

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCEGENERAL PURPOSES COMMITTEEProposed Extension to the ProtonLinear Accelerator BuildingsNote by T. G. Pickavance1. General

When the Proton Linear Accelerator buildings were originally designed they were functionally planned as the first part of a laboratory for a 600 MeV accelerator owned and to be used by the A.E.R.E. Since then, the original machine has been reduced in size to a 50 MeV accelerator owned by the N.I.R.N.S. to be used mainly by the University physicists. In addition, all the 200 Mc/s klystron and triode development work which was originally undertaken by A.E.R.E. and which is necessary for the running of the accelerator has been moved to the Rutherford Laboratory. Because of these changes, modifications and some extensions are now desirable if the laboratory is to meet the demands expected of it. Opportunity has been taken at the same time to provide a Radio-chemistry Laboratory to cope with medium level activity sources not only for research on the P.L.A. and to provide for the possible needs of similar work on NIMROD but also to cater for the requirement of University chemists who wish to use the A.E.R.E. research reactors.

It is convenient to divide the proposals into:-

- (a) Modifications and extensions to the existing physics laboratory and workshop space.
- (b) Extension to the experimental area.
- (c) The radio chemistry laboratory.

Plans have now been prepared and a copy is attached to this note.

The estimated approximate cost of the work has been divided for convenience into the above sub-headings. This cost will be found in the appendix together with details of the area of laboratory, office, workshop and other space allowed for in the plans.

The General Purposes Committee is now asked to consider and approve these proposals.

The estimate of £180,000 given in the appendix is believed to be reliable within 15%. A more detailed estimate is being worked out by the Architects and Quantity Surveyor and would be used when submitting the proposal for Treasury approval. The Committee's approval for a scheme counting not more than £200,000 is therefore requested.

2. Modifications and Extensions

When the plans for the 600 MeV accelerator was modified the large spaces, originally provided for the counting room and the control room, no longer needed to be so big for the 50 MeV accelerator and to meet the urgent needs of the NIMROD design team they were converted into a local workshop and laboratory, respectively. These modifications, so essential to the progress of the design of NIMROD during the past several years, have placed a severe restriction on the flow of traffic in the building. There is no way, for example, to the present control room except through either the workshop or through one laboratory and the counting room. This is most undesirable. It is now proposed to take a corridor through from one of the main entrances to the control room, by using part of the workshop fitting bay. The workshop is also to be enlarged to meet the minimum needs of the engineering support staff which is required to maintain and operate the complex accelerator efficiently and to construct some of the specialized apparatus for nuclear physics experiments. (Originally of course, the accelerator obtained all its engineering support staff from A.E.R.E. but this is no longer the case).

Space is also provided, for the first time, for changing rooms and lavatories for the workshop staff. The present counting room is much too small for the demands that are being made on it and it is proposed to enlarge it by using the adjacent electronics laboratory. Space for the electronics laboratory is then provided in the new wing. The new wing also contains some additional office space, four additional physics laboratories, one being for bio-physics work, for which there has been a demand from University research workers, a machine spares store (which does not exist at all at present) and a general equipment store. The present store is to be converted into a small local library and conference room. The present library and conference room exist in diminutive form in a temporary terrapin hut to the south of the permanent building. It is planned eventually to remove these temporary buildings and to replace them by an entrance hall and two laboratories to match the present "Boulton-Paul" buildings.

3. Extensions to the Experimental Area

Requests to use the accelerator from University physicists have already been on a very large scale and if we are to meet this encouraging support satisfactorily it is necessary for delays in changing from one experimental requirement to the next to be reduced to the minimum. To do this it is essential to increase the present size of the experimental area. It is proposed to add an additional 6,000 sq. ft.

A very simple pre-fabricated structure is envisaged here designed on the modular principle so that it can be erected with the minimum interference to the operation of the machine and so that it can be taken down and re-assembled elsewhere or in a different shape should the needs of the machine change over the years.

4. The Radiochemistry Laboratory

The radiochemistry laboratory included in the plan is for use by University visitors. It is being designed in collaboration with the Radiochemistry and Industrial Chemistry groups at A.E.R.E. to deal with sources of medium activity - up to about 1 curie - such as will be produced by irradiating materials in the P.L.A. beam. It will also provide for work up to the same level of activity with materials irradiated in Nimrod beams and in A.E.R.E. reactors.

The laboratory will contain four suites. It is not proposed that the N.I.R.N.S. should employ chemists to run the laboratory. Instead, it has been agreed that the A.E.R.E. Chemistry Division will provide some staff to supervise the laboratory; they will also provide some space in A.E.R.E. laboratories for a limited number of experiments with high activity sources. In return, the A.E.R.E. Chemistry Divisions will have the use of one of the four suites. One will be for visitors using the P.L.A. or Nimrod, and two will be for visitors using A.E.R.E. research reactors.

5. Siting Proposals

The drawing attached shows the proposed siting. There is provision for extension to the East and to the West should it be required in the future. Apart from the main functional requirements outlined above an attempt has been made in the planning to make the main approach to the building more satisfactory than it is at present by removing waste and rubbish dumps to a less conspicuous place.

6. Completion date

As the proposed additions are required to overcome an acute shortage of space in the area it is hoped that they could be completed with all reasonable speed. If this scheme is approved it is hoped that detailed drawings would be completed and the contract placed for building work to start in June, 1960 and be completed during the financial year 1961/62.

7. Budget Provisions

In the N.I.R.N.S. financial estimate a total sum of £55,000 was included for the financial year 1960/61 and an additional sum of £60,000 for the year 1961/62 for buildings associated with the P.L.A.

It is estimated that the proposal now submitted would involve an expenditure of £55,000 in 1960/61 and an expenditure of £125,000 in 1961/62.

APPENDIX

(a) Modifications and Extensions to the existing Physics Laboratory and Workshop Space:

The space is allocated as follows:-

	Approx. Area (Sq. Ft.)
(i) Four Physics laboratories, 400 sq. ft. each and one of 600 sq. ft.	2,200
(ii) Three offices, each 144 sq. ft. and four offices 100 sq. ft.	832
(iii) Machine Spares Store.	1,400
(iv) General Stores.	1,000
(v) Extension to Workshop.	1,700
(vi) Crew Room and Crew Office.	400
(vii) Changing rooms etc.	450
(viii) Toilets, Switch Rooms, Calorifier Room, Pump House, Cleaners' Room etc.	1,400
(ix) Entrance Hall, Passages etc.	1,500
(x) Boulton Paul hutting.	2,400
	13,282
 <u>Approximate Cost</u>	 <u>£60,000</u>

(b) Extension to the Experimental Area.

Total floor area. 6,000

Approximate Cost £25,000

Approx. Area
(Sq. Ft.)

(c) Radiochemistry Laboratory including drains and delay tanks

(i) Four suites, each 600 sq. ft., which includes the laboratory, an office and counting room.	2,400
(ii) "Cave" Room and Balance Room.	500
(iii) Passages.	900
(iv) Toilets and Change Rooms.	300
	4,100

Approximate Cost.

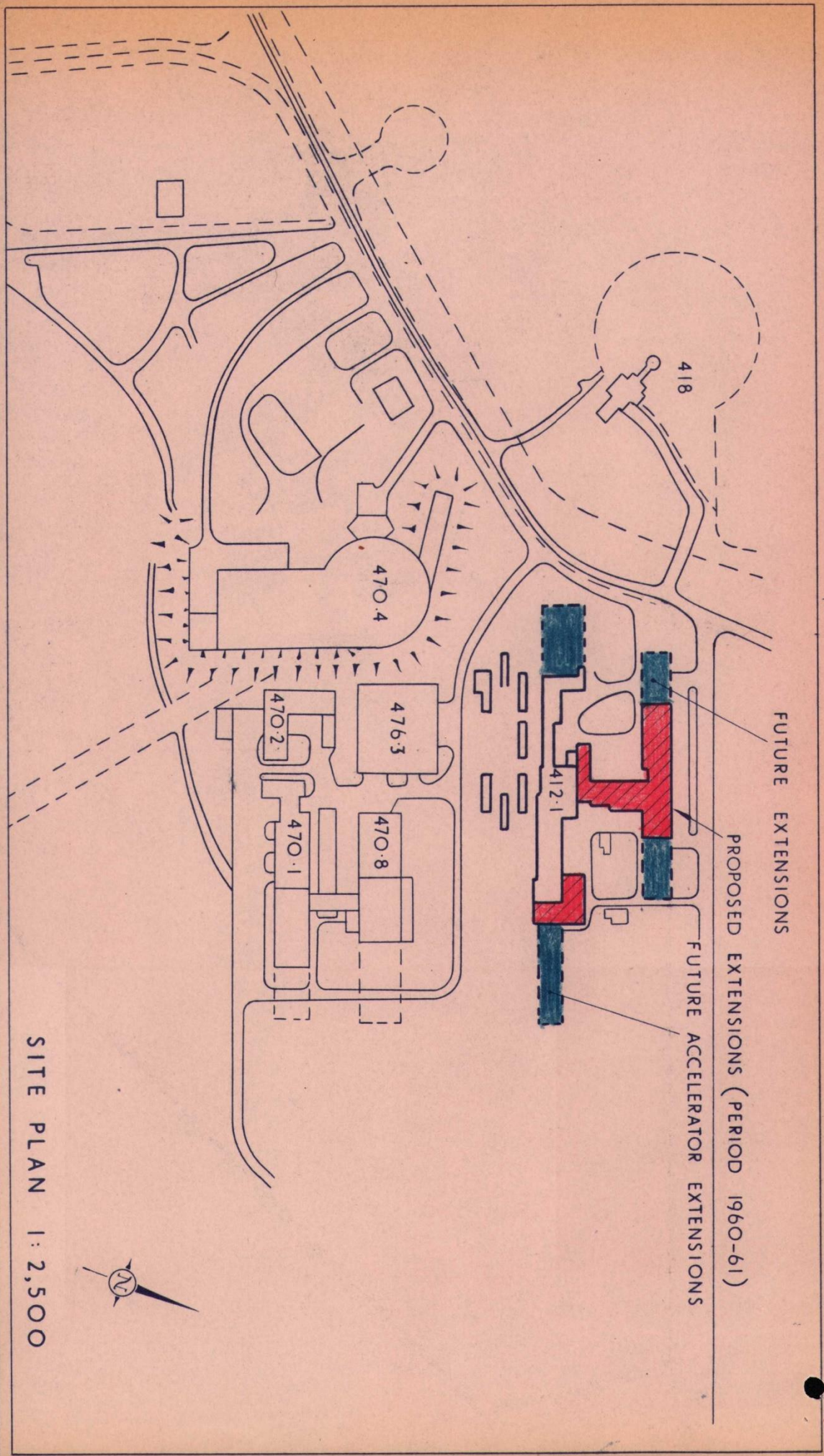
£85,000

Roads, Lighting, Car Parks, etc.

£10,000

TOTAL

£180,000



DRAWING NUMBER
SW/

UNITED KINGDOM ATOMIC ENERGY AUTHORITY
SOUTHERN WORKS ORGANISATION

FIG. A
BUILDING NO. 412
DATE 1959
SCALE 1/4" = 1'-0"
DRAWING OFFICE
CHECKED
APPROVED

ARCHITECT
41216 GENERAL EXTENSION FOR LABS
OFFICES, ETC.

DRAWING NUMBER
SW 41216/1A/K/A
RELATIVE NUMBER
S.M.D.

