



LCLS Engineering Specification Document # 1.1 – 320	Project Management	Revision 1
LCLS Collaboration Drawing Control		
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Brief Summary: This specification outlines the minimum requirements for the numbering of LCLS project drawings. It outlines the project's plan as to how and when to recover drawings from all LCLS collaborators and explains how these documents will be stored at SLAC.

Keywords: Drawing Numbers, Drawings, Design Files, Step, DXF, PDF , Drawing Storage

Key WBS#'s: 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.9

Introduction

The LCLS project is a collaboration of three (3) major national laboratories; SLAC, ANL, and LLNL. These organizations, as well as numerous other contributors, will use different engineering/design software packages to model, document, and control the construction of specific LCLS systems.

With the acceptance of collaboration hardware at SLAC, control of drawing documents and related electronic files for the entire project will become a SLAC responsibility. Prior to hardware delivery at SLAC, responsibility for drawing document control resides solely with the individual contributor.

The SLAC Mechanical Design Department will address this responsibility in two ways:

1. All LCLS collaboration released documents will be electronically stored and revision controlled through the Stanford Spires system.
2. SLAC MD will create and maintain a PDM Server that will manage related electronic files of different formats. This server and its contents will be viewable via the Web. This server will provide additional features, with files suitably constructed, to those using Solid Edge software and the appropriate SLAC user identification.

In order to successfully accomplish these tasks SLAC Mechanical Design requires:

1. A Spires compatible drawing name assigned to every LCLS drawing document.
2. A SLAC drawing number assigned to every LCLS drawing document in an LCLS WBS assigned hierarchy.
3. An updated drawing tree that correlates the SLAC drawing number with the collaborator identification. This will greatly facilitate the absorption of collaboration files into a single, accessible system that will reside at SLAC.
4. All 3D models and 2D files will be in the following formats:
 - a. 3D = STEP or IGES
 - b. 2D = DXF or IGES and PDF

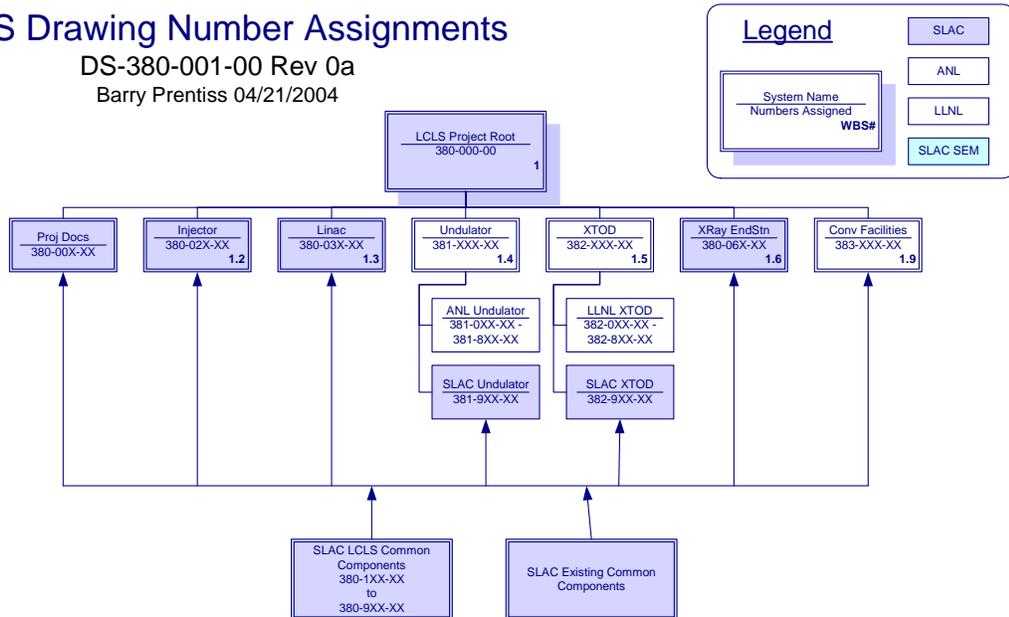
SLAC/LCLS Contact

Mike Dutcher will be the SLAC site contact for LCLS Collaboration Drawing Control. He will directly assist and or direct problems with the handling and the eventual archiving of all LCLS drawing to the proper LCLS resource. He can be reached at (650) 926-3810 or by E-Mail at: mdutcher@slac.stanford.edu.

Drawing Numbers / Hierarchy

LCLS Drawing Number Assignments

DS-380-001-00 Rev 0a
Barry Prentiss 04/21/2004



DS-380-001-00 represents a numerical distribution of core SLAC drawing numbers at System Level of the LCLS WBS.

SLAC Drawing Number

All drawings necessary for each LCLS System will be assigned a complete SLAC Drawing Number from each system's section. All LCLS System collaborators will organize a System Drawing Tree within their assigned section of drawing numbers.

A complete SLAC drawing number requires a Drawing Type prefix as defined in SLAC Specification DS-016-110-04 / Section 2. A revision number suffix is also necessary to create a complete SLAC drawing number.

