

Team Project: Part III

The A-Team

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Executive Summary

The Jane Doe kitchen remodel in Corvallis, Oregon has a total project cost to be less than \$100,000. The current kitchen is separated from the rest of the house and is about 10 years old. All aspects of the old kitchen will be removed and completely gutted. Walls will be removed to accommodate the new open floor plan concept. New flooring, lighting, cabinets, appliances, and countertops will be installed. The new kitchen will have high efficiency lighting, renewable flooring, and Energy Star rated appliances. The project duration is planned for nine weeks. The project timeline excludes unseen risks such as hazardous demolition materials or structural issues. These issues may extend the budget and timeline and will be addressed if they should arise. A Gantt chart has been created to verify that the project is progressing as anticipated, and to show the critical path for ontime completion.

The whole project is estimated to be done in 24 days. There are several potential risks in this project. The failure of the inspection from city hall might extend the project period but that could be avoided by working with experienced contractors. The rest of risks are either related to the need for more time or waiting for materials. These risks are easily solved since they are much more flexible.

For the cost of the project, the total expenditure of \$59,567.75 dollars. \$41,164.78 (69.1%) is spent on new equipment, \$16,402.97 (27.5%) are for human resources and materials, and \$2,000 (2%) is for City Hall's inspection.

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Introduction and Project Background

Introduction

The Doe family is wanting to remodel and modernize their kitchen. The kitchen was remodeled 10 years ago, but they would like to remodel it into an open floor plan design. Their maximum budget is \$100,000, however they would ideally like to stay at \$80,000. The Doe family is most looking forward to the installation of energy efficient appliances, flooring and lighting.



Figure 1. Kitchen model inspiration (Houzz)

Project Scope Statement

Project Objective

The client, Jane Doe, would like a full remodel of her 200 sq. ft kitchen using high-quality sustainable practices and equipment. She would like it to be completed in nine weeks at a cost ranging from \$80,000 to \$100,000.

Deliverables

- Design/selection: choose contractor
- Demolition
- Install Infrastructure:
 - Reposition gas lines
 - Move plumbing
 - Upgrade electrical
 - Paint
 - Back splash
 - Flooring
 - Lighting
- Install new cabinets
- Install new appliances:
 - Range
 - Refrigerator
 - Dishwasher
 - Microwave
 - Vent hood
- Install countertop:
 - Install sink
 - Install garbage disposal
- Final Inspection

Milestones

- Design Approval: Permitting - January 27 (2 weeks)
- Demo/Removal - February 3 (1 weeks)
- Infrastructure Installation - February 18 (2 weeks)
- New Equipment Installation - March 12 (3 weeks)
- Final Inspection - March 15 (1 days)

Technical Requirements

- Must meet local building codes
- Energy efficient lighting - LED dimmable, 2700K, CRI 90+
- Renewable flooring (50% or more post-consumer recycled materials)
- Appliances must be Energy Star rated

Limits and Exclusions

- Unforeseen special handling materials in demolition (asbestos, lead paint, etc.)
- Unforeseen structural issues
- Site work - Monday - Friday 8:00am - 6:00pm
- Contractor responsible for subcontractor work

Customer Review

Jane and John Doe

Priority Matrix

The project priority matrix (Table 1) reviews the basic criteria of the project, including the time, scope, and cost, and establishes the importance of each criteria. This ranking is determined from the desires of the clients.

	TIME	SCOPE	COST
CONSTRAIN		●	
ENHANCE			●
ACCEPT	●		

Table 1. Project priority matrix

Constrain

The scope will constrain this project. The client has asked that the new kitchen meets all of the energy efficient criteria. This is not negotiable and the client is willing to compromise on the other criteria as long as the original scope and project technical requirements are met.

Enhance

This project has a timeline of nine weeks. The client has asked that this be the goal, however is willing to budge a bit based on the contractor's schedule. The client is willing to compromise on the timeline, provided the initial project scope technical requirements will be met, however the timeline of the project should be optimized.

Accept

The cost will be allowed to vary a bit. The customer chose a window of 80-100k hoping to meet that, however is willing to accept if the project goes over budget as long as the original scope of the project is met. If there are opportunities to reduce completion time to stay more on track, the client has leeway. It is desirable to meet all three criteria, however it is understandable to the client that project timeline and cost might vary from what was initially proposed.

Project Plan

Coded WBS

The WBS (work breakdown structure) is a table that outlines tasks for the kitchen remodel. It includes vital project information such as start and end dates, and task duration. Using MS Project, the remodeling team was able to account for factors such as early starts, early finishes, late starts, late finishes, and the amount of slack associated with each task. The WBS table can be found in Appendix A.

Gantt Chart

The Gantt chart in Appendix B shows an overview of the project schedule and critical path of the Doe's kitchen remodel, as well as the resources assigned to each stage of the project. The critical path indicates the priority path of completion to maintain project schedules; these items are shown as red in the Gantt chart.

Network Diagram

The Network Diagram found in Appendix C provides a visual representation for the overall flow and sequencing of the kitchen remodel. The critical path items are shown in red. These are usually an indication of tasks that need to be completed before other tasks can be started. While other tasks can be completed at the same time as these items in red, they usually have less time associated with them. For example, in demolition the tasks are, Remove floors, Remove old equipment, Remove ceiling, and Remove walls. Each of these tasks require one day except the Remove floors task which requires two days. This means the other tasks can be started later, but the Remove floors task must be started on time or the schedule will slip.

Resource Sheet

Figure 2 shows a table of all the resources (and associated resource rates) necessary for the kitchen remodel. The table indicates the type of resource, associated costs, and other useful information to quickly understand the project and identify the various resources needed.

