

I'VE BEEN WORKING ON THE RAILROAD: A DIGITAL RECONSTRUCTION OF
A SITE OF LABOR ON THE SOUTHERN PACIFIC RAILROAD

by

Madelyn Mezzell

HONORS THESIS

Submitted to Texas State University
in partial fulfillment
of the requirements for
graduation in the Honors College
December 2022

Thesis Supervisor:

David Kilby

Second Reader:

Louie Valencia

COPYRIGHT

by

Madelyn Mezzell

2023

ACKNOWLEDGEMENTS

I would like to thank Dr. Kilby and Dr. Valencia for their guidance and support throughout this process and the entirety of my time here at Texas State. I am extremely grateful to Vicky and Jerod Roberts for their wonderful help in creating the reconstruction. I must also thank Amy Reid and the Center for Archaeological Studies for allowing me to inventory and analyze the collection. I would also like to express my gratitude to Katie Wilson and everyone at SHUMLA for welcoming me and allowing me to come on the Vinegarroon Trek. Especially, I would like to thank Raymond Skiles. This project would not have been possible without him inviting me into his home and allowing me to dive into this special history and place. Finally, I would like to thank my family and friends for their love and support. I am extremely lucky to have so many people helping me along this process. I am forever grateful.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
ABSTRACT	viii
CHAPTER	
I. INTRODUCTION.....	1
II. BACKGROUND.....	4
III. THEORHETICAL BASIS.....	11
IV. METHODOLOGY	13
A. Reconstruction.....	13
B. Inventorying Artifacts: Center for Archaeological Studies.....	16
V. CONCLUSION.....	19
APPENDIX SECTION.....	24
REFERENCES	35

LIST OF TABLES

Table	Page
1. ARTIFACT CATEGORIES AND POSSIBLE PERIOD OF USE	22
2. SKILES HISTORIC RAILROAD COLLECTION INVENTORY	24

LIST OF FIGURES

Figure	Page
1. Quadrangle map of Langtry, Texas.	4
2. Map of original railroad routes and current route	6
3. Drill holes in the landscape near the bridge abutment	7
4. Rock wedger from Skiles Historic Railroad Collection	8
5. “W B” carved into stone on bridge abutment	9
6. “T” carved into stone on bridge abutment	22

ABSTRACT

This thesis explores the history and archaeology of the Lower Pecos stretch of the Southern Pacific Railroad, specifically focusing on a bridge abutment along an abandoned section of track located near the town of Langtry, Texas. There have been archaeological investigations into the camp life of the different railroad labor groups, which were often made up of Chinese immigrant workers. However, less is known about the conditions of labor at the work sites and craftsmanship that went into the construction of railroad features. By analyzing the abutment through these lenses, I contribute to a greater understanding of how skilled labor was conducted in a time in which industrialism was becoming prominent. I use photogrammetry and computer graphics software (SfM) to create a 3-D, digital reconstruction of the abutment (National Oceanic and Atmospheric Administration). Additionally, I inventory and analyze the railroad artifacts, collected from the land that the abutment is on, to increase comprehension about what tools and objects the workers were utilizing during construction. The reconstruction of the abutment and analysis of artifacts, coupled with literary research, will be combined into an online platform meant to inform on the experiences of laborers and what can be learned from examining the product of their labor (<https://arcg.is/CKCXf>; see link also in appendix). Because the creation of the railroad and use of largely immigrant labor are intertwined with the diaspora of immigrants across the American West, studying a site of labor can be indicative of working-class treatment and its intersection with issues of immigration and ethnicity.

I. INTRODUCTION

Popular culture has always been fascinated with the American west. From ideas of Manifest Destiny to the “Wild West,” this fascination with the rugged landscape has shaped the development of post-colonial America. Uniting the West and the East, the creation of the Transcontinental railroad made the final frontier of American landscape accessible to commerce and settlers from the East. For the first time, people, goods, and ideas could travel easily across the country. As such a vital component of American history, the development of the railroad has been the focus of much study but until recently, the focus of this history has been on the railroad itself without much consideration for what made it possible: the workers that constructed it (McVarish 2008; Nock 1981; Shackel 2010). With a growing focus in both history and archaeology in investigating the lives of the working class, immigrants, and others of minority status in the American West, the construction of railroad has begun to be investigated (Dixon 2014:178).

The Southern Pacific Railroad Company – instrumental in uniting lines from Texas and California – employed almost exclusively Chinese immigrant laborers (Voss 2015:12). Regarded for their work ethic through strenuous and dangerous conditions (as well as that companies paid them half the amount as their white counterparts), these men dominated the labor force within the Southern Pacific Railroad Company (Turpin 1995:39). Despite this, their contribution to the development of the railroad has been excluded from historical narratives. However, in recent years, this standard has begun to shift. Stanford University established the Chinese Railroad Workers in North America Project (CRWNAP) in 2012, which houses a large online database of academic papers,

oral history interviews, information about previous investigations, and pictures and information about archaeological artifacts associated with Chinese laborers of the Transcontinental Railroad. This work represents a growing shift to not only acknowledging these workers' existence but trying to understand their experiences.

Archaeological investigations of sites along the Southern Pacific railroad have taken place, but most of them have been centered around residential camp sites or sites along the original Transcontinental Railroad (Briggs 1974; Buckles 1983; Chace and Evans 1969; Cleveland 1983; Dibble and Prewitt 1967; Gardner et al. 2002; MacNaughton 2012; Morris 1994; Polk and Simmons Johnson 2012; Turpin 1995; Wegars and Sprague 1981). Sites of labor have not been examined to the same effect. This, combined with a growing interest in digital humanities work, is why this project is being undertaken.

For this project, a site of labor and the work of the skilled workers that constructed it is studied through the creation of an SfM model of a bridge abutment. As a part of an abandoned section of the Southern Pacific Railroad, this feature offers the unique opportunity to analyze a product of labor as close to its original form as possible. By completing a digital reconstruction of the abutment, I seek to understand and learn about the conditions of labor through analyzing the product of that labor. The model will allow for analysis of the feature without having to be in the physical location, and the reconstruction preserves the architecture. By looking at the details of the abutment at any perspective, this reconstruction allows for greater understanding in the artisanal skill and sheer scale of the feature. In addition, the artifacts previously collected on the land around the site – currently housed at the Center for Archaeological Studies at Texas State

University – are inventoried to gain a greater comprehension of the objects that the workers were living and working with. This context will allow for possible specific labor groups to be identified. The reconstruction and analysis of the supplemental artifacts are combined into an online, accessible platform (utilizing ArcGIS online) in which people can interact with the reconstruction and gain a greater comprehension of the experiences of the workers and the craftsmanship needed to build the railroad.

