

**Caltrans Information Technology (IT) Standards
As Adapted by the Division Of Environmental Analysis
(DEA)**

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I. Overview

The purpose of this document is to provide guidance on Information Technology (IT) requirements on the use of software or applications when developing or updating an existing collaboration product/tool for the Division of Environmental Analysis (DEA). **If software not listed below will be used for the development of a product, written approval must be obtained from the DEA's Environmental Collaborative Services (ECS) prior to the commencement of work. Contact ECS for the approval process.**

II. Approved Software & Applications

Only the software and applications listed in Table 1 may be used to develop or update DEA products or tools, unless otherwise specified within a written contract, task order, or agreement and has been approved by DEA's ECS office.

Note: All deliverables are the property of the California Department Of Transportation (Caltrans). All security settings disallowing editing of a deliverable must be disabled. All passwords and supporting documents associated with the deliverable must be also provided as part of the deliverable.

Table 1

Databases <ul style="list-style-type: none">• Access 2013 (few records, not shared) ¹• MySQL 5.7 (mid-large recordset) ²	Web Scripting³ <ul style="list-style-type: none">• CSS• ASP.NET 4.0• PHP 5.6	GIS <ul style="list-style-type: none">• ArcGIS Server 10.3.1
Productivity Tools <ul style="list-style-type: none">• Office 2013• Visio 2013• Adobe Acrobat XI (11.0)• Adobe Presenter 8.0 ³• Camtasia studio 8	Image formats : <ul style="list-style-type: none">• JPEG (JPG) ^{4 & 5}• GIF ⁴• PNG ⁴• PDF ⁴	

¹ If Access data are to be shared, it is strongly recommended that a web interface is developed to add/modify and view the data.

² If vendor develops a database using MySQL, a web interface must be also developed by using one of the technologies outlined under the "Web Scripting" to enable user to access data in database.

³ Please contact Division of Environmental Analysis' Environmental Collaborative Services office prior to the commencement of work.

⁴ All graphics must include raw file(s), the file(s) used to create graphic(s), and the final graphic(s) on a portable storage device (CD, DVD, USB flash drive). File(s) must not contain any level of securities.

⁵ If deliverables include report files, the report files (PowerPoint, PDF) should use graphics that are a maximum of 1024 x 768 resolution at 72 dpi, and not larger than 1 MB in file size. The report files should not exceed 30 MBs in total file size. Submit all supporting files (such as graphics) along with report files. File(s) must not contain any level of security.

III. Website Publishing

All products intended for electronic publishing on DEA's internet and intranet

sites must adhere to federal, State, Caltrans, and DEA requirements.

A) Compliance with Web Accessibility Policy

[Web accessibility](#) guidelines set by the State's eServices Office for both Internet and Intranet sites must be followed.

Web content in HTML mark-up language, produced by Caltrans will conform to [W3C/WAI's Web Content Accessibility Guidelines, Checkpoints 1 and 2 and Section 508](#) posted on the Caltrans' intranet site.

The Division of Environmental Analysis requires all website products to be in compliance with the California Website Accessibility Standards (CWAS) as published at <http://webtools.ca.gov/web-content/web-accessibility/accessibility-resources/>.

B) Internet pages (non Caltrans intranet) web

In addition to the implementation of the CWAS, all website products destined to be published on the external server (accessible to the public) under the www.dot.ca.gov domain, are required to adhere to "Template for External Caltrans Pages" as described at: <http://www.dot.ca.gov/templates/>.

C) Contact the DEA's ECS office to determine additional standards and guidance prior to the commencement of work.

