

Sections A, B and C of the form capture general facility and accounting data for each asset while Section D calculates the total cost of ownership. The total cost of ownership data is automatically generated when the asset system and component cost information is entered.

Many fields in the form are fixed and/or contain fixed formulas. Wherever possible, use the fields as they were intended. Provide an explanation of any modifications on the designated "Notes" sheet attached to the form.

The following provides a detailed description of how to complete each field:

Asset Information

Asset ID – This field is the only field that should not be completed before sending to Comptroller Group, Financial Reporting Division. SAP is in charge of assigning the Asset ID, which generates after the form has been entered into the system.

Asset Name – Use this text field to describe the asset. It should be consistent with the name of the asset on associated funding documents, including the Work Breakdown Structure and Board Report appropriating funding. If in early planning stages, utilize the title on the Project Initiation Form.

Location – Enter the asset's location. It may be a geographic location (e.g. 9th Street) or a more precise location (e.g. within Terminal A).

Asset Type – Use this field to describe the asset's type (e.g. terminal building, administrative building, hangar). Users must take the asset type from the approved Facilities Registry Management. Refer to Facilities Management (FM) Handbook Section 2 for more information.

Constructed Date – The date construction of the asset was physically completed.

Projected Asset Life (in Years) – The project manager or management will ultimately determine the projected useful life of a capital asset. Base estimates on knowledge of the asset and its intended use.

Date – Format this field as a date (dd/mm/yyyy). Use the date the form is submitted to Comptroller Group, Financial Reporting Division.

Submitted By – This field should contain the person(s) completing the form.



Construction/Acquisition Cost – This field contains the asset's total construction contract value (final value, including change orders).

WBS/Total Capital Cost – This field includes the construction cost of the asset as well as any additional costs incurred during the asset's construction. Include a summary of every WBS cost associated with this asset.

Annual Projected Custodial – Derive this cost by calculating the annual cost of custodial services on the asset using local custodial services estimates in resources such as Whitestone, the BOMA Experience Exchange Report, and RS Means. LAWA Maintenance Services Division should also be consulted when projecting these costs.

Annual Projected Utility – Develop the annual utility cost using operational cost profiles for energy and water/sewer service from resources such as Whitestone and RS Means. Calculate these costs by square foot per year.

Asset System/Component Information

Asset System/Component – This field describes the asset system or component within the larger asset to be identified and capitalized. These systems should align with the ASTM UNIFORMAT II Elemental Classifications for Building Specifications and the asset classifications within LAWA's approved Facilities Registry Management. Refer to FM Handbook Section 2 for more information.

UNIFORMAT/FMS ID Number- Each asset system or component has a UNIFORMAT/FMS ID number associated with it. Find these numbers within the ASTM standard; FMU staff may also provide them.

Construction Costs

Date - This date marks the construction completion date of the asset system/component.

QTY - This field denotes the quantity of the asset.

UOM - This field identifies the asset quantity's unit of measure.

Cost – This field is a parametric estimate that determines the approximate cost of constructing (or acquiring) the asset system/component. The formula is an estimating technique that applies a weighted distribution factor that includes asset system/component variables to the construction cost of the asset. Since this field is a formula, do not modify the multiplication factor for the asset system/component should be adjusted. Note any modifications on the designated "Notes" sheet attached to the form.

Other Costs – This field is a parametric estimate that determines the other costs associated with constructing the asset system/component. The formula is an estimating technique that applies a weighted distribution factor that includes asset system/component variables to the other costs of constructing the asset (the total value of "Other Costs" is calculated by subtracting Total Cost of Construction by Cost of Construction). Since this field is a formula, do not modify the multiplication factor for the asset system/component should be adjusted. Note any modifications on the designated "Notes" sheet attached to the form.

Total Costs – This field is a parametric estimate that determines the approximate total cost of constructing the asset system/component. The formula is an estimating technique that applies a weighted distribution factor that includes asset system/component variables to the total construction cost of the asset. Since this field is a formula, do not modify the multiplication factor for the asset system/component should be adjusted. Note any modifications on the designated "Notes" sheet attached to the form.



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Total Cost of Ownership Information

Design Life – The project manager or designer determines the design life estimate for the asset system/component. Determine general design life estimates using industry construction estimating tools such as RSMeans. The Facility Registry Database also contains these tools.

Annualized Value – The annualized value of an asset system/component is the total construction cost realized on an annual basis. Since this field is a calculated formula, do not modify.

Annual Maintenance (Projected) – This value is the annual project maintenance cost of the asset system/component. Since this field is a calculated formula, do not modify.

Average Annual Renewal (Projected) – This value is the projected annual renewal cost for asset system/components with a design life of less than the project asset life. Since this field is a calculated formula, do not modify.

Annual Operating Cost (Projected) – This value is the projected annual cost to operate the asset system/component. Since this field is a calculated formula, do not modify.

Total Cost of Ownership (Projected) – This value is the total cost of owning the asset system/component over the life of the system. Since this field is a calculated formula, do not modify.



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LAWA's Facility Fixed Asset Capitalization Accounting Form

Table 8A.1 FFAC Accounting Form

LAWA FACILITY FIXED ASSET CAPITALIZATION FORM													
Asset ID (Ai.)											Date (Avii.)		
Asset Name (Aii.)			1								Submitted By (Aviii.)		
Location (Aiii.)			1								Construction/Acquisit	ion Cost (Aiz.)	
Asset / Facility Type (Aiv.)			1								WRS/Total Canital Co-	et (åv)	
Construction Date (Av.)			1								Annual Proiected Cust	odial (Azi.)	
Projected Asset Life in Years (1								Annual Projected Utilit	(Azii.)	
	UNIFORM			Constru	ction/Acqui≤	tion Costs		Design	Annualized	Annual	Autors Arrent	Annual Operating	I OTAL LOST OF
Asset System/Component (Bi.)	AT/FMS ID (Bii.)	Dete (Ci.)	QTT (Cii.)	UOM (Ciii.)	Cart (Civ.)	Other Cartr (Cv.)	Tatal Cart (Cvi.)	Life (Di.)	Annualized Yalue (Dii.)	Maintenance (Prejected) (Diii.)	Average Annual Renewal (Projected) (Div.)	Cost (Prejected) (Dv.)	Ownership (Projected) (Dvi.)
Substructure	A			SY	\$0	\$0	\$0	50	\$0	\$0	\$0	\$0	\$0
Exterior Enclosure	B20			SF	\$0	\$0	\$0	15	\$0	\$0	\$0	\$0	\$0
Roof	B10/B30			SF	\$0	\$0	\$0	15	\$0	\$0	\$0	\$0	\$0
Interior Construction	C10			SF	\$0	\$0	\$0	8	\$0	\$0	\$0	\$0	\$0
Interior Finishes	C30			SF	\$0	\$0	\$0	8	\$0	\$0	\$0	\$0	\$0
Conveying Systems (Elevator/Escalate	D10			EA	\$0	\$0	\$0	15	\$0	\$0	\$0	\$0	\$0
Plumbing	D20			SF	\$0	\$0	\$0	30	\$0	\$0	\$0	\$0	\$0
HVAC	D30			SF	\$0	\$0	\$0	30	\$0	\$0	\$0	\$0	\$0
Fire Protection	D40			SF	\$0	\$0	\$0	30	\$0	\$0	\$0	\$0	\$0
Electrical	D50			SF	\$0	\$0	\$0	30	\$0	\$0	\$0	\$0	\$0
Communications and Security	D5030			SF	\$0	\$0	\$0	5	\$0	\$0	\$0	\$0	\$0
Fixed Building Equipment (BHS, etc)	E10			EA	\$0	\$0	\$0	30	\$0	\$0	\$0	\$0	\$0
			TOTA	L COST:	\$0	\$0	\$0		\$0	\$0	\$0	\$0	\$0
Version 1													
Faci	lity Fixe	d As	set C	Capita	lization					То	tal Cost of Ow	nership	

