

Journeyman International: Third Lens Ministries Development in Jonestown, Mississippi

Josh De Mattei

California Polytechnic State University
San Luis Obispo, Ca

Jonestown, Mississippi has been known to be a place of poverty and in need of infrastructure. A nonprofit, Third Lens Ministries is developing housing for the people of Jonestown, Mississippi. Over the last 9 months, an architect Margy Maher, an engineer Autumn Wagner, as well as myself, a construction management major, have all collaborated in order to design, engineer and plan the perfect Dwelling for the people of Jonestown, Mississippi. While the scope of the project includes community centers and housing, our team's scope was to focus on the residential development and site work. As the construction manager, my deliverables are the construction scope analysis, which describes each piece of the work performed, a hazard mitigation analysis showing how natural disasters, crime and insect infestations will be mitigated, a construction safety plan outlining safety concerns, preventative maintenance and procedures, a storm water pollution prevention plan outlining how large rainfall will be handled and maintained on site, a site logistics plan showing phasing, material laydown, trailers, path of travel and phasing, an estimate broken into subcategories based on CSI formatting and finally a schedule describing each phase of the project beginning with utilities, residential structures and then site work.

Key Words: Site Logistics, Schedule, Estimate, Hazard Mitigation, SWPPP

How Project Came About

Third Lens Ministries is a non-profit contractor that focuses on connecting architects, engineers, real estate and construction professionals with organizations in need of facilities and infrastructure in order to create growth and economic development domestically and internationally. Due to the construction industry's high amount of liability, Third Lens Ministries provides planning, design and construction services. Their vision is "To connect people to eternity through the built environment and share lasting hope with the nations" and their mission is "To design and build environments of healing, empowerment and redemption." Third Lens ministries exists in order to look through a lens that sees politics and economics, but also the third lens of scripture, which they believe creates a full and in depth picture for all. They apply this idea to the global needs of our society as it faces hunger, illness, unsanitary drinking water, a lack of education and social injustice. Third Lens Ministries' core values are to place family first, collaborate effectively, lead with integrity and to pursue excellence.

This is a partnership between Journeyman International and Third Lens. Third Lens and Journeyman International were in contact in order to have the design, engineering and preconstruction services performed by university students in order to save money and have quality tangible and buildable deliverables. Third Lens and Journeyman International joined arms in order to improve Jonestown, Mississippi, a developing domestic location in need of support, which includes the following: housing, community centers, rehabilitation centers, sports fields, gardens, walking trails, parks, etc. Journeyman International and Third Lens Ministries both have similar core values, which is why they work so closely together. By them collaborating in order for our team to complete this project, they are opening the door for us to use our skillsets to develop design, structural specifications as well as a construction plan for the project to be a success from the start to finish.

As a student heading into the custom home world for high end clients, this project is a way for me to give back to a community in need utilizing my passion for the built environment, specifically a mix of homes and commercial developments. Having the opportunity to take on a feasible project and work closely with an interdisciplinary team of an architect, an engineer and myself, allowed us to be able to provide feedback to one another in order to develop a successful project all around. In the last week of working together, we discussed reasons why we were assigned this project and what our future holds. All three of us have a passion for building, but also are all interested in housing, whether it be affordable, multi-family or single family homes. We all intend on going into the home industry, so when we asked for a project to be assigned to, we all had one suggestion in common: housing. The reason for our connection to Journeyman International is due to our close ties with the founder, a California Polytechnic State University – San Luis Obispo graduate, Daniel Wiens. He worked closely with all of us in the design, engineering and construction planning processes. His support was vital to our effort in the planning stages. Not to mention, a couple times per month, I would meet with my Subject Matter Expert, Phil Barlow.

