

**Customer Needs**

Team 510

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### Customer Needs

To determine the needs for our design, Team 510 developed a set of questions to interview the project's sponsors, Darryl Beadle and Mickey Nguyen. The team presented these questions in a face-to-face meeting at the Ghost Controls Facility. These questions were developed with an understanding of the Ghost Controls consumer demographic and the challenges they face with their current systems. A common issue for these consumers is their gate sagging and gradually becoming misaligned over time. Table 1 below shows the questions asked to the advisors, their answers and interpreted needs to better inform our design process.

Table 1: *Customer Needs Q&A*

<b>Customer Needs Q&amp;A</b>			
	<b>Question</b>	<b>Customer Statement</b>	<b>Needs Interpretation</b>
1	What is the maximum gate size/weight we need to account for?	“The maximum gate length recommended for the gate opener is 20 feet. The arm for the opener weighs roughly 54 pounds.”	Mechanism works for lengths up to 20 feet.
2	Is the desired product a latch or a lock?	“It does not matter. A latch and lock are the same except for the security aspect. It is up to the team to choose, but if a lock design is chosen, it must be secure and resist 50 pounds of force.”	Gate lock design can resist 50 lbs. of force.
3	How often is the gate opener used?	“The gate is stationary way more than in motion.”	Gate can stay locked in the closed position after opener is used.
4	What are the biggest complaints about the current ZombieLock product?	“Check amazon reviews for specifics, but mostly the sagging of the gate over time results in the lock not properly latching.”	The gates tendency to sag is the root of the main issue with the current product.
5	What kind of	“They are marketed as no contact	Product is marketed for no

	environment do you market your gates for?	gates for properties and fencing. They are not for animal containment.”	contact gates such as a residential property.
6	Are there any specific types of lock options you would like us to focus on?	“No, anything you want to try is acceptable. Recall, the lock needs to be mechanical, and electronics can only be used for the release of the lock. A magnetic lock is not possible due to lack of energy.”	The type of lock is at the team's discretion if it is mechanical.
7	Are there any environmental factors you would like us to consider?	“The product needs to be universal and work in various weather conditions: high winds in the north, earthquakes in the west, etc. Note the gate can vary by length and material.”	The gate performs in rugged environments as well as perfect conditions.
8	How do you currently account for the sagging in the gate?	“Adjust the latch/lock or realign the post to account for the sag rather than fixing it.”	Gate adjusts system to account for the sag.
9	What is the desired budget?	“The current product is the ZombieLock and sells for \$199. Under \$99 would be preferred, to appear more affordable to customers.”	Improvement to lock costs less than the current market system.
10	How is power provided to the gate and lock?	“There is a 12V battery or solar panel to power the gate. The lock only receives power to unlatch and relatch.”	Lock is mechanical and draws power to lock and unlock the gate.
11	What occurs in the event of a loss of power?	“The mechanism must also have a mechanical, passive release method if power is lost or not available”	Product contains a fail-safe method of unlocking

As the needs were interpreted, a new locking mechanism that accounts for the inevitable misalignment due to sagging and other factors is desired. An emphasis was placed on the importance of ensuring the gate is secure when stationary. Various extreme environmental factors are accounted for when designing and selecting material. It is important for the product to maintain the current budget. The product only has access to power when unlatching and

relatching provided by the battery. The product is universal for various gate sizes up to 20 feet that are used in residential areas.