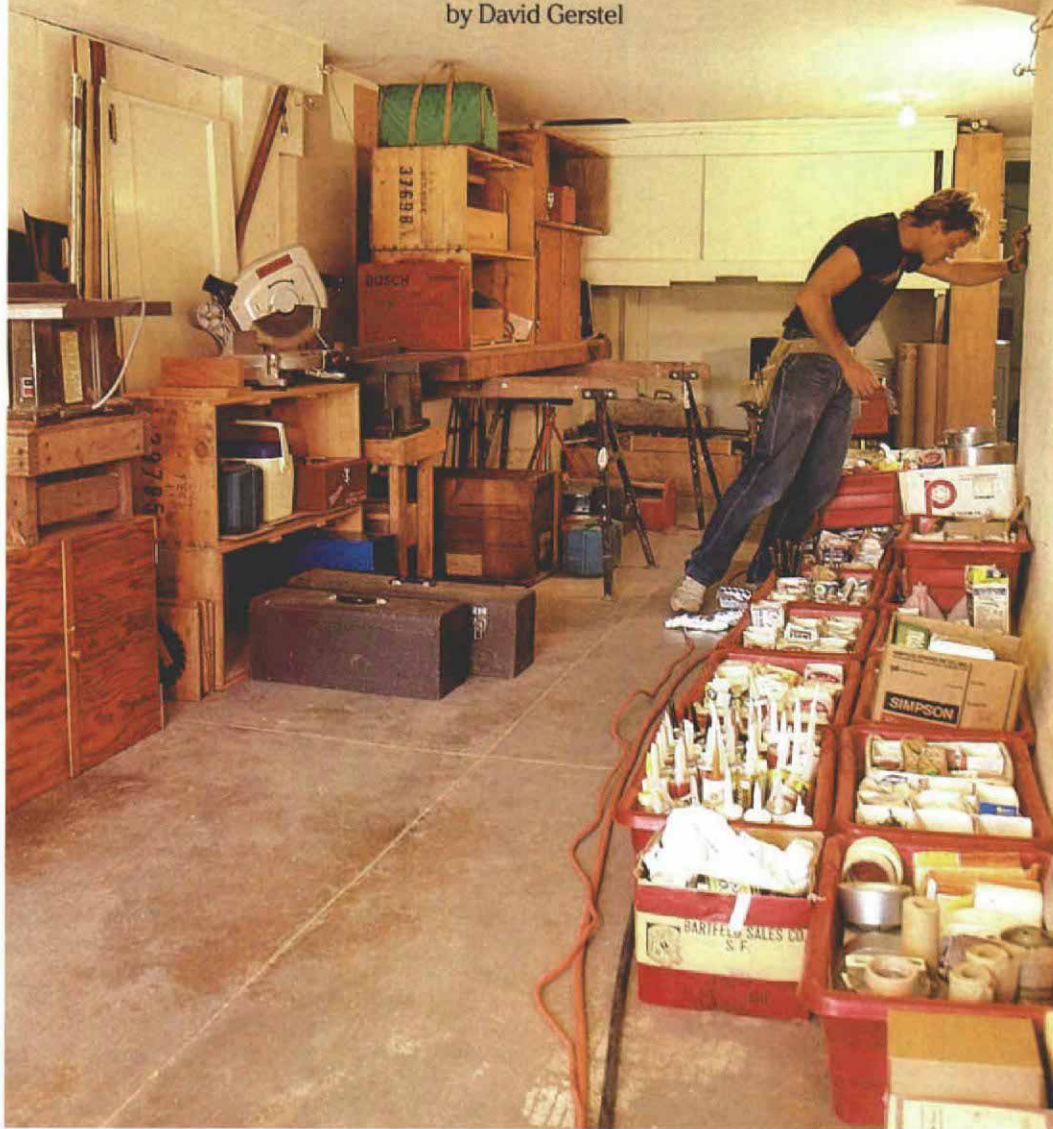


Organizing the Project

How one builder creates order at the job site

by David Gerstel



Workers are often blamed for poorly constructed buildings. But I think the builders in charge have to shoulder at least half of the blame because of their bad management practices. Construction sites sometimes tell the story at a glance. I've seen some that resemble public dumps, and others where crews stand idle for lack of materials.

I must admit that once my crew and I have a project underway, we are sometimes tempted to neglect the supportive tasks not directly connected to building. We might want to postpone daily cleanups, stacking materials in rational piles, storing tools and taking measures to protect the client's property. These chores seem to be a distraction from the making of floors, walls

and roofs. But though they may appear costly and irksome at the moment performed, in the long run they are well worth doing.

