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Subject Aerovox volume

Hi everyone, Please see the attached write-up for the Aerovox volume calculations. I think this gives you what you need, but let me know if more is required.

Thanks, Mike

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Aerovox Volume.pdf

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DD

Aerovox First Floor Volume Estimation

The purpose of this document is to outline the steps used to estimate the volume of the Aerovox facility below grade and below the top of the foundation.

The process used to estimate the volume of the Aerovox facility below grade and below top of foundation was comprised of the following three steps: measurement and data collection, plotting data points on building plans, followed by the calculations.

First Step The first step of collecting measurements was performed on the interior and exterior of the Aerovox facility. A tape measure was used to measure the distance between the floor and the top of the foundation to determine top of foundation elevations. Determining below grade elevations in some cases required exterior measurements in conjunction with interior measurements to calculate an elevation below grade. The apparent grade at the point of measurement on the exterior was used as the grade reference for each individual point. Significant floor elevation changes were also measured and recorded, however such small features as machine pads, sumps or ramps were not considered.

Second Step The second step in the estimating process was to plot the data points on a floor plan, spray painted marking points or numbered columns were used to place collected field data on the plan in the proper location. Any distances between points were measured off a scaled floor plan.

Field personnel also performed a quality check, which involved spot checking several points previously measured at Aerovox as well as a sensibility check of the lengths of all sides of the buildings as well as a slope calculation using elevation data collected.

Third Step The third step in the estimating process was the volume calculation. An as-built floor plan was scanned into the GIS system and stretched to line up with the aerial photography of the Aerovox facility. The as-built drawing contained interior wall locations which helped in the proper placement of survey locations. By stretching the as-built to align with the aerial photography, it assured that the as-built was at the proper scale and projection. All survey locations were then added as points to the building footprint.

The first volume calculation used the basement floor and the external grade of the facility as the reference points in calculating an available volume for disposal, ignoring any space that would be taken up by equipment, materials, tanks, debris etc. (all three volume calculations ignored these items). The survey points were then used to create a plane which interpolated elevations between known data points. This plane was converted to a grid with a known grid-cell-size and assigned a z-value from the interpolated plane. The z-value was then multiplied by the known length and width of the grid cell to calculate volume. The volumes for each grid cell were then summed for an overall volume within the Aerovox building footprint.

The second volume calculation followed a similar approach as described above. However, this calculation used the basement floor and the top of foundation walls as reference points in calculating the available volume. Depending on the location in the building, either the top of foundation wall or the external grade may be the higher point. This point led to the third volume calculation described below.

In the third volume calculation, if the distance from the floor to grade and the distance from the floor to the top of the foundation differed at any particular location, the higher number was used, giving the maximum volume of the Aerovox facility basement.

The three volumes generated were as follows:

- 1) Volume of basement from basement floor to external grade. This volume equals approximately 28,200 cubic yards (CY).
- 2) Volume of basement from basement floor to top of foundation. This volume equals approximately 26,300 CY.
- 3) Volume of basement from basement floor to the higher of either the external grade or top of foundation. This volume equals approximately 31,200 yd³.

Note: These volume estimates were performed using equipment of limited survey accuracy, with limited data points, and personnel unlicensed in survey techniques or practices. Therefore, the volumes presented should be considered rough estimates.