Process

To start, Journeyman International as well as Third Lens were in close communication due to their similar values and common interest in the field of construction as well as helping people. Journeyman International has close ties with many non-profit builders domestically and beyond and one of those is Third Lens Ministries, which is domestic. They came in contact when Journeyman International's team reached out to discuss partnering for construction projects. They signed contracts to partner up and Journeyman International connected Third Lens to the Cal Poly community and acted as the middle person throughout the process. For the architect, engineer and myself, our questions flowed from myself to the architect or engineer and from there, to Journeyman International. If Journeyman International was unaware, they would go to Third Lens for scope clarification. In the beginning of December, there were meetings between Third lens and myself in order to discuss the project, the area and its history. Then, I had monthly meetings with Journeyman International as well as meetings with our team in order to discuss and offer suggestions to the architect. Due to her vision, it did not require much feedback on the ARCE or my side, yet validated her strategic design. Once the design was finalized, we were sent renderings as well as some plans. We were sent a general site plan that showed the layout of the duplexes, the roads, sports fields, gardens and parking lots, which ended up being used for my site logistics plan as well as basic duplex plans that provided enough information for me to perform quantity takeoffs/estimating as well as for the architectural engineer to perform her structural calculations. Our team had a group text in place so that when any one had questions, they were answered within the hour. The project is named "Dwell Being" and we had a great time working together to create the "Dwell Being" incorporating a garden and an interwoven community to keep ideas and goals flowing around. This creates a social atmosphere that improves the quality of life for this community.

Deliverables

Third Lens and Journeyman International wanted deliverables from all three members of our teams based on our individual concentrations. From Maher, they requested a design package including the site plan, elevations, sections as well as some 3D renderings. From Wagner, they wanted her structural calculations as well as a structural design sizing all members involved in the process. This ensured that the architectural and structural design was prepared so that I could begin planning for the upcoming project. The deliverables below include the design and construction deliverables. For the construction deliverables, the construction scope analysis, hazard mitigation analysis, construction safety plan, storm water pollution prevention plan, site logistics and phasing plan included as one piece, an estimate and a schedule were all important elements to planning ahead for the project. The construction scope analysis breaks down each scope of the project into various descriptions showing the different parts of the project and how each will be undertaken. A hazard mitigation analysis addresses the natural disasters and other hazards of the area and mentions ways in which we can mitigate those risks. Next, the construction safety plan was created, which discusses the site specific safety hazards at play and what the Occupational Safety and Health Administration recommends in each hazardous condition or activity. The storm water pollution prevention plan (SWPPP) mentions and provides incite as to how to maintain all runoff on site and to avoid flooding in this particular area. Then, the site logistics and phasing of the project was strategically built on the principal of ensuring trade partner safety, having clear routes as well as phasing the project so that there is constant and efficient flow while ensuring trades do not get in one another's way. Next, after phasing the project in a big picture way and gaining an in depth understanding of how the project will be performed, the schedule was created as a best case scenario for the project. Its duration is just about two years including the site work post construction. At the end, when the project duration and phasing was fully understood, I performed an estimate of what I think is an accurate representation of what the project will cost. See below to get more detail.

Design

Third Lens wanted a few community centers, sports fields and housing in order to develop the community in Jonestown, Mississippi. The main challenge was designing a housing community that is within budget, but also allows for them to live on their own. Because grocery stores and basic necessities are such a large distance away, providing community gardens as well as a means of working out (sports fields/courts) are important amenities that we felt were necessary. Additionally, a goal of ours was to build sustainably, which means finding reclaimed corrugated metal, utilizing composite products as well as using hempcrete as our insulation material. Maintaining sustainability while maintaining a lower budget is quite the challenge. Additionally, some of the concerns from the engineer were costs behind a footing versus a slab on grade. Due to the fact that flooding is a common issue in Jonestown, MS, we had one meeting designated to deciding between a footing and slab on grade. A stem wall footing was chosen as life safety is more important than the cost difference. The final product is 65 duplexes at a total square footage of 1,100 SF as well as trails, sports fields, walking trails, gardens, etc.

Construction Scope Analysis

The Construction Scope Analysis included the parts and pieces of the project with brief descriptions of their site specific application. By breaking down each scope necessary to complete the project, this provides an overview of how the project will be undertaken. It includes the general requirements, temporary facilities and controls, traffic control, the storm water pollution prevention plan (SWPPP),

site work, surveying, excavation, grading, the sanitary sewer system, storm drainage, site concrete/asphalt, landscaping/planting, structural concrete, sustainability suggestions, metals, rough and finish carpentry, building insulation, doors and windows, mechanical, plumbing and electrical. Each one of these headings has a brief description of the systems, materials and assemblies utilized for this housing development.

