

# Rabbit Hutch

Eagle Scout Project Additional Documents

Hubert Chen  
Burlingame CA Troop 28 2019

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## Project Approval Signatures:

Candidate	Hubert Chen	(650) 924-7640	06/16/2019
Unit Leader	Daryl Thomas	(650) 281-3785	06/17/2019
Unit Committee	Chester Rice	(408) 569-3975	06/17/2019
Beneficiary	Johnny Chen	(415) 309-9618	07/31/2019
Council or District	Pam Fosnes	pamfosnes@aol.com	

<b>Candidate's Promise</b> <i>(Signed before approvals below are granted)</i> On my honor as a Scout, I have read this entire workbook, including the "Message to Scouts and Parents or Guardians" on page 21. I promise to be the leader of this project, and to do my best to carry it out for the maximum benefit to the religious institution, school, or community I have chosen as beneficiary. Signed <u>Hubert Chen</u> Date <u>6/16/2019</u>	
<b>Unit Leader Approval*</b> I have reviewed this proposal and discussed it with the candidate. I believe it provides impact worthy of an Eagle Scout service project, and will involve planning, development, and leadership. I am comfortable the Scout understands what to do, and how to lead the effort. I will see that the project is monitored, and that adults or others present will not overshadow him. Signed <u>[Signature]</u> Date <u>6/17/2019</u>	<b>Unit Committee Approval*</b> This Eagle Scout candidate is a Life Scout, and registered in our unit. I have reviewed this proposal, I am comfortable the project is feasible, and I will do everything I can to see that our unit measures up to the level of support we have agreed to provide (if any). I certify that I have been authorized by our unit committee to provide its approval for this proposal. Signed <u>[Signature]</u> Date <u>6/17/2019</u> <u>Chester Rice</u>
<b>Beneficiary Approval*</b> This service project will provide significant benefit, and we will do all we can to see it through. We realize funding on our part is not required, but we have informed the Scout of the financial support (if any) that we have agreed to. We understand any fundraising he conducts will be in our name and that funds left over will come to us. We will provide receipts to donors as required. Signed <u>[Signature]</u> Date <u>6/17/2019</u>	<b>Council or District Approval</b> I have read sections 9.0.2.0 through 9.0.2.15, regarding the Eagle Scout Service Project, in the <i>Guide to Advancement</i> , No. 33088. I agree on my honor to apply the procedures as written, and in compliance with the policy on "Unauthorized Changes to Advancement." Accordingly, I approve this proposal. I will encourage the candidate to complete a final plan and further encourage him to share it with a project coach. Signed <u>[Signature]</u> Date <u>7/31/19</u> <u>Pam Fosnes</u>

\*While it makes sense to obtain them in the order they appear, there shall be no required sequence for the order of obtaining approvals marked with an asterisk (\*). However, council or district approval must come after the others.

## Project Completion Signatures:

Candidate	Hubert Chen	(650) 924-7640	09/21/2019
Beneficiary	Johnny Chen	(415) 309-9618	09/21/2019
Unit Leader	Daryl Thomas	(650) 281-3785	06/15/2020

<b>Candidate's Promise</b> On my honor as a Scout, I was the leader of my Eagle Scout service project and completed it as reported here. Signed: <u>Hubert Chen</u> Date: <u>9/21/2019</u>	
<b>Completion Approvals</b> In my opinion, this Eagle Scout service project meets Eagle Scout requirement 5, as stated on page 4 of this workbook.	
<b>Beneficiary name:</b> <u>Johnny Chen</u> Signed: <u>[Signature]</u> Date: <u>Sept 21<sup>st</sup> 2019</u>	<b>Unit leader name:</b> <u>Daryl Thomas</u> Signed: <u>[Signature]</u> Date: <u>6/15/2020</u>

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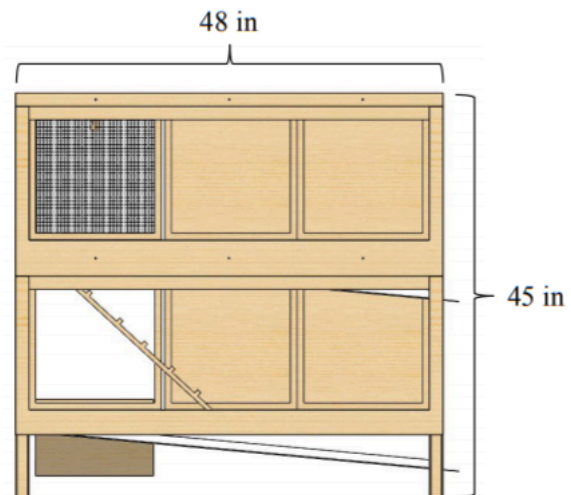
### Project Proposal Attached Documents:

