

Introduction:

Energy improvement projects are construction projects, and successful scheduling is part of any successful construction project. If you cannot stay on schedule, then the owner may be dissatisfied, construction seasons and funding deadlines may be missed, and other problems are likely to result.

There are many people who will affect the construction schedule, and they should all understand the importance of scheduling. The scheduling process, concepts, and concerns should be shared with team members, including the owner and the construction manager.

When planning a construction project, it is important to realize that the project will take a relatively long time from the first idea to the final paperwork, and that the time spent doing the actual construction work is a relatively small part of the whole process.

The following are case studies of two projects that took longer than expected (pages 2 and 3).



Sample Project 1:

This project took almost three years from completion of the energy audit to finish, but the time for the actual construction work was only six months.

| Date Completed | Task | Duration | Reasons for Delay |
|----------------------|---|-----------------|---|
| February 28 (Year 1) | Energy audit complete | | |
| January 30 (Year 2) | Workscope selection, owner approvals, design firm selected and contracted with. | 336 days | The board only met once per month. Decisions sometimes had to wait a month or longer before getting on the agenda and getting voted on. |
| August 28 (Year 2) | Design completed and bids out. | 210 days | The construction manager slowed the process, challenging and re-challenging calculations provided by the design team. |
| December 1 (Year 2) | Award bids and sign contract. | 95 days | The electrical contractor determined that the electric service was not sufficient and had to be upgraded. |
| December 21 (Year 2) | Obtain building permit, order long lead time items. | 20 days | |
| March 1 (Year 3) | Materials delivered and contractors start work. | 71 days | The boilers had to be changed when they did not affect the heating season. |
| September 1 (Year 3) | Construction complete. | 184 days | |
| October 2 (Year 3) | Testing, punch list completed, project closeout. | 31 days | |
| | Project total | 947 days | |

Sample Project 2:

This project took over one year from completion of the energy audit to finish, but the time for the actual construction work was only about 70 days.

| Date Completed | Task | Duration | Reasons for Delay |
|----------------|---|-----------------|---|
| September | Energy audit complete | | |
| March 1 | Workscope selection, owner approvals, design firm selected and contracted with. | 150 days | |
| May 1 | Design completed and bids out. | 60 days | The engineer had other projects which needed to be completed first. |
| June 30 | Award bids and sign contracts. | 60 days | Delay in the contract being signed because of the need for board approval, the board only meets once a month and questions were raised the first month. |
| July 7 | Obtain building permit. | 7 days | |
| July 23 | Submittal approvals, order long lead time items. | 16 days | |
| October 1 | Materials delivered, contractors start work, furnaces installed and tested. | 70 days | A change order was submitted to change the location of the gas heaters in the apartments to avoid interference with the cable TV connection. Another was required to provide vent extensions to compensate for the thick walls found during installation. |
| October 20 | Punch list completed and project closeout. | 19 days | |
| | Project total | 382 days | |

There are many phases before and after the construction work. Some of the non-construction phases of a construction project are: owner's choosing of measures and funding sources; obtaining funding; design development by an architect, engineer, or other design professional; obtaining permits; selecting contractors; ordering materials; arranging the schedule for work in people's apartments; inspections; testing; commissioning; training of building staff; warranty period; monitoring; and project closeout. These phases do not always occur in the same order.

It is important to be realistic about the time required for each step in the process. Some projects must be done during a certain season or time of year, such as replacing a heating system during the summer. Some tasks that appear simple and straightforward, such as waiting for a delivery of specially ordered materials, require large amounts of time.

Anticipate what is required for the next step, both in terms of time required and tasks that need to be accomplished. For instance, owner approvals can take a long time if the decision makers only have meetings once a month.

Choose reliable contractors. This is very important for controlling schedule. Ask for bids only from companies that have performed similar work successfully, and check references for on-time completion and customer satisfaction. Make sure that the contractors who you are asking to bid can meet the requirements for insurance coverage, labor laws, and licensing. Dealing with unqualified contractors is likely to result in delays, poor quality, and unforeseen expenses.



Set a professional tone with the project team members, including the owners, financing agencies, designers, construction contractors, and residents. Develop a realistic schedule based on the time that all the separate tasks require, and communicate it to everyone involved. Be clear about your expectations and confirm that everyone is in agreement with the schedule. If unexpected circumstances arise, communicate clearly about the effect that this will have on the schedule.

Communicate with the project team frequently and in a constructive manner.

Do not assume that everyone knows what they need to know. Over-communicate. A good project manager is the central point of communication between all the stakeholders in the project, such as the owner, the tenants, and the contractors.



Confirm that things are proceeding as planned. For example, if a boiler needs to be ordered, then confirm the following milestones: Was the boiler ordered? Was the order received by the supplier as evidenced by a confirmation email, web page, or paper receipt? What is the date that the boiler is expected to be delivered? Was the boiler shipped, and on what date? Was the boiler received? Was the boiler inspected upon receipt to confirm that it is the correct item and is undamaged? Frequent follow-up can be done without much effort, and is the key to projects staying on schedule. As soon as you complete follow-up on one step, schedule yourself a reminder to follow-up on the next step.

Attention to detail is important. Do not take anything for granted. For example, if you are ordering light fixtures, what color finish is specified? If the wrong item arrives, it will have to be returned and re-ordered, causing a delay.



If schedule is a priority, then you must prioritize it, as simple as it sounds.

Adherence to a strict schedule is more important for some projects than for others. For example, a delay in completing work is more disruptive for a summer boiler replacement project than for a parking garage lighting replacement project. There are always trade-offs when choosing how to do a project. You might select a contractor with a large office staff and a large workforce who may be able to schedule more precisely, or you might select a small contractor because they will give your job their full attention. You might select a contractor for low price and then schedule the work to fit their availability, or you might pay overtime to have work performed during nights and weekends. You might select readily available materials so that there is no concern with special orders and long lead times, or you might select special materials and build the schedule around when they will be available.

Refer often to the schedule when communicating with the project team. For example, if you are hiring an engineer to produce plans for contractors to bid on, be clear that there is an expected date for the delivery of the final plans and be clear that a delay in completion of the plans will cause a delay in completion of the project.

Include a schedule of dates in construction contracts for starting and finishing work.

Consider incentives for completion ahead of schedule and penalties for late completion.

Setting a realistic schedule and frequent follow-up about the schedule during the course of the project will help achieve the goal of on-time completion of your energy project.

