August 2006

Physical Plant: A Guide for Space Utilisation Professionals

Probably the largest fraction of the cost of implementing the *Physics Practicals* involves changes to our physical plant. Here we try to discuss our plan in a way that allows input and cost estimates from architects and other professionals in space utilisation.

What We Have

Compared to cognate Departments in North America, we are very rich in the total amount of space devoted to our current laboratory and related functions. Figure 1 shows a floor plan of the 1st floor of McLennan Labs. As shown in the figure, the labs plus office and work space related to the labs occupy almost the entire area.

The area marked *Labs* contains:

- Two large rooms, 125 and 126, separated by a cinderblock wall.
- Four small rooms, 125B, 125F, 126B and 126F.

The areas marked *Office and Preparation* contain office space and work space for:

- The supervisor of Physics Undergraduate Services and four undergraduate technologists
- Five academic staff members of the Physics Teaching Group
- The 1st Year Undergraduate Administrative Assistant

These areas also contain:

- A small office for Teaching Assistants who do not have an office in the building.
- A meeting/seminar room

The utilisation of the *Office and Preparation* areas evolved historically, and is currently not very efficient. We hope that the plan will include a rationalisation of the space.

What We Want

We wish to merge the existing laboratories and the tutorials into new *Physics Practicals*, using our existing laboratory space. Each student will attend a 2-hour Practical every week. With a total enrollment of about 1500 students, this will require that we have two Practical sessions every day.

In the Practicals students will be working in *teams* of 4 students at a *pod*. Figure 2 shows a pod. As shown in the Figure, often the activity will involve computer-driven experimentation on the tabletop. The edges of the hexagonal table and the square tables are 2 feet. Thus the distance from the wall to the edge of the hexagonal table is 2.27 m (7.46 feet). This distance must be no less than 2.2 m (7.2 feet).

We wish to sub-divide the laboratory space into six Practical rooms. Each room will have:

- 8 pods
- Workspace at the front for the Teaching Assistants
- Perhaps a cupboard for equipment storage.

Thus when in session each room will have 32 students and two Teaching Assistants.

Figure 3 shows what a room might look like. Not shown are two of the four walls.

Some decision considerations for the rooms that we feel are important are:

- Good controllable lighting, so that the room can be fairly bright or fairly dim depending on the need.
- Good acoustics so the entire group can engage in discussions when required.
- At least partially glass walls so the laboratory staff can look in and the students can look out.

We will require ample electrical power and computer networking to each pod. Water service is not required.

Above we mentioned the desirability of rationalising the *Office and Preparation* space . As part of that process, it would be very desirable to change the outer South facing doors of the North Wing, currently always locked, to become a primary access for students to the Physics Teaching Group area.

Designing in Flexibility

It is certain that other uses of the space will be found, both in the short term and the long term. We have given some thought to these issues.

Short Term Flexibility

From time to time we may wish to use one of the new rooms for a seminar or for a conventional class. If each hexagonal table is constructed of two trapezoids as shown in Figure 4, then we can re-arrange the furniture for either of these uses fairly trivially. Figures 5 and 6 show how the room might look for these uses.

Long Term Flexibility

Performing major re-designs of a physical space with cinderblock walls is always an expensive, messy and time consuming operation. We are very impressed by movable wall systems, such as used for the offices of the Faculty of Arts & Sciences Office of Planning and Information Technology, 3rd floor East of Sidney Smith. Using such a system for the walls of the new rooms would allow us to re-configure the space in a few days.