Hazard Mitigation Analysis

The hazard mitigation analysis provides the history of natural disasters in this area and how they will be mitigated. Some examples that pertain to this area are tornados as they happen 70% more than the United States national average, flooding as there have been eleven major floods over the last one hundred years as well as the area receives high amounts of rainfall relative to the rest of the United States. While natural disasters cannot be mitigated, the structures can be properly built to withstand the threats of them. As an example, we have chosen to place the duplexes on a stem wall footing instead of a slab on grade so that when large rains occur, the chances of the duplexes being flooded is greatly reduced. Even though stem wall footings are typically more expensive, we believe that this is a requirement to avoid water damage. In addition, sloping the sites properly so that water quickly leaves the site is crucial. Insect infestations are a common issue in these areas as they are moist, which makes termites and other insects attracted to the manmade structures. Because of this, mitigation strategies will be taken such as ensuring that soil and lumber are not in contact, using treated wood and treated concrete. Lastly, the crime rate in Jonestown, Mississippi is 11% and according to Crimegrade, the southwest part of Jonestown, Mississippi is the safest. In order to avoid theft and robberies, all duplexes will include security systems such as optional cameras, alarms and bolt locks to prevent robberies. Lastly, this piece of the project deliverable covers nearby hospitals in the case that there is an emergency during or after the construction process. Most hospitals are within about a 25 minute drive, which is relatively far for the area.

Construction Safety Plan

Safety is of the most importance in the construction industry and ensuring that the proper safety measures are taken is vital to a successful project. Prior to the project's start, there will be a site specific safety meeting in order to cover all potential hazards. Meeting on site is important so that the tradespeople involved are aware of the site conditions and get an idea of the lay of the land. Ensuring that all tradespeople are on alert when walking the site is one way to decrease safety incidents. Some main pieces touched on in the project deliverables are the following: overhead protection, confined space protection, struck by/caught in between incident prevention, requirement of PPE, traffic safety, silica safety, fall protection, electrocution prevention, ladder safety, heavy lifting procedures, and trench safety. The final piece is that if we maximize safety, we allow all tradespeople to go home safely to their families. We must maintain a safe and organized site in order to prevent injuries such as trips or falls. If money is the team's driver (rather than safety), missing work and getting injured is expensive, so be safe!

Storm Water Pollution Prevention Plan

Our storm water pollution prevention plan (SWPPP) is vital to ensuring all runoff stays on site and under control as well as properly disposing of all contaminants. With flooding being a major concern in this location, we will take measures to mitigate storm water hazards. Because this site is not sloped, it reduces our concerns of runoff leaving the site, but rather requires us to slope each lot and the general site properly during the rough grading process. Additionally, we will place permeable rock

prior to the start of the construction process to reduce mud on site. The site will have bio swales, trench drains, straw wattle, top soil, as well as permeable and absorbent rock to reduce on site flooding. Throughout the construction process, mitigation measures will be taken to ensure proper control of storm water runoff. Ensuring that we have this plan in place and that we execute it well before flooding begins is crucial to the project success. If storm water runoff is not properly managed, it not only impacts the environment but also the schedule and cost of the project. The construction team needs to do this early on in the process to ensure that when heavy rains do come, run off is managed and has a place to go that does not impede the workflow.

Site Logistics Plan/Phasing Plan

Our site logistics plan and phasing plan was separated into a few pages. There are seven stages of the project, but the construction routes change about three times. Please follow along below where screenshots of the site logistics plan as well as phasing plan is placed. The numbers show the order in which the duplexes in each phase will be constructed, the arrows refer to the construction routes and other pieces are labeled. While the schedule shows the project beginning after phase 2 utilities, the residential part of the project can begin after phase 1 utilities, which is why the construction route is as shown on page 2. The site logistics plan was separated into three pages. The first page is titled the "Utilities Phase" and the next two are titled "Residential Phases". The main goal is to complete phase 1 of utilities so that phases 3-5 for the residential can begin. The crews working on the utilities phase will backfill and put a base layer of asphalt so that this can be part of the construction route to and from the project during phases 3-5. By the time phases 6-7 and site work begin, phase two of utilities will be complete with a base layer of asphalt. If needed, the emergency gathering and turn around area will be in phase 7 of the residential area. The numbering of the homes signifies the order in which each home will be built during each phase. As one can see, there are trailers present, material lay down areas and toilets present on each phase. For cost savings they can be moved from phase to phase, but it is recommended to have a couple or a few to reduce personnel travel. The material laydown areas and waste bins are in convenient locations so that there is easy access for material delivery and waste pickup along the roads.