It is hard to pin down the amount of time workers lose stumbling over debris or digging through sloppily stored materials on a messy site. But I suspect the loss exceeds the cost of keeping the site in order, considering that good site maintenance is necessary for good workmanship, that good workmanship prevents callbacks, and that callbacks can take a substantial bite out of a small company's profits.

Project warehouse—To control the array of equipment and supplies used in residential construction, builders need a coherent storage sys-

tem. When my crew and I first set up a new site, we organize a mini-warehouse (photo above). On a remodel, the "warehouse" will likely be the client's garage. Along one wall we place our tools, using heavy wooden crates as modular shelving. Each carpenter gets room for his tools, and company tools are stored in another space.

Along the opposite wall, we organize our supplies. Fifteen buckets each hold a different type of nail. Fifteen plastic bins (Tumkey Material Handling, Inc.; P.O. Box 2000, 36 Letchworth St., Buffalo, N. Y. 14213), some sectioned with half-gallon milk cartons, hold various categories of hardware. One bin is for joist hangers, straps and similar framing hardware. A sectioned bin holds different types of screws, tacks and sta-

Protecting the clients' house

If we are working on a remodel, we begin the job with a series of protective measures. We cover heating registers exposed to debris with window screening. It keeps the big stuff from falling into an inaccessible run of ductwork, yet allows the heating system to operate. Over the floors, we tape down a double layer of kraft building paper. If one layer tears, the other still provides protection. In areas of heavy demolition we top the kraft paper with sheets of plywood.

To seal off the areas of the house that are occupied by the clients, we stretch polyethylene curtains across passageways. To protect the walls, we cover them with polyethylene sheets attached with duct tape or stapled to wood strips held in place by small finish nails. The holes left by the nails are almost invisible, and easily patched.

At the outset of a job we establish a dump area for waste and debris, which we keep covered with an opaque tarp. When the dump pile grows to a pickup truckload, we have it hauled away. Recently we invested \$400 in a Milwaukee industrial vacuum that keeps the site free of the fine dust stirred up by brooms.

Before any demolition begins, we remove doors, windows, trim, hardware and accessories. Since we may reuse the trim, we bundle related pieces (all the casing from one window, for example) into packages and label them. Hardware and accessories we store in a bucket. All the salvaged items are assigned a corner in the warehouse, where they remain until the job is done. That way, we never find ourselves grieving for a piece of molding or a latch that was dear to the client's heart and has now disappeared into the whirlwind of demolition and framing.

Builders who reduce their clients' pain of cohabiting with construction work will find the effort worthwhile. Instead of disgruntled clients calling to complain, the friends of pleased clients will be calling for the builder's services. Many owners have had their properties trashed by careless

builders, and will appreciate considerate builders. The tidiness of our sites is the feature of our work that clients and visitors most frequently comment on. It seems that they cannot judge the quality of the carpentry, especially the rough work, but take assurance from the neatness of the site that the construction is also done with care.

When we do new construction, we extend to neighbors the same consideration we give to remodeling clients. Realizing that a messy construction site is a neighborhood blight, we keep ours neater than concern for efficiency might call for. The neighbor of every construction project is a potential client. And honestly, we can't stand working in a mess. —D. G.



Gerstel protects floors with a double layer of kraft paper, and walls with polyethylene sheeting stapled to wood strips. If walls and ceilings are to be removed, he puts down a layer of plywood on top of the kraft paper, and duct-tapes the seams.

plies; another holds various tapes: duct tape, plumber's tape and drywall tape. At each site a few bins are set aside to store hardware ordered specifically for that project.

When we shift our supplies around a site or to the next project, the buckets and bins move and stack readily. Most important, they sharply reduce our "go-fer" runs. On many building sites, go-fer runs are a daily occurrence. We go weeks between runs. Our buckets and bins act as an inventory system, giving us advance notice when we are about to run short of a stock item.

As buckets and sections of bins near empty, we note the items on a "needs" list and phone them in to our supplier, for delivery with our regular loads of lumber, drywall, doors and

hardware. Occasionally we do have to schedule a separate delivery for depleted hardware and miscellaneous items. Our suppliers will have their drivers drop off a small load for \$10 or \$15—less than the cost of a trip to their yards. Rarely does one of our crew have to break stride to leave the site for supplies.