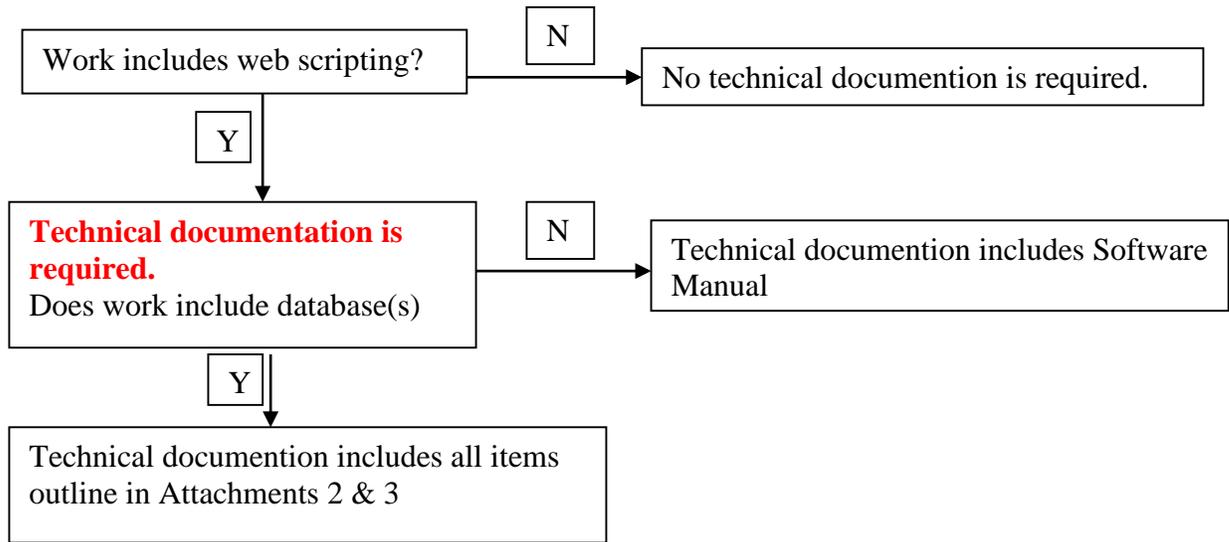
IV. Required Documentation

Any work during the development of the project or collaboration tool which includes the use of any web scripting language requires a **Technical Documentation** for submission as part of the deliverables.

A list of items required in the technical documentation is provided in Attachment 1. The Software Users Manual complies with the International Organization for Standardization (ISO) 9001 (Attachment 2).

If a database will be developed, a Structured Query Language (SQL) Documentation (Attachment 3) must be included as well.

The following is a flow chart to be used in the decision making process.



ATTACHMENT 1

Technical Documentation must include the following:

1. Executive summary - This provides a high level summary of the project and its goal(s).
2. Top Level Design - This describes what others need to know about the software, including, command interface, inputs, outputs, visible classes, external databases created and used, resources used, relationship to other projects and programs, etc.
3. Detail Design - This describes the pre-implementation design choices made to expand upon the top level design. It normally contains the basic structure for the program, the internal classes and database structures and such. (See SQL documentation for guidance). The detail design should include information, as appropriate:
 - Files: A list of important files within the application.
 - Functions and/or subroutines: Details of each function or subroutine, together with parameters and return values.
 - Global variables or constants: Details of how these are used.
 - How the application fits together: In the case of web applications using technologies such as PHP or ASP it may describe which include files are used by which pages. It may also describe the modules or class libraries used by the application.
 - 3rd party objects: In the case of applications using Microsoft technologies it may describe which 3rd party COM objects have been used.
 - API Reference: Details of how to use the Application Programming Interface (API) if applicable.
 - Associated entities: It may also be useful to document related items such as the database used by a typical client-server application.
4. Implementation and Test - This document describes the implementation time assumptions and decisions for the code and test cases for code-level testing.
5. Software Users Manual – Attachment 2 is a template to be used when a users manual is developed. In a word, it should explain to the user in simple terms what this program does and how to use it. The template is an excerpt from *Practical Support for ISO 9001 Software Project Documentation*¹ which used the Institute of Electrical and Electronics Engineers (IEEE) Std-1063-2001, IEEE Standard for Software User Documentation.

(Note: Remove “Attachment 2” title on final document)

¹ Land, Susan K., and Walz, John W. *Practical Support for ISO 9001 Software Project Documentation*, New Jersey: John Wiley & Sons, Inc., CD.

ATTACHMENT 2

[Project Name] *Software Users* *Manual*

[Company name]
[Project Name]
[Project Lead]
[Date]
[Document version]

[Project Lead Signature Block]

[Project Manager Signature Block]

[Date]

[Version]

Revision Sheet

Revision	Date	Brief Summary of Changes
Version 1.0(draft)	[Date]	Baseline document draft

[Date]

[Version]

1. INTRODUCTION.....
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3. GENERAL USE.....
4. PROCEDURES AND TUTORIALS.....
5. SOFTWARE COMMANDS
6. NAVIGATIONAL FEATURES
7. ERROR MESSAGES AND PROBLEM RESOLUTION.....

1. INTRODUCTION

[The Software Users Manual template is designed to facilitate migration of an application system from a development environment to a production/maintenance environment. This document template used IEEE Std-1063-2001, IEEE Standard for Software User Documentation as a primary reference material. Additional information has been incorporated as “lessons-learned” from multiple production application systems and user education opportunities.]

Users documentation may be presented in printed format, electronic format, or as part of an online help system. Each of these methods of delivery present their own unique challenges. Documentation presented in hardcopy format should include an index for quick reference, users manuals delivered electronically may contain hyperlinks to support content linkages for related topics, and online help systems must ensure that users can view the help topic and the application simultaneously. The information displayed in blocked text under each section offer suggested items for inclusion regardless of delivery method.

[Information displayed in brackets is explanatory. Delete the bracketed text items and add your project-specific input. These items are food for thought on the section they address.]