ID	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Comment/Reference
1	Interior Designer	Work		I		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
2	Plumber	Work		P		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
3	Plumber (gas)	Work		P		100%	\$75.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
4	Electrician	Work		E		100%	\$90.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
5	Electrician	Work		E		100%	\$90.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
6	Painter	Work		P		100%	\$50.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
7	Tile Man	Work		T		100%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
8	Carpenter	Work		C		100%	\$70.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
9	Carpenter	Work		C		100%	\$70.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
10	Carpenter	Work		C		100%	\$70.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
11	Carpenter	Work		C		100%	\$70.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
12	Drywall Man	Work		D		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
13	Appliance Group	Work		A		100%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	
14	Appliance Group Free	Work		A		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	Price is counted in the material/equipment price
15	Dumpster	Work		D		100%	\$0.00/hr	\$0.00/hr	\$500.00	Prorated	Standard	
16	City Hall	Work		C		100%	\$0.00/hr	\$0.00/hr	\$500.00	Prorated	Standard	
17	City Hall Inspector	Work		C		100%	\$0.00/hr	\$0.00/hr	\$500.00	Prorated	Standard	Cost 2% of the total budget
18	Gas Pipe	Material	foot	G			\$1.93		\$0.00	Prorated		https://www.homedepot.com/p/HOME-FLEX-2-in-1-
19	Water Pipe	Material	foot	W			\$1.52		\$0.00	Prorated		https://www.homedepot.com/p/The-Plumber-s-Choice-1/3050677keywon
20	Power outlet	Material	set	P			\$17.78		\$0.00	Prorated		https://www.homedepot.com/p/Leviton-20-Amp-5/3050677keywon
21	Power outlet (high amp)	Material	set	P			\$13.37		\$0.00	Prorated		https://www.homedepot.com/p/Leviton-50-Amp-5/3050677keywon
22	Wire	Material	foot	W			\$0.80		\$0.00	Prorated		https://www.homedepot.com/p/Southwire-25-ft-1/3050677keywon
23	Drywall	Material	piece	D			\$15.27		\$0.00	Prorated		https://www.homedepot.com/p/USG-Sheetrock-Br/3050677keywon
24	Drywall (ceiling)	Material	piece	D			\$15.27		\$0.00	Prorated		
25	Drywall joint compound	Material	gallon	D			\$14.98		\$0.00	Prorated		https://www.homedepot.com/p/Westpac-Material/3050677keywon
26	Concrete	Material	sqft	C			\$6.00		\$0.00	Prorated		https://www.concretenetwork.com/concrete/inter/3050677keywon
27	Trim	Material	pack	T			\$25.60		\$0.00	Prorated		https://www.homedepot.com/p/Woodgrain-Millwork/3050677keywon
28	Lighting fixtures	Material	set	L			\$258.00		\$0.00	Prorated		https://www.houzz.com/products/pendant-1-light-3050677keywon
29	Bulb	Material	unit	B	Energy star		\$3.65		\$0.00	Prorated		https://www.beeslighting.com/SE-350.0677keywon
30	Tile (backsplash)	Material	piece	T	Recycled material		\$17.08		\$0.00	Prorated		https://www.homedepot.com/p/Merola-Tile-Expre/3050677keywon
31	Tile (floor)	Material	piece	T	Recycled material		\$17.08		\$0.00	Prorated		https://www.homedepot.com/p/Merola-Tile-Expre/3050677keywon
32	Grout	Material	gallon	G			\$28.47		\$0.00	Prorated		https://www.homedepot.com/p/Custom-Building-3050677keywon
33	Cabinets	Material	set	C			\$399.00		\$0.00	Prorated		https://www.houzz.com/products/sunny-wood-gsv/3050677keywon
34	Paint	Material	gallon	P			\$17.46		\$0.00	Prorated		https://www.homedepot.com/p/Diamond-Brite-Pa/3050677keywon
35	Countertop	Material	piece	C			\$149.99		\$0.00	Prorated		https://www.homedepot.com/p/Wilsonart-5 ft-x-1/3050677keywon
36	Stove	Material	unit	S			\$972.00		\$0.00	Prorated		https://www.houzz.com/products/zline-36-inducti/3050677keywon
37	Fridge	Material	unit	F	Energy star		\$9,999.00		\$0.00	Prorated		https://www.homedepot.com/p/KitchenAid-25-2-c/3050677keywon
38	Dishwasher	Material	unit	D	Energy star		\$1,699.00		\$0.00	Prorated		https://www.homedepot.com/p/LG-SIGNATURE-24/3050677keywon
39	Microwave	Material	unit	M			\$3,149.00		\$0.00	Prorated		https://www.homedepot.com/p/Cafe-30-in-1-7-cu/3050677keywon
40	Vent	Material	unit	V	Energy star		\$379.00		\$0.00	Prorated		https://www.homedepot.com/p/GE-30-in-Under-C/3050677keywon
41	Sink	Material	set	S			\$1,305.34		\$0.00	Prorated		https://www.homedepot.com/p/KOHLER-Strive-All/3050677keywon
42	Garbage disposal	Material	set	G			\$408.00		\$0.00	Prorated		https://www.homedepot.com/p/InSinkErator-Evol/3050677keywon

Figure 2. Resource Sheet

Figure 3 shows the tasks assigned for the project and the costs associated with each task. This is a way to identify the impact of each task. For example, had the price of the project increased beyond what was comfortable for the owner, a quick look at the cost breakdown could identify areas where costs might be high.