II. BACKGROUND

Tucked away in the small town of Langtry, Texas, this abutment – not even visible from the road – stands unassuming. However, when one approaches the large structure, they cannot help but be impressed by the scale and skill that went into making this. Set against a rugged landscape, it seems almost impossible that people would be able to survive out there, much less build giant stone structures and entire rail lines. The mere existence of the structure, some 150 years after its construction, is a testament to those that built it.

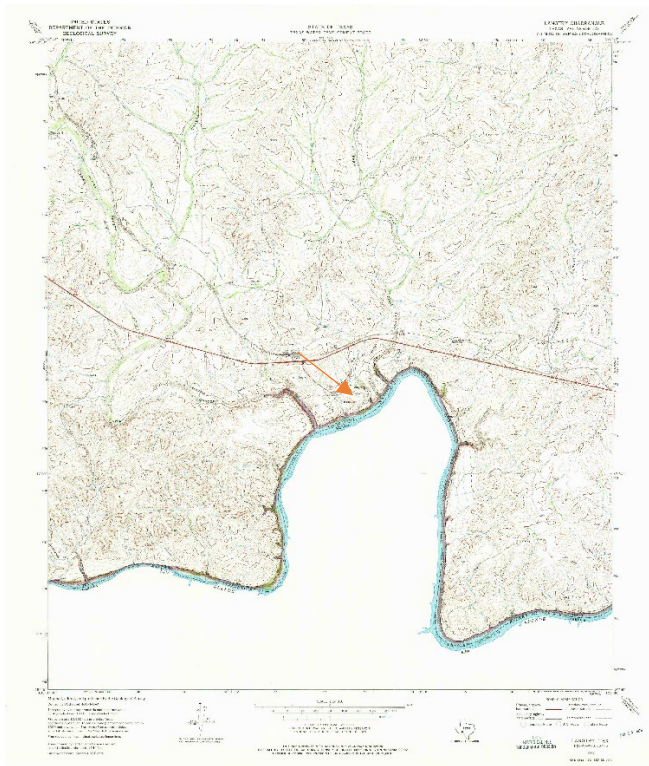


FIGURE 1. Quadrangle map of Langtry, Texas. (Courtesy of USGS)

For decades, plans had been made for the creation of a rail line extending from Texas, with larger goals of connecting the port of New Orleans to California and connecting these cities by rail for the first time. Issues – such as the American Civil War – had prevented this from occurring, but by 1880, the state and federal governments were

ready to make the railroad happen. The state legislature was offering “sixteen sections of land for each mile of the railroad built,” and companies were ready to jump on this offer (Skiles 1996:61). To maximize profits, the Southern Pacific Railroad Company and Galveston, Harrisburg, and San Antonio Railroad (G. H. & S. A.) agreed to build lines with the goal of connecting them into one transcontinental line. Southern Pacific began building east from El Paso, utilizing a crew of experienced Chinese railroad workers, and G. H. & S. A. would work west from San Antonio, working with a largely Irish – but more ethnically mixed – crew (Skiles 1996:63).

It was decided that the space in which these two sections of line would join would be near the Pecos River at a location referred to as the “Helmet” (Morrill and Wilson 1971:12). The main difficulty in constructing this is that the Pecos River stood in the way. 321 feet tall, the canyon that the river set in was too high and wide for technologies of the time to be able to build a bridge, so the railroad company was forced to go around it (Morrill and Wilson 1971:12). Thus, a stretch of track, known as the “Loop-Line,” was constructed from the West to go alongside the Rio Grande River, maintaining its elevation as much as possible (Morrill and Wilson 1971:34). Additionally, the stretch of track in that went through Langtry (which the abutment is on) was an instrumental, winding piece of track. There was an “abundance of water” in a “deep canyon running into the Rio Grande just west” of Langtry (Skiles 1996:78). Because steam engines needed tremendous amounts of water to run, this was to be a very important stop along the line.

