May 9th, 2013

Dear SSP Construction Team Member,

Welcome to the 2013 SSP team! This Construction Manual is a major part of your training to be a Construction Team member. Before you arrive at training in June, you are required to have read this manual and complete our Online Construction Training. In-person training will be a time to learn hands-on skills and to answer any questions that you have.

This manual is a great resource. You are not required to memorize all of the information in the next 100+ pages, but you are required to carry this with you on the job every day and to use it as a reference. I recommend calling me whenever you have a question, but check your manual first!

In the past few years, SSP has made a big effort to standardize and professionalize the work that we do. This has helped us stay on budget, provide better instructions to teams of youth, and provide higher quality work to those in need. Thank you for helping make this a reality.

Be prepared for high expectations and detailed work this summer. Thank you for choosing to spend your summer working for SSP; it will truly be a remarkable experience.

Megan Taylor
Director of Programs
Sierra Service Project
Office: 916-488-6441
Cell: 916-365-5892
megan.taylor@sierraserviceproject.org
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Schedules:

Construction Team members, just as any other staff member, have full schedules and must manage their time wisely. Our goal is efficiency so that you have more time to spend in fellowship with youth, counselors, community members and each other.

Summer Timeline

Training (Wednesday through Saturday, June 12-22)

- Job Specific Training
  - Hands-on tool training and project specific skills
  - Classroom sessions
  - SiteManager training
    - Budget tracking web-based software application that all Construction Team members will use daily
- Large group training sessions
  - Conflict resolution, culture and poverty, youth ministry, working with adult counselors, finances etc.
- Team building and spiritual retreat

Drive to your site in staff vehicles (Saturday, June 22 – the Arizona team will arrive at site on Sunday, June 23)

Set-up week (June 23-29)

- Meet with the tribal or community liaison that you will be working with to coordinate projects
- Visit homes that have requested work with your tribal or community liaison (intakes)
- Locate the nearest dump for construction material waste and recycling
- Plan projects for Week 1 based on highest need and projects that will take the most time (roofs and ramps especially); enter estimates in SiteManager and upload photos to Dropbox to review with Megan Taylor before Friday the 28th at noon PST. Plan as many projects during this week as possible, you will have more time during set-up week that you will the rest of the summer.
- Visit local hardware stores and lumberyards and compare prices on common items (lumber, concrete)
- Purchase materials
- Prepare Construction Journals for Week 1
- Review tool trailer and inventory provided by Headquarters. Test out your power tools so that you are familiar with them and giving instruction on how to use them.
- Plan Do-It-To-It and Hands-on safety presentations with staff
- Assist your team with basic site set-up needs (making signs, team meetings, cleaning, etc.)
Week 1 (July 30- July 6, Junior High sites end on Friday instead of Saturday like the High School sites)

- Intake, plan, estimate, purchase materials and prepare Construction Journals for Week 2
- Input SiteManager information daily throughout summer
  - Megan Taylor will review and provide weekly feedback on your entries. You must make these changes and respond weekly.
- Upload photos of each project worked on that week by Sunday at noon
  - Photos of youth working, projects in process, completed projects, and photos of questions that you have. These will be used in grant proposals, newsletters, SSP's website and facebook page.
- Revise safety presentations as needed

Week 2 (July 7-13)

- Intake, plan, estimate, purchase materials and prepare Construction Journals for Week 3
- Input SiteManager information daily; Megan Taylor will review throughout the week. Upload photos by Sunday at noon

Week 3 (July 14-20)

- Intake, plan, estimate, purchase materials and prepare Construction Journals for Week 4 (only projects than can be completed in three weeks or less, check averages and estimates in project sections in manual)
- Input SiteManager information daily; Megan Taylor will review projects throughout the week. Upload photos by Sunday at noon
- Budget check and mid-summer evaluations with Site Director
- Stockton team prepare for switch to Coarsegold and junior high youth. Susanville team prepare for switch to high school youth.

Week 4 (July 21-27)

- Intake, plan, estimate, purchase materials and prepare Construction Journals for Week 5 (only projects than can be completed in two weeks or less, check averages and estimates in project sections in manual)
- Input SiteManager information daily; Megan Taylor will review throughout the week. Upload photos by Sunday at noon

Week 5 (July 28-August 3)

- Intake, plan, estimate, purchase materials and prepare Construction Journals for Week 6 (only projects than can be completed in 4 ½ days or less, check averages and estimates in project sections in manual, you don’t want any work to be left over after the youth leave)
- Input SiteManager information daily; Megan Taylor will review projects throughout the week. Upload photos by Sunday at noon
Week 6 (August 4-10)

- Focus on volunteers completing as many projects as possible – prioritize low skill, high labor projects for volunteers to complete. It will be much easier for staff to complete projects like decking than it will be for the volunteers. Projects like painting should be emphasized; they have a lot more hands than the staff will!
- Input SiteManager information daily, Megan Taylor will review throughout the week
- Make sure that you have a folder of photos uploaded for each completed project.
  - Also include all photos collected throughout the summer of youth working, program photos etc.
  - All photos taken over the summer are ideal to upload. Don’t worry about filtering through the good/bad.
- Start writing the Construction Report for your site (follow guidelines emailed week 5)
- Review and follow the “Report and End of Summer Guidelines” and “Packing and Debrief Arrival Guidelines” that were emailed to your Site Director week 5

Clean up (Saturday through Tuesday, August 10-13)

- Complete any projects that aren’t 100% finished, do not cut corners or leave any unfinished work
- Return or donate all leftover bulky materials (concrete, roofing, lumber, opened paint)
- Inventory Tool Trailer (everything in Tool Trailer including materials and optimal quantities of tools)
- Pack your trailer according to guidelines provided by Headquarters – this is a huge safety item!
- Write Thank You notes to your tribal and community liaisons and other helpful folks; provide the list of people to Headquarters so they can be thanked by the Board of Directors, as well

Drive to Sacramento (Tuesday, August 13, Arizona will leave on Monday the 12th)

Debrief (Wednesday through Saturday, August 13-17)

- Analyze your summer and site location for your report and oral presentation to the entire staff, including recommendations for the future
- Site Director exit evaluation reviewing your work and plans for next summer
- Exit Evaluation with Headquarters staff reviewing your work and plans for next summer
- Construction Report and SiteManager complete by Thursday, August 15th at 8:30AM
- Oral site reports to entire staff as a team
- Celebration and reflection on the hard work that was completed over the summer
Weekly Schedule

Sunday
- Prepare boxes of tools/materials for work teams; deliver materials to project locations (only at sites where the tools can be securely stored) to alleviate Monday morning stress.
- Make preliminary volunteer work teams digitally based on the rosters available on SiteManager based on age, gender, church and special needs.
- At the first Staff-Counselor meeting, review the skills and seatbelts that each counselor has to place them on a work team; review and update your work teams based off of this new information.
- Introduce work teams to entire group during evening program.
- Describe projects to work teams and give them their Construction Journal.
- Lead Tool Toter and Scribe job descriptions to youth (each youth has a job for the week).

Monday
- Do-It-To-It Safety Presentation before anyone leaves for a work site.
- Hands-on Safety Presentation with stations for work teams to rotate through for everyone to practice using tools in a safe environment.
- Caravan work teams to sites with tools and materials for their first day of work.
- Explain Site Reports at evening program (each work team will present a brief, positive overview of their day at site, usually the Construction Team selects a different creative theme each day).
- Help with chores, gather youth, and generally support other team members throughout each day.

Tuesday
- Regular work day
- Intakes during work day for when projects finish (remember, it’s always best to have a few extra!)

Wednesday
- Half day at the work site because of Water Day (no work on Wednesday for LA site, regular work day for junior high).

Thursday
- Regular work day
- Intakes during work day for when projects finish
- Make sure projects are fully planned/estimated/approved and that you have all materials for the following week.

Friday (Thursday for Junior High weeks, half day for because of Splatterfest)
- Regular work day
- Collect Construction Journals and medical forms from work teams, make sure that you know what tools and materials each project will need for the following week. Great time to prepare tool boxes for following week when it is fresh in your mind.

Saturday (Friday for Junior High weeks)
- Reflect on feedback from youth and counselor evaluations with a positive attitude. This feedback will be invaluable for correcting errors and emphasizing the things that you did well.
- Purchase materials for following week, enter receipts into SiteManager (this should be done throughout the week as needed).
- Rest and rejuvenate for the following week.
Typical Daily Schedule

6:45  Wake up, sing volunteers awake

        Time to enter SiteManager info from previous day OR Construction Team Meeting (at least once a day)

7:45  Staff devotion to full group and help serve breakfast

        At tool trailer preparing for the work day, hand out tools and materials to work teams. Make deliveries to teams that can’t transport their own supplies.

        Spend morning visiting work sites making sure that they have the right tools, materials and instructions

12:00 Lunch at site or back at the kitchen OR Construction Team Meeting

        Spend afternoon visiting work sites or on intakes

3:45  At tool trailer, check in with Tool Toters, Scribes, and adult counselors to prepare for following work day

        30 minutes of rest from the work day

        Time to enter SiteManager information from work day OR Construction Team Meeting

        Free time with youth

6:00  Help serve dinner, provide leadership for chores, participate in program, lead Site Reports each night, staff/counselor meeting (attend once a week, gain feedback from Site Director and counselors daily), bedtime story, staff meeting, and candle (a time to share about your day)

10:30 Time to enter SiteManager information from work day OR Construction Team Meeting

        8 hours of sleep

As you can see, this is a very busy, highly demanding work schedule. This is why it is important to stay on track and not fall behind. Daily entries into SiteManager are required and are the best way to stay ahead of the curve. If you are having trouble with this, talk to your Site Director and make a plan with your Construction Team.

It is imperative that you meet as a Construction Team at least once each day. This way you can coordinate where key tools are going or if a shopping run is needed (to consolidate trips instead of each person shopping just for themselves.) Get in the habit of talking shop with your construction team, the emphasis here is that you are a team and the actions of one person will reflect on the appearance of everyone’s professionalism. By getting in the habit of knowing every project’s progress – and not just your own – you will all be better able to help volunteers complete their tasks and have a positive experience. Plus you will be able to learn about all of the projects, and not just the ones that you are managing.
**Tool Trailer:**

*Beginning of the summer*

Every site has the privilege of access to an SSP tool trailer. Each tool trailer contains over $12,000 in tools and should be treated with care. At the site in Los Angeles, there is a permanent shipping container that is full of tools and is used year-round by SSP. When you arrive at site, every Construction Team member needs familiarize themselves with the contents of the trailer and practice using the power tools. This will help you learn where tools are located and an opportunity to ask questions if there is an unfamiliar tool. Practicing using the power tools yourself will build your confidence in teaching youth the best way to safely use power tools. Each trailer contains a slightly different set of tools. Refer to the inventory spreadsheet (found on your site’s thumbdrive) to review the tools and quantities that you have. This is also the time to organize the materials that were purchased in bulk in Sacramento for your site; a list of what was purchased can be found in SiteManager.

*During the summer*

Each morning the Construction Team distributes tools and materials to work teams. This is an important time to ensure that they are restocked for the day. This process is much more efficient (saving time and gas) than running back to the trailer multiple times each day and minimizes making the team wait for tools or materials. At the end of each work day, work teams return to the tool trailer to check in with the Construction Team. Tool Toters are youth that are assigned the job of being responsible for the tools and materials delivered to the worksite. Scribes are responsible for the Construction Journal at each site. Check in with the counselors, Tool Toters and Scribes from each team; add additional tools and materials that will be needed to tool boxes. Remove tools and materials from tool boxes that will not be used the following day. This time is essential to avoid teams from waiting at the work site and also a time to gauge how a team is doing overall.

Tools are to be left in good condition after being used. This is true for all paint brushes, roller covers, mudding and putty knives, mud and paint trays, etc. If any tool is unusable, throw it away or label with tape and put it aside to be repaired at the end of the summer. It is the Construction Team’s responsibility to make sure that any tool put back into the tool trailer is “working” and is in fact in both in good working condition and is complete (i.e. has chuck keys for drill).

Over five weeks after the end of the 2012 summer, five of the trailers were unloaded and every tool was inspected (commonly referred to as Trailerpalooza). A lot of items were removed or repaired. All of the blades were replaced on circular, chop and table saws. Take note (photographs will be helpful) of how you receive your trailer. Your goal is to return it in even better condition than when you found it!

See Tool Lists in Section 11.

*At the end of the summer*

At the end of the summer, you will complete an inventory of your tool trailer; this will organize the tool trailer to leave it in good condition for the team that will use it the following summer – this is your team’s legacy! Use the spreadsheet emailed by headquarters Week 5. Your team will indicate quantity of tools and materials in the tool trailer and the optimal quantity of tools that would be ideal. This inventory ensures that the tool trailers can be restocked during the year with appropriate tools and bulk centrally purchased materials. This inventory will be saved on your site’s thumbdrive and is due at debrief. Trailerpalooza will not happen again in 2013.
Load the trailer at the end of the summer the same way it arrived and follow the guidelines provided. This is a safety precaution to ensure that whoever is driving it back to Sacramento will have a safe load and not have to spend time repacking it. The tool trailers are in storage the rest of the year; **no highly flammable materials like lighter fluid, paint thinner, or wood stain are left inside.** Any material with a short shelf-life like opened adhesives, mud, caulk, wood putty and paint is given away to homeowners or the community liaison. Ladders are packed flat in the trailer. Shake debris out of tarps and tightly roll them. Organize materials like fasteners and hardware in stackable, sealed containers that can be reused. Cardboard boxes and bags are not allowed as they easily rip and dump all of their contents in transit. Pack the heaviest items between the hitch and the axle according to the floor markings. See “Packing and Debrief Arrival Guidelines” for detailed instructions.

**Intakes:**

*What is an intake?*

An intake form is a work request form filled out by a homeowner or community organization. The first step in any project is to go on an “intake” with your tribal or community liaison. After you first meet with your liaison as a Construction Team, at least two Construction Team members will visit all work requests to meet the homeowner(s)/contact and take measurements and photographs (if permitted) of the surrounding project site. This visit is called an intake.

*What is the process for an intake?*

Intake forms are given to the community liaison in the months prior to SSP arriving for the summer; he or she will distribute these forms within the community to be filled out by those requesting work. (In LA this process is a little different as there is no one individual that acts as the community liaison; there are many contacts in LA we find work through.) When the Construction Team first meets with the liaison, there may be anywhere from 5 to 45 intake forms completed. The intake process determines which of these projects have the highest need; those projects will be started at the beginning of the summer. The community liaison will help the Construction Team prioritize projects, putting higher emphasis on wheelchair ramps and other safety needs over aesthetic or cosmetic requests.

Intakes will begin during set-up week (the week before volunteers arrive at site); try to complete as many intakes as possible during this week. Any intakes that are not completed during this week will be completed throughout the summer. This can happen at any time but must include at least two Construction Team members; this is important so that two sets of eyes are reviewing a project and looking for potential problems. It is important to plan ahead and have more intakes completed than projects needed; you never know when a new project will need to be started (being locked out of a home, rain, etc.) It is also very important to never commit to a project while visiting for the first time – a plan and cost estimate need to be done first to make sure that SSP can actually complete the work requested. Unfulfilled promises to do work can create mistrust between the tribe and SSP which is very hard to overcome. This has happened recently, and we hope to avoid it in the future. Be clear to state that you cannot promise anything, but will call or visit to let them know your team’s decision.

When you call or visit a homeowner to let them know you will be working on their home, let them know when they can expect you to be at their home. Coordinate being let inside to use the bathroom, outlets, etc. Let them know that on Monday the group will arrive around 11AM because of the two safety presentations. Also let them know of your Wednesday plans; homeowners sometimes worry when a team doesn’t show up when expected.
All intake forms should be addressed, even if it is not possible to do the work requested. At the end of the summer, call or visit all leftover intake forms to let the homeowner(s) know that their requested work will not be completed due to time constraints. Make a copy of the leftover intake forms and give the originals to your community liaison and bring the copy back to the SSP office; if we return to the site those intake forms can be forwarded to the following years’ Construction Teams. The intake process is important in creating good community relationships and trust; we want to ensure that every homeowner that requests work knows that we fairly evaluated the needs of the community with the assistance of SSP’s community liaison.

How is an intake evaluated by the Construction Team?

The intake is a critical part of the process to gather information about the scope of the project before SSP commits to it. SSP projects are limited by budget, ability, and time. As a Construction Team, you must assess these limitations as well as use common sense to evaluate whether each project is a good fit for SSP or not. Many projects that are requested are not a good fit for SSP (windows, doors, plumbing, electrical work, a project that only a few people can work on, etc.) The type of projects that you commit to Week 1 will be different than the ones started near the end of the summer. Larger and more complex projects will be started early in the summer while smaller projects will be started near the end of the summer. There are only six weeks of volunteers during an SSP summer; it is ideal for all work to be completed by the end of Week 6. If the work is not 100% complete, the staff will finish all work committed to.

Steps for an intake:

- Use a SSP Intake Checklist (Section 11) to document your visit, fill out all sections. Always bring your Construction Manual, camera, and measuring tape.

- Write down instructions on how to get to the site; sometimes directions on Reservations involve more descriptions than simply road names (i.e. turn left after the red barn).

- Introduce the Construction Team members present to the homeowner(s). Dress nicely – SSP polo and clean pants – this is your first impression and you need to create trust. Would you want someone you don’t trust repairing your roof?

- Ask if there is a bathroom, running water and electricity that the volunteers can use.

- Ask if you can take photographs; if permitted take “before” photos of the work requested. These photos will help as you plan the project; take photos from various angles and views. Photos will help remind you of what a site is like when you are planning the project at a later time.

- Take notes and draw a diagram of the work requested with necessary measurements (specific guidelines will follow for each type of project).

- Let the homeowners know that you will call or visit them to let them know if your team has decided to commit to a project; never promise anything that you won’t live up to. Before committing to a project make sure that the estimated project costs fit into the budget via your estimate in SiteManager. Never commit to a project while on an intake.

- Place the Intake Checklist (following page) in a binder for all Construction Team members and the Site Director to review.
Sierra Service Project Intake Checklist:

Homeowner name(s): ________________________________________________________________

Homeowner phone number(s): _______________________________________________________

Address and directions to home: ___________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

Date and time of intake: ____________________________________________________________

Construction Team members present: 1)_____________________________________________

2)____________________________________ 3)____________________________________

☐ Bathrooms available ☐ Running water available ☐ Power available ☐ Photographs allowed

Type of work requested: ___________________________________________________________

Notes, drawings and measurements:

Priority: ___________________________________
**Purchasing Materials:**

*Budget*

At SSP, most Construction Teams will spend over $10,000 in building materials throughout the summer. A budget will be given to each team based on the number of volunteers registered for a particular site. Out of the $360 each participant pays in fees, $32 is budgeted for building materials for 2013. A site with more volunteers will have a larger budget ($32 x 60 volunteers x 6 weeks = $11,520). In 2012, the five sites spent $27 per participant, while in 2009 the average was over $44 per participant. The $17 difference multiplied by 2,000 participants is $34,000! Sierra Service Project is a business and it is imperative that every Construction Team continues to be responsible for their budget.

*Lumberyards and Hardware Stores*

It is important during set-up week to visit multiple hardware stores and lumber yards. You must wear your SSP polo shirt the first time you visit these stores and take your team business cards to distribute. Meet the owners and staff and introduce them to what SSP is and what you will be doing in the community this summer. Some stores will give SSP a discount; be sure to ask and let them know that SSP is a 501(c)(3) nonprofit. Stores will be more willing to give you a discount if you describe SSP as a reputable nonprofit that is improving their community and will be spending $10,000 at their store, versus just a regular customer. Compare prices on basic materials between stores (lumber, roofing, concrete, etc.) Employees at these stores are generally really friendly and helpful. Ask if the store has a preferred contact person; ask them questions and utilize them as a resource! They know the area and climate much better than SSP does. SSP likes to support local businesses, but there are also some deals that exist at the larger box stores that SSP can take advantage of:

**Lowe’s**: SSP has a government account with Lowe’s which can save us 5-30% on items. Hardware is one of the most discounted items. To receive this discount you must enter a quote online (instructions are at the end of Section 1). Orders can be picked up from the store for free; employees will save you time by pulling all of the items from the shelves for you. Orders placed before 3PM can be picked up in two hours, all orders placed by 6PM will be ready at 7AM the next day for pickup. The delivery charge is $20 for all deliveries up to $500 and less than 20 miles; free if over $500 and less than 20 miles; all deliveries over 20 miles are an additional $1 charge per mile one way. Smith River does not have a Lowe’s nearby, but all other sites do. Los Angeles and Stockton are within 20 miles, Coarsegold is 25-30 miles away, and Chiloquin, Susanville and Arizona are 80-90 miles away. Obviously it only makes sense to order from Lowe’s in certain situations. Check their lumber quality before ordering from a store for the first time. Concrete is a great item to have delivered to save you from the burdens of loading, unloading, and heavy wear on SSP’s vehicles. We now also get 5% off all in-store purchases.

https://www.lowesquotes.com/
Username: SierraServiceProject
Password: ssp4all

**Home Depot**: SSP has a Pro Rewards account with The Home Depot that saves us 2.25% off of everything at participating stores. To get the Pro Rewards discount, all you do is give the cashier or enter in at the self-checkout SSP’s office phone number (916)-488-6441. Not all stores have the Pro Rewards program. Home Depot also offers a free In-Store Pick Up Service (BOPIS). Choose the Pick Up in Store option at the online checkout and select your desired store location for pick up. Most items will be ready for you within two hours of the time the order was placed. Specific items may take slightly longer due to inventory and/or availability. When you arrive at the store, stop by the Special Service/Pro desk for assistance with order pickup. Store pickup is valid only during normal operating hours and only for orders confirmed via In-Store Order Pickup Notification email. Every site has access to a Home Depot (distances are similar to Lowe’s; Chiloquin has one 30 miles away).
Deliveries

Check to see which stores offer deliveries and how much they cost. Deliveries are worth the extra cost; they eliminate wear and tear on the vehicles and it is much safer for your staff. After you have been to a store once, it is common to be able to call in or fax an order for a delivery – that saves a lot of time from actually driving to the store and loading up our own vehicles! Reliability varies between stores; make sure to ask what their policy is on deliveries and returns. Emphasize the importance of accurate and timely deliveries.

Initial Purchases

At the beginning of each summer, large quantities of materials are purchased and each Construction Team creates a small lumberyard near the tool trailer (ideally covered) with materials like lumber, bags of concrete, and roofing materials (based on the type of projects that are prevalent in the intake forms). This is the only time that materials will be purchased in excess of what you will actually need for your projects. The extra buffer of materials helps cover underestimation and the learning curve that occurs at the beginning of the summer.

Material Lists

After an intake has been completed and determined that it is a project that SSP can do, a material list is created based on the measurements taken at the project site and the plans made by the Construction Team. Guidelines for how to create this list will be in the corresponding project sections. Material lists are crucial to understand how projects fit within the budget and so that the correct quantity of materials can be purchased. Make sure that at least two Construction Team members review a material list to find any overlooked items.