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
0	A-Team_Gantt-Chart_new	\$0.00	Prorated	\$59,567.75	\$100,000.00	(\$40,432.25)	\$0.00	\$59,567.75
1	Design Approval/Permits	\$0.00	Prorated	\$5,000.00	\$10,000.00	(\$5,000.00)	\$0.00	\$5,000.00
2	Design/3D Model	\$0.00	Prorated	\$4,000.00	\$9,000.00	(\$5,000.00)	\$0.00	\$4,000.00
3	Choose contactor	\$0.00	Prorated	\$3,200.00	\$7,000.00	(\$3,800.00)	\$0.00	\$3,200.00
4	Generate 3D Model	\$0.00	Prorated	\$800.00	\$2,000.00	(\$1,200.00)	\$0.00	\$800.00
5	City Hall Approval	\$0.00	Prorated	\$1,000.00	\$1,000.00	\$0.00	\$0.00	\$1,000.00
6	Get design approval from city hall	\$0.00	Prorated	\$500.00	\$500.00	\$0.00	\$0.00	\$500.00
7	Get parking permission from city hall	\$0.00	Prorated	\$500.00	\$500.00	\$0.00	\$0.00	\$500.00
8	Demolition/Removal	\$0.00	Prorated	\$2,800.00	\$3,000.00	(\$200.00)	\$0.00	\$2,800.00
9	Remove old equipment	\$0.00	Prorated	\$560.00	\$600.00	(\$40.00)	\$0.00	\$560.00
10	Remove ceiling	\$0.00	Prorated	\$560.00	\$600.00	(\$40.00)	\$0.00	\$560.00
11	Remove all walls	\$0.00	Prorated	\$560.00	\$600.00	(\$40.00)	\$0.00	\$560.00
12	Remove all floors	\$0.00	Prorated	\$1,120.00	\$1,200.00	(\$80.00)	\$0.00	\$1,120.00
13	Infrastructure Installation	\$0.00	Prorated	\$9,605.97	\$14,000.00	(\$4,394.03)	\$0.00	\$9,605.97
14	Reposition gas lines	\$0.00	Prorated	\$657.90	\$1,000.00	(\$342.10)	\$0.00	\$657.90
15	Move plumbing	\$0.00	Prorated	\$1,645.60	\$2,300.00	(\$654.40)	\$0.00	\$1,645.60
16	Renew electrical	\$0.00	Prorated	\$1,004.54	\$1,600.00	(\$595.46)	\$0.00	\$1,004.54
17	Pass city hall's inspection	\$0.00	Prorated	\$500.00	\$500.00	\$0.00	\$0.00	\$500.00
18	Hanging and finishing drywall	\$0.00	Prorated	\$2,461.08	\$3,500.00	(\$1,038.92)	\$0.00	\$2,461.08
19	Seal and prime the wall	\$0.00	Prorated	\$814.98	\$1,500.00	(\$685.02)	\$0.00	\$814.98
20	Seal the ceiling	\$0.00	Prorated	\$681.87	\$1,000.00	(\$318.13)	\$0.00	\$681.87
21	Floor installation prep	\$0.00	Prorated	\$1,840.00	\$2,600.00	(\$760.00)	\$0.00	\$1,840.00
22	Measure the size for new cabinets	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
23	New Equipment Installation	\$0.00	Prorated	\$41,161.78	\$70,000.00	(\$28,838.22)	\$0.00	\$41,161.78
24	Finish trim	\$0.00	Prorated	\$1,299.20	\$2,000.00	(\$700.80)	\$0.00	\$1,299.20
25	Install lighting	\$0.00	Prorated	\$1,504.95	\$3,000.00	(\$1,495.05)	\$0.00	\$1,504.95
26	Flooring	\$0.00	Prorated	\$6,246.94	\$9,100.00	(\$2,853.06)	\$0.00	\$6,246.94
27	Place tiling	\$0.00	Prorated	\$5,230.00	\$7,500.00	(\$2,270.00)	\$0.00	\$5,230.00
28	Grout	\$0.00	Prorated	\$1,016.94	\$1,600.00	(\$583.06)	\$0.00	\$1,016.94
29	Back splash	\$0.00	Prorated	\$5,578.47	\$8,100.00	(\$2,521.53)	\$0.00	\$5,578.47
30	Place tiling	\$0.00	Prorated	\$4,910.00	\$7,000.00	(\$2,090.00)	\$0.00	\$4,910.00
31	Grout	\$0.00	Prorated	\$668.47	\$1,100.00	(\$431.53)	\$0.00	\$668.47
32	New cabinets	\$0.00	Prorated	\$5,586.00	\$8,000.00	(\$2,414.00)	\$0.00	\$5,586.00
33	Measure size for countertop	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
34	Install stove vent	\$0.00	Prorated	\$1,099.00	\$1,700.00	(\$601.00)	\$0.00	\$1,099.00
35	Install countertops	\$0.00	Prorated	\$599.96	\$1,000.00	(\$400.04)	\$0.00	\$599.96
36	Sink	\$0.00	Prorated	\$2,513.34	\$3,700.00	(\$1,186.66)	\$0.00	\$2,513.34
37	Install sink	\$0.00	Prorated	\$1,705.34	\$2,500.00	(\$794.66)	\$0.00	\$1,705.34
38	New garbage disposal	\$0.00	Prorated	\$808.00	\$1,200.00	(\$392.00)	\$0.00	\$808.00
39	Finish painting	\$0.00	Prorated	\$434.92	\$900.00	(\$465.08)	\$0.00	\$434.92
40	New Appliances	\$0.00	Prorated	\$16,299.00	\$32,500.00	(\$16,201.00)	\$0.00	\$16,299.00
41	Stove	\$0.00	Prorated	\$1,092.00	\$4,500.00	(\$3,408.00)	\$0.00	\$1,092.00
42	Fridge	\$0.00	Prorated	\$10,119.00	\$20,000.00	(\$9,881.00)	\$0.00	\$10,119.00
43	Dishwasher	\$0.00	Prorated	\$1,819.00	\$3,500.00	(\$1,681.00)	\$0.00	\$1,819.00
44	Microwave	\$0.00	Prorated	\$3,269.00	\$4,500.00	(\$1,231.00)	\$0.00	\$3,269.00
45	Final Inspection	\$0.00	Prorated	\$500.00	\$2,000.00	(\$1,500.00)	\$0.00	\$500.00
46	Dump waste	\$0.00	Prorated	\$500.00	\$1,000.00	(\$500.00)	\$0.00	\$500.00

Figure 3. Resource sheet with cost breakdown

Risk Management

Risk Analysis

This section will identify and categorize potential risks for this project. In identifying and categorizing these risks, a plan can be developed for how to deal with the identified items. Identifying the risk owner allows for quick tracking and quick implementation on the response plan. This process is ongoing throughout the life of the project and the Risk Assessment Form and Risk Response Form will be continually updated.

