

Change. It's a given in today's global marketplace. For researchers in today's laboratories, the pressure for change can originate from a number of sources: changes in staff size, outmoded facilities, regulatory changes, infrastructure deficiencies....to name a few.

When considering how to meet the need for research facilities, renovation is an option worth exploring. Here are some tips about how to undertake renovation cost-effectively and wisely.

- At the outset, understanding your impetus for renovation is critical. For example, your firm may find that your workgroup structure is evolving, and your facilities need to reflect this change.
- An experienced team will help. Supplement internal talent with qualified architects, engineers, and contractor personnel. Build a cohesive team with common goals, and put it into place as soon as possible. This is particularly helpful with renovation projects, which have many unknowns.
- Envision the end-product. Elements such as its anticipated life, staff size and mix, and flexibility needs are important to consider.
- Do not set an overly low budget. Try not to lock into a number too early but if you must, try to include contingency factors. Cost-effective strategies are accommodating the most complex function in the most flexible space; developing a clear view of how much areas, and how many systems, will be affected; and including a line-item for deviations and contingencies.
- Once you have done these things, then you want to analyze the suitability of your existing facility for renovation. This will minimize cost overruns and surprises. You also want to investigate the facility's functional arrangement - elements such as foot print, floor-to-floor heights, circulation systems, and more. Hazardous materials, such as asbestos, also need to be identified early, as they can add significantly to renovation costs.

A written plan should be developed which synthesizes your goals, people projections, and major facility constraints. The scope of the proposed project should be spelled out clearly.

Laboratory space need are typically driven by both the number of people and major equipment characteristics. Typical bench lab space can be projected based on linear feet per researcher, whereas analytical lab and pilot plant space is more often based on major equipment used. You will need to quantify the number of personnel by type and functional unit. Modularize lab requirements based on function, and then modify modules based on existing facility constraints. Whatever module you select, it must accommodate changes in function over time.

Don't forget to consider structural and mechanical/electrical/piping systems at the same time.

You should also address issues such as open vs. closed office space and support needs. Many firms believe that the opportunity to interact with peers is a crucial element in design.

At this point, you will want to translate your goals, data, and criteria into two- and three-dimension CAD-generated options. You should involve key user groups in the process.

Renovation is always going to involve compromise. The key is to make rational compromises and to observe aesthetic

considerations throughout the project.

Finally, try to anticipate surprises. Researchers will suffer disruptions, the contractor may uncover unknowns, and delays will occur. Build flexibility into your schedule and budget. It is also helpful if the person who represents the organization has the authority to proceed in the face of surprises.

The test of any renovation is how well the renovated facility holds up and meets your needs in the years ahead. With careful planning and creative strategies, renovation can be a successful and cost-effective way to meet changing R&D needs.