Estimating Project Costs

To estimate how much a project will cost, the material list is entered into SiteManager (a website that holds SSP’s database of information based on purchases and home repair projects that the Site Directors, Cooks and Office Staff will also be using. Returning staff are familiar SiteManager and will be able to help with questions. This web based software application will help Construction Teams and Headquarters track their costs.

SiteManager will create a cost estimate for each project based on the material list and the standard cost of each item. It is always best to be conservative when estimating because more materials are often needed due to mistakes at the site or oversight by the Construction Team (it is common practice to add 10% to an estimate to cover these areas). Based off of the $32 budgeted for each volunteer per week, projects are compared by their cost per person per day. The budgeted cost per person per day is $7.11 for 2013 ($8 in Los Angeles and junior high sites, less days of work)
Expensive projects (roofing, enclosed sheds, and ramps) need to be balanced with inexpensive projects (painting, drywall, and flooring) or with projects where some of the materials are donated or paid for by an outside source (tribe, homeowner, or nonprofit). Unless siding materials are donated or provided, SSP will continue to avoid these projects in 2013 because they are out of our cost range. SSP has received some donated flooring from The Home Depot which have allowed us to do these projects for very low cost.

<table>
<thead>
<tr>
<th>Type</th>
<th>2012 Projects</th>
<th>Average cost/person/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drywall</td>
<td>3</td>
<td>$2.62</td>
</tr>
<tr>
<td>Floor (donated flooring)</td>
<td>6</td>
<td>$2.73</td>
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<tr>
<td>Paint - Interior</td>
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<td>$3.47</td>
</tr>
<tr>
<td>Paint - Exterior</td>
<td>23</td>
<td>$3.53</td>
</tr>
<tr>
<td>Sheds - Open</td>
<td>3</td>
<td>$5.19</td>
</tr>
<tr>
<td>Deck</td>
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<td>$5.37</td>
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<tr>
<td>Awning</td>
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<td></td>
<td>$7.11</td>
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<td>Stair</td>
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</tr>
<tr>
<td>Sheds - Enclosed</td>
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<tr>
<td>Ramp</td>
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</tr>
<tr>
<td>Roofing</td>
<td>1</td>
<td>$10.42</td>
</tr>
</tbody>
</table>

**Shopping**

Shopping trips will be made weekly as projects are completed and new projects are started. If possible, do this during the week as the “off” time on the weekend is only 28 hours long. This is not always possible for sites that have to travel long distances to reach stores (Arizona). Plan projects ahead of time so that materials are purchased and ready for when a new project needs to begin.

**Receipts**

Every receipt is saved and mailed to SSP Headquarters every Monday; make a copy to save or ask for the vendor to print two copies of the receipt with the line items listed. The day of the purchase, each line item on the receipt is entered into SiteManager. Each item used will be attributed to a certain project. SiteManager is a great way for SSP to track project costs, material costs, and many other trends that help evaluate construction spending.
SiteManager:

SiteManager is a program that SSP has created which allows Construction Team members to estimate and accurately track project costs, as well as keep track of the inventory of materials that your team will purchase throughout the summer. All Construction Team members will be trained to use SiteManager during training in June and receive a user guide.

SiteManager requires the Construction Team to input material lists and estimated volunteer days before supplies are purchased, enter receipts, and keep a precise list of materials delivered and returned from the worksite. In addition to the material costs, it is important for SSP to track volunteer days. This means that weekends and the afternoons spent at water day are NOT counted. A project’s total cost is divided by the number of volunteer days spent on the project to get a cost per person per day. This number allows us to compare projects at your site (and between sites). For 2013, the budgeted cost per person per day is $7.11. Most projects will be over or under this number, but it is imperative that your site’s average is no higher than $7.11 per person per day.

Small items like fasteners (bolts, nuts, washers, nails, screws) and stain will not be tracked. Based on 2012 material percentages, a blanket percentage will be programmed in to add to your project estimate and deliveries to account for these items. This percentage will vary based on the project type. This will save you a lot of time! Your team will focus on the larger items like paint, lumber, concrete, hardware and roofing.

Multiple team members can update Site Manager at the same time because it is online. We suggest bringing a personal laptop with you if you are able – there will only be one SSP laptop per site. Last summer many Construction Teams were able to use their smartphones as well.

SiteManager will make a Construction Team member’s job easier to complete. In order for SiteManager to be an accurate depiction of the spending at your site, it must be updated daily. SiteManager will be reviewed weekly by Megan Taylor – because it is “live” on the internet, it can be reviewed at any time throughout the week and does not require one point of submission. Before a new project is started, the project’s estimate and plan must be approved by Megan first.

SiteManager Workflow

1) Go on an intake, make a plan and create a material list (use the guide found in each project section) and estimate the number of volunteer days the project will take (use 2012 averages found at the beginning of each section). Volunteer days entered into SiteManager are calculated by the work team size multiplied by the number of days they are expected to work on the project (7 volunteers x 4.5 days = 31.5 volunteer days per week, remember LA only works 4 days per week and junior high only work 3.5).

2) Enter the estimated material list and volunteer days for a project into SiteManager. It will assign a cost to each item that is based on the cost SSP previously paid for that item or a standard cost at the beginning of the summer. From the material list, SiteManager will create a project estimate and an estimated cost per person per day (c/p/d). This is always done before a project is committed to.
3) Enter separate projects for different types of projects completed. For example if SSP paints and roofs a home, that is two separate projects in SiteManager. You can’t compare the cost and time to complete a roof and painting project with a painting project. Separate decks and stairs, decks and ramps (a top landing of 5’ by 5’ is not considered a deck, anything larger is considered a deck), drywall and painting, etc. If you have a question, just ask!

4) After the Construction Team has decided to commit to the project, verifying that the cost fits within your budget, materials can be purchased. Each receipt is entered into SiteManager as a purchase. Each line item is entered on the receipt with the item’s name, cost, quantity purchased, budget category and units.

5) Some items may not be in the system; when adding a new item follow the same conventions as existing items i.e. Bolt ⅜” by 4-⅜” and Paint interior 1 gallon semigliss. This is imperative so that items are not duplicated within the system. Search for an item based by a few different terms before adding a possible duplicate item – it doesn’t work to add “waferboard” on a purchase and deliver “OSB” to a project. Be as descriptive as possible and go from general (left) to specific (right). For example, list bolt or paint first, then the size/type. If you have a question, look at similar items and follow the precedent or call the office. You will be asked to rename items if the conventions are not followed and remove duplicated – this can get messy!

6) As materials are delivered to the worksite, the Daily Note Sheet (page 16 or in Section 11) is filled out by the Construction Team Member so that precise quantities can be entered into SiteManager. Every day after the workday is over and before the next workday begins, SiteManager is updated with all of the material deliveries and returns from each worksite and any purchase orders (receipts) that are made. A team member cannot deliver materials in SiteManager without them first being added into the system on a purchase. Frequent updating allows for a more accurate depiction on how a project is progressing.

7) At the end of the week, the total number of volunteer days for each project are entered into SiteManager for the week based on the size of the work team subtracting half days for water day/splatter fest (subtract one day for LA’s Wednesday activities for each person).

8) When a project is complete, verify all of the materials and volunteer days consumed. As a check, the number of volunteers your site had for a particular week multiplied by the number of days worked (3.5 for Junior High, 4 for Los Angeles and 4.5 days for all other Senior High sites) should equal the total number of volunteers recorded for the week in SiteManager.

9) Square footages and the rise for stairs and ramps are noted in SiteManager under the description in order to compare projects of various sizes. This will provide more accurate information for 2014 Construction Teams.

10) If you find a bug or error in the program, alert Megan Taylor or Rick Eaton immediately so that it can be fixed.

11) Megan will review purchases, projects, items and the overall budget to verify that your team is on track for a successful summer. Make updates to SiteManager as you go while it is fresh in your memory,
### Daily Note Sheet:

**Day:**

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Safety: Do-It-To-It and Hands on Safety

Safety is everyone’s responsibility. However, it is the Construction Team’s responsibility to teach the volunteers how to be safe at SSP. This is done by leading by example and through two safety presentations called the Do-It-To-It and Hands on Safety. Both are presented on Monday mornings before volunteers leave for the worksite. The Do-It-To-It is a short skit that contains all of the points below. This is a great opportunity for the staff to express their creativity, but we must also clearly present all of the safety rules. Hands on Safety is where work teams rotate through stations where the staff lead small groups in practicing tool safety by actually using the tools. At the end of the presentations every person must sign a sheet stating that they understand how to be safe at SSP; this is mailed to SSP Headquarters every Monday. Safety topics must include but are not limited to:

Do-It-To-It:

- **We are Guests of the Community;** make sure that all of your actions and words are “SSPG” at all times. No spitting, cursing, fighting, stealing etc.

- **Car Safety;** if a vehicle is in motion don’t play around it. Always wear a seatbelt, drive slowly, and be respectful with the loudness of the music that you play (especially early in the morning).

- **Dress Code;** no tank tops, mid riffs, or underwear showing. Always have appropriate length shorts (mid-thigh), closed-toe shoes, and sunscreen.

- Always use Saw Horses when cutting wood. Position the sawhorses so that the piece being cut off will fall. This piece is never supported because it can bind the blade, creating a dangerous kickback on the saw.

- **Be Aware** of others using power tools and the cords that are connected to them. Unplug power tools when not in use. Use the shortest length of cord possible; do not knot or daisy chain cords (think of bending a hanger over and over, it will break at some point).

- **Wear Gloves** when handling pressure treated lumber and make sure that goggles and a dust mask are worn when cutting lumber or scraping paint. **Never Wear Gloves** when cutting lumber. Make sure sleeves and bracelets are out of the way; necklaces, drawstrings and hair are tied back, and that rings are removed.

- **Roof Safety;** always know where the edge of the roof is and move slowly while on a roof. Never throw tools off of a roof.

- Anyone on a ladder must have a **Ladder Buddy** holding it in place. When using an extension ladder make sure that it extends at least 2’ from the edge of the roof. The base of the ladder should be 1’ out from the wall for every 4’ of height to where the ladder rests on the edge of the roof. For example a ladder that is resting on the edge of the roof 8’ from the ground should be placed 2’ from the wall. Cushion the ladder to prevent scratches on the edge of the roof.

- **Stay Hydrated;** make sure to take a water break every 30 minutes, every 15 minutes if on a roof.

- **Keep Tools and Materials Out** of the sun and dirt; they can become very hot and burn hands. Put tools back in the tool box when not in use. Setting a drill on loose dirt will cause damage to the motor. Keep materials out of the sun to prevent deterioration (paint, caulk, roofing). Never borrow tools from a homeowner – we can’t test for safety or guarantee the condition they will be returned.
• Always use a **Board Buddy/Ladder Buddy**; never carry a ladder or piece of lumber longer than 4’ alone, this can result in an end accidentally hitting something or someone.

• **No Paint Play!** Paint is an expensive material and handprints on clothing or face painting wastes paint and money. Do not write words in paint on the house, as it is very hard to cover up.

**Hands on Safety:**

Hands on Safety is meant to get volunteers to experience using tools in a safe place, together, and under staff supervision. Here counselors can build their confidence in how to use tools properly and how to teach youth how to do it as well. For some volunteers, this may be the first time that they’ve ever held a power tool. It also provides youth working on a painting project etc. to gain experience using power tools.

Have each staff member lead a station. If you have more than 7 work teams, double up smaller teams. If you have less than 7 work teams, double of staff and station topics. Spend 7 to 8 minutes at each station and then rotate, so that each team can practice before heading out to site. This should take no more than one hour.

Set up the following stations so that staff can communicate safety tips to volunteers:

1. **Circular Saw:** Demonstrate saw safety and how to properly cut. Have each volunteer make a practice cut.

2. **Chop Saw:** Demonstrate saw safety and how to properly cut. Have each volunteer make a practice cut.

3. **Drill:** Demonstrate proper drill technique for drilling screws and boring holes. How to change bits. Have each volunteer practice drilling.

4. **Paint:** Explain how to prep, properly paint with a brush and roller, and clean up. Have each volunteer practice painting properly.

5. **Ladder:** Review ladder safety for both A-frame and extension ladders.

6. **Tool Boxes:** How to keep track of and care for your tools.

7. **Miscellaneous:** Can change depending on your specific projects. Ideas include math for the worksite, how to roof, drywall, measure and lay out a plan, etc.
Construction Journals:

Construction Journals are binders or folders that contain information about the community, plans for the specific project, and other important information. They are prepared each week by the Construction Team for the work teams. The journals are a way to connect a work team to the work done by previous groups on the project that they are working on (the average SSP project lasts over two weeks of volunteers).

Things Included in the Journal

1. Welcome sheet explaining what the purpose is of the binder/folder and why we do it
2. One page information and history about the tribe/community
3. Hospital directions with emergency phone numbers and site office phone number
4. Toolbox inventory (standard checklist with quantities added)
5. Any instructions, drawings, and reference materials for the specific project
6. Lined paper for the work team’s daily journal entries, and previous entries from the same project
7. Games to play during down time while waiting for tools or materials, question prompts for team building.

Journals add a lot of resource consumption (ink, paper, etc.) to SSP’s footprint. To eliminate wasteful use of our resources and to save money within our tight budgets:

- Print double sided in black and white using fast draft print settings (less ink)
- Print more than one image per page
- Don’t print just one word on a page; use a sticky note as a divider instead to separate sections
- Think smart and creatively!

End of Summer

The Construction Journals are to benefit the teams. The only information that needs to be turned in at the end of the summer is a digital copy on your thumbdrive of numbers 1, 2 and 7. You will submit project plans to Megan Taylor before each project is started.

Return to Megan all completed and leftover intakes (copies). Photographs will be submitted digitally in a folder on the site’s thumb drive organized into folders by homeowner – each week you will upload or email photos of each project in progress and general photos to share on the SSP Facebook page.
Decks:

Contents:

How to do an intake for a deck: ................................................................. 22
How to draw a plan for a deck: ................................................................. 23
SSP Standard Deck Plans: ..................................................................... 24
How to make a material list for a deck: .................................................. 25
How to construct a deck: ...................................................................... 26

2012 Statistics about Decks:

- SSP built 12 decks
- The average deck took 10.5 work days to complete (that’s almost 3 SSP weeks!)
- The average deck took 74 volunteer days
- The average cost of a deck was $400
- The average cost was $6.00 per square foot and 0.9 volunteer days per square foot
- The maximum square footage for an SSP deck is 12’ by 8’ or 96 square feet
- The average cost/person/day was $5.37

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the square footage by $6.00 per square foot. For a 96 square foot deck, a rough cost estimate would be $576. An estimate of volunteer days would be 86 (96 x 0.9 = 86).
**How to do an intake for a deck:**

When going on an intake that requests a deck take your manual, measuring tape, 2x4x8 and 2x4x12, string line and level, shovel, camera and the Intake Checklist (see Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a deck intake requires exact measurements of the site and proposed deck to be taken.

**Code requirements for a deck:**

- The maximum size of a deck that SSP can provide is 96 sq. ft., or 8’x12’
- If the top of the deck will be over 30” from the ground, a guard (handrail) must be included around the perimeter (not where the deck is directly against a wall)
- If the deck is over 7” above grade, a set of stairs will need to be built; determine with the homeowner the best place for these stairs (minimum of 3’ wide inside the handrails). The stair will need a handrail if the rise of the stairs will be over 21” (or four steps).

**Site Plan:**

Sketch a site plan with measurements while at the intake. Have one person measure and one person draw – this is why it is essential for at least two Construction Team members to be present while going on an intake. Measure everything; you never know what dimensions you will need later when planning a deck.

- **Doors:** Where is the door located and how does it swing open? How far off the ground is the door? Is the base of the door level? In areas that get snow, plan the top of the deck to be 7” below the door (unless there is a ramp); otherwise plan for the deck to be ½” below the door to prevent water from pooling and leaking inside.
- **Windows:** Where are windows located? If the deck has a guard, it should not block the windows.
- **The Home:** Is there anything sticking out of the house that will have to be built around? Dig down next to the wall; is there concrete that would prevent placing a post near the wall?
- **The Yard:** Use string line and string level (or lumber and level) to see how the site is sloped. This will be important when calculating how tall the posts need to be. If the yard slopes, make note so you can plan ramps and/or stairs accordingly. Also make sure that the grade under the deck is sloping away from the home so water will not pool under the deck or home. Any low spots can be filled with dirt. Use the lumber to mark out how large a deck 8x12 will be.
- **Obstacles:** Measure the location of obstacles such as bushes, trees and flowers. Measure the location of objects that the deck should not block, such as crawlspace access, hose bibs, gas/water meters, septic tanks, wells, etc.

Sometimes there is an existing deck that needs to be repaired or rebuilt. Check to see if there is any rotten lumber. If the decking or guard is damaged, those parts can be replaced. If the substructure is damaged, it will be safer to tear out the entire deck and start new. If the existing deck is constructed poorly, the deck can be unsafe. SSP values following building codes and safe construction; it is appropriate for SSP to upgrade unsafe structures. Once measurements, the site plan, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on the plan and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a deck project before a plan and cost estimate have been made.
How to draw a plan for a deck:

Once a site plan has been made, a plan needs to be made. This plan will allow a precise material list to be made. A good plan will tell the reader the measurements of each part of the deck and how those parts go together. Use the SSP Standard Deck Plans on the next page as a reference and starting point.

**Step 1: Draw the house**
The deck will be positioned based on the obstacles and other limitations of the project site. Draw the portion of the home where the deck will be. Mark on the plan where the doors and windows are.

**Step 2: Draw the outline of the deck**
Draw the perimeter of the deck into the plan; this is the frame. Keep in mind that lumber is sold in lengths of 8’, 10’, 12’, etc. This means that a deck which is 8’2” is going to cost much more than a deck which is 7’10”, because 10’ lumber will be needed for the 8’2” deck. Also remember that lumber is 1 ½” thick and should be drawn as a skinny rectangle and not as a line. Label the measurements of each segment.

Indicate the location of the posts that will run around the perimeter of the deck. These posts will be on the outside of the frame so that they can extend past the decking to support the guard. There need to be posts at each corner and every 6’ on center (o.c.) Draw the posts evenly spaced.

**Step 3: Determine the location of ramps and stairs**
If the deck requires a ramp and/or stairs, determine the location of these based on the homeowner’s desires, site limitations and code requirements. To support handrails for a set of stairs or ramp, posts need to be at minimum 3’ 9” apart, (4’ is ideal to minimize waste from cutting 3” off of decking). Draw these posts and adjust the posts you drew in step 2 accordingly.

**Step 4: Determine the direction of the decking**
The direction of the decking determines the direction of the joists. Decking is most often run parallel to a door. The decking can also be oriented in the direction needed for a ramp or stair (where the decking is always run perpendicular to the direction of travel). Make note of the direction you determine on the plan.

**Step 5: Draw the joists**
Joists will be inside the frame, perpendicular to the direction of the decking. The maximum span of a 2x6 joist is 6’; if needed add another framing member in the middle of the deck, which will be supported by an additional post(s). This will subdivide the frame into smaller sections, allowing the joists to span 6’ or less. Then draw the joists between your framing members, 24” o.c. or less. These joists will support the decking.

**Step 6: Label missing measurements**
Go back and write in all measurements that you did not write in during the drawing process. Everything that the team will need to cut should have a precise measurement written on the plan. Make sure that these measurements are legible and that it is clear what measurements relate to what part – counselors will follow your drawn plans unquestioningly, so give them the best set that you can!

**Step 7: Review plan**
Take a photo or scan and send to Megan Taylor for review. Make a copy of the original. Don’t give your only copy of the plan you have carefully worked on to the team, it will probably get drawn on and damaged.
Decking is 1/2" away from the home to promote drainage.
- Decking must be 6 in. or more than the between supports.
- Joists must span no more than 6 ft. (180 cm).
- 2x6 PT joists are perpendicular to posts.
- Joists attached to frame with 2 1/2" by 6d nails (15 ga) and 1 1/4" by 4 1/4" bolts.
- Attatched to live post bases with two 1/2" by 4 1/4" bolts.

Corner Deck Plans (12x6', maximum size):

- Concrete footing is 2' in diameter.
- Concrete footing is secured.
- 2x6 PT joists are perpendicular to posts.
- Joists attached to frame with 2 1/2" by 6d nails (15 ga) and 1 1/4" by 4 1/4" bolts.
- Attatched to live post bases with two 1/2" by 4 1/4" bolts.
How to make a material list for a deck:

Once a plan has been made, a material list can be made. Count the quantities of materials you will need to purchase based on the plan. Use this list as a reference. Print a copy from your thumbdrive and fill in for each project.

- **Pressure treated 4x4 posts**  _____x8 _____x10 _____x12 (buy long and cut in ½ when possible)

- **Pressure treated 2x6 frame**  _____x8 _____x10 _____x12

- **Pressure treated 2x6 joists**  _____x8 _____x10 _____x12

- **TOTAL pressure treated 2x6s**  _____x8 _____x10 _____x12

- **2x6 decking**  _____x8 _____x10 _____x12

- **2x6 cap (top of guard)**  _____x8 _____x10 _____x12 (total guard length)

- **TOTAL 2x6s**  _____x8 _____x10 _____x12

- **2x4 top and bottom rails**  _____x8 _____x10 _____x12 (2 times total guard length)

- **2x4 baluster**  _____x10 (2x4x10 ripped to 6 balusters for every 30” of railing)

- **TOTAL 2x4s**  _____x8 _____x10 _____x12

- **Bags of 60 lb concrete**  _____ (2 ½ per concrete footing)

- **4x4 Post bases, (PB44Z or ABU44Z)**  _____ (1 per footing; check trailer)

- **2x6 zinc joist hangers**  _____ (2 per joist, plus 2 per middle frame; check trailer)

- **4 ¼” x ¼” zinc bolt with nut**  _____ (2 per post base; check trailer)

- **6” x ¾” zinc bolt with nut and 2 washers**  _____ (1 per frame and post connection; check trailer)

- **Teco nails** (for joist hangers)  _____ (check trailer)

- **16d nails** (for post bases & joist hangers)  _____ (check trailer)

- **Deck screws** (for decking and guard)  _____ (check trailer)

- **Stain**  _____ (check trailer)

- **Drill bits** (Square/Philips, 1/16”, ⅛”)  _____ (check trailer)

See ramp and stair sections for corresponding material lists. This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

Divide the SiteManager estimate by the square footage of the deck; it should be around $6.
How to construct a deck (print this section for work teams)

Terms:
- **Post base**: Metal hardware set into the concrete footing.
- **Post**: Vertical structural member made of pressure treated (PT) 4x4 attached to a post base with two ½” by 4 ½” bolts and nuts.
- **Frame**: PT 2x6 structural members attached to the posts with ½” by 6” bolts, washers and nuts or joist hangers.
- **Joist**: PT 2x6 structural members every 24” on center (O.C.) or less, hung on to the frame with joist hangers. Supports decking.
- **Joist hanger**: Metal hardware used to support a perpendicular connection of two 2x6s (joists and frame). Attached with Teco nails to the frame, and 16d nails toenailed through the joist.
- **Decking**: Douglas fir (DF) 2x6s perpendicular to joists with staggered seams. Main surface of the deck attached with deck screws spaced 1/8” or one nail width apart to promote drainage.
- **Guard**: A handrail for the deck 42” above the decking; consists of a DF 2x6 cap, two DF 2x4s at top and bottom with DF 2x2 balusters running between 3 ½” (width of 2x4) apart to prevent small children from falling off.

