How to Build a House

Leading Volunteers *and* *Building Homes*

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OUTLINE

Introduction: "Service Construction"

The intention of this guidebook is to help volunteers, crew leaders, and site supervisors working with Habitat for Humanity of Tuscaloosa to maximize their capacities to lead volunteers in building homes. My hope is that it will help streamline information and establish standard operating procedures for our affiliate. I also hope that it will help us to build better houses, faster, while including homeowners and volunteers in the process.

Happy building.

I. How to Manage Volunteers

For-profit construction, for the most part, doesn't excite me. There's no life in it. It's just a job. The reason I enjoy building houses is because of the people. People make it fun. Sometimes, especially after long stretches (several weeks), of back-to-back volunteer groups I get that devious thought in the back of my mind, "Wouldn't it be nice to work by myself for a little while?" But, then, when I actually get that opportunity, most of the time it's no fun, and I don't get very much done. In the end I always have to admit that building a house with volunteers is much more challenging, much more fun, and much more productive.

In the non-profit housing business, volunteers are your most precious commodity. Yes, they are saving you about 20% of the cost of the house, but they are also adding life to the project. In a world where most things are driven by money, they aren't. They're driven by compassion. And it shows.

Show me a contractor who can build a house in a week, with their own flair and personal touches thrown in. Show me a construction worker who would voluntarily show up to work on a house on a Saturday or even a Sunday morning, in the rain, with a smile! The chances are very rare. But, in the volunteer business, these things happen all the time; in fact, they are the norm. It's a strange principle, but I've found that people will do infinitely more for something they care about than they will for money.

Treat your volunteers well – keep them safe and happy and productive – and they'll come back, they'll tell their friends, they'll write letters, they'll even send money. Give them a bad experience, however – an under prepared site, underuse them, make them feel stupid or un-needed, and they won't come back. They'll tell their friends, and they'll write letters (but not the good kind). And, they'll save their money for something else.

A. The Managing Part

Manage is a strong word. And, not a very inspiring one. "How to *Lead* Volunteers" might better represent my approach. I believe in "toolbelt management", working *with* people, leading them, helping them to accomplish a task, focusing their energy and talents to get the most out of what they have to offer. Amaze them with what they can do. That's your goal. Be invisible. Disappear. Be a member of the team -- just be the smartest, fastest, humblest, most visionary member of the team. Lead them in a way that they can stand back at the end of the day and say, "Wow, look what we did," and, "That was the best day I've ever spent volunteering."

The key to effective volunteer management is working side-by-side with volunteers. When they have what they need and know what they're doing, then it's time to back off. When they're stuck and need direction, tools, or materials, you need to be there. You should be constantly popping in and out of each task, each crew, like a waiter who's checking on customers at many different tables. Then, when opportunity allows, you jump in and go to work. This is especially important for technical tasks. Boxing in cornice, for example, may require your assistance for the first two or three sections. And,

even when the task is not technical, for example painting the porch, you will still find that productivity and quality control are greatly increased when you're able to grab a brush and participate in the process.

B. Recruiting Volunteers

In light of the last paragraph, your greatest weapon for recruitment is a good experience for existing volunteers. Word spreads fast. Repeat customers make good missionaries for your cause.

But, what to do if you don't have any? Recruiting volunteers is a long, involved process. It takes lots of work on the front end to see any results further down the road. One volunteer group can require 6 months of contacting, planning, coaching, and arranging. It's definitely a full time job.

Spreading the word among local groups is a good place to start. Churches, Non-profits, businesses, banks, hospitals, trade schools, even prisons can be "evangelized" to participate in building houses for people in need. Many churches and businesses are seeking for their next project to give back to the community. You can tap into that resource and serve them by making their service opportunity easy.

Any organization with an organized program for service can be very helpful. Schools that require service hours of their students, trade schools that require on-site training, Businesses or programs that require community service, all of these can be valuable resources when it comes to volunteers.

C. Scheduling, preparing

You can't over-prepare for volunteers. Everything you do to schedule, confirm, and plan for a successful experience will pay dividends in the end. I always try to over-prepare for volunteers, and it usually ends up just being enough. I like to try to match them with a job long before they arrive, and have at least a couple of back up plans in case plan A falls through, or in case they accomplish plan A in 4 hours instead of 4 days (which happens more often than you would think).

Your preparation should be driven by the answers to the following questions:

- **How many volunteers are scheduled to show up?** Of course, most of the time you need to account for the "volunteer margin of error", which is usually give or take 20 people.
- **What are their skills?** Four skilled volunteers requires a completely different plan than 40 unskilled volunteers.
- **What is their potential for leadership, i.e. crew leaders?** Planning to utilize their potential to lead themselves will increase your capacity and their sense of accomplishment.
- **What needs to be done on which projects?** Ideally, your planning should be driven by this question. Your number one objective is to help the volunteers to have a good, productive experience. But, they will feel most productive if they actually get you somewhere. The marriage between skills and tasks is not always a perfect match, but the more you can plug the volunteers into what you need to have

accomplished according to the construction schedule, the happier everyone will be, including you!

D. Staging, staging, staging

The more you can prepare a site, the greater chances you'll have for success. You may not be able to spend the time fully preparing for each group, your volunteers may show up back-to-back for six weeks in a row. But, the more you can do to set up the site in advance of their arrival, the more utilized they will feel.

1. The ever-powerful To-do List

Once I've selected a site for a particular group, I like to prepare with a to-do list. I like to write it on something large (usually a half sheet of plywood, or something), with a large permanent marker. Laying out this list helps me think through what tasks I hope they can accomplish. It also helps volunteers to see what the goals are the minute they set foot on the site. I also like to make a list because it helps me to think in terms of crews. I can lay out four things that are all exterior painting and put those things in brackets with the number 4 next to it to show that a crew of four could work on those things for the day.

I like to break the list into chunks that make sense (i.e. exterior carpentry, interior paint, etc.) I also like to make a marker handy so people can cross of items on the list. I like to make the list at least the day before the project. Getting it all out on "paper" usually helps me think of at least 2 or 3 things I've forgotten by the next morning.

I also find that the more specific my list is the more the volunteers can accomplish without me being present. "Touch-up cornice on NE corner" for example, will have a far better chance of actually happening than if you just write "Touch-up paint".

Lists do something for people. They see what's ahead. They know the plan. Some people, I think *most* people, like to cross things off a list. This helps everyone, including me, see progress. This also is a service to the volunteers. In essence, you're letting them know what's in your brain. There aren't any secrets. By making the list you've included them in the process, they see the big picture, they know the plan.

I'm amazed how a detailed list can maximize what we get done. When the list is in my head I invariably forget or don't get to several things I was hoping to accomplish. When the list is there, and it's well planned, I'm always amazed by how much gets done without me even having to be involved. Skilled volunteers can work down the list and get way more done than you could have told them while you were busy doing other things.

Plus, people are funny. I always like to put a bonus on the list just to throw out a little challenge. Some people go nuts trying to get to the bonus. I don't know why. But, I like it.

Post the list in a visible place (I often nail it to the temp. power pole, for example), so it can stay in one place and people can refer back to it when needed. This is a good place to have the morning pow-wow. It's very helpful for dividing volunteers into crews. I like to point out the various groupings and then quickly run through each item.

Then, it's really easy to come back to the top and say, "ok, who wants to be on the roof crew; I need about 8 people?"

The closer a house is to completion, the more important the list becomes. On day one, framing day, you may not need a very comprehensive list because everyone is framing all day. You may still want to break it down into roof crew, sheathing crew, etc. But, as you approach the completion of the house, the number of tasks increases, while the time it takes to complete each task greatly decreases. On a punchlist day, for example, you may have 50 twenty-minute jobs, and that's a lot to keep track of. The absence of a list at this stage will almost always result in lost productivity and unhappy volunteers.

2. Tools and Equipment

Making your to-do list also just gave you the added bonus of helping you think through what materials you'll need for the project. I like to simply add a "need" column off to the right of my to-do list. Then I can quickly run down the task list and write down what tools and equipment I'll need for each task. Some of the more common items (circular saw, cords, hoses, etc.) may just go on a paper list as I'm gathering tools for the project the day before. But, the odd-balls, like scaffolding, ladders, casing nails, etc. might be smart to go on the plywood list. This also has the advantage that someone else can stage your site for you if need be, because they know exactly what you need.

3. Materials

A third column on my list can be even more important than the other two. This is a materials column, or "To Get", as I like to label it. As a wise man once said, "you can't build it if you don't have it." This seems very self explanatory, but it's amazing how many times I've staged a site and then didn't have the plywood or the trim to do the job. This column also helps alert other people who are helping to stage the site.

4. Prioritizing your Prep-work

No matter what the project is, you have a limited time to prepare before volunteers show up. Realistically, you will never be able to get everything perfectly ready for them. You should therefore prioritize your preparation, doing the most important things first. Think in terms of what will keep the most people as quickly as possible. Also think in terms of order of operation. It doesn't make sense, for example, to be making a rafter pattern if you haven't finished the wall lay-out yet.

Essentially, the hour you spend before the people show up can make or break you. If you spend it cutting a tricky piece of siding that helps because you've already got it cut, but that will only keep two people busy for two minutes while they install it. If, on the other hand, you spend the time staging a siding cut station with sawhorses, cut blocks, saw, cord, safety glasses, etc. then you're ready to keep 15 people busy all day.

5. Stations, Locations, and Flow

Try to think in terms of the entire process. If you don't have a place for cut stations, painting, scaffolding, garbage, etc. then everything will emerge "selfishly", which usually turns out to be a jumbled mess.

This can be a challenge, especially with tight, narrow lots, which tends to be the norm in this business. Get creative. Set up a place for everything that needs to happen. Run a cord to each cut station, hoses to where you plan to use guns, etc.

The smarter you are in setting up stations, the smoother things will go. You should be thinking this through, even when material is being delivered.

E. Opening Ceremonies

1. First Impressions

A happy, early, friendly site supervisor who introduces him or herself right away to volunteers, one that is dressed for construction and looks the part, will inspire confidence. A stressed, grumpy site-supervisor who doesn't introduce his or her self and is wearing flip-flops and drinking coffee by the truck makes everyone anxious about how the day is going to proceed.

Look the part, play the role. Let people know from the beginning that you know what you are doing and you're happy to be doing it.

2. The Pow-wow

Nobody likes to hear a site supervisor give a twenty minute speech about the history of philanthropy. Especially when they're dying to go to work. But, a quick, to the point huddle can set the right tone for the day's activity. Obviously, there are different ways to do this, but no matter what you do, at least call everybody together to make a plan, even if it's only one sentence long.

Following is an example of what might be covered:

1. Thanks for coming
2. Introduce self
3. Ask a few questions of the group to get to know them, go through names if possible
4. Introduce homeowner
5. Briefly describe the organization or the cause
6. Express overall goals for the day
7. Run through the to-do list
8. Give safety reminder, food, water, nametags, etc.
9. Pray (if appropriate for organization / group)
10. Divide into crews
11. Go to work

This may seem like a long list, but each of these items should take a matter of seconds, not minutes. The whole thing should not take more than a few minutes. If people start getting wrestles, it's time to shut-up and get to work.

Dividing into crews can be a little tricky. I like to lay out the tasks and then ask for volunteers for each skill set. They know their skills and their comfort level. For example: "I need six people to install shingles on the roof, who feels comfortable with getting on the roof?" If you have a large crowd, try to get two or three big groups started, then break-away to get the smaller jobs started. Your goal is to have people standing around as little as possible. Another strategy is to have the whole crowd watch the siding demo. Just in case they might be doing siding. Then, peel off the paint crew and the clean-up crew.

It helps me to have people separate themselves according to crew as we're setting it up, so we can see who is what. Have the roofing crew walk over to the porch, the interior paint crew over by the PortaJohn, etc. Then, you can see who you've got, and people are less confused when you say go, because they at least know what group to stay with.

F. Productivity

Now, it's time to get to work. When you say "Go" this is the point of explosion. If you wander around looking for materials and leave all four groups standing in their places for twenty minutes you're going to have a revolt. Your goal at this point is to get as many people busy as fast as possible. For this reason, you should start with the simplest, largest tasks first. Save the most technical, specialized tasks for last.

For example, you can do a siding demonstration by having a few people install a piece with everyone watching as you're giving the 1,2,3 about siding. Then, once you get two siding crews rolling, you can pull off three people to start framing in the cornice.

If you are by yourself, with no other crew leaders, you can ask the caulking group, for example, to each get a gun, a tube of caulk, and a wet rag, and then meet you at the back corner of the house. This way you've got them busy for a few minutes while you're giving instructions to another group.

Now is the time when your preparation pays off. If you have tools and materials staged, then the crews can quickly go to work. If everything is everywhere and nowhere, then the volunteers will spend that critical first crunch, the time when they are most energized for the task, being confused and looking for stuff, or even worse, waiting.

Again, be creative. If you have too many specialty tasks to cover, you may want to start off with a 30 minute, all hands-on site clean-up, while you gradually pull one crew at a time.

1. Busy

The number one complaint I hear and see and feel from volunteers is that they were under-utilized. Most people who take time out of their lives to volunteer want to be used. The more they can get done in the short window they've got, the better they will feel about the sacrifice. Do everything in your power to think ahead and make sure no one has an excuse to be bored. Let them take a break when they need it, or let them wind down on their own, but try to keep sticks and saws ahead of them so they can accomplish as much as possible.

2. Happy

Make it fun. Sell the task. Have fun yourself. These people are here because they want to be, not because they have to be to get paid. They want to work hard and enjoy it.

3. Safe

Preach and exercise safety. If you feel uncomfortable about something, change it. It's tough to remember when you are really cranking, but taking five minutes to adjust a scaffold walk-board could save the day and even a life. For the most part, volunteers will follow your lead; if you practice and preach safety, they will generally follow suit.

Most accidents are falls. Make sure ladders are secure, and scaffolding is secure. Try to keep walk-boards in one place. When things keep moving around there is a greater potential for someone walking off the end of a walk-board.

Teach a healthy respect for saws and power tools. Don't rush your work. It's not going anywhere. Material has to fall up and away to avoid binding a saw, etc. etc.

Have a first-aid kit. Have an emergency plan. Have them sign the waiver.

4. Personalizing the Task

People want to be treated as individuals. Provide nametags. Learn people's names. Every year in Jackson we used to have a great group of 50 college students come down for the week. I used to challenge them that if I didn't know their name by the second day I would give them a buck. It was a fun challenge; I had to work on it throughout the first day, but the payoff was tremendous. Not only did they feel important, but I had the advantage of being able to call them by name instead of, "hey you". I could even set up crews for the next day by name instead of saying, "I need four people to install doors".