## Cost Analysis

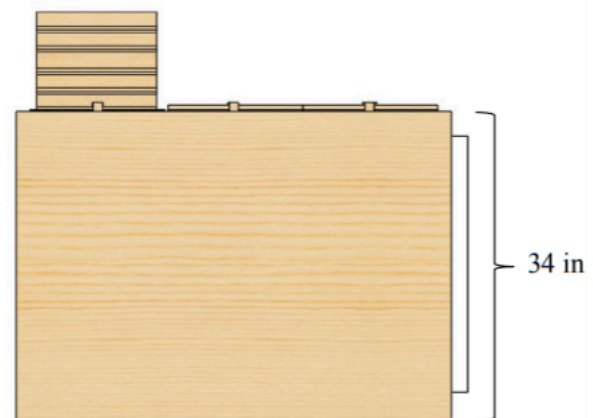
		unit price	amount	price	total		Other items (already available)
1/2 x 4 planks	<a href="https://www.homedepot.com/p/2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200">https://www.homedepot.com/p/2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200</a>	22.48	4	89.92	300.13		wood screws
2x2	<a href="https://www.homedepot.com/p/2x2-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200">https://www.homedepot.com/p/2x2-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200</a>	23.47	1	23.47			nails
1x1	<a href="https://www.rona.ca/en/1x1-2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200">https://www.rona.ca/en/1x1-2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200</a>	1.09	60	65.4			door hinges
sheet metal	<a href="https://www.discountbuilding.com/1-2-x-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200">https://www.discountbuilding.com/1-2-x-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200</a>	36.53	1	36.53			ground stakes
1/2 x 1 mesh	<a href="https://www.homedepot.com/p/2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200">https://www.homedepot.com/p/2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200</a>	21.99	3	65.97			
L brackets	<a href="https://www.homedepot.com/p/2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200">https://www.homedepot.com/p/2x4-4-1-2-in-x-8-ft-pressure-treated-spruce-pine-fir-lumber-50-pcs/305561200</a>	9.42	2	18.84			

# Dimensions

Side view (single module)



Top view (single module)



# Multiple module assemblies

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2 modules (front view)



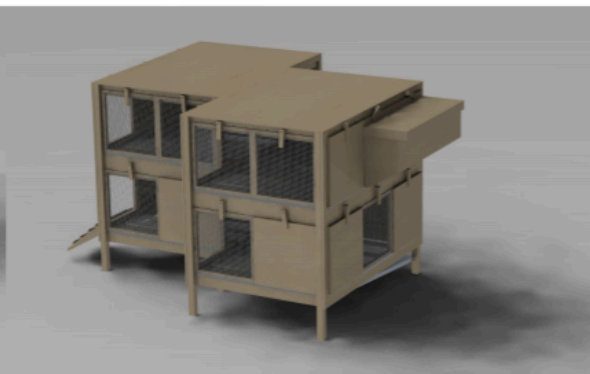
2 modules (rear view)



2 modules staggered (front view)



2 modules staggered (rear view)



## Single module assemblies

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Bare frame



Assembly with ramp floor panel



Assembly with feeder panel



# Side panels

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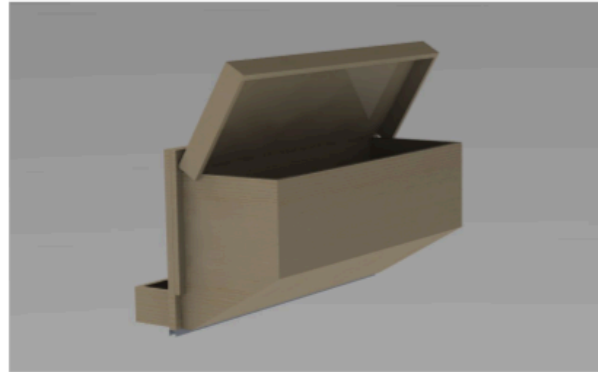
Single panels

Ramp panel

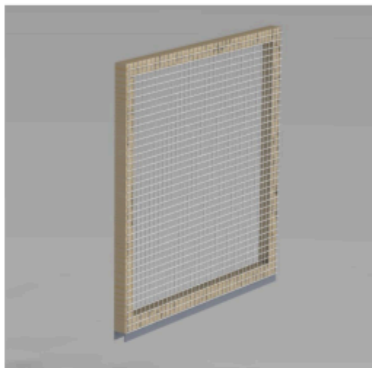


Double panels

Feeder panel (rear view)



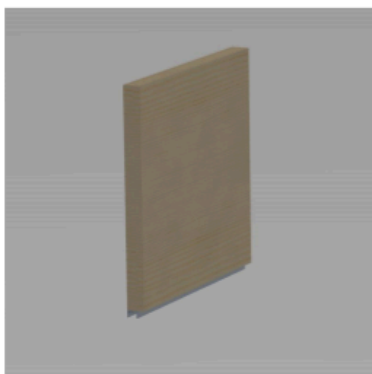
Mesh panel



Feeder panel (front view)



