

1.0 Executive Summary

Following a major storm event on July 28, 2015 in which the City of Humboldt saw 122mm of rain within a 24 hours period, Catterall & Wright was asked to provide design services for drainage improvements for several locations in Humboldt, SK. One of these locations was Centennial Park, a multi-use park space that includes a high school, hockey arena, swimming pool, curling rink, 5 baseball diamonds and a skateboard park. Several of the on-site amenities were highly saturated after the storm event and many were submerged in water. The saturated land made it extremely difficult to survey the area using conventional methods further increasing the difficulty in capturing the extent of the drainage issues on the property. Due to the complex nature of the terrain and site features, it was decided that the park would be measured using a photogrammetry based multi-rotor UAV.

The decision to use a photogrammetry based technique as the main source of survey measurements would enable the engineering team to get a comprehensive view of the parks drainage patterns. Deliverables for this project included a high resolution orthomosaic aerial image, a high density point cloud that provided 3D coordinate information for existing site features, and a bare-earth DTM representing existing drainage patterns. This method of surveying is comprehensive, cost effective and non-intrusive when compared to traditional methods. The combination of photogrammetry, total station and RTK GPS would provide an innovative and comprehensive solution to a complex survey problem.



Figure 1: Looking south-west from Highway 5, showing the extent of drainage issues in Centennial Park following the 2015 storm event.

2.0 Project Constraints

Due to the complex nature of the flight operation, the following constraints were identified prior to making the decision to use a photogrammetry based UAV for the project: