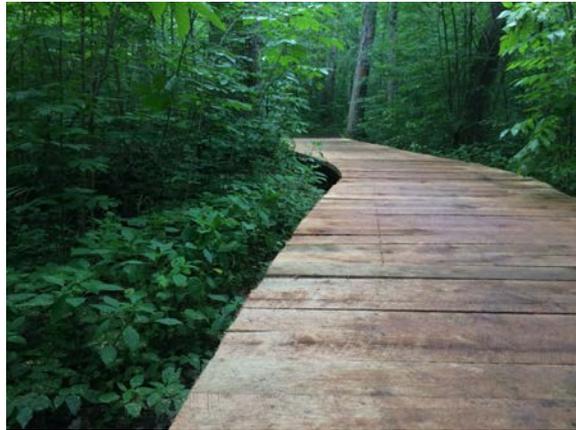


Toad's Traverse

— at —

Shaver's Creek Environmental Center



James Graef
Troop 32
State College
Pennsylvania
Completed 2015



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Introduction

I joined scouts as a Tiger Cub in first grade, and at my first pack meeting, even without a class A uniform, I knew that I would earn the rank of Eagle Scout. I had been inspired to become an Eagle Scout at a very early age. My Dad had earned the rank of Eagle Scout when he was a Boy Scout, and I had been attending his troop's alumni campout at Grachur Club for years by the time I joined Cub Scouts. I earned First Class within the first year of joining Troop 32 out of the State College Presbyterian Church and earned Star and Life ranks soon after. I continued for years developing my skills through scouts and elsewhere, and all the while looked for the perfect Eagle project. I knew attaining the rank of Eagle would improve my leadership ability and would allow me to reach greater goals in life.

Selection

I wanted to build something that would stand the test of time and would help an organization I truly believed in. My first idea was a series of combination bike rack repair stations modeled after some I had seen on a trip to Toronto, Canada. I also studied the feasibility of a bridge on Department of Conservation and Natural Resources land, but the approvals for later maintenance and any funding seemed too

daunting. My friend Tommy suggested I look for a project at Shaver's Creek Environmental Center. Shaver's Creek, "is Penn State's nature center, offering fun and educational environmental programs and events for the whole community," (Shaver's Creek Website). It seemed like a great place to help, especially because the approval process would be far more streamlined. Because the property is owned by Penn State who maintains many structures in the surrounding area, it would not be too onerous to maintain a new boardwalk as well. Shaver's Creek has played as big a role in my life as scouts has. I began to attend Shaver's Creek Summer Camp in first grade. Singing songs and enjoying nature were two of my favorite hobbies, so I absolutely loved it and attended every year. In middle school I graduated to Rock'n River Camp and Raptor Camp and then in High School I became a Leader in Training or LIT. As an LIT, I helped lead groups of campers just like I was led when I was a camper. As a senior, this was my last year as an LIT. It seemed fitting to do my Eagle project at a place I had called home for so long.

Initiation

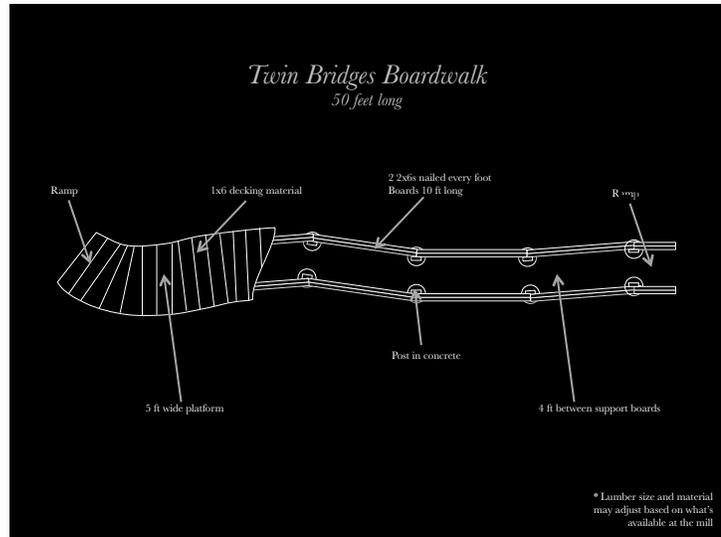
Tommy Butler, a fellow LIT and friend from Troop 31 was completing his Eagle Project, making signage at Shaver's Creek, as I was beginning to find my own. Shaver's Creek was on my list of potential projects, and Tommy also encouraged me to look there because they had some projects that needed to be completed. I loved the idea of helping Shaver's Creek just as they had helped me grow. I set up a meeting and attended a PA Trails Day at Shaver's Creek with my dad on Saturday, May 17, 2014 to

talk to Brian Sedgwick, the Building Services Coordinator at Shaver's Creek. We discussed options for Eagle projects, and I suggested building a boardwalk on the Twin Bridges Trail over a mud patch that had existed since my first years at camp. It had been bridged by many temporary boardwalks, but had never been bridged with a permanent structure. He thought it would be great to find a permanent solution to the problem.

At first, my plan was to finish the project before the winter, but I realized that it would be quite challenging. I realized it would be hard to secure the foundation the colder it got. I then set a goal to finish by early spring. This goal was pushed back a little bit by the delay in finalizing the wood order and delivery. Ultimately, I finished the project before the most important deadline for Shaver's Creek: the beginning of summer. As school comes to an end, Shaver's Creek gets very busy with daily visitors and the beginning of their Summer Camp programming, which uses the Twin Bridges Trail daily. The project was finished just in time for the beginning of summer and the increase in usage. Procrastination and difficulty in communication accounted for a lot of the increase in the real-time project duration versus my original estimate.

My original budget calculations for the project showed that it would be less than 1,000 dollars total. The vast majority of money was directed toward wood. Other building materials, like concrete and screws, took only a fraction of the cost. I communicated to Shaver's Creek that the price could be up to 1,500 dollars so a larger price tag would not catch them off guard. The actual cost for the project was around 1,250 dollars. Just

like with the estimates, most of the money was spent on wood. Most of the increase in price also originated in the wood. The cost of the parts for the boardwalk was paid by Shaver's Creek. I earned the money for the food provided to workers at each workday by



mowing the lawns of my family as well as some neighbors. I estimated the project would take 50 hours of my time and 100 hours of my helpers. I ended up spending close to 70 hours myself, and the hours of everyone involved, including me, totaled 300. This was due not to a specific area of difficulty in construction or planning, but to the fact that every activity seemed to take a little bit longer than expected initially. Each increase in time added up to create a massive difference between expected and actual hours of activity.

Planning

On Wednesday, June 4th, my Dad and I met with Mr. Sedgwick to discuss details of the project. We walked down to the site and decided the two trees which would determine the ends of the boardwalk, and then clarified and sketched a design. Because Shaver's Creek is an Environmental Center, they prefer not to use pressure treated wood on new structures. I created a drawing (Fig. 1.1) using Powerpoint and it



was taken by Mr. Sedgwick to the Shaver's Creek Staff to gain approval.