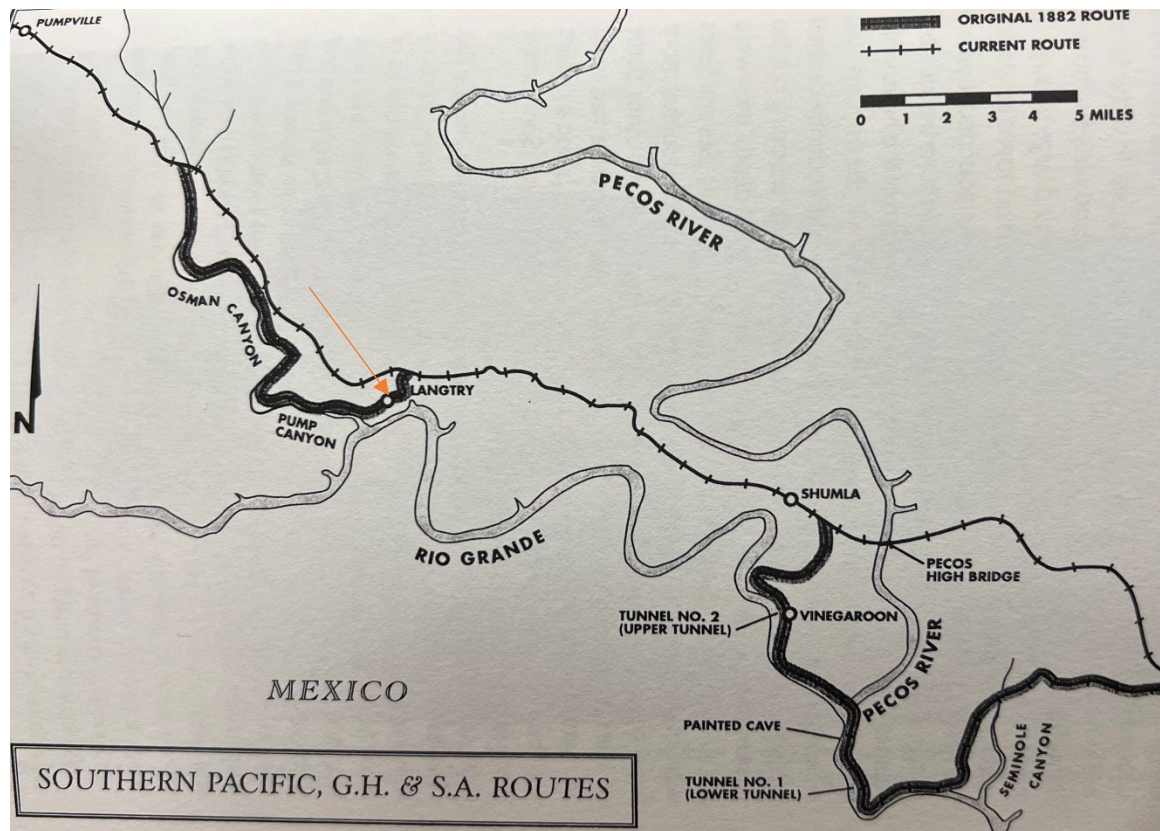


FIGURE 2. Map of original railroad routes and current route. (Skiles 1996:65)

On January 12th, 1883, the two stretches of the rail met along this loop, and the occasion was allegedly marked with the hammering of a silver spike into the last rail (Morrill and Wilson 1971:13). However, only ten years later, Southern Pacific company now had the technology and funds to construct a bridge to cross the Pecos, and because these winding lines were slower and longer, they decided it would be wise to create the bridge and shorten the line. As such, the Pecos High Bridge – the highest bridge in America at the time – was built, and the lines were abandoned (Skiles 1996:87).

The stretch of track that the abutment resides on continued running for a longer period than the Loop-Line, but it was also abandoned. In 1925, the Southern Pacific Railroad Company began building a track north of town to “shorten its route and eliminate bridges” (Skiles 1996:191). By doing this, the section of track in Langtry was

discarded as the line shorted by 4.5 miles (Turpin 1995:9). The abandonment is what makes the abutment such a valuable feature to study. Even though it was in use for 50 years, the stone structure would likely have held up well over time (considering the durability of material); it – except for the part that have been stripped from the line – ought to be close to its original form.

To construct this section of the line, a great amount of leveling had to be completed, which was extremely difficult given the terrain. Hills were cleared, tunnels were dug, and bridges were built, and almost all this work was completed by hand (Skiles 1996:66). Bridges, including the abutment, were constructed by skilled stonemasons and quarrymen. They took much of the limestone from the surrounding area instead of sourcing it from outside the Pecos area, and this is evidenced by the drill marks left in the rock shelves in the area surrounding the abutment.



FIGURE 3. Drill holes in the landscape near the bridge abutment. (Photo by author, 2022; courtesy of Raymond Skiles.)

This sourcing would necessitate quarrymen to drill multiple holes in a line and then utilize iron wedges into the holes, and the pressure from these wedges would be enough to break large blocks of the rock loose (Skiles 1996:66).



FIGURE 4. Rock wedger from Skiles Historic Railroad Collection (Photo by author, 2022; courtesy of the Center for Archaeological Studies, Texas State University, San Marcos, TX.)

The blocks of stone would then be reduced and fitted to the proper size. This work took great skill – with these blocks of stone often not needing mortar to fit together, and the stonemasons took great pride in their work – often inscribing their initials into the blocks (Skiles 1996:66). Despite strong indication of a largely Chinese workforce, this could be indicative that the quarry masons were European, but without confidently knowing their origin, there is no way to know for sure what they mean.



FIGURE 5: “W B” carved into stone on bridge abutment. (Photo by author, 2022; courtesy of Raymond Skiles.)

Construction of this feature took great artisanship, and most of the people laboring on it were seasoned Chinese immigrant workers. Despite not know which exact men carved their initials onto the blocks of stone, the documented evidence that this portion of the line was built by the Southern Pacific company coming from El Paso – in which 5,000 of the 6,000 workers were Chinese – and the presence of distinctly Chinese artifacts found in the area around the site is indicative of the presence of Chinese labor on this abutment (Voss 2015:12). These Chinese workers were viewed as valuable due to their perceived work ethic and that they could be paid less than their white colleagues (Voss 2015:18). Chinese presence is most obviously felt in the artifact scatter across the land, especially at camp sites. Artifacts such as woks, opium pipes, Chinese coins, and blue-on-white decorative bowls are indicative of a strong cultural existence. However, the location of the sites in West Texas and interaction of the two labor groups along the

Pecos demonstrates a blending of cultures, with a recorded large amount of distinctly American products and European, Mexican, and American laborers.

There were smaller residential camps scattered across the rail line, such as one in Langtry. However, there was one “tent city” in the area, known as Vinegarroon, that served as a central hub for all the workers during the construction (Skiles 1996:70). This camp, founded by Judge Roy Bean, boasted stacked stone structures that served as barber shops, saloons, and stores – everything that a city would need. Like other residential sites along the railroad, it was abandoned soon after the completion of the line. Because of the sheer number of artifacts left abandoned, residential camps such as this are great sources of understanding the daily lives of workers. Sources, such as the CRWNAP, have often focused on these sites to gain a greater understanding of the Chinese labor experience. The abutment is indicative of the skilled, immigrant labor needed to connect the East and West. Focusing on a labor site, this project seeks to add further understanding to the study of railroad workers by providing further context to previous investigations of labor camps.

III. THEORETICAL BASIS

Because there is no way to separate the intersections of identity in the creation of the railroad and settlement of the West, this project must be approached with the same considerations. By focusing on a site of labor, the opportunity to examine working class conditions and immigration through transnational and industrial capitalist lenses is clear. The creation of the railroad and the use of immigrant labor are intertwined with the rise of the American West and of industrial capitalist society, two approaches that have potential with understanding the historical archaeologies of the American West (Dixon 2014).

The railroad utterly transformed the American landscape. Creating the railroad transformed the physical landscape, carving out a place in the environment. Additionally, the railroad changed the way goods, ideas, and people were dispersed throughout the country. For the first time, America was truly interconnected. This, coupled with the increase in immigration, meant that the late 1800s were an incredibly important time for transnational immigration, and the status of the railroad workers as primarily immigrants are indicative of this. These laborers were not only a part of the working class, but they were also immigrants. Consideration of their status cannot be ignored when considering their experiences. The nature of work camps and transient jobs is inherently connected with experiences of immigration in the United States, with “most new migrants and immigrants to the American West” having participated in work camps (Voss 2015:15).

