

6th April, 1964

NI/GP/64/14

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

11/2a

GENERAL PURPOSES COMMITTEE

A Test Building for Experimental Apparatus Using Hydrogen

Note by P. Bowles

1. Liquid hydrogen is used at the Laboratory principally for targets. The association of hydrogen with experiments in high energy physics cannot be avoided, but because hydrogen air mixtures are ignitable over such a wide range it is essential to test and develop equipment in a remote area.
2. At present no adequate facilities exist. A building was erected for testing of targets for the P.L.A. but this is too small for the size of equipment to be tested for experiments on NIMROD. Temporary facilities for testing are being used in the Hydrogen Bubble Chamber Annexe whilst the chamber is at CERN. Liquid hydrogen is at present stored in a temporary building. The functional requirements are for adequate facilities located in a thinly populated area within reasonable distance of experimental usage to minimise the transportation of delicate apparatus.
3. The essential features of the scheme are a building for the testing of components and one for the safe storage of gas. The safe handling of hydrogen demands special provisions in the building such as flame proof equipment and special ventilation which are expensive features. To minimise cost, however, the size has been kept to a minimum, and the test building will cater for only two assemblies. It is estimated that a target assembly and its testing may take about a fortnight, a second assembly area must therefore be available for urgent requirements or enable a second assembly to be in progress. The general practice of splitting potential hazards and the desirability to leave the scheme so that it can be extended economically has led to the decision of making the hydrogen store/dispensary a separate building in the same compound.
4. The attached sketch shows the proposed scheme and after detailed examination it has been agreed that the most acceptable site is at the junction of the road to the Experimental Area (Road 3) and the Dido Road. The siting is consistent with foreseeable expansion to the experimental area and is as near as practical to both halls to minimise transportation difficulties whilst still being in a thinly populated area.

The internal areas of the building are as follows:-

Target test building and store	960 sq. ft.
Gas store	520 sq. ft.
Office and Control Point	120 sq. ft.

5. The cost of the above scheme based on a token estimate of the S.W.O. of the U.K.A.E.A. is £24,000 plus fees, which at about £8 per sq. foot of building cost compares well with other special buildings involving high

rate ventilation, flame proof equipment, steam, water and compressed air supplies. The approximate estimate is as follows:-