Get to know them as quick as possible. Figure out what their skills are. Help them to grow. Set them up for success. If no one in the crew has used a saw before then it doesn't make sense to have them trying to figure out compound angle cuts. If, on the other hand, Mr. Handyman is there, and he's owned a speed square all his life without knowing what the little numbers mean, then you have the perfect opportunity to teach him something new and let him figure out some cuts.

Basically, if they go home and the first thing out of their mouth is, “Honey, guess what I did today?” then you’ve done a good job. (I usually encourage women to have a slightly different approach with their husbands. I tell them to say something casually during dinner, like, “Y’know, we had that 14” radial-arm, compound, miter saw out and we were cutting our trim with a 22 ½ degree bevel, but we were getting a little bit of chatter on the finish side, do you ever run across that?”)

G. Instructions

Show me, don’t tell me. You can spend forty-five minutes explaining a task and leave your volunteers totally lost. Or, you can install the first piece together in five minutes, and watch their faces light up with understanding.

Construction is a physical business. It’s tactile. Ya just gotta do it. Worst case scenario, draw a picture. But don’t get stuck talking into the air.

Volunteers will take you very literally. Give specific instructions. It may be obvious to you that the siding runs horizontally rather than vertically, that the shingles don’t get painted, green side up, etc. etc. But, if you’ve never done it, it may not be so obvious.

Show, watch, check-up. Install a couple of pieces together. Then, watch them do a couple of pieces to make sure they’ve got it. Then, check up and see how things are going periodically. One check up to say, “hold on, this piece didn’t get lined up right,” can make all the difference. In that five second comment, they now know that you care, that you’re going to check up on them, and that it needs to be right.

Keep your belt on. Jump in where needed. Watch for snags. A jammed gun, how to re-load nails, the mad caulker (there’s one in every bunch; the one who’s sneaking around spreading caulk like it’s peanut butter), a tricky cut – there’s always something that could use your attention on the other side of the house. If you get too engrossed in one project, you will eventually pay the price by having to fix something later.

H. Monitorization

1. Multi-tasking

No matter what you do, this job is going to require you to do more than one thing at a time. It just is. Deal with it. That’s how you can get so many things done. The trick is managing to keep your head on straight, and still get the tasks accomplished the right way. Here are a few helpful hints:

Remember your abc priorities. Stay focused on A. Keep your eyes open. Look for people standing around or jobs getting done improperly, but stay focused on the goal.

If the caulkers are going slow but they're doing a good job, let them be. Especially if your number one priority is to finish trimming the cornice.

Make the rounds every once in a while. Most of the time your presence makes a big difference. If everything's going right then it only took you a few seconds to know that. If something's wrong, then it's a good thing you took a few minutes to check, so you can right the ship early on. This also sends a message to the volunteers: you are available if they need you, and their task is important enough for you to check up on. Sometimes knowing that you could come check on things at any time is all the quality enforcement you need.

Stretch them. Use volunteers at their threshold. In other words, use them to the highest degree they're capable, maybe even one step above their comfort zone. This makes them important, and it frees you up to get more done on other fronts.

Use cheat-sheets. Some volunteers are skilled enough that they really just need to know the plan and what sticks to use. I like to keep multiple copies of my "cheat-sheets" that I can give to volunteers and let them go to town. I have one for standard measurements, heater closets, how to build a stoop, etc. This still challenges them, but keeps you from having to be with them at every step just because they don't know how you'd planned to build it.

In the end, you're going to be frazzled. At the end of a good, productive day you will probably feel like you have been a waiter for 30 people at the same time, all day. That's what it is. You are there to serve them. You are helping them to help the homeowner.

2. Withitness

Part of your multi-tasking abilities include an ephemeral concept: withitness. This is the ability to know what's going on everywhere at the same time.

I borrowed it from my classroom teaching training. In teaching, it was explained to me like this: you have to present the lesson, give Ronnie his late assignment, re-fill the rewards jar, check-off the lunch order, and know who's passing a note to whom – all at the same time.

The same skill is needed in volunteer construction leadership. You have to have that unusual ability to be focused on what you're doing and watching two other crews and listening to a third.

Listen. Watch. Troubleshoot.

3. ABC Priorities

Because of this, you have to pick what's most important and spend most of your energy there. Your priorities will probably result from a combination of the following factors:
High up on the list of steps – If you look at the basic steps of construction in chronological order, the higher up on the list, the more important it is. The foundation, for example is more important than the trim paint on the storage building.

Technical-ness – If it takes more skill, it should get more of your attention. Boxing the cornice, for example, needs a lot more coaching than siding. In light of that, I would spend more time with the three people doing cornice, than the fifteen people doing siding.

Time sensitiveness – Sometimes tasks that aren't very technical, and not necessarily at the top of the chronological chart just need your attention now. Re-packing the dumpster because the truck is there to pick it up, building a set of steps so sheetrock can be delivered, building the heater closet so the sub.s can get started, all of these things become priority just because they are.

Focus on your target. Keep an eye on your other crews; make sure they have what they need, but give most of your attention to that number one goal until it gets finished. Then number two becomes your new number one.

Identify the priorities on your task list. Put a star by them. Express it to the volunteers. Pick your most capable volunteers for the most important tasks – and pick them first before you make other assignments.

Your job is to make sure the volunteers are happy, busy, and safe; the homeowner is happy and involved in the process, and that the house looks good, is good, and moving along.

If you don't set priorities you will find your whole day was spent in many places, but your top objectives were not met. There's a difference between finishing houses and just working on houses. Your attention to priorities will ultimately help you to finish houses faster. And that tends to make everyone happy.

4. Quality Control

When you think about it, it all boils down to what's good enough. Everybody has different standards, including the owner of the house. Your job is to make that judgment call. You need to teach for quality and then follow up and decide what needs to be re-done.

A few key points regarding this:
If you can build it, you can un-build it.
Sometimes better is the enemy of good.
Use Common Sense. Caulking above the door trim on the inside of a closet is not critical; crooked columns are.

It falls back on you. What can you live with? What do you feel strongly about? Where do you see the balance between perfection and production?

What would you do if it was your house?

And, of course, if you find yourself being too picky, remember these words of wisdom:

We're not building a piano, just the box it comes in.

It's not going to the fair.

A blind man on a fast horse will never notice.

5. Responding to the Group

Part of your withitness is going to be being aware of how your volunteers are doing. Were the tasks appropriate? Are they capable of performing them? Are they bored? Are they overheating?

You can't cater perfectly to the volunteers' particular skills and expectations. But, you can make adjustments mid-way through the project to scale back the task if its overwhelming them, or step up the challenge if they're chomping at the bit.

You may have to call a mandatory 10 minute break, for example, if people's brains are starting to melt in the summer heat.

You may call the day early if a group is overwhelmed, overworked, or severely underskilled.

On the flip side, when you have a very skilled group painting all week, you may let them frame a porch, or set cabinets at another site so they feel more used.

I. Special Circumstances

1. Downtime

Despite your best efforts, there will be times when you'll have a crowd of people with no work to do. Lack of power, late deliveries, bad weather, missing keys, stupid people filming, . . . sometimes things happen beyond your control. Do your best to fix the problem and get things back on line. In the meantime let the volunteers know what's going on. Give them an alternate task if possible (make sawhorses, clean the site, move dirt, etc.), or let them take a break or take an early lunch.

2. Emergencies

Things happen. Have a first-aid kit. Have an emergency plan. If it's serious, take them to the hospital. Don't hesitate to respond quickly. Lead the rescue team. You are the site leader. You are in charge. Show that you care by dropping everything, checking out the situation, and implementing the best form of aid.

When in doubt, call an ambulance, or take them yourself.

Follow up with a phone call or visit. Make sure they know you care.

3. Cleanliness / Organization

There may be times when you need to shut things down mid-stride to clean up the site or re-organize materials or equipment.

The beginning and the end of the day are the ideal times for clean-up / restructuring. But, don't be afraid to call a time-out at any point if needed. You may also be able to take a few people and just get it done without disrupting the main flow.

4. The Tough Ones

At some point you are also going to have some volunteers that are tough to work with. This could be the "I do this for a living" volunteer. This is the one whose number one objective is to tell you why he does everything you're asking him to do differently and why his way is better. I choose my battles carefully. Let them run the rails their way; as long as it looks good. Try to be humble. Try to give other ideas a fair chance. You never know when you're going to learn something new. On major issues you're going to have to stand your ground. If it's going to screw up the schedule or materials, or it's going to look like crud, you need to step in.

You've also got the, "My mom's making me be here" volunteers. These are the young ones (or sometimes the surprisingly not so young) that are writing their names on the roof with caulk or trying to break bricks with their foreheads, smoking under the house, painting each other, etc. etc. Choose your battles. Give them opportunities to work. In the end, if they'd rather not do anything productive, that's going to be their choice. If their actions (or lack thereof) are going to take the project "backwards", you need to step in and kindly re-express your expectations. In rare circumstances you may have to ask them to leave, or not come back tomorrow.

There may also be times when there's nothing wrong with the volunteers, but there are just too many of them. I'll never forget a certain Martin Luther King day when a whole college showed up instead of just the volleyball team. That morning I found out our tool truck had gone to the shop the day before. My co-worker and I had three tape measures and a hand-saw. We had two houses to work on that were 90% finished. There were about 80 college students anxious to go to work.

We did the best we could, pre-painting T-111 on the sidewalk, cutting 4x4 porch posts with a hand-saw, etc. We had crews of eight to ten doing jobs that ideally require one or two. There was no way we could have stayed ahead of them. We laughed through it and I think they went away thinking the day was "fun", if not totally productive.

5. Long-term Potential

Strive for repeat customers. People like to be needed. They also like to learn new skills. The more you challenge your volunteers and invite them to learn more and help more, the more they will do it. Your "regulars" or "boomarangers" not only increase your number of volunteers, they increase your number of skilled volunteers. They are familiar with your methods, they're getting better every time they come. Eventually these super-volunteers can become your crew leaders, even house leaders. Value them. Challenge them. Tell them you appreciate them. Invite them to return.

Basically, you can only prepare so much for the special circumstances. Be as prepared as you can be, and then respond to what happens. The flasher, the stolen tool, the governor coming to volunteer, tv cameras, 50 people showing up when there was supposed to be 2, and vice-versa – all these situations are going to require a cool-headed leader who can roll with the punches and keep things flowing. And, it also takes a good leader to see above all that and notice opportunities that arise and capitalize on them.

II. How to Build a House

A. Overview:

Most people are surprised to find out how much work goes into a house before the "fun part" begins. I've seen many volunteers show up to a site in the morning with just a floor. They raise walls and put a top on it in a day, and walk away thinking they just built a house. Well, technically they did, they just framed in the structure, but many, many critical steps had to take place to get to that point.

These are the steps that have to take place before you can raise walls. As you read through this list, remember that the closer something it is to the top of the list, the more important it is. Any mistakes along the chain can negatively effect everything further along. Conversely, careful planning on the front end can save you tons of head-aches later on.

One little case in point to illustrate: those volunteers can show up that day and raise those walls and do a perfect job of it, plumb and straight and perfect. But, if the house is sitting on the property line, the perfect walls aren't going to do much good.

The following list of basic steps provides an overview of the process of new construction. It is obviously not an exhaustive list, or a how-to manual, but it does lay out the basic sequence of events. The list is followed by a brief explanation of some key elements in the process that require some explanation or discussion. In general new construction is a little *cleaner* than remodeling, a little more clear-cut, but the work on the front end is usually more extensive than with a remodel.

Pre-construction

- Determine zoning, setbacks
- Evaluate build-ability of lot
- Assess Infrastructure (power, water, sewer, gas)
- Have plans drawn
- Obtain permit
- Prepare site (temp. power, toilet, dumpster, etc.)

Footings

- Set up batter boards with string lines marking perimeter of house
- Mark off the footings (usually at least 4 inches wider than house)
- Dig footings, set steel, spray for termites, request inspection
- Pour footings

Foundation

- Slab: form up, rough plumbing, lay plastic, set steel, inspect, pour
- Chainwall: lay block, backfill, place hold-downs, pour
- Crawlspace (conventional): lay block, place hold-downs, fill cells; form, fill, and pour saferoom slab

Floor System

- Block: set sill plate with sill seal, rim joist, floor joists, deck floor

Framing

- Frame porches
- Snap lines, layout plates
- Frame up walls, top plate, plumb corners, straighten walls, brace
- Trusses: layout, set trusses, use story boards, string middle or side
- Rafters: cut joists, rafters, ridges, etc., set joists, set rafters
- Install deadwood (nailers for sheetrock), and all hurricane ties
- Sheath exterior
- Deck and felt roof
- Brace rafters
- Wrap house

Exterior Finish

- Install metal roof
- Snap lines if using hardi-board
- Install doors and windows
- Frame in cornice (eaves), use string guide to straighten sub-facia
- Trim and finish eaves, siding, window and corner trim
- Finish decks, rails, steps
- Trim porch beam, columns, etc.
- Pour sidewalks, driveways – coordinate water / sewer lines, etc.

M.E.P.'s

- Rough-in mechanical, electrical, plumbing when roof is decked
- Call for and pass all 3 Inspections
- Call for and pass framing / insulation inspection

Interior Finish

- Insulate walls
- Hang sheetrock
- Finish Sheetrock
- Install doors and interior trim (baseboard, window trim, etc.)
- Clean floors, install underlayment if applicable
- Caulk and paint walls and trim
- Set cabinets
- Install accessories (hardware, doorlocks, bath accessories, etc.)

