**MUSE Basis of Estimate**

**Element WBS #2**

I. General Information

Task Name: BC422 for Silicon Photomultiplier Detector

Unique ID Number

Date of Estimate: November 2, 2015 (last update)

Estimate Generator: R. Gilman, R. Ransome

Cost Category:

 X M&S

 SWF

Comments:

Vendor Quote Number if Applicable\_\_Ssint-Gobain quote QUO-41707-T4D9L1\_\_\_\_\_\_

Drawing Reference Number or Attachment:

Costing Method: Quote

Total Task Cost: $4,920

Total Contingency: $492

Task Name: SiPMs for Scintillator with Silicon Photomultiplier Readout

Unique ID Number

Date of Estimate: October 2015

Estimate Generator: R. Gilman, from A Stoykov

Cost Category:

 X M&S

 SWF

Comments: AdvanSiD SiPMs are about 70% lower cost, but do not appear to provide quite as good performance.

Vendor Quote Number if Applicable\_\_Hamamatsu quote\_\_\_\_\_\_

Drawing Reference Number or Attachment:

Costing Method: Quote

Total Task Cost: $22,262

Total Contingency: $2,262

Task Name: amplifiers for Silicon Photomultiplier Detector

Unique ID Number

Date of Estimate: October 2015

Estimate Generator: R. Gilman, from A Stoykov

Cost Category:

 X M&S

 SWF

Comments:

Vendor Quote Number if Applicable\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Drawing Reference Number or Attachment:

Costing Method: expert guidance from A Stoykov, based on his recent purchases

Total Task Cost: $15,000

Total Contingency: $1,500

Task Name: Constant fraction Discriminators for Silicon Photomultiplier Detector

Unique ID Number

Date of Estimate: December 2015

Estimate Generator: R. Gilman, from K. Deiters

Cost Category:

 X M&S

 SWF

Comments:

Vendor Quote Number if Applicable\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Drawing Reference Number or Attachment:

Costing Method: verbal quote to K. Deiters from PSI electronics shop

Total Task Cost: $70,000

Total Contingency: $7,000

II. Cost Estimate Breakdown

Cost of each element, along with justification

Photek PMT240, $21,900 each

4 tubes will be ordered in year 1. Cost $87,600

5 tubes will be ordered in year 2 Cost $107,500

Total price is $195,100

III. Contingency and risk analysis

This is an off the shelf item, with low technical/price risk. However, it is produced in the UK, so we estimate a contingency of 10% should be applied for currency fluctuations.

Total contingency $19,510.



