



12000 Jefferson Avenue
Newport News, VA 23606

SPECIFICATION NO:
D00000-01-07-SXXX

TITLE: Lead for the Hall D Barrel Calorimeter DATE: DRAFT October 13, 2008

BY: Elton Smith

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A							

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Outline for Procurement Engineering Specification

1.0 SCOPE – This Thomas Jefferson National Accelerator Facility (JLab) is engaged in a project to double the energy of their accelerator from six to 12 GeV. This project also includes upgrades to the experimental equipment in the three experimental areas A, B, and C, as well as the construction of a fourth experimental area, Hall D, with its own experimental equipment. The new beam facilities and the improved detection systems will be used to carry out the proposed scientific program.

The experimental equipment in Hall D is based on a superconducting solenoidal magnet. The detectors will consist of drift chambers, scintillating counters, and electromagnetic calorimeters. The barrel calorimeter is based on a lead-scintillating fiber design, consisting of 48 modules, each 390 cm long and 25 cm deep. Its purpose is to measure the energy, position and timing of photons; and energy loss, and timing of charged particles.

1.1. Statement of Work. The selected vendor shall provide all labor, equipment, and facilities to fabricate, test and deliver all the lead for the barrel calorimeter of the Hall D detector with the dimensions and other properties as specified in this document. A listing of the deliverables for this contract is given here, but described in more detail in the sections that follow:

- 1.1.1. First-article consisting of the first container of lead sheets for verification of all dimensions and purity, as specified below, before production quantities are shipped.
- 1.1.2. All lead required by this specification, totaling approximately 26 metric tons.
- 1.1.3. Certification of lead purity and thickness uniformity.

2.0 APPLICABLE DOCUMENTS – The following codes and standards form a part of this Specification to the extent defined herein. The documents are of the current issue, but are referred to thereafter by their basic designation only.

2.1. Codes and Standards – (List applicable documents i.e., codes and standards, the list provided in 2.1.1 and 2.1.6 is for general guidance purposes).

2.1.1. British Standard (BS)

- BS EN 12659:1999 Chemical composition of Lead
- Material Number PB970R

2.2. Design Documents – (Documents provided by JLab).

2.2.1. Drawings

Placeholder

Description of Drawing Provided by JLab

3.0 TECHNICAL REQUIREMENTS

3.1. Dimensions and Quantity. The vendor shall deliver approximately 26 metric tons of strips of pure lead. All lead strips shall have a thickness 0.5 ± 0.02 mm. The

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corresponding English dimension is 0.0197 ± 0.0008 inches. The sheets will be cut to the following sizes:

- 3.1.1. 2360 strips 13 cm x 400 cm x 0.05 cm Pb (This is exact count 2148 + 10%).
- 3.1.2. 2360 strips 12 cm x 400 cm x 0.05 cm Pb (This is exact count 2148 + 10%).
- 3.1.3. 2360 strips 11 cm x 400 cm x 0.05 cm Pb (This is exact count 2148 + 10%).
- 3.1.4. 2360 strips 10 cm x 400 cm x 0.05 cm Pb (This is exact count 2148 + 10%).
- 3.1.5. **Note: Need to determine number and width of each size. Also need to add the tolerances on the width and lengths.**

- 3.2. **Lead purity.** The lead shall be 99.97% pure, conforming to the LME specification for pure lead, material number PB970R.

4.0 QUALITY REQUIREMENTS

- 4.1. **Factory Testing.** The manufacturer must certify the purity and thickness uniformity of their lead sheets, and provide corresponding documentation.
- 4.2. **First Article.** Before production quantities are delivered, the manufacturer shall provide a first-article shipment consisting of the first container of lead for verification of all specifications. The first-article shipment shall be packaged and shipped in the manner expected for routine production to verify the delivered lead sheets meet our fabrication requirements. The sheets will be tested by JLab, or its representative, for density, geometrical tolerances, and several sheets will be swaged to ensure compatibility of the material with our fabrication process.
- 4.3. **Acceptance Testing.** Acceptance of lead shipments will take place by JLab, or its representative, within 20 working days after receipt of the shipment. Dimensional tolerances will be checked on each shipment, as well as the uniformity in the swaging of the lead sheets.

- 4.3.1. **Note: Acceptance testing needs to be setup at Alberta.**

5.0 HANDLING, PACKAGING, AND DELIVERY

- 5.1. **Shipping containers.** The vendor shall propose the optimal size of shipments for the lead. The lead sheets shall be shipped flat in containers that allow for handling using conventional equipment. The vendor shall indicate any special handling procedures that would be required.
- 5.2. **Handling.** Handling procedures shall be developed by the Seller and submitted to the Buyer for approval. The procedures shall ensure that dimensional configuration and tolerances on the equipment are not affected by handling.
- 5.3. **Packaging.** The Seller shall submit for the Buyer's approval a packaging plan presenting the practices, procedures and instructions to be followed in meeting the following minimum requirements.

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- 5.3.1. The lead strips shall be separated with a layer of non-contaminating low-friction material proposed by the vendor for ease of removing a strip from a stack.
- 5.3.2. Equipment shall be protected from dirt, soil, and moisture by wrapping and sealing in 10 mil or thicker polyethylene film.
- 5.3.3. The wrapped and sealed components shall be boxed or crated in a manner to prevent damage during shipment and to permit handling by forklift or hoist while in storage or during installation.
- 5.3.4. Protect crated equipment from the weather.
- 5.3.5. The boxed or created components shall be blocked and securely fastened to prevent shifting, crushing, or bumping during handling.

5.4. Marking

- 5.4.1. Packages shall be suitably marked on the outside to facilitate identification of purchase order, the procurement specification, the package content, and any special handling instruction.

5.5. Delivery

- 5.5.1. Material not shipped in a weatherproof vehicle shall be protected from weather by a second sealed envelope or in a manner acceptable to the Buyer. Shipping procedures shall define the method of protecting components from the weather.
- 5.5.2. Shipping dunnage and tie-downs shall be such that the system components cannot be damaged or unduly stressed in any manner from carrier vibration or acceleration/deceleration.

- 5.6. **Schedule.** The vendor shall propose a delivery schedule based on the JLAB funding profile for FY 09, 10, and 11 (Fiscal year is from October 1 to September 30) whereby the total shipments delivered for each FY shall be based on a percentage of the total funds JLAB has estimated to be available. We have estimated 25% in FY 2009, 37.5% in FY 2010 and 37.5% in FY 2011.

Note: Must check actual fractions with procurement and schedule

- 5.6.1. **First article.** The first-article shipment shall be due one (1) month from the subcontract award date. JLAB personnel shall complete the first article acceptance review two (2) weeks after receipt of the first article.
- 5.6.2. **Production.** Production shipments of lead shall begin one (1) month after the first article acceptance notification by JLAB. All subcontract deliverables shall be completed within 36 months of subcontract award. The shipments of lead are to be shipped to the following address:

Dr. James Pinfeld
Centre for Particle Physics
445 CEB, 11322 - 89 Avenue

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University of Alberta
Edmonton, AB T6G 2G7

SUMMARY OF SUBMITTALS

Submittal Number	Submittal Title	No. of Code	Review and Approval	Review for Record
4.6.1.1	Placeholder			

Outline for Procurement Engineering Specification

**ATTACHMENT A
(XX PAGES)**

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**ATTACHMENT B
(XX PAGES)**