

January 24, 2020

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***RE: DART D2 Survey Report***

The DART D2 survey performed by Nathan D. Maier (NDM) was based on LTRA horizontal/vertical control provided in May 2018 with updates made from NDM in the summer/fall of 2018 and new traverse points set by NDM throughout 2019. This use of established control was used to create the topographic base files for this specific project.

The new control established by NDM was established by traversing beginning from the existing LTRA control using double angle measurements and the vertical was established by differential leveling which consisted of 3-wire leveling from the existing LTRA control. Once the field work was completed for the control, all data was brought into NDM's office and at which time, David Griffin, SIT, (Sr. Project Lead) applied a two-step QA/QC process in which required a Sr. Level Tech and himself to check all points before they were published for use.

Once the control was established and confirmed by the Sr. Project Lead, the limits of the topography was identified and confirmed by HDR. After which, NDM began gathering all surface features (including but not limited to, street features, vegetation, building faces, parking spaces, lane striping...etc.), including elevations. NDM's field personnel also acquired measure downs where applicable by opening storm and sanitary sewers as well as obtaining top of nut elevations by opening water valves.

Once all data was collected, NDM used Trimble Business Center and Excel spreadsheets to implement a QA/QC system in order to check all incoming field data. This is two-step process in which a Sr. Survey Tech processes the field data, then the Sr. Project Lead checks the work to ensure that all data gathered is within tolerance.

Once the data was processed, the DGN topographic basemap was created and checked by Sr. Project Lead and Sr. Cadd Tech. The topography was broken up in to several files in order to ensure clarity and workability due to the very dense nature of Downtown Dallas. The DGN files were created at 40 scale per request by HDR project lead and Spec-checker was run on all files for each submittal in order to ensure that all DGN files that NDM produced passed QA/QC. The reports were uploaded to the given path that HDR supplied.

Sporadic property corners were located during the field topographic survey, which field crews obtained in order to get a rough estimate for location of property lines so that properly placed Right-of-Way

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(ROW) and property lines could be shown. NDM then prepared a statement that stated that the ROW/Property Lines shown hereon for this survey was shown for informational purposes only and may not have been prepared for suitable for legal, engineering, or surveying purposes. It did not represent an on-the-ground boundary survey and represents only the approximate ROW based on research of City of Dallas block maps, Dallas county abstract maps, research at city vault, DCAD and GIS information. However, after receiving approval from DART and HDR to create ROW maps, NDM began researching deeds and plats, as well as the actual field survey for boundary corners to insure said lines were accurately placed. NDM also began preparing Parcel Acquisition documents for DART based on an actual property surveys. These exhibits have been prepared and submitted to DART for their approval.

NDM, also after receiving approval from DART and HDR, began basement surveys on six key structures located within the topographic limits. After meeting with building engineers and obtaining right of entry, traverse points were set down stairwells, as well as differential leveling, in order to gain access for control into the basements. This system of setting points was applied to gaining access to sub-basements as well. As the data was brought into the office, a Sr. Survey Tech processed the field data and using field sketches or floorplans obtained from said building engineers, began the process of creating a basement/sub-basement basemap.

NDM has applied QA/QC to all the PDF sets that we have submitted and provided a Quality Control Review Form in which all internal comments are attached.

Sincerely,



C. Michael Daniel, RPLS  
Surveyor of Responsible Charge  
Nathan D. Maier Consulting Engineers, Inc.