Care of the clients—When remodeling, we take steps to protect the clients' home from our work (sidebar, above). At the outset of a job I introduce the clients to the crew and, as they appear, the subcontractors. I frequently discuss details of the project with the clients. But I've found that because of the complexity of construction, clients often lose track of their respon-

sibilities. So early on I also establish a "communication corner," say the fireplace mantelpiece. There I keep a manila folder in which I can place notes and lists of tasks for the clients (choose plastic-laminate color, select tile, get towel bars), and where they can leave me their questions and instructions.

When the job is about one-third complete—the frame is up, rough plumbing is in and work seems to be flying along—I offer the first caution against what a builder friend calls the "90% blues." At this point I warn the clients that the job will seem to come to a standstill. So while they enjoy the swift changes of the rough-in, they should also brace themselves for the long haul of the finish work. I'm never sure the advice does my clients much good, but it helps me to keep the faith during those last phases of the job when it seems that for every detail scratched from the final punch list, three more are added.

Keeping a project on track—Well-organized builders spend much of their day putting items on, and scratching them off, lists. Good lists map a project, so that a builder can complete it with a minimum of missteps. In designing a set of lists, the important considerations are these: Which lists should be kept? Which are redundant? How do master and subordinate lists feed each other? Who should make the various lists—job foreman or contractor? Where are they kept?

Keeping lists is an acquired taste. Often it does not come easily to contractors and carpenters, a freedom loving and hell-for-leather bunch on the whole. One carpenter I worked with hated my list making so much that he not only refused to keep the lists I requested, but nagged other carpenters to refuse, also.

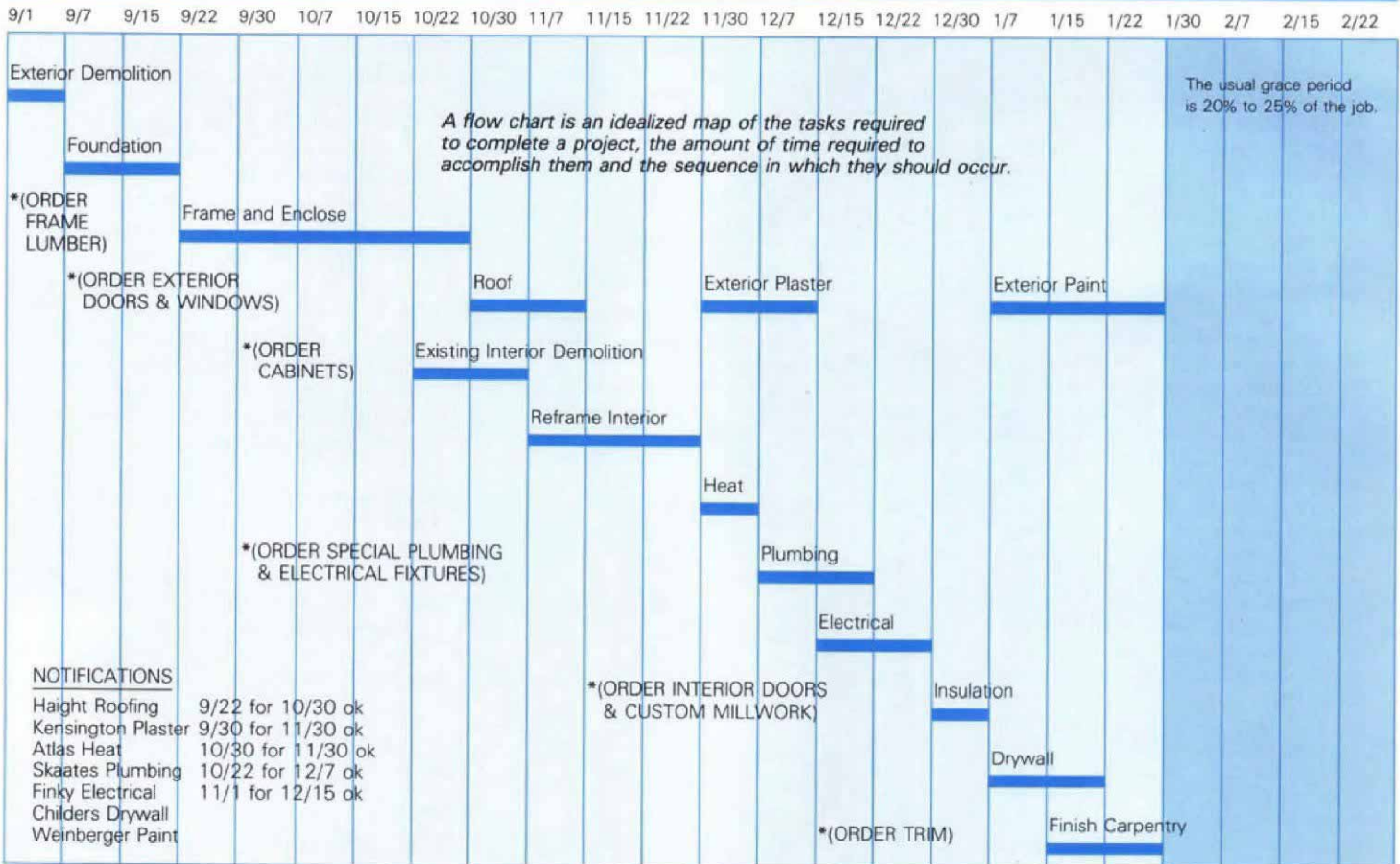
We, however, like our lists. Now that we have cultivated the habit of keeping them, my crew and I comfortably depend upon them to keep our jobs on track and tightly organized. Each detail of construction is effortlessly and automatically noted in a logical place. It does not disappear into our overcrowded memories but is attended to in due course.