On Saturday, September 6 after Summer Camps were finished for the year, we went to Shaver's Creek to plan the layout. We measured out five feet, the width of the boardwalk, to see where it would fit through the trees and brush. We also decided the location of each concrete post by securing a string reference line the length of the boardwalk and measuring off it to the posts on either side. We used the measurements

later to draw the technical drawings for the boardwalk (Appendix V). On Friday, September 12th, my Dad and I worked on a SolidWorks drawing of the boardwalk to relate the locations of the posts to the curve of the boardwalk planks (Appendix VI to VII). We needed to make sure they would fit together. It would take many iterations of drawings and much more time to complete the drawing correctly because of a barrage of problems constantly needing to be addressed. Multiple times, parts of the drawing were drawn in the incorrect layer, prompting a reworking of the entire drawing.

Workday 1 – Saturday, October 4th

For the first workday my plan was to dig all the holes which would be filled with concrete to create the support posts of the boardwalk. I started by sending an email to Mr. Sedgwick asking if it would be acceptable to use SonoTube rather than wooden posts in the concrete as had been previously discussed. This would add longevity to the project as wooden posts in the concrete would eventually rot. He thought it was a great idea. Organizing rides to the site was one of the hardest parts of the workday. After many phone calls, Mrs. Keene agreed to drive most of the workers to the site. After re-dimensioning the CAD drawing to make it easier to compare to real world measurements to place the digging sites, I gathered materials and tools Friday night.

We got to Shaver's Creek by 8:15 so we could lay out the digging sites. If we had waited until the other workers arrived, most of them would have had nothing to do when they got there, as only so many people could help lay out the sites. If some got distracted it could have spread to others, making the workday less productive. We set up the reference line again so we could measure off it and placed flags at each digging location. We used two tape



measures to triangulate the position. When the flags were placed, we started to demolish the old temporary boardwalk, beginning with places where holes would need to be dug.

At 9:20, I sent my dad to get the other workers from the main parking lot. The path to the worksite involves a couple of turns, so to avoid having to search for the workers, I decided we should send one person to retrieve them. When we started digging, we realized it was most efficient to have two people digging each hole, which left me and Sam Patzkowsky to demolish the rest of the old boardwalk. After the holes were dug, we covered them with the boards from the previous boardwalk for safety. We also used the remaining boards to make a path across the wettest area of the trail. We ended the workday with lunch. I talked to Mr. Sedgwick about supplies for filling in the holes, and we agreed to meet that night at Lowe's to get supplies. When we got home, my dad helped unpack from the day and repack supplies needed for the next workday.

Workday 2 – Sunday, October 5th

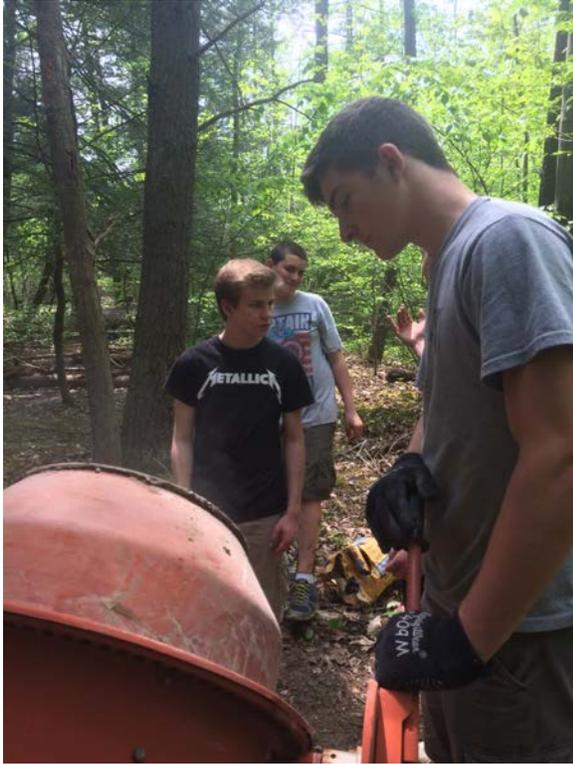
The night before the second workday, my dad and I went to Lowe's with Mr. Sedgwick to buy anchor bolts, washers, concrete, and Sonotubes. From the calculations I had done before, we needed 2.3 Sonotubes and 12, 80 pound bags of concrete, but to be



safe we got 3 Sonotubes and 20 bags of concrete. Shaver's Creek uses concrete all the time, so too much would not have been a problem. In the end, most of the Sonotube and 15 bags of concrete were used. Later that night, I texted other scouts to see if they could come to a workday on Sunday. I also texted Mr. Peck to see if I could borrow the surveying level from his work. Setting up drivers was an easier process than the first workday because there were less people and more drivers with whom to coordinate.

I planned two workdays for the same weekend so that we could finish digging and filling in the support holes before the weather turned cold. This followed my first goal of finishing construction before winter. Unfortunately, I did not send a scout to retrieve some of the workers and had only texted directions to them, so they ended up wandering around before they found the site. This prompted me to make a map for future workdays (Figure 3.1).

We started by uncovering the holes that had been dug the day before and bringing all our equipment down to the worksite from the truck. We used the level Mr. Peck had lent us to see the difference in elevation of each hole. Our first thought was to measure from near the average elevation so the posts would not have to be extremely tall. We realized, though, that trenches would need to be dug for the beams between the pilings that were at a higher elevation, and so we decided that we should measure from the highest hole. It ended up that even the lowest holes didn't need extremely tall posts, the ramps were still reasonable, and even though the calculations for concrete



and Sonotube jumped, we had bought enough extra that, along with some extra concrete provided by Shaver's Creek, we still had enough.



Starting with the highest hole, we placed Sonotube in each hole and leveled it both with the other holes and on all of its axes. We used plastic bags to protect the levels from the concrete. We then poured dry concrete in the holes that had collected water from the surrounding swampy ground, stirring until it started to harden. Then we started the generator and concrete mixer and mixed concrete to fill the rest of the holes. We worked out a system where some people mixed while others brought concrete to each hole, and the rest finished the leveling process and double checked the ones which had already been poured. Many times, we bumped the Sonotube as we poured concrete so it had to be leveled again. It became evident that it wasn't even



necessary to level the tubes before pouring, because it was likely we would need to repeat the work after it had been bumped. Anchor bolts were added to each hole and supported by a piece of cardboard to ensure each was completely plumb. The leftover dry concrete was brought back to the truck at the same time. Completing multiple activities like this helped keep all of the workers on task because each had something to do. Lastly, we got measurements between each anchor bolt to determine the length of wood necessary for support beams.

Winter – October to May

Over the winter months it was hard to get work done at the worksite so I focused mostly on communicating with Mr. Sedgwick and the lumber mill to obtain the wood necessary.



We selected white oak for all wood in the structure, because it was the most durable wood sold at the mill, and therefore the wood that would last the longest. My mom and I visited the mill to place an order for the boards I thought I would need. Communication thereafter took a long time because the mill had no access to computers. Usually, I would have to listen to a voicemail, email Mr. Sedgwick for an answer to their question, wait for a reply and then, after some procrastination on my part, call the mill back. The process could take close to a week, repeating for multiple

months. First we had to confirm the size and type of wood needed. There were specific questions about how long certain support beams could be and if planks could be twice as long as requested and then cut. Next we discussed payment. The fact that Penn State is tax free made the process more complicated. After some failed attempts at invoices, we finalized a correct one and then had to wait for the wood to be ready. Right when I got the call about the wood being ready, I set up a third workday.

