

15th May. 1958

N.I. (G.P.)(58) 7

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GENERAL PURPOSES COMMITTEE

Increased Estimate of Cost of Main Buildings
for the 7 GeV Proton Synchrotron

Note by Dr. T. G. Pickavance

The building estimates for the 7 GeV Proton Synchrotron approved by the General Purposes Committee, excluding A.E.A. Industrial Group Fees, CVC and contingencies, amount to £2,054,000.

In order to keep as close control as possible, the Project Committee has arranged for the estimates to be revised at frequent intervals. The latest estimate, dated 11.4.58, also excluding Industrial Group Fees, CVC and contingencies, amounts to £2,206,000, an increase of £152,000. The increase is detailed and explained in the note by the Chief Architect, A.E.R.E., which is appended to this paper.

Owing to an unavoidable postponement, the Project Committee will not meet until the day before the General Purposes Committee, but subject to their final comments, which will be reported verbally, the General Purposes Committee is invited to approve the revised estimate of £2,206,000.

PROTON SYNCHROTRON PROJECT COMMITTEEQuarterly Summary of Estimates - Main Buildings

1. The attached summary sheet shows a comparison between the intermediate estimate of 11th April, 1958 and the expenditure approved by the General Purposes Committee, and with Treasury Authority.
2. Excluding contingencies, I.G. Fees and C.V.C. the intermediate estimate totals £2,206,000 showing an increase of £152,000 over the sum of £2,054,000 previously approved by the General Purposes Committee.
3. Of this £152,000, £135,000 is attributable to increases in Architects' Services. The main items are:-

£

- (a) Job No. 900 - Magnet Room, Injector Room parasitic area, and shielding bridge.
Additional quantity of M.S. rod reinforcement now estimated as being required in the construction of the magnet room. 57,000
In the preparation of the Bills of Quantities a ratio of 1 ton of steel to 20 cubic yards of concrete was accepted by our consultants as a reasonable factor to apply in determining the quantity of reinforcement required. Due to the limited time available at that stage it was not possible to produce more than preliminary designs but these tended to confirm this factor.
By January this year sufficient working drawings had been prepared, which forced the consultants to review their previous estimate, and it is now found that the factor which should be used is close to 1 ton of steel to 15 cubic yards of concrete. The difficulty of making these assessments in advance of completed drawings is very great, especially in the case of an unorthodox type of building demanding unusually stringent tolerances.
- (b) Additional cost of importation of labour and increased National Insurance contributions. 13,000
Messrs. Chivers allowed in their tender for the importation of only 50% of tradesmen and steel fixers and should this percentage be exceeded, either their additional costs would be recoverable or they would undertake the responsibility of this importation for an additional lump sum payment of £31,062. The General Purposes Committee decided to adopt the former method and a sum of £20,000 was allowed in the estimate.
Subsequently it was ruled by Sir Donald Ferrott that a lump sum should be agreed, but it was not possible to negotiate a lower figure than £31,062, so the difference between this and £20,000 must be added to the estimate.
Subsequent to tenders being received but before acceptance of the lowest, National Health contributions were increased and an additional sum of £1,825 had to be added to the estimate

Carried forward 270,000

			£
	Brought forward		70,000
(c)	Adjustments on approximate Bills of Quantities. Tenders were invited on approximate Bills of Quantities prepared before working drawings were available. Subsequent issue of drawings has caused variations in quantities -		5,000
	Additions	£27,250	
	Omissions	£22,500	
	Nett additions	£5,000	
(d)	Job Nos. 905, 906 - Motor Alternator Building and Auxiliary Plant Building. The design of these buildings is dependent on the type of machines and plant used. These in turn are not known until tenders are accepted for their supply, and manufacturers drawings received. Some allowance was made in the estimate of expenditure approved by the General Purposes Committee for an increase in the cost of these buildings (see para. 5 of NI (GP)(58)3) but the actual increase in the required size of and loading on the buildings is greater than was allowed for. The design is still being developed in detail, and further increases cannot be entirely ruled out, but these should now be of a minor nature unless there is a further increase in plant size.		58,000
			<i>Increase in cost for Ventilation Plant & Lifting gear etc. 5/- per cub. ft.</i>
(e)	Other minor increases		2,000
	Total increase in Architects' estimate -	£135,000	
(f)	The Project Committee has authorised expenditure up to £10,000 from the £100,000 in the estimate for special measures to meet the tight programme. A sum of £7,000 has been transferred from this £100,000 to the Building and Civil Engineering estimate, to cover the cost of the plasticiser which the Industrial Group have instructed the contractor to use in the concrete mix. This transfer does not affect the overall total of the estimate.		
4.	The increase in the Engineers' estimate amounts to £17,000. This is attributable to:-		
(a)	Job No. 905 Increased crane capacity from 60-120 tons in the Motor Alternator Building after allowance has been made for minor savings on the other miscellaneous cranes.		11,000
(b)	Job No. 912 Guarding crane down-shop leads and providing for mobility of push button controls.		3,000
(c)	Job No. 912 Additional ventilation for Generator Room in Preparation Area.		600
(d)	Job No. 900 Reassessment of lighting and small power installation in Magnet Room and Injector Room, following design of lighting system and selection of type of bus-bar trunking.	2,400	
	Total increase in Engineers' Estimate	£17,000	

15th May, 1958.

G. W. Dixon
Chief Architect.

SUMMARY COMPARING THE BUILDING ESTIMATE DATED 11/4/58 WITH PREVIOUS APPROVALS

	Treasury Authority	Approved by G.P.C.	G.P.C. Reference	Latest Estimate 11/4/58	Variation from G.P.C. Approval	Variation from Treasury Authority
<u>Architects' Services</u> Building and Civil Eng.) Special Measures to Meet Programme) Ancillary Building (Arcon) Additional 10' Earth Shielding	1,400,000	1,178,000 (100,000) 42,000 25,000	N.I.(G.P.)(57)3 N.I.(G.P.)(57)6 N.I.(G.P.)(58)4	1,320,000 (93,000) 42,000 25,000	} + 135,000	) + 13,000 + 42,000 + 25,000
<u>Engineers' Services</u> Mechanical and Electrical Engineering Ancillary Bldg.	400,000	511,000 22,000	N.I.(G.P.)(57)3 N.I.(G.P.)(57)6	528,000 22,000	+ 17,000	+ 128,000 + 22,000
<u>Fees</u> Consultants' and Specialists' Fees Consultants - Ancillary Building	100,000	140,000 6,000	N.I.(G.P.)(57)3 N.I.(G.P.)(57)6	140,000 6,000		+ 40,000 + 6,000
<u>Furniture and Fittings</u>		30,000	N.I.(G.P.)(57)3	30,000		+ 30,000
<u>C.V.C. (2)</u> Contingencies Industrial Group Fees	1,900,000	2,054,000 128,000 165,000 85,000		2,206,000 128,000 13,000* 85,000	+ 152,000 - 152,000	+ 306,000 + 128,000 + 13,000 + 85,000
	1,900,000	2,432,000		2,432,000		+ 532,000

*The very low figure of £13,000 inserted against contingencies is merely the result of subtracting the total variation from G.P.C. approval from the original contingency figure. Since the project is still at an early stage, it must be expected that contingencies will actually amount to a greater sum.