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August 5, 2015

Dr. Stephen Brooks
Brookhaven National Laboratory
P.O. Box 5000
Upton, NY 11973

Dear Dr. Brooks:

Thank you for discussing the Cornell FFAG ERL and its fixed-field alternating gradient permanent magnet quadrupole lattice. We discussed your needs for fabrication, assembly, mounting, and testing of the approximately three hundred permanent magnet optics. I believe RadiaBeam's demonstrated expertise in not only accelerator physics but permanent magnet systems and mass production can be an asset to the Cornell FFAG ERL.

After our discussion and your answer period, we are please to offer our estimate for these three hundred permanent magnets of two types, mounted on strongbacks of eight magnets each, and inclusive of rotating coil measurements. We estimate the sales cost, not including permanent magnet material, will be \$1,450,000 with additional units costing \$4,400.00. This is a rough order of magnitude estimate that can vary by +10%/-20% based on the information provided. This estimate is based off of over two-dozen work package estimates and we believe it sufficient for your initial planning purposes. Time to completion is over one year, though shorter time frames are possible in some cases.

Included in this cost is a design review, extensive first article testing, 100% testing of all magnets, and phased deliveries. However, it does not include magnetic design, the permanent magnet wedges, or shipping costs to Cornell. We suggest marking-up your own material estimate by approximately 20% to cover transfer costs and to hedge against the often-volatile rare-earth metal market.

RadiaBeam thanks you for the opportunity to help you with this project. Please let me know if we can be of any assistance with correctors, diagnostics, infrastructure, or any other needs.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Ruelas", written in a cursive style.

Marcos Ruelas
Vice President of Sales