- Install fixtures have MEP’s trim out, including water, sewer lines

Utilities and close-out

- Hook up appliances
- Request temp. power disconnect, and perm. power connection
- Trouble shoot any MEP issues
- Call for final inspections

B. Step-by-step:

The following is a step-by-step procedural outline for building a house with Habitat for Humanity in Tuscaloosa:

BATTER BOARDS / FOOTINGS

Batter boards:

- After all lot prep. and permitting, stake corners of house on lot
- Pull string across property boundaries to be sure house is parallel to front property line and meets all required setbacks
- Prep. batterboards by laying out two 12-foot 2x4's at right angles about 6 feet beyond real corners of house
- Drive stakes in the ground at ends of 2x4's and where they intersect
- Use builder's level to determine highest corner
- Determine desired elevation for top of foundation block based on highest grade (19 inch minimum)
- Use high mark as reference point, match same elevation using grade stick and builders level on each stake
- Nail horizontal 2x4's so top edge is even with elevation marks.
- Set nails on horizontal 2x4's at required distance from front of property to establish front line of house / porch, parallel to front property line.
- Measure from front nails depth of the house and set nails in back batterboards to determine back line of house.
- Determine sides by setting nails
- Pull diagonals with 100 foot tape to make sure house is square
- Double check that string lines are level, dimensions are correct, and house is square
- Spraypaint lines on dirt 4 inches wider than string lines and 12 inches inside of string lines

Footings:

- Dig footings based on spray painted lines
- Double check against string lines
- Keep depth of footings to allow for the chosen number of block (an 8 inch increment – usually 24 or 32 inches), plus at least 12 inches of concrete
- Provided steps in footing if lot is uneven
- Re-check footings with string lines, widen edges where necessary, clean out loose dirt
- Set steel (rebar), 4 bars of ½ inch (#4's), 2 on bottom and 2 on top
- Be sure steel is up off ground using chairs or block

- Set grade stakes: vertical rods driven to specific 8 inch increment below string (this will be your reference for top of concrete footing)
- Set L's (90 degree turns) of rebar 1 foot in from each corner and every 8 feet and beside every window and door
- L's in saferoom footing sit in center of wall every 16 inches
- Set plumbing chase (5 in. pipe and 2 in. pipe) to act as sleeve to go through footings where water and sewer lines will run
- Pass inspection
- Get termite pre-treatment
- Pour footings

FOUNDATION AND FLOOR SYSTEM

Foundation:

- Lay block
- Set hold down anchors (threaded rod) at every bay where rebar L's come up from footing, rods should be placed in every corner, 6" from every opening(door or window), 6" from every break in the bottom plate and every 6' around exterior of house.
- Rods should have anchor (washer with nut on each side) and run from top of footing to 16 inches above top of block, 4 inches in from outside edge of block
- Set rods in saferoom foundation every 16 inches (opposite wall layout) lined up in center of each wall
- Build form for saferoom foundation by placing 2x6 mud sill on top of block, then 2x10's treated on edge to act as form for outside dimensions of saferoom (6'7" square)
- Pour Saferoom level with rim joist to ensure that plywood will cover saferoom slab. Use 30 ilb felt as a vapor barrier between plywood & concrete.
- Fill center of saferoom foundation with gravel
- Make rebar grid (every 6 inches) across top of pad, with turns going back down into block
- Pour cells with hold downs and saferoom slab

Floor system:

- Check block foundation for overall dimensions and square-ness
- Attach sill-seal to underside of 2x6 mudsills
- Layout 2x6 mudsill
- "Cheat" to make overall sill plate exact dimensions and square regardless of block
- Drill holes for hold downs
- Set sill plates by making corners right and sides straight.
- Build double rimjoist on top, lacing corners, and leaving outside of for end-nailing floor joists
- Layout floor joists to miss plumbing & add extra joists under parallel Interior walls.
- Cut joists to fit, match tops with rimjoist, add joist hangers on girders, make sure house doesn't grow (bulge in the middle with joists too tight)
- Glue joists and set tongue and groove Sturdy-floor strand board by snapping a line at 48 ¼", tongue side out so you can hit groove side if needed for future runs
- Stagger joints, nail every 6 inches on edges, 8 inches in the field
- Use 10 mil plastic sheething under floor, be sure to run plastic up the chain wall & attach to sill plate with cap nails.

LAYOUT AND PRE-BUILD

Layout:

- Paint deck with sealing primer.
- Snap lines on deck for all walls, spray with varnish to protect from weather
- Label walls (A,B,C,D) on prints and on the deck in that makes most sense for raising
- Decide which walls to run long on corners and which to run short based on order of operation (longest walls run long so they can stand first)
- Cut all plates to fit within snapped lines (a hair short is better than long)
- Drill holes for bottom plates to sit over threaded rod hold downs
- Stagger joints for long walls, breaking on 2 foot increments so joints straddle a stud naturally on layout
- Walk the floor after all plates are cut to make sure everything fits and matches floor plan
- Layout each wall – partitions (where other walls intersect), then doors and windows, corners and beam pockets, then studs and cripples
- Studs should always fall on 2 foot centers from outside edge of wall, left to right as you face the house from the outside
- Use KJ for King and Jack on sides of openings, S for Stud, C for cripple, P with X's on each side for partition L's for ext partions.
- Label headers by dimension and size of lumber, mark sill lengths for windows and "no nails" for door openings
- Label each wall with corresponding letter, number of plate in sequence, top or bottom, and North or West with arrow
- Mark truss / rafter layout on edge of top plate that will face inside of house when wall is erected
- Double check layout – an extra set of eyes never hurts

Pre-Build:

- Carefully make a detailed list of all components for the house (headers, corners, partitions, King Trimmers, cripples, porch beams, etc.)
- Have volunteers build and label components; stack in corresponding piles to make them easy to find

FRAMING START

Walls:

- Begin with one crew framing interior walls somewhere on the site, another crew framing exterior and long walls on the floor
- Box frame walls, 2 nails at each end of 2x4 walls 3 nails at each end of 2x6 walls.
- Top plate long exterior walls before raising
- Save window cripples for after wall goes up
- Attach string to top, inside edge of long walls for straightening later
- Raise walls in alphabetical order, plumb and brace with temporary diagonal braces attached to end of wall and outside edge of rim joist.
- Begin bringing in and installing short interior walls as soon as three exterior walls are up, match partitions all the way up, and make sure they get connected well.
- Begin top plating remaining walls as soon as a few interior walls are installed.
- Check outside corners for plumb, re-brace with diagonal braces on inside of all corners
- Straighten exterior walls, using string as a guide, and nail braces (diagonal 2x4's) at every interior wall and in the middle of long rooms to lock in place.
- Raise porch beam, lock into beam pockets, set temporary supports, check for level, square up beam with sides of house, brace diagonally, straighten with string, brace under window headers, add double top plate
- Build in window cripples

Sheathing:

- As soon as walls are straight and plumb, have the interior wall crew begin sheathing.
- Use ½ in. osb, run vertically, bottom edge even with top of block / bottom of sill plate
- Begin sheathing walls left to right as you face the wall from the outside in order to match the layout. Every joint should split on a stud.
- Make sure every sheet gets nailed every 4 inches on the edges and every 6 inches in the field.
- Use router, circ. saw, or sawsall to cut out windows and doors.

FRAMING FINISH

Roof Framing:

- Transfer truss or rafter and ceiling joist layouts from inside top plate to top of double top plate on exterior and long hallway walls
- If trusses, install back gable first with vertical bracing, flush with outside of wall, run string line from overhang to other side of house with a block to imitate same overhang; set trusses on layout, attach storyboards, match string line (leave 1 molecule of space between string and rafter tails); attach diagonal braces to gable truss once 4 or 5 trusses are set.
- If stick built roof: Install ceiling joists on "J" layout.
- Lay plywood on top of joists for work area
- Install 6 common rafters to ridge to skull up roof structure.
- Rafters attach to walls at "R" layout.
- Be sure to pull heal and seat cuts tight against top plate of wall.
- Check ridge for level.
- Install remaining common rafters.
- Cut 1 ½ in. off of corners of top plate at corners of building.
- Measure hips, cut, and install.
- Attach string ½' above center of hips in order to keep hips straight as jacks are installed.
- Install jacks, pulling heals and seats tight against top-plate, attach wherever jacks plane out with top edge of hip while keeping hip straight.

Specialty Framing:

- Install saferoom walls, plumb and brace
- Attach 14 gauge steel at corners with self-tapping screws; run vertically
- Sheath exterior with ¾" plywood run horizontal, pre drill holes and use Tech-screws, Ledger Locks, or Ramset nails to secure plywood every 12 inches.
- Sheath again with ¾" plywood run vertically, this time attaching with screws every 4 inches on edges and 6 inches in the field.
- Attach LGT2 straps at tops of walls to ceiling joists
- Install deadwood for sheetrock nailers on top of all walls that run parallel to ceiling joists / trusses
- Do misc. framing, including: check all cripples, headers, etc., frame out attic access, cut thresholds, roof bracing, cabinet blocking
- Attach threaded rod to every hold down sticking up through bottom plate by drilling hole in both top plates above hold down in floor, attaching 8 foot rod to bottom rod with a coupling, then tighten nut onto washer on upper top plate
- Install rafter ties where every rafter meets an outside wall.
- Caulk all rod holes penetrating top plates

ROOF START

Roof Deck:

- While specialty framing is taking place, upper crew can be starting the following:
- Snap a chalk line 46 1/2 inches up from rafter tails on all sides of roof.
- Begin decking on two long sides, let ends hang over
- Attach decking using snapped chaulk line as guide, break on rafters.
- Nail plywood corners and edges first, then mark tops of o.s.b. on two foot centers, and adjust rafters to straddle the marks.
- Nail plywood with 8d nails every 4 inches on edges and every 6 inches in the field.
- Attach felt and toeboards at edge of roof before standing on the plywood.
- Put ply-clips on top edges of 5/8 plywood., one between each rafter before installing next run.
- Stagger the joints for each consecutive run of plywood.
- Run ends long (at least 16 in.) and cut in place after roof is decked.
- Save drops to fill in other corners.
- Inspect all sheathing to make sure nails are sufficient and landed on rafters.
- Attach fly-rafters in gables, flush with outside edge of cut plywood overhang, keeping them straight and nailing down through decking into rafter
- Snap line for first run of felt, then overlap each consecutive roll to top line of the run below.
- Nail felt every 6 inches across the bottom, every foot in the middle row, and every 2 feet across the top.
- Leave bottom 3 inches of first run un-nailed so drip-edge can go underneath after facia is on.

Cornice Framing:

- Run string line across bottom, outside edge of subfacia from corner to corner.
- Nail sub-facia at each rafter tail using string as guide for up and down.
- Bump string down under bottom, outside edge of sub-facia in order to site up and bump the sub-facia in and out where needed to straighten it.
- Block in between sub-facia and soffit-nailer, only where sub-facia was bumped out.

ROOF FINISH

Cornice Trim:

- Attach facia (1x6 hardi) to sub-facia, using a gage to match straightness of sub-facia.
- Cut soffit to fit (3/8" A.C. plywood), leave gap at house side, cut vent holes 6”x14” centered.

Roof Covering

- Flash any valleys or penetrations in roof with Ice & Water sealable membrane.
- Install edge metal (drip edge) at eaves, leave gables until after rest of metal is installed.
- Set screws until rubber washer slightly grows – too tight breaks the seal.
- Pre-drill metal sheets 4” up then every 32”
- Set first panel square with roof edge using the 3,4,5 triangle method then snap line across top for reference.
- Install consecutive panels making sure to keep the 2 inch overhang.
- Screw each panel as you go to avoid walking on the metal
- Cut holes for vents, install boots with silicone and screws
- Install valleys, only screw on edges, let end overhang so sides of valley metal match 2 inch overhand at intersecting point.
- Install ridge cap and foam gaskets.

EXTERIOR

Windows and Doors:

- Once you have inspected wall sheathing nailing & passed inspection, wrap house with dow housewrap or blueboard, taping all seams, then call for inspection.
- Use 1 1/4 inch button cap nails every two feet along studs. Pull tight and avoid wrinkles.
- Cut out window and door openings, using the upside down martini glass method, wrap felt flaps to inside of framing.
- Install sill pans & tape accordingly.
- Snap lines every 7 inches from bottom of sill plate / top of brick for siding.
- Set windows with roofing nails, keeping them closed, plumb with 2 foot level.
- Tape windows with window wrap, bottom first then the sides then the top.
- Set entry doors with silicone seal under threshold, keep plumb, hinge side tight, making sure reveal stays just right so door hits weather stripping, but doesn't rub against door jam.
- Shim jam and attach with 3" screws behind the weather strip.

Siding and Trim:

- Trim out windows and corners with 1" thick 1x4 hardi trim. Again bottom first, then sides, then top.
- Run corner boards 1 3/4" below bottom of rimjoist; nail corners together first to get tight joint.
- Install siding, using lines as the law for top edges.
- Break joints on studs, stagger joints random, using drops for next run.
- Be sure to use nippers, hardi-blades in circular saws, or "The Guillotine" for cutting siding and trim.
- Check periodically and make sure corners are matching.
- Make sure both sides of windows and doors stay consistent so top piece matches both sides.
- Install siding shims to fir out for frieze board at top>
- Attach 1x6 (the 3/4" material) frieze board where siding meets soffit to cover the cut.
- Wrap porch columns and trim all sides of porch beam with ex-trim or 3/8" plywood.
- Cover and trim around porch ceiling.
- Caulk and paint all siding and trim.

Porches:

- Build back stoop and stairs (7 in. rise, 11 in. run).
- Build front porch rails (36 to 38" high), less than 4 inch spaces, start with spindle in exact middle, then find spacing that works using block as guide
- Plumb spindles while installing

INTERIOR START

MEP Rough-in's:

- Rough-in's for electrical, plumbing, and mechanical should begin as soon as roof is dried in.
- Pass all three rough-in inspections, then framing / insulation inspection.
- Mark outlets and switches on floor so they don't get covered by sheetrock.

Inside Cover:

- Seal electrical and plumbing holes in top and bottom plates with great stuff or caulk. If not done by sub-contractors.
- Seal all cracks around windows and doors with caulk or foam.
- Caulk perimeter wall bottom plates at front crack where it meets the floor and back crack where it meets the osb.
- Insulate exterior walls with R-19 batts, face side in; staple to inside of studs.
- Hang drywall, starting with ceilings, make sure all screws bite lumber and drive in below surface of paper without ripping paper.
- Cut drywall "loose", leaving at least 1/4" off measurements to account for imperfections in walls and in cuts. Better to have a little gap in corners than force the piece or try to shave it down.
- Leave dust on floor as it makes it easier to clean up drywall mud splatter.
- Tape and bed.
- Finish with skim coat and texture.
- Sand finished drywall.
- Clean floors well with scrapers and brooms.
- Run dry roller or slightly damp rag over walls to eliminate dust after sanding.
- Prime walls, then apply two finish coats of inside wall color to all walls.
- Paint all interior trim in advance.

Flooring:

- Cover entire floor with felt to be a moisture barrier, tack in place just to keep from moving around.
- Install bamboo wood flooring in bedrooms, hall, and living room; tight joints, use drops to start next run.
- Leave ¼ inch gaps at walls to allow for expansion (baseboard will cover).
- Install backer board in kitchen / laundry / bath.
- Layout tile, cut and install using spacers and even application of thin-set.
- Grout all floors at the same time, clean, clean, clean, then clean tile.
- Seal grout.
- Install thresholds and transitions.
- Cover floors well to protect from paint, etc.

INTERIOR FINISH

Trim:

- Install cabinets, cabinet trim, toe kicks.
- Hang interior door units, be sure to plumb and keep good 1/8" reveals.
- Build and install window boxes.
- Trim around attic access, entry doors, etc.
- Install baseboard tight to flooring.
- Install closet cleats and shelves.
- Install shoe mold if needed.
- Caulk and paint all trim and doors, touch up walls, especially where trim meets wall.

Accessories:

- Install plywood for countertops,
- install tile, grout and seal.
- Install pre fab Fermica countertop with glue, cut out sink & install ends before permanently fixing countertops.
- Install bathroom accessories (towel bars, mirror, t.p. holder).
- Install door locks and doorstops
- Install house numbers to outside of house.