Construction Estimate

For the estimating and takeoff portions of the project, a preliminary estimate was taken. Due to the fact that the design is in its early stages, most numbers were based on the whole home square footage and allowances were strategically inputted based on historical cost data and phone calls with subcontractors and general contractors in the Jonestown area. Starting off, percentages were assigned to each part of the construction process. This percentage is based on its typical cost per square foot, the duration of the process for manpower cost purposes as well as the current material pricing in this area. Once the conceptual estimate was planned, the costs were inputted into the final construction estimate. At this point, the conceptual estimate was completed and it was time to break down the costs a bit further as well as verify high scope values from subcontractors in the Jonestown, MS area. Electrical and plumbing trades were called as well as lumber yards in the area. The numbers were inputted based on the costs provided and the conceptual estimate was finalized. Finally, the cost of each duplex is \$165 per square foot, then with contingencies and taxes added on, the total cost is \$200,000.

Schedule

Site Logistics and the phasing plan set up the way in which the schedule is run. By splitting the utilities phases into two phases, it allows for the developer (Third Lens Ministries) to take two different directions depending on the push for completion. If the project is being rushed, once phase one utilities is complete, phases 3-5 of residential can begin. On the site logistics plan below, phases 3-5 have their own construction routes and each home is numbered to show the stage at which it is built. There are multiple ways to phase this project, but for the purposes of this, only one was scheduled. Once phase one concrete is poured, staking and grading for the next phases begins, yet another way to schedule this project is by allowing the crews to move from one phase to the next, one right after the other. This project was phased in a way where there are hold ups due to typical construction delays to plan for issues that could potentially arise. Additionally, line items of float were added for force majeure and other potential issues that could arise during the process. Once phases 3-7 of the residential process are complete, the site work, which includes a baseball field, parking lots, trails, planting, solar install and a final layer of asphalt will begin. The total duration for the project is about two years, for the utilities phase is 76 days (worst case), the residential phase is 335 days and the site work phase is 75 days.

Lessons Learned

Third Lens and Journeyman International had a mission to create opportunity in an area filled with poverty and their scope explanation to our architect, translated to a smooth design, engineering and preconstruction process. By being involved in the design process early on, I was able to get a clear sense of the design intent and began wrapping my head around the logistics, scheduling, estimating, safety hazards, etc. and got a keen understanding for the area. Going into industry, this is something that I will try to implement at the company I work at. Additionally, Daniel Wiens from Journeyman International was not constantly checking up on me, so I had to manage my time wisely. Third, team communication is key. Working with one architect and one engineer made us all realize that we were relying on one another for information when it was needed. We all rose to the challenge and replied quickly to each other's needs. Lastly, get second opinions. When working on your own performing a schedule, estimate, site logistics, phasing, a hazard mitigation analysis, a safety plan and a storm water pollution prevention plan, it is important to get a second set of eyes to ensure nothing was overlooked or forgotten about, so I appreciate a friend, Alex Trujillo, a member of the faculty, Andrew Kline and Daniel Wiens for taking the time to review and provide constructive feedback on my project deliverables.

Application to the Construction Industry

Within Cal Poly's construction management program, there are only a few classes that provide the interdisciplinary experience, so this project provided just that. An architect, an engineer and a construction manager have three different ways of thinking and sometimes different personality, so seeing those play out in this team setting was interesting and applicable to the real world. Being able to collaborate with an architect and engineer gave me a real world experience on what it is like to work with an architect and engineer. Sometimes, an architect has an amazing idea, but sometimes it may not be practical due to budgeting and constructability. When in industry, I will be working with architects and engineers on a daily basis, so this project was a good warm up for the next 45 or so years. Luckily, I had an amazing team surrounding me during this project, so I hope I am this lucky in the future! From a software standpoint, I learned how to use a new scheduling program, learned new and quick ways to estimate a structure, which will definitely be applied to industry.