- Only enter data into or modify blue highlighted fields
- Insert rows for multiple systems or non-homogeneous systems
- There may be multiple lines for an asset system if the design life varies or it is desirable to track the system uniquely from a financial depreciation standpoint
- UNIFORMAT ID/FMS ID is based on the LAWA FMS ID protocol
- Cost Information is for the building system, not overall asset
- Other Costs are non-construction costs allocated to each system on a pro-rata basis
- Design Life is the specified design life for the system.
- Annualized Value is total cost on an annualized basis
- Annual Utility Cost is the projected annual utility cost for the entire asset (GSF x \$/GSF)
- Annual Maintenance is the projected annual maintenance for the system
- Renewal is the projected renewal cost for systems with a design life less than projected asset life



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• Custodial is the projected annual custodial

Notes

Please use this page to document necessary notes or changes made to the accounting form that warrant documentation.

Location:	Notes/Information:
Location:	Notes/Information:



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SECTION 9: TOTAL COST OF OWNERSHIP (IN DEVELOPMENT)

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Under development.

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SECTION 10: F/S/C TRANSITION TO OPERATIONS AND MAINTENANCE (LAST REVISED 6/16/16)

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 Page: 10-3

 Charles World Airports
 Date: 08/31/12

LAWA Facilities Management Handbook Policy

Title: F/S/C Transition to O&M

Section 2.10-1

Authority: Deputy Executive Director, FMG

10.1 POLICY

Los Angeles World Airports (LAWA) will use consistent and uniform processes for managing the transition of facilities, systems and components (F/S/C) from construction or acquisition to operations and maintenance.

10.2 DEFINITIONS AND CONVENTIONS

- Electronic Form (E-Form): A form used to validate and/or collect data regarding F/S/C constructed or acquired through LAWA and tenant projects. The E-Form serves as a template for creating new F/S/C records and it typically includes drop-down menus or LAWA pre-defined information.
- Metadata: Information about data; for example, a text document's metadata may contain information such as: document length, author, creation date and summary.
- Project Record Documents (also known as As-Built Documents): The final installed and/or acquired F/S/C construction records, including, but not limited to: models, record drawings and specifications, product data, samples, spare parts and tools, technical manuals, permits, certificate of occupancy, miscellaneous record submittals, electronic form (E-Form) and F/S/C transition documents check list.

10.3 ROLES AND RESPONSIBILITIES

Administrator–Facilities Management Unit is responsible for transitioning F/S/C from construction or acquisition to operations and maintenance. They will distribute, receive, validate and upload data via E-Form. The Unit will also receive, review and file Project Record Documents. Documents shall be transmitted via email address FM-Unit@lawa.org.

Users – Any LAWA group, contractor, or consultant that acquires or constructs F/S/C will ensure that accurate information and documentation regarding an F/S/C is provided.

10.4 PROCESSES AND PROCEDURES

The process, as shown in Figure 10.1, is initiated by the design or acquisition team who identifies and names the F/S/C. For new or remodeled facilities, the team also names any spaces within. The information is transmitted to the Administrator for validation.



The Administrator will then prepare the E-Form that will be used and updated throughout the life of the project. Airports Development Group (ADG) Project Managers and Properties Agents are to require the use of the E-Form in bid or procurement documents.

Once construction or acquisition is concluded, ADG Project Managers and Properties Agents are responsible for ensuring that Project Record Documents are in accordance with the specifications. The documents and date are then submitted to the Administrator by e-mailing <u>FM-Unit@lawa.org</u>. Theinformation is validated and uploaded into the various LAWA systems (i.e. Facility Management System [FMS], Geographical Information Systems [GIS], and Document Management System [DMS]).





Figure 10.1F/S/C Transition to Operations and Maintenance



The following sections describe procedures for F/S/C transition to operations and maintenance. Further explanation and/or assistance can be provided by the Facilities Management Unit, if needed.

10.4.1 Identification of Registry Records

The design or acquisition team will initially identify F/S/C to be registered in the FMS database and submit a proposed F/S/C list to Facilities Management Unit.

Upon receipt and verification, Facilities Management Unit will provide Users an E-Form (with instructions) to collect F/S/C information throughout the life of the project.

When collecting F/S/C registry attribute information, Contractors and Acquirers will need to determine whether to use the general template or a detailed template. Refer to Section 3.4.1.1 for setting record registry detail. The following fields are included on both templates: F/S/C unique identifier, description, UNIFORMAT II code and location.

An example of a detailed registry record template, with pre-populated general fields, is included as Appendix 10A.

10.4.2 F/S/C Data Requirements

The E-Form typically includes drop-down menus or LAWA pre-defined information which requires validation by the Contractor or Properties Agent. Any changes to pre-defined data are to be identified in a consistent way to allow for tracking (use Facility Change Control Document provided in FM Handbook References Section 12A.1).

10.4.3 F/S/C Maintenance Requirements

Contractors and Acquirers will use the E-Form template drop down list to select from a menu of existing Job Plans and PMs. When applicable Job Plans or PMs are not found on the menu, Users are to create new ones.

When creating new Job Plans, Users are to include procedures sufficient to properly diagnose, troubleshoot, repair, check-out and return to service an F/S/C. If pre-populated PMs are not applicable, or insufficient, Contractors and Acquirers shall provide specific maintenance procedures which will include, at a minimum, tasks for preventive maintenance, emergency response and routine maintenance.

When a contractor performs maintenance work prior to LAWA's acceptance of the facility, work management information is to be submitted electronically, monthly to the Facilities Management Unit via email <u>FM-Unit@lawa.org</u>. The contractor is encouraged to use LAWA's FMS (Maximo).

For additional guidance concerning creation of Job Plans and PMs refer to the Work Management Policy (FM Handbook Section 6) Appendix 6D: Job Plan Procedure and Appendix 6E: Preventive Maintenance Procedure.

The format for an example Job Plans is shown in Appendix 10B.PM example is shown in Appendix 10C.

10.4.4 F/S/C Documentation Requirements

The project close-out document requirements are found in the LAWA Design and Construction Handbook Guide Specifications (Appendix 10D). Appendix 10F provides a F/S/C document transition checklist.