Workday 3 – Friday, May 1st



Fig. 3.1

The Tuesday before the workday, I received a call from the lumber mill that the wood for the boardwalk was ready. I learned the mill's hours were weekdays until 4:15, so I called to see if arriving at 4, after school,

would be too late. I didn't get a response. On Friday my Dad picked me up from school so that we could get to the mill in time. I called the mill to ensure someone would be there, and the secretary said they would probably still be there but she could make no promises. We arrived at the mill at 4:05 with two people still working. The wood was easily loaded onto the trailer, provided by my dad's work, with the help of the mill's machines.

As we traveled to Shaver's Creek, I thought about the amount of work that needed to be completed. I was thinking with one person per plank and maybe two people per support beam, we would easily carry the wood and have nothing else to do. I would have hated for the workers to have come all the way to Shaver's Creek for barely any work. I estimated it would take two hours working slowly. My dad assured me it would take long enough and even said we might need multiple workdays. When we arrived, we experimented with wood carrying and then fully understood how heavy each piece was going to be.



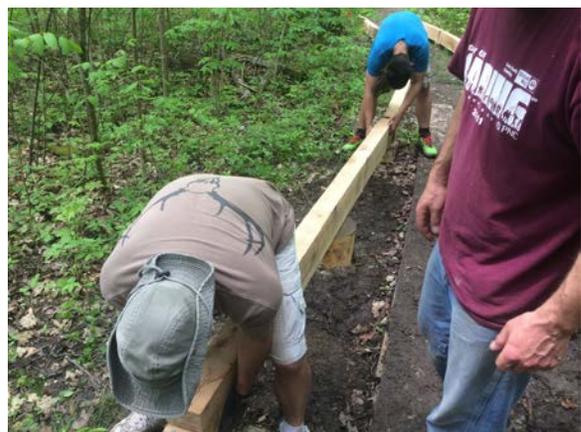
After noting that the trailer would not be able to be driven down the hill closer to the worksite, we decided we could load the back of the truck with wood and take it down the hill, take the wood out and bring it to the worksite, and repeat the process. Two people carried each plank and support board because of their weight. If we unloaded the truck's contents onto the ground, we could move the unloaded wood to the site and at the same time load the truck with more wood. Both jobs finished at around the same time and the process could

be repeated without loss of productivity. In total, it took about 5 or 6 trips of the truck to unload all the wood. While the others were eating dinner, I measured how close the posts were to what we had planned, and they turned out almost perfectly. Some of the posts could move slightly in their holes due to the marshy soil around them. We decided we would add four more posts for extra support during the next workday. After moving all the wood, we returned the trailer and went home. The two hours I had estimated for moving the wood was almost perfect, but there was no problem with a lack of things to do (as I had feared) due to the weight of the boards.

Workday 4 – Saturday, May 16th

For the fourth workday my goal was to get the last holes dug and place the support beams. My Dad and I went to Wegman's for snacks and food, and to Lowe's for concrete. We already had three bags from the previous workdays, but we wanted to be prepared. Mr. Sedgwick had also gotten more concrete, and so we had 6 extra bags.

After bringing all of the materials to the site and thanking some friends for coming to give us more snacks, we dug the extra





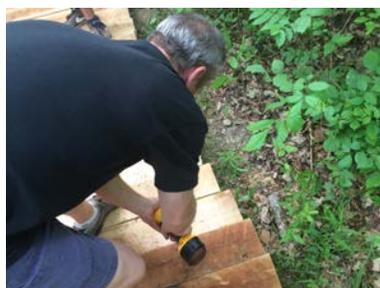
holes, cut and leveled Sonotubes for each, and poured concrete. We then cut the support boards to the correct length of each span and carried them to their respective posts. While the others were eating lunch, we experimented with placing the ramps and connecting them to the anchor bolts. Again this worked as a way to keep the workers distracted so the couple of people necessary for measuring and experimenting could work without interference, and the workers could go back to work directly after lunch. Experimentation and final installation took a long time, because it was necessary to move dirt and make sure the beams were parallel before they were bolted together. We also cut notches out of each board to put nuts on each anchor bolt so the nuts would not interfere with the decking. The whole process of placing the support beams was long and didn't require many workers because many steps had to be completed in succession, so some workers became bored. To combat this, I had them clean the cement mixer and move things back to the truck to clean up. We finished the workday



with some unused cement, so we brought it back to Lowe's. The workday ended at 4:00. I estimated it would end an hour earlier, but a lot was accomplished.

Workday 4.1 – Tuesday, May 19th

My Dad and I went to the work site to plan and experiment with the deck boards before I brought other workers to the site to screw them down. We cut three of the boards to length and spread them out to see what it would look like to have all of the boards parallel. The end posts were already parallel, as we had planned, so we decided having all the boards parallel would be the easiest and most aesthetically pleasing method of construction. I also realized that it would be best to begin decking farther from the pile and continue closer to the wood pile. That way, people bringing new boards would not have to jump up to, and then off, the already completed boardwalk to bring boards to the correct spot. We marked the places where we had put the three experimental boards, so we knew where to lay the first board at the next workday. We also talked about how the curve would be measured and cut, and decided we should lay out all of the boards and then screw them down to ensure they were in the correct position for the cut of the curve.



Workday 5 – Friday, May 29, 2015

My goal for my 5th workday was to put in place all of the decking necessary for people to walk across the boardwalk. Others thought it would be hard to finish all of the decking in one workday.

After school, my Dad and I packed the car and headed to Lowe's to get screws, washers, and bits for the special decking screws. While at Lowe's I called Mr. Metzel and Mr. Inman to see if one of them could pick up Eric Reichard on their way to the site. I also called the lumber mill to see how much the wood would shrink when dry to determine how much space should be left in between each board. Because each would shrink by $\frac{3}{8}$ of an inch, we elected to put the boards right next to each other so they would shrink to the correct distance apart. When we got to the site, we split into different groups to accomplish different tasks. One worker screwed the new, larger washers to each anchor bolt, improving the connection between the anchor bolts and the support beams. Another group worked on tearing up and carrying to the truck the temporary boardwalk we had made while construction of the support posts and beams was taking place. My dad started to cut decking boards in half, so they would be the right length to span the support beams, and another group carried the cut boards to me and Eric. We inspected the boards to determine the better side, which we placed face up. We then lined each plank up to get the correct spacing to cut the curve on each side of the boards. Because there were so many people bringing boards to be placed, there was a backlog of boards waiting for me and Eric to lay them out, but

because the process didn't take too much time, the backlog was not much of a problem.

When the decking was all laid out, we realized that we had many extra 12 foot boards. We decided to put them in the middle of the span at their full 12 foot length and have benches on either side of the walkway, cantilevered over the ground below. This was not in the original plan at all, but made the boardwalk much more useful. While the others were having dinner, we found the center of each pair of support beams at each cement post. We then placed a chalk line between those points to show where screws should be placed. With three people drilling and three people screwing, work progressed rapidly after dinner. The people who weren't screwing or drilling helped place screws in holes so the people screwing could finish faster. I checked that each board had the correct amount of screws.