Spires Drawing Name

SPIRES is the SLAC database system list of released drawings. A Spires Title is the condensed, abbreviated version of the three-line drawing title per ASME Y1.1.

All drawing formats require an abbreviated description of the drawing title: to be 30-characters or less, to preferably appear approximately below the format border and underneath the drawing title block. The CAD formats have a defined, 30-character data field, in which text can be placed.

Due to the limitation of 30 characters maximum, use approved abbreviations to fully describe the drawing title, whenever possible.

Collaborators must uniquely assign, record, status, and correlate SLAC drawing numbers and Spire's names with their own unique system of document control. This correlation is best included within the System's Drawing Tree. Drawings with assigned numbers that are not required after System Commissioning are to be identified as obsolete. Model Name, and/or Electronic File Name for each necessary drawing are also important identities to be included in the final version of the Drawing Tree supplied to SLAC.

Drawing Transfer to SLAC

LCLS is concerned with only three cases of drawing transfer from collaborators:

1. Working
2. Released
3. As Built

Working

During the design cycle, graphical information will need to be shared between collaborators. LCLS Management considers this exchange to be a point-to-point concern between collaboration members. Working information can be exchanged in many mutual formats and by many methods. Since working files are temporary to the design cycle, there will be no attempt to archive these transfers.

To assist in the 'working' transfer of files, LCLS will establish a System Drop Box on the LCLS Home page.

All registered LCLS Users can have read access to Drop Box. Under each system a folder structure that will best facilitate information exchange should be established by each collaborator.

A consistent naming convention should be used to identify working files on the SLAC "V: Drive". As defined by ea Lab's Hierarchy.

Released

At the collaborator defined point of document release, the responsible collaborators will deliver a sufficient package of 'released' drawings to LCLS Project Management. This delivery will include electronic files, (in Adobe PDF format), that represent the sub-system.

These copies and files are considered temporary and will be purged with the delivery of 'As Built' drawings.

As Built

Complete 'As Built' documents will be delivered to LCLS Project Management Office. This should occur no later than upon delivery of collaboration hardware to SLAC. All collaboration drawings and the most complete and up to date revised drawing tree available should be delivered to the SLAC LCLS Drawing Manager within this time period.

While the minimum drawing delivery will be half size paper copies of all finalized drawings not to exceed "C" sized, STEP/IGES, DXF & Adobe PDF electronic files, every reasonable attempt will be made to deliver to SLAC the models and electronic CAD files associated with these drawings in a neutral file format, as outlined.

Given the transience of the state of the art in neutral file formats within the CAD industry, the specific format employed will be agreed upon by LCLS Project Management and each collaborator at the time of delivery, and should be consistently applied by the collaborator.

Until the acceptance of 'As Built' drawings, each collaborator is responsible for documentation and revision control within their local system.

All final collaboration drawings will represent the 'As Built' condition.

SLAC Mechanical Design Archive

All released drawings and associated electronic files will be controlled by the SLAC Mechanical Design Department.

Meta data for these documents will be managed and controlled using SLAC data management systems. Once integrated, LCLS engineering drawings will be searchable and viewable through a Web interface.



Revision control for final LCLS drawings will become a SLAC responsibility.

Appendix

The appendix includes a sample of each collaborator's Drawing Title Block and Web page Drop box and instructions for uploading files.

CALCULATION.		5 SA 238-004 01 CORRECTOR, MAG. TYPE 4 10		SD-380-030-21	
86.323 M		4 SA 902-675 01 GE-4 MAGNET ASSEMBLY 8			
332.000 M		3 ID 906-203 47 GIRDER 21-9 INSTL 1			
118.323 M		2 AD 771-002 00 ASSEMBLY, TYPE "ABAB" GIRDER 4			
		1 AD 771-001 00 ASSEMBLY, TYPE "BABA" GIRDER 4			
ITEM NO	PREF	BASE	SUFF	TITLE OR DESCRIPTION	QTY
SCALE: NONE		DO NOT SCALE DRAWING		CAD FILE NAME: sd38003021.dft	
STANFORD LINEAR ACCELERATOR CENTER STANFORD UNIVERSITY STANFORD, CALIFORNIA			LCLS SCHEMATIC DIAGRAM SECTOR 21		
PROPRIETARY DATA OF STANFORD UNIVERSITY AND/OR U. S. DEPARTMENT OF ENERGY. RECIPIENT SHALL NOT PUBLISH THE INFORMATION WITHIN UNLESS GRANTED SPECIFIC PERMISSION BY STANFORD UNIVERSITY.			SD-380-030-21		
DRAWN BY: P. STEPHENS			REVISION NUMBER: 0		
CHECKED BY: P. STEPHENS			E		
2			LCLS SCHEMATIC SECTOR 21		

