



Automated Settlement Device

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Introduction and Problem Statement

Many buildings face an important safety issue which is the building settlement, and it can be noticed by the cracks in the walls. To prevent this issue, the project idea is: Develop a device to monitor foundation settlement, preventing building cracks by accurately measuring settling, ensuring durable foundations and structural stability

BUILDING FOUNDATION



Constraints

- The Device Is Installed For New Structures
- The Device Is Stable After Mounting It On a Pipe
- The Pipe Is Made Of HDPE (PE-100)

Target Specifications

- Project Life-Time: 30-40 Years
- Sensor's Accuracy: ± 0.01 mm
- Operation Temperature: 25°C
- Minimum Power Efficiency In All Operational Modes: 90%

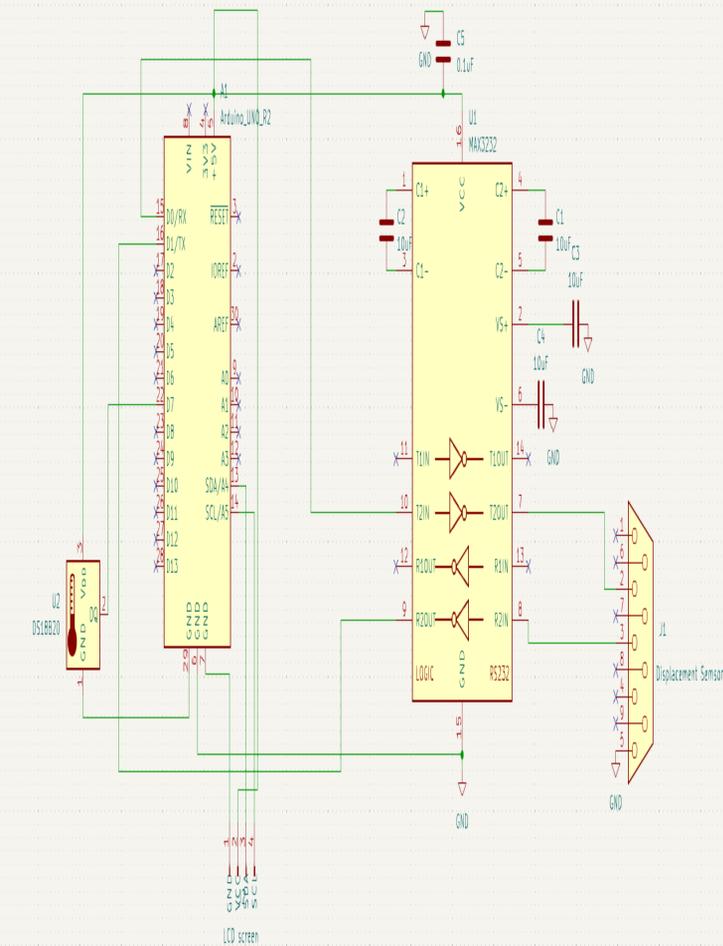
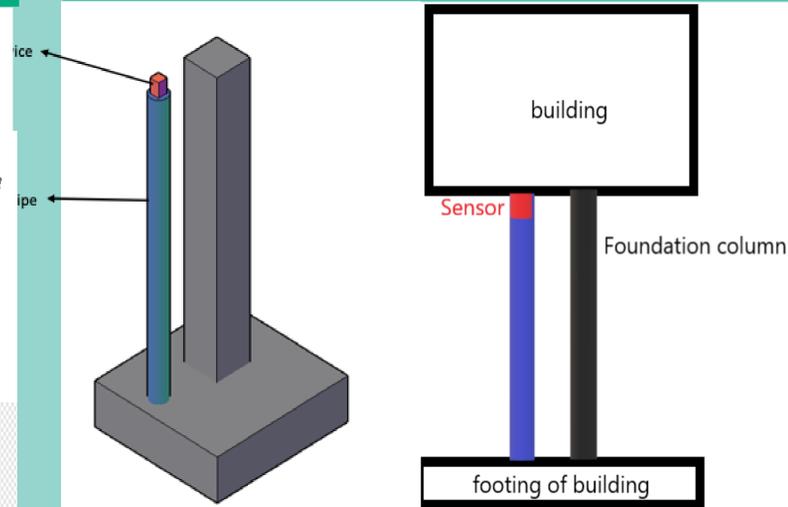


Project Impact

The main impact of this project is that it will prevent many risks from the settlement, and the most important is safety since it will provide a safe structure for living beings.

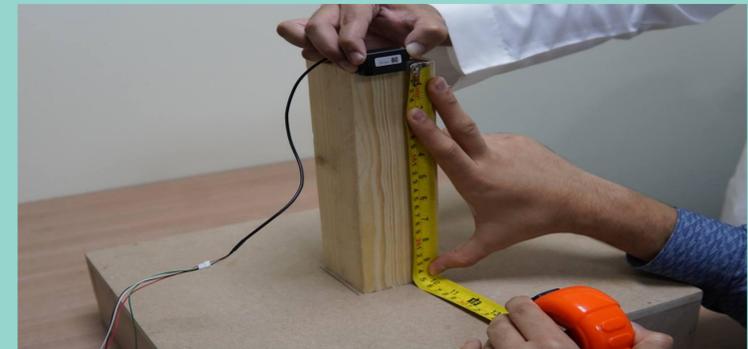
Moreover, the project will have an impact from the economic aspect since it will decrease the risk of building crashes that would lead to money loss.

Prototype Design



Testing

In our project, we've met most of the specifications, but the sensors we used measure in centimeters instead of millimeters because the millimeter ones are expensive. However, when we tested our device against a meter stick, it was 94% accurate in its measurements compared to the meter stick.



Conclusion

To sum up, we've developed an Automated Settlement Device to monitor building settlement and prevent cracks in new structures. While we aimed for millimeter accuracy in sensors, we opted for centimeter measurement due to cost. However, our device showed 94% accuracy when tested against a meter stick, ensuring reliable monitoring for building stability.