Establishment of the railroad is also intrinsically connected to the rise of industrial capitalism. Advancements in technologies allowed for the transcontinental railroads to be built, and in turn, they allowed for goods and industrialization to spread across the

country. However, it is vital to consider that despite the shifts of this time, the railroad was primarily constructed by hand through skilled labor. This dichotomy is incredibly interesting to consider. This transportation system allowed for the capitalist system to flourish, and it was built by immigrants.

The issue with examining a system such as the railroad from an historical archaeology perspective is that it is inherently site based, and in contrast the railroad is incredibly mobile. The labor and function of the railroad is constantly changing, and although mobility has always characterized society, but in the modern era, especially with topics such as transportation, the scale of mobility can potentially be too much for historical methods (Voss 2016:147). The railroad is a dynamic entity. It is:

more than a right-of-way and steel rails; more than engines, cars, depots, telegraph-lines, terminals and other paraphernalia making up the physical plant. It is an activity; a going concern, an organization; a living, breathing, palpitating thing – with policies, traditions, intuitions, methods, objectives and ideals – all rooted in its history, growth and development – the composite of the efforts, hopes, plans, experiences, failures and successes of a host – living and dead (Morrill and Wilson 1971:5)!

IV. METHODOLOGY

The purpose of this project is to inform on the importance of skilled immigrant labor and the conditions of construction by looking at the product of that labor. This is accomplished in two ways. First, to reconstruct the bridge abutment through photogrammetric and 3-D modeling. Secondly, (to provide context for the labor conditions and the people constructing the railroad) supplemental inventory and analysis of the Skiles' collection of railroad artifacts is completed at CAS. These two parts are then combined into an online, accessible platform. The reconstruction allows for viewers to see the architecture and craftsmanship of the abutment in different perspectives, and the discussion of the artifacts shows what labor groups constructed the abutment and what products characterized their time.

A. Reconstruction

The most effective way to complete this task appears to be to digitally reconstruct the abutment and place it into a platform that people can easily access. Photogrammetric methods, to create 3-dimensional, realistic models, are utilized (National Oceanic and Atmospheric Administration). Travel out to the site is necessary to capture photographs covering the entire structure. These photographs are then plugged into a software – called Agisoft – that will render them back together, culminating in a digital, SfM model of reconstruction.

In order to achieve this, trips out to Langtry and the Lower Pecos region were critical. An initial trip was untaken in mid-September to see the abutment and meet Raymond Skiles. Raymond is the owner of the land that the abutment is on, and his family has always taken great interest in the history of this area, especially the railroad.

They have done extensive research on Langtry and the railroad. His father, Jack Skiles, wrote the book *Judge Roy Bean Country*, which details the construction of the railroad and its operation. During this trip, we discussed his family's ties to the land and the history of the town took place, and he showed me the old path of the railroad, seeing the original bed and other features (such as culverts). This allowed for greater context of the path of this rail line and how Langtry was born as a water depot along the line. Being able to experience the abutment in its landscape was utterly transformative, for it brought the landscape to life. Because others are not afforded the same opportunity to see the site in person, this trip was critical to me for reconfirming the importance of the reconstruction. It was the best way for others to visualize conditions along this section of the railroad.

A second trip was necessary to capture the data needed to complete the reconstruction. Prior to this trip, I acquired the cameras from the archaeology department, and instructions on how to capture the images were carried out by Vicky Roberts and Jerod Roberts. Along with the capturing session, the trip was also an opportunity to attend a trek, led by Shumla, to the Vinegarroon residential camp site. Despite being only a small portion of the camp that once housed 4,000 people, stacked stone structures and the sheer number of debris left of the ground demonstrate the operation's scale.

To capture the necessary pictures, every section of the abutment needed to be documented. The data collection was carried out in a systematic way, with two-thirds overlap between pictures and a logical progression to the photos. This was done for the program to effectively compile the images. To ensure that at least one half of the abutments is thoroughly captured, a good portion of the time was dedicated to the eastern

abutment. Along with capturing the broad scale of the abutment, the details of the structure – such as the letters incised in the stone and drill holes – were focused on. Additional photos of these details were taken by capturing the area around it at the same distance as the rest of the photographs then taking equal steps forward and photographing the same area at these different depths. This allows for as much detail to be gathered as needed while maintaining proportion within the abutment. Following this, the other abutment was captured. To get the two halves of the abutment in their environment, the area ground in between the abutments and surrounding them was also photographed. In total, this process took approximately five hours.

There were unforeseen difficulties in gathering this data. The thick vegetation surrounding the base of the structures made documenting those sections extremely difficult. Additionally, the goal was to get as perpendicular shots of the abutment as possible, but because of the height of the abutment, this proved to be impossible. The terrain surrounding the structures was too uneven for a ladder to have been effective in solving this issue. As little of an angle on the shots of the top of the structures was attempted, including climbing onto the opposite abutment to document the top of the other one, but they were not as perpendicular as the photographs of the lower section. Very basic measurements of the abutment were attempted, but due to constraints, they are not exact. However, they ought to have still assisted the program in understanding the scale.

Once the photographs were captured, it was time to run them through the modeling software. I used Agisoft Metashape, a photogrammetric modeling software to configure the reconstruction. The images were taken off the camera and uploaded onto

one of the computers at Texas State University's Archaeology Laboratory. I separated the images into three sections: abutment left, abutment right, and ground layer. This was done to upload the images into different "chunks," to gauge what section aligns the best. With the aid of Vicky Roberts, I uploaded the different chunks and begin the process of aligning the photographs.

After the initial alignment, I determined that the section with the highest likelihood of a successful reconstruction is the left abutment, so I decided to only continue with that section. Following this, there were data points that have not aligned properly, and I removed those with the selection tool and the delete button – being cautious to not remove too much. Alignment continued with the gradual selection and optimization process, which are two more settings to run to better the alignment process. At this point, the reconstruction was still largely data points with no clear image of the abutment, so the next step was to build the dense cloud. The dense cloud will "move as many pixels as it can into the 3D space," and because of that, this process took the most amount of time to run (Koenig and Mckee 10). Since the model following the dense cloud process will form a more concrete image, this was another time to delete any unwanted or incorrect pixels. Using this point, the solid model was built by running the build mesh process. This model was not anchored in the environment, so ground control points for GPS were not inputted. In order to make the model realistic, the final step was to create a 3D texture, which is done with the build texture feature. At the end of this process, there is a moveable, 3D, and realistic model of the bridge abutment.

B. Inventorying Artifacts: Center for Archaeological Studies

As these trips are taking place, additional work on the project was being

completed at the Center for Archaeological Studies (CAS). The Skiles family had donated a portion of the historic artifacts they found on their railroad-related land. These artifacts had not been properly inventoried, tagged, and were still in the transportation boxes. Throughout the semester, I inventoried and rehoused the collection. By doing this, analysis and understanding of the types of artifacts used around this section of the rail line was possible and, I helped CAS bring this collection's storage to curatorial standards.

There had been a very basic inventory of the artifacts, but it was not complete. Additionally, there were no tags made for the artifacts, and they were not put into curation boxes and bags. Having already volunteered for CAS for a semester, I was aware of the procedures for inventorying artifacts and was able to get started on the collection swiftly. Each specimen must be given a category, object name, description, count, and any additional information must also be documented in a catalog sheet. In addition to this inventory, each specimen is also given a tag with the same information to be kept with the artifacts. Because the artifacts in this collection were primarily stored in Ziploc bags or wrapped in tissue paper, they needed to be placed in heavy duty bags that match curatorial standards. This was done to ensure that the artifacts are not damaged and preserve properly.

The primary function of the catalog is to keep an inventory of what artifacts are in the collection, how they are housed, and their conditions (see Appendix). To accomplish this, I created an excel spreadsheet with different categories, and I filled out the information for each artifact. They already had temporary accession numbers, but they needed to be categorized, given object names, described, and counted. Additionally, any

additional information written on pieces of paper bagged with the objects and any note about the conditions of the artifacts were included in the notes column. This is kept in CAS's online storage, so if a researcher is wanting to pull and look at a particular artifact, they can easily locate it and see a description of the object.

Following the completion of these two parts, I compiled the research and the reconstruction into ArcGIS online, mapping software that allows for one to combine different forms of media into an online platform. By doing this, I synthesize my work into an accessible form. The reconstruction is the central component of this platform, but I also used background research and images of artifacts and their descriptions to contextualize the abutment. This is all done in order to help people understand why the abutment was built and why it is important to study skilled labor and analyze its product.

V. CONCLUSION

The process of recording and reconstructing this abutment is both difficult and gratifying. Although I initially wanted to create a model of both sides of the abutment, choosing to focus on one of them allows me to really ensure that the model fits the standard that I want. Despite having never created a 3D model or worked in photogrammetry, the finished product captures the details and scale of the abutment.

Inventorying the artifacts is very insightful as to what people would have constructed the abutment and how they lived and worked. Prior to the process, I considered what qualifications and assumptions I would need to make about the collection I was viewing. Because I know that the rail line was in use for approximately ten years, I cannot assume that all the artifacts are from the period of construction. However, the objects that can be identified as tools for the construction and upkeep of the railroad (such as drill wedgers or spikes) still have importance to my line of inquiry, for they are indicative of labor. Additionally, any artifacts that are distinctly Chinese in origin can be surmised to be from the period of construction. The Chinese laborers disbanded and left the rail line soon after its completion, so these artifacts ought to be not from the time of use (Skiles 1996:78). I use these assumptions to characterize my analysis of the artifacts. With that, I found that a large amount of the artifacts can be categorized as Chinese. There are opium pipe fragments with Chinese characters inscribed, rice bowl sherds with Chinese decorative style (some also with possible Chinese characters), and Chinese coins – as well as others. This coincides with the historical documentation of the Southern Pacific Railroad Company employing primarily Chinese laborers, and that they most likely worked on this specific feature. Drill wedges add further evidence to that the workers used local sources for stone, which is

emphasized by the drill marks in the landscape directly by the abutment. Spikes are other tools also can be attributed with the use of hand tools and small-scale machinery, indicative of skilled labor.

TABLE 1

ARTIFACT CATEGORIES AND POSSIBLE PERIOD OF USE

Category	Object Name	Description	Count	Period of Construction (yes, no, or maybe)
Ceramic	Historic sherd, decorated	fragments of Chinese rice bowls	16	yes
Ceramic	Historic sherd, decorated	fragments of opium pipes	2	yes
Metal	Coin	coins with Chinese characters	2	yes
Metal	Opium box fragments	Chinese characters inscribed	4	yes
Glass	Ink bottle	clear glass bottle with Chinese characters	1	yes
Metal	Miscellaneous hardware		10	maybe
Metal	Ammunition casing	shell casings	2	maybe
Ceramic	Historic sherd, undecorated	various sherds	9	maybe
Ceramic	Historic tile fragment, decorated		2	maybe
Metal	Button	various buttons	4	maybe
Metal	Miscellaneous hardware	various tin lids and cans	10	maybe
Metal	Nail	various nails	5	maybe
Metal	Spike	railroad spike	1	maybe
Metal	Spike removers	large and small removers	2	maybe
Glass	Bottle	ink and medicine bottles	4	maybe
Metal, glass	Light fixture	various railroad lights	9	no
Ceramic	Historic sherd, decorated	"SOUTHERN PACIFIC LINES" logo	1	no
Metal	Lock	railroad locks	5	no

Metal	Livestock marker	marker to indicate livestock by track	1	no
Metal	Token	SP railroad token	1	no
Faunal	Feather	feather in bag with ink bottle	1	no
Metal, wood, plastic	Telegraph machine		1	no

Going into the project, I also sought to be able to identify what the initials on the stone blocks of the abutments meant. They are all English letters, so I hoped to be able to determine if they proved the existence of another labor group than Chinese workers. However, I could not find any mention of what carvings like this meant in the research that I did. As such, I cannot argue that they are maker's marks, code for stonemasonry, or any other possibility. Despite this, these letters are still notable to this project, and discovering their meaning merits further research. The goal for this project is to shed light on skilled labor and the work/conditions of these laborers, and these carvings are incredibly indicative of that. This abutment was carved and built by skilled craftsmen, and regardless of meaning, the letters represent the individual workers. They carved their marks into stone, and their work stands to this day.



FIGURE 6: “T” carved into bridge abutment (Photo by author, courtesy of Raymond Skiles)

Combining all these aspects into one final product allows for a complete synthesis of the project. It is incredibly important to make history and archaeology accessible, especially when investigating social issues and underrepresented histories, and that is why the final product is online. Because the point of the project is to show – by having the reconstruction – a product of artisanal work and demonstrate why it is important and what can be gleaned from it, the reconstruction needs to be accessible. Providing context through historical research and the artifacts allows for those looking at the reconstruction to understand who made it and why the abutment exists as it does.

Although this project sets a solid foundation of research, it is only a start. There are so many additional lines of inquiry that ought to be studied. Specifically, the carved letters warrant further study than what was possible within the scope of the project. After inventorying the “railroad” collection, I have also begun inventorying the more general

“historic” Skiles collection at CAS. I have only worked through the first box of this collection, but within that, I have found more opium pipe and rice bowl fragments, indicating that this collection also contains railroad artifacts. A further project could work to determine what of this collection is from a railroad context and work to combine these collections. Beyond this specific abutment, there are other sites within the Skiles land and in this region that would be incredibly insightful to understanding the railroad, the expansion of the American West, and how labor intersects with class and immigration.

With all of these future possibilities, this project can serve as an important resource. The primary goal is to explore the archaeology and history of this site and the lives of the people that created it, but it also serves as a way for the public to learn about this area and researchers to have the ability to see a site without having to physically go to it. This reconstruction also serves to record the abutment as an archaeological site, documenting the architecture and artifacts in a way that withstands the passage of time. Prior to this project, I had no depth of knowledge about the railroad or about digital humanities and the benefits of online models. I have developed an incredible foundation for research inquiry, modeling, and have become truly passionate about the history of the workers that built the railroad. Despite being a largely unassuming bridge abutment in a rural area of West Texas, this abutment is a testament to those that made it, still standing approximately 100 years after its abandonment. Because of the work of these largely minority, immigrant workers, the American landscape and experience was utterly transformed, and their lives and labor ought to be acknowledged. This project, in a small way, achieves this goal.

APPENDIX

Link to online platform: <https://arcg.is/CKCXf>

Link to reconstruction (Sketchfab): <https://skfb.ly/oATtA>

TABLE 2

SKILES HISTORIC RAILROAD COLLECTION INVENTORY

Temporary Artifact #	Material Class	Object Name	Description	Count	Box #	Notes
1	Metal	Miscellaneous hardware	harmonica plate ? Flat piece with rectangular holes	1	RR Box #1	
2	Glass	Bottle	medicine bottles; one with residue inside	3	RR Box #1	paper with: " <u>MEDICINE BOTTLES</u> CONTAINED PILLS OR POWDER." inside bag
4	Ceramic	Historic fragment, decorated	piece of opium pipe ? Decorated with chinese characters	1	RR Box #1	paper with: " <u>PORTION OF AN OPIUM PIPE</u> FROM CHINESE RAILROAD CAMP WEST OF LANGTRY" inside bag
3	Ceramic	Historic fragment, decorated	incised fragment of opium pipe ?	1	RR Box #1	paper with: " <u>PORTION OF AN OPIUM PIPE</u> FROM CHINESE RAILROAD CAMP WEST OF LANGTRY" inside bag

5	Metal	Coin	coins with chinese characters; one attached to metal strip with loop	2	RR Box #1	paper with: " <u>CHINESE COINS</u> " inside bag
6	Ceramic	Historic tile fragment, decorated	piece of tile decorated with leaf and line pattern	1	RR Box #1	paper with: " <u>PIECES OF GLASS FROM THE TRAIN WRECK AT GLASS CURVE IN 1899 ONE MILE EAST OF LANGTRY</u> " inside bag
6	Ceramic	Historic tile fragment, undecorated	white tile piece and green tile piece	2	RR Box #1	paper with: " <u>PIECES OF GLASS FROM THE TRAIN WRECK AT GLASS CURVE IN 1899 ONE MILE EAST OF LANGTRY</u> " inside bag
7	Glass	Bottle	ink ? Bottle with chinese characters and leaf decoration on bottle	1	RR Box #1	paper with: " <u>CHINESE INK BOTTLE</u> " inside bag
8	Ceramic	Historic bowl, decorated	base and rim of bowl; decoration on inside and outside possible makers mark on bottom of inside	1	RR Box #1	paper with: " <u>PIECES OF RICE BOWLS FROM CHINESE CAMP</u> " inside bag

8	Ceramic	Historic sherd, decorated	various sherds with incised decoration	10	RR Box #1	paper with: " <u>PIECES OF RICE BOWLS</u> FROM CHINESE CAMP" inside bag
8	Ceramic	Historic sherd, undecorated	various sherds	9	RR Box #1	paper with: " <u>PIECES OF RICE BOWLS</u> FROM CHINESE CAMP" inside bag
8	Metal	Ammunition casing	shell casing	1	RR Box #1	paper with: " <u>PIECES OF RICE BOWLS</u> FROM CHINESE CAMP" inside bag
8	Metal	Button	button with A.O.C.O. S.M.	1	RR Box #1	paper with: " <u>PIECES OF RICE BOWLS</u> FROM CHINESE CAMP" inside bag
9	Ceramic	Historic bowl, decorated	body of decorated bowl with base missing	1	RR Box #1	did not fit in original bag
10	Metal	Button	two complete spherical buttons with loop; one flat button fragment with decoration	3	RR Box #1	paper with: " <u>CHINESE BUTTONS</u> " inside bag
11	Ceramic	Historic base sherd, decorated	base of bowl; possible makers mark on bottom of inside	1	RR Box #1	

