

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCERUTHERFORD LABORATORY BUILDING COMMITTEE

Approval is requested for a building to house a collapsible container for receiving vapour discharged from the heavy liquid bubble chamber during an emergency dumping operation. The site proposed for the building is to the south-west of the bubble chamber annexe at roadway level against the shielding mound.

Two possible types of building are suggested, one of semicircular section, constructed mainly in corrugated asbestos sheet and costing approximately £500 and the alternative in brickwork and asbestos sheet, costing approximately £850. The effective volume of the building is 2500 cu.ft.

Purpose of Building

During the emergency disposal of the contents of the heavy liquid bubble chamber, a quantity of vapour must be released to reduce the chamber to atmospheric pressure and remove the hazard in the laboratory. The volume discharged is dependent on the temperature and pressure of the chamber contents at the time of release and also on the particular circumstances of the emergency. On present information the quantity involved could be in the region of 2300 cu.ft. when expanded to atmospheric pressure.

The liquids at present receiving the most serious consideration for use in the bubble chamber are:-

1. Propane, which presents a fire and explosion hazard in the presence of air and must therefore not be discharged indiscriminately.
2. Freon 13 B.I., which is relatively inert, but is of sufficiently high cost to warrant reclamation of the vapour discharged during dumping.

Consideration of various methods of dumping has indicated that a system involving capture of the vapour followed by controlled dispersal or reclamation, appears to offer the most satisfactory solution. Various types of receivers have been considered, including pressure vessels, gasholders and collapsible containers in plastic and rubber materials. The most convenient and least costly method appears to be by the use of a collapsible container in a selected P.V.C. material, protected from the weather and external interference by a simple form of housing. A comparison of the estimated costs of the various types of receiver considered are given in the appendix.

Housing for Collapsible Container

Schemes for the proposed building are shown in drawing RLA/R66/71.

Fig.a shows the semi-circular section building constructed in corrugated asbestos-cement sheets, with timber framed and panelled ends. Internally, a smooth surface would be presented to the collapsible container by part lining and partitioning in building board.

The cost of this building is estimated to be £500.

An alternative form of construction is shown in fig.b. The three walls facing the roadway are in 9" brickwork and the fourth wall and roof in asbestos sheet.

The cost of this building is estimated at approximately £850.

Site

A suggested site for the housing is shown on the drawing. This is to the south-west of the bubble chamber annexe at roadway level and close to the foot of the mound in its eventual form.

Services

Gas from the bubble chamber will be conveyed to the collapsible container through a pipe of approximately 3" O.D. This will cross the roadway to the south of the bubble chamber annexe at a height of 18' and run overground to the building. No normal building services are envisaged.

Building R.1 Link

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3rd November, 1961

APPENDIX I

Estimated Costs for Vapour Receivers

Receiver	Total Cost	Receiver	Housing or Hardstanding
	£	£	£
Pressure Vessel	3100	3000	100
Gas Holder	4600	4500	100
Reinforced Rubber	2000	1800	200
Plastic	(a) 600	100	500
	(b) 950	100	850