MEP Trim-outs:

- Set all plumbing fixtures.
- Trim out electrical (plugs, switches, covers, fixtures, fans, etc.).
- Set HVAC grills.
- Pass final inspections for all three.

Finish:

- Pass final building inspection, obtain C.O.
- Connect permanent power.
- Dedicate home.
- Move 'em in.

C. Key Elements:

A few key elements for each stage of the process are worth noting:

Pre-construction:

Some of the elements of pre-construction require a little more detail than the outline provides. Following are a few key points to be aware of before beginning the construction of a new home.

Ownership:

Habitat needs to own the property before construction begins. This seems self-explanatory, but property issues like title searches can take much longer than expected.

Zoning:

Find out from the planning division at city hall what the zoning requirements are for the property you want to build on. Most areas in Tuscaloosa are going to be zoned R-3 or R-4, which require the same setbacks (25 feet in the front, 30 in the back, minimum of 5 feet on each side with a minimum aggregate of side yards at 14 feet.

Lot Considerations:

Soil:

The grade of the lot and the soil type are important elements to consider as you prepare to build. A soil sample is required if you are having an engineer design the foundation. If your foundation doesn't have to be custom designed by an engineer, it's still a good idea to have a soil test, but it's expensive, and most people opt for common sense. If the soil is soft and marshy, or has the "roller coaster" effect, you may need to "muck out" the bad soil and bring in fill dirt. If the lot is a "bowl", it's a perfect time to bring in some good fill dirt and make a slight crown where the house will sit to prevent water from settling under the house. Use compactible fill dirt and if possible, compact it by driving over it repeatedly with a tractor or other heavy equipment. If you are putting in a slab, the compaction of the soil is critical.

Surveys:

It's always best to have a boundary survey done. Fence lines and tree lines rarely mark real property lines (despite what the neighbors say!). The smaller the lot, the more important the survey becomes.

Size:

The size and orientation of the lot will often determine the size of the house. Keep this in mind when choosing or designing houseplans.

Significant Obstacles:

Large pieces of debris, old concrete, trees, and other existing structures may need to be removed before construction can begin.

House plans:

The design of the house is worth putting some time into. Choose a house plan that can fit on the lot and still meet the required setbacks. Work with the potential homeowner to find a house plan that meets their needs and interests.

Site plan:

The placement of the house on the lot may seem like a simple thing, but it is actually a big decision. Again, time invested in planning at this stage can pay big dividends down the road. Homeowner's preference, driveway space, sunlight exposure, existing trees, and required setbacks are all important things to consider in the placement of the house.

Permits:

You need to have a permit before you begin construction. Fill out the permit application at City Hall, pay the determined amount and submit a proposed site plan for review.

Infrastructure:

Power, water, and sewer are crucial components that are sometimes overlooked. Obviously power is first priority. Temporary poles must be assembled, set in the ground, and then connected by the power company.

Water is also essential to construction. It's a good idea to get a jump start on the water issue, as the process can take time. Existing water meters may be used, but they can e difficult to locate. Once you've found it, a temporary faucet can be affixed to the water meter to provide water for the site until the water is connected to the house.

Sewer is also something to get a jump on. If there was existing sewer you should be able to tie directly into it. If there was no existing sewer, you may have to request and pay for a "sewer tap" to have the sewer run from the street to the property.

Extras:

A well prepared construction site will also have a portable restroom, an organized method

for trash disposal, and any other staging necessary to make the job run smoothly. This may involve things like saw horses, work stations, delivery areas, scaffolding, etc.

Construction:

Footings:

Footings are an anchor for the foundation. Tuscaloosa requires footings to be 12 inches wide and 12 inches deep. Laying out, digging and cleaning the trenches, setting the steel and getting inspected, treated, and poured can be a long process. You need to try to speed it up as quickly as possible to avoid the negative influence of rain in the process.

Foundation:

Again, a little extra attention on the front end can pay big dividends down the road. It goes without saying that the foundation is the most important part of the house. It's best to layout the foundation carefully, with batter boards, and double check that they are square, level, match the dimensions of the house plan, and meet the required setbacks.

Framing:

Two people who know what they're doing can spend a day of advance preparation and greatly maximize the efforts of volunteers. Whenever possible, it's a good idea to let the "A" team snap lines for walls, do a layout, get a count on headers and components, pre-cut rafters, etc. Then, when the group arrives, they can hit the ground running.

Be sure that corners are plumb, walls are straight, and everything is well-braced before installing rafters or setting trusses. Don't remove diagonal braces until roof and walls are sheathed.

Boxing in the cornice, or framing in the eaves, is in most cases the most technical framing to be done on a simple house. Taking the time to string, straighten, and block the sub-facia will pay big dividends when running trim.

Roof:

Make sure metal gets started square with the roof. Mark a 2 inch overhang on every piece of metal to make sure it stays consistent.

MEP's:

All three sub.s can begin work once the house is waterproof. They usually won't like to work around each other, but usually have to out of necessity. Push to have all specialty framing done before they start. Push inspections so you can get your framing / insulation

inspection. Getting the inside ready for drywall, then ready for paint and trim can be a challenge.

Exterior Finish:

This is the dressing on the house. Take the time to get it right. Snap lines and check and double check. Make sure heights stay consistent over tops of windows and doors, and around corners.

Interior Finish:

Insulate, inspect, then hang and finish drywall. Taking the time to plumb doors, keep a consistent reveal, and shim the jams makes a big difference. Window trim and cased-openings can also fairly easily be installed plumb and straight, even if the openings are not. Cover floors, while finishing trim. Try to have trim pre-painted.

Utilities and close-out:

Punch list, utility lines and connections, a final grade of the lot, driveway, and landscaping can take a lot longer than anyone wants them to. Try to be vigilant and fight hard to the very end! Request and pass final inspections, turn in a revenue report to the city to get the certificate of occupancy.

Walk-through and Ceremony:

Do a final walk-through with the homeowner to educate about electrical panel, water shut-off, etc., and to make sure there aren't any issues you may have missed or they may be concerned about. Dedicate the house and move them in!

III. How to Build a House – *Fast* ("The Blitz")

My first real blitz was a 10 house, one week blitz in Americus, Georgia. As a full-time volunteer for Habitat in Americus I got to help with a lot of the prep. Work, and I was excited for the main event to arrive. But I had no idea what I was in for. We started early, and had a frenzy of activity, (30 volunteers and 5 leaders to each house). We worked into the night that first day, went home late, tired, and happy – and then woke up early the next morning and started again. On day two our crew shut down before dark and my friends and I went and worked on another house that was still going.

At the end of the week we were totally exhausted, looking at 10 finished houses – I'm talking mailboxes, clotheslines, shutters, house numbers, carpet – everything. It was one of the most amazing things I had ever been apart of. I did absolutely nothing else that week. Never had I been so committed to one physical task for such a compressed period of time. And the result was amazing. I was part of something much bigger than me. It was a testament to what a group of people can do with a common goal and a lot of determination. We built 10 houses in a week! This was something I could really get in to. I was hooked.

A. Definition:

A blitz is "an accelerated build". Most blitzes are one week long, but some are two weeks. My friend and mentor did a 17 hour house, and there are groups all around the world who keep claiming the record: a 3 hour house, 2 hours and 42 minutes, etc. etc.

A blitz can be whatever you want it to be, but in most cases it means starting with a foundation and finishing with a completed house. Level of completion, and amount of volunteer labor compared to contract labor depend on who's doing the blitz, what your resources are, and what your goal is.

Besides being a "cool" and "fun" experience, it gives those who participate the unique experience of getting the big picture of how to build a house. It's like reading a 300 page book in one sitting. You get to see the beginning, middle, and end – and every step in between – almost all at once, or at least close enough together that the other steps are fresh in your mind.

It also gives those who plan and prepare for the blitz the unique opportunity to maximize the efficiency of every procedure in the process. Having to prep. Everything on the front end helps you to get better at every step.

Lastly, it's a great way to build a house. It's compressed energy and enthusiasm. It focuses effort and energy in a way that doesn't happen on a 10 week house. It's good for materials to get used so fast, good to track the financing all in one crunch, even good for the sub.s to get in and get out with all inspections all in one bang. I always find it amazing that you can spend a week or two trying to chase down MEP's to get roughed-in

and get their inspections, but you set up a blitz and prepare them for it right and you can have all of it done in one day or less. It's even good for inspectors. Prepare them for the event, make them feel important, and they get to make one trip instead of four. And, if there are any inspection issues you're standing right there with your sub-contractors and 30 volunteers to correct what's needed.

It also maximizes the efforts of your volunteers. A volunteer group that's only in town for a week, for them to build a house in a week makes them feel extremely productive and you got the most you possibly could get out of them.

In the end, it's a miracle. Like one friend described it, "It's like a fine-tuned orchestra that's never practiced together."

B. Planning

There's nothing more incredible than a successful blitz. And, there's nothing more deflating than a failed blitz. And the difference is the planning that goes into it. The irony is that the volunteers take ownership and feel like they did all the work to build that house in a week. But, the truth is, if you've done you're job, you've been "building" that house on paper, on the phone, and on the ground for at least a month prior to the "start" of the blitz.

No one can do it alone. It takes a team.

Start with a schedule. Make up a schedule based on your overall goal and your resources. Distribute it. Live by it. See the example schedule below. It can be modified to meet the needs of your particular project. It can also be fleshed out with more detail if needed. If you're good you'll provide a "blitz manual" to all crew leaders, staff members, inspectors, sub-contractors, media rep.s, whomever, at least a week in advance so they can do their homework and be prepared one day one of the big event. Besides a schedule, the manual might cover detailed how-to's of the more critical construction methods, emergency contacts, organizational lay-out, etc.

Work out the lot, design, family, colors, etc. The more you have to crunch for this thing the worse it will go. Securing the property, getting the permits, and getting the foundation in – these things need to happen as far in advance as possible. Whatever else does or does not happen, you can't build a house without a place to build it. The more you have to stop during the blitz to figure out an unanswered question, the slower you'll go. Have a cheat sheet of every possible pertinent piece of information, from the color of the exterior trim, to the phone number of the inspector, to the names of the kids who are going to live there.

Schedule your strongest volunteers. You need you're a-team. Recruit your best people. Make them feel important, because they are. Your skilled, regular volunteers are a huge asset. Make sure you have the numbers. 30 is not too many. I've done it with 60, even

90 on day one. This is a time when you want as many people as possible. If you're dealing with locals who may or may not show up, I would schedule 50 so at least 25 will show up.

Arrange materials. I would try to have every single thing you need to build the house on site the day before the blitz. Ideally, I would spend the week leading up to the blitz
Set up contractors and inspections.
Go.

C. Organization

You can't over-prepare for a blitz.

They say the best classroom management is the kind you can't see. In other words, the teacher who has the systems in place just smiles and lets the system work. That's the way your blitz should be. Everything you set up should be totally dummy-proof. Your layout, materials, paint stations, schedules, etc. should be set up so thoroughly that if you suddenly couldn't be there, everyone could still figure out what to do.

Label all parts, stage materials in logical locations, organize tools, clean the site – do everything you can to make things fast and easy. At Habitat I always pushed for building storage buildings first so that we could stage everything in its place. I didn't feel comfortable going into a blitz without having paint labeled and stacked; rags, rollers, covers, and poles all lined up, nails in the proper bins, even paint brushes hanging from a line of nails across the back of the storage building.

The more organized you have it, the more you can breathe easy and enjoy the experience during the actual build. There will be enough surprises during the blitz that you don't need to set yourself up to be chasing emergencies that could have been avoided. Also, the more organized your stuff is, the better chance there is of your volunteers putting everything back in its place and keeping it organized.

A few more things to keep in mind as you prepare:

Prior to Start:

- Do everything you possibly can in advance of the Blitz start: i.e. floor or slab in, lines snapped, walls labeled, headers and components built, rafters cut, story boards laid out, porch beam cut, etc.
- Take time to stage the site. Have a specific place for dumpster, toilet, cut stations, paint stations, supplies, materials, tools, etc.
- Run through the Blitz Prep Checklist to see that all materials, supplies, etc. are on site and in the right place

Pre-game Huddle:

- Start day one (and every day of the Blitz) with a quick huddle to put everybody on the same page. The first day's huddle should cover the following:
- Explain the goal of the blitz and the goal for the day.
- Introduce homeowner and participating groups.
- Review crews and crew leaders.
- Briefly describe the framing components and order of operation.
- Remind everyone about safety and hydration
- Cover any procedural items (where things go, DON'T MIX THE NAILS, etc.)

D. Flow

Running a blitz is something that's hard to teach, hard to explain, and hard to write about. You have to do it to get good at it. You have to compress your energy twice as much as the volunteers. You have to be one step ahead of everything. You have to see the details and the big picture at the same time. You have to enjoy the madness. A blitz is organized chaos. If you don't enjoy the rush, you shouldn't be leading the blitz.

Somehow, in the middle of it all, you'll get that rush, that realization that it's working, that you're conducting this orchestra, playing the music you composed, and its working. Come early, leave late. Go to bed early. Don't plan anything else for the week.

The last hour of each workday should be spent planning tomorrow; thinking through the schedule, making your task list, checking materials, adjusting to compensated for snags, etc.

You will most likely go through the emotional roller-coaster gamut throughout the course of the week. I find that in a five-day blitz **Monday** is a blast. It's all framing. It's easy to keep lots of people busy. It's the exciting part, the productive part, the crucial part.

Tuesday is a killer. You're everywhere with several critical objectives. Basically, the blitz revolves around sheetrock. You can't install it until the MEP's are done (correctly, too!), and you can't do anything inside until it's hung and finished. Tuesday is your crunch day to make it happen. You're trying to rush sub.s through and inspections, sheetrock and finishing, and you're trying to get the roof on to protect it. At the same time you are overseeing many technical aspects outside; boxing the cornice, starting siding and trim, etc.

Wednesday things are still all over the place, but you are in less of a crunch if you met your objectives on Tuesday.

By **Thursday** you should be starting to crash. If you haven't hit a few walls by Thursday, something's wrong. It's a lot like running a marathon. You have to reach the point where you ask yourself, "Why am I doing this?" By Wednesday or Thursday I usually start to get cranky at some point, things are slowing down a little, the big

pressures are off, but there's still a long way to go. At this point, I have to remind myself to step back and chill out, and don't say some things that enter into my brain. When I'm mad and frustrated with my staff, my boss, the volunteers, and the homeowner, it's time to step back and reconnect.