Workday 5.1 – Wednesday, June 10th

My parents and I went out to the site alone so we could cut the curves on each side of the boardwalk. My Mom had gotten a rope that could be used to lay out the curves, and we traced each rope line with chalk. We measured five feet over to find the other, mirrored curve edge. My Dad cut the curve behind us with a chainsaw. We cut all of the sides except the boards touching the ground. We had many scraps of wood which we left in a pile, but needed buckets to remove during the next workday.



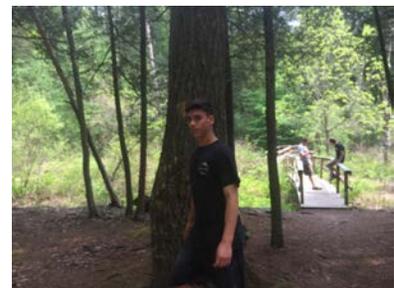
Fig. 5.1 - Before



Fig. 5.2 - After

Workday 5.2 – Wednesday, June 24th

After a day of Leader in Training community service at Shaver's Creek, I went to the site with my dad to build the benches which had been added to the project because of the extra wood available. We also replaced a step on a bridge close to the site, that previously was uneven and eroding, with some of the remaining wood (Figure 5.1, 5.2). The next day after Leader in Training, I swept off the wood shavings from the night before so they wouldn't hold moisture close to the wood. These jobs were done with one and two people because more would have hindered the work. Most of the time we were measuring or my dad was cutting, so only one or two people could be working at a time, and anyone else might have been distracting.





Workday 6 – Friday, September 4, 2015

The goal of my sixth and final workday was to stain the entire top side of the structure to protect it from weathering and rotting, but first it was necessary to clean up the worksite. Some blocks of wood were still on the ground after being sawed off when the curve was cut. These needed to be collected into five gallon buckets I had forgotten to bring to previous workdays. Lastly, we cut the indents out which would mirror the shapes of adjacent tree trunks. We also removed the boards that almost touched the ground, cut their ends to the correct curve, and placed them back on the ramp.

The stain was the same as what is usually used around the Environmental Center, a water based mix, as opposed to oil based, to decrease environmental impact. Originally, my dad and I thought it would be thick and hard to apply, requiring multiple coats just to cover every crack of the wood. We also suspected rollers would not be able to apply the stain thoroughly, so brushes would have to be used, slowing the process more. We expected it would take multiple hours, especially with our crew of five. I knew it was good to have a smaller crew, so that those not staining didn't



interfere with those staining and the stain that had already been applied, so I was prepared to stretch the staining into two workdays if necessary.

When we started staining, we were all pleasantly surprised. The stain could be poured onto the boards and rolled out with rollers and would still get into the cracks. It seemed to go on thick enough that we suspected we wouldn't even need a second coat. After the initial pour we continued down the length of the boardwalk with two scouts staining on either half of the walking surface. Another two scouts went along the edges with a brush to make sure every inch was covered and to stain the edges of the planks. The most difficult part of staining was the edge between two planks which weren't exactly even. Sometimes brushes were needed to reach into the cracks. Ahead of the staining workers was a sweeper, getting dust and leaves off the boardwalk before they were stained. We worked from farthest ramp to closest, to be able to access the non-stained portion, and therefore, the trail to the truck. With such a small, older, experienced crew it was easy for me to help with staining. There were never any problems with workers being off task.

After a snack, we took the buckets with wood and the remaining board back to the truck and unloaded the buckets of wood into the scrap pile at the environmental center. What I had thought would be a workday which continued until dusk or into

another workday in reality ended early, in large part due to the stain being thinner than expected.

Challenges

Communication was the biggest obstacle of the project by far, and seemed to create its own issues and help make others worse. Predicting time and budget was a major challenge but was necessary to communicate the goals and costs of the project. I predicted when workdays would end relatively accurately most of the time and even when they went late, the drivers were usually already there working. Because of this, we could go a little bit late without any inconveniences.

Overall, I communicated the budget and time schedule well to Shaver's Creek. The project cost \$1200, about half way between the minimum and maximum prices I estimated, \$1000 and \$1500. I finished the project before the critical deadline of summer, even though communication and procrastination contributed to a slower project than expected. Total working hours for the project were much higher than expected at 300 rather



than 150. This was due to small things taking longer to accomplish than estimated, but didn't impact the outcome of the project greatly.

Much of my planning time, which itself comprised a lot of my total hours, included emailing, calling, or meeting with individuals about the project. Throughout the winter I was calling the lumber mill and waiting for a response, only to realize I still had one more question or still had to answer one. I would then have to email Mr. Sedgwick and get a response before I could call the lumber mill back. This was compounded by my procrastination in getting back to emails or phone calls. The fact that I would have to use phone or fax to communicate with the mill did not help. They couldn't be copied in an email to Shaver's Creek, and I had to use the fax machine at my Dad's work. Once all of the materials were collected, I had to gather a workforce. Although I often made announcements a couple of days before the workday at the scout meeting, I rarely had a confirmed workday two weeks in advance to announce, which might have improved attendance.

Even once I had workers, I needed to get them to the worksite. If I had been preparing for a workday in State College where no one would have needed to carpool, preparation might have been cut by one third. Many times my Dad and I would go to the worksite early, so we might have only been able to take one other scout with us. I would first have to find a driver who signed up for the workday or who had a scout going, who could drive and then return to State College. Then I would have to find out who needed a ride to the site and at what time. Then I would have to give the driver the



contact information for each scout so they could pick them up and give them a map to the worksite, which they could sometimes figure out and sometimes could not.

Once workers were at the site, they were very productive, probably for two reasons. First, most of my volunteers were older scouts, as with most Eagle projects, and the younger scouts who volunteered would get the idea from the older scouts that they should work without distracting others. Second, I made it a point to keep everyone busy. When I saw someone not doing anything, I would stop what I was doing and would make sure they had something to do. Before each workday I even made lists in my head of things workers could do if there was nothing else to work on, like cleaning up the worksite. I made sure they were real jobs that needed to happen, not busy work, because I know when I am assigned to busy work I get aggravated. It was important to me that I keep everyone working, firstly as a courtesy to workers since they were willing to help me, and secondly so we could finish everything I intended to finish.

I always set high goals and then communicated them to workers so as much as possible could be finished in a set amount of time. When I first picked up one of the

boards that we would have to carry to the worksite on the third workday, my previous workday duration estimate of two hours seemed impossible. Mentally, I thought it was going to take at least twice as long and possibly go into another workday, just like my dad and Mr. Brooks had suggested. But instead of saying it would never get done to the workers, I told them my estimate of two hours of work. We finished carrying the wood in almost exactly two hours. I think the only reason it was done that quickly was because the expectation was set and the workers were motivated to finish. In general, I tried to orient my workdays around finishing a certain task rather than setting a certain end time, because it communicated to the workers that they would finish early if they worked quickly. The same thing happened when I attempted to screw all of the planks and then stain all of them in one workday where others thought it would take two. Both times we finished within one day with great results. In school, I had always learned making goals was a good thing to do, but my Eagle project was a physical manifestation of the principal that goals allow me to achieve more.