Solid Wood panel



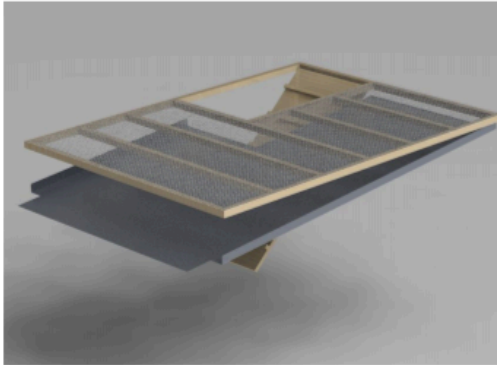
Organic Waste panel



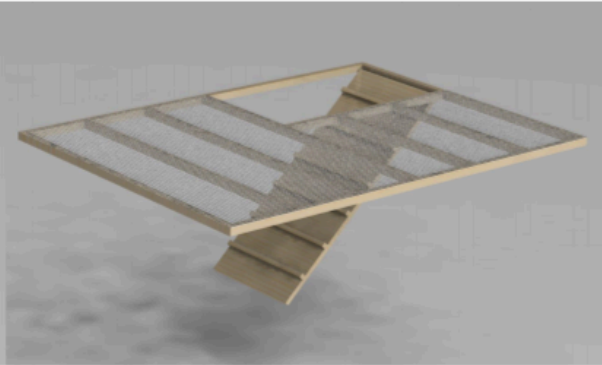
# Floor panels

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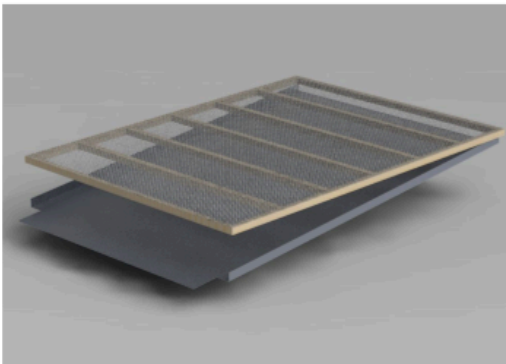
Ramp floor panel with  
waste collector underneath



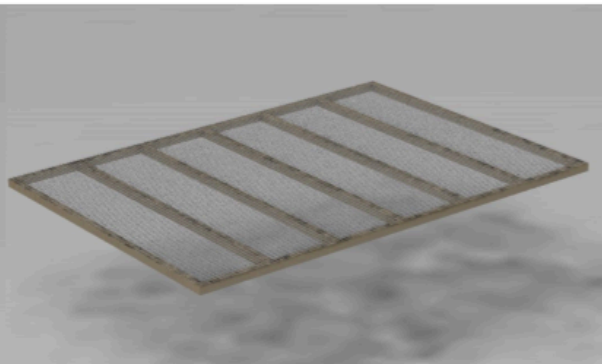
Ramp floor panel (bare)



Standard floor panel with  
waste collector underneath



Standard floor panel (bare)



## Project Plan Attached Documents:

### Preliminary time estimate:

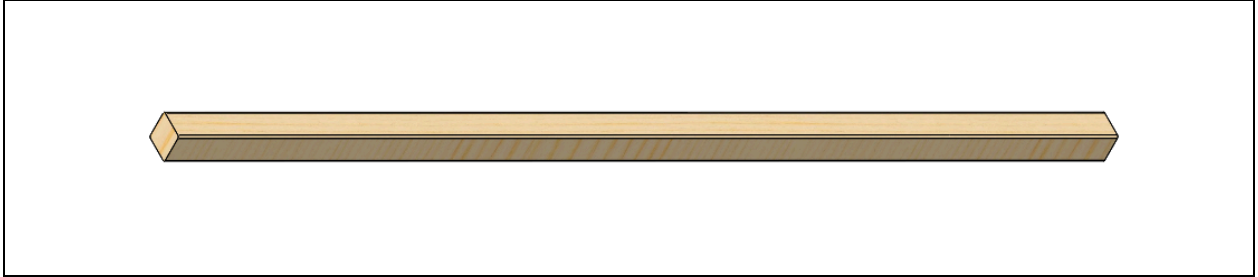
	Things to make	Quantity calculations	Quantity	Time estimate (hours)	Current count	Amount left		
Single panels	1"x1" 14"	152(singles) + 10(doubles)	159	1	0	159	Total time estimate	
					0	0	10.85	
Floor sides	1"x1" 44.875"		16	0.25	0	16		
Floor cross	1"x1" 31.375"	49(flats) + 5(ramps)	54	0.5	0	54		
Floor ramp	1"x1" 21.3125"		2	0.05	0	2		
Floor ramp	1"x1" 18.625"		1	0.05	0	1		
Doubles long	1"x1" 29"		10	0.1	0	10		
Side long long	0.5"x4" 48"		16	0.2	0	16		
Side long short	0.5"x4" 44"		16	0.2	0	16		
Side short long	0.5"x4" 33"		16	0.2	0	16		
Side short short	0.5"x4" 30"		16	0.2	0	16		
Side spacers	0.5"x1.5" 15" (Low Priority) (Use Scrap)		32	0.5	0	32		
Vertical Supports	2"x2" 45"		16	0.25	0	16		
	Cut 8 of each sides (#9-#12) at 1.25" long way		32	0.2	0	32		
Roof	34"x48" (Use Scrap)		4	0.25	0	4		
						0		
						0		
						0		
						0		
						0		
						0		
Single panels	mesh sheet 14.75"x14.75"		19	1	0	19		
U Channels	14.75"	38(singles)	38	0.5	0	38		
U Channels long	29.5"		5	0.1	0	5		
						0		
						0		
						0		
						0		
						0		