Risk Assessment Form

The risk assessment form is used to identify potential risks for the project. This table would be continuously updated throughout the life of the project. The categories used are:

- **Id Number**- unique number to help track each potential risk
- **Risk Event**- brief description of the risk.
- **Likelihood**- Probability of risk occurrence, often based on past experience from similar projects
- **Impact**- How would this risk impact the completion of the project, or what would happen to the project should this risk occur?
- **Detection Difficulty**- How difficult is it to identify this risk when it is about to happen?
- **Project timeline**- In what phase is this risk most likely to occur?

ID Number	Risk Event	Likelihood	Impact	Detection Difficulty	Project Timeframe
1	More time is required for permits	Moderate	Moderate (could push back demo start date, project has to be rushed or go past deadline)	Moderate	During City Hall approval stage
2	Energy efficient appliances cost more than estimated	Moderate	Moderate (impacts budget)	High	Before installing new appliances, when gathering materials for project)
3	Unable to find affordable, sustainable flooring	Moderate	Moderate (impacts budget and sustainability goals outlined in scope)	High	Before installing new flooring, when gathering materials for project)
4	New infrastructure does not pass city hall inspection	Low	High (rework could set back schedule, increase budget)	Moderate	During city hall infrastructure inspection
5	Contractors require more time during demo and/or installation	Moderate	High (impacts schedule; more time spent working = higher cost)	Moderate	Anytime during demo/installation
6	Doe family asks for add'l features	Low	Moderate (impacts budget and schedule)	Moderate	Anytime

Table 2. Risk Assessment Form

Risk Response Matrix

The risk Response Matrix is used to provide a response to the risk should it happen. A well thought out plan will help mitigate the impact of the risk. This table will be continuously updated throughout the life of the project. The categories used are:

- **ID Number**- unique number to help track each potential risk, these are the same as in the Risk Assessment Form
- **Risk Event**- brief description of the risk
- **Response**- what the team will do before the risk ever materializes
- **Contingency Plan**- alternate plan that goes into effect should the risk be recognized
- **Trigger**- what would cause the contingency plan to go into effect?

- **Responsibility**- the responsible party tasked with identifying the trigger and monitoring the risk event

ID Number	Risk Event	Response	Contingency Plan	Trigger	Who is Responsible
1	More time is required for permits	Mitigate: submit permit for approval early in project	See if demolition can be started while waiting for permit approval so delay isn't too bad	Permit not approved on or by January 28	General Contractor
2	Energy efficient appliances cost more than estimated	Avoid: do research on energy efficient appliances before purchase; take advantage of price matching offered by certain retailers	Determine cost estimate for appliances and add contingency funding to budget in case appliances are more expensive than initially estimated	Appliances are more expensive than what was listed in budget	Design Engineer
3	Unable to find affordable, sustainable flooring	Mitigate: research flooring early on to include accurate cost estimate in budget	Add contingency funding to budget for more expensive, sustainable flooring option	Sustainable flooring option is either more expensive than budgeted, or is unavailable	Design Engineer
4	New infrastructure does not pass city hall inspection	Mitigate / Avoid: research city hall codes for infrastructure; hire contractors with experience in infrastructure installation that meets local standards	Account for additional time / financial resources needed in case infrastructure requires rework	City Hall does not approve infrastructure during inspection	General contractor
5	Contractors require more time during demo and/or installation	Mitigate: make sure contractors have materials necessary to complete job in a timely manner	Include contingencies / cushions in budget and schedule in case contractors need more time during demo / installation	Demo and/or installation stages take longer than estimated	General Contractor

6	Doe family asks for add'l features	Avoid: sit down with client before project start to determine what they want in their new kitchen	Include contingency funding in case Doe family requests additional features	Doe family requests add'l features at any point during project	Doe Family
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Table 3. Risk Response Matrix

Contingency Funding

Contingency funding, depending on the risk, would come from the source of the risk. For example if inspections are not approved, the responsible contractor would need to make up any cost difference associated with extra labor costs to fix problems or adjust installation to make it code acceptable. If the Doe family wants to change the design after the installation has started then they would be responsible for added costs.

There are limited contingency funds built into the contract pricing and estimates given by the contractors for limited extra costs. However major changes or structural issues will need a reduction in project scope or an increase in project budget.

Project Cost

Overall Cost

Looking at figure 4, the total cost for this project will be \$59,567.75 dollars. Breaking down the total cost, the baseline is \$100,000 dollars, and the variance is \$40,432.25 dollars. The most expensive single task will be purchasing and installing a fridge, which takes \$10,119 dollars to complete. A single fridge is \$9,999 dollars, and the cost of work is \$120 dollars for 2 hours. The overall cost is lower than what we expected at the beginning of the project. We have saved the most part of the budget from scheduling and worker fees. We start multiple tasks at the same time and shorten the duration of some tasks, so that workers can finish some tasks in a day or two and we do not need to pay them extra for a single task.

Cost by Deliverable

According to figure 4, the cost for each deliverable is:

- Design approval/Permits: \$5,000
- Demolition/Removal: \$2,800
- Infrastructure installation: \$9,605.97
- New equipment installation: \$4,116.78
- Final inspection: \$500
- Dump waste: \$500

From the costs listed above, the deliverable of new equipment installation has taken the most, at \$41,164.78 dollars. Following that is infrastructure installation, \$9,605.97 dollars. In the deliverables of new equipment installation, the variance cost has more percentage than the baseline cost, which is \$100,000 dollars, that is because the materials and worker fees contribute the most in this cost of deliverable. The most expensive sub-deliverable in the deliverables of new equipment installation is flooring, which is \$6,246.94.

