

TRANSPORTATION INSPECTION

PROBLEM OVERVIEW

CUES was contacted by an In-Pipe Multi-Sensor Pipeline Inspection Company to assist in determine the horizontal location of a 68-inch diameter RCP sanitary pipeline that traverses I-35 in Texas. The company needed this information for a future highway widening and bridge expansion project.

CUES APPROACH

CUES developed a large diameter Accurate Mapping Probe (AMP™) carrier (refer to Figure 1) specifically for use in large diameter pipelines. The large diameter carrier was designed to transport CUES's AMP™ technology in which horizontal coordinates and vertical elevation measurements are collected at the rate of 100 readings/second through the use of: Gyroscopes; Accelerometers; and Inclometers. Additionally, the design of this large diameter carrier allowed for the placement of two AMPs™, this allowed for a drastic reduction in field time required in obtaining positional data within the pipeline. Since this pipeline was under flow and could not be by-passed, CUES configured the AMPs™ in opposite directions (refer to Figure 2) allowing for the pipeline to be mapped twice going only in one direction, with flow.

RESULTS

This particular pipeline had a length of over 1,250 ft and was under half flow conditions. Since the manhole entrance was 22-inches in diameter for this 68-inch diameter line this necessitated placing an individual into the line to construct the large diameter AMP™ carrier. CUES was able to map this pipeline under these conditions. Positional data collected from the AMPs™ were averaged together and compiled into one plan and profile drawing provided as Figure 3. Additionally, through the use of AMPVUE™ (web-based AMP™ data deliverable production service) the plan view of this pipeline was also generated and was provided as a Google Earth KML file and is depicted as Figure 4.



Operational range of 3.5in ID (90mm) to 58in ID (1473mm). Whether the pipeline is made of steel, concrete, PE, or PVC, this mapping system can be used to accurately locate any pipe.



Figure 1: Large Diameter AMP™ Carrier

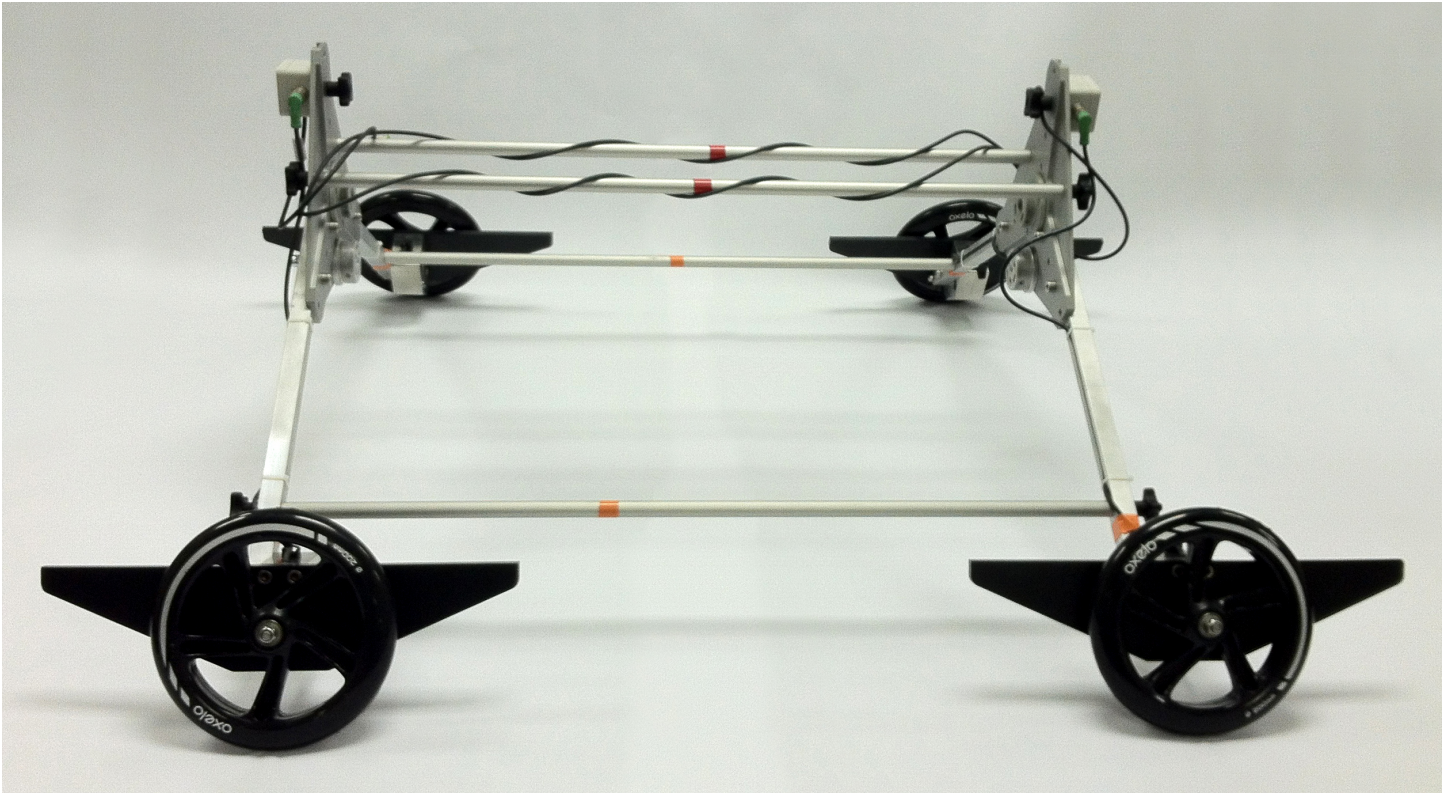


Figure 2: Placement of 2 AMPs™