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JUNIATA VALLEY COUNCIL
BOY SCOUTS OF AMERICA

Pre-Approval Application for Eagle Scout Service Project

Give a brief description of this project:

A boardwalk for crossing a muddy portion of the Twin Bridges Trail, a path at the Shaver's Creek Environmental Center. The boardwalk will be about 50 feet long, will have a slight curve, and be low to the ground.

Tell who will benefit from this project:

The Shaver's Creek Environmental Center will benefit, at which I have attended and volunteered for summer camps since 1st grade.

Tell how they will benefit:

All visitors including summer camp attendees and bikers will have an improved experience. The environment will also benefit from less foot traffic on the muddy ground which would spread the muddy area further down the path. Muddy ground also tends to make hikers detour around it widening the path, thereby hurting the environment further.

Name and position of official from the group benefited who was contacted for guidance and/or approval of this project:

Brian Sedgwick - Building Services Coordinator

How much funding will be required and how will it be raised?

The project will cost approximately \$1000. Shaver's Creek will provide funding. Suppliers will be asked for donations or discounts.

How many people will be recruited to carry out the project?

Crews will range in size from 2 to 6 people depending on the task.

How much time do you anticipate you will need to spend on the project?

About 50

How much time do you anticipate will be required of helpers?

About 100

Name: *James Gruel* Troop No. *32* Phone No.: *814.883.9767*

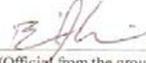
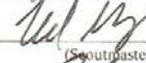
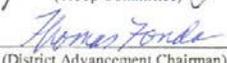
Address: *1360 Linn St. State College, PA 16803*

Date of Birth: *December 31, 1997*

Signature



We approve the concept of this Eagle service project and agree that, if properly conducted, it will meet the expected standards for such projects. This pre-approval does not imply that the progress board of review will accept the way the project is carried out. Such acceptance will be based upon the successful completion of the project in an orderly and responsible manner, and a satisfactory project report.

Date	<u>8/1/14</u>	Approved		Phone No.	<u>814-863-2000</u> X 7520
			(Official from the group benefited)		
Date	<u>8/5/14</u>	Approved		Phone No.	<u>814-883-9767</u>
			(Scoutmaster)		
Date	<u>8/28/14</u>	Approved		Phone No.	<u>814-880-806</u>
			(Troop Committee)		
Date	<u>9-2-14</u>	Approved		Phone No.	<u>738-4758</u>
			(District Advancement Chairman)		

5/08

1956 Norwood Lane
State College, PA 16803
September 3, 2014

James Graef
1360 Linn Street
State College, PA 16803

Hi James,

This letter confirms my approval of your proposed Eagle Scout project to construct a boardwalk on the Twin Bridges Trail at the Shaver's Creek Environmental Center. It will now be up to you to complete the project in such a way that it will meet the expected standards for an Eagle by following the procedures in the most recent (May 2014) edition of the *Eagle Scout Service Project Workbook*. This project should represent your best effort and require enough time and work to make it something special. Remember, the requirement emphasizes that you are to "plan, develop, and give leadership to others" in this service project. Your planning should clearly demonstrate that this is **your** project and the total working time should provide enough of an opportunity for you to effectively utilize your leadership skills.

All of the requirements for you to earn the rank of Eagle Scout, including the submission of your final project report and *Eagle Scout Rank Application*, must be completed before your 18th birthday. Remember that your report should be a "word picture" of your project for those who won't be able to observe it directly.

When you write up your detailed report after the project is completed, remember to include answers to questions such as:

1. What was the project? How did you choose it?
2. What did you do to plan and develop this project?
3. How did the project benefit others?
4. Who from the group benefited gave you guidance?
5. What steps were taken to complete the project?
6. Who helped you carry out the project?
7. How much time was spent by you and each of your helpers?
8. What materials were used and how were they acquired?
9. What were the sources and amounts of any money raised and how was the money spent?
10. What problems did you encounter during the project and how did you resolve them?

It is also helpful to include other available back-up material such as any plans, pictures, or articles about your project. And, please include a letter from the group benefited verifying that your project was completed and appreciated.

If you have any questions about this process or want any help with your final report, please contact me. I should review your final project report and your completed *Eagle Scout Rank Application* should be sent to the Scout Service Center in Reedsville for verification of your advancement record prior to your 18th birthday. Then we will be able to schedule your board of review.

Sincerely,



Tom Fonda, Chair
Advancement Committee
Nittany Mountain District
814-238-4758
tfonda@juno.com

cc: Ted Graef, Scoutmaster

Approval Letter

- Design
- Prototype
- Production
- Stainless Steel Fabrication
- Laser Cutting

GP Precision, Inc.

METAL FABRICATORS

- Welding
- Assembly
- Polishing
- Plating
- Painting
- Silk Screening

ISO 9001 : 2000

when can we work? *can't do before*

open - 7 days 10-5 weekends better - also work groups *when Brian is here*

time line?

but: Oct 18-19, *have it done?* summer, school programs - off or labor day to 1st week nov

do you need anything (names, etc.) of people working?
Not really

what natural materials
no pressure treat - pine/locust/oak/fur - coat with stuff SC has

if curves, what railing?
boardwalk railings good

min width for ADA?
6' tread - growth above as well *6" wide boards*

how high?
6" - 8" to bottom of board *plan before FL*

ramp slope? / step?
not too steep - cart, wagon, bikes, etc. 4-1 at least *next tri - 15' email - on - small - 15'*

is cement natural? - cement or stone or dry concrete

cement for footers ok, have stone as well

who will get materials?
purchasing card - heilap - tax exempt - talk for *discounts - via letter from - 50' + ramps*