Project Baseline Cost

From the baseline cost listed below, the total baseline cost for this project is \$100,000 dollars, and the cost for each deliverable is shown below:

- Design approval/Permits: \$10,000

- Demolition/Removal: \$3,000
- Infrastructure installation: \$14,000
- New equipment installation: \$60,000
- Final inspection: \$2,000
- Dump waste: \$1,000

The baseline cost for each work package is shown below. We have the starting baseline cost at \$100,000. The total baseline cost has been rationally distributed to each work package, and those established costs are more than enough to cover the costs for each work package. The tasks that exhaust the established baseline budget are related to the city hall approval because they have a fixed cost, so the project can fund the accurate budget for them.

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
0	A-Team_Gantt-Chart_new	\$0.00	Prorated	\$59,567.75	\$100,000.00	(\$40,432.25)	\$0.00	\$59,567.75
1	Design Approval/Permits	\$0.00	Prorated	\$5,000.00	\$10,000.00	(\$5,000.00)	\$0.00	\$5,000.00
2	Design/3D Model	\$0.00	Prorated	\$4,000.00	\$9,000.00	(\$5,000.00)	\$0.00	\$4,000.00
3	Choose contactor	\$0.00	Prorated	\$3,200.00	\$7,000.00	(\$3,800.00)	\$0.00	\$3,200.00
4	Generate 3D Model	\$0.00	Prorated	\$800.00	\$2,000.00	(\$1,200.00)	\$0.00	\$800.00
5	City Hall Approval	\$0.00	Prorated	\$1,000.00	\$1,000.00	\$0.00	\$0.00	\$1,000.00
6	Get design approval from city hall	\$0.00	Prorated	\$500.00	\$500.00	\$0.00	\$0.00	\$500.00
7	Get parking permission from city hall	\$0.00	Prorated	\$500.00	\$500.00	\$0.00	\$0.00	\$500.00
8	Demolition/Removal	\$0.00	Prorated	\$2,800.00	\$3,000.00	(\$200.00)	\$0.00	\$2,800.00
9	Remove old equipment	\$0.00	Prorated	\$560.00	\$600.00	(\$40.00)	\$0.00	\$560.00
10	Remove ceiling	\$0.00	Prorated	\$560.00	\$600.00	(\$40.00)	\$0.00	\$560.00
11	Remove all walls	\$0.00	Prorated	\$560.00	\$600.00	(\$40.00)	\$0.00	\$560.00
12	Remove all floors	\$0.00	Prorated	\$1,120.00	\$1,200.00	(\$80.00)	\$0.00	\$1,120.00
13	Infrastructure Installation	\$0.00	Prorated	\$9,605.97	\$14,000.00	(\$4,394.03)	\$0.00	\$9,605.97
14	Reposition gas lines	\$0.00	Prorated	\$657.90	\$1,000.00	(\$342.10)	\$0.00	\$657.90
15	Move plumbing	\$0.00	Prorated	\$1,645.60	\$2,300.00	(\$654.40)	\$0.00	\$1,645.60
16	Renew electrical	\$0.00	Prorated	\$1,004.54	\$1,600.00	(\$595.46)	\$0.00	\$1,004.54
17	Pass city hall's inspection	\$0.00	Prorated	\$500.00	\$500.00	\$0.00	\$0.00	\$500.00
18	Hanging and finishing drywall	\$0.00	Prorated	\$2,461.08	\$3,500.00	(\$1,038.92)	\$0.00	\$2,461.08
19	Seal and prime the wall	\$0.00	Prorated	\$814.98	\$1,500.00	(\$685.02)	\$0.00	\$814.98
20	Seal the ceiling	\$0.00	Prorated	\$681.87	\$1,000.00	(\$318.13)	\$0.00	\$681.87
21	Floor installation prep	\$0.00	Prorated	\$1,840.00	\$2,600.00	(\$760.00)	\$0.00	\$1,840.00
22	Measure the size for new cabinets	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
23	New Equipment Installation	\$0.00	Prorated	\$41,161.78	\$70,000.00	(\$28,838.22)	\$0.00	\$41,161.78
24	Finish trim	\$0.00	Prorated	\$1,299.20	\$2,000.00	(\$700.80)	\$0.00	\$1,299.20
25	Install lighting	\$0.00	Prorated	\$1,504.95	\$3,000.00	(\$1,495.05)	\$0.00	\$1,504.95
26	Flooring	\$0.00	Prorated	\$6,246.94	\$9,100.00	(\$2,853.06)	\$0.00	\$6,246.94
27	Place tiling	\$0.00	Prorated	\$5,230.00	\$7,500.00	(\$2,270.00)	\$0.00	\$5,230.00
28	Grout	\$0.00	Prorated	\$1,016.94	\$1,600.00	(\$583.06)	\$0.00	\$1,016.94
29	Back splash	\$0.00	Prorated	\$5,578.47	\$8,100.00	(\$2,521.53)	\$0.00	\$5,578.47
30	Place tiling	\$0.00	Prorated	\$4,910.00	\$7,000.00	(\$2,090.00)	\$0.00	\$4,910.00
31	Grout	\$0.00	Prorated	\$668.47	\$1,100.00	(\$431.53)	\$0.00	\$668.47
32	New cabinets	\$0.00	Prorated	\$5,586.00	\$8,000.00	(\$2,414.00)	\$0.00	\$5,586.00
33	Measure size for countertop	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
34	Install stove vent	\$0.00	Prorated	\$1,099.00	\$1,700.00	(\$601.00)	\$0.00	\$1,099.00
35	Install countertops	\$0.00	Prorated	\$599.96	\$1,000.00	(\$400.04)	\$0.00	\$599.96
36	Sink	\$0.00	Prorated	\$2,513.34	\$3,700.00	(\$1,186.66)	\$0.00	\$2,513.34
37	Install sink	\$0.00	Prorated	\$1,705.34	\$2,500.00	(\$794.66)	\$0.00	\$1,705.34
38	New garbage disposal	\$0.00	Prorated	\$808.00	\$1,200.00	(\$392.00)	\$0.00	\$808.00
39	Finish painting	\$0.00	Prorated	\$434.92	\$900.00	(\$465.08)	\$0.00	\$434.92
40	New Appliances	\$0.00	Prorated	\$16,299.00	\$32,500.00	(\$16,201.00)	\$0.00	\$16,299.00
41	Stove	\$0.00	Prorated	\$1,092.00	\$4,500.00	(\$3,408.00)	\$0.00	\$1,092.00
42	Fridge	\$0.00	Prorated	\$10,119.00	\$20,000.00	(\$9,881.00)	\$0.00	\$10,119.00
43	Dishwasher	\$0.00	Prorated	\$1,819.00	\$3,500.00	(\$1,681.00)	\$0.00	\$1,819.00
44	Microwave	\$0.00	Prorated	\$3,269.00	\$4,500.00	(\$1,231.00)	\$0.00	\$3,269.00
45	Final Inspection	\$0.00	Prorated	\$500.00	\$2,000.00	(\$1,500.00)	\$0.00	\$500.00
46	Dump waste	\$0.00	Prorated	\$500.00	\$1,000.00	(\$500.00)	\$0.00	\$500.00

