



Company: Polysurveying, Inc.
Location: Mobile, AL

Project: Flood elevation certificates
Location: Mobile, AL

Topcon Products:
CORS GPS+ reference station
HiPer+ base w/ 2 rovers
HiPer XT 2-unit system
Topcon total stations



Polysurveying's office - the canopy of massive Live Oaks made it a poor choice for a CORS site.



Matthew Orrell, P.L.S. vice president

The 2006 Hurricane season wreaked havoc on the Gulf Coast. From Texas to the Florida panhandle, buildings and infrastructure were damaged and destroyed by high winds, bay surges, and flooding. One year later, reconstruction efforts are well underway.

The surge in reconstruction has increased the demand for flood elevation certificates. These documents confirm

that the first floor of a new or rebuilt structure is constructed above a minimum vertical distance above the base flood elevation for the particular area. Flood elevation certificates are not only required for occupancy permits, but also for flood insurance acceptance.

The rapidly escalating demand for elevation certificates has challenged the resources of local survey firms like Polysurveying in Mobile, Alabama. This family-owned firm has been in business for over 30 years. Sidney J. Orrell, with 47 years of experience, presides over the firm as president. S. Matthew Orrell, vice president and project manager, drives the daily operations. Matt's younger brother, Darren M. Orrell, serves as secretary/treasurer. This year, Polysurveying will welcome the third Orrell generation to the firm. Matt's son Brett, recently started work as an L.I.T. - land surveyor in training.

The traditional workflow required to produce a certifiable flood elevation certificate entails many tasks. In the office, the subject property must be located on a parcel map. A known benchmark in the vicinity of the property is determined. In the field, the benchmark elevation must be transferred cross-

country with a level to the jobsite. A hub is set at the site to mark the interpolated elevation. From the new reference point, the elevation of building features can then be determined. Back at the office, a map is drafted, checked, and certified.

The increasing demand for elevation certificates led Matt Orrell on a search for a more efficient way to produce these documents. At the same time, he sought to resolve one of the inherent problems with traditional methods - the risk of human error. The increasing thrust of land development continues to push residential construction into outlying areas where reliable benchmarks are scarce. Transferring elevations cross-country over long distances multiplies the chance for a mistake.

Orrell first considered a subscription to a local Continuously Operating Reference Stations (CORS) network as a potential solution. CORS sites provide GPS correction data over a wide area via cellular data systems. A GPS rover connected to the network with a cellular modem can perform RTK surveying to one centimeter accuracy without the need for a site-specific base station.

The subscription rates were substantial. Orrell decided to consider setting up his own CORS reference station, but wasn't sure about cost, installation, and operating procedures. For the past 15 years, Polysurveying has purchased Topcon optical and GPS survey instruments exclusively to equip their survey crews. To learn more about setting up a CORS site, he contacted Roger Wheeler, his local sales representative for Topcon dealer Hayes Instrument Company, Shelbyville, Tennessee.

After learning the details, Orrell decided to implement his own CORS site. Polysurveying's office is located on a side street where the canopies of mature Live Oaks almost entirely cover the roof of the building - not a good site for an antenna. A service station a few blocks away presented a much better site with an unobstructed sky view. Polysurveying had an established account at the station to provide gas for their survey crew vehicles. Orrell negotiated a deal with the owner and the CORS site was subsequently installed at the station.



A nearby gas station with an unobstructed sky view presented a better location for Polysurveying's Topcon CORS site.



Dunivant and Baxter prepare to shoot features of a typical coastline residence. Topcon's HiPer+ rover is connected to the CORS site with a cellular modem

Orrell is extremely pleased with his decision. "Our Topcon CORS site is a logical solution to our concerns about vertical elevation accuracy," he said. "It provides us with an infallible point of reference wherever we go within 20 or 30 miles of our office. And it minimizes the risk of human error."

Since the Topcon CORS site was installed put into operation, Polysurveying has experienced an incredible increase in productivity. "It has reduced that amount of work that we have to do in research," he continued. "It has also reduced the amount of field work my crews have to expend trying to recover these ancient monuments that may or may not be where we say they are. We no longer depend on those points of reference. Our point of reference now is on top of the service station about a half a mile from here."

Clayton Baxter, party chief, and Ricky Dunivant, instrument man, work together as Polysurveying's primary elevation certificate team. Baxter talked about how the CORS site has produced a dramatic increase in his daily production.



Ricky Dunivant and Clayton Baxter set an elevation reference hub on the edge of Mobile Bay, 17 miles from Topcon's CORS site near the home office.

"We were doing elevations in two and a half to three hours running level loops," Baxter stated. "Now we're doing it in a quarter of that time. Just yesterday, we finished nine jobs that conventionally would have taken us at least four to five days."

How long would it take the CORS station pay for itself? Orrell determined that saving the cost of subscription fees to another RTK GPS network would easily pay for all equipment and installation of the Topcon CORS site within a three to four year period. "And that's not even counting the savings we are going to have in office and field work," Orrell added.

Topcon's CORS network system has moved Polysurveying to the next level of professional survey services. "We're now able to do jobs approximately 30 miles from this site with greater accuracy and greater confidence than we've ever had before, Orrell said." In turn, we can better meet the critical need for elevation certificates and provide our clients with the service they deserve. We're very satisfied with it."

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