LCLS Engineering Specification Document # 1.1 – 320	Project Management	Revision 0

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, 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 drawings 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.

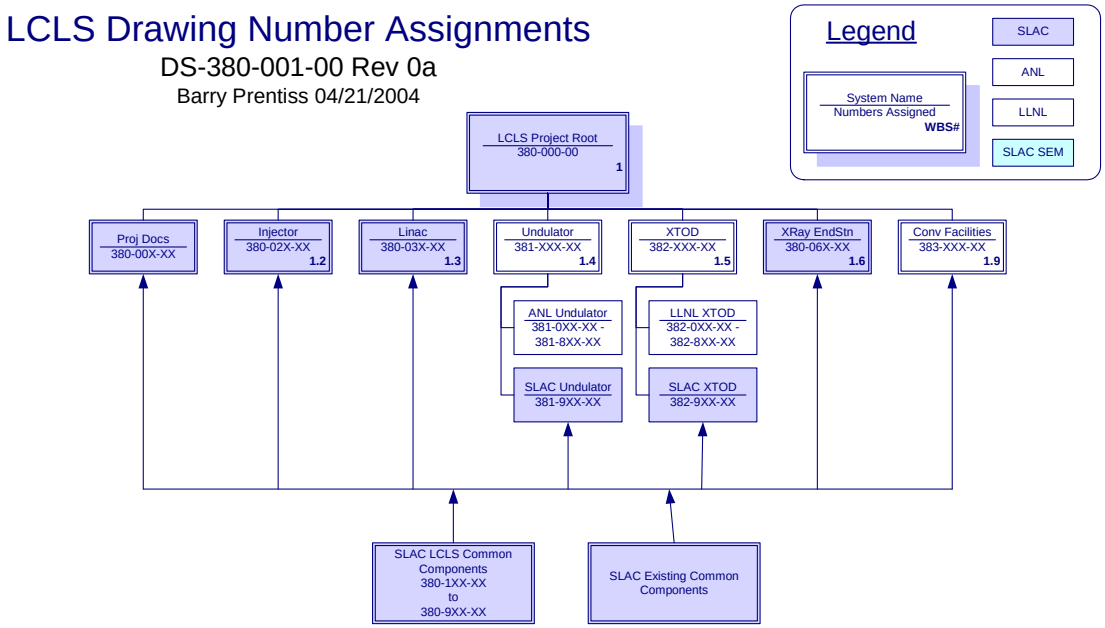
In order to successfully accomplish these tasks SLAC Mechanical Design requires:

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.

SLAC/LCLS Contact

Carl Rago 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) 926-3636 or by E-Mail at: rago@slac.stanford.edu.

Drawing Numbers / Hierarchy



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.

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. The Board, or Vellum, drawings require the application of a 30-character adhesive sticker, to be applied to the back, or wrong, side of the vellum and acts as a lettering guide, such that the spires title designation may be written on the front, or right, side of the vellum. This aids in future drawing revisions. Spires's stickers are obtainable from the Document Control Department.

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 in the LCLS section of the SLAC 'Groups' Drive for each major system. All registered LCLS Users can have read access to this drive. 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 'Groups' drive.

Released

At the collaborator defined point of document release, the responsible collaborator's will deliver a sufficient package of 'released' drawings to LCLS Project Management. This delivery will include a single set of C sized hard copies in addition to 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 again be C sized hard copies and 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.