F/S/C TRANSITION TO OPERATIONS AND Los Angeles World Airports

10.4.5 F/S/C Documentation Metadata Requirements

Documents provided to Facilities Management Unit must include metadata suitable for use in LAWA's document management system. Appendix10E: Document Metadata provides a template for the metadata needed for each document furnished to LAWA.

10.4.6 F/S/C Warranty Requirements

Contractors and Acquirers are to use the E-Form to submit warranty information in an electronic format suitable for uploading to FMS (Maximo). Typical warranty information may be pre-populated.

At a minimum, the warranty information is to include:

- Contract identifier,
- Vendor information,
- Warranty start date,
- Warranty end date,
- Warranty items (F/S/C),
- Sub-components, spare parts if applicable,
- If warranty contract labor: labor categories and rate schedule, and
- Terms and conditions.

10.4.7 Submission Requirements

All submissions are to be made via email to <u>FM-Unit@lawa.org</u>. Prior to submission to the Facilities Management Unit, the Construction Manager or the Properties agent will confirm the validity of the information and that the data is ready to upload into the FMS.

10.5 KEY PERFORMANCE INDICATORS

The following reports are Key Performance Indicators (KPIs) used to assist in evaluating the integrity of the database.

Table 10.1 Key Performance Indicators

KPI Title	KPI Description	What it Measures	Why This is Important	Frequency (F) and Performance Goal (G)
Data Import	Ensures there are no import errors for validated fields when data is imported from the E-Form into FMS	Maintains quality of the data in Maximo	To ensure that the F/S/C data is imported correctly and is usable in FMS	F: Every data import G: Zero errors
Registry Database Validation	Analyzes the population of the attribute fields based upon the priority of the Registry record	Determines whether data exists in a field for those registry records that are medium or high priority	To identify where there are gaps in information	F: 6 months G: No missing information for high priority registry records



10.6 HISTORY

Revision	Description	Author	Date
0	Initial Release	FMG	August 31, 2012



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APPENDIX 10A: REGISTRY TEMPLATE (EXAMPLE)

NOTE: This template will be included in E-Form. Refer to Appendix 12B_Data Dictionary to populate E-Form.

Attribute	Domain / Range of Values			
Component ID	Unique id for the entity AHU###		TER02.AHU001	TER02.AHU002
SAP ID	ID used to reference SAP Asset		N/A	N/A
Component Description	A narrative description of the entity	LAWA entered general	Air Handling Unit	Air Handling Unit
System ID	The associated system ID	information to be confirmed by	TER02.HVA001	TER02.HVA001
Location	Building Location	Contractor/	TER02.L1A12	TER02.L1A12
Uniformat Code	D3052	Acquirer	D3052	D3052
Criticality	1, 2, 3, 4, 5		3	3
Date Entered	System date of record entry			
Bar Code	Bar code cross-reference	Contractor/		
Year Built	Year that the component was constructed	Acquirer supplied		
Design Life	Design life	data for each F/S/C		
Warranty Period	Date of warranty expiration			
Manufacturer	To be developed on-the-fly			
Component Type	Single Zone, Multi Zone	Contractor/		
Legacy Names	Common name or previous name of the entity	Acquirer supplied data for F/S/C with		
Condition Rating	Condition rating of the component	a criticality of 3 or		
Inspection Date	Last inspection date for the condition rating	greater		



Attribute	Domain / Range of Values		
Remaining Useful Life	Remaining useful life estimate		
Original Construction Cost	Cost of initial construction or purchase cost		
Replacement Cost	Current replacement value of the component		
Serial Number	Unique identifier for the Component		
Model Number	Manufacturer's model number (catalog id)		
Has Cooling Coils	Does the unit of cooling coils?		
Has Heating Coils	Does the unit of heating coils?		
Heat System Type	None, Electric, Steam, Hot Fluid		
Number Of VAV Boxes	Number Of VAV Boxes		
CFM	Volume of air flow	Contractor/	
Tonnage	Cooling rating	Acquirer supplied	
BTU	Heating rating	data for F/S/C with a criticality of 3 or	
Motor Manufacturer	To be developed on-the-fly	greater	
Motor Serial Number	Unique identifier for the Component		
Motor Frame Size	Per specification		
Motor Voltage	Operating voltage for the motor		
Motor Phases	1 Phase, 3 Phase		
Motor Amps	Current draw for the motor		
Motor Horse Power	Motor HP rating		
NEMA Designation	NEMA Designation		

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Date:



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APPENDIX 10B: JOB PLAN TEMPLATE (EXAMPLE)

NOTE: This template and typical Job Plans will be included in E-Form.

Refer to FM Handbook Section 6 Work Management to populate E-Form.

Example Job Plan Template – Air Handling Unit Example

	Job Plan ID	AHU-Q-001								
	Job Plan Deso	cription	AIR HANDLING UNIT, OVER 3 TONS TO 24 TONS							
	Work Order	Гуре	PM Overall Duration							
Task			Estimated Duration (hrs)	Labor Classification	Materials	Unit Cost	Material Quantity	Contractor	Unit Cost	Contractor Quantity
Sequence	Task Name	Task Description		0						
		Check with operating or area		HVAC						
1		personnel for deficiencies	0.50	Technician						
		Check controls and unit for proper		HVAC						
2		operation	0.25	Technician						
3		Check for unusual noise or vibration	0.25	HVAC Technician						
		Check tension, condition and alignment of belts; adjust as		HVAC						
4		necessary	0.50	Technician						
		Clean coils, evaporator drain pan, blower motor and drain pining as								
-		required	1 00	HVAC Tachnician						
5		i cquii cui	1.00	rechnician						

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	Job Plan ID Job Plan Desc Work Order T	AHU-Q-001 ription	AIR HAN PM	IDLING UNIT, O	/ER 3 TONS TO	24 TONS Overall D	uration			
Task Sequence	Task Name	Task Description	Estimated Duration (hrs)	Labor Classification	Materials	Unit Cost	Material Quantity	Contractor	Unit Cost	Contractor Quantity
6		Lubricate shaft and motor bearings	0.25	HVAC Technician	Lubricate	\$1.00	1			
7		Replace air filters	0.50	HVAC Technician	HEPA Filter T9AB43272 1	\$469.9 5	1			
8		Inspect exterior piping and valves for leaks; tighten connections as required.	0.25	HVAC Technician						
9		Clean area around equipment.	0.50	HVAC Technician						
10		Fill out maintenance checklist and report deficiencies	0.25	HVAC Technician						
11	more	add more lines if needed								



Job Plan ID Format:

The following convention is to be used by the contractor for creating Job Plan ID's.

Job Plan Id Format





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APPENDIX 10C: PM TEMPLATE (EXAMPLE)

NOTE: This template and typical PMs will be included in E-Form.

Refer to FM Handbook Section 6 Work Management to populate E-Form.