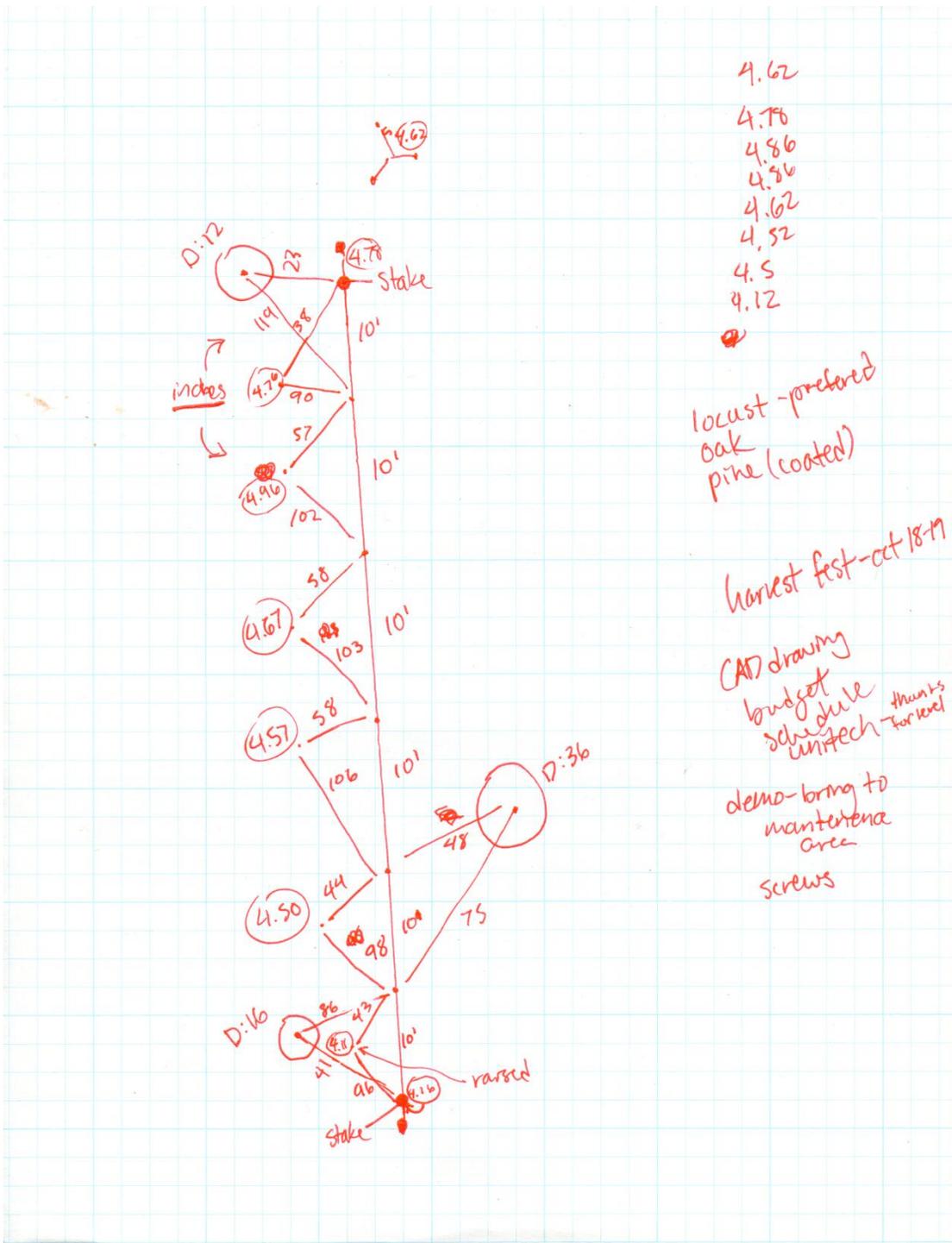
stuff here - boards trash, hardware recycle

small gap - not 1" that's there now

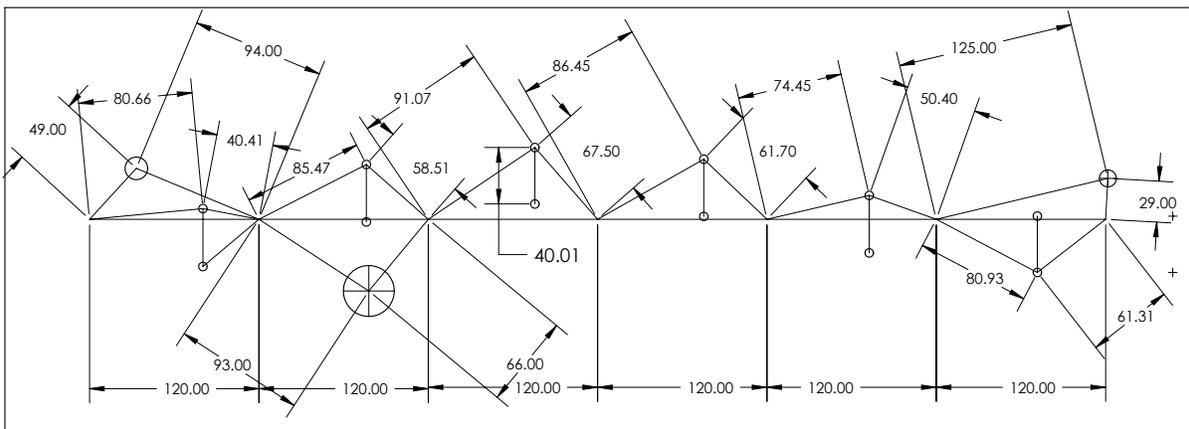
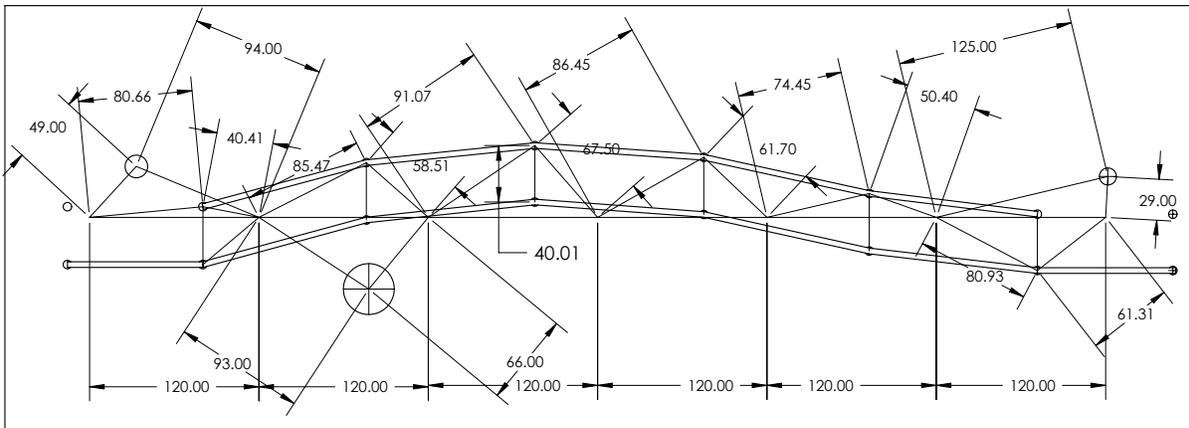
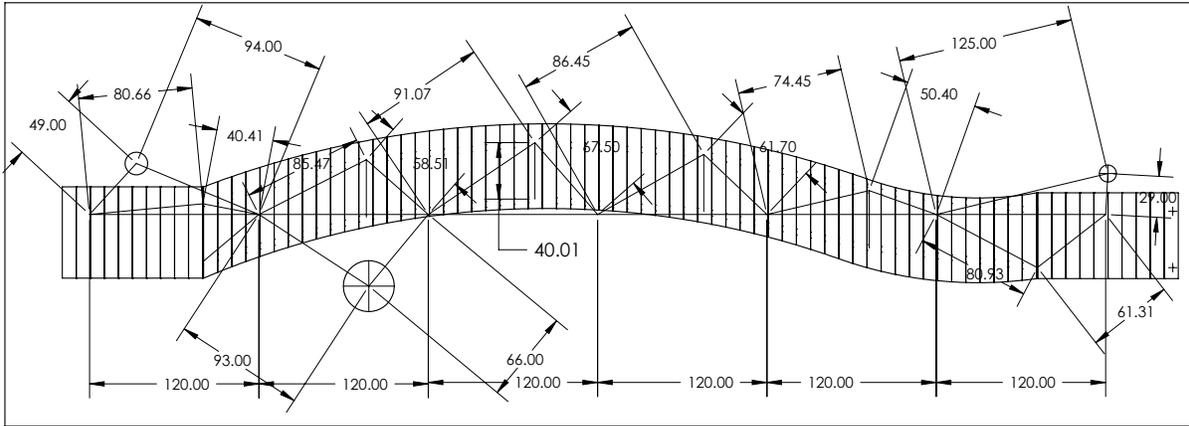
1/4
4

