

Construction Site Analysis/Inspection

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Introduction to Small Unmanned Aircraft Systems

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Friday, May 7, 2021

Drones are prevailing to be more useful in many industries especially in the construction industry. In the past decade, technological advancement has opened a vast number of uses for drones in countless ways and any field. The application of drones in site analysis and site inspection is just a drop in the vast ocean of uses. Drones in site analysis can save time, money, and lives. Money and time are incredibly important factors in construction and everyday life. A drone can improve all three stages of construction site analysis at the beginning phase and site analysis during the construction phase and even after completion of the project. Drones could show to have a positive impact in the construction world.

Drones can be used to do construction site analysis, and this can be at the beginning of the construction process during the planning stage. They can also be used during the construction phase and the completion of the project. During the planning processes its paramount that there is a proper understanding of the site condition. A drone could benefit the site analysis process by giving a bird's eye view of the property, which is a point of view contractors never have had the luxury of. A view from above may show indications of how water moves on the site and how much debris needs to be removed. It can also be a much fast method of covering a vast amount of property in a short amount of time. Also, some drones are capable of mapping and surveying an entire site. This would be an extreme improvement over the traditional site surveying methods. A drone can survey an area with less crew and equal precision when compared to the traditional methods. An actual aerial map of a job site could prove to be very useful to a construction crew. If the drone is also capable of storing flight video, then you can keep the footage and use it to refer to at a later date in time and to prove you conducted a site visit.

Sometimes there are legal issues with builders and property owners when there is not a site visit done and then an issue occurs who is to pay for the issue.

During the construction phase, the drone can be used to make a quick assessment of the progression of the job site and use that to make sure it is on course with a schedule. This can also be useful to document and date as certain phases of construction are completed and have video evidence of the quality of work that was performed. Such has inspecting welds high up on a structure that normally requires a crane and a basket to reach. A drone would also be much faster than a crane and a basket. Saving money by not paying for a crane the permits and the operating and other man-hours to go up and inspect the welds. Drones equipped with proper software and technology are capable of making precise measurements in a very efficient manner. Heliceo is a company that has developed a measuring device for drones. The device allows the user to plug and play with almost any drone. The drone connects to the control box and uses satellites and has a positioning accuracy of one centimeter.

The last phase of construction can be benefitting the contractor in a few ways, future proof of the quality of work, 3d modeling, and advertisement. Always important to have proof of work and quality of the completion for future reference. 3d modeling can be beneficial to the contractor because they can use it to help design and improve future projects. Also pairing 3d modeling with VR the contractor could use it and other pictures and videos as advertising. This would be a highly effective method of advertisement, being able to see firsthand the product you would be receiving. This could also display to customers the quality of work the contractor provides.

Construction is a dangerous occupation, 5,333 workers died on the job in 2019, and if there is any way at all drones could be implemented to protect the lives of construction workers and site inspectors should be taken. Drones would excel on inspections on skyscrapers where you have to go 100's of feet in the air to inspect the welds and connections of beams. Osha requires all personal above 6 feet off the ground to tie off, but accidents still happen and on average 1000 workers die from falls each year. Drones could help improve the safety of inspection on risky job sites and other structures such as hydro dams and even oil rigs out in the ocean. The minimal time a dam can go without inspection is 10 years and currently there are 80,000 hydro dams in the united states. They require thorough inspection and sometimes can put personal in extremely dangerous situations. Area drone application would work flawlessly in this position and could keep men and women off the face of a dam. Even more treacherous is when divers have to descend into the water and inspect the turbines and the structure below the surface. This is where the implementation of underwater drones would be perfect for inspection. The corps of engineers spent 11 million dollars on inspections and removal of muscles from the dam's structure.

The applications of drones in the construction industry are truly full of vast potential and the use for inspection and site analysis can prove to be extremely advantageous to the construction industry. Drones assist and improve the site analysis in all three stages the planning stage and the construction phase and even after completion. They even can improve the safety and the speed at which inspections are done for all different kinds of job sites. Drones can help contractors save money, time, and lives. Drones are truly the future and will continue evolving at an exponential rate.