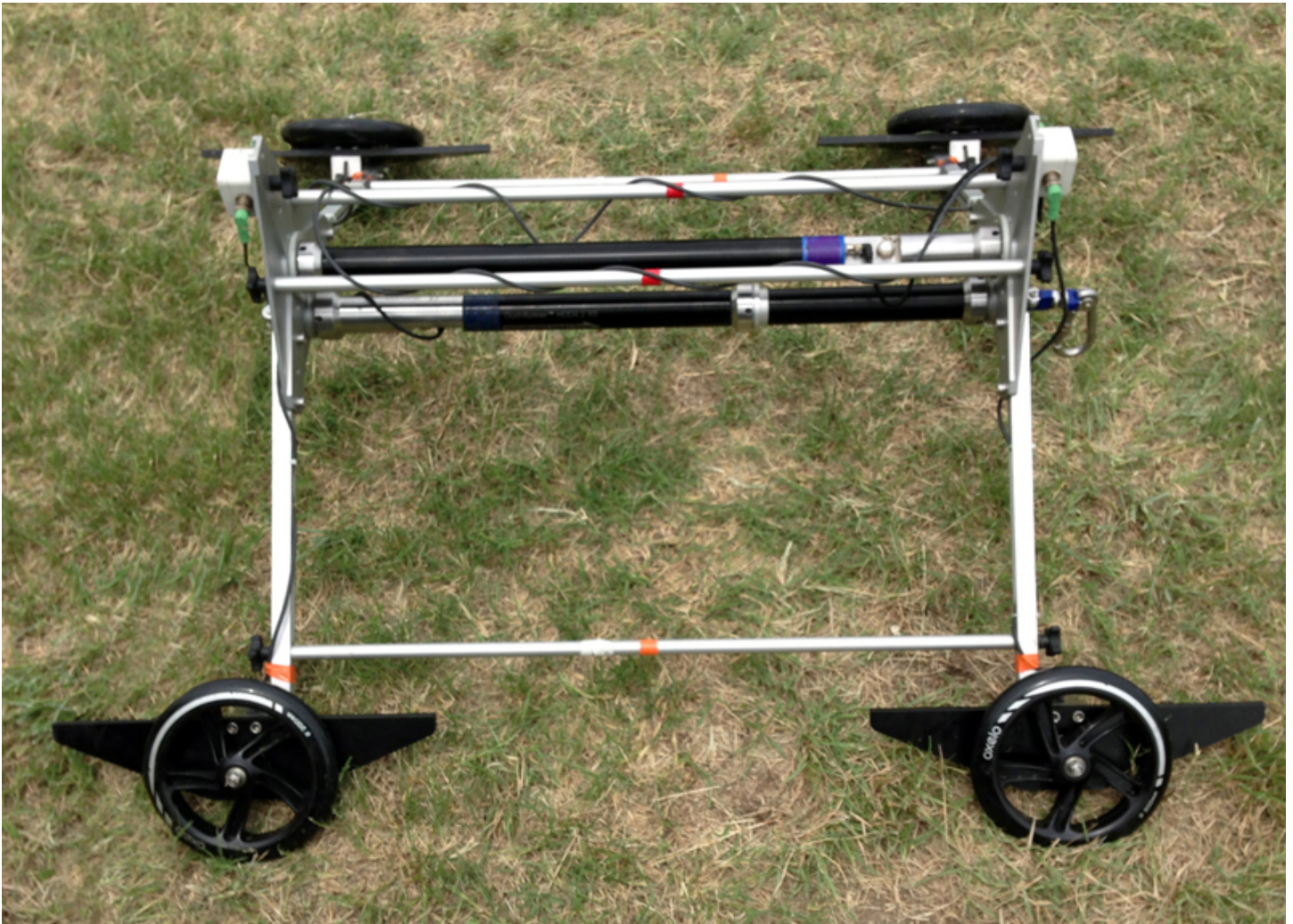


Figure 3: Plan & Profile

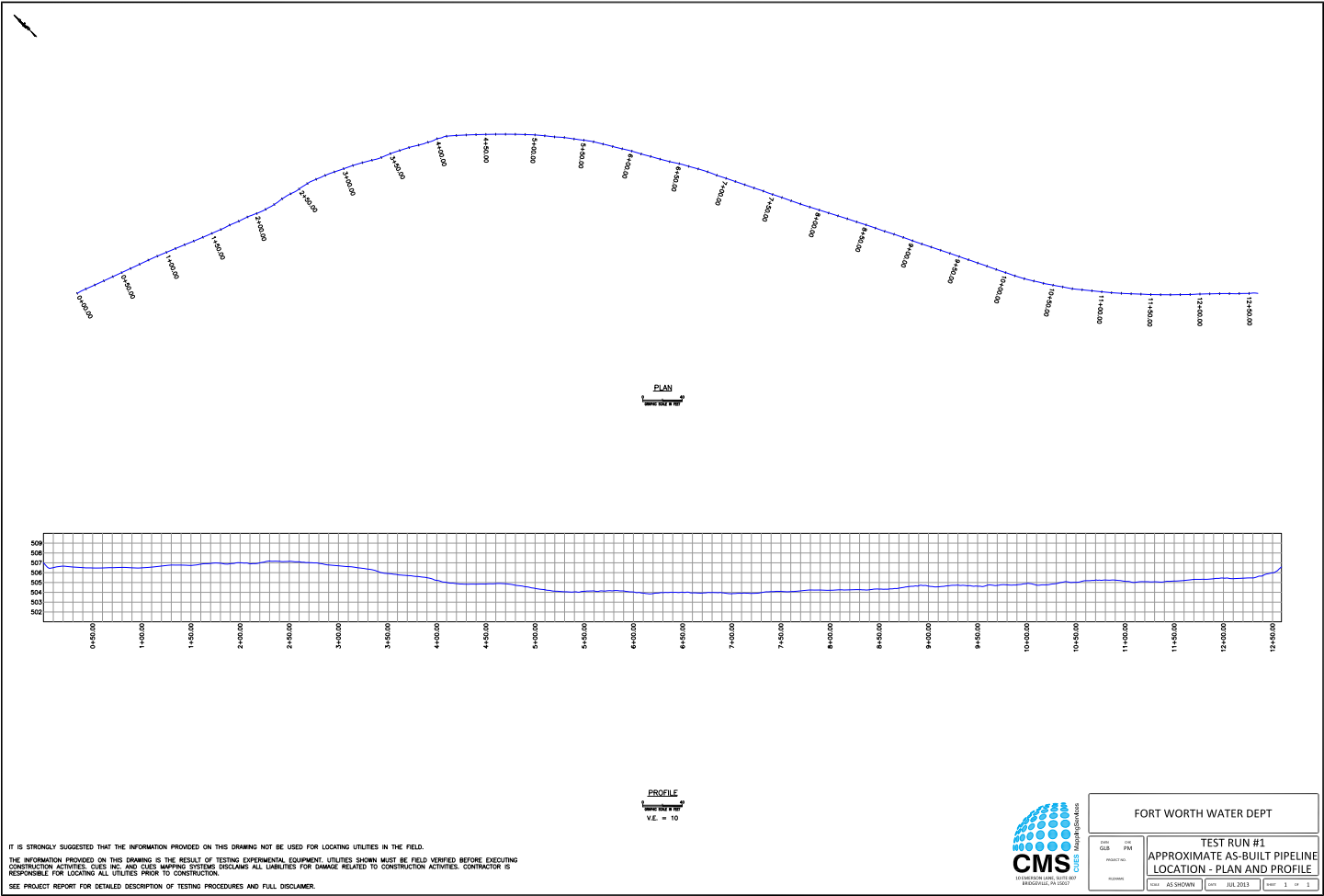


Figure 4: Google Earth KML

