University of Salahaddin
College of engineering
Department of architecture

X-ray Departments

Diagnostic imaging

The essential feature about planning 'imaging departments' is that, apart from ultrasound, imaging modalities require specialized protective .arrangements, either from radiation or from magnetic fields

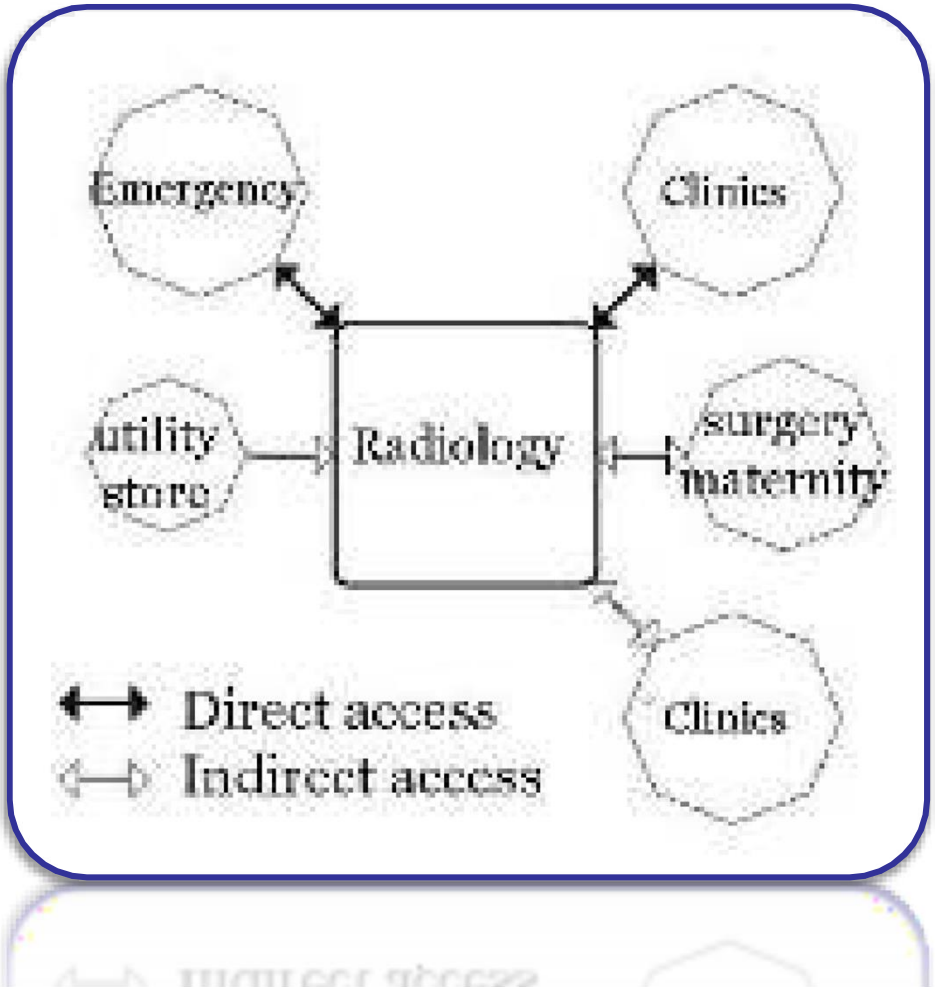
Protection in X-ray rooms may be provided by lead or by barium plaster which prevent the emission of radiation beyond the room. Where control .positions are within the room, operators may be protected by lead screens

During investigations staff who must work in close proximity to the patient, may additionally wear lead aprons, and patients themselves may require .specific shielding from radiation to sensitive zones such as gonads

X- ray Department[Diagnostic Imaging]

:Location ❑

- Very close to the emergency department and external clinics.
- Easily accessible from internal division.
- Ground floor is preferred.