Friday is stressful as you get more and more jobs that are more and more technical but keep volunteers busy for less and less time. I have to really tune in on Fridays to give a last good push, to try and make the house as complete as possible. This can be a tough day because all of the things that are left to do are the things that you had problems getting done during the week. I always try to think that the more we don't get done while the crowd is here and the fire is burning, the more I'll have to do later when the excitement and the people are gone. Friday is the magical day, though, too. It's gel time. Friday morning you see all the things that still need to be done and think there's no way you'll get there, and somehow everything starts to come together and all of a sudden you look around and realize that you did it.

E. Potential snags

Materials – running out of materials can kill you. I would stock two extra of everything rather than run one board short and have to wait for it, especially things like siding or cabinets or paint that could be troublesome matching and getting quickly.

Sub-contracors – they'll make or break you. Prep. Them thoroughly. Promise them a bonus. Offer them future work. Threaten them. Whatever it takes, help them to understand that if they're not willing to show up early and do what it takes to get inspections, you'll be glad to find someone else you can trust. Re-confirm with them the week before the blitz. Go over the plans with them. Talk through the potential snags. Determine who's providing the tub, etc.

Inspectors – you have to have them on board. Play it up. Make them feel important. Make them feel like they've got a chance to make the municipality look good. Coach them just like the sub-contractors. Some larger blitzes have been known to make a deal with the city to pay the overtime wages of the inspectors to be on site for the entire blitz! You may not have this luxury, but you should still make the partnership as close and as positive as possible. Play to their ego. Make them believe that the whole, amazing project depends on them. Most inspectors, like all of us, are suckers for something different that makes us feel important.

Volunteers – You can't do a blitz without people. I've tried. I've done blitzes where two or three days had only three or four people. Ain't happenin'. It doesn't work. I've also tried to do blitzes with 60 to 70 people per day, totally unskilled, who arrive and depart at random times throughout the day. This also doesn't work. You have to prep. This resource just like the others. Help them understand that they are the most important piece of the puzzle. Schedule your A-team. Have them committed to starting early, working late, and being prepared with tools, etc.

De-briefing – the final hours of a blitz can be anti-climactic. Everyone's tired. Everyone's asking questions about where you want the water hose, the buckets, the sawhorses, etc. I would try to get as much of the clean-up and shut-down as possible and then have a closing something. Do a dedication, say hurrah, take a group picture, whatever, just do something to give everyone a sense of completion and the clue that it's time to go home. There's nothing worse than being on site by yourself at 5:30 at the end of a blitz with tools and materials all over the place. Wind it down. Have a conclusion. Smile. Be in the picture. Then go home and rest!

One Week Blitz Schedule

Day One – Framing

Objective: walk away with waterproof house

Tasks:

- Raise walls
- Frame roof system
- Sheath entire exterior
- Felt and housewrap
- Install Windows and entry doors
- Prep interior for sheetrock

Day Two – Siding and Sheetrock

Objective: have sub.s in and out, start sheetrock, build most of exterior

Tasks:

- Finish out rough-ins
- Get inspections
- Insulate and sheetrock, tape and bed if possible
- Install siding
- Trim out most, if not all cornice

Day Three – Finish Exterior, Tape and float sheetrock

Objective: build exterior completely, caulk and paint, float sheetrock

Tasks

- Finish building all exterior siding and trim
- Trim porches, set columns, build rails and stairs
- Caulk and Paint exterior
- Sand and skim sheetrock

Day Four – Exterior Touch-up, Interior Trim

Objective: Completely finish exterior, install interior trim

Tasks:

- Finish any loose ends on exterior, including touch-up paint
- Install doors, base, window trim, underlayment

Day Five – Interior Paint

Objective: Caulk and Paint interior

Tasks:

- Caulk and paint all doors, trim, walls, etc.
- Begin accessories, if possible
- Catch up on anything else that has fallen behind

Day Six – Cabinets and Accessories

Objective: Set Cabinets, Install Accessories

Tasks:

- Set Cabinets and countertops
- Install door locks, closet rods, and other accessories
- Have sub.s trim out
- Fine tune, punch-list, clean-up, touch-up

General Notes:

- This is for a six day blitz, starting with a floor, layout done, materials on the ground, etc.
- This is an aggressive schedule – realistically some things will bleed into the next day.
- Things often forgotten about: adequate power, dumpster, toilet, multiple tools (framing guns, trim guns, compressors, hoses, cords, circ. Saws, miter saws, extra hammers, tape measures, speed squares, pencils, string, levels, sledge hammer, string, etc.), scaffolding, food / break tent, pre-paint area, 6 sets of saw horses.
- Sheetrock is the critical issue. Sub.s can make you or break you.
- Ideally a handful of people are prep.ing each site starting at least one week before the blitz
- Cushion and back up plan
- Subcontractors- prep. them with info, check on their own preparation, stress the importance of timing, offer rewards, have a back up. Coach them, check on them, make sure they have what they need once they start. Tell them that you've scheduled inspections at least 4 hours before you've actually scheduled them.
- Inspections -- meet with inspectors, their boss, and the mayor, stress the good p.r. the even will be for the city, and how much bad p.r. would come from finding out the city was the hold up. Go over all inspections, all procedures, make sure everyone is on the same page. Set up schedule, have back up plan, get cell number if possible. Be nice.
- Secret short-cuts – Truss layout, rafters, dormers pre-cut, snapping lines on plywood, prep.ing porch beam, the secret hour after they leave and the hour before they get there.
- Supervision – strong crew leaders –
    - Have a crew leader's meeting prior to the blitz. Give them a set of the plans, the schedule, s.o.p.s, special instructions, etc.
    - If possible walk the sight together the day before the blitz and talk through day one so everyone will get a feel for what's what
- Crew divisions
    - Day one makes sense to have deck and high crew, interior wall and exterior wrap crew -- always make the high crew strongest
    - Day two – roof crew, cornice boxing, siding
    - Day three – you may be able to divide up per side of house (four crews)
    - Day four – interior paint crew, interior underlayment crew, exterior paint/deck/finish crew
    - Day four and five crews can disband somewhat and choose people for jobs
    - As you progress the number of different tasks increases and the time it takes to accomplish each task decreases. Day one is easy to set up – frame

house and it takes all day. Day 5 might entail a list of 30 things from cleaning the tub, to touch up, to one more rail, etc. Let people cross off items on the list and get a new job when finished.
    - Always divide up into inside and outside when possible.
- Stress and crunch
    - It will probably almost kill you, but that's the way it works
    - If at some point you don't think something like, "why are we doing this, this is never going to work, we're never going to make it" then you're probably not keeping up
    - It's normal to get a little flustered and testy, especially among supervisors and planners. Things go wrong. Everything is under pressure. Try to relax and enjoy the unusual buzz. There is a high that comes with being a part of (and especially directing) something so chaotic and amazing as building a house in a week. Keep in mind that in the end, in most cases the progress you will have made will be worth it, even if you end up falling short of your goal. Also, remember that there is a light at the end of the tunnel, that at the end of the week everyone will be friends again, you can raise a toast, and hopefully rest for a couple of days.
- Gel time
    - There usually comes a point, usually on the last day when you think there's no way it's going to work. It is amazing, however, how quickly the loose ends can simultaneously start coming together, and how quickly you can find yourself suddenly looking for work for the volunteers because you've run out of things to do. The frenzy seems to increase as the blitz progresses and there is a "crescendo" as the finale approaches.
- The magic
    - Standing on the sidewalk, arms around volunteers and staff and homeowner, looking at a beautiful house that was built in a week, is all worth it.

IV. How to Manage the entire process (Construction Management)

A. The Big Picture

Most of the things we've talked about so far relate to the role of site-supervisor or house-leader, the person or people who are working side by side with the volunteers. They get to do the "fun stuff"; working with volunteers, cutting sticks, swinging a hammer. But, there are many things that have to happen behind the scenes for the "fun stuff" to be possible. Someone has to be managing the overall process, seeing the big picture, doing the before and after, rescuing problems, and troubleshooting potential snags. Enter the construction manager.

His main job? To see the big picture. He certainly can (and should) make forays into the action, i.e. jumping in with the volunteers on framing day, putting in a dryer vent, etc. Otherwise he'll lose touch with what's going on, and probably loose his inspiration for the job. But, he has to be careful not to get too sucked in to one house or one phase of the project, or he'll loose touch with the big picture. And the big picture is so important.

1. Multi-tasking

Seeing the big picture means knowing what's going on with all projects at all times. This isn't easy. It takes practice. But it's do-able. You have to make constant judgment calls, most often between a large pile of things that need to happen right now. When I first started shifting from site-supervisor to construction manager I was amazed by how long my lists were, and how many completely different tasks I was able to accomplish in one day. Check on that permit, call the electrician on that issue, call for a re-inspect at that house, check out the water heater problem, call the cabinet vendor about the upper cabinet size, check on the volunteers and site supervisor at that site, make sure the plywood got there, do a take-off on interior trim, measure those doors, order those trusses, etc. etc.

And, do all this while new things are coming at you: the dumpster bill, the other electrician, the staffing issue, the media event, the homeowner complaint, the doors that didn't fit, etc. It can make your head spin. If you're not careful you could run circles around yourself all day, letting every issue send you on a wild tail-spin goose chase. The trick is to stay focused, to manage your time, to do a lot of things fast. Sometimes I make my long list and then pick the most important thing on it and then say to myself, "If I don't get anything else done today, I'm at least going to get that one done." Then I fight like mad to get it done, bouncing of the arrows of the new emergencies, adding them to the list, re-working my plans. Then, when I get number one done I can move to number two, and so on.

2. Starting and Finishing

Believe it or not, the hardest part of building a house is starting it. The second hardest part is finishing it. The actual building of the house is the "easy" part. And, since the construction manager gets to deal with all the hard stuff, he usually spends most of his time on the starting and finishing of houses. Of course he has to be involved in the building part, ordering materials, setting up the sub.s, etc. But, if he's not spending a good chunk of his time preparing new lots with new plans and new foundations, then things will quickly come to a grinding halt. And, on the other side of the spectrum, if he's not pushing through punch-lists, final inspections, and utility connections, then houses drag on and on, people don't move in, and the overall goal is thwarted.

B. With-it-ness

Like it or not, the C.M. is going to spend more time on the phone, in the truck, and at the computer, than swinging a hammer. That's the sad part. The cool part is that he gets to be part of everything, gets to make key decisions, gets to have a wider influence.

This skill is similar to the "with-it-ness" of the site-supervisor. The difference is that the site-supervisor needs to be "with-it" regarding everything that's happening with the house at the same time. The construction manager is doing the same thing, only with many different houses. He keeps his eye on everything, so nothing falls through the cracks. Spinning plates, keeping balls in the air -- the analogies are usually pretty accurate. The trick is to focus on a few key plates that need the most attention, but still keep the others spinning.

In my work in Biloxi, a colleague and I visited 84 houses in one day. There were 26 we didn't see, and it took us most of the day, but the information gained was invaluable. Seeing something with your eyes suddenly puts you in the know. It gives you experiential information. And, as construction manager you are the king of information. The site-supervisor has all the skills. The construction manager has all the information: the number to the dumpster company, the code for driveways, the sizing of the air-handler, etc. etc.

C. Taking the Slack

In light of all this, the construction manager gets to deal mostly with the snags. His job is to keep things flowing. Therefore, the things that are flowing smoothly get very little of his attention. He gets to deal primarily with the problems. He's there to trouble-shoot, to un-kink the snags, to put out fires. And, lucky for him, the non-profit construction world tends to never have a lack of fires. The volunteer that got hurt, the contractor who didn't show up, the dumpster bills that got messed up, the staff member who keeps showing up late, the permit that won't go through, the trusses that didn't show up, etc.

These are some of the hidden joys that nobody realizes or appreciates. If the C.M. does his job, he dances through these issues and keeps things flowing and nobody knows

there was a problem. If he drops the ball, then things go poorly and everyone knows it. Sorry.

D. Creating Systems / Structure

Somehow you've got to keep track of it all. There's no way you can keep it all in your head. You can use a computer or a notebook or a piece of sheetrock and a crayon, but somehow you have to track what's going on. Your method will depend on your operation. With Habitat I was tracking 5 to 10 houses with 5 staff members. I made my lists, and made a weekly calendar of who would work at which sites which days, and that covered us pretty well.

When I managed a pilot program to build houses in a disaster zone after Hurricane Katrina, my tracking system was much different. I had to track client selection, title searches, loan closings, parcel numbers, surveys, contracts, and more. (See appendix C)

Then, my second Katrina-recovery endeavor was managing the process for an LTRC, or Long Term Recovery Committee. Here our goal was to track all of the volunteer construction efforts in the entire community. Suddenly my spreadsheets got bigger and the font got smaller. I basically spent the first six months of the job developing a tracking system that worked. The trick was to provide the essential information for each of up to 130 simultaneous houses without getting so big it was un-readable. The other complication here was that besides the raw construction issues I also had to track 5 to 10 different funding sources (each with their own set of restrictions and procedures), 5 to 10 different service groups (both long and short-term), real expenditures verses projected budgets, and more. It didn't leave much room for straight-up construction issues. (See Appendix D).

1. Schedules

Schedules can be tricky in the non-profit world because you live and die by volunteers and funding. Both are fickle, and subject to change at the drop of a hat. Still, you have to make a schedule to shoot for. At Habitat we laid out a yearly calendar that mapped out house starts, one-week blitzes, two-week blitzes, and 10 week "Saturday-only" houses. Of course, the calendar revolved around funding and volunteer commitments, but it gave us a plan.

My Hurricane recovery work was a different story. Everything was pretty fluid. We systematically pushed casework into potential projects into assessments into material lists into vendor/contractor quotes into grant submittals into real materials into construction projects. Inject into this cumbersome, convoluted process the random, "episodic" nature of not only our volunteers, but those of other groups as well, and voi la! There's our construction schedule. Basically we matched our list of priority houses with

our list of potential volunteers and pushed as hard as we could. I pushed hard to get them "on the board" and started, then I pushed to get them "dedicated".

2. Budgets

It was an amazing epiphany for when I realized things cost money. It was just a few years ago. I was 34. As a site supervisor with an organized non-profit all I had to do was get the stuff on the ground and put it together. Get me a pile of sticks and a crowd of people and I could build a house. Simple.

Well, as I got further and further into construction management, with emerging organizations that were flying by the seat of their pants in a disaster zone, I quickly realized that if you money is important. "If ya ain't got it, ya cain't build it."