434 Sand Shore Road, Hackettstown, NJ 07840 Phone: (908) 850-1940 Fax: (908) 850-5926
www.gpsheetmetal.com • sales@gpsheetmetal.com

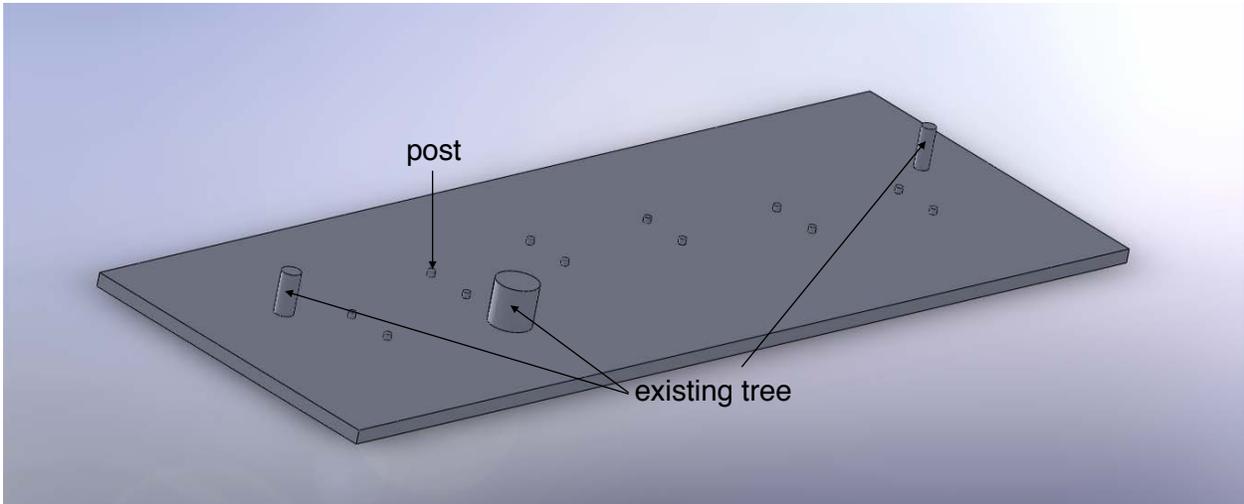
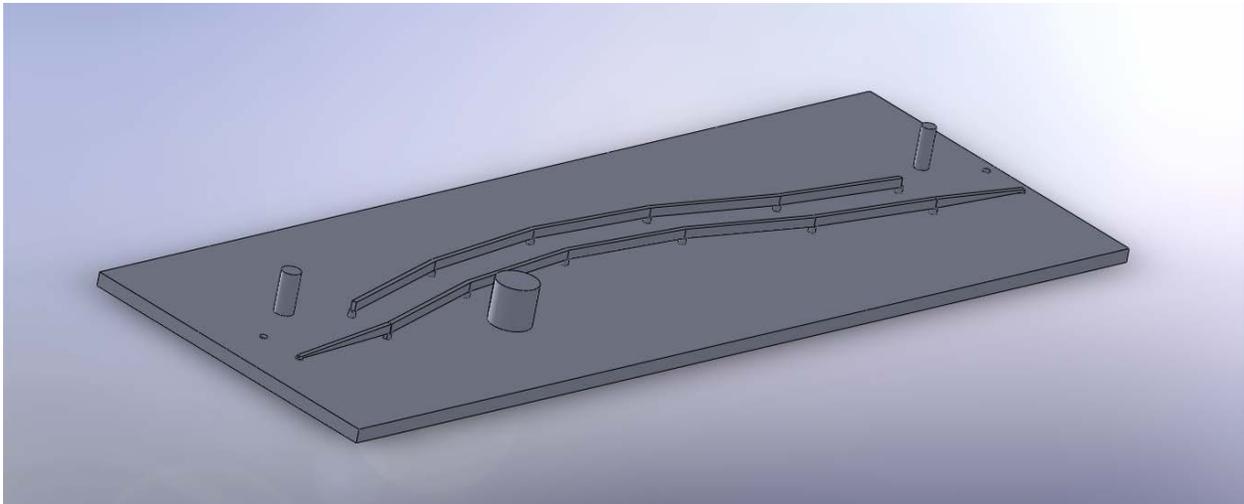
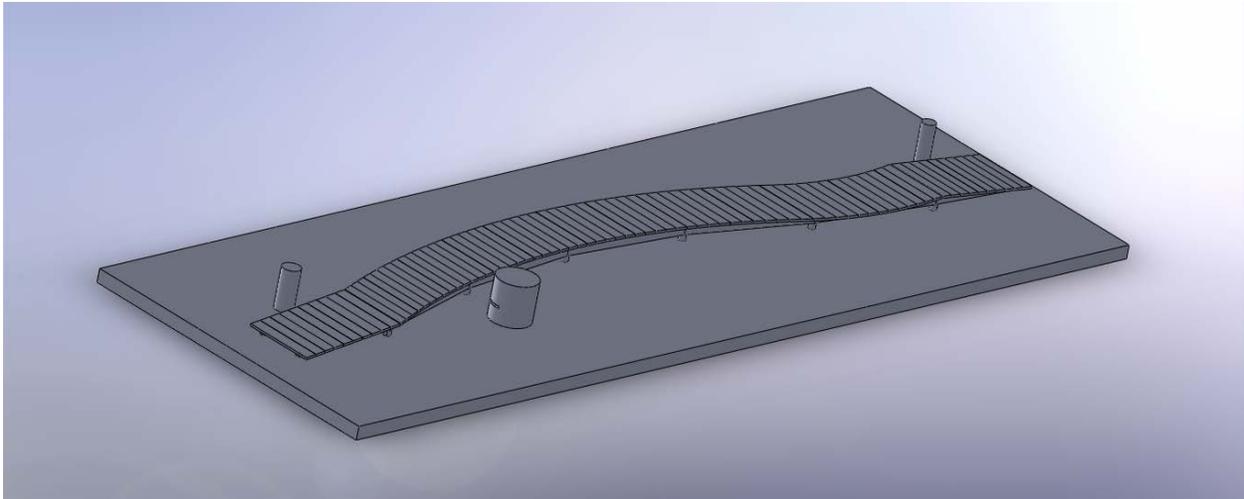
List of questions for a meeting with Mr. Sedgwick



Sketch of Measurements to potential digging sites



Technical drawings of posts, supports, and decking



Technical renderings of posts, supports, and decking



INVOICE
Kish Lumber Co., LLC

157 Sawmill Road • Belleville, Pa. 17004
Phone (717) 667-6157

Nº 5425



Date March 13, 2015

Name Shaver's Creek

P.O. # James Graef

Address _____

TOTAL PKG. _____

TOTAL SPECIES _____

TERMS: 1-1/2% per Month added after 30 Days

QUANTITY	DESCRIPTION	PRICE PER M	AMOUNT
11	4 x 8 x 10 White Oak		234.67
3	4 x 8 x 10'6"		67.20
145	2 x 6 x 5'6"		696.00