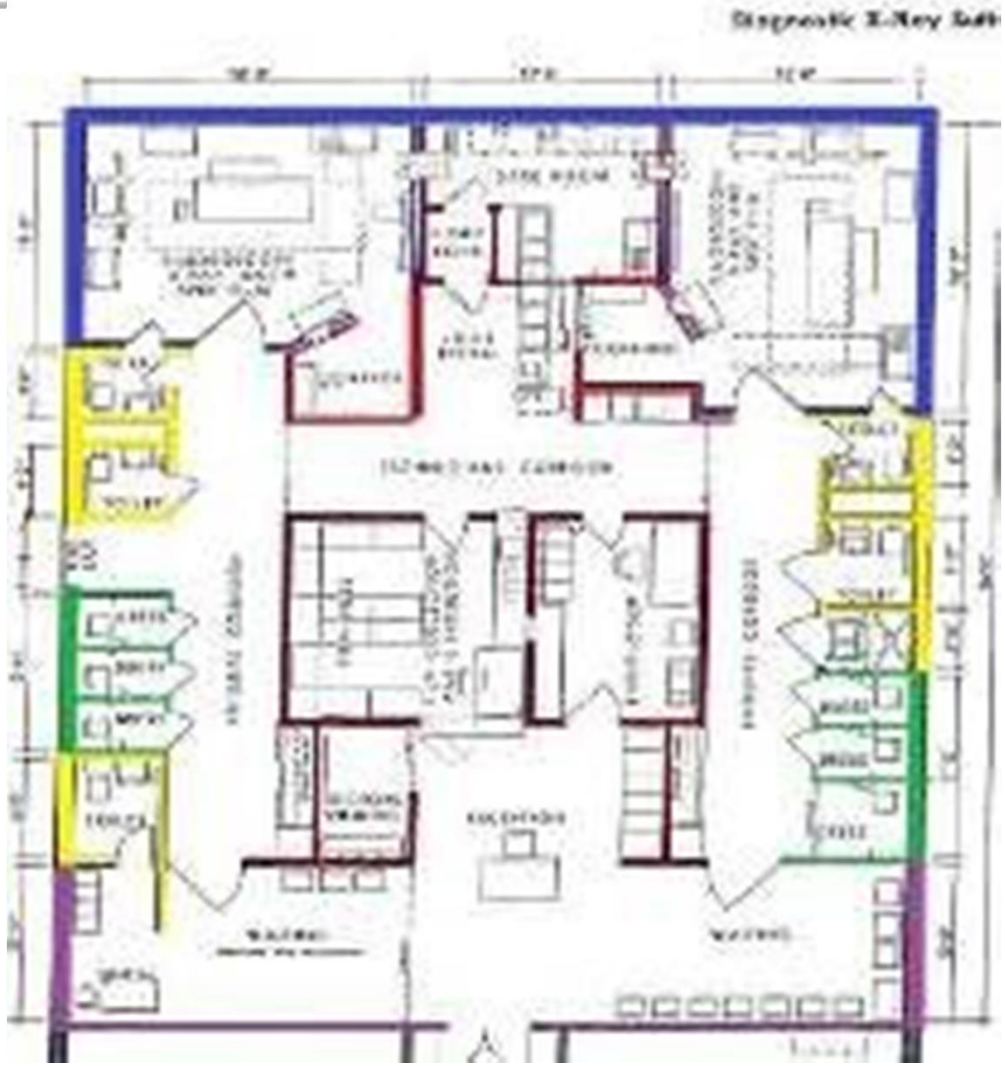
X- ray Department[Diagnostic Imaging[

This term includes diagnostic investigations using X rays (plain films) and the non-X-ray modalities using ultrasound and magnetic resonance to .[produce image [MRI

X- ray Department[Diagnostic Imaging[

Patients on entry to the imaging department need quiet reception and waiting areas before moving to .the diagnostic rooms

The layout of the department should ensure that frequently used rooms and those whose .investigations are brief (e.g plain X-ray, chest rooms) are sited .closest to the waiting areas