					0	0		
Stage 1 assemblies								
Name	Required items for one unit (quantity #row)							
Singles frame	4 #2		38	1	0	38		
Doubles frame	2 #2, 2 #8		10	0.5	0	10		
Sde bois center	2 #9, 2 #10, 2 #11, 2 #12		4	1	0	4		
Sde bois Top	Requires #15 to be finished		4	1	0	4		
Sde bois Top	Requires #15 to be finished		4	1	0	4		
Floor ramp	2 #4, 5 #5, 2 #6, 1 #7		1	0.1	0	1		
Floor flat	3 #4, 7 #5,		7	0.7	0	7		
						0		
						0		
						0		

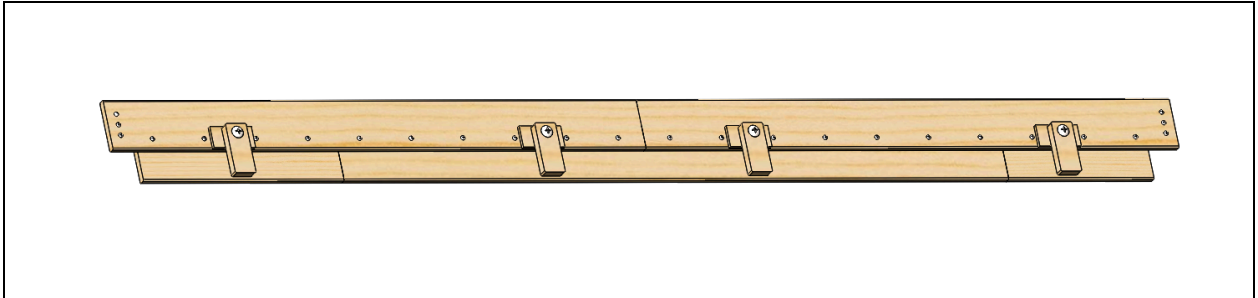


## Modules to construct:

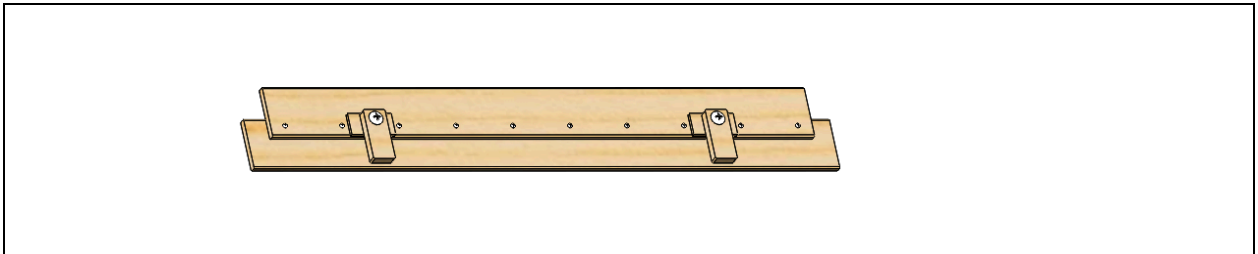
Corner post QTY = 4:



Long side beam QTY = 6:

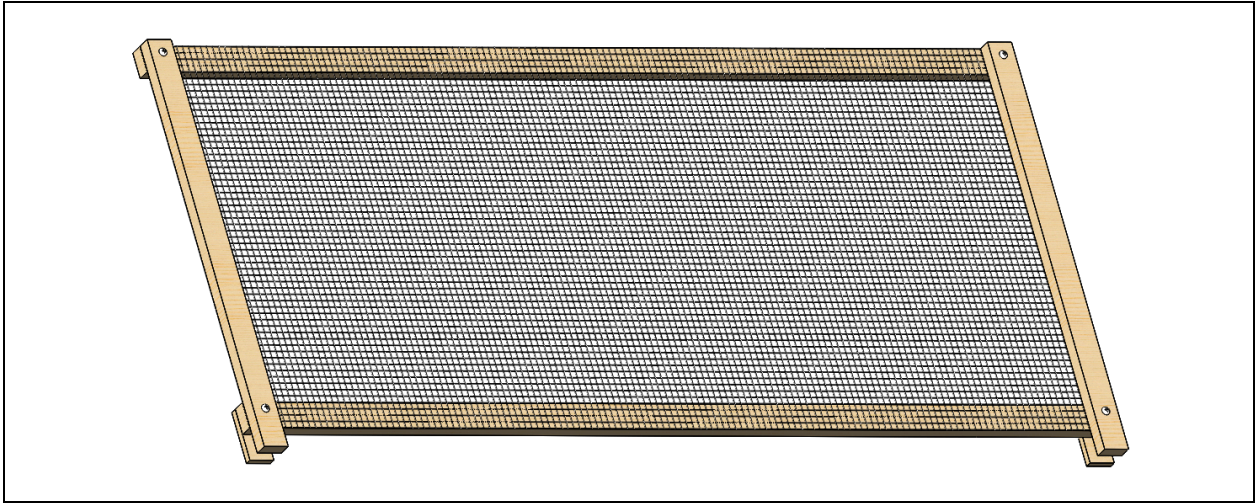


Short side beam QTY = 6:





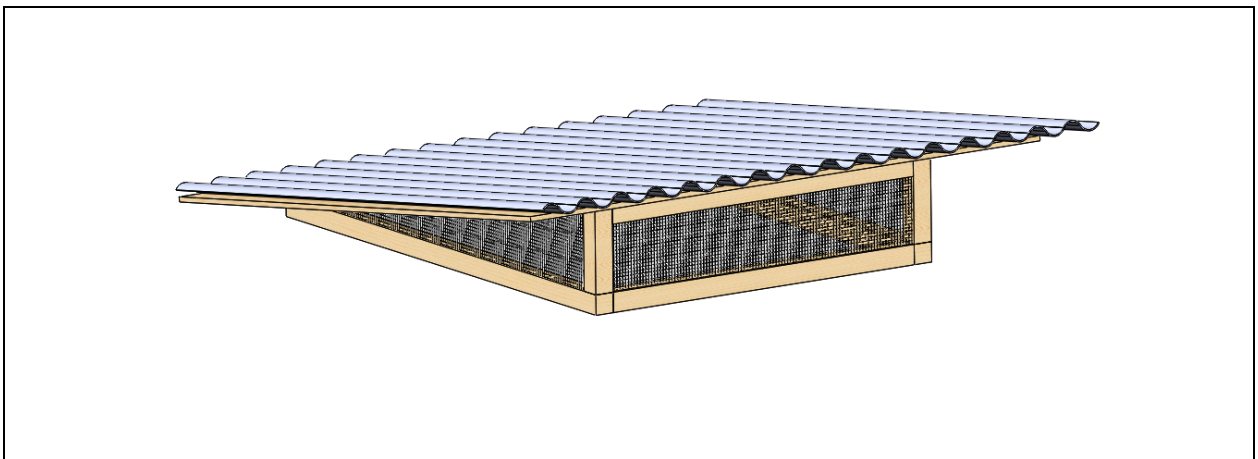
**Side panel with mesh QTY = 14:**



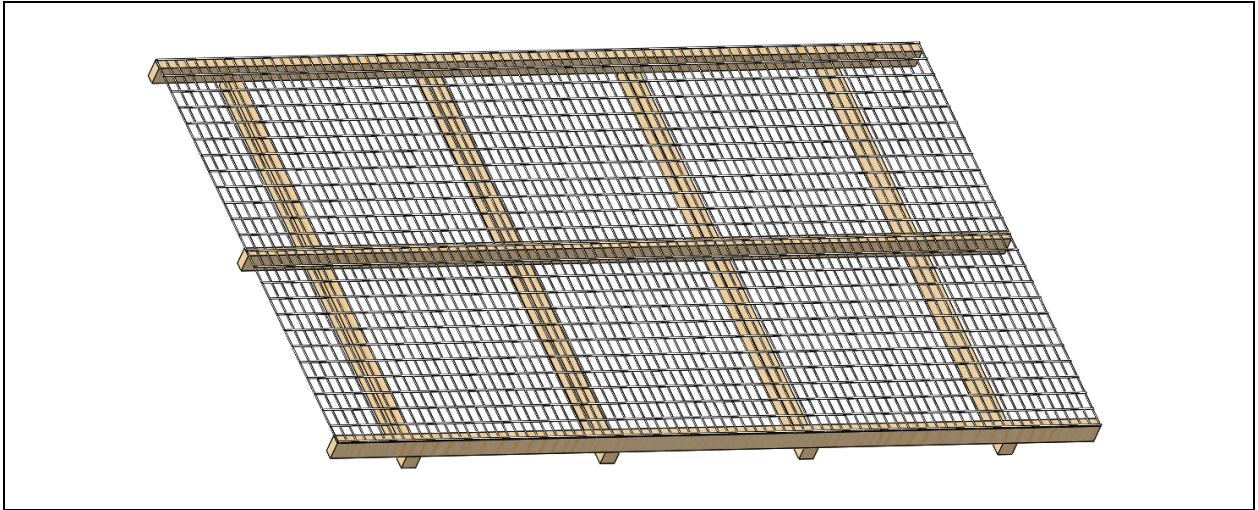
**Side panel with solid board QTY = 14:**