PM Template Example

Field	Instructions	Templates					
PM ID	Auto-number						
PM Title	Title for the PM	Quarterly air handling unit PM					
PM Description	Description for the PM	Quarterly air handling unit PM					
F/S/C	F/S/C ID	TER02.AHU001	TER02.AHU002	TER002.AHU003			
F/S/C Location	F/S/C location	TER02.L1A12	TER02.L1A15.01	TER02.L1D08			
Job Plan	Job plan ID	AHU-Q-001	AHU-Q-001	AH-Q-001			
Sequence	If more than one Job Plan for a PM schedule then the sequence in which the Job Plan is to be executed.	1	1	1			
Time Based Frequency	Interval for PM's	1	1	1			
Time Based Units	Time period (<u>D</u> ays, <u>W</u> eeks, <u>M</u> onths, <u>Q</u> uarters, <u>Y</u> ears)	Q	Q	Q			
First PM Date	Date when the first PM is to start						
Alert Lead Time	14 days, 2 weeks, 0.5 months, leave blank for quarters and yearly intervals.						

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Field	Instructions		Templates				
PM ID	Auto-number						
PM Title	Title for the PM	Quarterly air handling unit PM					
PM Description	Description for the PM	Quarterly air handling unit PM					
Meter Based Frequency	Interval for PM's						
First Start Meter Reading	Meter reading when the first PM is to start						
Fixed or Floating Schedule	Fixed is the same day every period, floating is the same interval every period.	Fixed	Fixed	Fixed			
Seasonal Dates							
Seasonal Start Date	Start month/day						
Seasonal End Date	End month/day						



APPENDIX 10D: PROJECT CLOSE-OUT DOCUMENT REQUIREMENTS

The LAWA Design and Construction Handbook is available for reference at: http://www.lawa.org/laxdev/designConstructionHandbook.aspx

1. PROJECT RECORD DOCUMENTS (As-Built Documents)

- A. General: Comply with the requirements of the Contract Documents regarding submittal requirements. Comply with the policies outlined in "*LAWA's Facilities Management Handbook*" latest revision to be found at http://insidelawa/uploadedFiles/Facilities/Facilities_Engineering/FM%20Handbook%20r2-%20sections%201-11.pdf
- B. Summary: This subsection includes administrative and procedural requirements for Project Record Documents, including, but not limited to, the following:
 - Record Drawings,
 - Record Models,
 - Record Specifications,
 - Record Product Data,
 - Record Samples,
 - Spare Parts and Tools,
 - Technical Manuals,
 - Permits,
 - Certificate of Occupancy,
 - Miscellaneous Record Submittals,
 - Equipment Summary Data Forms, Equipment Summary Maintenance Forms or Maximo[®] E-forms (FM Handbook Section 10), and
 - F/S/C Transition Documents Check List (FM Handbook Appendix 10.G),
- C. Store Project Record Documents and samples in the field office, in a secure, fire-resistive location, apart from the documents used for construction. Maintain Project Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for LAWA reference during normal workinghours.

2. RECORD DRAWINGS

A. Initial Submittal: Thirty days prior to Substantial Completion, submit one paper copy set and PDF electronic files of marked-up (in contrasting color) record prints and one set of plots from corrected record digital files. LAWA will indicate whether general scope of changes, additional information, and quality of drafting are acceptable.

Additional information is to include, but not be limited to, the following:

- Note requests for information, change orders, alternate numbers, and similar information, where applicable
- Measured horizontal and vertical locations of underground substructures, utilities and appurtenances, referenced to permanent surface improvements
- Measured locations of substructures, internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work



- When substructures are encased in concrete, the outside dimensions of the encasement shall also be given
- Field changes of dimension and detail
- Details not on original Contract Drawings
- Revisions to electrical circuitry and locations of electrical F/S/C
- Where the plans are diagrammatic or lacking precise details, the contractor shall produce dimensioned full-sized sheets
- In the case of those Drawings which depict the detail requirements for F/S/C to be assembled and wired in the factory, the Record Drawings shall be updated by indicating those portions which are superseded by final Shop Drawings
- B. Record Digital Data Files: Immediately before inspection for Substantial Completion, review marked-up (in contrasting color) record prints with LAWA. When authorized, prepare a full set of corrected digital data files of the Contract Drawings as follows:
 - Format to be same digital data software program, version, and operating system as the original Contract Drawings
 - LAWA will furnish one digital data set of the original Contract Drawings for use in recording information
 - Annotated, indexed PDF electronic files with comment function enabled
- C. Final Submittal: Upon approval of Initial Submittal, but not less than fifteen days after substantial completion, submit one paper copy set and PDF electronic files of marked-up (in contrasting color) record prints, one set of record digital data files, and three sets of record digital data file plots. Plot each drawing file, whether or not changes and/or additional information were recorded.
- D. Identify and date each record drawing; including the designation "PROJECT RECORD DRAWING" in a prominent location.
- E. Organize record prints and newly prepared record drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
- F. All electronic files shall include metadata describing the content in a format compatible with LAWA's document management system. Metadata for record drawings is to include the information as shown in FM Handbook Appendix 10E: Document Metadata.
- G. Record models shall be submitted to LAWA in pre-approved format.
- H. Building Information Model (BIM) files shall be cleaned of extraneous objects, layers, stories, abandoned designs and other content or data not part of the construction or record documents (i.e. cleaned and purged) and submitted to LAWA in pre-approved format.
- I. Contact LAWA at <u>FM-Unit@lawa.org</u> for formatting standards.

3. RECORD SPECIFICATIONS

- A. Mark Specifications in contrasting color to indicate the actual product installation, where installation varies from that indicated in Specifications.
- B. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.



- C. Mark copy with the proprietary name and model number of products, materials and F/S/C furnishes, including substitutions and product options selected.
- D. Record the name of manufacturer, supplier, installer and other information necessary to provide a record of selections made.
- E. Submit one paper copy and a set of annotated, indexed PDF electronic files of Project Specifications, including addenda and contract modifications.
- F. All electronic files shall include metadata describing the content in a format compatible with LAWA's document management system. Metadata for record specifications is to include the information as shown in FM Handbook Appendix10E: Document Metadata.

4. RECORD PRODUCT DATA

- A. LAWA will use consistent and uniform processes for managing the transition F/S/C from construction or acquisition to operations and maintenance. Maximo[®] E-forms will be used to validate and/or collect data regarding F/S/C constructed or acquired through LAWA and tenant projects. The Maximo[®] E-form serves as a template for creating new F/S/C records and it typically includes drop-down menus or LAWA predefined information. Submission of forms will be coordinated with LAWA Planning & Development Group and Facilities Management during the Close-Out phase.
- B. Equipment Summary Data Forms shall be submitted to provide LAWA Facilities Maintenance and Utilities Group with sufficient information to catalogue newly purchased equipment items installed. This information is used for inventory purposes as well as for equipment performance tracking purposes. Each item of equipment installed must be documented on one of two forms provided by LAWA; either Equipment Summary Data Form or Maximo[®] E-forms.
- C. Equipment Summary Maintenance Forms shall be submitted to provide LAWA Facilities Maintenance and Utilities Group with information sufficient to properly diagnose, troubleshoot, repair, check-out, and return an item of equipment to service. In addition, Maintenance information required to troubleshoot, repair, and return electrical/electronic equipment to service (including set point, derivatives, etc.) shall be included as required. Information must be documented on one of two forms provided by LAWA; either Equipment Summary Maintenance Form or Maximo[®] E-forms.
- D. LAWA will provide Contractor with list of typical equipment Job Plans and Preventative Maintenance activities included in its existing Facilities Management System. Contractor shall select applicable plans. If none exist, Contractor shall work with LAWA Planning & Development Group and Facilities Management to create them.
- E. When using Equipment Summary forms in lieu of Maximo[®] E-form, submit one paper copy and a set of annotated, indexed PDF electronic files of each Form and/or submittal.