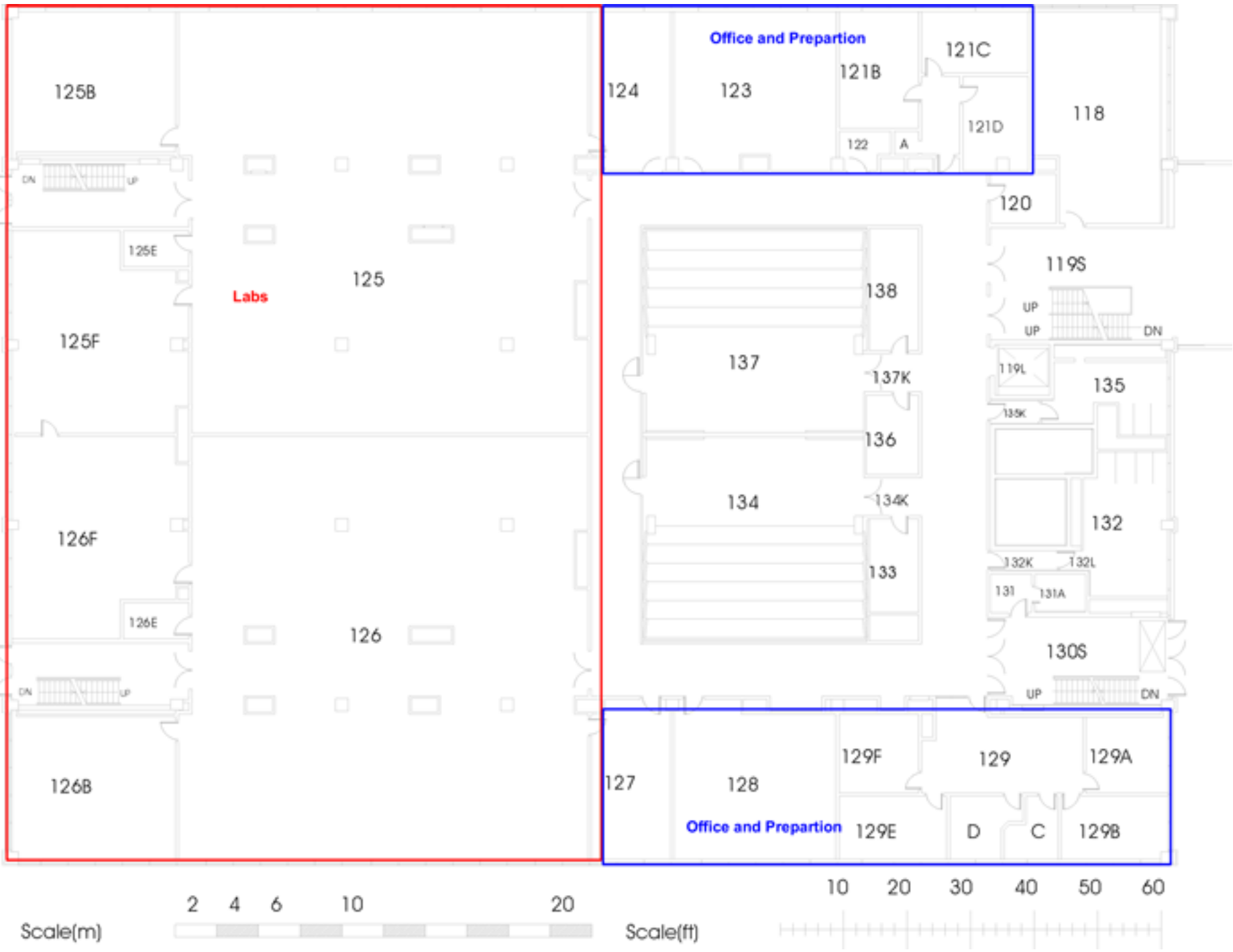

Figure 1: Current Configuration

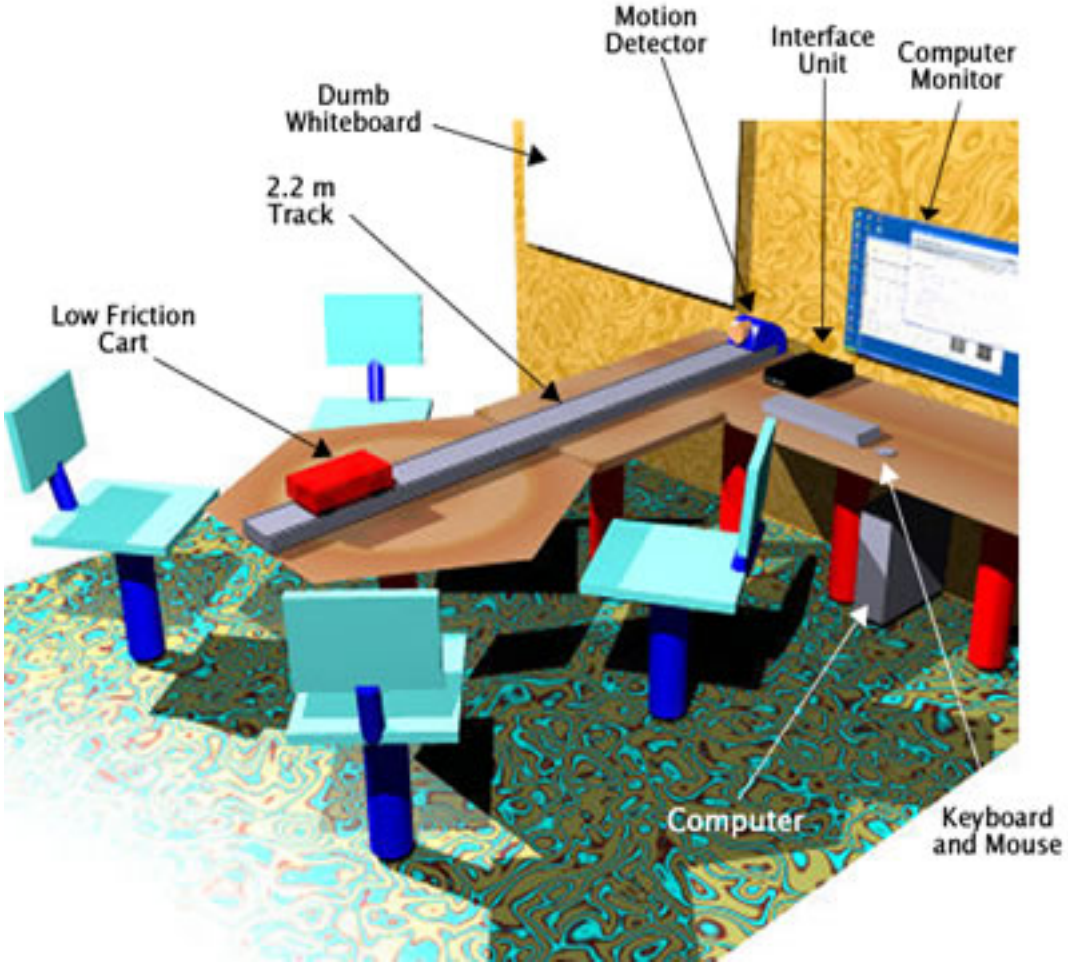

Figure 2. A pod