The lists—List making for a project starts as soon as I begin negotiating for its construction. I set up a manila folder for the project's paperwork. On the folder's inside flap, I write the phone numbers of the client, the architect, engineer, building inspector and anyone else with whom I will be in constant contact.

Next, I make what I call my "Do" list. I fold a sheet of typewriter paper the long way and clip it to the inside of the folder. At the top of the sheet I write "Do." Underneath, I list the items I must take care of to keep the project tracking smoothly. My first "Do" list includes all the steps of generating an estimate for the project.

The estimate includes all the steps of construction arranged in sequence and serves as a basis for writing the flow chart for the project (chart, next page). With a glance at the flow chart, I can tell exactly when my subcontractors need to begin and end their work, so that we can complete the project on schedule. A corner of the chart serves as a convenient place to

Flow chart



keep track of notifications to subs. I also use the chart to note deadlines for ordering supplies not readily available at the lumberyard in order to avoid bottlenecks in the job.

Here I've shown a portion of a flow chart for a \$200,000 residential remodeling project that included a three-story addition, deck, wine cellar and extensive interior work. The project was organized to minimize disruption of the client's life, so I scheduled the shell of the addition to be completed before we touched the existing interior. Note that the critical elements of the job—namely those which must be completed before others can begin—step down the chart from left to right. Non-critical items (those which could be fitted in at various stages of the job without upsetting overall progress) are placed outside these steps. I also flag items that must be ordered well in advance by bracketing and capitalizing them.

The grace period included at the end of the flow chart is especially useful with contracts that carry a penalty for delayed completion of the project. Nothing takes the satisfaction out of a job or erodes quality like the pressure to rush to completion. A grace period acts as a pressure release valve.

Calculation of a grace period is not guesswork. Instead, all the delays that can occur in a project, such as the plumber arriving to begin rough-in two days later than optimal, are estimated and added up. The total, or some reasonable portion of it, is the grace period. In my ex-

perience, grace periods are 20% to 25% of the estimated length of the job.

The flow chart and "Do" list are kept in a folder in my briefcase. A second set of lists comprises what I think of as my "shirt-pocket office." In my shirt pocket I always carry two small notebooks. One is a month-at-a-glance calendar with a day-at-a-glance calendar, made of a sheet of typewriter paper, clipped to it. The other, a small looseleaf binder, contains questions and points of information. It has a page for the major individuals—the client, the foreman, the plumbing sub, the architect and so on—associated with each ongoing job.

At the job site is a third and final set of lists, kept by the foreman. The most important of his lists is the sequence/takeoff list, which records in chronological order each carpentry operation and the materials needed for it.

Rather than make a separate sequence/takeoff list, some builders give their estimates to their foreman, who uses them as a construction guide. My carpentry estimates, however, are done in quite large units—so many board feet of 2x4 for all exterior walls, for example. The foreman needs more precise units—so many 14-ft. and 20-ft. 2x4s for first-floor sills and plates.

Before the job begins, I work from the estimate to list the carpentry operations. On small jobs I list every step in the project. On large jobs I delay finish lists till the rough work is nearing completion. I leave ample room between each item for the foreman and me to make additions

and notes on technique. He completes the list and does the detailed material takeoffs.