Make a budget for each project. Do a detailed take-off. Get real bids and real quotes. The grand total is the big picture. Plug in potential funding. Then turn actual funding into houses. Track it as you go. Pay the bills. Watch for overspending. Revamp when needed. Don't be afraid to pull the E-brake once in a while when needed to keep from going over-budget. (See Appendix F)

3. Other tracking mechanisms:

As construction manager you should be continually developing systems that work. The trick is to come up with systems that simplify and produce but don't bog down the process. Create forms and procedures as needed. Then monitor their effectiveness (Is anyone using them? Are they helpful? Do you ever refer back to them and its helpful then?). Too many procedures can be like too much tracking; you reach a point of diminishing returns. Appendix G through L are some of the forms I've found to be helpful. Construction information (permit schedules, standard critical measurements, how-to sheets, etc.), initial assessment forms, homeowner selection sheets, punch-list sheet, final walk-through, are some of the ones I've found to be helpful. \

Play with them, develop your own, modify mine. Develop your own binder that contains your key tracking tools. If nothing else, these tools should at least give a sense of order to the chaos, and put some caps around the project so things have a clear beginning, middle, and end.

E. The G.C. Role

The non-profit construction manager is a lot like the for-profit general contractor. Both manage budgets, staff, construction schedules, etc. But, the construction manager has even more on his plate. He also has to deal with creative funding issues (donations and grants), the intricacies of a volunteer labor force, and all of the inner workings of staff, volunteers, homeowner, office staff, media coverage, you name it.

1. Steady Pressure

Managing construction, like parenting, is a test of your patience. Can you be grace under pressure, or will you crack? When I asked a fellow construction manager how he gets so many houses finished and keeps smiling, he responded, "No worries, but steady pressure." That's the key. It's amazing how volunteers will leave the porch un-trimmed for weeks, how contractors will forget to show up at all, etc. They need constant "encouragement", or steady pressure. Sometimes this involves sweet-talking, playing to their ego, begging, bribing, threatening, having your staff do it, and lastly, doing it yourself. Bottom line is this: Is it getting done? If not, find a way to get it there. If you look at your tracking system and you haven't been able to fill in any new boxes on a project for a while then something's wrong.

2. Sub-Contractors

Another friend and mentor has stated, "Anyone who has managed sub-contractors is qualified to run a day care." Contractors are funny people. They come in all forms. They're just people. Most of them are trying to make a living. Treat them like children. Set limits. Get it in writing. Make them give you firm bids. Try to be positive with them. Last resort, threaten them with no future work, hold a check back, etc. Try offering rewards. Punishments if necessary.

Stay in constant contact. Be clear about what role you play, what you will and won't provide, what the volunteers will and will not do, etc. Follow up.

Get references, licenses, documentation. It's a pain in the keester, and nobody has time to do it, but you can save yourself a lot of trouble by asking for those things up front. If they can't provide them, that tells you a lot right there. If they give them to you on the spot and everything checks out, chances are you've found one of the good ones. One person telling you, "He did a good job for me at a fair price" is worth more than two days of conversations with the contractor. Ask if you can see some of their work. If they can't think of any it's a bad sign. If they're doing a job down the street and you can go look at, go do it. By walking through one of their jobsites you can tell more about the contractor than anything else could tell you.

Weed out the bad ones. Your strongest criticism is to never use them again. When you find that rare bird, the one who gives you a fair price, does what he says he'll do, answers the phone, etc., hold on to him. Use him as much as possible. Help him out once in a while by unloading the drywall, calling in his inspection, letting him borrow your trailer. Most of the time, the good ones are going to return the favor.

F. Managing the Construction Staff

Your other key responsibility as a construction manager is to manage your construction staff. Treat them like volunteers. Lead them. Coach them. Work with them. Give them your expectations, then give them some room to do it. Teach them. Set them up for success. Give them responsibilities. Challenge them. Give them opportunities to grow. Listen to them. Give them some choices. Keep them happy.

When you give them opportunities to learn and grow (lead their own house, manage the sub.s, do a take-off, run a blitz), you're accomplishing two goals at once. They are feeling important and needed and they're staying fresh; they want to stick around and learn more. And, at the same time, you are getting more and more capable staff members.

Organize. Get together at least once a week. Ask for project reports, plan next week and beyond, throw out key points, key events, things to work on, etc. Give everyone a chance to bring anything to the table. Keep it short. Have it at a time that will be least disruptive to the flow of volunteers, etc. Keep it the same time every week so everyone can plan for it and plan around it. Every once in a while have donuts or something.

Help them. Give them the tools and resources they need to make their jobs easier. Try to see what their obstacles are. If everybody's loosing keys, get lockboxes or labeled key rings. If standard measurements are getting messed up, make-up a cheat-sheet. If boxing cornice is confusing everybody, do a tutorial or make a little how-to sheet. Draw pictures. Step in and help every once in a while. These kinds of small gestures send a message that you're trying to create solutions instead of just giving out assignments. It also helps to get the work done. This will also result in good karma; your team will be more willing to jump in and help you out with what you need if you've done the same for them from time to time.

Inform them. Keep them in the loop. You're going to be in a lot more meetings, have a lot more conversations, and do a lot more "networking" than your site supervisor. You can't tell them everything that goes on because it would take too much time. But, at least do them the service of keeping them up-dated about what's going on. Even if it's something that doesn't directly affect their job, if it's something significant to the organization, let them in on it. Communication is a service that tells people you care enough to let them know what's going on.

Cross-train. Every so often, take somebody with you to accomplish something that's part of your job as construction manager. Set up batter-boards, meet with a contractor, participate in the board meeting, anything that helps them see the bigger picture. This accomplishes several obectives. You get help, even if it's just a second take on whatever you're doing, your staff member gets to see what you do, and they become more capable of doing those tasks without you if needed. And, someday, you're going to want somebody to take your place who knows what you've been doing and how you've been doing it.

Delegate. Working for a construction manager who tries to do everything himself can be more frustrating than working for one who does nothing. Find the balance. Step back and trust your people with important tasks. Monitor how they do. Then step it up or pull back, depending on how they did. You'll have happier staff, and you'll have less pressure on yourself to be everywhere at the same time doing everything.

Give feedback. Critique with tact, but be direct. If you never tell them what you expect, then how do you expect them to ever perform the way you'd like them to? Give honest, sincere praise, not just "I really appreciate you guys", but "Man that porch looks hot; how did you guys knock that out so fast?" When they screw up, tell them. Do it in a professional way that lets them keep their dignity. Sometimes you may have to write it out so it's very clear.

Step in when needed. Choose your battles. If it's a little thing and only happened once and it's not that big of a deal, let it ride. If it happens once a week, it's driving you crazy, and it's hurting the organization in some way, then you have to deal with it. If you don't, who will? You are the manager. You're the one who has to do the un-fun stuff, remember? It can be uncomfortable, but most of the time, in my experience, when it's done the right way, it ends up being very helpful, and even improves the working relationship.

Teach them in the way you'd like to be taught. If a boss is never satisfied with performance and harps on weaknesses, if he micro-manages to death, pretty soon people are going to stop trying or find another job. Treat them with respect.

G. The Pay-off

In general, as a construction manager you're going to take care of all the head-aches. That can sound like a pain, and it can be, but just like with everything else, the bigger the challenge, the greater the reward when you work through it. Managing the construction side of a non-profit organization can whoop you, but it can also bring you a tremendous sense of satisfaction. You may miss some of the hands-on, grass-roots fun stuff, but your pay off is that you get to have a bigger influence on the overall process. And believe it or not, that can be kind of fun, too.

Tool List

Power tools:

- Compressor
- Circular saws
- Miter saw
- Sawsall
- Framing guns
- Trim guns
- ¼" staple gun
- Drills
- Drivers for roof / saferoom
- Nibbler for roof metal
- Hardi chopper / shears

Accessory Tools:

- Extension cords
- Air hoses
- Electrical splitters
- Air splitters
- 4 foot levels
- 2 foot levels
- Sledgehammers
- Post hole diggers
- Brooms
- Floor scrapers
- Garbage can

General Supplies:

- String
- Ladders
- Hose and sprayer
- Wash station
- Saw horses / paint horses
- Wheelbarrow

- Scaffolding
- Walkboards
- Container w/ shelves

Volunteer Supplies

- Hammers
- Pencils
- Tape measures
- Speed squares
- Tape measures
- Utility knives
- Dust masks
- Gloves
- Water cooler / cups / ice

Paint Supplies:

- 4 inch brushes
- 2 ½ inch brushes
- Roller frames, covers, poles
- Paint cups or containers
- Caulk guns
- Roller pans
- Bucket screens
- 5 gal. buckets

Standard Measurements

Framing

Jack length (supports under window and door headers)	81 ¼”
Saferoom wall stud length	82 ½”
Headers = width of rough opening + 3”	+ 3”
Window rough openings = size of window call-outs (36” x 62”)	exact
Door rough openings = door call-out + 2 ¼” (i.e. 3 0 door = 38 ¼”)	+ 2 ¼”
Cripples under 3’0” x 3’0” (kitchen sink) window	43 ¾”
Cripples under 5’2” tall windows	17 ¾”
Return air closet platform (down from bottom of header)	50”
Return air opening	21 ¼” x 21 ¼”
Attic Access	22 ½” x 54”
Heater closet minimums (inside dimensions)	32” wide, 36” deep
Water heater closet minimums	27” x 27”
Rafter length overhang at eaves(Horizontal measurement)	20”
“ if accounting for vented ridge	21”
Gable roof overhang (to outside of sub-facia)	16”
Bottom of soffit nailer (22 ½” overhang, 5/12 pitch)	8 ¼”
Heal cut height on stick built rafters	1 ½”
Kitchen cabinet blocking (centered)	36” (bottom), 56” (middle), 84” (top)
Towel bar blocking	52” to center
Toilet paper holder blocking	18” to center

Siding

Line spacing for 8 ¼” hardi-board (start from top of block)	7”
Corners overhang below top of block	1 ¾”

Plumbing

Tub-shower unit spacing between walls	60 ¼”
Offset for studs at shower side (start at 15” to center)	7 ¼” each way
Tub drain diameter (centered at 4” from wall)	2”
Toilet drain diameter (centered at 13” from wall)	4”
Spacing for toilet (minimum clearance)	30”

Closets

Shelf height (top of cleat) from floor	60”
Closet rod from back wall	12”

Cabinets

Kitchen cabinet height (lowers)	36”
Kitchen cabinet depth (lowers)	24”
Kitchen cabinet height from floor (uppers)	56”
Kitchen cabinet depth (uppers)	12”
Vanity depth	21”
Vanity height	36”

Appliances

Washer / Dryer closet width minimum (in the clear)	64”
Washer / Dryer closet depth minimum (in the clear)	36”
Refrigerator width for opening	36”
Stove width (opening in cabinets)	30 1/8”
Venthood width	30”

Stairs and Railings

Deck / Porch rail height	36” to 38”
Max spacing between spindles	3 7/8”
Max spacing between spindles beside stairs	4 1/4”
Maximum stair riser height	7 ¾”
Minimum tread depth	10”
Ideal stair tread and risers	7” x 11”
Maximum porch height without needing rails	30”
Graspable Handrail Height above tread nose	34-38”

How to Build a Storage Building

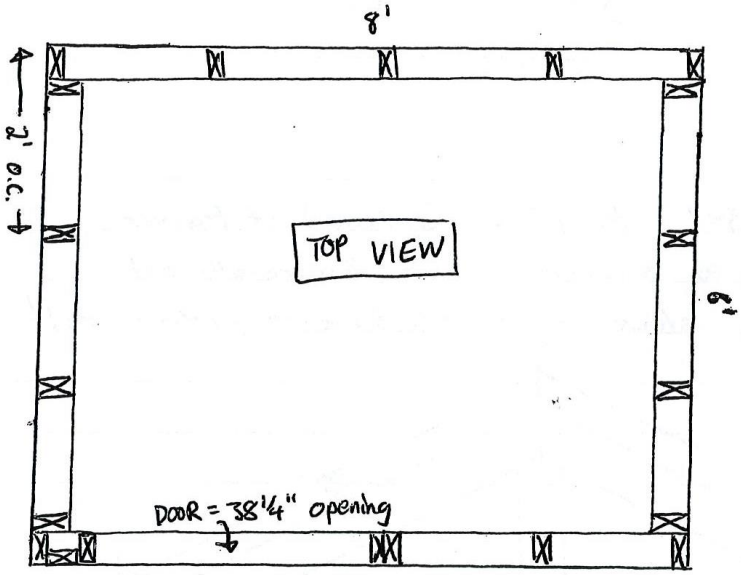
1. **Floor**
   a. Use 2x6x8 pressure treated stock – cut both exactly 8 feet long
   b. Use 4 2x6x12 p.t. – cut 7 at 5'9" (leaves one leftover 6 footer)
   c. Build floor frame by nailing short pieces in between long pieces on 16 inch centers
   d. Square frame by matching diagonals, brace diagonally on bottom
   e. Locate best spot for building in back yard, square up in relation to house, must be 5 feet from property line
   f. Dig holes in 4 corners inside of frame with post hole digger
   g. Shim under frame so all 4 sides are level, 6 inches above grade
   h. Cut 4x4 posts to fit down in holes, inside corners, nail in place
   i. Fill holes with quickcrete
   j. Deck floor with ¾ x4x8 plywood, save leftover 2 feet for shelf

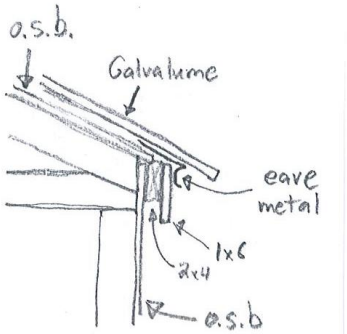
2. **Walls**
   a. Cut 4 2x4's exactly 8 feet for long wall top and bottom plates
   b. Cut 4 2x4's (14 ft. stock) at 5'5" for short wall plates
   c. Cut 20 2x4's 82 ½ " long (14 ft. stock) for studs
   d. Layout walls and build as shown
   e. Nail bottom plates in place, tie corners together
   f. Plumb walls and brace with diagonals on inside

3. **Roof**
   a. Build trusses according to diagram – all 2x4 material
   b. Install trusses on 2 foot centers
   c. Sheath roof with o.s.b., then felt
   d. Sheath exterior walls with o.s.b.
   e. Wrap building with felt or housewrap
   f. Install 2x4 flat around top perimeter of building as soffit
   g. Install 1x6 facia with top edge planing out with top of plywood

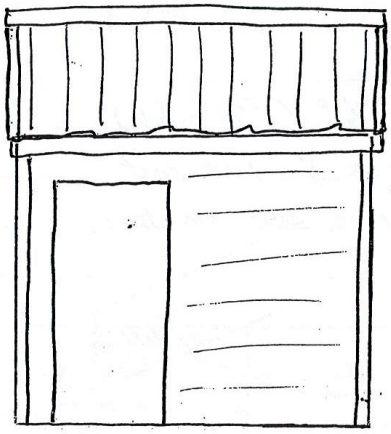
4. **Siding**
   a. Install 5/4 x 4 Miratech corners by overlapping one side
   b. Install siding using 7 inch spacing (for 1 ¼" overlap)
   c. Build door with plywood, 2x4's, siding, and trim
   d. Caulk and Paint exterior
   e. Build shelves inside, label and organize