5. RECORD SAMPLES

Not more than 30 days prior to the date of Substantial Completion, the Contractor will meet at the Jobsite with LAWA to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to LAWA for record purposes. Comply with delivery to a storage area designated by LAWA.



6. SPARE PARTS AND TOOLS

- A. Submit a Recommended Spare Parts List to LAWA 60days prior to date certified for substantial Completion. This is to be a list from the manufacturer of the Recommended Spare Parts adequate to ensure two continuous years of normal operation after expiration of the F/S/C warranty.
- B. The Recommended Spare Parts List shall include, but not be limited to, items requiring replacement under the following conditions:
 - Wear, corrosion, or erosion during normal operation,;
 - Failure which causes a shutdown of F/S/C;
 - Damage or breakage during routine maintenance or inspections of F/S/C;
 - Custom or specially fabricated parts; and
 - Long lead items.
- C. Approval of the individual F/S/C submittal does not constitute authorization to procure the Recommended Spare Parts.
- D. The Spare Parts supplier must be the manufacturer or a factory authorized representative of the manufacturer. The manufacturer will be responsible for any default of the representative that is not corrected by the representative in a timely and efficient manner. This responsibility includes replacing incorrect or defective parts, trouble shooting, and correcting problems that are traceable to the manufacturer's parts. The supplier shall provide, along with the Spare Parts List, a formal letter of certification from the manufacturer that the supplier is an authorized representative of the manufacturer.
- E. The supplier shall be a stocking facility of the manufacturer of the proposed parts, or the manufacturer must maintain a stocking facility of these parts on the West Coast, or the supplier can guarantee delivery of spare parts within 72 hours.
- F. The Spare Parts list shall be in addition to any other lists required under any other sections of these Specifications. This list shall be delivered in electronic format and include but is not limited to the following:
 - Current prices including delivery to the Jobsite;
 - Original Equipment Manufacturer (OEM) part numbers, which identify interchangeability;
 - Make and type of F/S/C as well as Model number;
 - Size;
 - Supplier's address and telephone number;
 - Address and phone number of local representative;
 - Address and phone number of servicing location;
 - Letter of certification from the manufacturer;
 - Materials;
 - Special tools, lubricants and/or fuels;
 - Estimated delivery lead times;
 - Warranty: State terms of warranty of spare parts offered;
 - Cross-sectional, exploded view or assembly-type drawing with part numbers; and
 - Manufacturer's price list catalog.
- G. Upon approval of the Spare Parts list, and no less than 30 days prior to Substantial Completion, deliver tools, spare parts, extra materials, and similar items to location designated by LAWA.

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- H. The Contractor shall be responsible for proper storage and protection of the Spare Parts until delivered to LAWA.
- I. Spare Parts should be supplied in the manufacturer's original packaging and shall be new and unused. A statement shall be included to clearly indicate that the Spare Parts are new and unused.

7. TECHNICAL MANUALS

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- A. This section includes administrative and procedural requirements for preparing technical manuals, including the following:
 - Documentation directory,
 - Emergency manuals,
 - Operation manuals for F/S/C,
 - Product maintenance manuals, and
 - Maintenance manuals for F/S/C.
- B. Submit technical manuals as required in individual Technical Specification Sections and in the following format:
 - PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to LAWA.
 - Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked directory.
 - Enable inserted reviewer comments on draft submittals.
 - Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - Four paper copies. Include a complete directory. Enclose title pages and directories in clear plastic sleeves. Bind in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11-inch paper with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversized sheets.
 - If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary.
 - Identify each binder on front and spine with title, project title, subject matter of contents, and indicate specification section number on bottom of spine. Indicate volume number for multiple volume sets.
 - Dividers are to be heavy paper with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components included in the section on each divider, cross-referenced to specification section number and title of project manual.
 - Provide protective sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 - If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents and drawing locations.
- C. Timeliness of draft technical manual submittals is detailed in the other subsections. Before final payment, the Contractor shall prepare and deliver to LAWA, four each printed and two each electronic copies on compact discs (CDs) of the final technical manuals. The content of the manuals is detailed in the subsections below.

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- D. The manuals shall be approved and stamped by the respective Subcontractors.
- E. Submit draft copy of each manual at least 30 days before commencing demonstration and training. LAWA will comment on whether general scope and content of manual are acceptable. Correct or modify each manual to comply with LAWA comments.
- F. Include a section in the directory for each of the following:
 - List of documents,
 - Alphabetic list of F/S/C, and
 - Table of Contents include for emergency, operation, and maintenance manuals.
- G. Where manuals contain manufacturer's standard printed data, include onlysheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in tabular format, identify each item using appropriate references from the Contract Documents.
- H. Prepare a separate manual that provides an organized reference to all technical manuals. This is called the Documentation Directory.
- In the Documentation Directory and in each technical manual, identify each F/S/C with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
- J. Enable bookmarking of individual documents based upon file names. Name document files to correspond to F/S/C names used in manual directory and table of contents. Group documents for each F/S/C into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the F/S/C names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.
- K. All electronic files shall include metadata describing the content in a format compatible with LAWA's document management system. Metadata for record drawings is to include the information as shown in FM Handbook Appendix 10E: Document Metadata.

8. EMERGENCY INSTRUCTIONS

- A. Content: Organize manual into separate section for each of the following:
 - Type of emergency
 - Emergency instructions and procedures (Job Plans)
- B. Type of emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each F/S/C:
 - Fire,
 - Flood,
 - Gas leak,
 - Water leak,
 - Power failure,
 - Water outage,
 - F/S/C failure, and
 - Chemical release or spill.

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- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of operating personnel for notification of installer, supplier and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 - Instructions on stopping;
 - Shutdown instructions for each type of emergency;
 - Operating instructions for conditions outside normal operating limits;
 - Required sequences for electric or electronic systems; and
 - Special operating instructions and procedures during emergency.