			997.87
Comments:			DISCOUNT
Received By:		Date Received:	TOTAL

Pa
Check 5677287

Invoice from Kish Lumber, the mill which provided the wood



Receipts from trips to Lowe's, including the return of concrete

Estimated		Actual		
Item	Amount	Item	Amount	
(11) 1x2x10	175.56	Wood	997.87	
(~50) 1x6x5.5	448.5	Lowe's Trip 1	115.67	
(28) 2x6x8	139.16	Lowe's Trip 2	17.62	
(7) 4x4	57.19	Lowe's Trip 3	45.44	
(14) Concrete	52.5	Food	70	approx.
(2 box) Screws	39.41			
Total	912.32	Total	1246.6	Wood and Lowe's Trip 1 payed by SCEC

Estimated and actual budget for the project

Name	Workdays						Planning									Total
	10/4/14	10/5	5/1/15	5/16	5/29	9/4	4/17/14	6/4	9/6	prep for 10/4	prep for 10/5	prep for 5/1/15	5/19	6/10	Various	
James Graef	5	5.5	4.75	7	5	5.5	1	1	4	8	6	1	2	3	8	66.75
Ted Graef	5	5.5	4.75	7	5	5	1	1	4	2	3.5		2	3	7	55.75
Mr. Brooks		4.5	2.25	4					4						3	17.75
Brian Sedgwick	1	1	1	1	1	1	0.5	1	1		1				4	13.50
Rita Graef				1	1	1				0.75				3	2	8.75
Eric Reichard	4.25	4.5		5.5	2.75	4.5										21.50
Sam Patzkowsky	2.5		2.25		2.75	4.5										12.00
Terrence Saylor			2	5	2.75											9.75
Brien McChesney				5		4.5										9.50
Nick Brooks		4.5		4												8.50
Calder Placky				5.5	2.75											8.25
Mr. Holdridge				5	2.75											7.75
Mr. Inman				5	2.75											7.75
Jamie Friedken				5												5.00
Nick Friedken				5												5.00
Tanner Holdridge				5												5.00
Greg Manno		4.5														4.50
Sam Plafcan		4.5														4.50
Daniil (Russian Exchange)	4.25															4.25
Mr. Biber			2.25		1.75											4.00
Mr. Patzkowsky					2.75											2.75
Mr. Placky					2.75											2.75
Zane Saylor					2.75											2.75
Austin Keene	2.5															2.50
Nathan Pons	2.5															2.50
Evan Barger			2.25													2.25
Nikki (Ben's girlfriend)					1.75											1.75
Gregg Allen				1												1.00
Kendall Allen				1												1.00
Milan Liu				1												1.00
Total	27	34.5	21.5	73	40.25	26	2.5	3	13	10.75	10.5	1	4	9	24	300

Service Hours

Re: Eagle Project Wood

Inbox x



Brian Sedgwick <bjs192@psu.edu>

Apr 1 ☆

Reply ▾

to me ▾

Hi James,

We received the invoice, but there is a problem. They included tax and we cannot send payment until the invoice is accurate, so we need them to send a new invoice. I have been calling and have left a few messages, but I am not getting hold of anyone. If you could try calling them as well, that would be helpful. My next step if we do not get through will be to go to the mill.

Brian

On Apr 1, 2015 9:43 PM, "GRAEF, JAMES" <jhg13@scasd.org> wrote:

Mr. Sedgwick,

Have you received an invoice for the wood from Kish Lumber in the last couple of weeks? If you have, could you send a scan of it to me for my report if possible? If you haven't I need to call them to see what's happening. As soon as I have a date for the wood delivery I will get workdays scheduled so I can finish the project.

Thanks,
James Graef

Eagle Project Boardwalk



GRAEF, JAMES <jhg13@scasd.org>

Feb 9 ☆

Reply ▾

to Brian ▾

Mr. Sedgwick,

The lumber company has asked for a 30% deposit of the \$997.87 boardwalk. They are wondering to where they should fax or invoice it. I was also wondering if I would need to do anything to make sure it is tax exempt other than let them know.

Thanks,
James Graef

Selected emails detailing the paying process for wood



Brian Sedgwick bjs192@psu.edu via gmail.com

Aug 5

Reply

to me

Hi James,

Wow! The walkway, or as I am calling it, Toad's Traverse, looks amazing! Everyone is very pleased with it. Their only "complaint" is that they wished you did another 100 feet, or the whole trail, or another one on a different trail. It's that good that it needs replicated on some other muddy trail spots. Thank you!

I know there is still some clean up to do and a last few minute details. As far as staining, the stuff we would use is Timber Oil, a water-based sealer. It helps to protect the wood and it will give it a little bit of a golden color. It will look similar to the other structures around the Center. The Boardwalk is not treated but it is made out of black locust boards, a much sturdier material and what we originally wanted for your structure. If left alone, your oak boards will not match the look or the longevity of the Boardwalk. I think a coat of the timber oil will help protect it for two years and we'll need to reapply .

I have attached your letter. please read it over and let me know if everything is there that you need.

Let me know when you are coming back out so we can set up a day to apply the timber oil.

Thanks again, James. Excellent work!

Brian

On Wed, Jul 22, 2015 at 11:24 AM GRAEF, JAMES <jhg13@scasd.org> wrote:

Mr. Sedgwick,

In my previous workdays we have almost finished the boardwalk. The curve has been cut and we added two benches using extra wood at the end of the last workday. I hope you have been down to see the progress.

We still have to cut the ends of the boards at the bottom of the ramp and cut small curves where trees are. We were also planning on routing the edges of the boardwalk for a smoother look. The people at the mill said that each board would shrink over time by 3/8 inches and so we left them touching when we placed them so that they would grow apart.

Previously we had discussed staining the wood. Seeing the wood on the boardwalk now, I think that the wood looks very good without a stain and that a stain might make it look artificial. What are your thoughts on not staining the boardwalk?

Also at some point, could you send me the letter that certifies that I did the project for my report?

Thanks,
James Graef

Selected email showing thoughts from Shaver's Creek



3400 Discovery Road
Petersburg, PA 16669

814-863-2000
www.shaverscreek.org

Wednesday, August 5, 2015

RE: James Graef's Eagle Project

To Whom It May Concern:

I am pleased to announce that James Graef has successfully completed his Eagle Project at Shaver's Creek Environmental Center as of August 5, 2015. James designed a 50-foot boardwalk to span an area of trail that saw continuous flooding and drainage issues. The section of trail is located on our Twin Bridges Trail, a path used by visitors to travel down to the creek and enjoy the wildlife in the area.

James, along with scouts from his troop, did an excellent job of installing cement footers to support the oak walkway, curving the planked walkway to align with the trail, and building ramps at either end to support strollers and bikes. With extra wood on hand, James added 2 benches along the walkway. Being built out of local oak timbers, this boardwalk fits in with Shaver's Creek's existing designs and our mission to be more sustainable upon the earth.

The staff members of Shaver's Creek are very happy with James' work and are enjoying the mud-free trail. I am especially proud of James for working through the entire process, from design, to researching, to gathering materials and building and installation. He set a timeline and finished on-schedule, and the results are terrific.

If you have any questions, please call me at 814-863-2000, ext. 7520 or by email at bjs192@psu.edu.

Sincerely,

Brian J. Sedgwick
SCEC Grounds & Facility Coordinator

Verification Letter