Figure 4. Project Baseline Cost

Summary

The goal of this project is to remodel an old 200 sq. ft kitchen into an open floor plan in Corvallis, Oregon. The budget of the remodel is \$100,000 dollars. The project is to be completed within nine weeks. The new materials and equipment should be environment friendly, and energy efficient. The remodel must meet all local building codes. The site work will be completed Monday-Friday from 8:00 am- 6:00 pm and the contractor will be responsible for all subcontractor work. The project will be reviewed by the customer, the Doe Family.

This project is divided into five phases: Design Approval (2 weeks), Demolition (1 week), Infrastructure Installation (2 weeks), New Equipment Installation (3 weeks), and Final Inspection (1 day). When it comes to priority, the scope of meeting energy efficient criteria is not negotiable. It is most important that all of the technical requirements are met. The customer prefers to finish the work on time, and if necessary they accept to go over the budget a little bit to meet their initial project scope.

The whole project is estimated to be done in 24 days. There are several potential risks in this project. The failure of the inspection from city hall might extend the project period but that could be avoided by working with experienced contractors. The rest of risks are either related to the need for more time or waiting for materials. These risks are easily solved since they are much more flexible.

For the cost of the project, the total expenditure of \$59,567.75 dollars. \$41,164.78 (69.1%) is spent on new equipment, \$16,402.97 (27.5%) are for human resources and materials, and \$2,000 (2%) is for City Hall's inspection.

References

Houzz, K. (2021). *Dream a Little Dream* [Photograph found in DC Metro]. Retrieved January 31, 2021, from <https://www.houzz.com/photos/dream-a-little-dream-transitional-kitchen-dc-metro-phvw-vp~165927337>