Step 1: Clear out the area
Clear out the area where the deck will be built. Pile debris out of the way and clear the work area until there is nothing in the way. De-nail any lumber removed. Make sure you ask the homeowner if you need to move something in their yard.

Step 2: Mark out the frame of the deck
Using the measurements from the plan, mark out the dimensions of the shed using metal stakes and string. Put your stakes 2’ from where the post will be. Where the strings cross will be where you dig your hole. To ensure that the layout is square, use the Pythagorean Theorem by measuring six feet along one side and eight feet along an adjacent side. The distance between these points will be ten feet if the sides are square. (Use a 3-4-5 triangle if dimensions are smaller.) Check all four corners. The diagonals across the entire rectangle will be equal if the layout is square.

Step 3: Dig concrete footings
Use the plan to figure out exactly where the posts will go. When you are sure that the posts are in the right location, remove the string (keep stakes in place) and dig the holes. Post holes are 18” deep and 12” wide. Make sure to slope the concrete away from the post bases so that water will not pool around the posts. Replace the string on the stakes and place the post base in the concrete and make sure that they are all in line with one another; allow the concrete to cure overnight. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures.

Step 4: Measure and cut posts against the building
Cut the 4x4 pressure treated posts to length that are against the building; they should be 1 ⅝” shorter than the finished height of the deck to compensate for the thickness of the decking. The finished deck height will be ½” below the door, or 7” if it is in an area where it snows. If there will be a guard, the corner posts will extend past the height of the deck to support the guard; add 42” to the length of these posts adding the height needed for the railing. It’s good practice to cut the posts a little long, and need to later cut them shorter rather than replace the entire post if it is cut too short.
Step 5: Cut the first length of frame and attach posts
Cut the piece of the 2x6 pressure treated frame that will be attached to these posts. Attach this frame to the posts from step 4, making sure that the top of the frame is level and 1 ½” shorter than the desired deck height. Use one 6” by ½” bolt with washers and nuts to attach the frame to each post; this requires a ½” hole to be predrilled into the wood before the bolt is secured. After the frame and posts are secured, attach each post to the post bases with two 4” by ½” bolts and nuts in each.

Step 6: Repeat for the rest of the frame
Work around the frame, continuing with the process outlined in steps 4 and 5. Remember as you go along to make sure that the frame is square and level. Make sure that posts that will support a guard extend 42” past the top of the frame.

(Note: framing members in the middle are attached to other framing members with joist hangers instead of bolts)

Step 7: Cut and attach joists
Next attach 2x6 pressure treated joists on the inside of the frame. Joists are 24” on center or less. Attach joist hangers to the frame with Teco nails, using a scrap 2x6 to squeeze the hanger to the right dimensions around the wood. Attach the joists to the joist hangers with 16d nails. Measure for each joist because they will likely not all be the same length; make sure that the top of the joists are flush with the top of the frame.
Step 8: Cut, stain and attach decking
The 2x6 douglas fir decking will run perpendicular to the joists. If the decking material is not long enough to span the entire deck, a seam is needed. Seams are staggered so that a weak spot is not created. If there is a 12’ deck and 8’ lumber, use one 8’ piece and one 4’ piece, alternating which side of the deck the 4’ piece is on. Make sure that all seams are over a joist. Before attaching the decking, stain all 6 sides of the decking and allow to dry. After putting the decking in place, snap a chalk line where the joists are on top of the decking. This will ensure that when you install screws that they will be aligned and hit the joists every time. Attach the decking using 2 deck screws on each joist ½” from the edge of the lumber, sinking screws just below the surface of the deck. Deck boards are spaced ⅛” apart, or the width of a 16d nail, so that rain water will drain. Place the decking so that the grain is oriented like the diagram below; over time the decking will warp and will either cup up and capture water, or cup so that the water will drain. If the deck screws are difficult to secure, predrill a small pilot hole first (1/16”).

Step 9: Install the guard
A guard is required for any deck that is 30” or higher from the ground, or if there is a ramp attached. A guard, or railing, consists of a 2x6 cap on top of the posts and 2x2 balusters 3 ½” (width of 2x4) apart spanning between two 2x4s running around the perimeter of the deck. All lumber for the guard is made of douglas fir lumber.

The top of the cap is 42” from the top of the decking as required by code. The 2x6 cap rests on top of the posts, flush with the top 2x4. The other 2x4 is 4” from the top of the decking.

Balusters are cut from a 2x4x10 using a table saw or circular saw. Make sure that the balusters are plumb (perpendicularly level). All pieces of the railing are attached with deck screws and are stained on all 6 sides before being attached!
Ramps:

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SSP Standard Ramp Plans (large): .......................................................... End of Section

Ramps are a high priority SSP project!

2012 Statistics about Ramps:

- SSP built 11 ramps
- The average ramp took 13 work days to complete (that’s over 3 SSP weeks!)
- The average ramp took 91 volunteer days
- The average cost of a ramp was $850
- The average cost per inch rise was $39 and 3.3 volunteer days per inch rise
- The average cost/person/day was $9.30

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the total rise by $39 per inch rise. For a ramp with a 30” rise, a rough cost estimate would be $1,170. An estimate of volunteer days would be 99 (30 x 3.3 = 99).
**How to do an intake for a ramp:**

When going on an intake that requests a ramp take your manual, measuring tape, 2x4x12, string line and level, shovel, camera and the Intake Checklist (see section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a ramp intake requires exact measurements of the site and proposed ramp to be taken.

**Code requirements for a ramp:**

- 36” wide in the clear between the railings; this is so that a wheelchair can comfortably fit
  - Minimum distance between posts: 3’ 9”
  - Optimal distance between posts: 4’ to minimize waste when installing decking
- 1:12 slope maximum; for every inch in rise, the ramp must run one foot long
- Every 30” in rise (or 30’ in length) there must be a landing 5’ long
- A railing on both sides of the ramp is required if the rise is over 6”
- The top of the round handrail must be between 34 and 38” from the top of the decking
- If the ramp changes directions, the landing must be at least 5’ by 5’ (for turning radius)
- There must be a landing at the top and at the bottom of the ramp at least 5’ long

**Site Plan:**

Sketch a site plan with measurements while at the intake. Have one person measure and one person draw – this is why it is essential for at least two Construction Team members to be present while going on an intake. Measure everything; you never know what dimensions you will need later when planning a ramp.

- **Doors:** Where is the door located and how does it swing open? How far off the ground is the door? Is the base of the door level? The top landing will be ½” below the door so that water does not leak inside.

- **Windows:*** Where are the windows located? Avoid railings blocking the windows.

- **The Home:** Is there anything sticking out of the house that will have to be built around? Dig down next to the wall; is there concrete that would prevent placing a post near the wall?

- **The Yard:** Use string line and string level (or lumber and level) to see how the site is sloped. Review SSP’s Standard Ramp Plans to quickly determine where the ramp will end. You need to calculate the total rise of the ramp from the ending location of the ramp not the distance from the deck/door to the ground. Recalculate and measure a few times to verify that your ramp plan will meet the maximum slope of 1:12.

- **Obstacles:** Measure the location of obstacles such as bushes, trees and flowers. Measure the location of objects that the deck should not block, such as crawlspace access, hose bibs, gas/water meters, septic tanks, wells, etc.

Find the SSP Standard Ramp Plan that best fits the site’s limitations and the total height the ramp needs to rise. Map out the basic dimensions of what the ramp will require. From the estimated end location, re-measure the slope and assess if the ramp will need to be longer or shorter. Usually it will take up a shocking amount of space. Make sure that the homeowner is ok with the space requirements that a ramp will need. Once measurements, the site plan, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on the plan and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a ramp project before a plan and cost estimate have been made.
## SSP Standard Ramp Plans

### Straight Layouts

<table>
<thead>
<tr>
<th>Rise</th>
<th>Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10.25&quot;</td>
<td>A</td>
</tr>
<tr>
<td>10.25 - 16.5&quot;</td>
<td>B1, B2, B3</td>
</tr>
<tr>
<td>15.5 - 22.25&quot;</td>
<td>C1, C2, C3</td>
</tr>
<tr>
<td>21.5 - 28.25&quot;</td>
<td>D1, D2, D3</td>
</tr>
</tbody>
</table>

### Switchback Layouts

<table>
<thead>
<tr>
<th>Rise</th>
<th>Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.25 - 16.5&quot;</td>
<td>B2</td>
</tr>
</tbody>
</table>

### L and P Layouts

<table>
<thead>
<tr>
<th>Rise</th>
<th>Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.5 - 22.25&quot;</td>
<td>C3</td>
</tr>
</tbody>
</table>

To determine which layout to use, measure the rise of the ramp (measure the distance from grade). Use the rise range on the left to find which layouts will satisfy the length of ramp required. Next determine which layout is appropriate based on the site limitations and the overall footprint of the ramp.
Each of these layouts show the maximum rise for each range.

To alter the plan for a shorter rise within the range, the sloping sections can be reduced and the posts can be moved closer together in these sections based on a 1:12 slope. (the landings must stay the same dimensions).

KEY:

- **top landing**
- **middle landing**
- **bottom landing**
- **sloping sections**

All of these plans follow the code requirements. Call Megan Taylor if you need other standard plans or if you have questions about these plans.
How to draw a plan for a ramp:

Once a site plan has been made, a plan needs to be made. This plan will allow a precise material list to be made. A good plan will tell the reader the measurements of each part of the ramp and how those parts go together. You must use the SSP Standard Plans as a starting point – they pass all of the code requirements already.

Step 1: Draw the house

The ramp will be positioned based on the obstacles and other limitations of the project site. Draw the portion of the home where the ramp will be. Mark on the plan where the doors and windows are.

Step 2: Draw the top landing

Draw the landing at the top of the ramp. Most often this will be a deck that SSP builds, but sometimes there is already a deck in place. Account for the door swing and provide enough space for a wheelchair to maneuver; at minimum the top landing must be as wide as the ramp and 5’ long. The top landing is just like a deck; a frame with joists on the inside and posts on the outside. Remember that lumber is 1 ½” thick and should be drawn as a skinny rectangle and not as a line. There needs to be a post on both sides of the ramp where the ramp meets the deck. Draw these posts if they are not there already (3’ 9” minimum between, 4’ ideally).

Step 3: Draw the middle landings

If the ramp changes direction, or if the ramp will rise more than 30”, additional landings are required. Each landing needs to be at least as wide and as the ramp and 5’ long. When a ramp turns 90°, a landing 5’ by 5’ is required. This is also true for top landings as well where a wheelchair would have to turn 90° to enter the ramp. Where a switchback (180° turn) is required, the landing will be 5’ by twice as wide as the ramp. Each of these landings is built as a small framed deck. Place posts on the outside of the frame so they can continue above the level of the decking to support the handrails. Refer to the deck section if needed. Posts are spaced no further than 6’ on center.
Step 4: Calculate the height of each landings
The length of the ramp depends on the height of the landings and the slope of the ramp. The slope of the ramp must be 1:12 or shallower. If your ramp has multiple sloped sections, the slope of each must be the same. Starting at the top landing, work your way down the ramp and calculate the height of each of the landings. To do this, measure the distance between landings. Apply the slope to this distance to get the rise or change in height between the landings. If the landings are 15’ apart, the maximum change in height will be 15” based off of a 1”:12” slope.

Step 5: Determine the end of the ramp
Determine the ending point of the ramp based on the height of the last landing and the slope. Adjust the ending of the ramp to account for the concrete transition that begins 3 ½” above grade (subtract 3’6” from the ending point of the ramp). Draw the concrete transition and pad at grade the width of the ramp by 7’4” long, with 2’4” of this as the concrete transition to grade.

Step 6: Draw the stringers and posts
Draw the stringers connecting the landings. Stringers are 2x6 pressure treated lumber 24” o.c. Posts must be at least 3’ 9” apart (4’ ½” on center) to meet code requirements; only three stringers are needed (versus four shown in the standard plans). Stringers need to be supported every 6’; draw posts on the outside of the end stringers 6’ o.c. Posts can be shared between upper and lower sloping sections of a switchback ramp. Middle stringers are supported by 2x6 pressure treated purlins. Purlins are connected to the posts underneath the stringers. Draw the purlins on the plan. Two purlins are needed when there is a seam in the stringers (stringer that can’t reach both landings without a seam in the lumber), one on either side of the posts.

See larger SSP Standard Plans at the end of this section.
How to make a material list for a ramp:
Once a plan has been made, a material list can be made. Count the quantities of materials you will need to purchase based on the plan. Use this list as a reference. Print a copy from your thumbdrive and fill in for each project.

- **Pressure treated 4x4 posts**
  - x8 x10 x12 (buy long and cut in ½ when possible)

- Pressure treated 2x6 landing frame
  - x8 x10 x12

- Pressure Treated 2x6 landing joists
  - x8 x10 x12

- Pressure Treated 2x6 stringers
  - x8 x10 x12

- Pressure Treated 2x6 purlins
  - x8 x10 x12

- **TOTAL Pressure Treated 2x6s**
  - x8 x10 x12 (buy long and cut in ½ when possible)

- 2x6 decking
  - x8

- 2x6 railing
  - x8 x10 x12 (total railing length)

- **TOTAL 2x6s**
  - x8 x10 x12

- 2x4 bumper
  - x8 (2x4x8 ripped to 6 balusters for every 30” of railing)

- **TOTAL 2x4s**
  - x8 x10 x12

- Bags of 60 lb concrete
  - (2 ½ per concrete footing + 27 bags for pad and transition)

- Welded wire (purchase flat 4’x8’ section)
  - (3’x7”4” for concrete bottom landing and transition)

- 4x4 Post bases, (PB44Z or ABU44Z)
  - (1 per footing; check trailer)

- 2x6 Zinc joist hangers
  - (2 per joist, plus 2 per middle frame; check trailer)

- Hurricane ties, zinc
  - (1 per middle stringer and purlin connection)

- Metal tie plate
  - (1 per middle stringer seam)

- Handrail brackets
  - (1 per 4’ of railing, support both ends; check trailer)

- 1 ½ - 2” round handrail (closet rod)
  - (total railing length)

- 4 ⅜” x ⅜” zinc bolt with nut
  - (2 per post base; check trailer)

- 6” x ⅜” zinc bolt with nut and 2 washers
  - (1 per 2x6 and post connection; check trailer)

- 8” x ⅜” zinc bolt with nut and 2 washers
  - (1 per double purlin and post connection)

- 6” x 3/8” bolt with nut and 2 washers
  - (2 per end stringer and post connection at transition)

- Duplex, Teco and 16d nails
  - (check trailer)

- Deck screws (for decking and railing)
  - (check trailer)

- Stain
  - (check trailer)

- Drill bits (Square/Philips, 1/16”, ⅛”, ⅜”)
  - (check trailer)

This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

- Divide the SiteManager estimate by the rise in inches; not including the top landing it should be roughly between $40 and $50 per inch rise (last year’s range); including the top landing it should be roughly between $45 and $55 per inch rise (last year’s range).
How to construct a ramp (print this section for work teams)

Terms:

- **Slope**: Measure of rise to run; a slope of 1:12 rises 1” over a run of 12” (maximum slope by code)
- **Landing**: Any flat or level section of a ramp (a deck).
- **Post base**: Metal hardware set into a concrete footing.
- **Post**: Vertical structural member made of pressure treated (PT) 4x4 attached to a post base with two ½” by 4 ½” bolts and nuts.
- **Frame**: PT 2x6 structural members attached to the posts with ½” by 6” bolts, washers and nuts or joist hangers.
- **Joist**: PT 2x6 structural members every 24” on center (O.C.) or less, hung on to the frame with joist hangers. Supports decking.
- **Joist hanger**: Metal hardware used to support a perpendicular connection of two 2x6s (joists and frame). Attached with Teco nails to the frame, and 16d nails toenailed through the joist.
- **Stringer**: PT 2x6 structural members at a slope that supports the ramp decking. The outside stringers are attached to the posts with ½” by 6” bolts, nuts and washers; the middle stringers are attached to the purlins with hurricane ties.
- **Purlin**: PT 2x6 structural members attached to the posts under the stringers with ½” by 6” bolts, nuts and washers; supports the middle stringers.
- **Hurricane tie**: Metal hardware used to connect the middle stringers to the purlins.
- **Decking**: Douglas fir (DF) 2x6s perpendicular to joists with staggered seams. Main surface of the ramp attached with deck screws spaced 1/8” or one nail width apart to promote drainage.
- **Concrete pad**: Level concrete at grade built with formwork. Bottom landing.
- **Concrete transition**: Concrete at a slope that transitions from the wood ramp to the concrete pad.
- **Railing**: 34-38” above the decking; consists of a top DF 2x6 and bottom DF 2x4 with DF 2x2 balusters running between 3 ½” (width of 2x4) apart to prevent small children from falling off. A round handrail is attached to the top 2x6 with handrail brackets (every 4’).

**Step 1: Clear out the area**

Clear out the area where the ramp will be built. Pile debris out of the way and clear the work area until there is nothing in the way. De-nail any lumber removed. Make sure you ask the homeowner if you need to move something in their yard.

**Step 2: Construct top landing**

If a deck or landing doesn’t preexist already, start by making the top landing. Using the measurements from the plan, mark out the dimensions of the shed using metal stakes and string. Put your stakes 2’ from where the post will be. Where the strings cross will be where you dig your hole. To ensure that the layout is square, use the Pythagorean Theorem by measuring three feet along one side and four feet along an adjacent side. The distance between these points will be five feet if the sides are square. Check all four corners. The diagonals across the entire rectangle will be equal if the layout is square.

Use the plan to figure out exactly where the posts will go. When you are sure that the posts are in the right location, remove the string (keep stakes in place) and dig the holes. Post holes are 18” deep and 12” wide. Make sure to slope the concrete away from the post bases so that water will not pool around the posts. Replace the
string on the stakes and place the post base in the concrete and make sure that they are all in line with one another; allow the concrete to cure overnight. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures. Cut the pressure treated 4x4 posts at a slight angle to the appropriate length to support a railing 34-38” above the level of the decking. If there are some posts that will not be a part of the railing, cut them 1 ½” shorter than the height of the decking to the ground and at 90°. It’s good practice to cut the posts a little long, and have to cut them shorter later rather than replace the entire post if it is cut too short. Attach the posts to the post bases with ½” by 4 ½” bolts (predrill a ½” hole). Attach the pressure treated 2x6 frame with one 6” by ½” bolt, nut and washers to each post and making sure that its level. Attach joist hangers to the frame every 24” or less with Teco nails. Hang the PT 2x6 joists to the hangers with 16d nails (flush with the top of the frame).

**Step 3: Construct middle landing(s)**

Build these landings according to the plan just like the top landing, but at their prospective heights in relationship to their location in the ramp. To calculate the height difference between landings, first measure the distance between the landings. Then use the slope of the ramp to figure out how much the ramp lowers over that distance (1” rise for every 12” of run between the landings). The landing will need to be that much lower vertically than the previous landing. Use a string and a line level to stretch a level line from the first landing to the second landing. This will allow you to measure the vertical change accurately. Make sure that the landings are square to one another (use a 3-4-5 triangle) and that the posts are aligned. Double check the post heights to make sure that they will be able to support the railing (34-38” above the decking).

**Step 4: Prepare the bottom landing**

Using the same method as in step 3, find the location where the ramp will meet the ground. Measure the height of the last landing and apply the slope of the ramp (1” rise for every 12” of run between the landings). This will tell you how long the last segment of ramp needs to be (be sure to account for any slope the ground might have). Subtract 3’ 6” from the end location to account for the concrete transition. Mark this point on the ground, which will be the end of the wood ramp (3 ½” above grade) and the beginning of the concrete transition to grade.

Dig out the area where the concrete pad at grade and concrete transition will be. Use 2x4s to build the formwork for the pad. Make a box with the inside dimensions the width of the ramp (between 3’ 9” and 4’) by 7’4” long. Cut a 28” piece of 2x4 diagonally and nail to one end of the box, making the slope required for the transition. Finish the formwork by nailing a 2x4 to the end of the transition. Place the
formwork in the area dug out making sure that it is at the location determined in the previous step; the top of the flat section of the formwork should be flush with the ground. Two posts will need to be placed at the end of the sloping section of the concrete pad; mark and dig these holes after removing the formwork – this concrete will be poured after the formwork is removed so the post base can be flush with the pad. Make sure that the framework is level. Pack dirt around the formwork and insert welded wire 2” from the ground; this will provide tensile strength to the concrete. Use tin snips to cut it and make triangles out of the wire to keep the mesh 2” above the ground while the concrete cures around it. Pour the concrete; it should require roughly twenty five 60lb bags of concrete. After pouring the concrete, use a screed board to ensure that the top of the concrete is flush with the edges of the formwork (especially the sloping transition). Finish the concrete with concrete finishing tools. Brush the concrete with a broom after it has set a bit; this will add traction to the concrete. Remove the formwork after it has cured for at least a day.

Step 5: Install the ramp posts
Mark the locations for each pair of posts in the sloping section of the ramp. Make sure that the posts are in line and square with the other posts. Dig the post holes once their locations have been triple checked. Pour the concrete footings and set the post bases. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures. Cut each post the proper height based on its location in the ramp. After the concrete has set overnight, attach each post to a post base with two ½” by 4 ½” bolts. Make sure the posts are plumb, or vertically level (check this by using two levels).

Step 6: Cut and attach the stringers
Cut the 2x6 pressure treated stringers to length; seams in the stringers must occur at a post. Cut the ends of the stringers to match the angle where they meet the landings; this can be done by placing the stringer in place at the correct angle (slope of 1:12) and tracing a vertical line (using a level) onto the stringer. Attach the end stringers with on 6” by ½” bolt on each post. Wait to install the middle stringers because there is nothing yet to support them. The bottom stringers need to be cut at an angle; you can trace this angle by setting the stringer in place and tracing a level line across the stringer. The bottom of the stringers must be 2” tall. Attach the end stringers to the posts using 3/8” by 6” bolts (preditrill 3/8” hole). Make sure that all the stringers are at the right slope and flush with the other stringers before attaching the decking, which will be difficult to do if they are off.

Step 7: Cut and attach the purlins
Pressure treated 2x6 purlins are attached between posts to support the middle stringer. Cut them to length and attach to each post underneath the stringers with one ½” by 6”. Use hurricane ties to attach the middle stringers to the purlins (use Teco nails). If there is a seam between stringers, use two purlins, one on either side of the post, to support both stringers. Use one ½” by 8” bolt to attach the purlins to the post. Tie all seams in middle stringers together with a metal plate. At the end of the wood section of the ramp, pressure treated 2x6 blocking needs to be toenailed with 16d nails in between the stringers to stabilize the middle stringers which are not bolted to the end posts. Add pressure treated 2x6 blocking between the stringers throughout the ramp.
Step 8: Cut, stain and attach decking

The 2x6 Douglas fir decking will run perpendicular to the joists and stringers. Before attaching the decking, stain all 6 sides of the decking and allow to dry; if any piece needs to be cut to length, make sure the cut is stained afterwards. Attach the decking using 2 deck screws on each joist or stringer ½” from the edge of the lumber, sinking screws just below the surface of the lumber. After putting the decking in place, snap a chalk line on the decking where the joists or stringers are so that the screws are aligned and to ensure that the joists or stringers are hit every time. Deck boards are spaced ¼” apart, or the width of a 16d nail, so that rain water will drain. Place the decking so that the grain is oriented like the diagram to the right; over time the decking will warp and will either cup up and capture water, or cup so that the water will drain. If the deck screws are difficult to secure, predrill a small pilot hole first (⅛” bit or smaller).