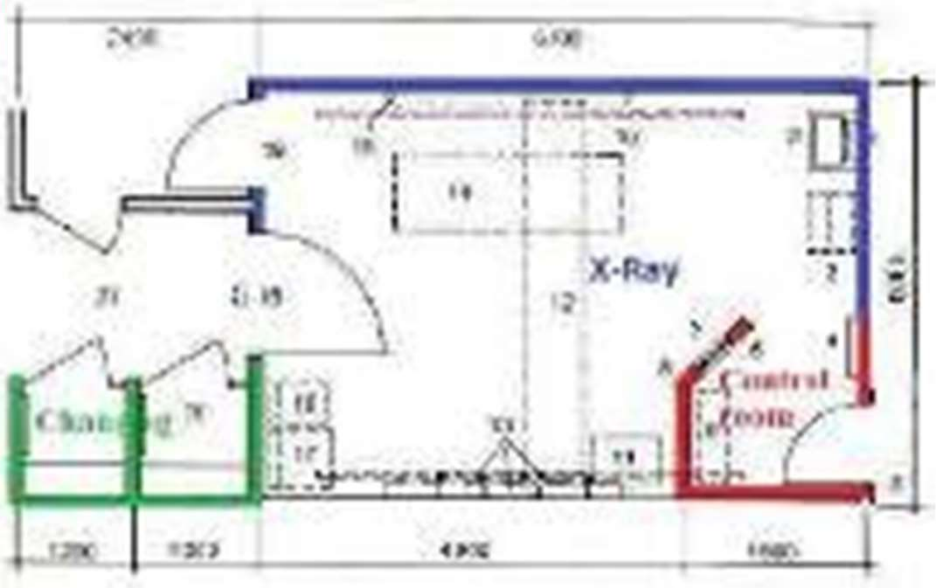


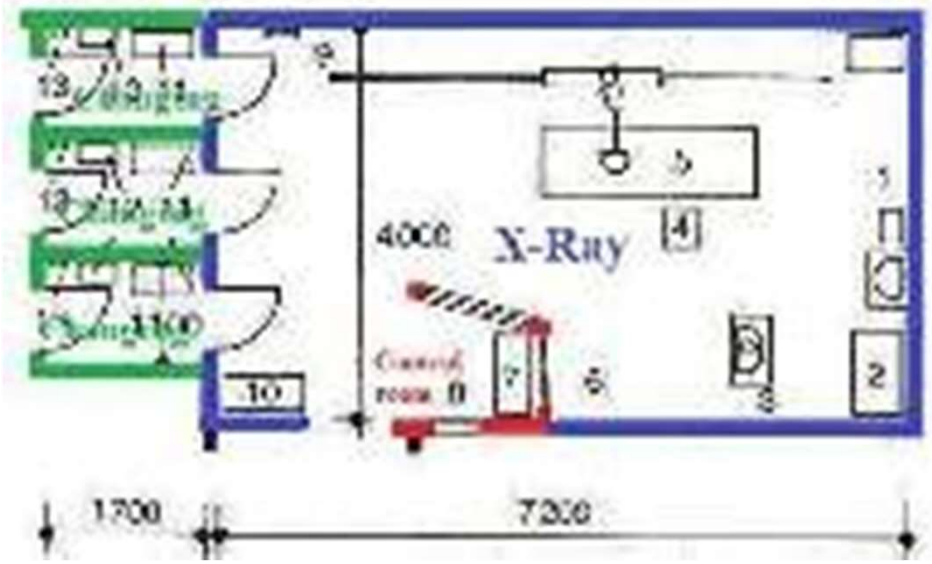
X- ray Department[Diagnostic

All rooms will require patient **changing** facilities.

Changing rooms may be either **'stand-alone'** or **'pass-through'**.

In this latter category, the **patient accesses** the room from **the sub waiting** space, and **enters the diagnostic** room directly from the **changing room**.