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

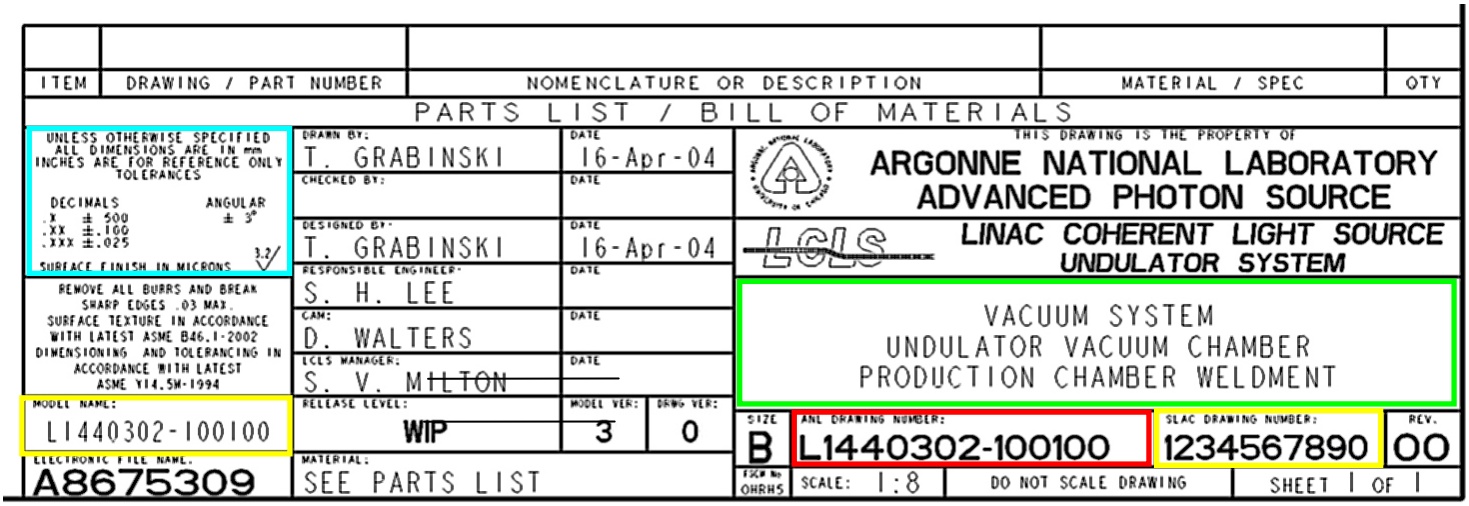
All released drawings and associated electronic files will be controlled by the SLAC Mechanical Design Department.

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.



ITEM	DRAWING / PART NUMBER	NOMENCLATURE OR DESCRIPTION	MATERIAL / SPEC	QTY

PARTS LIST / BILL OF MATERIALS

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN mm INCHES ARE FOR REFERENCE ONLY TOLERANCES
DECIMALS .X ± 500 .XX ±.100 .XXX ±.025 ANGULAR ± 3°
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