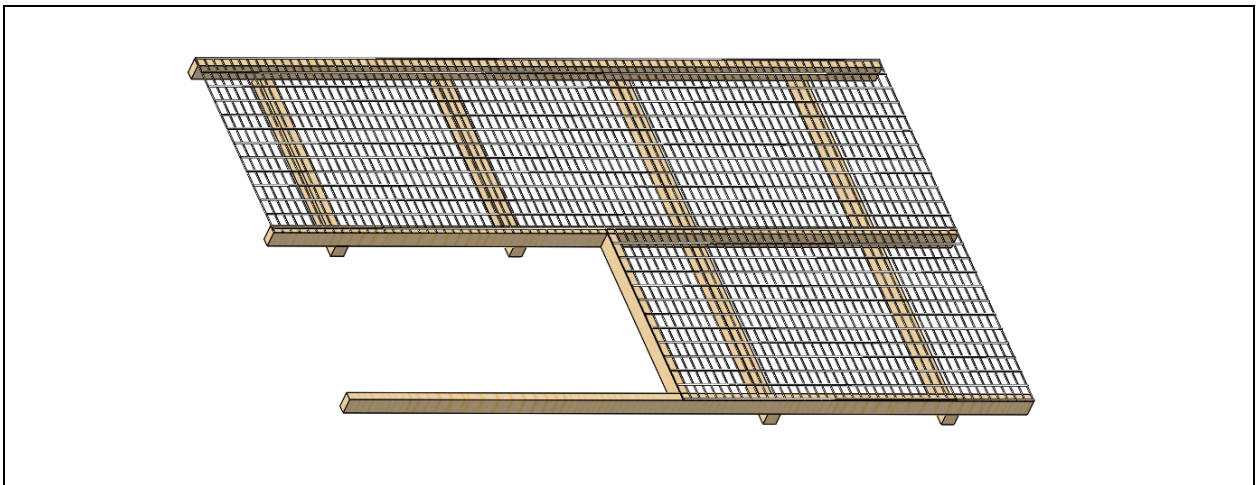
**Roof module QTY = 2:**



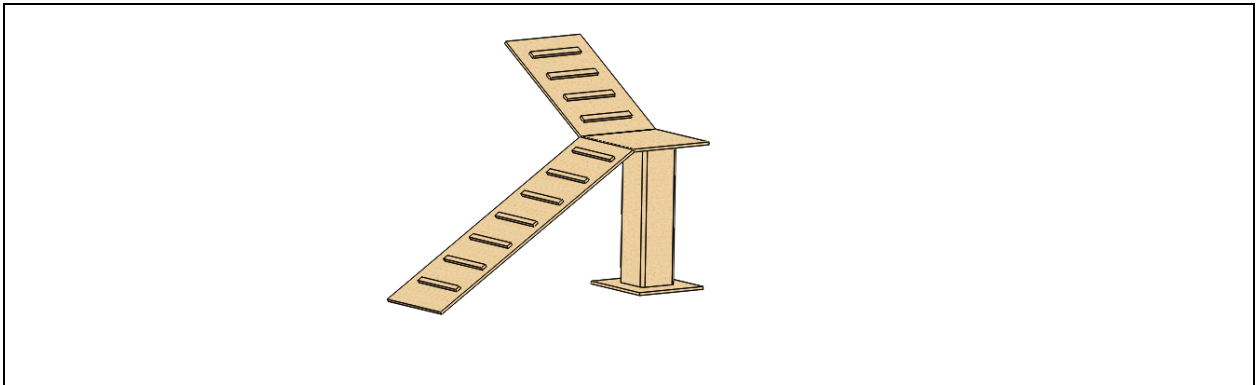
**Floor module QTY = 5:**



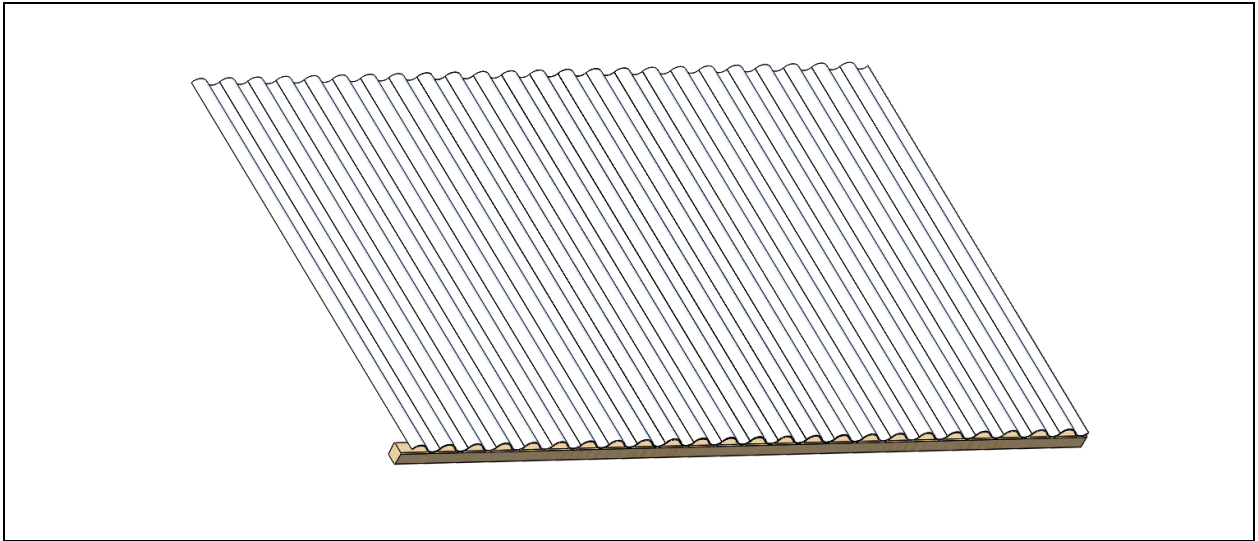
**Floor module with cutout QTY = 1:**



**Ramp module QTY = 1:**



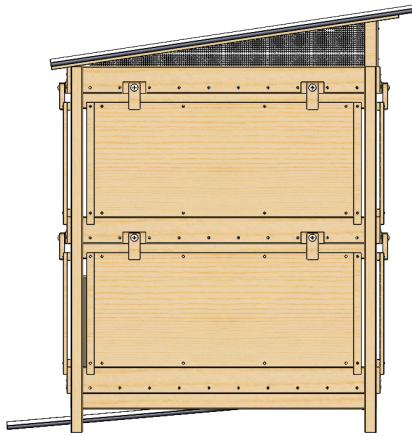
**Organic waste collector module QTY = 1:**