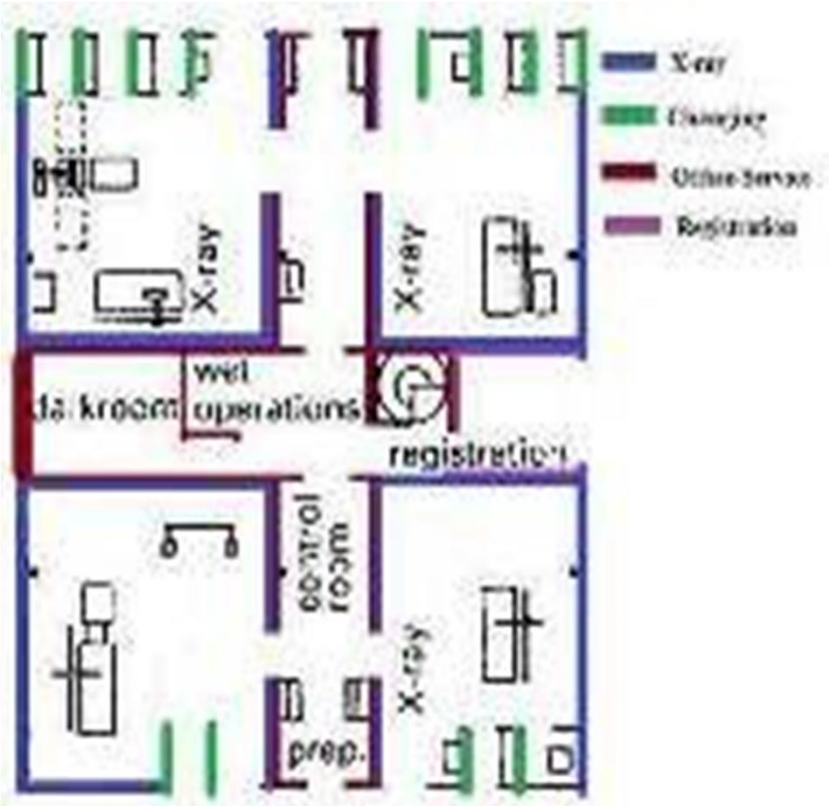
X- ray Department[Diagnostic Imaging[

These rooms have the advantage that, once undressed, the patient does not have to traverse any general circulation and so benefits from .greater privacy

However this pattern is often found to be very claustrophobic for patients, and can generate anxieties that one has been placed in this .isolated space and forgotten

It is also a pattern which, because of the more numerous doorways into the X-ray rooms, creates additional problems in achieving .radiation protection

The greater flexibility of the stand-alone pattern .usually makes it the preferred option



X-ray diagnosis with layout known as an X-ray cross

4 University Hospital, Bonn

X- ray Department[Diagnostic Imaging[

In radiology departments, considerations of radiation protection demand that the diagnostic rooms are internal. In those circumstances it becomes particularly important that the more general spaces, offices, sorting and reporting rooms and staff rest. rooms have natural light

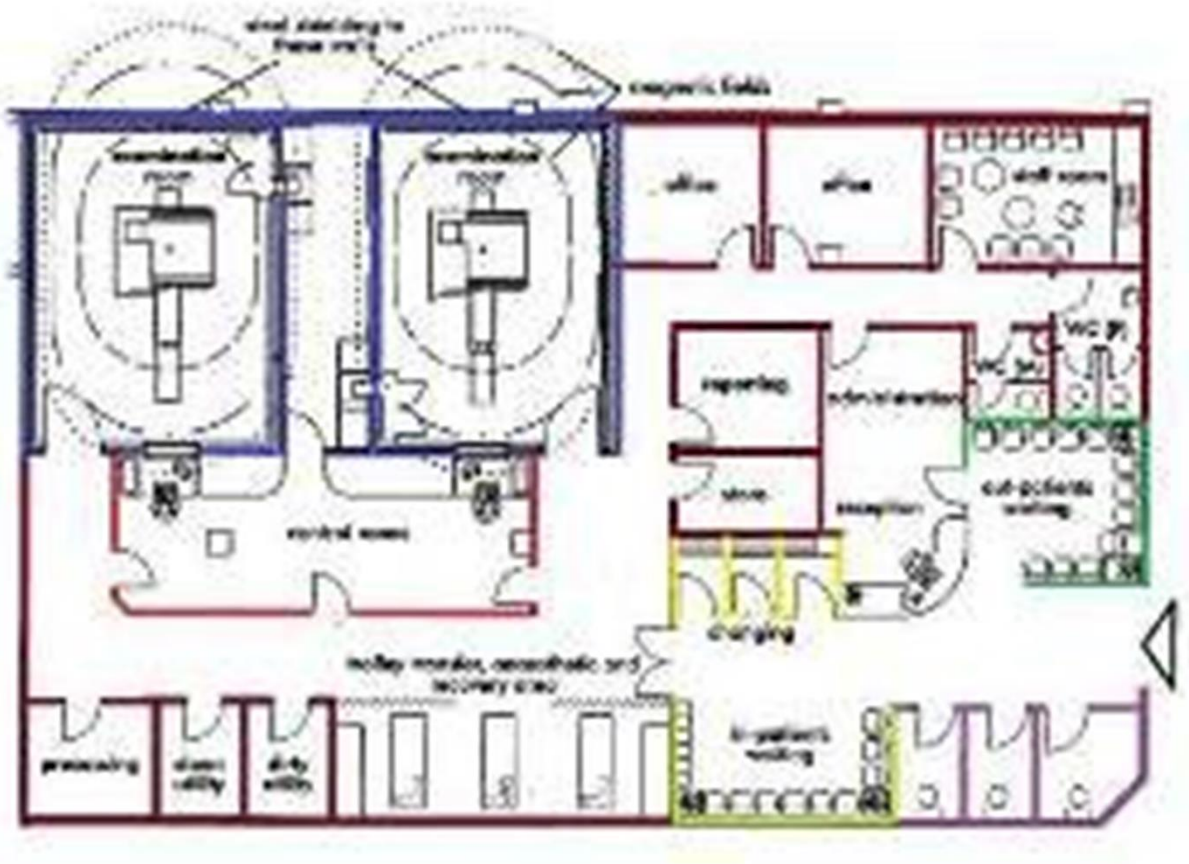
Most X-ray processing now makes use of daylight processing, and processors can be sited within the staff areas or within general circulation space, which can help to simplify circulation. and to create a more compact staff working area