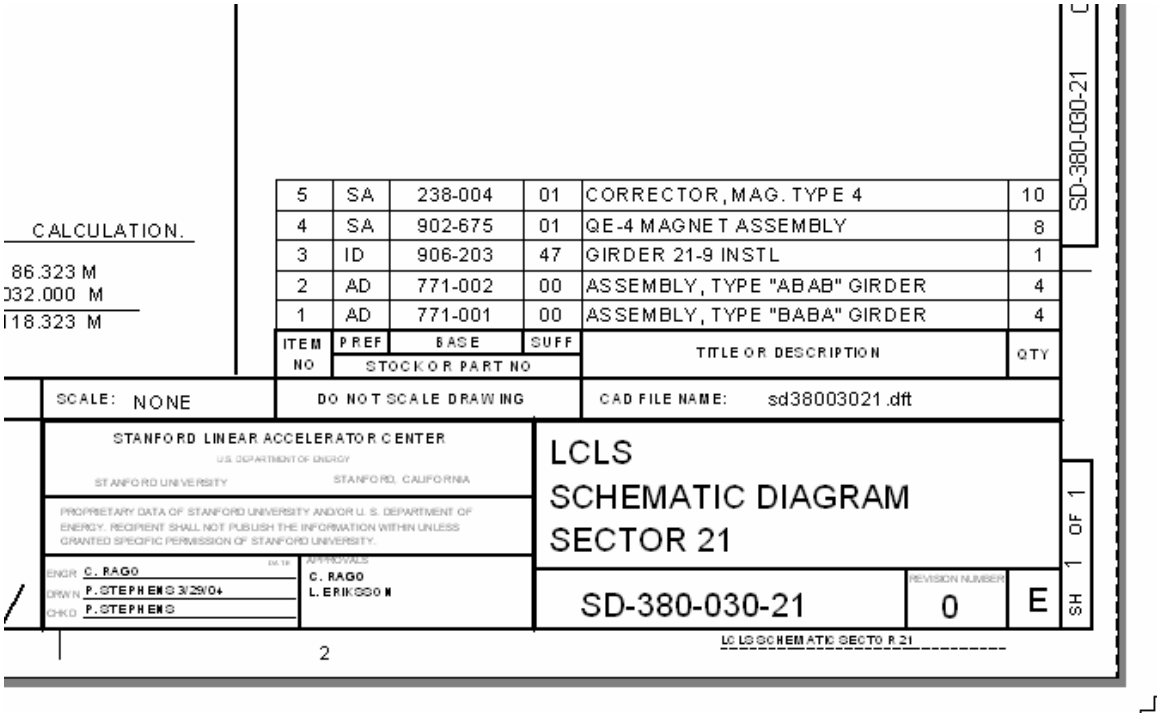
MODEL NAME: L1440302-100100
ELECTRONIC FILE NAME: A8675309

DRAWN BY: T. GRABINSKI DATE 16-Apr-04
CHECKED BY: DATE
DESIGNED BY: T. GRABINSKI DATE 16-Apr-04
RESPONSIBLE ENGINEER: S. H. LEE DATE
CAM: D. WALTERS DATE
LCLS MANAGER: S. V. MILTON DATE
RELEASE LEVEL: WIP MODEL VER: 3 DRWG VER: 0
MATERIAL: SEE PARTS LIST

THIS DRAWING IS THE PROPERTY OF
ARGONNE NATIONAL LABORATORY
ADVANCED PHOTON SOURCE
LCLS LINAC COHERENT LIGHT SOURCE
UNDULATOR SYSTEM

VACUUM SYSTEM
UNDULATOR VACUUM CHAMBER
PRODUCTION CHAMBER WELDMENT

SIZE B | ANL DRAWING NUMBER: L1440302-100100 | SLAC DRAWING NUMBER: 1234567890 | REV. 00
FSCM No 0HRH5 | SCALE: 1:8 | DO NOT SCALE DRAWING | SHEET 1 OF 1



CALCULATION.
86.323 M
032.000 M
118.323 M

ITEM NO	PREF	BASE	SUFF	TITLE OR DESCRIPTION	QTY
	STOCK OR PART NO				
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4	SA	902-675	01	QE-4 MAGNET ASSEMBLY	8
3	ID	906-203	47	GIRDER 21-9 INSTL	1
2	AD	771-002	00	ASSEMBLY, TYPE "ABAB" GIRDER	4
1	AD	771-001	00	ASSEMBLY, TYPE "BABA" GIRDER	4