UNCLASSIFIED THIS DRAWING WAS CREATED BY THE UNIVERSITY OF CALIFORNIA WHICH OPERATES LAWRENCE LIVERMORE NATIONAL LABORATORY FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. W-7405-ENG-48(1)LLNL. ANY REPRODUCTION AND/OR FABRICATION IS PROHIBITED WITHOUT THE PERMISSION OF LLNL.		CLASSIFICATION: UNCLASSIFIED THIS DRAWING IS THE PROPERTY OF ARGONNE NATIONAL LABORATORY ADVANCED PHOTON SOURCE LCLS LINAC COHERENT LIGHT SOURCE UNDULATOR SYSTEM	
THIS DRAWING WAS CREATED BY THE UNIVERSITY OF CALIFORNIA WHICH OPERATES LAWRENCE LIVERMORE NATIONAL LABORATORY FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. W-7405-ENG-48(1)LLNL. ANY REPRODUCTION AND/OR FABRICATION IS PROHIBITED WITHOUT THE PERMISSION OF LLNL.		THIS DRAWING IS THE PROPERTY OF ARGONNE NATIONAL LABORATORY ADVANCED PHOTON SOURCE LCLS LINAC COHERENT LIGHT SOURCE UNDULATOR SYSTEM	
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: DECIMALS: .XX ± .100 ANGULAR: ± .025 SURFACE FINISH IN MICRONS: 3.2		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: DECIMALS: .XX ± .100 ANGULAR: ± .025 SURFACE FINISH IN MICRONS: 3.2	
REMOVE ALL BURRS AND BREAK SHARP EDGES .03 MAX. SURFACE TEXTURE IN ACCORDANCE WITH LATEST ASME B46.1-2002 DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH LATEST ASME Y14.5M-1994		REMOVE ALL BURRS AND BREAK SHARP EDGES .03 MAX. SURFACE TEXTURE IN ACCORDANCE WITH LATEST ASME B46.1-2002 DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH LATEST ASME Y14.5M-1994	
MODEL NAME: L1440302-100100 ELECTRONIC FILE NAME: A8675309		MODEL VER: 3 DRAW VER: 0 MATERIAL: SEE PARTS LIST	

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES ARE FOR REFERENCE ONLY TOLERANCES: DECIMALS: .XX ± .100 ANGULAR: ± .025 SURFACE FINISH IN MICRONS: 3.2		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: DECIMALS: .XX ± .100 ANGULAR: ± .025 SURFACE FINISH IN MICRONS: 3.2	
REMOVE ALL BURRS AND BREAK SHARP EDGES .03 MAX. SURFACE TEXTURE IN ACCORDANCE WITH LATEST ASME B46.1-2002 DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH LATEST ASME Y14.5M-1994		REMOVE ALL BURRS AND BREAK SHARP EDGES .03 MAX. SURFACE TEXTURE IN ACCORDANCE WITH LATEST ASME B46.1-2002 DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH LATEST ASME Y14.5M-1994	
MODEL NAME: L1440302-100100 ELECTRONIC FILE NAME: A8675309		MODEL VER: 3 DRAW VER: 0 MATERIAL: SEE PARTS LIST	



LCLS Project Home Page

Home Page	LCLS Project Office	Project Databases	Announcements Meetings
What's New	Project Office Page	Parameters	EIR
Project Calendar	Upload Files to Project Office	Drawings (Index)	January 25-27 LCLS Weel
Email/Phone Numbers	PMCS	Upload Drawings (ANL)	April 4-6 LCLS Week
Photo Archive	WEB Development	Upload Drawings (LLNL)	April 7-8 FAC Mtg
Organization Chart	Technical Systems	Controls	April 17-22 COMM2005
LCLS Publications	Injector	Racks, Crates, Cabling	April 27-29 EPICS Meeting
Staff Pictures	Linac	DEPOT (Manual)	May 10-12 DOE Review
LCLS WEB Help	Undulator	Purchasing Requisitions	June 6-8 WUS2005
LCLS WEB Cam	X-Ray TOD	Organization Documents	August 21-26 FEL2005
Upload Drawings from LLNL	X-Ray End Station	CDR	Reviews
	Conventional Facilities	DOE Documents	Status Reviews
	Technical Integration	Major DOE Approvals	LCLS CM/GC Procuremer
	FEL Physics	DOE Reviews	LCLS CM/GC RFP
	Alignment	Project Documents	
	Controls	Advisory Committees	

Home Page	Uploading of file to the LCLS Project office is done using the Microsoft Internet Explorer. Unfortunately, it will not work with any other browser.
Back to Project Home Page	It is also necessary that you are connected into the SLAC network via VPN.
What's New	Follow these steps:
Project Calendar	1. Make sure that your computer is connected into the SLAC network. Start a VPN session, if necessary.
Email/Phone Numbers	2. Display this page in the Microsoft Internet Explorer
Photo Archive	3. Double-Click the "My Computer" icon on your desktop and find the files that you want to upload.
Organization Chart	4. Click: LLNL Dropbox to open a window to the LLNL Drawings Dropbox. You may be asked to authenticate yourself. Enter slacusername and password for your slac windows account.
LCLS Publications	5. Drag and drop your file(s) from the "My Computer" window to the "LLNL Dropbox" window.
Staff Pictures	6. Send an email to notify the Michael Dutcher to report your upload
	7. You can close the windows when you are done.