Quality Assurance Checklist

THIS FORM CAN BE USED AS A TOOL BY LCLS PROJECT PERSONNEL TO CONTROL THE SEQUENCE OF QUALITY ASSURANCE ACTIVITIES TO BE PEFORMED ON LCLS COMPONENTS OR PROCESSES. THIS FORM CAN ALSO BE ATTACHED TO LCLS HARDWARE AS A QUALITY ASSURANCE TRAVELER.

System or Component Name	*Part or Drawing Number* *Drawing Revision*	*Serial No.*	Manufacturer	Purchase Order No. Modification No.
First Article Support Mover Girder	*L1430401-100400* *05*	01	Metalex, Inc	7A-08189

Special Instructions:

The First Article Inspection shall consist, as a minimum, witnessing the verification of critical dimensions, reviewing Q/A documentation and material certification.

Quality Assurance Tasks (attach continuation sheets if additional steps are required)

Seq No.	Task Description *Inform the LCLS Technical Lead if a task cannot be competed or a requirement met	Completed by/Date*	Requirement Met	Requirement Not Met*
1	Verify that the girder has been fabricated to the correct purchase order modification number		☐	☐
2	Verify that the girder was fabricated to the same drawing revisions as the “As-Stored” versions appearing in the APS Pro Intralink Design Database		☐	☐
3	Verify that the contractor has obtained the Laboratory's written approval prior to effecting any change in ANL approved (1) design, (2) workmanship standards, (3) manufacturing process or (4) inspection procedure for use in this procurement and has documented as "marked drawing" changes to the engineering drawings for the affected item prior to the Laboratory's approval and has issued revised drawings if approved by the Laboratory.		☐	☐
4	Verify that the contractor has reported any non-conformances to specifications, drawings, or other contract requirements on ANL Form 311.		☐	☐
5	Verify the identifying markings for the Undulator Girder Assembly per L1430401-100396, shall be stamped or engraved on the support girder in the area labeled “Surface ‘G.’” The markings should be near the left side and bottom of “Surface ‘G’” as shown on L1430401-100400, but at least 20 mm from either edge. a) The first line shall be the ANL Part Number-Revision Number (L1430401-100396-00). b) The second line shall be the SLAC Part Number (SA-381-002-76). c) The third line shall be the unique serial number for the particular assembly.		☐	☐
6	Discuss the inspection methodology with the contractor’s inspection personnel. Discuss the primary, secondary and tertiary datum references used to verify position tolerances, the # of data points used for round features, line features, plane features, and accuracy verification methods.		☐	☐
7	Verify that the contractor’s test and measurement instruments used to inspect the girder were within their required calibration interval		☐	☐

Optional Comments:

LCLS Technical Lead Pre-approval: _____ **Date:** _____

LCLS QA Coordinator Pre-approval: _____ **Date:** _____

Distribute completed traveler to: Responsible Engineer, Technical Lead, LCLS Quality Assurance Coordinator, Chief Engineer

Other: _____

Seq No.	Task Description Inform the LCLS Technical Lead if a task cannot be competed or a requirement met	Completed by/Date*	Requirement Met	Requirement Not Met*
8	Witness the verification of the heights and parallelism of the riser blocks used to contact the "J" surfaces.		☐	☐
9	Review repeatability results of the flatness of datum C and hole positions. (If accepted by Metalex)		☐	☐
10	Review of First Article Inspection Results.		☐	☐
11	Witness the measurement of the flatness of datum C on the first article with using the Metalex CMM		☐	☐
12	Witness the verification of the flatness of datum C on the first article with a Metalex dial indicator.		☐	☐
13	Verify materials used to fabricate the girder are in compliance to the statement of work.		☐	☐
14	Verify that all welded parts shall have a post-weld stress relief as specified in the Structural Welding Code, ANSI/AWS D1.1-D1.1M:2004, Section 5.8 unless otherwise specified on the drawing. Note that the Girder, L1430401-100400, requires a full anneal. The stress relief, or anneal shall be documented with a chart of the furnace cycle showing the heat, soak, and cooling times and temperatures		☐	☐
15	Verify that all dimensions apply at a temperature of 20°C. The part must be in thermal equilibrium during measurements and at the same temperature at the beginning and conclusion of the measurements within 2°C. Experience with the prototype fixed supports indicates that at least 24 hours is needed for the support to get near thermal equilibrium with the measurement room. The part temperature, before and after dimensional measurements, shall be recorded and reported.		☐	☐
16	Verify the following items are critical features of the Girder needing actual measured values have been reported. On L1430401-100400, page 2, top view, measure and report the following dimensions: a) Flatness of Datum B. (0.030) b) Perpendicularity of Datum B to Datum C. (0.25) **c)** Flatness of Datum A. (.030) d) Perpendicularity of Datum A to Datum C. (0.25) **e)** Diameters of the six holes labeled “D.” (∅6.315-6.329) f) True positions of the “D” holes as shown on the marked up drawing. On L1430401-100400, page 2, side view, measure and report the following dimensions: a) Flatness of Datum C. (0.030) The method of supporting the girder while measuring the flatness of Datum C should be agreed upon between the Contractor and ANL. L1430401-100400, bottom view on page 2, and Section B-B on page 3, measure and report the following dimensions related to the mounting surfaces for the four support pads: a) The distance from Datum B to each of the first two mounting pad area leading edges. (749.78±0.15) b) The distance from the first two mounting pad area leading edges to the second two mounting pad area leading edges. (2340.00±0.15) c) Parallelism of all four support pad area leading edges to Datum B. (0.05) d) Parallelism of all four support pad area longitudinal edges to Datum A. (0.03) e) Parallelism of all four support pad surface areas to Datum C. (0.07) f) The distance from Datum C to each support pad surface area. (109.5±0.2)		☐	☐
17	Verify Structural welds were made by qualified welders as defined in section 4 part C of the Structural Welding Code ANSI/AWS D1.1-D1.1M:2004 and that welder qualifications were submitted to ANL.		☐	☐
18	Verify that all structural welds shall be visually inspected as defined in section 6.9 of the Structural Welding Code, and that the contractor has certified that the welds were inspected and were acceptable.		☐	☐

19	Verify the following: Steel surfaces that are specified on the drawings to be painted shall be painted with epoxy paint. The paint shall be non-dusting or chalking, with a gloss or semi-gloss finish. Paint types and colors are specified on the applicable drawings. Bearing surfaces shall be lubricated as required by the assembly drawing. Unpainted steel mounting surfaces (those surfaces clearly defined on the engineering drawing to be paint free) shall be clean, rust free and coated with a light film of machine oil. On steel parts requiring a black oxide surface, the parts shall be black oxide coated by immersion in a hot alkaline bath in conformance with MIL-DTL-13924D, “Coating, Oxide, Black, for Ferrous Metals,” Class 1. After the parts are coated and dry, they shall be dipped in a suitable corrosion-preventive oil.		☐	☐
20	Verify the Contractor has forwarded their proposed shipping containment design to ANL for review.		☐	☐
21	Verify the shipping containers and the means used to constrain the Girder Assembly shall be sufficiently sturdy to insure the units suffer no damage in shipment and are protected from weather.		☐	☐

Enter Action Items, Quality Improvement Opportunities, or Lessons-Learned resulting from this activity below: