

# Exploring the application of a control system in a local context

THE CONTROL SYSTEM FOR GATES TO AUTOMATICALLY OPEN AND CLOSE



## Reasons why the Automatic Gate is needed

- Security of the house, keep robbers & unwanted people out of the house
- Safety of the people in the house
- Use of Gate in bad weather, no need to get out of the car to open
- Easy to open & close by pressing a button on the remote control in your car
- Gate can be opened from the house by pressing a button on the Telephone in the house



# Research needed for Automatic Gate Control system

- Checked on-line for Automatic Gates Control systems
- Looked in my locality for Automatic Gates
- Interviewed users to determine if there were any user problems with the Gates
- Checked Safety aspects of the operation of the Gates
- Did a cost plan to see if it was worthwhile to spend the required amount of money on the Project & if the money was available
- Developed a basic understanding of how the Automatic Gates control system works

## The Design of the gate

- This section is the first step in the Project
- The Time for the Design will take 1 week
- Items to be considered include the following:
  - Objectives & suitability of Project
  - Basic drawings of system
  - Location & Ground level
  - Type of components & materials to use
  - Site survey to decide on locations of installation
  - Search to locate components for purchase
  - Cost of components & parts
  - People required to do the work



## Design findings

- There is a rise in ground level from the road to the house. The gate was installed in this rising ground.
- In swinging gates were not suitable because they would hit the rising ground and would not open
- The gate that was suitable was one that could slide across the drive
- To control opening and closing the gate a remote control, an intercom, and house telephones were best suited
- To get the gates to slide a rack and pinion and a motor were needed
- For safety measures people sensors were needed
- A picture of a rack and pinion is to your right



## The control system

- The control system has a number of components, these are listed as follows; a motor, rack and pinion, movement sensors, remote control, an aerial for the remote control, cables and wires, power switch and fuse, an intercom, remote telephone handsets, electronic controls in the motorbox and a limit switch in the motorbox.
- All the above components are linked together to control the opening and closing of the gate
- The control system opens the gate via a pinion on the motor linked to a rack on the gate and it stops opening and closing when the gate hits the limit switch
- Picture of the remote telephone handsets needed for the gate



## The installation of the control system

- The control motor is installed beside the gate in such a way that the pinion on the motor will move the rack on the gate
- The motor needs electricity supply and this is coming from the main electrical distribution board which is in the garage. (This is a board that splits the electricity all around the house of switches.)
- To your right there is a picture of what the main power distribution board looks like



## The installation of the control system

- In order to get the electricity from the garage to the gate an underground cable will be installed from the garage to the gate
- The intercom is installed in the gate pillar and it is connected by an underground cable to the intercom telephones in the house.
- The gate controls which is the limit switches and the people sensors will need to be installed on bracket(a bracket is a piece of metal made to hold the components)

- A picture of an intercom





## Background Information

- The Gates was a special design that had wheels built into the bottom of it.
- A metal base was installed under the gate & there was a track installed on the base for the Gate to run on.
- The Gates was made by a Gates manufacturer in Swinford
- The Electronic Components such as the Motor, limit switch, people sensor, intercom, house Telephones were bought of an Automatic Gates company in Dublin
- The underground Electric cables were bought of a company called CT Electric in Castlebar
- The whole Project took 3 months from start to finish
- The overall cost of the Project was reduced by the installation been carried out by members of the Household & as a result it was good value for money

## Project conclusions

- I was interested in the many components for safety and security measures. An example of a few of these components were the people sensor, the telephone, and the intercom. I was particularly interested in these three as not all gates would have these components.
- I enjoyed learning about the projects unique design. Most gates would usually open and close inswinging but ours had to slide across because of the rising ground.
- I found it interesting how some of the components were installed inside the house and I was eager to find out how they connected up to the gate.
- I enjoyed learning about the background information of the gate, where the components came from and how long it took to make the gate
- I would recommend this project to anyone because you can get a lot of information out of it and it was interesting

## Teacher Annotations

The research method was appropriate, and some analysis was evident. The response could have used more primary sources to support the research.

The investigation was quite broad and did not explore the defined function of the controller system.

There was an attempt to evaluate the Classroom-Based assessment, but it relied on brief conclusions.

The Classroom-Based assessment was presented appropriately using a combination of text and images

## Overall Judgement

In line with expectations