Step 9: Install the railing

Stain all sides of railing members before attaching them with deck screws. All of the railing can be attached with deck screws. The handrails for a wheelchair ramp need to provide a suitable surface for gripping. Cut the posts to the proper height (if not already) with a slight angle so that water will drain. Then install a 2x6 against the top of the posts so that the 2x6 is 1 ½” above the top of the posts. Handrail brackets will be attached to this 2x6 every 4’ and round lumber will be attached to the brackets; attach the brackets so that the top of the handrail will be 34-38” above the top of the decking. This handrail method is required by code. There need to be bumpers below the railing to prevent wheelchairs from rolling off the ramp. These bumpers are 2x4s installed against the inside of the posts 1 ½” above the decking on the ramp. Install 2x2 balusters between the 2x4 and 2x6 to protect children from falling off the ramp. These balusters are 2x4s ripped (cut) in half and installed 3 ½” apart (width of 2x4). Six balusters can be made by cutting a 2x4x8 in half lengthwise and then in thirds. Make sure that the balusters are plumb.
**Stairs:**

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- How to make a material list for a stair: .................................................................48
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**2012 Statistics about Stairs:**

- SSP built 9 stairs
- The average stair took 3 ½ work days to complete
- The average stair took 24 volunteer days
- The average cost of a stair was $200
- The average cost per inch rise was $6.28 and 0.8 volunteer days per inch rise
- The average cost/person/day was $8.31

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the rise by $6.28 per inch rise. For a 30” rise stair, a rough cost estimate would be $188. An estimate of volunteer days would be 24 (30 x 0.8 = 24).
How to do an intake for a stair:

When going on an intake that requests a stair, take your manual, measuring tape, string line and level, calculator, shovel, camera and the Intake Checklist (see Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a stair intake requires exact measurements of the site and proposed stair to be taken.

Code requirements for a stair:

- A stair must be built for a deck that is above 7” from grade
- 36” wide in the clear between the railings
  - Minimum space between posts: 3’ 9”
  - Optimal space between posts: 4’ to minimize waste when installing decking
- Each tread, or step, must be at least 11” deep
- Each riser must be between 4 and 7” tall
- Each step must have the same riser and tread dimensions within 3/8”
- A railing 34 to 38” from the nose of the step to the top of the handrail is required if there are more than 4 risers (more than 28” rise)

Site Plan:

Sketch a site plan with measurements while at the intake. Have one person measure and one person draw – this is why it is essential for at least two Construction Team members to be present while going on an intake.

- **Rise**: Measure the height of the deck to grade that the stairs will cover. Remember to measure from the top of the decking, not the frame.
- **Space**: A quick calculation will determine how much space the stair will take up:
  - Rise (from top of decking to grade in inches) divided by 7” (maximum riser height)
  - Round up to get the number of steps required for the height (can’t have 5.5 steps)
  - Multiply the number of steps by 11” (the tread depth required)
  - Add 11” (the length of the concrete pad) to the length that the stair requires
  - This will be the rough length of the stairs in inches (divide by 12 for feet)
    - Use a string line and level to extend the deck level until it’s over the location of where the concrete pad will be and measure straight down with a measuring tape. This is the total rise of the stairs compensating for any slope of the ground. Divide this number by 7” and round up; if this is a different number of steps repeat the process with one more or one less step.
  - The width of the stairs will be at least 4’ 4” (minimum width inside railing is 3’ plus 9” for the width of the railing and 7” for two posts)

Map out the basic dimensions of what the stair will require. Make sure that the homeowner is ok with the space requirements that the stair will need. Once measurements, the site plan, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on the plan and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a stair project before a plan and cost estimate have been made.
How to plan and draw a plan for a stair:

Once a site plan has been made, a plan needs to be made. This plan will allow a precise material list to be made. A good plan will tell the reader the measurements of each part of the stair and how those parts go together.

Step 1: Draw the home and existing deck
The stair will be positioned based on the obstacles and other limitations of the project site. Draw the portion of the home where the stair will be; if a deck already exists that the stair will connect to, draw it as well.

Step 2: Calculate the dimensions of the stair
Using the height measured from deck height to grade at the location of the end of the stair, calculate the dimensions for the risers and treads.

example:

\[
\frac{38\text{” rise total}}{7\text{” max rise per step}} = 5.42 \text{ steps} = \text{round up to 6 steps}
\]

\[
\frac{38\text{” rise total}}{6 \text{ steps}} = 6 \frac{1}{3}” \text{ rise per step}
\]

1. Height (from top of decking to grade in inches) divided by 7” (maximum riser height)
2. Round up to get the number of steps (risers) required
3. Divide the height by the number of steps required (from the previous calculation)
4. This number will be the height of each riser
5. If your riser has a decimal like 6.33”, subtract the whole number (6) and multiply by 8, this will give you the fraction of an inch in eighths, which is common in construction. For 6.33” use 6 \frac{1}{8}”. With the rounding error, multiply your final number by the number of steps required; find the difference between this calculated height and the actual height. Subtract this amount from the top riser (each riser will be within the required 3/8” of one another).

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6. Multiply the number of steps by 11” (the tread depth required)
7. This will be the total length of the stairs from the deck in inches (divide by 12 for feet)
Step 3: Calculate stringer length

Like the slope of a ramp is 1:12, the slope (proportion of rise to run) for a stair is between 4:11 and 7:11. For every riser (somewhere between 4 and 7” by code), there is 11” of tread depth (SSP uses two 2x6s for each step which add up to 11” with an 1/8” gap in between). To determine the length of pressure treated 2x12 stringers to purchase, use the Pythagorean Theorem (take the square root of the \( \text{total rise}^2 + \text{total run}^2 \)) or purchase 13” for each step as a general estimate. Add 13” extra to this estimation as a buffer. For example, if the height of the deck required six steps, you would purchase 6 x 13” = 78” + 13” = 91” or 7’ 7” of 2x12 stringer. For a 3 to 4’ wide stair, three stringers are required (24” o.c.).

![Diagram of stair calculates](image)

Step 4: Draw the posts

If your stair requires a top landing or deck, refer to the deck section. A small 6’x6’ deck can be made with four 4x4 posts, 2x6 frame and two 2x6 joists. The pressure treated 4x4 posts for the stair must be at least 3’9” apart (to comply with the 36” minimum width inside the railings). Using three stringers, the maximum distance the posts can be apart is 4’ (this is optimal to provide a stair that makes the most out of its substructure; the decking can be made from one 2x6x8 for each step). If the total length of the stairs is under 6’, only 2 sets of posts are required (6’ o.c.); if the length is over 6’, add another set of posts in the middle. Draw the posts on the plan based on the requirements. All of the posts for the stair will continue past decking level to support the handrails.

Step 5: Draw the stringers and purlins

Draw the stringers on the inside of the posts and one in the middle (keep in mind that the stringers drawn in plan do not reflect the length of the stringers; the calculation in Step 3 shows the appropriate lengths to purchase). In plan view, the stringers will be drawn the as the length of the stairs from the first calculation done during the intake (number of steps multiplied by 11” for each tread). If there are a middle set of posts for the stair, draw in a purlin to support the middle stringer; a pressure treated 2x6 purlin is attached to the posts underneath the stringers. Remember that lumber is 1 ½” thick and should be drawn as a skinny rectangle and not as a line.

Step 6: Draw the concrete pad

The concrete pad at the end of the stair will be as wide as the stair and will be 12” in front of the first step and continue underneath the stringers 12” to protect the wood. The width of the pad will encompass the concrete footings at the end of the stair; make sure that the pad is at least 4 ¾” past each post to allow for the proper 12” width required for the concrete footings. A typical size is 2’ by 5’ 3 ½ “.
Step 7: Label measurements

Take the time to go back now and write in all measurements that you did not write in during the drawing process. Everything that the team will need to cut should have a precise measurement written on the plan. Make sure that these measurements are legible and that it is clear what measurements relate to what part. Based on the height of the stair at the location of each post, calculate the length of post needed to support a handrail 34-38” above the level of the decking.

SSP Standard Stair Plan:

This framing plan works for stairs that rise 7 to 42”.

Add a middle set of posts and purlin if the stair rises 42 to 91”. The only thing that changes is the distance of the pad from the end of the deck.
How to make a material list for a stair:

Once a plan has been made, a material list can be made. Count the quantities of materials you will need to purchase based on the plan. Use this list as a reference. Print a copy from your thumbdrive and fill in for each project.

- **Pressure treated 4x4 posts**  
  ____x8 ____x10 ____x12 (buy long and cut in ½ when possible)

- **Pressure Treated 2x12 stringers**  
  ____x8 ____x10 ____x12 (use calculation from step 3)

- **Pressure treated 2x6 deck frame**  
  ____x8 ____x10 ____x12 (if building a deck as well)

- **Pressure Treated 2x6 deck joists**  
  ____x8 ____x10 ____x12 (if building a deck as well)

- **Pressure Treated 2x6 purlins**  
  ____x8 ____x10 ____x12 (if stair has a middle set of posts)

- **TOTAL Pressure Treated 2x6s**  
  ____x8 ____x10 ____x12 (buy 12’ and cut in half when possible)

- **2x6 decking**  
  ____x8 ____x10 ____x12 (4’ wide stair has one 2x6x8 per tread)

- **2x6 railing**  
  ____x8 ____x10 ____x12 (total railing length)

- **TOTAL 2x6s**  
  ____x8 ____x10 ____x12

- **2x4 bumper**  
  ____x8 ____x10 ____x12 (total railing length)

- **2x4 baluster**  
  ____x8 (one 2x4x8 to 6 balusters every 30” of railing)

- **TOTAL 2x4s**  
  ____x8 ____x10 ____x12

- **Bags of 60 lb concrete**  
  ____ (2 ½ per footing + 9 bags for pad)

- **Welded wire** (purchase flat 4’x8’ section)  
  ____ (2’x5’ 3 ½” for concrete bottom landing)

- **4x4 Post bases, (PB44Z or ABU44Z)**  
  ____ (1 per concrete footing; check trailer)

- **2x6 Zinc joist hangers**  
  ____ (if building a deck as well; check trailer)

- **2x12 Zinc joist hangers**  
  ____ (one for every middle stringer)

- **Hurricane ties, zinc**  
  ____ (1 per middle stringer/purlin connection, if over 42” rise)

- **Handrail brackets**  
  ____ (1 per 4’ of railing, support both ends; check trailer)

- **1 ¼ - 2” round handrail (closet rod)**  
  ____ (total railing length)

- **4 ½” x ½” zinc bolt with nut**  
  ____ (2 per post base; check trailer)

- **6” x ½” zinc bolt with nut and 2 washers**  
  ____ (1 per 2x6 and post connection; check trailer)

- **Teco, duplex and 16d nails**  
  ____ (check trailer)

- **Deck screws**  
  ____ (check trailer)

- **Stain**  
  ____ (check trailer)

- **Drill bits (Square/Philips, ¼”, ½”, ⅜”, ⅝”)**  
  ____ (check trailer)

This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

- Divide the SiteManager estimate by the rise in inches; it should be around between $6 and $9 per inch rise (last year’s range).
How to construct a stair (print this section for work teams)
If a deck is also being built, see the section on how to build a deck.

Terms:
- **Riser**: Vertical rise in a step.
- **Tread**: Horizontal run in a step; surface made of two Douglas fir 2x6 decking boards.
- **Nose**: Outside corner of a step; transition between the riser and tread
- **Post base**: Metal hardware set into a concrete footing.
- **Post**: Vertical structural member made of pressure treated (PT) 4x4 attached to a post base with two ½” by 4 ½” bolts and nuts.
- **Stringer**: PT 2x12 structural member that is cut in the shape of the steps. The end stringers are attached to the posts with ½” by 6” bolts, nuts and washers; the middle stringers are attached with a joist hanger to the deck frame at the top, and with PT 2x6 blocking at the bottom.
- **Purlin**: PT 2x6 structural member attached to the posts under the stringers with ½” by 6” bolts, nuts and washers; supports middle stringers for stairs over 42” of rise.
- **Hurricane tie**: Metal hardware used to connect the middle stringers to the purlins.
- **Decking**: Douglas fir (DF) 2x6s on top of the stringers. Two 2x6s create each tread surface, attached with deck screws spaced 1/8” or one nail width apart to promote drainage.
- **Concrete footing**: Concrete and post base which supports the bottom of the posts.
- **Concrete pad**: Level concrete at grade built with formwork.
- **Railing**: 34-38” above the decking; consists of a top DF 2x6 and bottom DF 2x4 with DF 2x2 balusters 3 ½” (width of 2x4) apart to prevent small children from falling off. A round handrail is attached to the 2x6 with handrail brackets (every 4’).
- **Joist hanger**: Metal hardware used to support the middle stringer on the frame of the deck. Attached with Teco nails to the frame, and 16d nails toenailed through the joist.

**Step 1: Clear out the area**
Clear out the area where the stair will be built. Pile debris in an out of the way location and clear the work area until there is nothing in the way. De-nail any lumber removed. Make sure you ask the homeowner if you need to move something in their yard.

**Step 2: Cut the stringers**
Mark the rise (riser height) and run (tread depth) on a framing square with tape. Place the square on the 2x12 and line up the dimensions with the edge of the board. Mark the edge of the square. Repeat marking steps down that side of the board; this will be cut out to provide the shape of the steps. Mark one more section than there are steps. Extend the first line of the first cutout and the last line of the last cutout to match the angles of the deck and the ground.
Cut out the marked sections using a circular saw; remember that since the blade is curved, the cut will be finished with a handsaw. Do not cut further than the marked lines with the circular saw! After all the marks are cut, cut off an additional 1 ½” off the bottom of your last step. This compensates for the 2x6 decking which will add an additional 1 ½” of height. After cutting the first stringer, the other stringers can be precisely traced using the first as a template (Hint: Angle your pencil into the corner or the wood to trace the outline versus adding an extra ¼” to each stringer. Make sure to use one stringer as a template for both of the others.)

**Step 3: Install the top posts**

There need to be posts at the top of the stairs on either side to support the stringers and the handrails. Measure their exact location from the plan, dig and pour the concrete footings 12” wide and 18” deep, placing the post bases into the concrete at the proper locations. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures. Once the concrete has set overnight, cut the posts to the proper height (if building a handrail the posts are 34-38” above the decking, cut at a slight angle) and attach to the post bases with two 4 ½” by ½” bolts. Make sure that the post is plumb (perpendicular to level; use two levels) and mark where the bolts will go; predrill ½” holes for the bolts.

**Step 4: Set stringers in place and site location of concrete pad**

Place the stringers in place so that the exact position of the concrete pad can be determined; this will show the position where the stairs will end. Make sure that the stringers are level with one another. The pad needs to extend past the edge of the stairs 12”. The pad also extends 12” underneath the stringers so that the stringers will be completely over concrete. The pad should be 8” wider than the stringers on both sides, to allow for the concrete footings at the end of the stair. Mark the dimensions of where the concrete pad will be with metal stakes.

**Step 5: Pour concrete**

Dig out the area for the pad. The pad needs to be at least 3 ½” deep (see the plan for the dimensions of the pad). Add 3” to both dimensions of the pad to compensate for the 2x4 lumber that will provide the formwork for the concrete pad. Use duplex nails to nail together a rectangle of 2x4 lumber (inside dimensions will be the size of pad) and insert into the area dug out. Make sure the pad is at the correct location, square and level. There will be two post bases set into the concrete that will support the end of the stairs and railing. Where these posts will be, 18” deep hole needs to be dug out 12” wide to provide a strong concrete footing for the post. If the stair requires posts in the middle of the stringers, dig the post holes at this time making sure that all of the post bases are aligned.

Pack dirt around the formwork and insert welded wire 2” from the ground; this will provide tensile strength to the concrete. Use tin snips to cut it and make triangles out of the wire to keep the mesh 2” above the ground while the concrete cures around it. Pour the concrete. After pouring the concrete, use a screed board to ensure that the top of the concrete is flush with the edges of the formwork. Finish the concrete with concrete finishing tools. Brush the concrete with a broom after it has set a bit; this will add traction to the concrete. After the concrete is finished, set the post bases in the proper location, double checking that the post bases are properly spaced and aligned with the rest of the stair. Remove the formwork after it has cured for at least a day.
Step 6: Install the posts
Once the concrete has set overnight, cut and install the rest of the posts. If the stair has more than 4 steps, a handrail is required. The round handrail needs to be 34-38” from the nose of each step; see the measurements on the plan for how long to cut the posts. It is safest to cut a post long and re-cut it again later if needed. Make sure that the posts are plumb and that they are cut at a slight angle so that water will not pool on top.

Step 7: Install the stringers
Attach the stringers to the posts. For the outside stringers, attach to each post using one 6” by ½” bolt. Make sure that all of the stringers are level so that the tread decking will also be level. Attach the middle stringer to the deck frame using a 2x12 joist hanger. If there are middle posts, place a 2x6 pressure treated purlin between the two middle posts underneath the stringers; use one 6” by ½” bolt to attach the purlin to each post. Attach the middle stringer to the purlin using a hurricane tie and Teco nails. Install pressure treated 2x6 blocking on the concrete pad to stabilize the middle stringer (not shown in image below).

Step 8: Install stair treads
Cut the stair treads (decking) to size. Use two 2x6 for each tread. Stain all 6 sides before screwing onto the stringers. Use two screws per stringer no closer than ½” from the edge of the lumber. Space decking ⅛” apart to allow for water drainage (or the thickness of a 16d nail). Place the decking so that the grain is oriented like the diagram below; over time the decking will warp and will either cup up and capture water, or cup so that the water will drain. If the deck screws are difficult to secure, predrill a small pilot hole first (⅛” bit or smaller).

Step 9: Install the railing (if more than 4 steps)
All pieces of the railing are Douglas fir lumber and are stained on all sides before being attached. All parts of the railing are attached with deck screws. First attach the 2x6 top rail 1 ½” above the level of the posts, running between the posts 34-38” above the nose of each step. Cut the posts if needed; they should be at a slight angle. Handrail brackets will be attached to this 2x6 every 4’, making sure that there is one at the bottom and at the top of the stair. Round lumber is attached to these brackets and is the actual handrail that the top of must be 34-38” from the nose of each step. The second step is to attach the 2x4 bottom rail that is 1 ½” above the nose of each step. Between the top and bottom rail, 2x2 balusters are attached 3 ½” apart (width of 2x4); make sure that the balusters are plumb. Six balusters can be made by cutting a 2x4x8 in half lengthwise and then in thirds.
1 1/4 - 2" round handrail with handrail bracket every 4'
2x6 top rail
4x4 pressure treated post
2x12 pressure treated middle stringer connected to purlin with a hurricane tie
2x6 decking for stair treads, screwed to the stringers
2x4 bottom rail
2x12 pressure treated end stringer bolted to posts with 6" by 1/2" bolts
2x6 pressure treated purlin bolted underneath stringers to posts with 6" by 1/2" bolts. (if there are middle posts)
post base bolted to plumb posts with 4 1/2" by 1/2" bolts

36" minimum between handrails (minimum 3' 9" between posts)

top of handrail must be between 34 and 38" above the decking on the nose of each step

concrete footing 12" wide by 18" deep

Gaurd for deck 42" above decking, 2x6 cap and 2x4 top and bottom rails with 2x2 balusters in between. Bottom rail max. 4" from decking. Post cut to 40 1/2" above level of decking to support cap and stair handrail.

2x4 bottom rail 1 1/2" above nose of step to prevent 6" sphere from passing through

middle stringer attached to frame with 2x12 jolst hanger

2x4 jolst and frame for deck

2x2 balusters 4" max. between

hand rail bracket 4" o.c. max. apart

4x4 pressure treated posts 6" o.c. max. apart

top of round handrail 34 38" above nose of stair
Awnings and Sheds:

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2012 Statistics:

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<td>6x10 - $886</td>
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Awnings are needed over decks, stairs and ramps to provide shade during the summer and shelter from snow and rain during the winter. Sheds provide a safe place for homeowners to store fire wood, tools and other items securely.

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the square footage by

- $3.65 per square foot for an awning; a 6x6 awning has 36 square feet and an estimate is $130
  - Volunteer days estimate: 25

- $7.55 per square foot for an open shed; a 6x6 shed has 36 square feet and an estimate is $270
  - Volunteer days estimate: 50

- $15.36 per square foot for an enclosed shed; a 6x6 shed has 36 square feet and an estimate is $550
  - Volunteer days estimate: 58
How to do an intake for an awning/shed:

When going on an intake that requests an awning/shed take your manual, ladder, measuring tape, string line and level, shovel, camera and the Intake Checklist (Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), an awning intake requires exact measurements of the site and proposed awning to be taken.

**Code requirements:**

- Mobile home: Never attach to the home
  - Requires an unattached awning with two rows of posts at different heights with rafters spanning between
- House: May attach to the home
  - Ledger board secured to home with one row of posts at a lower height with rafters spanning between. This is only an option if a ledger board can be securely attached structurally to the home.
  - Posts are 6’ o.c. If also building a deck, ramp or stairs, the same posts can support the deck, railing and continue to support an awning.
  - Rafters are 24” o.c. unless there is a snow load, then they must be 16” o.c. (ask the local building department or housing authority)
  - Rafters can cantilever (extend past their supports) a maximum of 22”. Unless attached to a building, all rafters should cantilever 1’ past their supports to provide an overhang.

**Specifications:**

- Attached or Freestanding: Is the intake for a mobile home or a house? If it is a house, can a ledger board be securely attached? One or two rows of posts required?
- Dimensions: Determine the dimensions of the structure with the homeowner. Verify that posts will be able to support the awning in the location desired (no obstacles). Posts can be secured to existing concrete if needed.
  - SSP Standard Shed plans are either enclosed or open:
    - 6’x6’ footprint  8’x8’ roof line
    - 6’x10’ footprint  8’x12’ roof line
  - Standard awning width of 8’ (2x6x8 for rafters) and 6, 12, 18’, etc. long (using maximum distance between posts of 6’ O.C.)
  - If the structure is freestanding away from the building, it is considered a shed and can be open or enclosed. Discuss this with the homeowner. If there is only a back wall, make sure it is oriented to protect the inside of the structure from wind etc. (think of a wood shed).

**Awning Height:**

- **Upper height**: Measure the height of the existing roof line to grade at the location of the requested awning. This will be the upper height of the awning.
- **Existing roof material**: Is the roofing three tab or roll roofing? The awning will have the same type and color of roofing material.
  - If there is roll roofing, the slope of the awning will be between 2:12 and 4:12
  - If there is three tab, the slope of the awning will be between 4:12 and 6:12
- **Lower height**: Based on the width (projected distance from the home) of the requested awning, determine the lower height of the awning.
Determine the slope of the awning based on the roofing material and use the width of the awning to calculate the change in height over the width or run.

