

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Working Party on the Electron Laboratory - Siting

Note by T. G. Pickavance

1. At the request of the Governing Board (NI/61 Third Meeting) a working party was set up with myself as Chairman, and with members from the Universities of Glasgow, Liverpool and Manchester and from the Rutherford Laboratory, to co-ordinate preparatory work on the Electron Laboratory. Three meetings have been held in Liverpool, Manchester and Glasgow, and a fourth has been arranged. The working party has been concerned with parameters and design study work on the synchrotron and buildings, and siting. This note is concerned only with the urgent question of siting. An Appendix lists the members who attended and the reports produced by the working party.
2. The initial conditions were to find a site in the northwest of England, within easy reach of Liverpool and Manchester but satisfactory also for the needs of Glasgow, with subsoil conditions suitable for the magnet ring and heavy shielding and in a region suitable for the needs of the Laboratory generally. The initial area required will be 20 acres, but it has been thought desirable to seek a site capable of ultimate extension to 100-120 acres to provide for the possibility of constructing a larger machine at some future time. The proximity of suitable services, such as electricity and water, and reasonably attractive surroundings with housing available nearby, were also considered to be important. Finally, the likelihood of obtaining planning permission has been considered in informal contacts with the local authorities of Lancashire and Cheshire.
3. A suitable site could not be found in Lancashire. Two Government sites, Risley and Burscough Airfield, have unsuitable subsoil. The only regions of the County with satisfactory subsoil and reasonable access from Liverpool and Manchester are a small area near Ormskirk, which is farming land of the highest quality and would be unobtainable, and a very small area at Woolston. The Woolston site is considered to be too small, and in any case the County wish to complete a housing development there and are unlikely to permit its use for anything else.
4. The Cheshire authorities are anxious to avoid this type of development in their Green Belt areas, and would prefer us to use their "White Area", which roughly follows the line Crewe - Warrington and is about 15-20 miles in width. The White Area was explored, and the best site, recommended by the local officials, was Stretton Airfield. This is very convenient for access from both Liverpool and Manchester, and is near an entrance to the new M 6 motorway. We arranged a site investigation by Soil Mechanics Ltd., who found 6 to 25 feet of boulder clay with Keuper Marl below. A piled foundation, with the piles founded well into the Keuper Marl (10 feet or more) would be required. Moreover, the water table was only 2 to 5 feet below ground level in September, and would be higher in the winter and spring.

A Ministry of Supply site at Dunham on the Hill has also been investigated by Soil Mechanics Ltd. This has a high water table, and very unsatisfactory subsoil - clay of various types down to 39 feet, at which depth drilling was abandoned.

A site at Wood Park, Wirral, is very much better geologically but is in the Green Belt. It is owned by Liverpool University, who would be willing to sell or lease sufficient land to the Institute. Soil Mechanics, Ltd., have investigated Wood Park for us. Over most of the site there is sandstone bedrock at depths of 5 to 9 feet below the surface; no water table was found. Foundations for the synchrotron could be placed directly on the sandstone. The site is very attractive.

A site at Mickledale, Frodsham, also has good sandstone at or near the surface and is very attractive. We have not surveyed this site; it is in private ownership and is farmed, and we saw no reason to approach the owner at this stage. It is in a "rural amenity area", and there would be difficulty in obtaining planning permission.

5. We have concluded that Wood Park would be very satisfactory, that the Mickledale site would be equally satisfactory subject to site-boring tests, and that every other site which we have been able to find is unsuitable. Stretton might be made useable but at very great expense and with continuing trouble from the high water table; it is also bleak and unattractive.

Wood Park has the advantage that it is already owned by one of the universities most concerned, whereas Mickledale is privately owned and may be costly even if the owner is willing to sell. However, Mickledale is more centrally placed (20 miles from Liverpool, 30 from Manchester; Wood Park is 11 miles from Liverpool, 38 from Manchester). Mickledale is rather more undulating than Wood Park. Both have good road access, and both should give the possibility of future extension to about 100 acres. Some members have expressed the fear that development by Liverpool University at Wood Park in the distant future, as yet unforeseen, might make it difficult for N.I.R.N.S. to demonstrate their complete independence and impartiality on the same site, but would readily accept Wood Park if Mickledale proved to be unsuitable or unobtainable. Recent informal contacts with Cheshire officials have suggested that we may expect a sympathetic hearing on either site in view of the technical unsuitability of sites in the White Area.

6. We are unable to recommend a single site. We recommend concentration on the Mickledale and Wood Park sites and, unless the Board feel able to make a choice, an approach to the Cheshire authorities on both as alternatives.

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APPENDIX to NI/61/24

Working Party on the Electron Laboratory

1. Members of the Working Party

The following have attended one or more meetings of the Working Party:

Dr. T. G. Pickavance	Chairman
Professor J. M. Cassels	Liverpool University (Chairman of the second meeting)
Professor A. W. Merrison	Liverpool University
Dr. J. R. Holt	" "
Dr. H. C. Newns	" "
Mr. M. J. Moore	" "
Professor B. H. Flowers	Manchester University
Professor E. B. Paul	" "
Dr. J. N. Calvert	" "
Professor P. I. Dee	Glasgow University
Professor J. C. Gunn	" "
Dr. J. M. Reid	" "
Dr. W. M. Macfarlane	" "
Mr. P. Bowles	Rutherford Laboratory
Mr. L. B. Mullett	" "
Mr. W. W. Woodall	" " (Secretary)

2. Reports prepared for the Working Party

E.L.1	Notes on Sites	B. Rodgers (Department of Geography, Manchester University)
E.L.2	Schedule of Requirements for a 4 GeV Electron Laboratory on a New Site	P. Bowles
E.L.3	The Magnet for a 4 GeV Electron Synchrotron I	J. R. Holt H. C. Newns
E.L.4	Siting of 4 GeV Electron Synchrotron	M. J. Moore P. Bowles
E.L.6	Siting of 4 GeV Electron Synchrotron (Second Report)	M. J. Moore P. Bowles
E.L.5	The Choice of an Architect and Consulting Engineer for the Building Works of the Electron Synchrotron	P. Bowles