1.1 Document Use

[This section should describe the intended use of the software users manual. The organization of the users document should effectively support its use. If the users manual is going to contain both instructional and reference material, each type should be clearly separated into different chapters or topics. Task-oriented documentation (instructional) should include procedures that are structured according to users tasks. Documentation used as reference material should be arranged to provide access to individual units of information. This section can provide an overview of the type of information provided, its intended use, and the organization of the users manual.]

1.2 Definitions and Acronyms

[This section should identify all definitions and acronyms specific to this software users manual. This should be an alphabetical list of application specific terminology. All terminology used with the users manual should be consistently applied.]

1.2.1 Key Acronyms

1.2.2 Key Definitions

1.3 References

[This section should provide a list of all references used in support of the development of the software users manual. Include a listing of all the documentation related to the product that is to be transitioned to the operations area, which includes any security or privacy protection consideration associated with its use. Also include as a part this, any licensing information for the product.]

2. Concept of Operations

[This section should provide an overview of the software to include its intended use. Descriptions of any relevant business processes or workflow activities should be included. Any items required in support of the understanding of the software product should be included. This may require a description of theory, method, or algorithm critical to the effective use and understanding of the product.]

3. General Use

[Date]

[Version]

[Information should be provided in support of routine user activities. It is important to identify actions that will be performed repetively to avoid redundancy within the users manual. For example, describing how to cancel, or interrupt, an operation while using the software would be in this section. Other task-oriented routine documentation could include: Software installation and deinstallation procedures, how to log on and off the application, and the identification of basic items/actions that are common across the applications' user interface.]

4. Procedures and Tutorials

[Information of a tutorial (ie., procedural) nature should be provided in the users documentation as clearly as possible. A consistent approach to the presentation of the material is important when trying to clearly communicate a concept to the user. The following structure is suggested:

Describe the purpose and concept for the tutorial information presented in the users manual. Include a list of all activities that must be completed prior to the initiation of the procedure or tutorial. Identify any material that should be used as reference in support of the task. List all cautions and other supporting information that are relevant in supporting the performance of the task.

It is important to list all instructional steps in the order that they should be performed, with any optional steps clearly identified. The steps should be consecutively numbered and the initial and last steps of the task should be clearly identified. It is important that the user understand how to successfully initiate and complete the procedure or tutorial.

Warnings and cautions should be distinguishable from instructional steps and should be preceded by a word and graphic symbol alerting the user to the item. For example, *warning (graphic)*, would precede a warning to the user. The use of the following format for warning and cautions is suggested: Word and graphic, brief description, instructional text, description of consequences, and proposed solution or workaround.]

5. Software Commands

[The users manual should describe all software commands to include: required and optional parameters, defaults, precedence, and syntax. All reserved words and commands should be listed. This section should not only provide the commands, but should also provide examples of their use. Documentation should include a visual representation of the element, a description of its purpose, and an explanation of intended action. A quick reference card may be included in the users documentation provided the user with the ability to rapidly refer to commonly used commands.]

6. Navigational Features

[The document should describe all methods of navigation related to the software application. All function keys, graphical user interface items, and commands used in support of application navigation should be described and supported with examples.]

7. Error Messages and Problem Resolution

[Information in support of problem resolution (ie., reference) should address all known problems or error codes present in the software application. Users should be provided information that will either help them recover from known problems, report unknown issues, and suggest application enhancements.]

Index

[An index provides an effective way for users to access documented information. It is important to remember that for an index to be useful it should contain words that users are most likely to look up and should list all topics in the users documentation. Pay special attention to the granularity and presentation of the index topics. Place minor key words under major one, for example instead of using *files* with 30 pages listed, use *files, saving* and *files, deleting* with their associated specific pages listed.]

ATTACHMENT 3

SQL Documentation

- Tables
 - Column names
 - Whether column is a primary key
 - Column data types
 - Column lengths
 - Whether column is nullable
 - Table relationships to primary and foreign keys
 - Dependency information
- Views
 - Column names
 - Column data types
 - Column lengths
 - Whether column is nullable
 - SQL script for creating each View
 - Dependency information
- Stored Procedures
 - Column names
 - Column data types
 - Column lengths
 - Column type (input or output parameter)
 - Dependency information
 - The Create Procedure SQL script for creating the stored procedure.
- Functions
 - Column names
 - Column data types
 - Column lengths
 - Dependency information
 - The Create Procedure SQL script for creating the stored procedure.
- Triggers
 - Shows which table is associated with the trigger.
 - Shows which SQL actions (insert, update, delete) the trigger is associated with
 - Dependency information
 - The Create Trigger SQL script for creating the trigger.
- Full-Text Catalogs
 - Shows the full-text catalogs that may be associated with a database.
 - Shows the tables and table columns in each full-text catalog.
- Diagram(s) illustrating relations between tables and fields