9. OPERATIONAL INSTRUCTIONS

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- A. Content: In addition to requirements of this Section, include operation data required in individual Specification Sections and the following information:
 - F/S/C descriptions: use designations for F/S/C indicated on Contract Documents;
 - Performance and design criteria if Contractor is designated design responsibility;
 - Operating standards;
 - Operating procedures;
 - Operating logs;
 - Wiring diagrams;
 - Control diagrams;
 - Piped system diagrams;
 - Precautions against improper use; and
 - License requirements including inspection and renewal dates.
- B. Descriptions include the following:
 - Product name and model number: use designations for products indicated on Contract Documents;
 - Manufacturer's name;
 - F/S/C identification with serial number of each component;
 - F/S/C function;
 - Operating characteristics;
 - Limiting conditions;
 - Performance curves;
 - Engineering data and tests;
 - Manufacturer's recommended tolerances and clearances;
 - Complete internal and connection wiring diagrams: circuit diagrams and schematics shall be down to component level;
 - Complete programming procedures and ladder logic documentation for all computer controlled, programmable logic controllers and automated F/S/C;
 - Approved isometric drawings of piping systems; and
 - Complete nomenclature and number of replacement parts.
- C. Operating Procedures include the following, as applicable:
 - Startup procedures;
 - F/S/C break-in procedures;
 - Routine and normal operating instructions;

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- Instructions on stopping;
- Normal shutdown instructions;
- Seasonal and weekend operating instructions;
- Instructions regarding load changes;
- Recommended "turn-around" cycles;
- Required sequences for electric or electronic systems;
- All special operating instructions and procedures; and
- Inspection procedures.
- D. F/S/C includes exploded views and schematics of each assembly.
- E. F/S/C Controls: Describe the sequence of operation and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

10. MAINTENANCE INSTRUCTIONS

- A. Product Maintenance Manuals: Include each product, material, and finish
 - Include the following as applicable (see 10.4.2):
 - o Product name and model number;
 - o Manufacturer's name;
 - o Color, pattern, and texture;
 - o Material and chemical composition; and
 - Reordering information for specially manufactured products.
 - Include manufacturer's written recommendations (see 10.4.3) and the following:
 - o Inspection procedures;
 - Types of cleaning agents to be used and methods of cleaning;
 - List of cleaning agents and methods of cleaning detrimental to product;
 - o Schedule for routine cleaning and maintenance; and
 - o Repair instructions include local sources of materials and related services
- B. F/S/C Maintenance Manuals: For each F/S/C
 - Include manufacturer's maintenance documentation (see 10.4.3) including the following for each F/S/C:
 - o Standard maintenance instructions and bulletins;
 - Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly;
 - o Identification and nomenclature of parts and components;
 - Include service, calibration, and lubrication requirements and standard time allotments; and
 - Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies
 - o Include manufacturer forms for recording maintenance
 - List the following information and any items that detail essential maintenance procedures:
 - Test and inspection instructions;
 - o Trouble-shooting guide;
 - Precautions against improper maintenance;
 - Disassembly: component removal, repair, and replacement; and reassembly instructions; and
 - o Aligning, adjusting, and checking instructions.

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- C. The maintenance manual letters are to be on the front cover of the Maintenance Manuals.
- D. When a contractor performs maintenance work prior to LAWA acceptance of the facility, the information required is to be submitted monthly to the Facilities Management Unit (<u>FM-Unit@lawa.org</u>) in accordance with FMS standards. The contractor is encouraged to use LAWA's FMS (Maximo) for work management.

11. WARRANTY SUBMITTALS

- A. Submit written warranties to LAWA 30 days prior to date certified for substantial Completion. If Certificate of Substantial Completion designates commencement date for warranties other than date of Substantial Completion for Work, or designated portion of Work, submit written warranties upon request of LAWA.
- B. When a designated portion of Work is completed and occupied or used by City, by separate agreement with Contractor during construction period, submit properly executed warranties to LAWA within 15 days of completion of that designated portion of work.
- C. When Contract Documents require Contractor, or Contractor and subcontractor, supplier or manufacturer to execute special warranty, prepare written document that contains appropriate terms and identification, ready for execution by required parties. Submit draft to LAWA, for approval prior to final execution.
- D. Refer to other sections for specific content requirements and particular requirements for submitting special warranties.
- E. Form of Submittal: At Final Completion compile two copies of each required warranty properly executed by Contractor, and/or by sub-Contractor, and/or by supplier, and/or by manufacturer. Organize warranty documents into orderly sequence based on table of contents of Project Manual.
- F. Bind warranties in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11-inch paper.
 - Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark tab to identify product or installation. Provide typed description of product or installation, including name of product, and name, address, and telephone number of Installer.
 - Identify each binder on front and spine with typed or printed title "WARRANTIES," project title or name, and name of Contractor.
 - When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.
 - Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide a table of contents at the beginning of the document.
- G. Provide duplicate notarized copies of warranties in operation and maintenance manuals.
- H. Execute and assemble documents from subcontractors, suppliers, and manufacturers
- I. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on the work that incorporates the products.



- J. When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- K. When work covered by warranty has failed and has been corrected, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with equitable adjustment for depreciation.
- L. Upon determination that Work covered by warranty has failed, replace or repair Work to an acceptable condition complying with requirements of the Contract Documents.

12. KEYING SCHEDULE

For those areas to be operated and maintained by LAWA, within 30 days of Substantial Completion, provide key schedule for review. Make final changeover of permanent locks and deliver keys to LAWA. Advise LAWA's personnel of changeover in security provisions.
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APPENDIX 10E: DOCUMENT METADATA

The following information is required to be submitted (as a Microsoft ExcelTM spreadsheet) to the Facilities Management Unit during the project close-out process:

Field Name	Field Name Description / Use
Folder Name	Name of the folder where the document resides; used for importing into DMS
Name	User name for the document
Document File Name* ²	File name for the document
Discipline	Primary discipline for the document (i.e. mechanical, electrical, plumbing, etc.)
Project Title*	Name of the project that created the document
Location*	Location of the project (facility name)
Address / Coordinates	Facility address or GPS coordinates
Document Type*	Type of document (i.e. drawing, specification, manual, etc.)
Working Units	For drawings, the working units (i.e. metric, US, etc.)
Coordinate System	The coordinate system that is used for infrastructure and airfield locations
Scale*	Scale for a drawing
Organization	The division / department / customer that the F/S/C is installed for.
Designed By	Company that designed the F/S/C that the document is for
Completion Date	Date that the project was completed or operational date of F/S/C
Issue Number	Revision / issue number of the document
Document Source	Source / publisher of the document (i.e. vendor, consultant, etc.)
Sheet Title*	For drawings the title in the title block on the sheet
Subject	What the document is for
Sheet Number*	Sheet number of the drawing set
Total Sheets	Total number of sheets in the drawing set
Original Paper Size	Standard size of the document (A, D, 8-1/2 x 11, legal, etc.)
Status	Status of the document (draft, final, etc.)
Designer	Name of the designer for the F/S/C that the document relates to
CAD Drawing	CAD drawing file name
Keyword Search	Searchable field of words that can be used to search for the document

Table 10E.1 Record Metadata for Drawings

 $^{^{2}\ \}star$ Indicates that this is a required field.