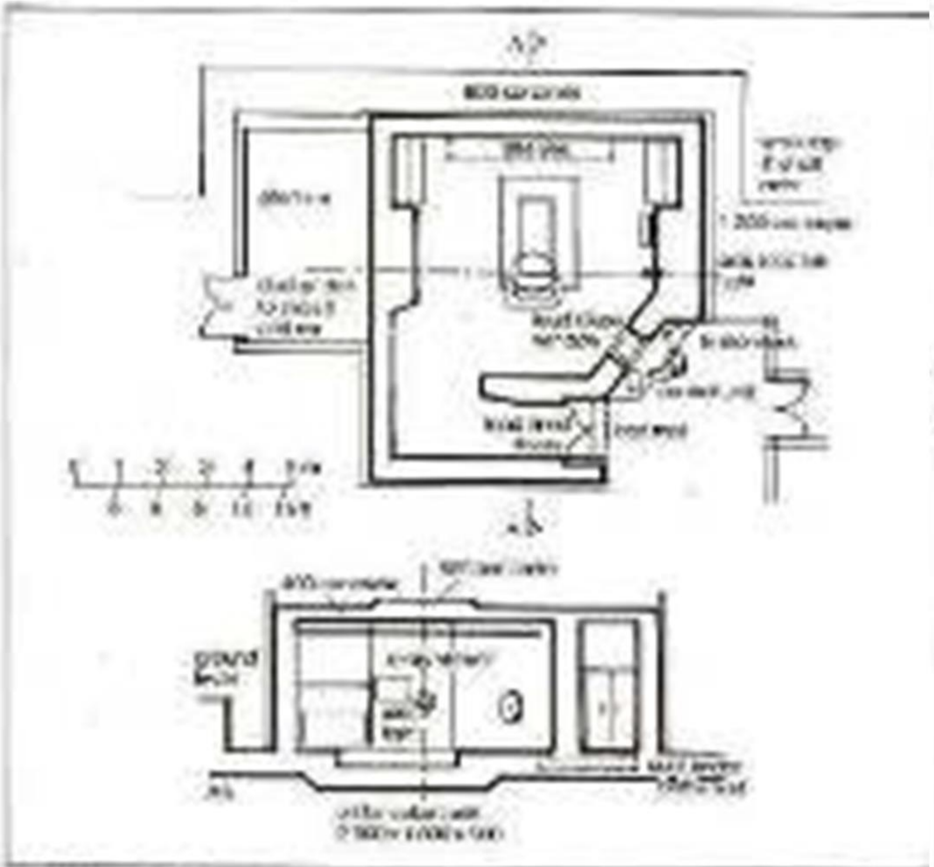
However, some specialist investigations may make use of cine film, and for these a small dark room needs to be provided.

Magnetic Resonance Imaging [MRI[

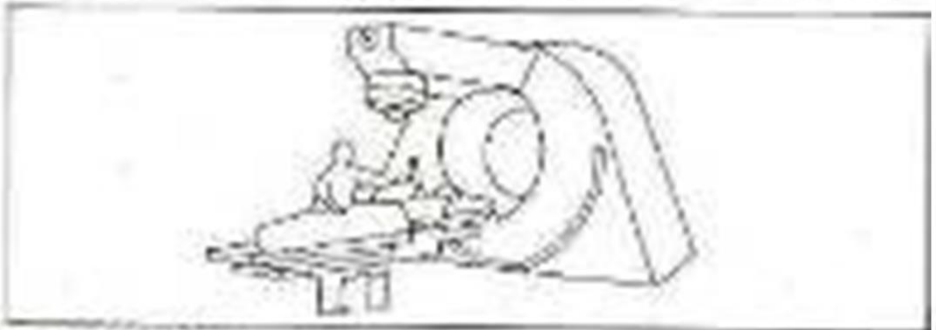
Protection from magnetic fields in magnetic resonance imaging [MRI] studies initially depended on the provision of sufficient area around the magnet for the strength of the field to fall .off