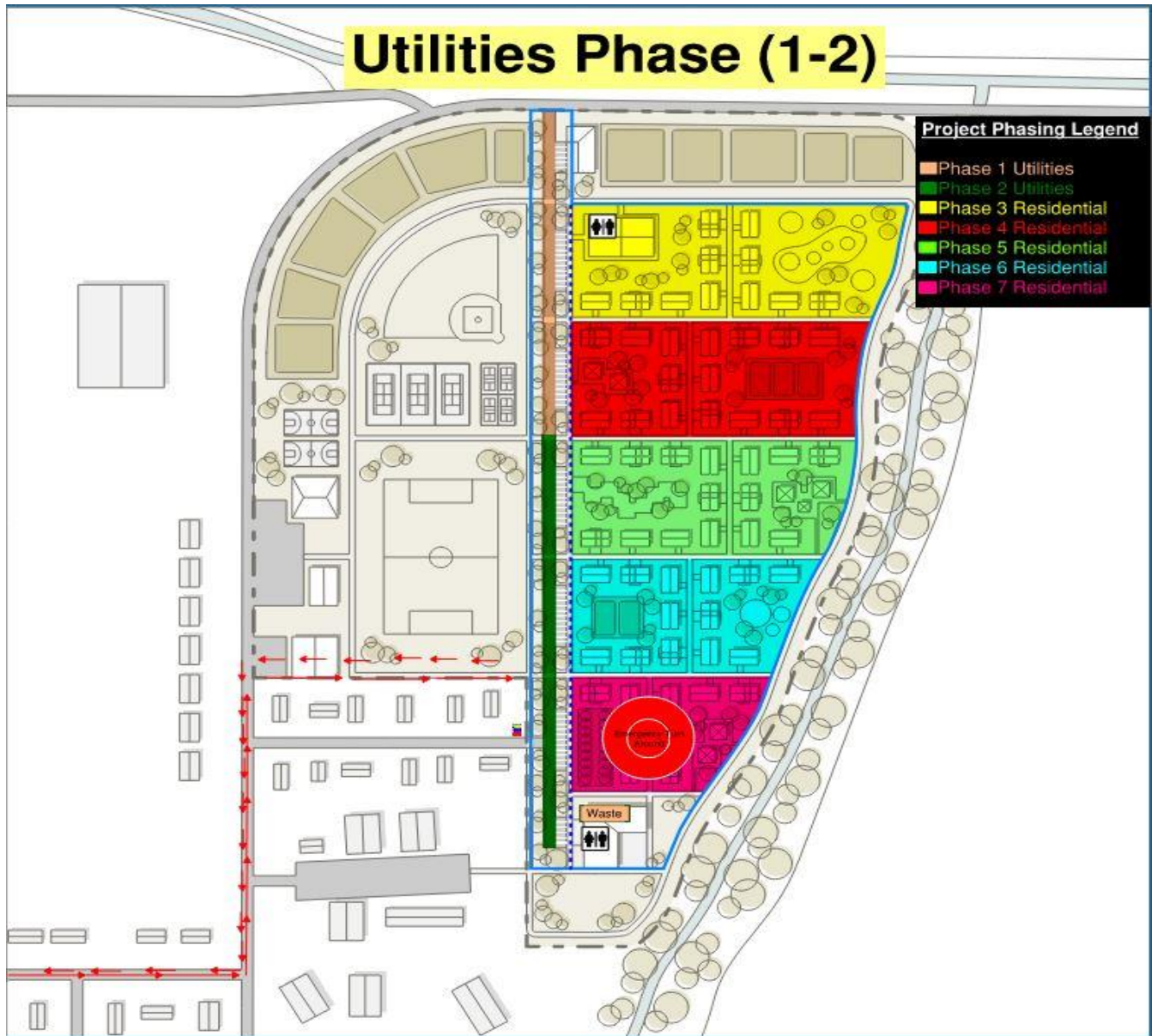


Figure 1: Utilities Phase

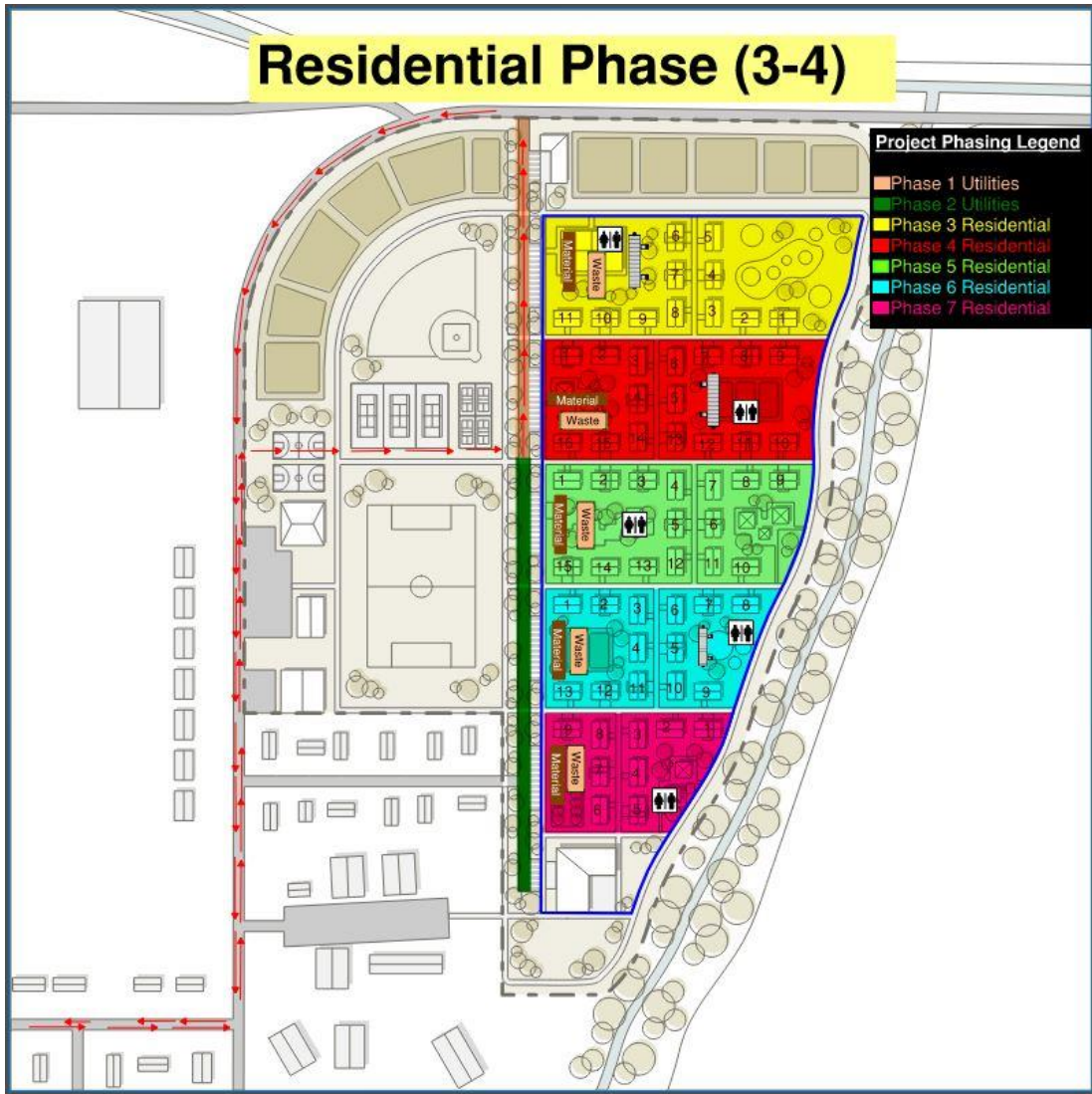


Figure 2: Residential Phases 3-4

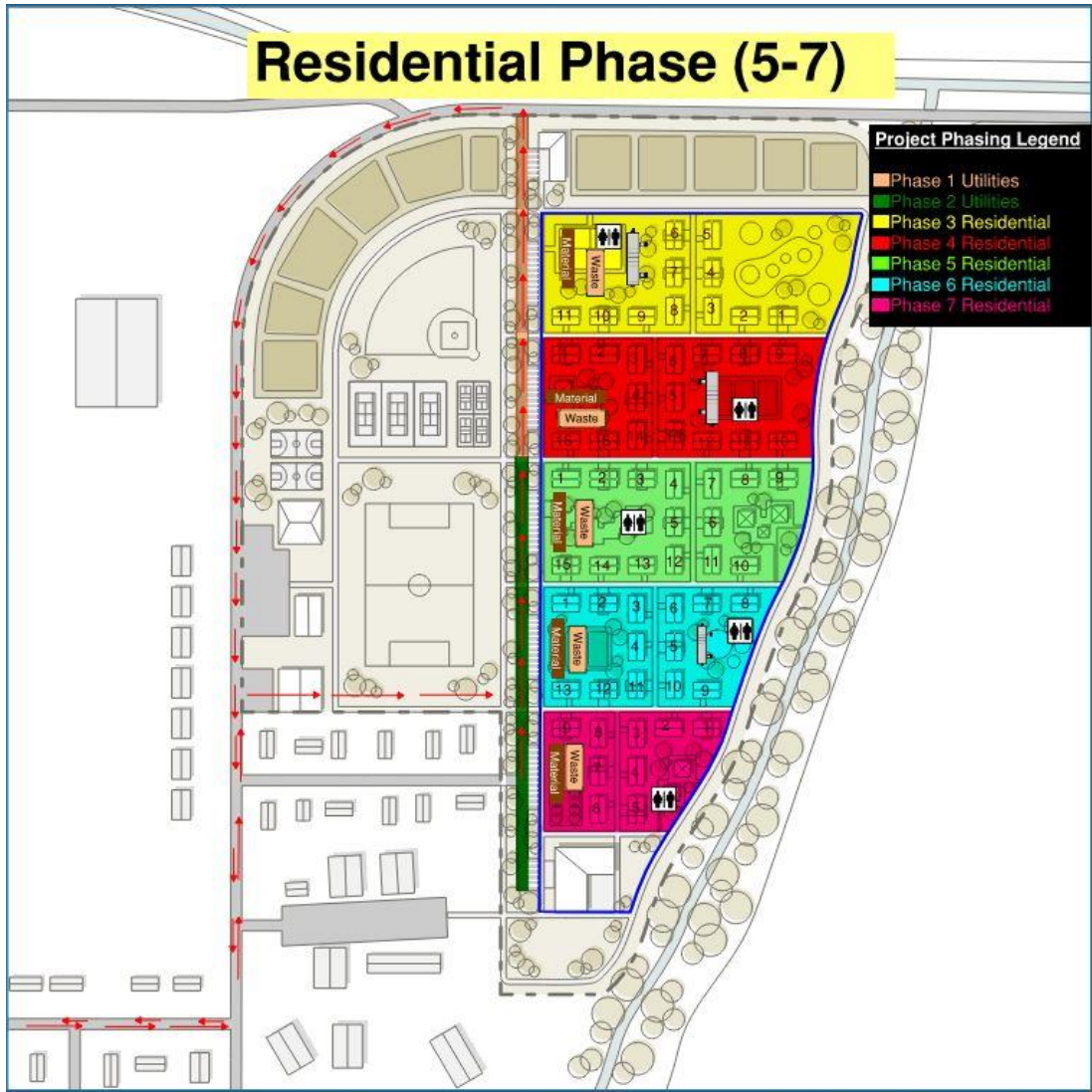


Figure 3: Residential Phases 5-7

Task Name	Duration	Start	Finish	2022					Qtr 3, 2022			Qtr 4, 2022			Qtr 1, 2023			Qtr 2, 2023			Qtr 3, 2023			Qtr 4, 2023			Qtr 1, 2024			Qtr 2, 2024			
				May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May					
Preconstruction	21 days	Mon 5/16/22	Mon 6/13/22	■																													
Notice to Proceed	0 days	Mon 6/13/22	Mon 6/13/22	◆ 6/13/22																													