In the past, I did the detailed takeoffs. But the foreman finds the procedure helps him to acquire the same grip on the project that I got by doing the estimate. Moreover, we have both learned that material deliveries rarely correspond exactly to site needs. The foreman has found he can more readily make field adjustments when he is the author of the takeoff.

During the workday, the foreman usually keeps the sequence/takeoff list close at hand in an aluminum forms folder. Along with it he keeps a running list of needs for our on-site warehouse and a list of questions and observations that the crew has for me during my daily visits to the site.

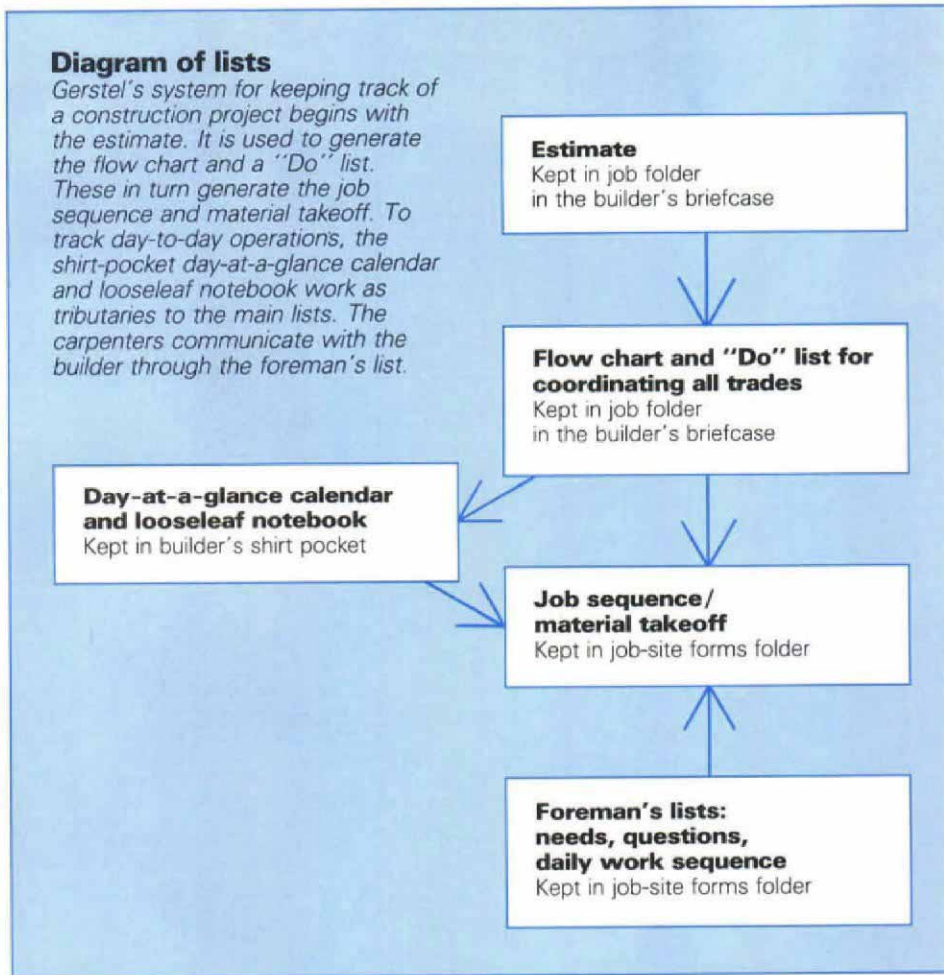
Now, the challenging aspect of our list system: using it.

Linking the lists—One friend who read an early draft of this article told me that she identifies with the carpenter who refused to keep a list. It all sounded dreadfully compulsive. I'd better illustrate my explanations with cartoons, she advised, or be dismissed as a hopeless neurotic better suited to a career as a statistician than a builder.

Without denying the charge, I'd like to observe that the good builders I've known all share a certain instinct (compulsion?) for order. Diligent list making requires that. But it is also true that once the system and the habit of using it are

Diagram of lists

Gerstel's system for keeping track of a construction project begins with the estimate. It is used to generate the flow chart and a "Do" list. These in turn generate the job sequence and material takeoff. To track day-to-day operations, the shirt-pocket day-at-a-glance calendar and looseleaf notebook work as tributaries to the main lists. The carpenters communicate with the builder through the foreman's list.



established, the lists are used automatically. In fact, they prevent the "oh my God, I forgot to call for an inspection" panics that yank builders out of sound sleep many a night.