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Field Name	Field Name Description / Use
Comments	Free form field to add any comments about the document
Barcode	Barcode if the document has a barcode
Project File	Project file name
Checked By	Name of person that checked the validity of the document
Record Archive	Is this document archived? (yes / no)

Table 10E.2 Record Metadata for Specifications, Documents, Manuals and Warranties

Field Name	Field Name Description / Use
Folder Name	Name of the folder where the document resides; used for importing into DMS
Name	User name for the document
Document File Name*	File name for the document
Discipline	Primary discipline for the document (i.e. mechanical, electrical, plumbing, etc.)
Project Title*	Name of the project that created the document
Location*	Location of the project (facility name)
Address / Coordinates	Facility address or GPS coordinates
Document Type*	Type of document (i.e. drawing, specification, manual, etc.)
Organization	The division / department / customer that the F/S/C is installed for
Designed By	Company that designed the F/S/C that the document is for
Completion Date	Date that the project was completed or operational date of F/S/C
Issue Number	Revision / issue number of the document
Document Source	Source / publisher of the document (i.e. vendor, consultant, etc.)
Subject	What the document is for
Status	Status of the document (draft, final, etc.)
Designer	Name of the designer for the F/S/C that the document relates to
Keyword Search	Searchable field of words that can be used to search for the document
Comments	Free form field to add any comments about the document
Barcode	Barcode if the document has a barcode
Project File	Project file name
Checked By	Name of person that checked the validity of the document
Record Archive	Is this document archived? (yes / no)

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APPENDIX 10F: F/S/C TRANSITION DOCUMENTS CHECKLIST

This form was developed to help the project team account for F/S/C transition documents. During the construction phase, work with Facilities Management staff to develop a form with F/S/C identifiers prepopulated for your project.

In accordance with Appendix D Project Close-out, a hard copy of this checklist should be updated by Properties Agent or Construction Manager until all sign-offs are received from Engineering and Facilities Management Division (EFMD) staff. Upon completion, EFMD will receive and file the checklist.

F/S/C Identifier (From Registry as Validated on E-Form)	Record Drawings (Hard Copy and Electronic Copy)	abmitted to and approved by EFMD	Record Specifications	Submitted to and approved by EFMD	Operations and Maintenance Manuals submit	to and approved by EFMD	Warranty Manuals	b submitted to and approved by EFMD	Spare Parts , Special Tools, and Attic Stock		F/S/C E-Form (or Maximo Records)	b submitted to and approved by EFMD	F/S/C Metadata – EFMD sign off (initials)	Notice of Completion submitted to EFMD	Einal Permit(s)submitted to EFMD	
	DAT E	VD BY	DA TE	VD BY	DA TE	VD BY	DA TE	VD BY	DA TE	VD BY	DA TE	VD BY	VD BY	DA TE	DA TE	
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SECTION 11: INFORMATION TECHNOLOGY CHANGE (LAST REVISED 8/31/12)



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Facilities Management Handbook

INFORMATION TECHNOLOGY CHANGE

LAWA Facilities Management Handbook Policy

Title: Information Technology Change

Los Angeles World Airports

Section 2.11-1

Authority: Deputy Executive Director, FMG

11.1 POLICY

The Facilities Management Group (FMG) will perform group-wide assessments of information technology purchase (change) requests. Change request assessments facilitate communication with the intent to eliminate redundancy and increase effective use of information technology.

This policy does not apply to network infrastructure system, telecommunication systems or basic business hardware and software provided solely by the Information Management and Technology Group (IMTG).

11.2 ROLES AND RESPONSIBILITIES

Administrator – Responsible for supporting division coordinators and managers throughout the process. The administrator audits the process and produces compliance reports.

Requestor – Any FMG staff member can initiate an information technology change request.

Division Coordinator – Supports the division's requestor and manages completion of the change request process. Coordinators are responsible for facilitating communication of requests will all other division coordinators.

Approvers – Division manager of approve or reject requests and forms. FMG Deputy Executive Director has a final approval authority.



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11.3 PROCESSES AND PROCEDURES

FMG assesses requests for information technology changes using a process that assures communication within and among divisions. The process begins after a division decides that new or upgraded information technology is needed. When the requesting division decides that change is important, the requestor completes a change assessment request form and submits the form to the division coordinator. The assessment review process is shown in Figure 11.1.



Figure 11.1 FMG Information Technology Change Assessment Process Workflow

The workflow steps are as follows.

- Initiate request. The requestor fills out the relevant sections of the Change Assessment Request Form (refer to Appendices 11A and 11B for a sample form with instructions). Use this form only if the change relates to the following:
 - Developing new and updating existing information management workflow processes
 - Developing new and updating existing information technology standards
 - Purchasing new or upgrading existing FMG specific software or hardware

If the request only relates to standard productivity software such as MS Office, Adobe or SharePoint, the requestor does not need to fill out this form. Instead, contact the Information Technology (IT) Help Desk. The LAWA intranet maintains a complete list of standard productivity software, found in the User Requirements Request (URR) Form within IT Forms.

Upon completion, the requestor will submit the original form to the division coordinator for assessment and copies the administrator. Division coordinator assesses requests and works with requestor to complete the following:

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- Business and technical justification
- Benefits, both quantitative and qualitative
- Costs
- Staffing and training needs

Complete guidance on the form may be found within the Change Assessment Guidance document provided in Appendix 11B.

The coordinator makes recommendations, weighing the division's business goals and the request's costs and benefits. Upon completion, the coordinator sends the completed form to the administrator and other coordinators.

- 2. The administrator and other coordinators have two calendar weeks to provide comments.
- 3. Once comments are received, the administrator submits the completed form to the Division manager for approval or rejection.
- 4. Division manager returns the form to the administrator, who in turn informs the requestor and the requesting division coordinator. The division manager submits approved requests to the FMG director for authorization.

11.4 KEY PERFORMANCE INDICATOR

All new change assessment requests should use this process. The policy administrator is responsible for keeping track of all requests. Complete and timely participation by all divisions is the assessment policy's objectively verifiable indicator of success.

Table 11.1	FIM Key Performance	Indicator
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Key Performance Indicator (KPI)	KPI Description	What it Measures	Why This is Important	Frequency (F) and Performance Goal (G)
Complete Participation in Assessments	Number of requests completed within 30 calendar days with input from all divisions	Level of coordination	Improved use of information technology to meet FMG's business objectives	F: 6 months G: 100% compliance

11.5 HISTORY

Revision	Description	Author	Date
1	Revised Policy Number from 10 to 11	FMG	August 31, 2012

APPENDIX 11A: REQUEST FORM INSTRUCTIONS

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The form template is provided in Section 12A. The form provided here is annotated with instructions for completing each field.