STORAGE BUILDING PLAN

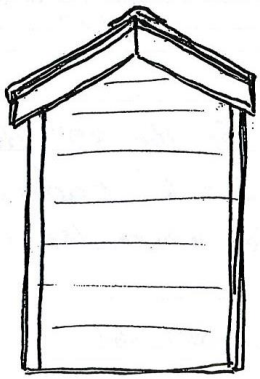




CORNICE DETAIL



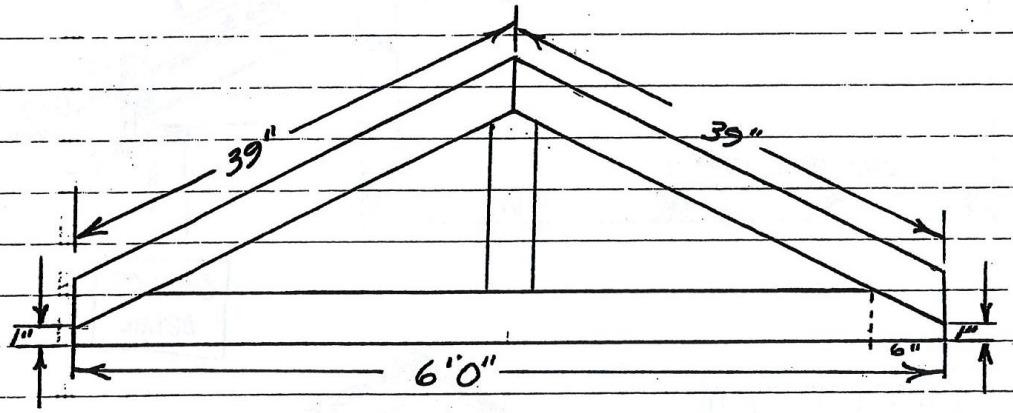
FRONT VIEW



SIDE VIEW

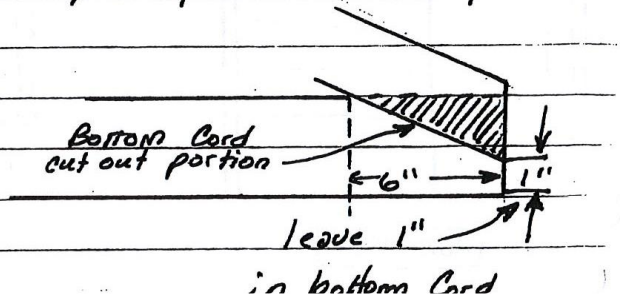
TRUSS PLAN

Cut (10) 39" top pieces (rafters) of trusses just as shown. Cut 3 carefully out of 10' stock - you will have very little waste!!



The angle for the 39" stock is 22½° (5/12 pitch) take the 5 - 6' bottom cord pieces & cut out along the edge where the top 39" peice sets on top

See diagram to right sorta.



Cut (5) middle peices

How to Build a Saferoom

1. Walls

a. Cut long wall plates (6 spruce, 2 pressure treated) @ 6'7"
b. Cut short wall plates (6 spruce, 2 p.t.) @ 6'
c. All top and bottom plates will be doubled
d. Cut 46 2x4's at 82 ½ inches for studs (use 14' stock)
e. Layout top and bottom plates (15 ½, then 16 in. on center)
f. Build walls (per diagram) - build door wall around metal frame
g. Use bottom plate straps (SPH4's) on every stud
h. Drill holes to match threaded rod layout
i. Install walls, bolt down with 3" washers, ½" nuts
j. Tie corners together (flush)
k. Plumb and brace diagonally on inside

2. Ceiling

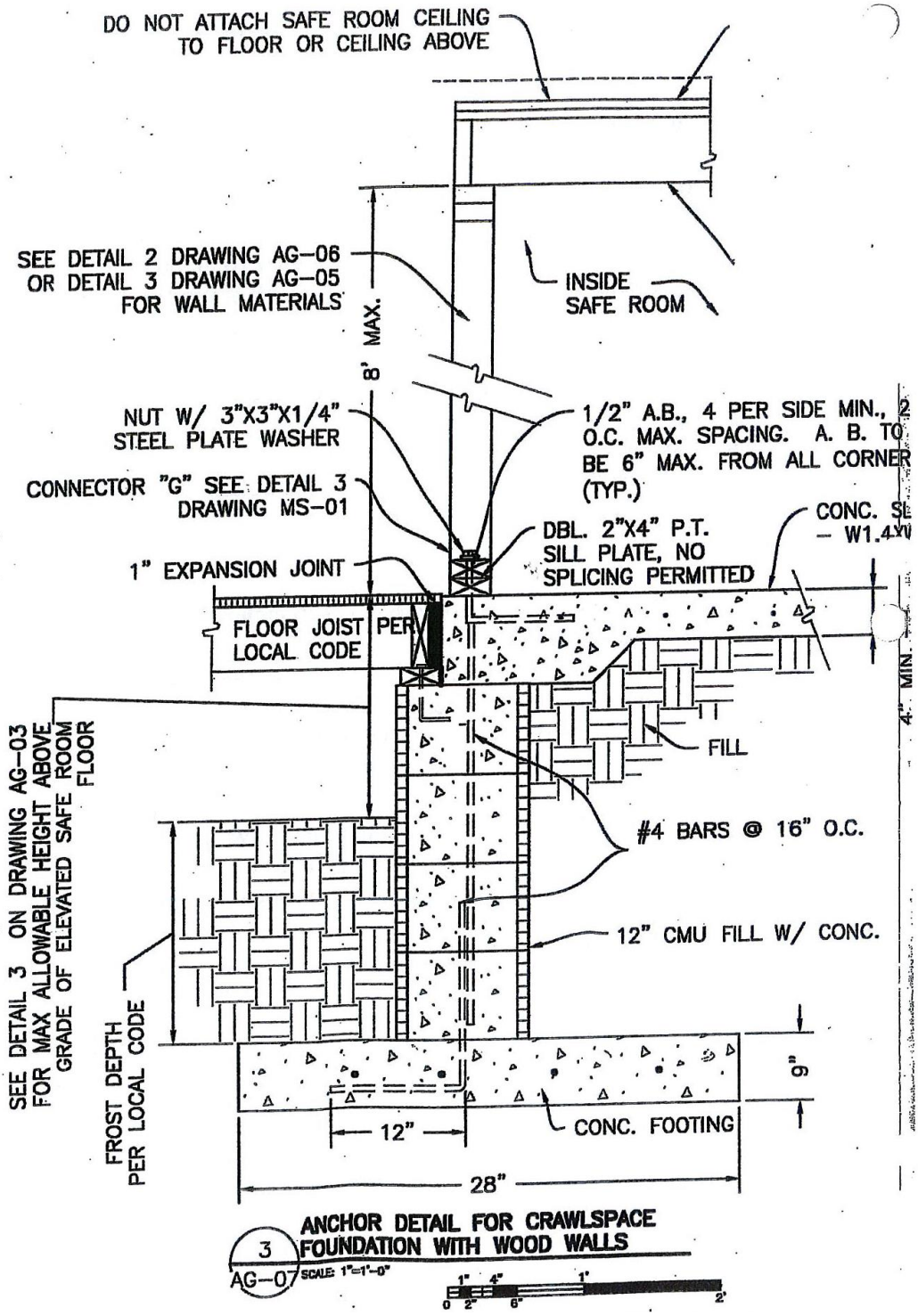
a. Cut 10 ceiling joists out of 2x6 pine (76 inches)
b. Cut 2 2x6's 79"
c. Use 2 of each to build ceiling joist band on top of walls
d. Install double joists parallel with door wall, on stud layout
e. Attach LGT2 hangers to studs, top plates, and ceiling joists

3. Sheathing

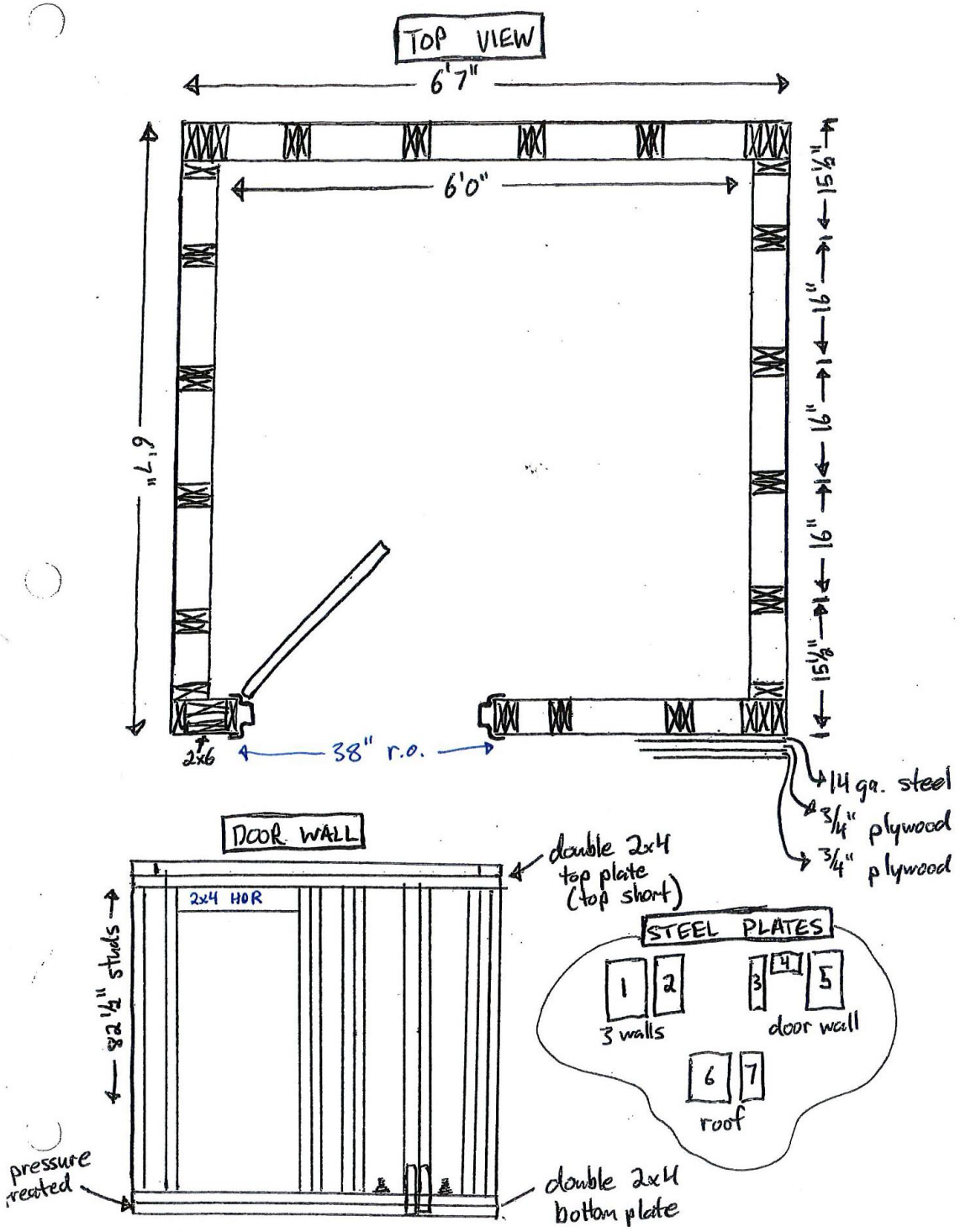
a. Attach steel sheathing according to diagram w/ nails in corners
b. install first layer of ¾ plywood, horizontal, with short Tech screws, ledger locks, or ramset nails - every 12".
c. Install 2nd layer of plywood sheathing, vertical, long screws
d. Attach with screws every 4 inches on perimeters, 6 in. in field

4. Finish

a. Set door on finished floor, plumb in all directions
b. Make deadbolts align exactly
c. Trim around door jam (inside and out)
b. Paint door, install handle and dead bolts


DO NOT ATTACH SAFE ROOM CEILING TO FLOOR OR CEILING ABOVE
SEE DETAIL 2 DRAWING AG-06 OR DETAIL 3 DRAWING AG-05 FOR WALL MATERIALS
INSIDE SAFE ROOM
8' MAX.
NUT W/ 3"X3"X1/4" STEEL PLATE WASHER
1/2" A.B., 4 PER SIDE MIN., 2 O.C. MAX. SPACING. A. B. TO BE 6" MAX. FROM ALL CORNER (TYP.)
CONNECTOR "G" SEE DETAIL 3 DRAWING MS-01
DBL. 2"X4" P.T. SILL PLATE, NO SPLICING PERMITTED
1" EXPANSION JOINT
FLOOR JOIST PER LOCAL CODE
FILL
#4 BARS @ 16" O.C.
12" CMU FILL W/ CONC.
SEE DETAIL 3 ON DRAWING AG-03 FOR MAX ALLOWABLE HEIGHT ABOVE GRADE OF ELEVATED SAFE ROOM FLOOR
FROST DEPTH PER LOCAL CODE
9"
12"
CONC. FOOTING
28"
4" MIN.
ANCHOR DETAIL FOR CRAWLSPACE FOUNDATION WITH WOOD WALLS
3
AG-07
SCALE: 1"=1'-0"

SAFEROOM PLAN



How to Build a Stoop

1. Frame Deck

a. Cut 2 2x6's 8 ft. even (8 ft. material)

b. Cut 7 2x6's 4 ft. 9 in. (10 ft. material)

c. Build Frame as shown (top diagram), joists on 16" centers

d. Square frame by matching diagonals, attach diagonal brace

2. Set posts

a. Dig four holes (18" deep) to receive posts (top diagram)
b. Post for stairs sits 36" from house to inside edge
c. Set frame in place, level in all directions with temp. vertical braces
d. Set posts, plumb in both directions, attach to frame
e. Fill holes with quick-crete
f. Attach blocks around inside faces of posts for deck board support