Site Logistics	12 days	Tue 6/14/22	Wed 6/29/22	■																													
Phase 1 Utilities	38 days	Thu 6/30/22	Mon 8/22/22	■																													
Phase 2 Utilites	38 days	Tue 8/23/22	Thu 10/13/22						■																								
Phase 3 Residential (11)	162 days	Fri 10/14/22	Mon 5/29/23						■																								
Phase 4 Residential (16)	170 days	Tue 12/6/22	Mon 7/31/23											■																			
Phase 5 Residential (17)	186 days	Mon 1/30/23	Mon 10/16/23																■														
Phase 6 Residential (13)	157 days	Thu 4/27/23	Fri 12/1/23																■														
Phase 7 Residential (9)	139 days	Mon 7/17/23	Thu 1/25/24																■														
Site Work/Solar Install	75 days	Fri 1/26/24	Thu 5/9/24																					■									

Figure 4: Milestone Schedule

References

“Developing a Stormwater Pollution Prevention Plan (SWPPP).” *EPA*, Environmental Protection Agency, 1 Nov. 2016, www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swPPP.

Third “Jonestown, Mississippi.” *City-Data.com*, www.city-data.com/city/Jonestown-Mississippi.html.

Occupational Safety and Health Administration, United States Department of Labor, www.osha.gov/.