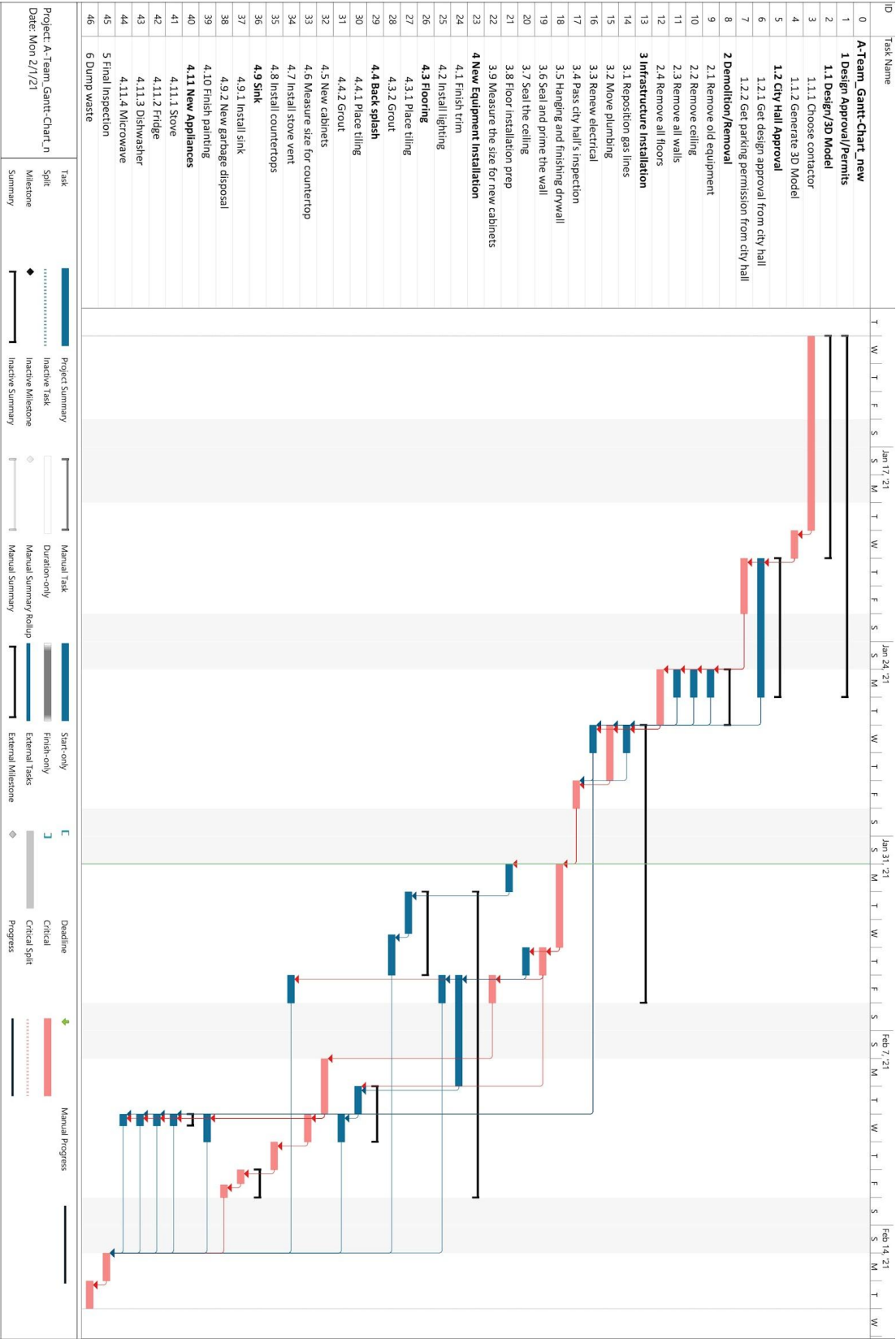
Appendix

Appendix A - Coded WBS

	Task Name	Duration	Start	Finish	Baseline Finish	Predecessors	Early Start	Early Finish	Late Start	Late Finish	Total Slack
0	4 Team Gantt Chart_new	24 days	Wed 1/13/21	Tue 2/16/21	Mon 3/15/21		Wed 1/13/21	Tue 2/16/21	Wed 1/13/21	Tue 2/16/21	0 days
1	1 Design Approval/Permits	8 days	Wed 1/13/21	Mon 1/25/21	Tue 1/26/21		Wed 1/13/21	Mon 1/25/21	Wed 1/13/21	Tue 1/26/21	0 days
2	1.1 Design/3D Model	5 days	Wed 1/13/21	Wed 1/20/21	NA		Wed 1/13/21	Wed 1/20/21	Wed 1/13/21	Wed 1/20/21	0 days
3	1.1.1 Choose contractor	4 days	Wed 1/13/21	Tue 1/19/21	NA		Wed 1/13/21	Tue 1/19/21	Wed 1/13/21	Tue 1/19/21	0 days
4	1.1.2 Generate 3D Model	1 day	Wed 1/20/21	Wed 1/20/21	NA	3	Wed 1/20/21	Wed 1/20/21	Wed 1/20/21	Wed 1/20/21	0 days
5	1.2 City Hall Approval	3 days	Thu 1/21/21	Mon 1/25/21	NA		Thu 1/21/21	Mon 1/25/21	Thu 1/21/21	Tue 1/26/21	0 days
6	1.2.1 Get design approval from city hall	3 days	Thu 1/21/21	Mon 1/25/21	NA	4	Thu 1/21/21	Mon 1/25/21	Fri 1/22/21	Tue 1/26/21	1 day
7	1.2.2 Get parking permission from city hall	2 days	Thu 1/21/21	Fri 1/22/21	NA	4	Thu 1/21/21	Fri 1/22/21	Thu 1/21/21	Fri 1/22/21	0 days
8	2 Demolition/Removal	2 days	Mon 1/25/21	Tue 1/26/21	Tue 2/2/21		Mon 1/25/21	Tue 1/26/21	Mon 1/25/21	Tue 1/26/21	0 days
9	2.1 Remove old equipment	1 day	Mon 1/25/21	Mon 1/25/21	NA	7	Mon 1/25/21	Mon 1/25/21	Tue 1/26/21	Tue 1/26/21	1 day
10	2.2 Remove ceiling	1 day	Mon 1/25/21	Mon 1/25/21	NA	7	Mon 1/25/21	Mon 1/25/21	Tue 1/26/21	Tue 1/26/21	1 day
11	2.3 Remove all walls	1 day	Mon 1/25/21	Mon 1/25/21	NA	7	Mon 1/25/21	Mon 1/25/21	Tue 1/26/21	Tue 1/26/21	1 day
12	2.4 Remove all floors	2 days	Mon 1/25/21	Tue 1/26/21	NA	7	Mon 1/25/21	Tue 1/26/21	Mon 1/25/21	Tue 1/26/21	0 days
13	3 Infrastructure Installation	8 days	Wed 1/27/21	Fri 2/5/21	Wed 2/17/21		Wed 1/27/21	Fri 2/5/21	Wed 1/27/21	Tue 2/9/21	0 days
14	3.1 Reposition gas lines	1 day	Wed 1/27/21	Wed 1/27/21	NA	12,6,9,10,11	Wed 1/27/21	Wed 1/27/21	Thu 1/28/21	Thu 1/28/21	1 day
15	3.2 Move plumbing	2 days	Wed 1/27/21	Thu 1/28/21	NA	12,6,9,10,11	Wed 1/27/21	Thu 1/28/21	Wed 1/27/21	Thu 1/28/21	0 days
16	3.3 Renew electrical	1 day	Wed 1/27/21	Wed 1/27/21	NA	12,6,9,10,11	Wed 1/27/21	Wed 1/27/21	Thu 1/28/21	Thu 1/28/21	1 day
17	3.4 Pass city hall's inspection	1 day	Fri 1/29/21	Fri 1/29/21	NA	16,14,15	Fri 1/29/21	Fri 1/29/21	Fri 1/29/21	Fri 1/29/21	0 days
18	3.5 Hanging and finishing drywall	3 days	Mon 2/1/21	Wed 2/3/21	NA	17	Mon 2/1/21	Wed 2/3/21	Mon 2/1/21	Wed 2/3/21	0 days
19	3.6 Seal and prime the wall	1 day	Thu 2/4/21	Thu 2/4/21	NA	18	Thu 2/4/21	Thu 2/4/21	Thu 2/4/21	Thu 2/4/21	0 days
20	3.7 Seal the ceiling	1 day	Thu 2/4/21	Thu 2/4/21	NA	18	Thu 2/4/21	Thu 2/4/21	Mon 2/8/21	Mon 2/8/21	2 days
21	3.8 Floor installation prep	1 day	Mon 2/1/21	Mon 2/1/21	NA	17	Mon 2/1/21	Mon 2/1/21	Tue 2/9/21	Tue 2/9/21	6 days
22	3.9 Measure the size for new cabinets	1 day	Fri 2/5/21	Fri 2/5/21	NA	19	Fri 2/5/21	Fri 2/5/21	Fri 2/5/21	Fri 2/5/21	0 days
23	4 New Equipment Installation	9 days	Tue 2/12/21	Fri 2/12/21	Thu 3/11/21		Tue 2/12/21	Fri 2/12/21	Mon 2/8/21	Fri 2/12/21	0 days
24	4.1 Finish trim	2 days	Fri 2/5/21	Mon 2/8/21	NA	19,20	Fri 2/5/21	Mon 2/8/21	Tue 2/9/21	Wed 2/10/21	2 days
25	4.2 Install lighting	1 day	Fri 2/5/21	Fri 2/5/21	NA	20,19	Fri 2/5/21	Fri 2/5/21	Fri 2/12/21	Fri 2/12/21	5 days