Information Technology Change Assessment Form						
Subiect	Subject Brief name of the proposed request [filled by the requestor]					the requestor]
Originatin	a Division	Divisio	on Name [fille	d by the reque	estor]	
Contact N	Name & phone number of a requestor					
Submittal		[filled	by the requestor]			
Category:	Workflow process	S	oftware	Nonstanda	rd	Standards
[filled by the coordinator]	🗌 New 🗌 Chan	ge 🗆] New 🗌 Change	Hardware] Change	🗌 New 🗌 Change
Requested	Action: [filled by th	e reque	estor]			
Describe the change exis new one(s), nonstandard	e specific action tha ting workflow proce to purchase new s hardware.	t you ar ess(es) (eoftware	re asking to be app or develop new on e or upgrade existir	roved. This n e(s), to chang ng one(s), or to	nay be a reo e existing s purchase	quest for approval to standard(s) or develop or change
General De	scription: [filled by	the req	questor]			
Insert gener advantages	al description of the of the of the of the product.	e reques	sted change. Inclu	de a brief bac	kground, ac	ctivities required,
Business P	Process Impacts: [f	illed by	the coordinator]			
Describe the "Guidance"	e objective(s) of the for assistance]	reques	ted change and its	impact(s) on	your busine	ess processes. [See
Technical A	Assessment: [filled	by the	coordinator]			
Describe the etc. [See "G	Describe the technical justification of this request and its impact on other systems, databases, policies, etc. [See "Guidance" for assistance]					
Benefits: [fi	illed by the coordina	ator]				
Describe bo [See "Guida	th quantitative and nce" for assistance	qualitat]	ive benefits associ	ated with the i	mplementa	tion of the request.
Costs: [filled	d by the coordinato	r]				
Describe the expected costs associated with implementation. [See "Guidance" for assistance]						
Staffing Ne	eds: [filled by the c	oordina	tor]			
IT and non-l required. [S	IT staff addition or r See "Guidance" for a	eductio assistan	n if requested action nce]	n is approved	. Also, mei	ntion if training is
Timeframe:	filled by the coord	inator]				
Timeframe t	o implement the red	questea	l action.			
Requestor: Do Not Complete Section Below						



Information Technology Change Assessment Form							
Requesting Division Coordin	nator Review:						
Based on your assessment, bi	riefly state why you re	commend (or not) the requested action.					
Division Coordina	tor Initials and Com	ments:					
Based on your review, briefly s recommendation. In case you	Based on your review, briefly state why you concur (or not) with the Originating Division Coordinator recommendation. In case you are unable to perform the review, only initial the form.						
Division Coordina	tor Initials and Com	ments:					
Division Coordinator Initials and Comments:							
Division Coordinator Initials and Comments:							
Division Manager Review:							
Authorization:	Approved	Disapproved					
FMG Director review:							
Authorization:	Approved	Disapproved					
Comments:							

APPENDIX 11B: CHANGE REQUEST ASSESSMENT GUIDANCE

This guidance is intended to help coordinators complete the following sections of the FMG Request Form: business process impacts, technical assessment, benefits, costs and staffing/training needs. Consider the suggested lists of issues and questions below when evaluating the relevant section. The coordinator should use them only if deemed applicable and useful. There may be additional issues to consider that are not listed in this guidance.

1. Business Process Impacts

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- Consider how the proposed request supports your division's business goal(s).
- Consider whether the proposed request will change your existing business process. For example, the request could automate, standardize or eliminate an existing process, or it could create a new process.
- Consider how extensive the impact of the request will be on the business process(es) of both internal and external FMG divisions. For example, the request could impact one, many, or all FMG division(s) as well as divisions outside FMG.
- 2. Technical Assessment
 - Consider whether the request will generate new information/data as output. If so, consider the user of this new information/data.
 - Consider whether the request will need new information or data as input. If so, determine how the new information or data will be generated and what its source will be.
 - Where the request will use existing information or data (legacy data), consider how the legacy data will be migrated into the new system (manually or automatically). Also consider how to ensure the accuracy and integrity of the data.
 - If the request implements a new system or application, consider how to ensure that intended users will fully utilize it.
 - Avoid duplication, meaning that no existing systems do or could achieve a similar objective.
 - Consider how the proposed request will be integrated with existing systems and processes.

3. Benefits

Examples of quantitative benefits:

- Savings Will we stop doing something? Will it save time or resources? For example, the proposed request could eliminate one or more applications/systems.
- Materials and Supplies Will the proposed request decrease the amount of materials and supplies used?
- Customer Satisfaction Will the proposed request improve customer satisfaction? LAWA staff, passengers, tenants, concessionaires, and contractors are examples of customers.
- Response Cycle Will the request reduce the time needed to perform the task(s)? If so, try to estimate an approximate time reduction (e.g., 50%, 25%, etc.)
- Quality Improvement Will the request reduce re-work? If so, try to estimate an approximate reduction (e.g., 50%, 25%, etc.)
- "Green" benefits Will the request reduce energy and water consumption, carbon footprint, paper usage, etc.?

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Examples of qualitative benefits:

- Simplicity Will the request simplify daily tasks?
- Redundancy Will the request eliminate redundant tasks?
- Accuracy Will the request significantly reduce errors and improve accuracy?
- Reliability Will the request eliminate workarounds and improve current process reliability?
- Management Effectiveness –Will the request ease management decisions?
- Service Production Will the request improve productivity?
- Versatility Will the request increase the business unit's scope and ability?
- Flexibility Will the request allow staff to respond to a greater number and variety of requests?
- Consistency Will the request create a more consistent quality of service?

4. Costs

Consider the proposed request's associated costs, such as procurement, operations, and maintenance. Some possible outcomes are as follows:

- No capital or operating funds are required if the request is implemented; all required equipment and infrastructure are already in place and available.
- Minor investment may be needed (\$5,000 or less).
- Intermediate investment may be needed (more than \$5,000 but less than \$150,000).
- Large investment will be needed (the investment needed will exceed \$150,000), in which case IT Governance Committee review is required.
- Not known at this time.

5. Staffing and Training

Consider the proposed request's staffing and training needs. Some possible outcomes are as follows:

- No additional staff or training is required.
- Minor investment in staff and/or training may be needed.
- Additional staff and training are needed.
- Not known



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SECTION 12: ELECTRONIC FORMS AND REFERENCE MATERIALS (LAST REVISED 8/31/12)



SECTION 12A ELECTRONIC FORMS

This section contains electronic forms needed to perform the facilities management procedures detailed in this handbook. Each document is stored on the attached CD.

The forms include:

- 12A.1 Facility Change Document
- 12A.2 Space Naming Procedure Checklist
- 12A.3 Building System Scorecard
- 12A.4 Building System Scorecard (BSS) Calculation Form
- 12A.5 Facility Condition Assessment (FCA) Data Collection and Processing Form
- 12A.6 Facility Fixed Asset Capitalization (FFAC) Appendix Form
- 12A.7 E-Form for F/S/C Transition
- 12A.8 Information Technology (IT) Change Assessment Form

SECTION 12B REFERENCE MATERIAL

This section contains reference materials called out in other section. Each document is stored on the attached CD.

The forms include:

- 12B.1 Data Dictionary
- 12B.2 ASTM UNIFORMAT II Classification for Building Elements
- 12B.3 PCR Template
- 12B.4 Assessment Guide for Buildings
- 12B.5 Assessment Guide for Maintained Landscape
- 12B.6 Assessment Guide for Landside Signs
- 12B.7 Assessment Guide for Landside Lighting
- 12B.8 Assessment Guide for Landside Pavement



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