12	Ceramic	Historic base sherd, decorated	base of bowl; possible makers mark on bottom of inside	1	RR Box #1	
13	Metal	Box	Brass opium boxes; two boxes and two end pieces; chinese characters inscribed	4	RR Box #1	paper with: " <u>BRASS OPIUM CONTAINER</u> FROM 1882 CHINESE RAILROAD CAMP" inside bag; in bubble wrap
14	Metal	Cup	tin cups with handle	2	RR Box #1	not originally packaged together inside bag; wrapped in bubble wrap
15	Metal	Lid	baking powder lid inscribed with GANTZ SEA FOAM BAKING POWDER BEST IN THE WHOLE WORLD	1	RR Box #1	paper with: " <u>SEA FOAM BAKING POWDER</u> BEST IN THE WHOLE WIDE WORLD" inside bag
16	Metal	Lid	lid inscribed with FRANK MILLER'S BLACKING 1884 PEERLESS NEW YORK	1	RR Box #1	paper with: " <u>FRANK MILLER'S BLACKING</u> 1884 - NEW YORK" inside bag
17	Metal	Lid	lid decorated with image of child ? and J.M. WYATT'S STANDARD BLACKING NEW YORK	1	RR Box #1	paper with: " <u>J.M. WYATT'S STANDARD BLACKING</u> FROM RAILROAD CAMP" inside bag
18	Metal	Shaker	salt/pepper shaker	1	RR Box	

					x #1	
19	Metal	Token	SP token with design on front, hole, and 6 incised on back	1	RR Box #1	paper with design drawn inside bag
20	Ceramic	Historic rim sherd, decorated	fragment with decorative flower border and SOUTHERN PACIFIC LINES logo	1	RR Box #1	
21	Metal	Can	sardine can	1	RR Box #1	paper with: <u>"SARDINE CAN THIS LID IS SOLDERED ON"</u> inside bag
22	Metal	Nail	cut nails. 1 large; 2 medium. One has two raised circles on nail head	3	RR Box #1	
23	Metal	Ammunition casing	shell casing	1	RR Box #1	
24	Metal	Box	tin box with lid open and attached	1	RR Box #1	some metal flaking off; did not fit in original bag
25	Faunal, Glass	Feather; Bottle	feather and ink bottle (purple)	2	RR Box #1	paper with: <u>"INK BOTTLE"</u> inside bag
26	Metal	Flask	mark on bottom of flask (PAY 1859 ?)	1	RR Box #1	some metal flaking off

27	Metal	Miscellaneous hardware	matching pieces of metal frame ?; one with loop	2	RR Box #2	paper with: " <u>CARPET BAG FRAME</u> FROM THE 1882 CHINESE RAILROAD CAMP WEST OF LANGTRY"; removed from RR Box #2 and placed in original box; needs reboxing
28	Metal	Miscellaneous hardware	parts of grinder; both pieces fit together	2	RR Box #2	paper with: " <u>PART OF A COFFEE GRINDER</u> FROM 1882 RAILROAD CAMP" inside bag
29	Metal	Lock	metal lock with key and chain attached; maker's marks inscribed on lock and key	1	RR Box #2	paper with: " <u>RAILROAD LOCK</u> " inside bag
30	Glass	Insulator	blue glass insulator to hold light bulb	1	RR Box #2	paper with: " <u>INSULATOR</u> FROM FIRST TELEGRAPH LINE INSTALLED IN 1883" inside bag
31	Metal	Miscellaneous hardware	part of coffee grinder ?	1	RR Box #2	

32	Metal	Lock	lock with triangle incised	2	RR Bo x #2	paper with: " <u>LOCKS</u> USED TO SECURE BATTERY BOX AT BASE OF RAILROAD SIGNALS (DONATED BY PETE BILLINGS) inside bag
32	Metal	Lock	lock with key hole and cover	1	RR Bo x #2	paper with: " <u>LOCKS</u> USED TO SECURE BATTERY BOX AT BASE OF RAILROAD SIGNALS (DONATED BY PETE BILLINGS) inside bag
32	Metal	Lock	lock with key hole and cover; incised on loop; paper taped to back	1	RR Bo x #2	paper taped to back that says: "Ames Sword Co. Chicopee, Mass pat. Sept 19, 1882. Donated by Robbie Dudley. She found it behind Neal Jr.'s house." paper with: " <u>LOCKS</u> USED TO SECURE BATTERY BOX AT BASE OF RAILROAD SIGNALS (DONATED BY PETE BILLINGS) inside bag

33	Metal	Miscellaneous hardware	nonfragmented metal object with loop	1	RR Box #2	paper with: " <u>CHIMNEY HOLDER FOR CABOOSE KEROSENE SIDE LAMP</u> (DONATED BY PETE BILLINGS)" inside bag
34	Metal	Spike removers	one large one small; wench-shaped with spherical protrusions on handle	2	RR Box #2	paper with: " <u>SPIKE REMOVERS</u> (CIRCA 1882) (DONATED BY PETE BILLINGS);" was in bag outside of boxes; put back in box #2
34	Metal	Spike	small railroad spike	1	RR Box #2	paper with: " <u>SMALL SPIKE USED AROUND 1900</u> ;" was in bag outside of boxes. Put back in box #2
35	Metal, wood	Miscellaneous hardware	rail alignment tool ?; appears to have been restored	1	RR Box #2	paper with: " <u>RAIL ALIGNMENT TOOL</u> (DONATED BY PETE BILLINGS)" inside bag
35	Metal	Miscellaneous hardware	two metal rectangles fused; possibly piece of rail; part of alignment tool ?	1	RR Box #2	paper with: " <u>RAIL ALIGNMENT TOOL</u> (DONATED BY PETE BILLINGS)" inside bag

36	Metal	Bar	circular bar with wedge at one end	1	RR Bo x #2	paper with: " <u>WEDGE USED TO SPLIT ROCK FOR SOUTHERN PACIFIC</u> IN 1882" inside bag
37	Metal	Lamp	two lamps with metal cage and handle	2	RR Bo x #3	not yet packaged together; needs reboxing
38	Metal, glass	Light fixture	fixture with yellow glass on one side; train marker	1	RR Bo x #3	paper with: " <u>CABOOSE MARKER ONE HUNG ON EACH SIDE OF THE CABOOSE (DONATED BY PETE BILLINGS);</u> " needs reboxing
39	Metal	Light fixture	fixture with one opening for light to come out; possibly a caboose tail marker	1	RR Bo x #3	paper with: " <u>CABOOSE TAIL MARKER LIGHT</u> PROBABLY USED BEFORE 1900;" needs reboxing
40	Metal, wood	Nails in railroad ties	nails with numbers on head in railroad tie timbers	2	RR Bo x #4	paper with: " <u>DATE NAILS PLACED IN THE END OF RAILROAD TIES AT THE TIME OF INSTALLATION;</u> " some nails coming loose; needs reboxing