	Task Name	▼ Duration	▼ Start	▼ Finish	▼ Baseline Finish	▼ Predecessors	▼ Early Start	▼ Early Finish	▼ Late Start	▼ Late Finish	▼ Total Slack
26	4.3 Flooring	3 days	Tue 2/2/21	Thu 2/4/21	NA		Tue 2/2/21	Thu 2/4/21	Wed 2/10/21	Fri 2/12/21	6 days
27	4.3.1 Place tiling	1.5 days	Tue 2/2/21	Wed 2/3/21	NA	21	Tue 2/2/21	Wed 2/3/21	Wed 2/10/21	Thu 2/11/21	6 days
28	4.3.2 Grout	1.5 days	Wed 2/3/21	Thu 2/4/21	NA	27	Wed 2/3/21	Thu 2/4/21	Thu 2/11/21	Fri 2/12/21	6 days
29	4.4 Back splash	2 days	Tue 2/9/21	Wed 2/10/21	NA		Tue 2/9/21	Wed 2/10/21	Thu 2/11/21	Fri 2/12/21	2 days
30	4.4.1 Place tiling	1 day	Tue 2/9/21	Tue 2/9/21	NA	19,24	Tue 2/9/21	Tue 2/9/21	Thu 2/11/21	Thu 2/11/21	2 days
31	4.4.2 Grout	1 day	Wed 2/10/21	Wed 2/10/21	NA	30	Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2 days
32	4.5 New cabinets	2 days	Mon 2/8/21	Tue 2/9/21	NA	22	Mon 2/8/21	Tue 2/9/21	Mon 2/8/21	Tue 2/9/21	0 days
33	4.6 Measure size for countertop	1 day	Wed 2/10/21	Wed 2/10/21	NA	32	Wed 2/10/21	Wed 2/10/21	Wed 2/10/21	Wed 2/10/21	0 days
34	4.7 Install stove vent	1 day	Fri 2/5/21	Fri 2/5/21	NA	19	Fri 2/5/21	Fri 2/5/21	Fri 2/12/21	Fri 2/12/21	5 days
35	4.8 Install countertops	1 day	Thu 2/11/21	Thu 2/11/21	NA	33	Thu 2/11/21	Thu 2/11/21	Thu 2/11/21	Thu 2/11/21	0 days
36	4.9 Sink	1 day	Fri 2/12/21	Fri 2/12/21	NA		Fri 2/12/21	Fri 2/12/21	Fri 2/12/21	Fri 2/12/21	0 days
37	4.9.1 Install sink	0.5 days	Fri 2/12/21	Fri 2/12/21	NA	35	Fri 2/12/21	Fri 2/12/21	Fri 2/12/21	Fri 2/12/21	0 days
38	4.9.2 New garbage disposal	0.5 days	Fri 2/12/21	Fri 2/12/21	NA	37	Fri 2/12/21	Fri 2/12/21	Fri 2/12/21	Fri 2/12/21	0 days
39	4.10 Finish painting	1 day	Wed 2/10/21	Wed 2/10/21	NA	32	Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2 days
40	4.11 New Appliances	0.25 days	Wed 2/10/21	Wed 2/10/21	NA		Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2.75 days
41	4.11.1 Stove	0.25 days	Wed 2/10/21	Wed 2/10/21	NA	32,16	Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2.75 days
42	4.11.2 Fridge	0.25 days	Wed 2/10/21	Wed 2/10/21	NA	32,16	Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2.75 days
43	4.11.3 Dishwasher	0.25 days	Wed 2/10/21	Wed 2/10/21	NA	32,16	Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2.75 days
44	4.11.4 Microwave	0.25 days	Wed 2/10/21	Wed 2/10/21	NA	32,16	Wed 2/10/21	Wed 2/10/21	Fri 2/12/21	Fri 2/12/21	2.75 days
45	5 Final Inspection	1 day	Mon 2/15/21	Mon 2/15/21	Mon 3/15/21	44,41,42,43,39,38	Mon 2/15/21	Mon 2/15/21	Mon 2/15/21	Mon 2/15/21	0 days
46	6 Dump waste	1 day	Tue 2/16/21	Tue 2/16/21	NA	45	Tue 2/16/21	Tue 2/16/21	Tue 2/16/21	Tue 2/16/21	0 days

Appendix B - Gantt Chart



Appendix C - Network Diagram