Example: If the awning will be 8’ wide and there is roll roofing on the home, the slope of the awning could be 3:12 and the awning will lower 24” (3” of rise per foot x 8’ of run).

Subtract this height from the existing height of the roof line; this will give the lower height of the awning (top of the roofing). Make sure that this will provide enough space underneath the awning for someone to walk. Subtract 10” from the lower height to account for the awning depth and measure at various locations to ensure that there is enough space (minimum of 7’ from the bottom of the beam to grade or the deck/ramp walking surface). Alter the slope or width of the awning if needed to provide adequate space underneath the edge of the roof.

Example: If the upper height was 11’, subtract 2’ for the slope of the roof, then subtract 10” for the height of rafters, beam and roofing to get 8’ 2” which is more than the 7’ minimum.

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<th>Slope</th>
<th>Width from roof edge to end of rafter cantilevering 1’ past posts</th>
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<td>4’</td>
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<tr>
<td>2:12 – Roll Roofing</td>
<td>8’ 5”</td>
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<tr>
<td>3:12 – Roll Roofing</td>
<td>8’ 9”</td>
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<tr>
<td>4:12 – Either</td>
<td>9’ 2”</td>
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<tr>
<td>5:12 – Shingles</td>
<td>9’ 7”</td>
</tr>
<tr>
<td>6:12 – Shingles</td>
<td>9’ 11”</td>
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</tbody>
</table>

Map out the basic dimensions of what the awning will require. Once measurements, the site plan, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on the plan and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to an awning before a plan and cost estimate have been made.
How to plan and draw a plan for a shed:

Follow the four SSP Standard Shed Plans at the end of this section. If a shed is requested that is not a standard plan, follow the plans as an example of what to draw. Elevations (or side views of the walls) are important to show the studs and how the wall goes together. A plan and roof plan are also essential to show the details of the overall layout.

How to plan and draw a plan for an awning:

Once a site plan has been made, a plan needs to be made. This will allow a precise material list to be made. A good plan will tell the reader the measurements of each part of the awning and how those parts go together.

Step 1: Draw the home
The awning will be positioned based on the obstacles and other limitations of the project site. Draw the portion of the home where the awning will be.

Step 2: Draw the posts (and ledger board)
Draw the posts 6’ o.c. Draw one or two rows based on if the awning can securely be attached with a ledger board or if it will be freestanding. If the awning is attaching to the house, draw a ledger board next to the home.

Step 3: Draw the beam(s)
A 4x4 beam will run at the top of each row of posts.

Step 4: Draw the rafters
Draw the rafters every 24” or 16” o.c. depending on local requirements (check with building department or housing authority). 2x6 rafters can extend no more than 1/3 of their span or 22” cantilevered from their supports (past the beam). Divide the total length of awning by 24” or 16” (rafter spacing) to determine how many rafters are required; round up and then add one to the total.

Step 5: Label measurements
Take the time to go back now and write in all measurements that you did not write in during the drawing process. Everything that the team will need to cut should have a precise measurement written on the plan. Make sure that these measurements are legible and that it is clear what measurements relate to what part. Based on the height of the awning at the location of each post, calculate the length of post needed to support the beam.
awning slope 4:12
32” rise in height

posts 7’ 7”

posts 10’ 3”

2x6 rafters 24” o.c.
(16” o.c. if snow load)

DF 2x6x8

1/3 span or 22”

cantilever

home

4x4 posts 6’ o.c.

4x4 beam on top of posts
How to make a material list for a shed:

In SiteManager, the exact materials lists for the four standard sheds are preloaded. Refer to the suggested items and add more as you see fit based on your specific project needs.

How to make a material list for an awning:

Once a plan has been made, a material list can be made. Count the quantities of materials you will need to purchase based on the plan. Use this list as a reference. Print a copy from your thumbdrive and fill in for each project.

Framing Materials:

- Bags of 60 lb concrete ____ (2 ½ per footing)
- 4x4 Post bases (PBS44AZ) ____ (1 per footing) Heavy duty post bases are used which go into concrete further and support 4x4 higher than PB44Z models do.
- Pressure treated 4x4 posts ____x8 ____x10 ____x12 (if building a deck, use same posts)
- 4x4 Post caps (BC4Z) ____ (1 per post)
- Douglas fir 4x4 beam ____x8 ____x10 ____x12
- Douglas fir 2x6 rafters ____x8 ____x10 ____x12 (buy 12’ and cut in half when possible)
- Hurricane ties (H1Z) ____ (2 per rafter if unattached, 1 per if attached, check trailer)

- 4 ½” x ½” zinc bolt with nut ____ (2 per post base; check trailer)
- 16d nails ____ (for post cap connection with beam and post)
- Teco nails ____ (check trailer, for hurricane ties)
- Stain ____ (check trailer)

If attaching to home:

- Douglas fir 2x6 ledger board ____x8 ____x10 ____x12
- 2x6 zinc joist hangers ____ (1 per rafter; check trailer)

- 4” x ½” lag bolt and washers ____ (1 every 2’ on the ledger board)

See roofing section for roofing material list.

The lists above the red lines for each section will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red lines are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

- Divide the SiteManager estimate by the square footage; it should be around $5 for an awning, $6 for an open shed and $10 for an enclosed shed.
How to construct a freestanding awning:
See roofing section for more information on those areas. Print this section for work teams

Terms:

- **Concrete footing**: Concrete and post base which support the bottom of a post.
- **Post base**: Hardware that structurally connects the bottom of a post with the concrete footing.
- **Post**: Vertical structural member made of pressure treated (PT) 4x4 attached to a post base with two ½” by 4 ½” bolts and nuts.
- **Beam**: Horizontal structural Douglas fir (DF) 4x4 that rests on top of the posts.
- **Post cap**: Hardware that structurally connects the beam to the top of the posts (16d nails used).
- **Rafter**: A structural DF 2x6 member that spans from beam to beam.
- **Hurricane tie**: Hardware that connects rafters to the beams; used on each rafter/beam connection (Teco nails used).

**Step 1: Clear out the area**
Clear out the area where the awning will be built. Pile debris in an out of the way location and clear the work area until there is nothing in the way. De-nail any lumber removed. Ask the homeowner if you need to move something in their yard. Before continuing, make sure that the ground slopes away from the building.

**Step 2: Mark out the layout**
Using the measurements from the plan, mark out the dimensions of the shed using metal stakes and string. Put your stakes 2’ from where the post will be. Where the strings cross will be where you dig your hole. To ensure that the layout is square, use the Pythagorean Theorem by measuring 3’ along one side and 4’ along an adjacent side. The distance between these points will be 5’ if the sides are square; adjust if necessary. Check all four corners. The diagonals across the entire rectangle will be equal if the layout is square. (If the awning is 6’x8’ or larger, use a 6-8-10 triangle instead.)

**Step 3: Dig Concrete Footings**
Use the plan to figure out exactly where the posts will go. When you are sure that the posts are in the right location, remove the string (keep stakes in place) and dig the holes. Post holes are 18” deep and 12” wide. Make sure to slope the concrete away from the post bases so that water will not pool around the posts. Replace the string on the stakes and place the post base in the concrete and make sure that they are all in line with one another; allow the concrete to cure overnight. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures.

**Step 4: Measure and cut the first row of posts**
Cut the first row of 4x4 pressure treated posts that are against the building; they may not be all the same height if the ground is not level. Cut one post to the proper height and hold it in place and use a level to determine the next post’s height. Continue with this process down the row; the end goal is for all of the posts to be level at the top with one another.

**Step 5: Attach the beams**
Once the posts are cut to the right length, attach a post cap to the top of each post with 16d nails. Dry fit the posts (with post caps attached) and beam together, making sure that the posts are plumb (perpendicularly level) by using a level on both sides of the post. Mark where the post caps will be on the beam and lower the 4x4s to
the ground. Cut and stain the DF 4x4 beam to the proper length. Nail the post caps to the beam on the ground, which is much easier than in the air.

**Step 6: Attach posts to post bases**
Attach the posts to the post bases using 4 ½” by ½” bolts and nuts; predrill a ½” hole. Make sure that the posts are plumb.

**Step 7: Repeat steps 4-6 for second row of posts**
Keep in mind that the second row of posts will be lower than the first row of posts.

**Step 8: Cut and attach the rafters**
The rafters are cut with a jig saw (or hand saw) to fit snuggly on top of the beams; this is called a bird’s mouth cut. This can be done by measuring with a framing square; use the chart and the slope of the awning noted on the plan to determine how much to cut. Make the cut at the location where the rafter hits a beam. After making the bird’s mouth cut, hold the rafter in place and use a level to draw a vertical line (left side of drawing). Cut this triangle off the end of the rafter so that the roof will cover the entire rafter. After cutting one, it can be used as a template for the other rafters. Stain all sides of the rafters (including cut bird’s mouth) before attaching them. After staining, attach the rafters to the beams with a hurricane tie and Teco nails. Follow the plan for proper spacing (no more than 24” on center). Snap a chalk line between the two end rafters and trim as needed (90° cut). Install a 1x6 trim board to the ends of the 2x6 rafters.

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**Step 9: Roof the awning**
Follow the roofing instructions on how to install roof sheathing, drip edge, underlayment, and shingles or roll roofing.
How to construct an attached awning:
See roofing section for more information on those areas. Print this section for work teams

Terms:
- **Ledger board**: Douglas fir 2x6 that is securely attached to the house with 4” by ½” lag bolts and washers.
- **Joist hanger**: Metal hardware that is attached to the ledger board that rafters are attached to (16d and Teco nails are used).
- **Concrete footing**: Concrete and post base which support the bottom of a post.
- **Post**: Vertical structural member made of pressure treated (PT) 4x4 attached to a post base with two ½” by 4 ½” bolts and nuts.
- **Post base**: Hardware that structurally connects the bottom of a post with the concrete footing.
- **Beam**: Horizontal structural Douglas fir (DF) 4x4 that rests on top of the posts.
- **Post cap**: Hardware that structurally connects the beam to top of the posts (16d nails used).
- **Rafter**: A structural DF 2x6 member that spans from the ledger board to the beam.
- **Hurricane tie**: Hardware that connects rafters to the beams; used on each rafter and beam connection (Teco nails used).

Step 1: Clear out the area
Clear out the area where the awning will be built. Pile debris in an out of the way location and clear the work area until there is nothing in the way. De-nail any lumber removed. Ask the homeowner if you need to move something in their yard. Before continuing, make sure that the ground slopes away from the building.

Step 2: Mark out the layout
Using the measurements from the plan, mark out the dimensions of the shed using metal stakes and string. Put your stakes 2’ from where the post will be. Where the strings cross will be where you dig your hole. To ensure that the layout is square, use the Pythagorean Theorem by measuring three feet along one side and four feet along an adjacent side. The distance between these points will be 5 feet if the sides are square; adjust if necessary. Check all four corners. The diagonals across the entire rectangle will be equal if the layout is square. (If the awning is 6’x8’ or larger, use a 6-8-10 triangle instead.)

Step 3: Dig Concrete Footings
Use the plan to figure out exactly where the posts will go. When you are sure that the posts are in the right location, remove the string (keep stakes in place) and dig the holes. Post holes are 18” deep and 12” wide. Make sure to slope the concrete away from the post bases so that water will not pool around the posts. Replace the string on the stakes and place the post base in the concrete and make sure that they are all in line with one another; allow the concrete to cure overnight. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures.

Step 4: Measure and cut the posts
Cut the posts; they may not be all the same height if the ground is not level. Cut one post to the proper height and hold it in place and use a level to determine the next post’s height. Continue with this process down the row; the end goal is for all of the posts to be level at the top with one another.

Step 5: Attach the beam
Once the posts are cut to the right length, attach a post cap to the top of each post with 16d nails. Dry fit the posts (with post caps attached) and beam together, making sure that the posts are plumb (perpendicularly level) by using a level on both sides of the post. Mark where the post caps will be on the beam and lower the 4x4s to the ground. Cut and stain the DF 4x4 beam to the proper length. Nail the post caps to the beam on the ground, which is much easier than in the air.
Step 6: Attach posts to post bases
Attach the posts to the post bases using 4 ½” by ½” bolts and nuts; predrill a ½” hole.

Step 7: Attach the ledger board
Cut the 2x6 ledger board to length and stain. Based off of the plan (rafters no more than 24” on center), attach the joist hangers to the ledger board with Teco nails; it is much easier to do this on the ground versus on a ladder! Hold the ledger board in place with a few deck screws making sure that it is level; predrill 3/8” holes every 2’. Use 4” by ½” lag bolts to attach the ledger board to the home.

Step 8: Cut and attach the rafters
Cut the 2x6 rafters to length. The rafters are also cut with a jig saw (or hand saw) to fit snuggly on top of the beam; this is called a bird’s mouth cut. This can be done by measuring with a framing square; use the chart and the slope of the awning noted on the plan to determine how much to cut. Make the cut at the location where the rafter hits the beam. After making the bird’s mouth cut, hold the rafter in place and use a level to draw a vertical line that will be cut to allow the rafter to fit snugly into the joist hanger. After cutting one rafter, it can be used as a template for the others. Stain all sides of the rafters (including cut bird’s mouth) before attaching them. After staining, attach the rafters to the joist hangers with 16d nails. Next attach the rafter to the beam with a hurricane tie and Teco nails. Follow the plan for proper spacing (no more than 24” on center). Snap a chalk line between the two end rafters and trim as needed (90° cut). Install a 1x6 trim board to the ends of the 2x6 rafters.

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Step 9: Roof the awning
Follow the roofing instructions on how to install roof sheathing, drip edge, underlayment, and shingles or roll roofing.
How to construct a shed:
See roofing section for more information on those areas. Print this section for work teams

Terms:
- **Concrete footing**: Concrete and post base which support the bottom of a post.
- **Post base**: Hardware that structurally connects the bottom of a post with the concrete footing.
- **Post**: Vertical structural member made of pressure treated (PT) 4x4 attached to a post base with two ½” by 4 ¾” bolts and nuts.
- **Beam**: Horizontal structural Douglas fir (DF) 4x4 that rests on top of the posts.
- **Post cap**: Hardware that structurally connects the beam to the top of the posts (16d nails used).
- **Rafter**: A structural DF 2x6 member that spans from beam to beam.
- **Hurricane tie**: Hardware that connects rafters to the beams; used on each rafter/beam connection (Teco nails used).
- **Studs**: Wall structural member made of DF 2x4s.

Step 1: Clear out the area
Clear out the area where the awning will be built. Pile debris in an out of the way location and clear the work area until there is nothing in the way. De-nail any lumber removed. Ask the homeowner if you need to move something in their yard. Before continuing, make sure that the ground is fairly level.

Step 2: Mark out the layout
Using the measurements from the plan, mark out the dimensions of the shed using metal stakes and string. Put your stakes 2’ from where the post will be. Where the strings cross will be where you dig your hole. To ensure that the layout is square, use the Pythagorean Theorem by measuring 3’ along one side and 4’ along an adjacent side. The distance between these points will be 5’ if the sides are square; adjust if necessary. Check all four corners. The diagonals across the entire rectangle will be equal if the layout is square. (If the shed is 6’x8’ or larger, use a 6-8-10 triangle instead.)

Step 3: Dig Concrete Footings
Use the plan to figure out exactly where the posts will go. When you are sure that the posts are in the right location, remove the string (keep stakes in place) and dig the holes. Post holes are 18” deep and 12” wide. Make sure to slope the concrete away from the post bases so that water will not pool around the posts. Replace the string on the stakes and place the post base in the concrete and make sure that they are all in line with one another; allow the concrete to cure overnight. You can temporarily attach post bases to a piece of lumber to ensure that they will stay aligned as the concrete cures.

Step 4: Measure and cut the first row of posts
Cut the first row of 4x4 pressure treated posts; they may not be all the same height if the ground is not level. Cut one post to the proper height and hold it in place and use a level to determine the next post’s height. Continue with this process down the row; the end goal is for all of the posts to be level at the top with one another.
Step 5: Attach the beam

Once the posts are cut to the right length, attach a post cap to the top of each post with 16d nails. Dry fit the posts (with post caps attached) and beam together, making sure that the posts are plumb (perpendicularly level) by using a level on both sides of the post. Mark where the post caps will be on the beam and lower the 4x4s to the ground. Cut and stain the DF 4x4 beam to the proper length. Nail the post caps to the beam on the ground, which is much easier than in the air.

Step 6: Attach posts to post bases

Attach the posts to the post bases using 4 ½” by ½” bolts and nuts; predrill a ½” hole. Make sure that the posts are plumb.

Step 7: Repeat steps 4-6 for second row of posts

Keep in mind that the second row of posts will be at a different height than the first row of posts.

Step 8: Cut and attach the rafters

The rafters are cut with a jig saw (or hand saw) to fit snugly on top of the beams; this is called a bird’s mouth cut. This can be done by measuring with a framing square. Make the cut at the location where the rafter hits a beam. After making the bird’s mouth cut, hold the rafter in place and use a level to draw a vertical line (left side of drawing). Cut this triangle off the end of the rafter so that the roof will cover the entire rafter. After cutting one, it can be used as a template for the other rafters.

Stain all sides of the rafters (including cut bird’s mouth) before attaching them. After staining, attach the rafters to the beams with a hurricane tie and Teco nails. Follow the plan for proper spacing (no more than 24” on center). Snap a chalk line between the two end rafters and trim as needed (90° cut). Install a 1x6 trim board to the ends of the 2x6 rafters.

Step 9: Roof the awning

Follow the roofing instructions on how to install roof sheathing, drip edge, underlayment, and shingles or roll roofing.
Steps for enclosed sheds only: Frame the walls and install siding and trim

- If the homeowner doesn’t want a gap between the siding and ground, bury a pressure treated 2x4 or before installing framing. The top of this lumber will be the bottom of the framing and siding.

- **Install Framing:** Measure the top and bottom between your posts. If they are as planned, go ahead and make the 2x4 stud frames outside of the shed, following the spacing on the drawings and measuring your posts in reality. You can slip the frame into place, nailing into the posts to secure. The framing is planned to make installing siding really easy with as few pieces and cuts as necessary.

**OR**

If your posts are a little bit out of line, another method is to build the 2x4 frames directly to the 4x4 posts. Follow the plans the best you can given the existing 4x4 structure. Go piece by piece starting with the perimeter, then add in the middle studs. Make sure to make the studs plumb to make siding easier.

- **Paint Siding:** At the same time as framing, some people can prime and paint the siding. Prime all six sides of the siding (edges too) unless it is pre-primed, to protect it from moisture damage before it is secured to the wall. Make sure to do as many layers of primer as necessary – new wood will soak up a lot of paint. It is much easier to paint the panel before it is attached. Paint the groves with a paintbrush first, and then paint the panel with a roller.

- **Install Siding:** Follow the elevation plans which minimize waste. Orient the panels so that the groves are vertical. Make sure that the vertical edges of the siding end on a stud so they can be secured to it. Make adjustments to the plans based on your posts and studs. Install the back wall first to get the hang of the process. The siding is raised off of the ground, in line with the framing, running up to the bottom of the rafters. Cut the pieces to the right size (maximize the 4’ width ad much as possible).Overlap the siding where there is a small lip. It is OK if there is a small gap on the corners; this will be covered by trim pieces and gives you a little wiggle room. Siding is attached with 6d nails every 6” around the perimeter of the panel and every 12” on the inside.

- **Make Door:** To make the door, make the frame based on the opening and install siding on it. Cross bracing will reinforce it and make it stronger. To install the cross braces, take a 2x4x8 and lay it across the frame, overlapping the top and bottom so it only has to be trimmed once (two cuts would be needed if it ended in the corner). Cut these angles and nail in place. Use hinges to hang the door and trim the door as necessary to make sure that it opens and closes easily. Install a latch to give the door a way to be locked.

- **Add Trim:** Prime all six sides of the trim. Paint all of the sides that will be exposed before attaching it to the wall (this will be much easier and require less masking and detailed work). Use 6d nails every 2’ or less to attach each trim board to the wall; use 3 nails for a board less than 4’ long. Offset the nails so that they are staggered (i.e. two on the right side of the board and two on the left side of the board for a vertical piece of trim). You will need two pieces of trim for each corner of the shed (one on each side) and around the door.

- **Add blocking between the rafters:** Add 2x6 blocking or screen material in-between the rafters on top of the beam (2x6s should be added before roofing, screen can be done at the end). Make sure that the edges don’t poke up over the level of the rafter; this will make it really difficult to install the sheathing.
Roofing:

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2011 Statistics about Roofing:

- SSP completed only 1 roofing project in 2012; stats are from 2011 when there was more data.
- The average roof took 13 work days to complete (that’s over 3 SSP weeks!)
- The average roof took 89 volunteer days
- The average cost of a roof was $778
- The average cost per square (100 square feet) of roll roofing was $90 and 11 volunteer days per square
- The average cost/person/day for roll roofing was $10.94
- The average cost per square (100 square feet) of three tab was $120 and 13 volunteer days per square
- The average cost/person/day for three tab was $9.89

A leaky roof can damage almost every other part of a home, and any other repairs made will not last without repairing the roof. This places roofs at a very high priority. Roofs also make an excellent project for youth. It is easy to teach and learn, and daily improvement is very visible. Also, many youth have never done anything like roofing before (unless they worked on a roof previously at SSP) and so it places them in a position to learn something new. A roofing project is also relatively easy to plan and purchase materials for, and therefore one of the easier projects to keep supplied and running smoothly for a Construction Team. Despite the high heat on roofs and being one of the more expensive types of projects SSP does, roofing is one of the best projects for SSP to undertake.
How to do an intake for a roof:

When going on an intake that requests roof repairs take your manual, a ladder, measuring tape, flashlight, level, camera and the Intake Checklist (see Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a roofing intake requires careful inspection of the existing roof and the possible dangers that may exist (visible or hidden beneath the roof surface).

Things to look for:

- Is there water damage inside the home? In one location or many? Look on the roof for the source of the leak. Once the water makes it past the roof barrier, it will run down rafters before hitting the ceiling. Wind-driven rain can also force water up a roof through the roofing materials. Visible water damage in the home may not be directly below the source of the problem.

- Are there a few shingles blown off or is there larger visible damage to the roof surface?

- Is there damage to the sheathing below the roofing material? Carefully pace around the roof and make note of any weak or soft spots. The weak spots determine the location where the sheathing needs to be replaced. Try to obtain access to the attic; this will allow you to spot damage to rafters and roof sheathing from below (take a ladder inside and use a flashlight to search for damage).
  - Pull up the layers of roofing to measure what the existing sheathing thickness is (you will want to match this as close as possible when purchasing materials).

- Is there more than one layer of roofing material? Take note of the existing roofing material; use the same as a replacement (three-tab or roll roofing).

- Are you working on a Reservation or Rancheria? When not working on a tribal land, repairing the entire roof likely requires a building permit. Ask your local building department what the limitations and requirements are in terms of roofing. Getting a permit can be a lengthy process and should be started as early as possible. DO NOT start a roof without the proper permits. The permit must remain on site at all times!

- SSP does not do roofing on mobile homes.

What to measure: (these can only be measured accurately if on the roof)

- Draw a diagram of the roof and note the dimensions of each side.
- Measure the perimeter of the roof edge (not the walls). Measure dimensions of each section of roof (some roofs are a simple gable that has two sides, some are more complicated). This will allow you to calculate the square footage of the roof (roofing materials are sold by the square, or 100 square feet).
- Measure the length of the peak.