3. Attach deck boards

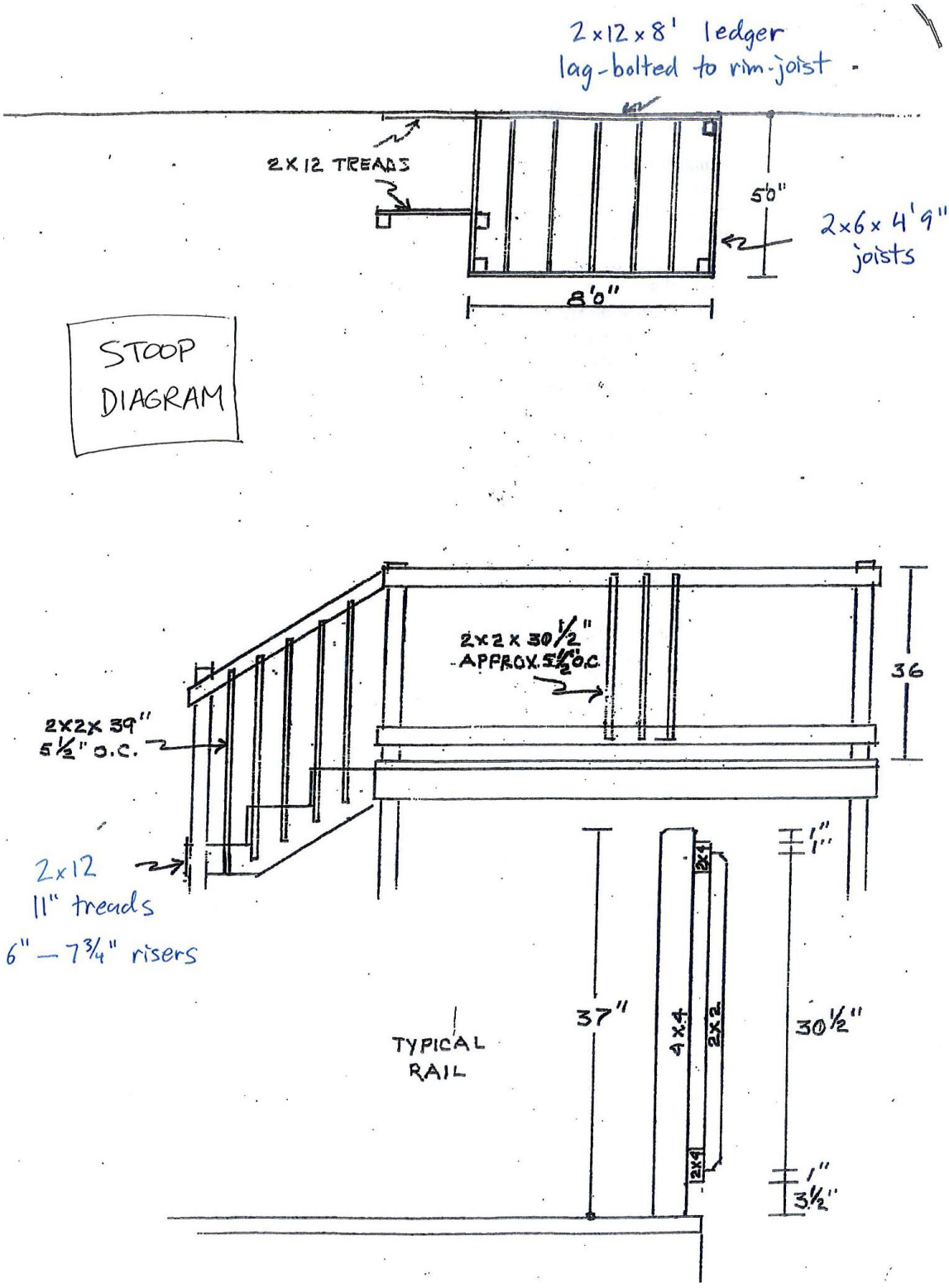
a. Cut deck boards exactly 8 ft. (8 ft. material)
b. Starting at outside edge, attach deck boards, snug tight
c. Notch deck boards with jig saw to fit around 4x4 posts

3. Build Rails

a. Cut off posts 37" from top of deck boards
b. Champfer, router, or sand top edges of posts
c. Cut top and bottom rails to fit, butt joints are ok (middle diagram)
d. Attach bottom rail 3 ½ in. above top of deck boards
e. Nail top rail level, 1 in. below top of posts
f. Cut spindles 30 ½ in. with top and bottom champfer
g. Attach spindles (evenly spaced), 3 7/8 in. max

4. Steps

a. Determine total rise = distance from top of concrete to top of deck
b. Divide total rise by desired number of steps to get riser height
c. Riser height must be less than 7 ½ in. (7 in. is ideal)
d. Cut stringer using riser height and 11 in for treads
e. Subtract tread thickness (1 ½ in.) from bottom tread
f. Attach 3 stringers to make a 36" wide set of steps
g. Attach treads (2x12 material)
h. Lay 2x4 rail on steps and scribe where they hit posts to get angle
i. Attach stair rails and spindles


2x12x8' ledger
lag-bolted to rim-joist
2X12 TREADS
5'0"
2x6x4'9" joists
8'0"
STOOP DIAGRAM
2X2X 39" 5½" O.C.
2x2 x 30½" APPROX. 5½" O.C.
36
2x12 11" treads
6" — 7¾" risers
TYPICAL RAIL
37"
4x4
2x2
2x4
2x4
1"
1"
30½"
1"
3½"

Punchlist Checklist
Habitat for Humanity of Tuscaloosa

Homeowner: _____
House Address: _____
Supervisor: _____
Date: _____

Exterior:

- All facia/soffit/cornice caulked and painted 2 coats
- All siding installed, repaired, loose edges nailed, caulked, painted
- Foundation Access door installed, painted
- Porch rails installed, screwed, supported, caulked, painted
- Step rails installed with graspable handrail
- Stoop complete
- Materials, horses, scaffolding, etc. removed from site
- Storage building finished, caulked, painted, cleaned out (leave spare paint)
- Yard landscaped, 6 inches of fall in 10 feet, positive drainage
- House numbers mounted
- Shutters installed
- All entry doors and trim stained / painted
- Soffit vents installed
- Threshold under front door installed, caulked, painted
- Porch floor stained

Other:

- _____
- _____
- _____
- _____
- _____
- _____

Interior:

- All materials, tools, etc. removed from house
- All interior trim installed, caulked, painted, touched up
- All walls touched up, finished
- All flooring installed, including thresholds, grout
- Tubs cleaned out
- Stickers removed from windows and windows cleaned
- Closet shelves installed, caulked, painted, rods installed
- Door locks installed
- Doors adjusted for even reveal
- Door stops installed
- Screens in windows
- Cabinets finished
- Escutcheons and drains meeting wall caulked under all sinks
- Countertops grouted/ sealed, caulked if laminate
- Mirrors installed
- Bath accessories installed
- Dryer vent sleeve attached
- Appliances in / functional
- Attic access door installed, caulked, painted, insulated cover
- Saferoom door painted, locks installed
- Saferoom door trimmed, caulked, painted
- Platform to air handler in attic installed
- Plumbing / electrical fixtures set and functional
- Final inspections

Other:

- _____
- _____
- _____
- _____
- _____
- _____

Blitz Preparation Checklist

- [ ] Foundation is in, ready to build
- [ ] Layout is complete
- [ ] Pre-build components (headers, etc.) have been checked to match layout
- [ ] Trusses are on the ground, correct number, correct dimensions, pitch, etc.
- [ ] Story boards labeled
- [ ] Push poles cut
- [ ] Porch Beam is cut and pre-fabbed
- [ ] Dormer, or other specialty framing pre-fabbed
- [ ] Ceiling Joists / Rafters are cut, counted, labeled, and stacked for easy access
- [ ] Dumpster is on site and empty
- [ ] Portable Toilets are clean and adequate for volunteer load
- [ ] All ordered materials have been checked against the order, counted, staged
- [ ] Neighbors have been notified about staging/painting/traffic on their property
- [ ] Tools are inventoried and available
- [ ] Storage container on site
- [ ] Tent
- [ ] Food / snacks / hydration plan in place
- [ ] Nametags and sign-in available
- [ ] Site is clean
- [ ] Paint stations set up
- [ ] Water source with hose, sprayer, and "washboard" accessible
- [ ] Crew leaders are identified and briefed
- [ ] Houseplans and color choices are readily available

House Construction and Color Choices

Homeowner:_____

Cell#:_____ **Home#**:_____
Work#:_____

Address:_____

House Size:_____

House Plan:_____

Roof Plan:_____

Columns:_____

Rails: Stained / Painted / Combination Stain Color:_____ Rail Style:_____

Flooring: Bamboo, Toast

Kitchen: Tile Color:_____ Grout:_____

Bathroom: Tile Color:_____ Grout:_____

Laundry: Tile Color:_____ Grout:_____

Countertops:_____

Siding
Color:_____

Trim
Color:_____

Accessibility Accommodations:

_____

_____

Other:

_____

Generic Material Order -- Foundation

Location:
Owner:
Vendor:
Ordered by:
Delivery Date:

Quantity	Item	Use	Unit Cost	Total
Foundation				
72	1/2" x 20' rebar			
200	3", 2-set plastic re-bar chairs			
48	1/2" x 10 zinc plated all thread rods	hold-downs		
144	1/2" nuts			
108	3" flat washers			
56	1/2" round washers			
24	2x4x12' spruce	batter boards		
2	rolls tie wire			
16 yds.	concrete			
357	8x16" regular c.m.u.	bottom courses, front wall (5 in back, 6 in front)		
153	12"x16" c.m.u.	piers and saferoom		
425	8x16" splitface c.m.u.			
20	splitface corners			
	sand and mortar			
Floor System				
2	roll 9 mil plastic	vapor barier		
17	2x6x14 p.t.	sill plate		
28	2x10x14 pressure treated	rim joists		
66	2x10x14 s.y.p.	floor joists		
9	2x6x12 p.t.	porch rim & girders		
8	2x6x14 p.t.	porch joists		
34	5/4x6x14 radius edge deckboards	porch deck		
66	galv. 2x10 joist hangers			
24	galv. 2x6 joist hangers			
4	double 2x6 joist hangers	porch frame girders		
42	3/4 x4x8 t&g strandboard	subfloor		
12	29 oz. tube Construction Adhesive			
1	2x12x8 p.t.	stoop ledger		
40	2x12x16	walk boards		

Storage Building

4 bags	quickcrete			
1	4x4x12 p.t.	posts		
2	2x6x8 p.t.	floor frame		
7	2x6x12 p.t.	floor frame		
2	3/4x4x8 CDX	floor		
8	2x4x8	long plates, soffit		
5	2x4x10 spruce	rafters		
6	2x4x12	short plates, door, etc.		
16	2x4x14 spruce	studs		
9	7/16x4x8 o.s.b.	sheathing		
6	5/4x4x12 Miratech board trim	corner trim		
45	8 1/4 x 12 cedarmill hardi board	siding		
3	1x6 Miratech board	facia		

Fasteners

2	30 lb. boxes 12d galvanized commons			
1	20 lb. box 1 1/2" #10 joist-hanger nails	floor joists		
1	30 lb. box 8d galv. Ringshank nails	decking / porch boards		
4	30 lb. boxes 12d sinkers			
2	30 lb. boxes 3" Passload, paperstrip nails			
1	20 lb. box 3" Passload, paperstrip, galvanized			

Framing and Exterior Cover

Quantity	Item	Use	Unit Cost	Total
Framing				
180	2x4x92 5/8 pre-cut (spruce)	wall framing		
160	2x4x14 spruce	top/bottom plates, ect.		
60	2x4x12 spruce	wall plates, bracing, etc.		
1	2x4x12 p.t	saferoom sill plates		
1	2x4x14 p.t.	saferoom sill plates		
200	2x6x92 5/8 pre-cut	ext. wall studs (+plumb)		
40	2x6x14 spruce	pl wall top/bottom plates		
12	2x6x12 s.y.p	headers		
50	2x8x12 s.y.p	ceiling joists		
16	2x8x14 s.y.p	cj over living room		
6	2x6x14 s.y.p	saferoom c.j.		
50	2x6x18 s.y.p.	rafters - main		
16	2x6x10 s.y.p.	rafters - porch		
5	2x8x24 s.y.p.	ridge, ledgers, hips		
4	2x10x12 s.y.p.	porch beams		
2	2x10x14 s.y.p.	side porch beams		
Nails, Hardware				
3	30 lb. box 12d cement coated nails	framing		
2	30 lb. box 8d cement coated nails	sheathing		
56	hurricane ties (H2.5's)			
2	boxes 1 1/4 in. button caps			
500	5/8" plywood clips			
1	10 lb. 1 3/4" roofing nails	siding		
2	20 lb. boxes spiral shank, galv. 8d	hardi trim		
8	LGT2's	c.j. ties for saferoom		
41	SPH4's	sr bottom plate straps		
Exterior Cover				
38	7/16"x4x9 o.s.b.	wall sheathing		
66	5/8" CDX plywood	roof sheathing		
12	3/4x4x8 CDX plywood	saferoom sheathing		
9	rolls 30 lb. felt	roof felt		

Porch rails

4	6x6x10 p.t.	columns		
2	4x4x8 p.t.	front rail posts		
12	2x4x12 p.t.	rails		
30	2x2x12 p.t.	spindles		
2 bags	quick-crete			

Stoop

14	2x6x8 p.t.	frame, deckboards		
4	2x6x10 p.t.	frame		
5	4x4x12 p.t.	posts		
3	2x12x12	stringers / treads		
4	2x4x12	rails		
14	2x2x12	spindles		
5 bags	quick crete			

Windows and Doors

6	rolls window tape			
1	3'0"x3'0" windows			
7	3'0"x5'2" windows			
1	Left Hand 3'0" steel entry door, 6 9/16" jam			
1	Right Hand 3'0" wood door, 1/2 round glass, 6 9/16" jam			

Exterior Finish

16	1x6 Miratech board - smooth	facia		
22	1x4 Miratech - smooth	freize		
28	5/4x4 Miratech - smooth	window trim, corners		
22	3/8 x 4 x 8 AC plywood	soffit		
220	8 1/4x12' woodgrain hardi	siding		
16	1x8 ex-trim	column trim		
4	1x4 ex-trim	column trim		
7	1x12 Miratech	porch beam trim		
2	vinyl, octogan gable vents			

Exterior Paint

10	gal.s exterior siding paint			
8	gal.s trim paint			
4	boxes white latex paintable caulk			
2	boxes of rags			
6	3" brushes			
6	2 1/2 " brushes			

8	roller covers, frames, poles			
4	5 gal. screens			
10	paint cups			
2	empty 5 gal. buckets			

Interior

Quantity	Item	Use	Unit Cost	Total

Interior Cover

5	15 lb. felt	floor		
46	3/8x4x8 AC plywood	underlayment		

Interior Trim

1	5'0"x6'8" twin colonist, 6 panel door unit			
4	3'0"x6'8" RH door unit			
5	3'0"x6'8" LH door unit			
1	2'8"x6'8" RH door unit			
1	2'0"x6'8" RH door unit			
1	2'0"x6'8" LH door unit			
480 l.f.	3 1/4" o.g. base			
480 l.f.	1/4-round molding			
340 l.f.	#356 casing (2 1/4")	window boxes, etc.		
48 l.f.	1x6 un-primed #2	closet cleats		
4	1x12x12 pine	closet shelves		