However, current trends are for the use of lower tesla magnets and for protection from the magnetic field to . be built into the machine

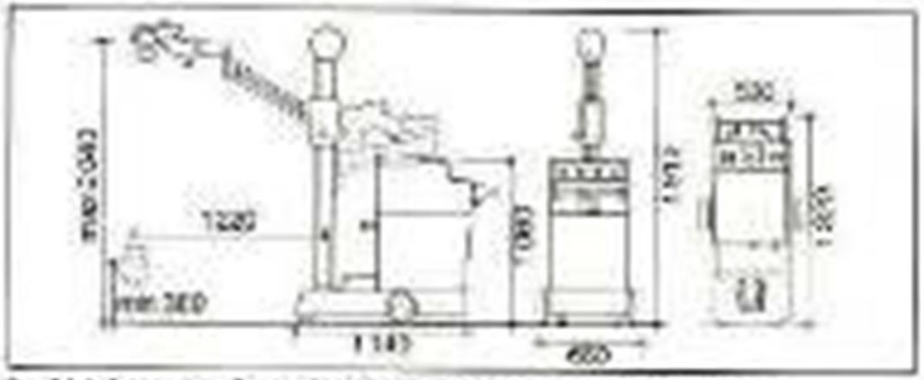




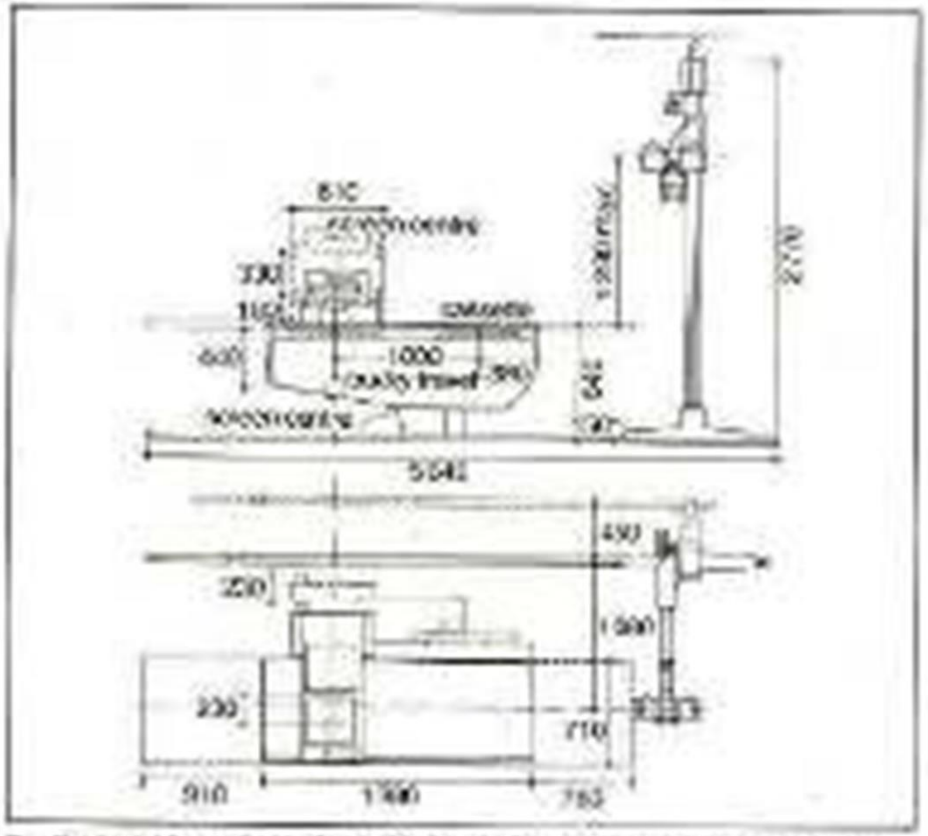
3 Cobalt unit for radiotherapy Pembury England Arch S.E Thames RHA



4 Typical cyclotron



1 Mobile x-ray unit; can be power or hand driven: weight 590 kg



2 Bucky table: min 1 required with floor/ceiling tubestand min 3000 max 4000