Once the roof diagram, measurements, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on an estimate and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a roof before a cost estimate has been made. Roofs are expensive and can take multiple weeks to complete!
How to plan a roofing project and estimate materials:

**Step 1: Calculate the square footage**
Based on the diagram of the roof that was drawn at the intake, calculate the area of each section. Some helpful area formulas are:

- Triangle: \( \frac{1}{2} \times \text{base} \times \text{height} \)
- Trapezoid: \( \frac{1}{2} \times (\text{base1} + \text{base2}) \times \text{height} \)

Sum up the different sections to get the total square footage. Divide this by 100 to get the square footage in “squares” which is the unit that roofing materials are sold by.

**Step 2: Estimate how much sheathing needs to be replaced**
OSB sheathing will replace whatever the rotten sheathing is on a roof. This may be replacing plywood, 1x6 or 1x12s. Based on the notes taken at the intake, estimate how many 4’ by 8’ sheets of OSB should be purchased. Always add a few more sheets than calculated; it is hard to estimate with all of the roofing materials still on top of the sheathing! Try to match the thickness of the existing sheathing measured at the intake. If only a few 1x12 or 1x6 sheathing boards need to be replaced, replace with a similar material instead of OSB. If the sheathing isn’t rotten but has some holes in it, small holes can be ignored and holes up to 1” can be covered with sheet metal flashing.

**Step 3: Estimate how much underlayment will be needed**
*Synthetic underlayment* is the first layer of roofing on top of the sheathing. Grace Tri-Flex is one brand of synthetic underlayment which comes in a roll 4’ by 250’ which has 10 squares per roll (1,000 square feet). Home Depot and Lowe’s carry this brand. Divide the square footage of the roof by 1,000 square feet; this is how many rolls to purchase. Plastic caps nails are used to secure the underlayment (the heads prevent the underlayment from ripping through the nail heads).

SSP will also be installing ice and water shield underlayment for the first row of underlayment at the edge of the eave (bottom edge of roof). This will protect sloped roofs from water penetration due to wind-driven rain and water back-up resulting from ice dams. This is usually self-adhesive and comes in rolls 3’ wide. Grace or Owens Corning are two brands; a roll may contain one to two squares per roll (100-200 square feet).

Both of these can be ordered online from Home Depot and shipped for free – so plan accordingly.

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Image Credit: [http://www.homedepot.com/catalog/pdfImages/01/0180428c-420a-4f9f-82fd-1ddf23611561e.pdf](http://www.homedepot.com/catalog/pdfImages/01/0180428c-420a-4f9f-82fd-1ddf23611561e.pdf)
Step 4: Estimate how much roofing will be needed

- **Three-tab:** 25 year shingles are the grade of shingles that are purchased at SSP. Shingles are sold in bundles either 3 or 4 bundles to a square. In bundles, purchase 3 or 4 times the number of squares (see specific manufacture’s recommendation on bundle package). Depending on the price, Architectural Shingles are a higher quality shingle and will last longer.

- **Roll roofing:** 25 year roll roofing is also appropriate to purchase at SSP. Roll roofing comes in rolls that are 3’ wide by 36’, just over one square of coverage. Purchase one roll for every square of roof.

Step 5: Estimate how much flashing and ridge vent will be needed

- **Drip edge:** Based off of the diagram, add up the perimeter of the roof. Drip edge comes in 10’ sections. Divide the perimeter by 10.2 to determine how many pieces of drip edge to purchase; this will allow for a 2” overlap between pieces.

- **Ridge vent:** A ridge vent is installed on the entire peak length which allows warm, humid air to escape a building’s attic. Purchase baffled vents if you can. Owens Corning VentSure can be purchased at Lowe’s and special ordered from Home Depot.

**TIP:** For all roofing products, review their specific installation guides and follow. To find these, look up on their website or on Lowe’s/Home Depot’s website and look under the items specifications tab.
How to make a material list for a roof project:

A material list can be made from the previous step estimating material usage. Use this list as a reference. Print a copy from your thumbdrive and fill in for each project.

Roll Roofing:
- Roll roofing ______ (Step 4)
- Tar ______

OR

Three-Tab:
- Three-tab bundles ______ (Step 4)
- Roll roofing ______ (length of valleys and hips)
- Tar ______

- OSB 4’x8’ sheet ______ (Step 2, matched to the thickness of existing)
- Synthetic underlayment ______ (Step 3)
- Ice and Water Shield Underlayment ______ (Step 3)
- Drip edge 10’ ______ (Step 5)
- Ridge vent ______ (Step 5)
- 6d ring shank nails ______ (to secure OSB sheathing to rafters)
- Hook blades ______ (to cut roofing materials)
- Plastic cap nails ______ (100 nails per square of roof; check trailer)
- Roofing nails, 1” and 1 ½” ______ (3 lbs. per square of roof; check trailer)
- Paint and paintbrushes ______ (to seal all cuts made on OSB)
- Panel clips ______ (if rafters are more than 24” o.c.)

This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

✓ Divide the SiteManager estimate by the square footage; it should be roughly between $1.00 and $1.50 per square foot depending on the extent of sheathing repair.
How to roll roof (print this section for work teams)

“Think like a rain drop! Always start at the bottom and work up the roof.”

Terms:

- **Rafter**: A structural member that supports the roof.
- **Sheathing**: OSB that lies on top of the rafters; provides solid surface that can be roofed (6d nails are used to attach to rafters).
- **Course**: A row of roofing material.
- **Synthetic Underlayment**: Nailed to the sheathing with plastic cap nails as the first layer of roofing; overlap 4” between courses and 6” between pieces in the same course. The first course of underlayment is always an ice and water shield (not for sheds or awnings).
- **Plastic cap nails**: Nails with plastic caps that secure the underlayment every 8” around the perimeter and 24” on center in the middle of each row; caps prevent the underlayment from ripping off of the nail heads.
- **Drip edge**: Metal flashing at the perimeter of the roof that directs water away from the edge of the roof; nailed every 1’ under the underlayment on the bottom edge and above the underlayment on the sides of the roof.
- **Roll roofing**: Main surface of roof; attached with 1” roofing nails and tar under seams.
- **Tar or Roof Cement**: Seals the sections to the roof to avoid wind-driven rain from penetrating the roof surface.

**Step 1: Remove old roofing material**

Tear off the old roofing material on one side of the roof; this will prevent exposing the entire roof to the elements at the same time. Place a tarp down where you will pile the trash in an out of the way location; ask where the homeowner where the best positioning would be. Walk carefully on the roof, taking note of soft spots. Use hammers, flat bars, and roofing shovels to tear off the roofing materials down to the sheathing (this may be OSB, plywood, 1x6s or 1x12s). Be careful not to damage anything you are not tearing off.

**Step 2: Repair the sheathing**

Inspect the sheathing for damage. If there is any rot, soft spots, or burnt areas tear off the entire panel (or board in the case of 1x6s, 1x12s etc.) and replace with new material. Use OSB to replace any plywood and use 1x lumber to replace damaged 1x’s. All vertical seams must fall on a rafter. If you cut any OSB, the cut edges are painted to seal them from water moisture.

Use 6d nails to fasten the sheathing to the rafters every 6” on the edges and 12” in the interior of the panel. Space sheathing 1/8” apart to allow for swelling from moisture. If rafters are more than 24” apart, use panel clips on the horizontal edges of the sheathing between rafters. If re-sheathing the entire roof, take only a few pieces off at a time. If a roof is completely unsheathed it is very vulnerable and serious damage can happen to the home if it rains.
For the ridge vent, there needs to be a gap in the sheathing at the peak of the roof. If installing all new sheathing, cut the sheets to 7/8” short of the peak before attaching them. If existing sheathing is in good condition, use a chalk line, and strike a line on either side of the ridge board 7/8” down from the ridge board at the peak of the roof. Set a circular saw depth to the thickness of your roof sheathing to avoid cutting into the roof rafters. Following the chalk line, cut both sides of the peak. Remember to leave 8-10” near the end of the roof or chimney. At either end of the cuts, you may need to use a wide chisel to cleanly sever the wood perpendicular to the saw cuts to remove the strip of wood. Using a pry bar, remove the sheathing that you just cut. Be sure to remove any nails left behind in the exposed part of the rafters.

**Step 3: Install the bottom drip edge**
Along the bottom edge of the roof, install the drip edge. One side of the drip edge will have a slight flare to it; that is the side which hangs off of the roof. Attach using roofing nails every foot. Overlap pieces of drip edge 2”. If you need to cut it, wear gloves and use tin snips. The cut edges will be very sharp!

**Step 4: Install the Ice and Water Shield (not for sheds or awnings)**
The first row of underlayment will be Ice and Water Shield (not for sheds or awnings). Sweep sheathing until it is clean, dry and free of debris so that the shield will adhere properly. Make sure no nail heads are sticking up. Cut the material into 10 to 15’ long pieces, overlapping pieces 6” on the ends. This will make it easier to work with. Lay the first piece in place and cut to fit if it is too long. This product is VERY sticky. Fold over 2 to 3 feet of your first length to be installed so that you expose the underside. Peel back the release liner, and flip the shield back over. Use your hands to press it into place firmly. Reach underneath and grab the release liner and pull it toward the unadhered end of your piece. Stop frequently and use your hands to ensure proper adhesion to the roof deck, keeping the shield material straight and smoothing out wrinkles.
Step 5: Install the Synthetic Underlayment

For the second course and following courses up to the peak of the roof, use synthetic underlayment. Roll the underlayment as straight as possible across the roof with the printed side facing up; the straighter you roll it the easier it will be to install the roll roofing. Overlap 4” between courses and 6” between pieces in the same course. Secure the underlayment with plastic cap nails every 8” around the perimeter and 24” on center in the middle of each row. Overlap over valleys and hips making sure that no sheathing is exposed.

Step 5: Install the side drip edge

Install the drip edge on the sides on top of the underlayment so that the wind will not be able to get underneath it. Install this drip edge the same way as the other drip edge, starting at the bottom and working up to the peak (overlapping 2” so water will run off).

Step 6: Install the first course of roll roofing (Concealed Nail Method)

**Edge Strips:** Place 9” wide strips of roll roofing along the eaves (bottom edge) and rakes (sloping sides), positioning them to overhang the sheathing ¼” to 3/8”. Fasten the strips with rows of nails located 1” and 8” from the roof edge and spaced 4” on center in each row.
First Course: Apply the first course with a full width strip of roll roofing so that its lower edge and ends are flush with the edge strips at the eaves and rakes. Fasten the upper edge with nails. Lift the lower edge of the first course and cover the edge strips with lap cement. In cold weather, turn the course back carefully to avoid damaging the roofing material. Press the lower edge and rake ends of the first course firmly into the cement-covered edge strips. Work from one side of the sheet to the other to avoid wrinkling or bubbling. End laps should be 6" wide and cemented over the full lap area with the recommended cement. Nail the underlying sheet in rows 1" and 5" from the end of the sheet with the nails spaced 4" on center and slightly staggered. End laps in succeeding courses must not line up with one another.

Second and Succeeding Courses: Apply the second course so that it overlaps the first course at least 3". Fasten the upper edge to the deck, cement the laps and finish installing the sheet in the same manner as the first course. Follow the same procedure for each successive course. Do not apply nails within 18" of the rake (side) until cement has been applied to the edge strip and the overlying strip has been pressed down.

Hips: Trim, butt and nail the sheets as they meet at a hip. Next, cut 12" x 36" strips from the roll roofing and bend them lengthwise to lay 6" on each side of the joint. Do not bend the strips in cold weather without first warming them. These will be used as “shingles” to cover the joint, each one overlapping the other by 6" as shown in Figure 2. Start hips at the bottom and work up the roof to the peak.

To guide the installation, snap a chalk line 5½" from and parallel to the joint on both sides. Apply asphalt plastic cement evenly over the entire area between chalk lines from one side of the joint to the other. Fit the first folded strip over the joint and press it firmly into the cement, driving two nails 5½" from the edge of the end that will be lapped. Cover the 6" lap on this strip with lap cement. Then place the next strip over it. Nail and cement in the same manner as the first strip. Continue the same procedure until the hip is finished.

Valleys: Valleys are where two slopes come together at an interior corner. The first step is to run an 18" strip of roll roofing face down the entire length of the valley; nail every foot on the edges. This strip goes on top of the underlayment, but under all other roofing. Then run a 36" strip face up the length of the valley, nailing every 6" on the edges. Lap each side of the roofing over these strips and cut 3" from the centerline of the valley. Fasten 3” from the edge (6” from the centerline of the valley), every 2” and use 5” of tar underneath seam.
**Step 6: Repeat for other side**

Repeat steps 1-6 for the other side.

**Obstacles:**

Vents and other roof obstacles should be installed overlapping as if they were a section of roofing. Put the lower edge of vent on top of lower courses, on the sides and top of the vent. Cut sections of roll roofing even with the vent so they fit around it. Courses above the vent should go on top. For other obstacles, use roll flashing and tar around them to make a watertight barrier. Then install sections around them as you would a vent. Follow the same principle with flashing as you would other roofing materials; overlapping layers to promote water drainage.

**Ridge Vent:**

After roofing to the edge of the sheathing at the peak of the roof, install the ridge vent using long roofing nails. The nails should be long enough to penetrate through the vent, roll roofing, and securely into the sheathing. Using 1¼ - 1½" roofing nails, cover the roof vent with strips of roll roofing the same way you would for a hip (see instructions above).
Tips:

1. Roll roofing should be cut into maximum 18' lengths and stacked in a pile on the roof before application until they relax and heat up for a flatter installation. This is important to prevent wrinkling after application.

2. Use a hook blade in a utility knife to cut the roll roofing. A chalk line can be used to mark a straight line to cut.

3. It’s important to keep the courses straight with respect to both the top and the bottom of the roof. The easiest way to do this is to snap a chalk line at the proper location for each course, and then line up the roll roofing appropriately. If the roof is not square (this is actually very common) you can gradually make up the difference in the middle.

4. Be careful not to damage the new roof by scraping the rocks off when walking on it!

5. This method of roll roofing will have no exposed tar and will be much cleaner than the old way SSP used to install roll roofing.
How to three-tab roof (print this section for work teams)

“Think like a rain drop! Always a start at the bottom and work up the roof.”

Terms:
- **Rafter**: A structural member that supports the roof.
- **Sheathing**: OSB that lies on top of the rafters; provides solid surface that can be roofed (6d nails are used to attach to rafters).
- **Course**: A row of roofing material.
- **Synthetic Underlayment**: Nailed to the sheathing with plastic cap nails as the first layer of roofing; overlap 4” between courses and 6” between pieces in the same course. The first course of underlayment is always an ice and water shield (not for sheds or awnings).
- **Plastic cap nails**: Nails with plastic caps that secure the underlayment every 8” around the perimeter and 24” on center in the middle of each row; caps prevent the underlayment from ripping off of the nail heads.
- **Drip edge**: Metal flashing at the perimeter of the roof that directs water away from the edge of the roof; nailed every 1’ under the underlayment on the bottom edge and above the underlayment on the sides of the roof.
- **Three-tab**: Main surface of roof; each shingle is attached with 4 roofing nails, 6 in high wind areas.

**Step 1: Remove old roofing material**
Tear off the old roofing material on one side of the roof; this will prevent exposing the entire roof to the elements at the same time. Place a tarp down where you will pile the trash in an out of the way location; ask where the homeowner where the best positioning would be. Walk carefully on the roof, taking note of soft spots. Use hammers, flat bars, and roofing shovels to tear off the roofing materials down to the sheathing (this may be OSB, plywood, 1x6s or 1x12s). Be careful not to damage anything you are not tearing off.

**Step 2: Repair the sheathing**
Inspect the sheathing for damage. If there is any rot, soft spots, or burnt areas tear off the entire panel (or board in the case of 1x6s, 1x12s etc.) and replace with new material. Use OSB to replace any plywood and use 1x lumber to replace damaged 1x’s. All vertical seams must fall on a rafter. If you cut any OSB, the cut edges are painted to seal them from water moisture.

Use 6d nails to fasten the sheathing to the rafters every 6” on the edges and 12” in the interior of the panel. Space sheathing 1/8” apart to allow for swelling from moisture. If rafters are more than 24” apart, use panel clips on the horizontal edges of the sheathing between rafters. If re-sheathing the entire roof, take only a few pieces off at a time. If a roof is completely unsheathed it is very vulnerable and serious damage can happen to the home if it rains.
For the ridge vent, there needs to be a gap in the sheathing at the peak of the roof. If installing all new sheathing, cut the sheets to 7/8” short of the peak before attaching them. If existing sheathing is in good condition, use a chalk line, and strike a line on either side of the ridge board 7/8” down from the ridge board at the peak of the roof. Set a circular saw depth to the thickness of your roof sheathing to avoid cutting into the roof rafters. Following the chalk line, cut both sides of the peak. Remember to leave 8-10” near the end of the roof or chimney. At either end of the cuts, you may need to use a wide chisel to cleanly sever the wood perpendicular to the saw cuts to remove the strip of wood. Using a pry bar, remove the sheathing that you just cut. Be sure to remove any nails left behind in the exposed part of the rafters.

Step 3: Install the bottom drip edge
Along the bottom edge of the roof, install the drip edge. One side of the drip edge will have a slight flare to it; that is the side which hangs off of the roof. Attach using roofing nails every foot. Overlap pieces of drip edge 2”. If you need to cut it, wear gloves and use tin snips. The cut edges will be very sharp!

Step 4: Install the Ice and Water Shield (not for sheds or awnings)
The first row of underlayment will be Ice and Water Shield (not for sheds or awnings). Sweep sheathing until it is clean, dry and free of debris so that the shield will adhere properly. Make sure no nail heads are sticking up. Cut the material into 10 to 15’ long pieces, overlapping pieces 6” on the ends. This will make it easier to work with. Lay the first piece in place and cut to fit if it is too long. This product is VERY sticky. Fold over 2 to 3 feet of your first length to be installed so that you expose the underside. Peel back the release liner, and flip the shield back over. Use your hands to press it into place firmly. Reach underneath and grab the release liner and pull it toward the unadhered end of your piece. Stop frequently and use your hands to ensure proper adhesion to the roof deck, keeping the shield material straight and smoothing out wrinkles.
Step 5: Install the Synthetic Underlayment

For the second course and following courses up to the peak of the roof, use synthetic underlayment. Roll the underlayment as straight as possible across the roof with the printed side facing up; the straighter you roll it the easier it will be to install the shingles. Overlap 4” between courses and 6” between pieces in the same course. Secure the underlayment with plastic cap nails every 8” around the perimeter and 24” on center in the middle of each row. Overlap over valleys and hips making sure that no sheathing is exposed.

Step 5: Install the side drip edge

Install the drip edge on the sides on top of the underlayment so that the wind will not be able to get underneath it. Install this drip edge the same way as the other drip edge, starting at the bottom and working up to the peak (overlapping 2” so water will run off).

Step 6: Install the starter course

When installing a three-tab roof, it is important to install a starter course underneath the first course of shingles to prevent water from going through the cutouts of the first course and find exposed underlayment. To create a starter course cut off the tabs from a shingle, and install it with the tar strip at the edge of the roof (this seals it to the first course). Cut the first starter shingle in half to stagger the cut outs from the first course, and then continue across the entire bottom of the roof with full shingles with the tabs cut off. Fasten the starter course with roofing nails, 1” above the tar strip. Cut the last starter course shingle to length.

Step 7: Install the first course of shingles

After the starter strip is installed, the first course of full shingles can be installed. Start the first course with a full shingle. The shingles overhang the drip edge on the bottom and edges ¼”. Each full shingle has 4 nails in it (6 if in a high wind area), one on each side and one on top of each cutout beneath the tar strip. Nails are never installed through or above the tar strip. Place full shingles all the way across the first course, keeping them straight (snap a chalk line across the roof to ensure this). Cut the last shingle to length.
To start the second course, cut off half of a tab from the first shingle in the course, so that the cut edge is against the edge of the roof. This will offset the cutouts of the second course so that they do not line up with those of the first course. Make sure that no nail heads are showing through the cutouts, if they do, check your nailing pattern. The second course should be installed so that there is 5” of the previous course still showing. After installing the first shingle, continue by installing full shingles across the course; cut the last shingle to length.

It’s important to keep your courses straight with respect to both the top and the bottom of the roof. Snap a chalk line at the proper location for each course (5” above the top of the previous course), and then line up the course appropriately. If the roof is not square (this is actually very common) gradually make up the difference in the middle.

Keep installing until you reach the peak, cutting off an additional half of a tab from the first shingle in each course. This will make the gap between shingles stagger across the roof. Your 7th course will start with a full shingle. Continue installing courses up the entire roof in the same fashion.
Step 8: Repeat for the other side(s) and roof peak
Repeat steps 1-7 for the other side of the roof.

Step 9: Install ridge vent and peak shingles:
After roofing to the edge of the sheathing at the peak of the roof on both sides, install the ridge vent using long roofing nails. The nails should be long enough to penetrate through the vent, shingles, and securely into the sheathing.

Cut peak shingles (ridge caps) from 1/3 of a shingle (use scraps first); taper each piece so that the next covers it completely. Fold over the ridge vent and nail with 1½ - 1¾” roofing nails with one nail on each side of the peak just below the tar strip. Double the first course of peak shingles. Each course has the same 5” exposure as the regular courses. Align the peak shingles so that the direction of the prevailing wind (ask homeowner) will not catch underneath shingles. The last peak shingle will have only the tab section of the 1/3 of a shingle and will be secured with 4 nails. These will be the only exposed nails on the entire roof; cover each nail with a drop of tar.

Valleys:
Valleys are where two slopes come together at an interior corner. The first step is to run a 36” strip of roll roofing centered the length of the valley, nailing every 6” on the edges. This strip goes on top of the underlayment, but under all of the three-tab. On one side of the roof, extend each shingle 12” minimum beyond the centerline of the valley; nail as normal plus two extra to secure the edge that is overlapping the valley. On the other side of the roofing, cut each shingle 2” from the center of the valley; nail as normal and tar underneath the cut edge of the shingle.
Hips:
A hip is where two slopes come together at an exterior corner. The first step is to run a 36” strip of roll roofing centered the length of the hip, nailing every 6” on the edges. This strip goes on top of the underlayment, but under all of the three-tab. Run courses on both sides as normal, trimming shingles at the centerline of the hip. Cut hip shingles from 1/3 of a shingle (use scraps first), folding over the hip and nailing with one nail on each side just below the tar strip. Taper the pieces so that the next covers it completely. Double the first course of hip shingles. Each course has the same 5” exposure as the regular courses.

Obstacles:
Vents and other roof obstacles should be installed overlapping as if they were a section of roofing. Put the lower edge of vent on top of lower courses, on the sides and top of the vent. Cut sections of shingles even with the vent so they fit around it. Courses above the vent should go on top. For other obstacles, use roll flashing and tar around them to make a watertight barrier. Then install sections around them as you would a vent. Follow the same principle with flashing as you would other roofing materials; overlapping layers to promote water drainage.