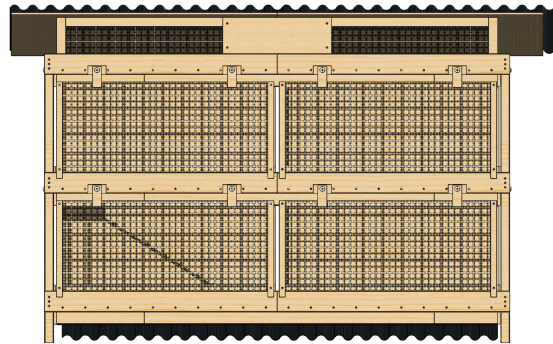


## Final Assembly Plan:

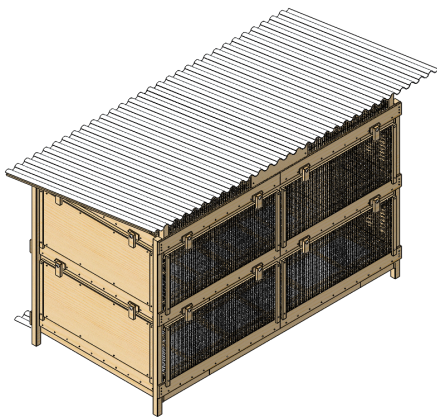
Side view:



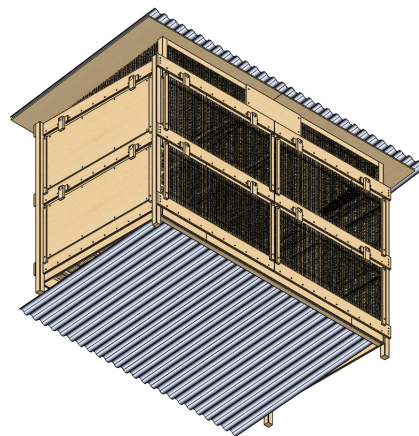
Front view:



Top isometric view:



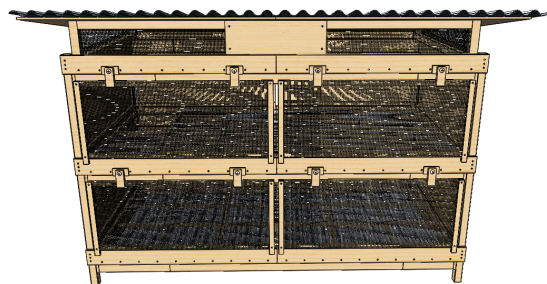
Bottom isometric view:

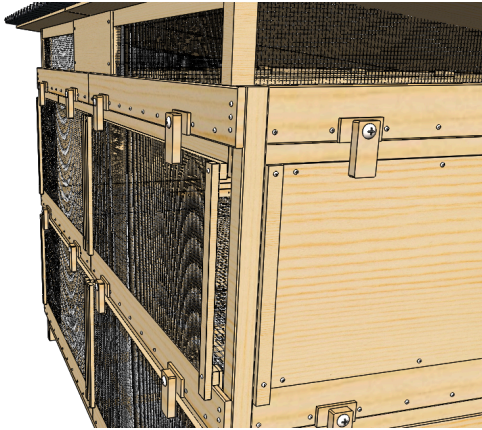
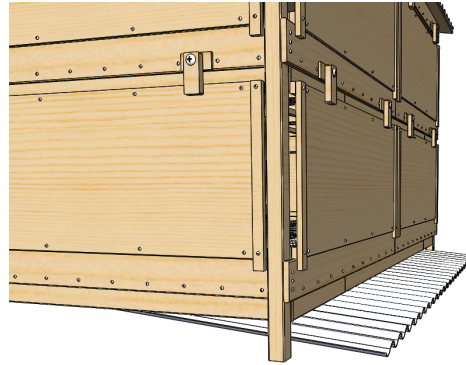
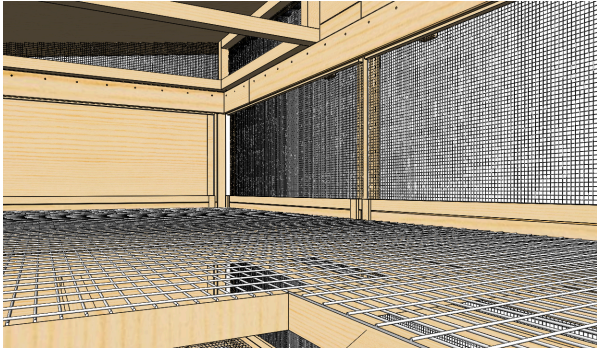
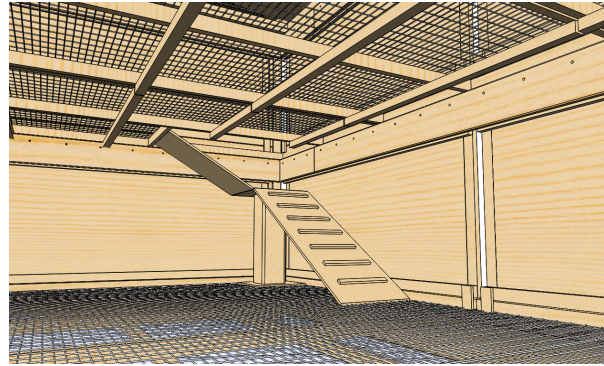


Miscellaneous perspective view 1:



Miscellaneous perspective view 2:



**Miscellaneous perspective view 3:****Miscellaneous perspective view 4:****Miscellaneous perspective view 5:****Miscellaneous perspective view 6:**

**Full render:**





## Project Report Attached Documents:

(Parentheses signifies the presence of a person, but just not inside the photo)



Pallets at the Asian Community Garden. A handful were selected for scrap wood in the use of this project.

In picture: (JD Chen, Hubert Chen, Johnny Chen)

Jul 13, 2019



Wood scrap at the Asian Community Garden. A handful were selected for scrap wood in the use of this project.

In picture: (JD Chen, Hubert Chen, Johnny Chen)

Jul 13, 2019



Installation site prior to installation. The garden bed shown in the photo was removed to make way for the rabbit hutch.

In picture: (JD Chen, Hubert Chen, Johnny Chen)

Aug 10, 2019



A pallet being deconstructed to collect wood planks.

In picture: Hubert Chen (JD Chen, Johnny Chen)

Aug 3, 2019





Floor modules being constructed offsite.  
In picture: Darrion Chen (JD Chen, Hubert Chen, Justin Tien Smith)  
Aug 11, 2019



Side modules being constructed offsite.  
In picture: Hubert Chen, Darrion Chen (JD Chen)  
Aug 10, 2019



Side modules being constructed offsite  
In picture: Hubert Chen (JD Chen)  
Aug 16, 2019



Modules being loaded into the family SUV for transportation to the installation site.  
In picture: Hubert Chen (JD Chen)  
Aug 17, 2019





Side modules being assembled with corner posts onsite. In the left of the photo is shown all the other modules yet to be assembled.  
In picture: Hubert Chen, JD Chen (Dr. Smith, Johnny Chen)  
Aug 17, 2019



Frame fully assembled with corner posts onsite.  
In picture: Hubert Chen, Dr. Smith (JD Chen, Johnny Chen)  
Aug 17, 2019



Frame assembly being installed onsite.  
In picture: Hubert Chen, JD Chen (Dr. Smith, Johnny Chen)  
Aug 17, 2019



Rabbit hutch stress testing.  
In picture: Hubert Chen (JD Chen, Dr. Smith, Johnny Chen)  
Aug 17, 2019





Completion of initial installation.  
In picture: Hubert Chen, Johnny Chen, JD Chen (Dr. Smith,)  
Aug 17, 2019



Side panels being revised offsite. (Safety precautions were relaxed since we were only filing wood and mesh)  
In picture: Phyllis Tien, Sean Lennane, Justin Tien-Smith, Hubert Chen (Dr. Smith, JD Chen)  
Aug 25, 2019



Completion of side panel revision and roof revision.  
In picture: Hubert Chen, JD Chen (Johnny Chen,)  
Aug 31, 2019



Fully completed rabbit hutch, still awaiting occupancy. (No picture was taken immediately after completion, so this is the earliest one)  
In picture: (Hubert Chen, JD Chen, Darrion Chen)  
May 25, 2020

**Events in which pictures are not available:****Table saw cutting**

A table saw was used by Darrion Chen (adult family member) under the supervision of Ian Hovander (robotics team mentor and volunteer).

Parties present: Darrion Chen, Ian Hovander, Hubert Chen.

Aug 3, 2019

**Problems and notes:****Wood splitting problem**

It was discovered that the wood, due to being old and recycled, was very prone to splitting. In order to solve this problem, pilot holes were drilled in a staggered pattern that ensured fasteners were not all in one line along the grain of the wood. Furthermore, a countersink tool was used to ensure that the wood screw countersink did not split the wood.

**Long side module assembly**

The large side modules were too long to be made with 1 single panel from the pallets, so multiple were attached together. This connection used bolts, washers, and tee-nuts instead of nails and screws for extra durability.

**Gaps in the sides**

It was revealed after the initial installation that there were large gaps to the left and right sides of the side panels. This was solved with the installation of boards to cover them up.

**Roof module**

At first, a simple flat roof was made as a placeholder since the intended roof module had not yet been created. I also hoped that the beneficiary would approve of it since the intended roof modules were rather complicated to make, but that was not the case. (The flat roof can be in photo 1 on page 20)

**Floor panel accessibility**

It was revealed after the initial installation that it was difficult to remove and place floor panels in the hutch. To solve this, we created a floor panel “tool” which was essentially a large fork that allowed the user to grab the floor panel from its center.

## Time Log:

[illegible]