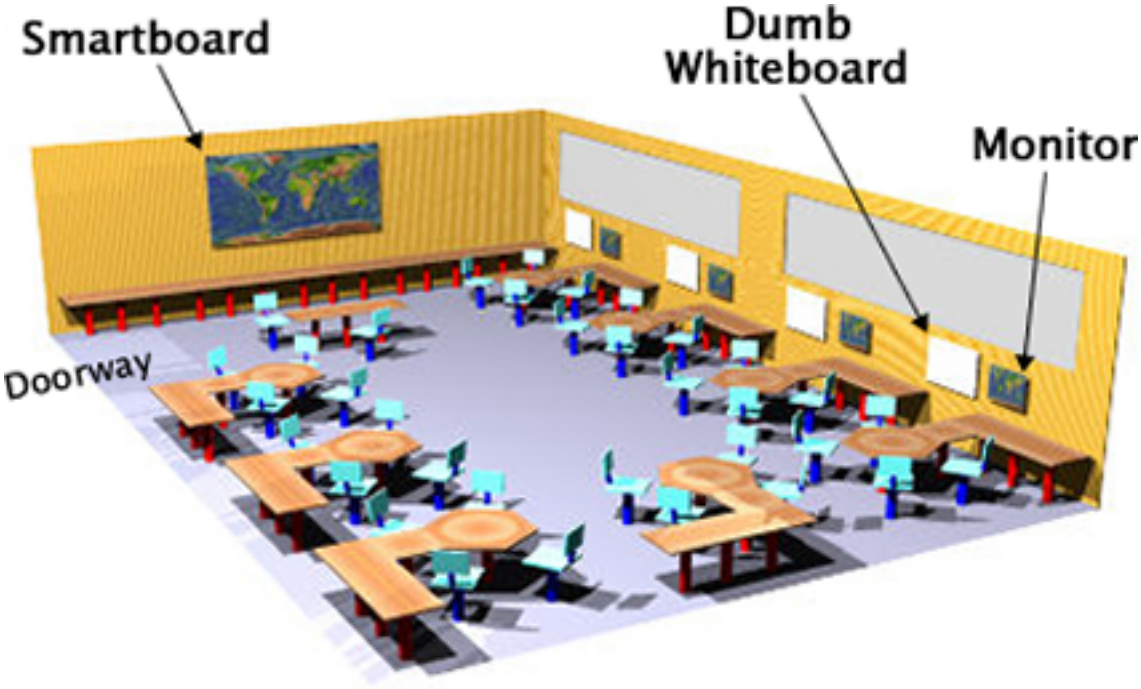

Figure 3. A possible room

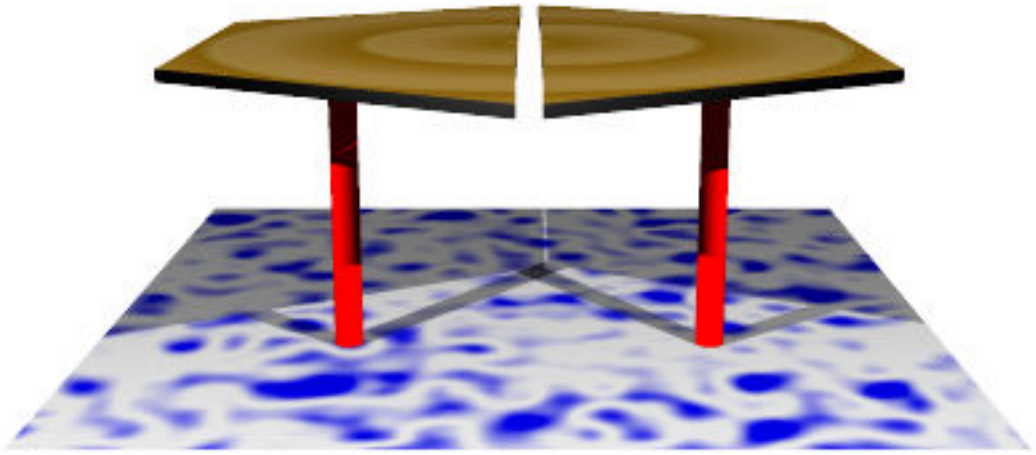

Figure 4. Hexagonal tables are split