Image Credits: Graphic Guide to Frame Construction by Rob Thallon, pg 183
Drywall:

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2011 Statistics about Drywall:

- SSP completed only 3 drywall projects in 2012; stats are from 2011 when there was more data.
- The average drywall projects took 6 work days to complete
- The average drywall projects took 39 volunteer days
- The average cost of an drywall projects was only $73
- The average cost per square foot was $0.52 and 1 volunteer day per 8 square feet
- The average cost/person/day was $2.62

There are two types of drywall projects, repair and new install. The most common reason to install new drywall at SSP is if an existing room has not been finished. Most SSP drywall projects will be patching damage to existing drywall.

Drywall projects have a tricky timeframe. Mudding is a three step process with a drying period in between. This makes it very important to have another project for the team to work on in the downtime; be very aware of the team’s schedule.

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the square footage by $0.52 per square foot. For a 300 square foot drywall project, a rough cost estimate would be $156. An estimate of volunteer days would be 38.
How to do an intake for a drywall project:

When going on an intake that requests drywall repairs, take a ladder, measuring tape, camera and the Intake Checklist (Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a drywall intake requires careful inspection of the existing walls and ceilings.

Request for new drywall:

- When asked to install new drywall in a room where there is none, it’s important to evaluate what the room will be used for. If the room is a bedroom where one wall never had drywall installed, that is a good project. If it is an exterior shed, there are probably higher need projects.

- Measure the area that needs drywall. Make note of the stud spacing. Vertical seams between drywall panels need to rest on studs. Draw a diagram with measurements of the studs in the area that needs drywall.

- If there is existing drywall in the room, measure the thickness of the existing drywall. It is important to match the thickness so that there are no changes in thickness that will be hard to cover up in the mudding process.

- Does there need to be insulation installed as well? Insulation is only needed on exterior walls and ceilings. Insulation will keep the space cool in the summer and warm in the winter by slowing the transfer of heat. This is a good time for this because the wall is already open and the stud bays are exposed. Are the studs 2x4s or 2x6s? The size of insulation depends on the thickness of the wall and the stud spacing (16” or 24” o.c.)

- Is it in a bathroom or kitchen? Moisture resistant drywall should be used in these rooms.

Request for drywall repairs:

- Places where the drywall has a hole or has water damage need to be repaired. If there is water damage, make sure that the cause of the damage has been repaired before repairing the drywall! This means repairing the roof if it is leaking first.

- There are two options when repairing drywall damage. For small holes (up to 7” by 7”), a metal mesh patch can be used over the hole with joint compound (mud) to cover. Or you can make the hole a square and use strips of wood as backing for a small new square of drywall. For larger holes, areas with water damage or many holes in the same area, the damaged section can be cut to the studs on either side and replaced with a new section of drywall.

- When measuring the damaged area, first determine if you can use a patch; make note of the dimensions of the hole. If replacing a larger section of drywall, measure the dimensions of the damaged area. The new drywall will need to meet the studs on both sides of the hole and be at least one foot tall.

- Is it in a bathroom or kitchen? Moisture resistant drywall should be used in these rooms.
No matter if you are repairing or installing new drywall, the area will need to be primed and painted after the mudding process has finished. Paint the entire wall corner to corner to avoid mismatching sections. Measure the square footage that will need to be painted. Take a piece of the existing painted drywall to match the color of the paint (a small amount of paint can be purchased to match this wall). Enter this into SiteManager as a painting project.

Once the measurements, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on an estimate and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a drywall project before a cost estimate has been made.
How to plan a drywall project and estimate materials:

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New drywall estimation:
Drywall comes in 4’x8’ sheets and is installed horizontally (with the long edge perpendicular to the studs). All vertical seams between sheets must rest on a stud; seems are staggered to prevent cracking. After using a full sheet, the next row above could be a half sheet to stagger the studs. Starting at one edge of the area, determine how many sheets of drywall will be needed based on the stud layout (refer to diagram drawn at intake). Maximize the number of full sheets (4’x8’) that can be used. It is strongest if a section of drywall spans at least three studs.

Repair drywall estimation:
Count how many patches will need to be purchased. For places that will be patched with drywall, calculate the size of the piece of drywall needed. If it will extend to the studs on either side of the hole (16” or 24” usually), it needs to be at least 1 foot tall. Figure out the most efficient way to fit your patches into 4’x8’ sheets and note how many sheets you will need. Note that most hardware stores will sell scrap pieces if you only need a little bit.

Other drywall materials:
Check your trailer for items including dust masks, drywall screws and drill bits. Joint compound is sold dry in boxes and in premixed five gallon buckets; always buy premixed joint compound in buckets (never purchase joint compound that is dry in a box). Purchase drywall sanding screens in boxes (it will keep for future projects) for hand sanders in coarse and fine grit.

If drywalling any exterior corners (corners that come to a point rather than a valley) purchase corner bead to protect the corner. Measure the total length of all such corners and buy the same length in corner bead (usually come in 10’ lengths). Paper corner bead is easier to install than all metal – paper corner bead doesn’t need screws to attach to the wall just joint compound.

Primer and paint estimation:
All new drywall needs to be primed before it is painted. Based off of the total square footage measured at the intake, calculate how many gallons of primer will be needed; estimate one gallon for every 200 square feet. Use the primer that was centrally purchased that is in your tool trailer before purchasing primer. Estimate one gallon of paint for every 150 square feet. See the paint section for a detailed material list and instructions on how to paint – this will be entered in as a separate project in SiteManager.
How to make a material list for a drywall project:

A material list can be made from the previous step estimating material usage. Use this list as a reference.

- **Insulation**
  - (thickness to fit in 2x4 or 2x6 stud wall, depending on stud spacing 16” or 24” o.c.)

- **Drywall 4’x8’**
  - (match existing thickness; moisture resistant or regular)

- **Drywall patch**
  - (smaller than 7” by 7” hole)

- **Joint compound**
  - (purchase pre-mixed in 3 to 5 gallon buckets)

- **Paper corner bead**
  - (for exterior corners)

- **Staples**
  - (to secure insulation)

- **Utility knife blades**
  - (check trailer)

- **Drywall screws**
  - (check trailer)

- **Phillips bits/dimplers**
  - (check trailer)

- **Drywall mesh tape**
  - (purchase fiberglass mesh tape)

- **Sanding screens**
  - (boxes of coarse and fine grit to fit on hand sanders)

- **Dust masks**
  - (check trailer)

See painting section for corresponding material lists. This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

- ✓ Divide the SiteManager estimate by the square footage; it should be around $0.52.
How to install new drywall (print this section for work teams)

Step 1: Add supports
Every corner of a panel of drywall must be supported. If there are places where a panel is needed but the corner will not be supported, use pieces of scrap lumber to add a support for the corner, screwing into the existing wall studs.

Step 2: Cut the drywall
Measure for each sheet carefully; mark on the finish side (the white side) and only use pencil (pen and marker will bleed through the paint). Drywall is cut by scoring on the line using a utility knife and straight edge (drywall square), snapping the core and then cutting the other paper face along the fold created by the snapped core. To cut out holes for power sockets and light switches, score a box where the hole needs to be; then score an X in the box. Knock out the hole by lightly hitting the hole with a hammer. Make sure you measure for these boxes carefully! Holes can also be drilled in the corners and a jig saw can be used to cut out the box. All cuts are made on the finish side of the drywall.

Step 3: Attach the drywall
Hold the drywall in place and attach with drywall screws. Place screws 6” apart on the edges of the sheet and 12” apart in the center of the sheet (the field). Screw them just below the surface of the drywall without breaking through the paper. If available, use a drywall dimpler (drill bit that prevents sinking a screw too deep). If a screw misses a stud, pull it out, or else it will hinder the mudding process. Drag a drywall knife over screw heads to check to see if they are in far enough – this will make the mudding process much smoother.

Step 4: Tape and mud
Apply a piece of fiberglass mesh tape over all of the seams. Apply mud to all the seams using a 6” drywall knife. Make this as thin as possible, resulting in a smooth transition across the tape. The goal is to make a smooth transition from one piece of drywall to another. When working with the drywall knives, apply pressure to the outside edge of the knife, making the outside edge of the mud slightly thinner than the area over the seam. Do this twice, putting pressure on each side of the seam. This will ensure a smooth transition. This layer should not be thick.

For interior corners, use the same process as a seam. When applying tape, fold the tape lengthwise and apply mud into the corner. Use a corner drywall tool if available. For exterior corners, install corner bead using a layer of mud underneath and over the paper corner bead. No tape is needed for exterior corners. Smooth all tape and corner bead transitions like a seam. Apply and smooth mud over every exposed screw head. Many will be covered when you mud over the seam, but for those that are in the field, use a small amount of mud to do this.

Step 5: Sand
After the mud has dried completely (usually overnight), use a drywall trowel to remove ridges and high spots of mud; this will reduce the amount of sanding necessary. Be aware that in humid or cool areas, or in poorly ventilated rooms, the mud will dry more slowly. Leave a fan running overnight to speed up the process. Use a coarse sanding screen on a hand sander first, and then move to a finer screen to make it smooth. Be very careful not to sand too much and expose the paper. When you have sanded the mud smooth, inspect the seams. If the seams and other mudded locations still show some height difference or you can see the tape through the mud, apply another layer of mud, allow it to dry (usually overnight) and knock down ridges and sand again. Repeat this as many times as necessary. The goal is to get the wall smooth so that after priming and painting someone will not be able to tell where the seams are. Any slight irregularity will show, so be meticulous!
Note that the fiberglass reinforced mesh tape that we use is self-adhesive and does not need to be imbedded in a layer of mud.
How to repair drywall (print this section for work teams)

Repairing Drywall Damage:
Repairing drywall damage can either be done with a patch or by cutting away the damaged drywall to the studs and replacing with new drywall. Use a patch for holes smaller than 7” by 7”. If the hole is larger, if there are many holes in the same place, or if there is water damage, you will have to cut away the damaged material.

Using a Drywall Patch:
Most drywall patches are self-adhesive. Simply clean the area around the hole, and stick the mesh in place over the hole. Apply joint compound (mud) over the entire patch and surrounding area. Spread the mud thin, but not so thin as to expose the patch. Wait for the mud to dry (overnight) and sand the surface smooth with sanding screens on a hand sander. If necessary, add more mud and sand again. Make sure that the area is smooth so that when the surface is primed and painted someone will not be able to notice the patch.

You can also make the hole a rectangle using a carpenter’s square and keyhole saw. Then use strips of wood behind the drywall and screw to the top and bottom of the hole into the existing drywall. A new rectangle of drywall can then be inserted in the hole and screwed to the strips of wood. This new drywall can be taped, mudded and sanded like normal.

Replacing Drywall:
Step 1: First, cut away the damaged drywall; cut with a keyhole saw to the stud on either side of the damaged area, at least 1’ tall. Cut halfway over each stud so that the new piece can be screwed to the stud (a utility knife and straight edge can be used instead of a keyhole saw). Or you can attach a scrap of 2x4 to the existing studs for the new drywall to attach to. It is strongest for drywall to span three studs when possible.

Step 2: Measure for each piece carefully; mark on the finish side of the drywall (the white side) and only use pencil (pen and marker will bleed through the paint). Drywall is cut by scoring on the line using a utility knife and straight edge (drywall square), snapping the core and then cutting the other paper face along the fold created by the snapped core.

Step 3: Hold the drywall in place and attach with drywall screws. Place screws 6” apart on the edges of the sheet and 12” apart in the center of the sheet (the field). Screw them just below the surface of the drywall without breaking through the paper. If available, use a drywall dimpler (drill bit that prevents sinking a screw too deep). If a screw misses a stud, pull it out, or else it will hinder the mudding process. Drag a drywall knife over screw heads to check to see if they are in far enough – this will make the mudding process much smoother.

Step 4: Apply a piece of fiberglass mesh tape over all of the seams. Apply mud to all the seams using a 6” drywall knife. Make this as thin as possible, resulting in a smooth transition across the tape. The goal is to make a smooth transition from one piece of drywall to another. When working with the drywall knifes, apply pressure to the outside edge of the knife, making the outside edge of the mud slightly thinner than the area over the seam. Do this twice, putting pressure on each side of the seam. This will ensure a smooth transition.

For interior corners, use the same process as a seam. When applying tape, fold the tape lengthwise and apply mud into the corner. Use a corner drywall tool if available. For exterior corners, install corner bead using a layer of mud underneath and the paper corner bead. No tape is needed for exterior corners. Smooth all tape and corner bead transitions like a seam. Apply and smooth mud over every exposed screw head. Many will be covered when you mud over the seam, but for those that are in the field, use a small amount of mud to do this.
Step 5: After the mud has dried completely (usually overnight), use a drywall trowel to remove ridges and high spots of mud; this will reduce the amount of sanding necessary. Be aware that in humid or cool areas, or in poorly ventilated rooms, the mud will dry more slowly. Leave a fan running overnight to speed up the process. Use a coarse sanding screen on a hand sander first, and then move to a finer screen to make it smooth. Be very careful not to sand too much and expose the paper. When you have sanded the mud smooth, inspect the seams. If the seams and other mudded locations still show some height difference or you can see the tape through the mud, apply another layer of mud, allow it to dry (usually overnight) and knock down ridges and sand again. Repeat this as many times as necessary. The goal is to get the wall smooth so that after priming and painting someone will not be able to tell where the seams are. Any slight irregularity will show, so be meticulous!

Note that the fiberglass reinforced mesh tape that we use is self-adhesive and does not need to be imbedded in a layer of mud.
Painting:

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End of Section

2012 Statistics about Painting:

- SSP completed 33 painting projects – 10 interior, 22 exterior and 1 lead paint exterior projects
- The average exterior painting projects took 10 work days to complete (over 2 ½ SSP weeks), 7 work days for interior.
- The average exterior painting project took 72 volunteer days, 48 for interior
- The average exterior cost of a painting project was $255, $166 for interior
- The average cost per square foot was $0.20 for both interior and exterior ($1.45 for lead paint)
- Estimate 1 volunteer day per 50 square feet for interior, 16 square feet for exterior and 5 square feet for a lead paint project.
- The average cost/person/day was $3.50 for both interior and exterior ($2.25 for lead paint)

Painting is one of the most important projects SSP can do. It protects the home from weather and will make the home last longer. It is cheaper to apply a good paint job now than it is to fix damage later. A high quality paint job will add years to the life of the home. A great paint job also improves the appearance of a house, boosting the community’s and the homeowner’s sense of pride and self-esteem.

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the square footage by $0.20/square foot. For a home with 1,000 square feet of siding, a rough cost estimate would be $200. An estimate of volunteer days would be 63 days for an exterior paint project (1,000 square feet/16 square feet per volunteer day = 63 days).
How to do an intake for a painting project:

When going on an intake that requests painting take SSP’s paint chips, lead paint test kit, a ladder, measuring tape, camera and the Intake Checklist (see Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a painting intake requires careful inspection of the existing surfaces.

- **Test for lead paint:**
  There are new laws regulating the process for scrapping and preparing a house that has lead paint. Lead is potentially dangerous to our youth and homeowners. For all painting projects that will require scrapping or disturbing the paint surface, test the paint with a lead tester (check your trailer). If it tests positive for lead, follow the SSP provided instructions for dealing with lead paint (see end of this section). If you do not test for lead paint, you must assume that it contains lead and proceed accordingly (guilty until proven innocent).

- **What to look for:**
  When going on a painting intake the main thing to look for is the quality of the existing paint. Is the paint on the home damaged? Are there places where the paint is falling off, exposing the wood underneath? This is a sign that the paint should be redone. Look for rot and other damage to the home. Do not paint over existing damage. Fix damage to siding or fascia first, and then paint. Painting over rot does not make the damage go away, and the rot will continue to spread. Removing damage and painting will prevent the damage from reoccurring. Note and measure any siding or wood that needs to be replaced.

- **Calculate the square footage:**
  For the purpose of estimation, each gallon of:
  - Primer will cover 200 square feet
  - Exterior paint will cover 250 square feet
  - Interior paint will cover 150 square feet

  Measure the area of all surfaces to be painted. (width x height) for rectangles and (½ base x height) for triangles. If working inside, remember to measure the ceiling. Add the square footage together to get the total square footage for the building. Divide the square footage by 250 (or 150) to determine how many gallons of paint that will be needed. Measure only the areas that need to be primed (bare material or darker color than the new color) and calculate how many gallons of primer that will be needed (divide by 200).

- **Paint color choice:**
  SSP has five colors to offer homeowners. This paint will be shipped from California Paint Recycling Inc. a recycled paint manufacture in Sacramento to site after you have completed your intakes during set-up week. Do as many painting project intakes as you will need for the summer and make one paint order during set-up week. Bring paint chips (samples) to the intake and ask the homeowner to select a color for the trim and a color for the body. Homeowners can also provide their own paint.

Once the lead test, measurements, paint color choice, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on an estimate and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a painting project before a cost estimate has been made.
How to plan a painting project and estimate materials:

**Primer:**
Primer is needed anywhere where bare material is exposed that you will be painting. Anything that does not have at least one coat of paint on it already needs to be primed. If the existing paint color is darker than the new paint color the surface is also primed. It is cheaper to paint multiple coats of primer than it is to paint multiple coats of finish paint. Based off of the area measured that needs to be primed, divide by 200 to determine how many gallons or primer that will be needed. SSP has centrally purchased interior/exterior recycled primer. You must use this first before purchasing any primer at site. Let Megan Taylor know when your site is close to or has ran out of the primer and HQ can supply your site with more.

**California Paint Recycling Inc.:**
SSP is working with a recycled paint manufacture for the fourth year to provide paint for our projects. In addition to the benefit of using a very high-quality, recycled product, 5 gallons of recycled paint costs around $60 versus the $120 SSP paid in 2009. SSP spent over $10,600 on exterior paint alone in 2009 compared to $4,422 spent in 2010 after switching to recycled paint. In 2013, Construction Teams will order paint through HQ for the entire summer during set-up week and it will be shipped directly to site. (For the Arizona site, depending on the cost of shipping you may be allowed to purchase premixed paint at local hardware stores instead of through the recycled paint manufacture.)

**Type of paint:**
Use interior paint for interior projects and exterior paint for exterior projects; this may seem obvious but the properties for each type are specific to their location. For exterior painting, use flat paint. Use semi-gloss for interior kitchens, bathrooms, children’s bedrooms, cabinets, doors and trim. Use eggshell or satin for living rooms, dining rooms, bedrooms and hallways. Use flat for interior ceilings. The more gloss the paint has the better it will stand up to being washed.

**Trim paint:**
A good rule of thumb for trim paint is to purchase 1 gallon of trim paint for every 3 gallons of body paint. This depends on the amount of trim to be painted of course. You can calculate the square footage of trim and purchase 1 gallon for every 250 square feet to be more precise.

**Centrally purchased materials in trailer:**
Check your inventory for centrally purchased items including primer, dust masks, paint brushes, roller covers, tape etc. You are required to use these items first before purchasing any like items.

**Teaching teams how to paint:**
A common Construction Team mistake is not providing enough instruction for painting projects. Print out the “How To” instructions at the end of this section for a work team that will be painting. Check in with the team at every step before allowing them to continue to the next step. Show the teams thorough demonstrations how to properly prep, prime, paint, etc. It is critical to give these work teams attention as the perception is often that the work that they are doing is less meaningful and powerful than a typical SSP carpentry project, which is not true.
How to make a material list for a painting project:

A material list can be made from the previous step estimating material usage. Use this list as a reference.

- **Caulk** ______ (to fill small gaps)
- **Wood putty/spackle** ______ (to fill larger gaps)
- **Stucco patch**
- **Wood and nails** ______ (to replace rotten or damaged wood)
- **Primer (exterior/interior)** ______ (check trailer)
- **Recycled Paint**
  - **Exterior body** ______ (flat, 1 gallon per 250 square feet)
  - **Exterior trim** ______ (flat, 1:3 ratio of body paint)
  - **Interior body** ______ (flat/semi-gloss/eggshell, 1 gallon per 150 square feet)
  - **Interior trim** ______ (semi-gloss, 1:3 ratio of body paint)
- **TSP** ______ (for interior projects)
- **Dust masks N95** ______ (check trailer)
- **Sand paper** ______ (boxes of sheets of 50 [coarse] and 100 [fine] grit)
- **Masking tape ¼”** ______ (check trailer)
- **Masking paper**
- **Roller covers 3/8”, thicker for stucco** ______ (check trailer)
- **Purdy paint brushes** ______ (check trailer)
- **Rags** ______ (use lost and found and thrift store material)

**DO NOT PURCHASE TRAY LINERS; properly clean paint trays after using them!**

This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

✔ Divide the SiteManager estimate by the square footage; it should be around $0.30 per square foot (last year’s average).
**How to paint the exterior of a home (print this section for work teams)**

**Rules and guidelines:**

- No paint play! No intentional paint on clothing, skin, etc. Paint is very expensive.
- Only scrape or paint when there is a drop cloth in place.
- Clean up spills immediately; it will be much easier to clean up when it is still wet.
- Work on one wall at a time; don’t move on from one step until that step is done for the entire wall.
- Wrap brushes, roller covers, paint trays and containers during breaks in cellophane or clean bread bags.
- Clean up brushes, rollers and trays at the end of the work day so they will be ready for the next day. (See instructions for cleaning up)
- Respect your brushes and roller covers; they need to last for the entire week!

**Step 1: Move obstacles and lay drop cloths**

Move all debris away from the area. If there are bushes or trees growing right against the building, trim them or use twine to tie them back. It is important that nothing will rub up against the wet paint. Do this carefully; you don’t want to damage any plants. Lay drop cloths anywhere you will be scraping or painting. It is important that paint is only applied over an area where there is a drop cloth. Paint doesn’t come off easily; avoid dripping paint. It is ok to move drop cloths from one wall to another as you go along.

**Step 2: Scrape and prep surfaces**

Follow the demo by the Construction Team member. Preparing surfaces is half of the work to a good paint job. Before you begin painting, it is important to prepare the surface. You can paint directly over existing paint that is good quality. Places where the existing paint is flaking off need to be scraped. Use a combination of paint scrapers, wire brushes, and sandpaper to knock the flaky paint off the surface. A good scraping job will knock the loose paint off, creating a smooth transition from paint to wood. Trim needs to be prepped too!

Paint should not be scraped off the entire house. It should take about a day to prep a paint job. Use the drop cloths to collect paint scrapings; gather in a bucket to dispose of. After the surface has been scraped, wash off dirt and paint flakes using a pressure washer or garden hose with nozzle. Paint that is applied on a dirty surface will flake off in a short amount of time. Remove the drop cloths before washing down the wall. After washing, be sure to let the wall dry at least a day before painting. Rotate around the building, scraping and washing one side and then move to work on the next side while the first side is drying.

**Step 3: Patch and caulk**

Cracks, gaps, and rotted wood need to be patched before they are painted. Use caulk to fill in small gaps, wood putty or spackle to fill in larger ones, and stucco to patch stucco. Cut out rotted wood and replace as necessary. Sand the patches after they are dry so that they are smooth and blend into the rest of the wall.