41	Metal	Live stock marker	rectangular marker; it reads "LIVE STOCK ON RIGHT OF WAY BEHIND MY TRAIN NEAR MILEPOST GO AT ONCE AND LOOK AFTER THEM SEND THIS PLATE TO ROADMASTER ON FIRST TRAIN"	1	RR Box #4	needs reboxing
42	Metal	Can	oil can	1	RR Box #4	paper with: " <u>OIL CAN</u> (DONATED BY PETE BILLINGS);" needs reboxing
43	Metal	Light fixture	lamp; with wall mount attached	1	RR Box #4	paper with: " <u>RAILROAD STATION LAMP</u> (CIRCA 1900);" needs reboxing
44	Metal, glass	Light fixture	fixture with reddish glass on one side and red paint on inside	1	RR Box #4	paper with: " <u>YARD SWITCH REFLECTOR</u> (DONATED BY PETE BILLINGS);" needs reboxing
45	Metal	Light fixture	lamp; metal piece with inscription on the top part	1	RR Box #4	paper with: " <u>ADLAKE SWITCH LAMP</u> MADE ABOUT 1906;" needs reboxing

46	Metal	Can	black powder can; "BLACK BLASTING POWDER 25Lbs 1CC 132" inscribed on bottom	1	RR Box #5	paper with: " <u>BLACK POWDER CAN</u> HELD 25 LBS OF EXPLOSIVE;" needs reboxing
47	Metal	Light fixture	lamp; hand held ?	1	RR Box #5	needs reboxing
48	Metal, wood, plastic	Telegraph machine	telegraph with wires and Prince Albert tobacco can attached	1	RR Box #5	paper with: " <u>RAIL USED IN 1882</u> (DONATED BY PETE BILLINGS);" needs reboxing

References

- Briggs, Alton K.
1974 The Archaeology of 1882 Labor Camps on the Southern Pacific Railroad, Val Verde County, Texas. Master's thesis, The University of Texas at Austin.
- Buckles, William G.
1983 Models for Railroad Construction Related Sites in the West. In *Forgotten Places and Things, Archaeological Perspectives on American History*, edited by Albert E. Ward, pp 213-223. Center for Archaeological Studies, Albuquerque.
- Chace, Paul G., and William S. Evans, Jr.
1969 Celestial Sojourners in the High Sierras: The Ethno-Archaeology of Chinese Railroad Workers (1865-1868). Paper presented at the Second Annual Conference on Historical and Underwater Archaeology, Tucson, AZ.
- Cleveland, G.C.
1983 'Archaeological Testing at "Trestle City" a Railroad Construction Camp of the early 1900s', in R. Schalk (ed.) *Cultural Resource Investigations for the Lyons Ferry Fish Hatchery Project, Near Lyons Ferry, Washington*, Pullman, Washington State University, pp. 99-126.
- Dibble, David S. and Elton R. Prewitt
1967 *Survey and Test Excavations at Amistad Reservoir, 1964-65*. Texas Archaeological Salvage Project Survey Reports 3, The University of Texas at Austin.
- Dixon, Kelly J.
2014 Historical Archaeologies of the American West. *Journal of Archaeological Research* 22(3):177-228.
- Gardner, A. Dudley, Barbara Clarke, and Lynn Harrell
2002 Final Report for the Aspen Section Camp 48UT660 and the Associated Union Pacific Railroad Grade 48UT668. Report to Wyoming Bureau of Land Management, Cheyenne, from Western Wyoming Community College, Rock Spring
- Koenig, Charles and Arlo Mckee.
2017 Exercise in 3D Site Modeling using Agisoft Photoscan Pro. TAS Tech Academy.
- MacNaughton, James W.
2012 A Historical Investigation of Changing Ethnicity and Consumption

Patterns at the Union Pacific Railroad Section Camp of Peru (48SW3795): How Changing Ethnicity Can Be Interpreted in a Nineteenth Century Railroad Landscape. Master's thesis, Department of Anthropology and Sociology, Illinois State University, Normal.

McVarish, Douglas C.

2008 *American Industrial Archaeology: A Field Guide*, Left Coast Press, Walnut Creek.

Morrill, Clifford R., and Hugh Bascom Wilson.

1971 *Railroad History : El Paso Division : Southern Pacific*.

Morris, Michael.

1994 'Towards an Archaeology of Navvy Huts and Settlements of the Industrial Revolution', *Antiquity* 68:573-584.

National Oceanic and Atmospheric Administration

[2017] Photogrammetry. Ocean Exploration.

<https://oceanexplorer.noaa.gov/technology/photogrammetry/photogrammetry.html>.

Nock, O.S.

1981 *Railway Archaeology*, Patrick Stevens, Cambridge.

Polk, Mike R., and Wendy Simmons Johnson

2012 From Lampo Junction to Rozel: The Archaeological History of the Transcontinental Railroad across the Promontory Mountains, Utah. GOSP Synthesis Report. Manuscript, Golden Spike National Historic Site, National Park Service, Promonto

Shackel, Paul A.

2010 'Labour's Heritage: Remembering the American Industrial Landscape', in C.C. Fennell (ed.) *Revealing Landscapes, Perspectives from Historical Archaeology*, No. 5: 178-192.

Skiles, Jack.

1996 *Judge Roy Bean Country*. Texas Tech University Press.

Turpin, Solveig A.

1995 *41VV540: A RAILROAD ERA INDUSTRIAL SITE IN SEMINOLE CANYON STATE HISTORICAL PARK Val Verde County, Texas*. Texas Parks and Wildlife Department Cultural Resource Program Report 95-1. Austin, Texas.

Voss, Barbara L., and 色色拉沃斯.

2015 The Historical Experience of Labor: Archaeological Contributions to Interdisciplinary Research on Chinese Railroad Workers / 劳工的历史经验: 考古学对于中国铁路工人之跨学科研究的贡献. In *The*

Archaeology of Chinese Railroad Workers in North America, Barbara L. Voss, editor. Thematic Issue, *Historical Archaeology* 49(1):4-23.

Voss, Barbara L.

2016 Towards a Transpacific Archaeology of the Modern World. *International Journal of Historical Archaeology* 20(1): 146-174.

Wegars, Priscilla. and Roderick Sprague.

1981 *Archaeological Savage of the Joso Trestle Construction Camp, 45-FR-51 Lower Monumental Project*, University of Idaho Anthropological Research Manuscript Series, No. 65 Moscow.