



STERLING HIGHWAY MILEPOST 44.5 TO 58  
RECONSTRUCTION SURVEY SERVICES  
Z530140000

## Surveying for Right of Way Report

**PREPARED FOR:**

State of Alaska Department of Transportation & Public Facilities – Central Region

**PREPARED BY:**

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The Surveying for Right of Way (ROW) was performed by R&M Consultants, Inc. (R&M) between July 27, 2019 and October 6, 2019. Field survey information is located in R&M Field Books No. Z530140000, Books 1 and 2.

**INTRODUCTION**

The Sterling Highway as we know it today was originally constructed during the 1940's and 1950's. While much of the highway has been upgraded over time, the segment of road included in this project has not been greatly improved. The ROW survey task included searching for and locating if found, all the necessary monuments to establish property and ROW lines that fall within and adjacent to the Juneau Creek Alternative alignment.

**HORIZONTAL CONTROL**

This project is located entirely within the "Anchorage 2015" Low Distortion Projection (LDP), a U.S. Survey Foot grid coordinate system developed by the Alaska Department of Transportation. The primary control was established by R&M under a different task for this project. Please refer to the report created by R&M titled "SterHwy MP 45-60 Survey Report" which explains the control created for this project.

The positions for all the found Right of Way and property corners were established by either static GPS network techniques using both Javad Triumph-1 and Trimble R10 receivers, or conventional methods using a Trimble S7 total station. All receivers were mounted on adjustable tripods, and were centered over the point using Leica tribrachs which were pegged while on the project site prior to use. The height reading was measured in feet and meters both before and after each observation session. All data was collected at either 5-second or 1-second intervals with an elevation mask of 10 degrees for a minimum observation time of thirty minutes. The receiver number, antenna height, start/stop times, and the monument description were recorded in the field notes for each occupation. Digital photos

were taken of all points set or tied. For those points that were surrounded by thick vegetation, the only photos taken would be the cap photo and the cap setting photo.

All points were adjusted in a simultaneous least squares network adjustment within Trimble Business Center, version 4.10. For maximum redundancy, three static "base stations" set up over known control points were used while two static "rover" units were used to rove around to tie the found property corners. After adjustment, most points had an error ellipse better than 0.10' at the 95 percentile. A couple of the points that were located way out by themselves with dense & large tree coverage had error ellipses of 0.20' at the 95 percentile, these adjusted positions were accepted due to limited options.

The vegetation coverage varies drastically throughout the project. Every effort was taken to utilize static GPS to tie all the found monuments, however conventional methods were needed for the areas where cutting trees was not an option (i.e. adjacent to private property). When conventional ties were required, an azimuth pair was set and tied with the GPS adjacent to the found property corner. From the adjusted positions of the azimuth pair, "two rounds" were turned and recorded to the found monument. When azimuth pairs wouldn't work, a traverse was ran to tie the found monuments. Three traverses were run for this project. Two of the three closed better than 1:10,000 after adjusting the angular error. The third traverse that did not close better than 1:10,000 had a length of only 280 feet with a horizontal misclosure of 0.03' by 0.05', the traverse and side shots were accepted.

No problems were encountered during this survey.

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As the basemapping task progressed along it was discovered that a Placer mining claim existed within the SW quarter of Section 19, Township 5 North, Range 3 West. The claim was "Located" and "Posted" on 4-28-18 and 4-29-18 respectively. While flagging the "specialized" clearing limits in late March, it was decided to have the field crew search for and tie if found the four mining claim posts. Three of the four posts were found (SW, SE & NE) and located using RTK methods. Two shots on each post were taken: The first 60-second shot represents the coordinate for the found post, while the 2<sup>nd</sup> 60-second shot was taken after re-initialization and was used for checking purposes. The 4<sup>th</sup> post (NW Corner) could potentially be there, however due to the snow load at the time of survey the field crew was not able to find it. Once the snow has melted away and access to the site is open, it is suggested that the field crew re-visit the site to search for the Northwest corner post and tie if found.