Lists must not only be complete but must be used in a systematic relationship to each other. They must form a complete net, not one with gaping holes so that items fall between lists and are forgotten. The relationship of our lists is described in the chart above.

I usually begin my day with a look at my shirt-pocket calendar. Frequently I rewrite it quickly to make sure I have the day's tasks arranged in the most efficient order. Generally I have phone calls to make and appointments to keep in the morning. As each is completed, I scratch it off the list. All devoted list keepers know the great satisfaction of scratching off. One builder I know actually lists items that could be left to memory in anticipation of the fun of putting a line through them when they are done.

By always having the small looseleaf in my shirt pocket along with the calendar, I ensure that I do not lose track of important questions and ideas. My best ones arrive at odd times, like when I'm bellying around in a crawl space or reading the sports page at lunch. With the looseleaf handy, I can jot them down for the appropriate person before they flee from memory.

When the morning's work is complete, I head for the job site and again consult the day-to-day calendar for the items I need to attend to there. I walk about the site, talk with subs and look

over the work. As I do, the looseleaf binder goes in and out of my pocket. In checking it for questions that need to be asked or recording additional questions as they come to mind. If I pause to make a phone call to the architect, inspector or a supplier, I open the looseleaf and check it for questions again. Checking my notes saves me those hasty and embarrassing redialings to ask the question I forgot to ask the first time we were talking.

During my visit to the job site, I check my flow chart. A flow chart is, of course, an idealized sketch of the way a job should proceed, and must therefore omit innumerable details. On every project the chart must be fitted to reality. For example, the flow chart here shows roofing work occurring before exterior plaster. In fact, part of the roof work—namely the gutters—could not be completed until the stucco contractor had finished. Such variations from the chart as well as the finer details of the coordination of the subcontractors' tasks are filled out on the "Do" list as the job proceeds. I frequently add to and refine the "Do" list during my daily visit to the site. As I make adjustments during a project, I take care to stay with the original flow-chart pattern of scheduling subs sequentially, not simultaneously. Some years ago, I stuffed plumbing, electrical and heating subs along with carpenters into a 12x15 bedroom/bath remodel. The resulting havoc taught me to spread the subs out.

At the end of my daily visit to the site, I talk

with the foreman. We trade questions and answers from our various lists, and as required we add items and notes on procedure to the sequence/takeoff list. As I leave the site, I consult my calendar for the next task.

The day-to-day calendar is for six days only. I know that if I let it, the construction business will keep me going every waking hour. I do insist on one free day a week.

One project at a time—We work on one project until it's nearly complete before we move to the next, rather than work on many jobs at once. A competitor of mine recently dissolved his company in frustration and bitterness with the building business. Looking back on his career as we stood chatting one day, he thought he had probably made his wrong turn when he expanded to multiple crews in hopes of big money.

The temptation is there, and sometimes I wonder how much income I have sacrificed by staying with one crew on one project at a time. Maybe none. One project run to maximum efficiency can net more than several run poorly. And the chances of a disastrous loss are less. A project that is badly estimated or bogged down because of inadequate attention from a contractor stretched thin over multiple projects can bury a year of earnings.

The rewards of running one project at a time go beyond financial. I enjoy a large measure of the personal freedom that drew me to the life of the builder in the first place. I'm not running about putting out fires and working to exhaustion. I have time to do my builder's work carefully, and I also have time for hobbies and friends. I'm not an office-bound estimator and money watcher, known to the craftspeople only as a name on their paycheck. I stay close to the smell of sawdust and share in the camaraderie of the crew.

Perhaps one day I will want to organize a larger company. If I do, I may have to modify my practice of running one crew on one project at a time. Instead, I'll attempt to keep each of my crews on a single project until it is complete. Morale is damaged when workers are shifted from project to project as if they were utility tools to be shared around the company. If they stay on a project from start to finish, they'll care about it and do their best work.

After all, the ultimate purpose of management is to support good construction. In the portfolio of my own company's work, among the photos of redwood decks, vertical-grain fir trim and cherry cabinets, I have pictures of open forms with the rebar wired in place. When I show them to prospective clients, I point with pride to the accuracy of the work. Our foundation forms are square and straight and plumb to an eighth of an inch or better. That's important because finish work really begins at the foundation. It's not a bad sales pitch, but I should really say that finish work begins even earlier, well before contractor and client meet, with the development of good management practices. □

David Gerstel is a general contractor in the San Francisco Bay Area. He is writing a book on management for small-volume builders.