**Step 4: Mask**

Follow the demo by the Construction Team member. Masking is the process of taping and papering over things that you do not want to get paint on. It is hard to paint right up against something without accidentally getting paint on the surface. Use masking tape and masking paper (or newspaper) to mask over any surface you don’t want to paint. This includes windows, concrete, doors, lights, fixtures, trim, etc. This will make painting more fun if you spend the time to properly get ready first.
Step 5: Spot prime
Follow the demo by the Construction Team member. Make sure that everything is masked appropriately and that drop cloths are back in place before starting to prime. Do not start priming a wall before all the prep work is done for that wall. Primer is important because it gives a good base for the paint to stick to. Remember, unless you are painting over a dark color with a lighter color, you only need to prime areas where bare wood or stucco is exposed and all patched areas. Check with your Construction Team member to verify what needs to be primed. Work from top to bottom, making sure that each wall is complete before beginning another wall.

Step 6: Apply paint
Follow the demo by the Construction Team member. Once a wall has been primed, wait at least 2 hours before painting. Start at the top and work down, and move from one side to the other. This will avoid drips. Work on the shaded side of the house first and work as the sun moves around the house. First paint the corners and detail work with a brush (anywhere that you cannot paint with a roller); this is called cutting in.

Paint the rest of the wall with a roller. Rollers should be dampened with water before use. Move the roller up the paint tray or grate to distribute paint on all parts of the roller. Roll back and forth to remove excess paint. Paint the walls in square sections of two to three feet. With a full roller, draw an M or W on the wall to distribute the bulk of the roller’s paint on the wall. Use vertical strokes to even out the paint and fill in the rest of the area. Refill the roller and continue with the next square area. Paint left-to-right and top-to-bottom.

Wait at least 5 hours between coats. If the previous coat is still wet the new paint will not adhere properly and you will end up pushing the paint around on the wall. It is important to avoid putting too much paint on a roller or brush. Never immerse a roller or bush all the way into the paint. A brush should never be dipped more than 1/3 of the way into the paint. Avoiding this will make clean up a lot easier.

Finish painting the base coat on each wall before moving on to the trim. It may need two coats – do this before removing the masking tape and paper. You don’t want to be painting two different colors on the same wall at the same time. After the base has dried for 5 hours, the tape and masking paper can be removed and redone to reflect what needs to be masked for the trim paint.

Step 7: Touch up
After all the painting is done, walk around the house and inspect the paint. If there are any places that need to be touched up, do it now. Make sure that lines between trim and base paint are straight and clean. Make sure that the drop cloths are in place wherever touch up work is being done.

Step 8: Clean up
Wrap roller covers, trays and brushes with cellophane (or in clean bread bags) during breaks to prevent them from drying out. After the workday, clean the brushes, roller covers, and trays. Use a 5-in-1 tool to scrape excess paint off of the rollers. Completely clean all paint from trays and paint containers. Thoroughly clean out brushes and rollers; once you’ve rinsed them out, wrap them in clean cellophane or a bread bag. Doing a good job of cleanup will get you painting quicker the next day.
How to paint the interior of a home (print this section for work teams)

Rules and guidelines:

- No paint play! No intentional paint on clothing, skin, etc. Paint is very expensive.
- Only scrape or paint when there is a drop cloth in place.
- Clean up spills immediately; it will be much easier to clean up when it is still wet.
- Work on one wall at a time; don’t move on from one step until that step is done for the entire wall.
- Wrap brushes, roller covers, paint trays and containers during breaks in cellophane or clean bread bags.
- Clean up brushes, rollers and trays at the end of the work day so they will be ready for the next day. (See instructions for cleaning up)
- Respect your brushes and roller covers; they need to last for the entire week!

Step 1: Move furniture and lay drop cloths

Move all furniture and other objects to the center of the room away from the walls; cover with drop cloths or plastic. It is important that nothing will rub up against the wet paint or get dripped on. Do this carefully; you don’t want to damage the homeowner’s belongings. Mask off the floor anywhere you will be painting. It is important that paint is only applied over an area where there is a drop cloth. Paint doesn’t come off easily, especially from carpet or furniture; avoid dripping paint.

Step 2: Prep surfaces

Follow the demo by the Construction Team member. Preparing surfaces is half of the work to a good paint job. Before you begin painting, it is important to prepare the surface. You can paint directly over existing paint that is good quality. Make sure the walls and ceiling have no holes or damage; repair before continuing. Water damaged drywall should be replaced; notify your Construction Team member if you find this. Walls and ceilings need to be clean for the paint to adhere; paint that is applied on a dirty surface will flake off in a short amount of time. With TSP, water, rags and a bucket, wash the walls and ceilings. Remember that trim needs to be prepped too! After washing, be sure to let the surface dry overnight before masking and painting.

Step 3: Mask

Follow the demo by the Construction Team member. Masking is the process of taping and papering over things that you do not want to get paint on. It is hard to paint right up against something without accidentally getting paint on the surface. Use masking tape and masking paper (or newspaper) to mask over any surface you don’t want to paint. This includes windows, doors, lights, fixtures, trim, etc. Make sure that the entire floor is covered. This will make painting more fun if you spend the time to properly get ready first.

Step 4: Spot prime

Follow the demo by the Construction Team member. Make sure that everything is masked appropriately and that drop cloths are back in place before starting to prime. Do not start priming a wall before all the prep work is done for that wall. Primer is important because it gives a good base for the paint to stick to. Remember, unless you are painting over a dark color with a lighter color, you only need to prime areas where all of the paint has flaked off and all patched areas. Check with your Construction Team member to verify what needs to be primed. Work from top to bottom, making sure that each wall is complete before beginning another wall.
Step 5: Apply paint

Follow the demo by the Construction Team member. Once a wall has been primed, wait at least 2 hours before painting. Start at the top and work down, and move from one side to the other. This will avoid drips. First paint the corners and detail work with a brush (anywhere that you cannot paint with a roller); this is called cutting in.

Paint the rest of the wall with a roller. Rollers should be damped with water before use. Move the roller up the paint tray or grate to distribute paint on all parts of the roller. Roll back and forth on the grate to remove excess paint. Paint the walls in square sections of two to three feet. With a full roller, draw an M or W on the wall to distribute the bulk of the roller’s paint on the wall. Use vertical strokes to even out the paint and fill in the rest of the area. Refill the roller and continue with the next square area. Paint left-to-right and top-to-bottom.

Wait at least 5 hours between coats. If the previous coat is still wet the new paint will not adhere properly and you will end up pushing the paint around on the wall. It is important to avoid putting too much paint on a roller or brush. Never dip a roller or brush all the way into the paint. A brush should never be dipped more than 1/3 of the way into the paint. Avoiding this will make clean up a lot easier.

Finish painting the base coat on each wall before moving on to the trim. It may need two coats – do this before removing the masking tape and paper. You don’t want to be painting two different colors on the same wall at the same time. After the base has dried for 5 hours, the tape and masking can be removed and redone to reflect what needs to be masked for the trim paint.

Step 6: Touch up

After all the painting is done, walk around the space and inspect the paint. If there are any places that need to be touched up, do it now. Make sure that lines between trim and base paint are straight and clean. Make sure that the drop cloths are in place wherever touch up work is being done.

Step 7: Clean up

Wrap roller covers, trays and brushes with cellophane (or in clean bread bags) during breaks to prevent them from drying out. After the workday, clean the brushes, roller covers, and trays. Use a 5-in-1 tool to scrape excess paint off of the rollers. Completely clean all paint from trays and paint containers. Thoroughly clean out brushes and rollers; once you’ve rinsed them out, wrap them in clean cellophane or a bread bag. Doing a good job of cleanup will get you painting quicker the next day.
Although siding projects may be high need, they are often too expensive for SSP’s budget; each panel of 4’ by 8’ siding costs between $25 and $36. Siding projects are only allowed when siding has been donated or provided by the homeowner, housing authority or other organization. If you have an intake that requires some siding repair, please contact Megan Taylor to discuss the options.
**How to do an intake for a siding project:**

When going on an intake that requests painting take a ladder, measuring tape, camera and the Intake Checklist (see Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a siding intake requires careful inspection of the existing siding.

- **Test for lead paint:**
  There are new laws regulating the process for demolishing a surface that has lead paint. Lead is potentially dangerous to our youth and homeowners. For all siding projects that will require the removal of existing siding, test the paint with a lead tester (check your trailer). If it tests positive for lead, follow the SSP provided instructions (at the end of the Painting section) for dealing with lead paint. If you do not test for lead paint, you must assume that it contains lead and proceed accordingly (guilty until proven innocent).

- **What to look for:**
  When going on a siding intake the main thing to look for is the quality of the existing siding (wood, vinyl, metal, composite, etc.). Is the siding on the home damaged? Look for rot and other damage to the home. Removing damage and painting will prevent the damage from reoccurring. Note what type of siding will be used to make the repairs (SSP only uses wood and composite siding). Note and measure any trim boards that need to be replaced. What size are these boards (i.e. 1x3, 1x6 etc.). Look to see if there is existing insulation and its condition.

- **Calculate the square footage:**
  Measure the area of all surfaces that need to be replaced. (width x height) for rectangles and (½ base x height) for triangles. Add the square footage together to get the total square footage. When in doubt, replace an entire panel of siding (4’ by 8’, 1’ by 16’ etc.). The siding will be nailed to the wall studs, so consider the stud spacing if you can determine it. If you are going to be conducting a siding project, make sure that it gets painted well to prevent damage from occurring again. All new siding needs to be primed on all six sides, edges too. Measure the area that will need primer, body paint and trim paint. Siding and paint projects will be entered as separate projects in SiteManager, but both pieces of information can be collected at the same intake.

Once the measurements, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on an estimate and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a siding project before a cost estimate has been made. Siding projects can have a very expensive cost per person per day.
How to plan a siding project and estimate materials:

Insulation:

If there is not insulation, or the existing insulation is damaged, SSP should install new insulation. This will help keep the home cool in the summer and warm in the winter; although it will add extra cost, it will improve the quality of living within the space and what better time to do it when the wall is already torn open. Determine the stud size, spacing and the total length of insulation to purchase. It comes in rolls already the width and depth for either 2x4 or 2x6 stud walls at either 16 or 24” o.c. Purchase insulation with an R value of 13 or greater; the higher the number the better the home will be insulated. Kraft paper backed insulation is much easier to work with.

Vapor Barrier (Tyvec or felt paper):

The first layer on the outside of the wall studs is a vapor barrier. This should overlap starting at the bottom of the wall and working up so that water will drain to the outside of the wall versus the inside (think like a rain drop).

Siding Panels:

The next layer is the siding. After determining the siding product that will replace the damaged areas, use the square footage to determine how many panels are required. When using 4’ by 8’ panels, the vertical edges will slightly overlap and the horizontal edges will require z-flashing to direct water to the outside of the siding versus leaking inside the wall. Calculate the length of z-flashing needed (if a wall is taller than 8’, z-flashing will be used between horizontal rows of siding).

Trim Boards:

Replace any rotten trim boards as well as siding. Match the existing dimensions of lumber. These are nailed to the siding or rafters with 6d nails staggered every 2’.
How to make a material list for a siding project:

A material list can be made from the previous step estimating material usage. Use this list as a reference.

- Fiberglass batt insulation (if none exists or damaged) ___ (2x4 or 2x6 studs 16” or 24” o.c., R-13 or greater)
- Vapor barrier ___ (total square footage of damaged area)
- Tape for vapor barrier ___
- Siding ___ (wood or composite)
- Z-flashing (to accommodate thickness of siding) ___ (4’x8’ horizontal seams, comes in 10’ lengths)
- Trim/Fascia boards ___ (based on existing dimensions of wood)

- Acrylic, latex caulk ___ (to fill nail heads and seams)
- 6d stainless steel nails for siding ___ (every 6” around perimeter, every 12” in interior)
- Staples ½” ___ (to secure insulation/vapor barrier to studs)
- 6d nails for trim ___ (every 2’)

See painting list for painting materials. Enter as separate project in SiteManager.

This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.
How to repair and install siding (print this section for work teams)

Terms:

- **Studs**: 2x4 or 2x6 wall supports
- **Insulation**: Keeps the space cool in the summer and warm in the winter – slows the transfer or heat. Always wear gloves and a dust mask when working with fiberglass insulation; wash your hands before touching your face and put your work clothes in garbage bags each night. Long sleeves and pants are a must.
- **Vapor barrier**: Protects the insulation from moisture damage; overlap starting at the bottom and working up the wall so that water will drain to the outside of the wall.
- **Siding**: The exterior surface of a building. Nailed with 6d nails every 6” on the edges of the panel and 12” in the inside of the panel. All nail holes are caulked.
- **Z-flashing**: Use between horizontal seams in 4’ by 8’ panels of siding; it directs water to the outside of wall.

**Step 1: Remove damaged trim, siding, vapor barrier and insulation**

Use pry bars and cat’s paws to remove damaged trim and siding. Carefully remove all nails from any lumber removed; this will prevent someone from accidentally stepping on a nail. Gather the old nails in a container to be disposed of. Make sure to use the proper protection when working with insulation.

**Step 2: Install insulation**

If any insulation needs to be installed, do this next. Cut to fit snugly on all sides with a straight edge and utility knife cutting on the paper side. Staple the insulation to the wall studs on either side. A little more is better than a little less in insulation; fill any small gaps.

**Step 3: Install vapor barrier**

The next step is to install the vapor barrier. Starting at the bottom of the wall, staple the vapor barrier to the studs every 2’. Overlap the next piece and continue up the wall; tape all vertical seams.

**Step 4: Prime and paint siding**

Prime all 6 sides of siding (unless it is pre-primed) to protect it from moisture damage before it is secured to the wall. Make sure to do as many layers of primer as necessary – new wood will soak up a lot of paint. It is much easier to paint the panel before it is attached. If there are grooves, paint those with a paint brush first, and then paint the panel with a roller.
Step 5: Install siding and z-flashing

When installing siding, start at the bottom and work up the wall. If using 4’ by 8’ panels, the vertical seams will slightly overlap. Make sure that each vertical edge of a panel is over a stud. Nail the panel to the studs every 6” around the edges and every 12” on the inside of the panel with 6d nails. To determine where the studs are on a piece of siding (after it has been tacked into place with nails around the perimeter), drive a nail into the center of each stud above the siding. Attach a plumb bob or a string line and carry the line to below the siding; this will indicate where to nail.

Set the z-flashing on the top edge of each piece of siding on a fat bead of caulk and hold it in place with just the heads of roofing nails driven into the studs. Don't nail through the flashing itself or it will eventually leak. Overlap the ends of the flashing by at least 2” and run a bead of caulk where pieces overlap. Just before the next layer of siding goes on, caulk along the top edge of the metal as extra protection against water. The next layer of siding will be 1/8” to ¼” above the bottom leg of the z-flashing so water can easily drain away from the joint.

Step 5: Install trim

If there is a small gap in the siding, the trim will hide it. Match how the existing trim is cut around the corner of doors and windows (45° or 90°). Prime all six sides of the trim. Paint all of the sides that will be exposed before attaching it to the wall (this will be much easier and require less masking and detailed work). Use 6d nails every 2’ or less to attach each trim board to the wall; use 3 nails for a board less than 4’ long. Offset the nails so that they are staggered (i.e. two on the right side of the board and two on the left side of the board for a vertical piece of trim).
Flooring:

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2012 Statistics about Flooring Projects:

- SSP completed 6 floors
- The average floor took about 7 days to complete
- The average floor took 48 volunteer days
- The average cost of a floor was only $130!
- The average cost per square foot was $0.81 and one volunteer day per 3 square feet
- The average cost/person/day was $2.73

Although flooring projects may be high need, they are often too expensive for SSP’s budget. Flooring projects are only allowed when finish flooring material is donated or provided by the homeowner, housing authority or other organization.

Home Depot used to donate flooring material to SSP, but we have stopped receiving donations from them this year due to lack of sufficient warehouse space. Some sites may receive donated flooring at the beginning of the summer, mostly of vinyl self-adhesive squares or click-lock laminate flooring. Most flooring will come with instructions on the packaging; the internet is a great resource for specific installation instructions for each flooring product.

To check your estimate in SiteManager to verify that it is in the right ballpark, multiply the square footage by $0.81/square foot. For a 250 square foot floor, a rough cost estimate would be $200. An estimate of volunteer days would be 83 (250 square feet/3 volunteer days per square foot = 83).
How to do an intake for a flooring project:

When going on an intake that requests flooring take a measuring tape, pry bar, hammer, flooring samples, camera and the Intake Checklist (see Section 11) to fill out while at the home. In addition to filling out the Intake Checklist and meeting with the homeowner(s), a flooring intake requires careful inspection of the existing finish flooring, subfloor and floor joists and beams.

- **What to look for:**
  When going on a flooring intake the main thing to look for is the quality of the substructure. Determine what parts of the floor are damaged. Make sure that whatever caused the damage is now fixed; do not repair a rotten floor without making sure that the leak is fixed (which SSP does not do). If you can, pull up the finish floor to look at the substructure.

  - What type of finish floor exists (carpet, tile, vinyl, wood)? What is its condition?
  - What material and color are the baseboards?
  - What is the thickness of the subfloor? What is its condition?
  - What are the sizes (2x6, 2x8, etc.) of floor joists/beams that need to be repaired? What condition is the substructure in?
  - Is the problem fixed (leak or otherwise)?

- **Calculate the square footage:**
  Measure the area of all surfaces that need to be replaced. When in doubt, replace an entire panel of subfloor. The subfloor will be screwed to the floor joists, so consider the joist spacing if you can determine it. Add 10% to the square footage to compensate for waste, damaged product and end cuts.

- **Determine the finish flooring material:**
  Bring with you samples of the flooring material and square footages that your site has available. The square footage will determine which types are available (it is best to save a large amount of flooring for a large project).

Once the measurements, intake checklist and photographs (if permitted) are completed, let the homeowner know that you need to work on an estimate and that you will let them know when the Construction Team has decided if it is a good project for SSP. Never commit to a flooring project before a cost estimate has been made.
How to make a material list for a flooring project:

A material list can be made using this list as a reference.

- PT floor joist material, match existing
- Subfloor, match thickness of existing
- Construction adhesive (Liquid Nails) for subfloors
- Leveling compound
- Donated finish flooring
- Wood or MDF base boards
- Transitions in doorways or to other flooring
- Through bolts or lag screws
- #8 wood screws (length = 3X the thickness of subfloor)
- Finish nails
- Acrylic, latex Caulk
- Primer and Paint for trim

This list above the red line will be input into SiteManager to create a project estimate before materials are purchased. This ensures that there is a clear understanding of project costs before a project has been committed to. The items below the red line are untracked in SiteManager; you should verify that you have these either in stock or on your shopping list.

- Divide the SiteManager estimate by the square footage; it should be around $0.24 per square foot (last year’s average). For perspective, if you need to purchase flooring, add $0.40 to $0.70 per square foot to the estimate. If you bought flooring, the project would cost about $1 per square foot.
How to repair and install flooring (print this section for work teams)

Terms:

- Floor joist or beam: the substructure for a floor underneath the finish flooring and subfloor
- Subfloor: Plywood or OSB that is secured to the floor’s substructure; provides a surface for the finish flooring
- Transition: material that covers the transition between two different flooring materials, often in a doorway
- Base boards/vinyl cove base: material that goes around the perimeter of a room at the base of a wall

Step 1: Remove base boards or vinyl cove base
Carefully remove existing base boards or vinyl cove base that surround the damaged area; try to reuse these if they are in good condition. In either case, remove all nails.

Step 2: Repair subfloor
If the subfloor is damaged, cut it back to the nearest floor joists or beams. Make sure to cut so that the old subfloor is halfway over the joist and that the new will be able to be attached to the other half. Or add a pressure treated 2x4 onto the existing joist for the new subfloor to attach to. You can use a circular saw that is set to the depth of the subfloor so that the joists are not cut (removing nails that will interfere with this cut beforehand).

Step 3: Address rotten wood
If any of the substructure is rotted, spray a 10% bleach solution on the area and scrape off any flaking wood. Then “sister” in a new pressure treated board that is the same size (2x6 for 2x6). Attach it to the existing wood on either side of the damaged area with through bolts or lag screws. Do not cut out the damaged wood.

Step 4: Attach new subfloor
Measure and cut new subfloor to replace what was damaged; always stagger the seams. If using OSB, paint any cut edges to seal them. Make sure to secure the subfloor so that the low grade is facing down, with the higher grade facing up (read the label printed on the panel). Make sure that there is a 1/8” gap all around the edges of the subflooring material; this allows for swelling. After the panel is the proper size, lay down a bead of construction adhesive on the floor joists; this will prevent the floor from squeaking. Use wood screws three times the thickness of the subflooring; screws are spaced every 6” around the perimeter where there is a floor joist and 12” in the interior of the panel where there is a floor joist. Snap a chalk line to mark where the joists are.

Step 5: Prepare for the finish flooring
Make sure that there are no screw heads sticking up past the subfloor. Drag a long flat tool across the floor to determine if any screw heads need to go in further. Spread a thin layer of leveling compound along the subfloor seams and low spots with a 6-inch drywall knife. Allow to dry completely (about 30 minutes). Sand the seams smooth with 100-grit paper. Sweep the area immediately before installing the finish flooring.
Step 5: Attach finish flooring

For click lock plank and other types of flooring, follow the instructions on the package (or find online). For vinyl self-adhesive squares, use the following instructions:

Begin by determining the center of the room. The flooring will start in the center and work towards the perimeter. This will hide the fact that the room may not be square (most rooms are not perfectly square). Measure the width of the room in two places and in each case mark its exact center on the floor.

Snap a wall-to-wall chalk line lined up on the marks. Measure the chalk line and mark its center to indicate the room's center point. Line up a framing square along the chalk line at the center point, then make a line along the square perpendicular to the chalk line. Do the same on the other side of the chalk line. Snap a second wall-to-wall chalk line on the perpendicular lines to divide the room into quadrants.

Look for the arrows on the bottom of each square. Arrange all of the squares in the same direction. To cut a square, use a framing square and a utility knife; always cut on the back of the square and snap to break through the square. Once a square is down it is very hard to pull it back up. Leave a ¼” gap around the perimeter of the area being floored; this will allow for expansion and contraction and will be hidden by the base boards.

Tile the floor one quadrant at a time, beginning at the center point. Peel off the backing sheet from the first tile and set it into the corner formed by the intersecting chalk lines. Press the tile to the floor. Set the rest of the tiles in the quadrant. Work out from the first tile in a step pattern, first out along the chalk lines, then filling in (Image A). Continue until you reach the last course before the walls; then start on the next quadrant.

To trim the perimeter tiles, place one full tile on top of the tile closest to the wall. Align the top tile so that its four edges line up with the already-installed tile below. Set a second tile on top of the first and slide it up against the wall. Draw a pencil line along the inner edge of the top tile, marking the middle tile (Image B). Slide out the middle tile for cutting. After laying all of the tile, roll the entire floor with a rolling pin. That will ensure that every tile is firmly bonded to the underlayment.

Step 6: Attach base boards

Try to reuse what existed prior to the repairs. If not, attach new base boards, priming and painting beforehand unless they are preprimed. Use construction adhesive in an S pattern and finish nails every 3’ to attach the base boards to the wall. Stagger the nails to suck the board to the wall, one up, one down, repeat. Use a nail set to tap the finish nails into the wood – this will be filled with caulk to hide the nails.