SD-380-030-21

SCALE: NONE | DO NOT SCALE DRAWING | CAD FILE NAME: sd38003021.dft

STANFORD LINEAR ACCELERATOR CENTER
U.S. DEPARTMENT OF ENERGY
STANFORD UNIVERSITY STANFORD, CALIFORNIA
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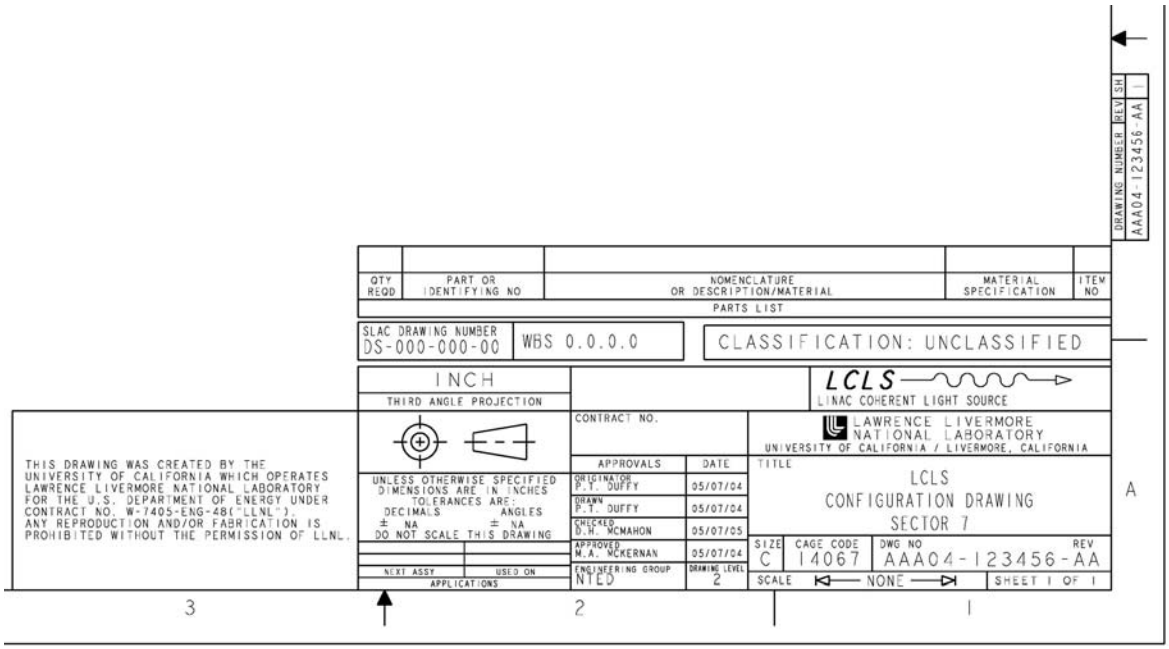
ENGR C. RAGO
DRWN P. STEPHENS 3/29/04
CHKD P. STEPHENS
APPROVALS DATE
C. RAGO
L. ERIKSSON

LCLS
SCHEMATIC DIAGRAM
SECTOR 21

SD-380-030-21 | REVISION NUMBER 0 | E | SH 1 OF 1

2

LCLS SCHEMATIC SECTOR 21


DRAWING NUMBER
REV SH
AAA04-123456 AA 1
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PART OR IDENTIFYING NO
NOMENCLATURE OR DESCRIPTION/MATERIAL
MATERIAL SPECIFICATION
ITEM NO
PARTS LIST
SLAC DRAWING NUMBER
DS-000-000-00
WBS 0.0.0.0
CLASSIFICATION: UNCLASSIFIED
INCH
THIRD ANGLE PROJECTION
LCLS
LINAC COHERENT LIGHT SOURCE
CONTRACT NO.
LAWRENCE LIVERMORE NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA / LIVERMORE, CALIFORNIA
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("LLNL"). ANY REPRODUCTION AND/OR FABRICATION IS PROHIBITED WITHOUT THE PERMISSION OF LLNL.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS ANGLES
± NA ± NA
DO NOT SCALE THIS DRAWING
APPROVALS
DATE
ORIGINATOR P.T. DUFFY 05/07/04
DRAWN P.T. DUFFY 05/07/04
CHECKED D.H. MCMAHON 05/07/05
APPROVED M.A. MCKERNAN 05/07/04
ENGINEERING GROUP NTED
DRAWING LEVEL 2
NEXT ASSY
USED ON
APPLICATIONS
TITLE
LCLS
CONFIGURATION DRAWING
SECTOR 7
SIZE C
CAGE CODE 14067
DWG NO AAA04-123456-AA
REV
SCALE NONE
SHEET 1 OF 1
A
3
2
1