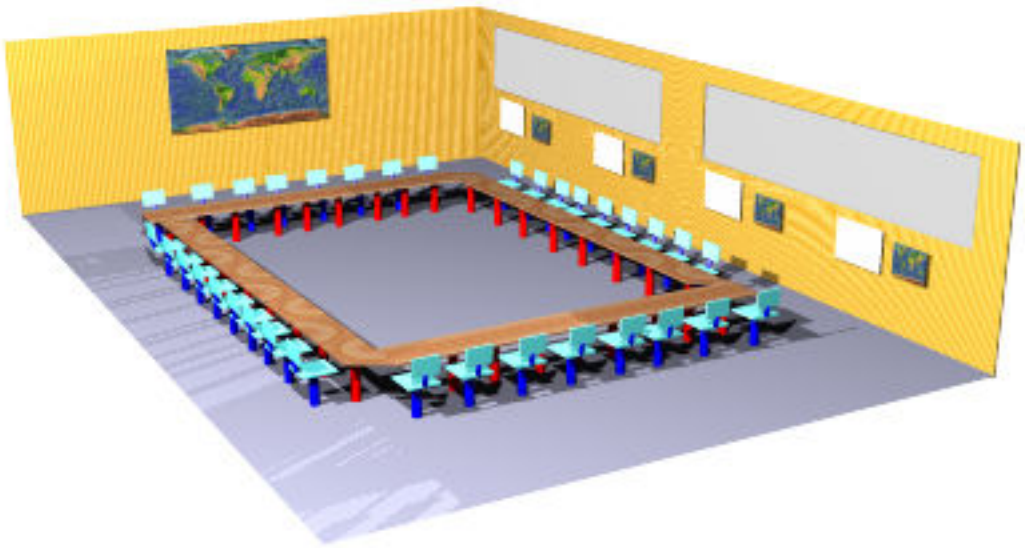

Figure 5. The room configured for a seminar

Figure 6. The room configured for a conventional class