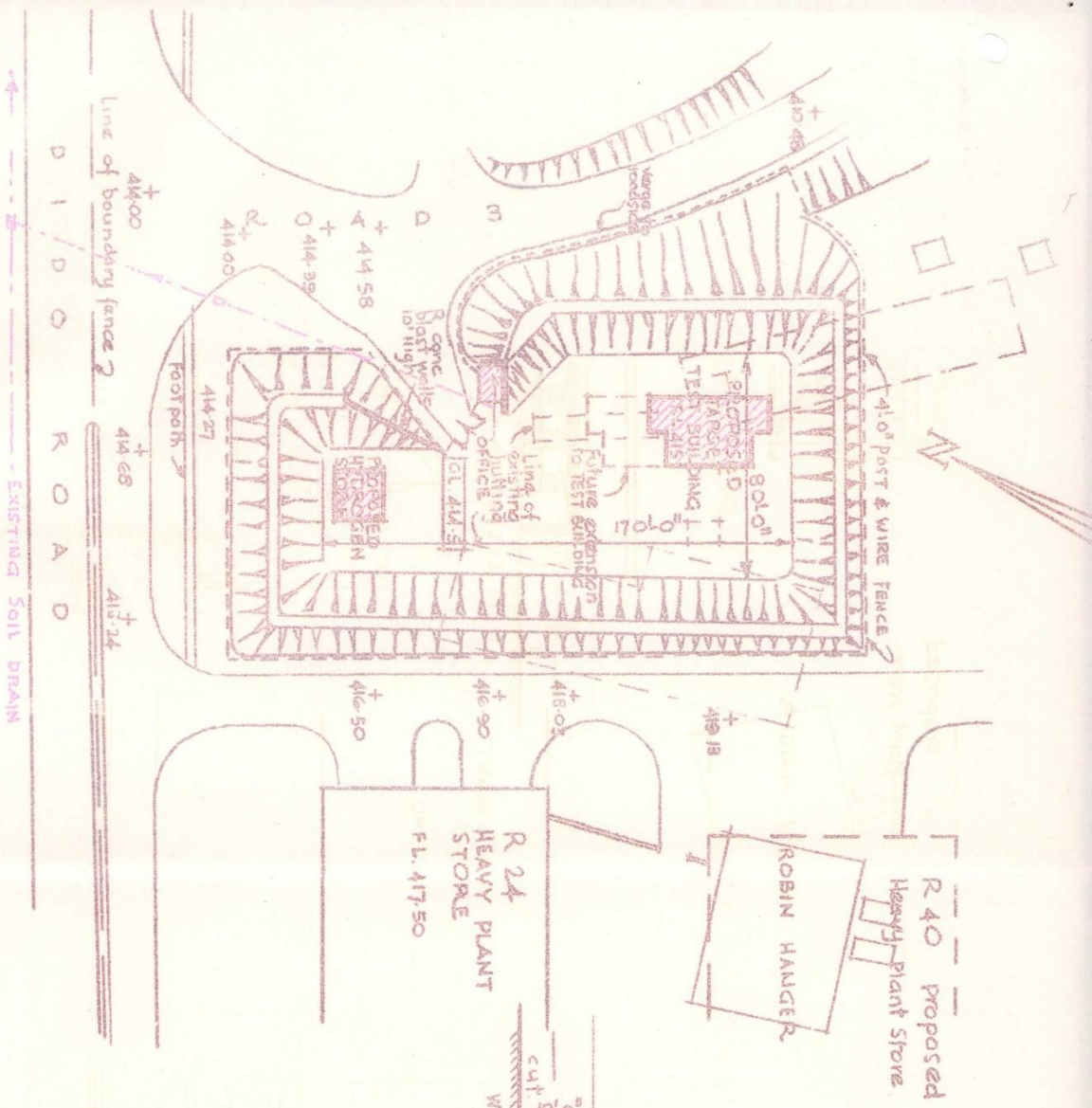
External Works	£ 11,000
Buildings/ M & E Internals	13,000
Total Works cost	24,000
Fees, say 17%	4,080
	£ 28,080

6. Financial Provision has been made for this scheme in the 1964/65 and 1965/66 estimates, and it is estimated that if a start be made in October this year the expenditure will be approximately as follows:-

1964/65	£ 8,100, including fees
1965/66	£20,000, including fees

7. Authority is requested for:-

- (i) Approval in principle
- (ii) Design work to proceed
- (iii) For tenders to be invited
- (iv) The Chairman to approve on behalf of the committee if the lowest acceptable tender brings the cost of the scheme within 15% of the approximate estimate.



SCALE 1:500M.

HYDROGEN TARGET BUILDINGS. N.I.R.N.S.

SCALES: AS NOTED.

DRAWN BY P.M.C. APPROVED BY:

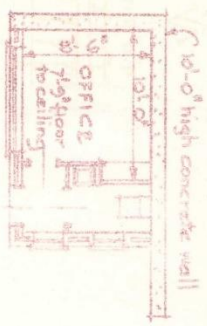
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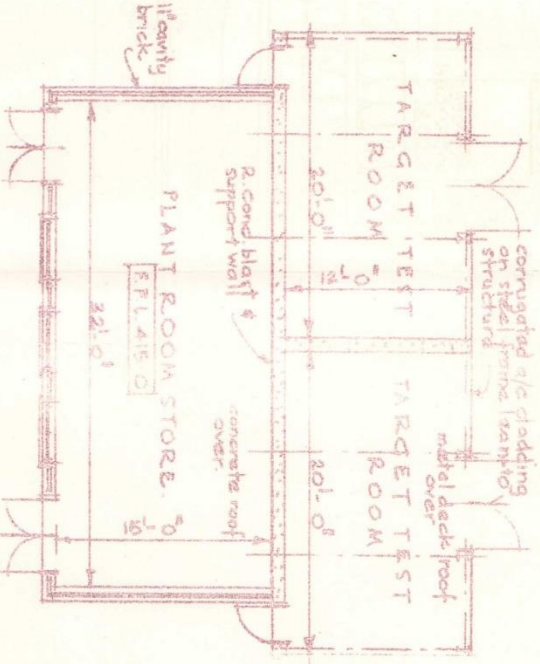
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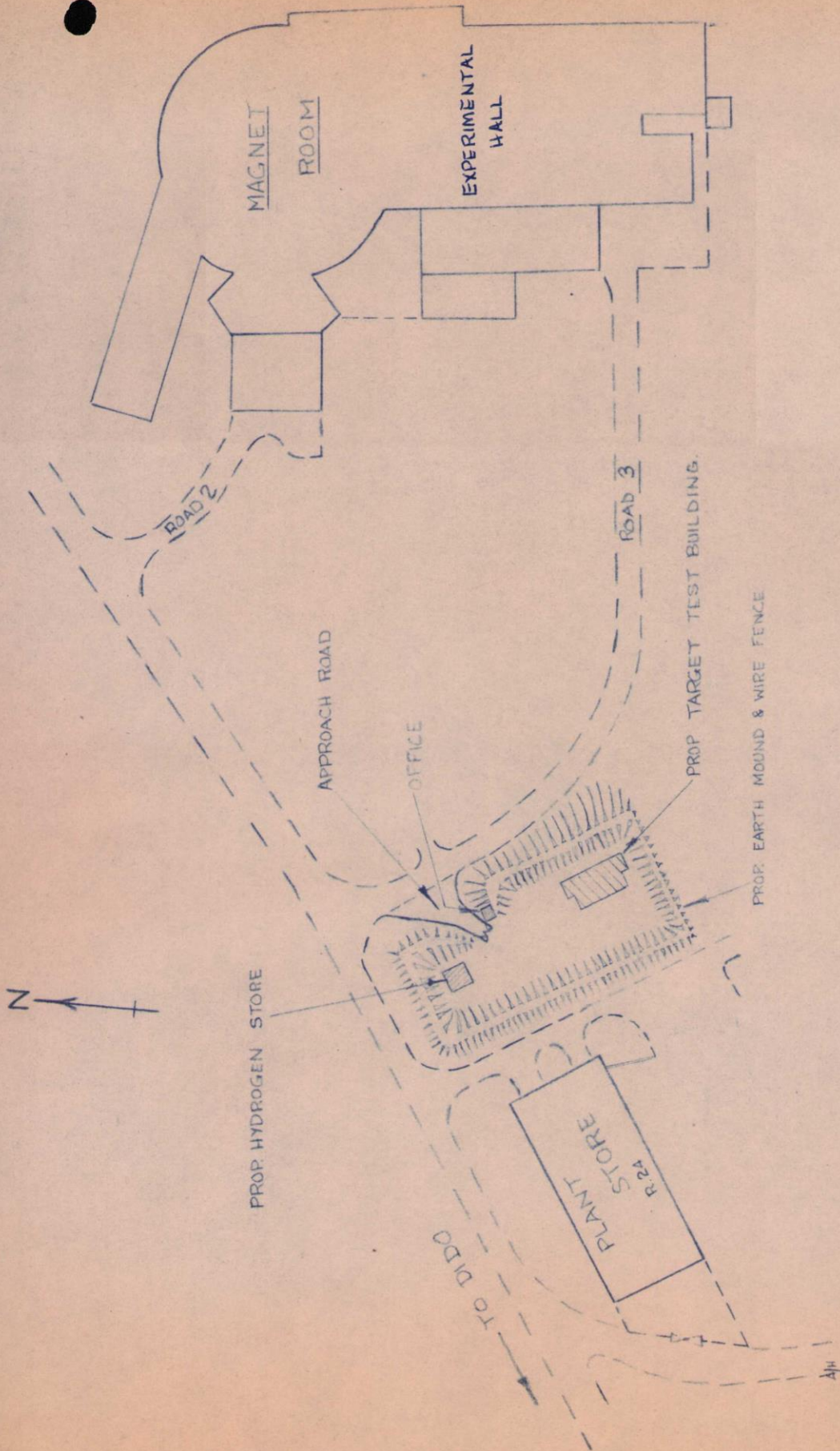
[Signature]

OFFICE BUILDING 1/8" = 1'-0"



TARGET BUILDING 1/8" = 1'-0"





SITE PLAN: PROPOSED HYDROGEN TARGET BUILDINGS