

Policy: 4445-2- Guidelines for Construction Cross Sections

Section: Photogrammetric Cross Sections

Office/Department: Office of Design Policy/Support

Reports To: Division of Engineering

Contact: 404-631-1000

This memorandum is written for the purpose of establishing procedures and guidelines for measuring photogrammetric cross sections of construction projects that have excavation as a per unit pay item in the contract.

It is Departmental Policy that projects which have small amounts of excavation will be field cross sectioned because it is more efficient than the photogrammetric process. However, projects which have small amounts of excavation can still be cross sectioned photogrammetrically if any of the following conditions exist:

1. Field survey personnel would be abnormally exposed to unsafe traffic conditions.
Insufficient survey personnel to measure cross sections.
2. More accurate earthwork volumes could be determined photogrammetrically due to the geometrics of the roadways (baseline required).

When a construction project has been approved for cross sectioning by the photogrammetric process, the following activities are the responsibility of the Area Engineer:

A. General Requirements

1. Establish and maintain communications with a representative from the Statewide Location Bureau.
2. Serve as the communication link between the contractor and the representative of the Statewide Location Bureau.
3. Insure that the Statewide Location Bureau has been notified of the Preconstruction Conference.
4. Retain copies of the data (target notes, control network coordinates, profiles, field cross sections, etc.) that are transmitted to the Statewide Location Bureau. All field data should be forwarded immediately after it is gathered. The Project Engineer must insure that all field data is legible and properly recorded.

B. Original Terrain Cross Sections

1. Insure that the project is properly cleared and grubbed for photogrammetric cross sectioning. Contact the photogrammetric representative 8 weeks before project is ready to be flown so that it can be inspected and the PRF submitted.
2. During the clearing and grubbing operation, contact the photogrammetric representative to coordinate the staking and elevating of the project control alignment.

The contractor or a district survey party must stake and elevate either construction centerline alignments or a control network (random survey traverse points) as determined by the photogrammetric representative.

3. Provide profile of the staked centerline alignments or coordinates and elevations of the control network points to the Statewide Location Bureau.
4. Insure that the construction alignments or the control network points are properly targeted and that targeting notes are kept. (Detailed instructions will be provided by the photogrammetric representative.)
5. Measure original terrain cross sections in all areas where excavation is required prior to project being flown for cross sections. The alignment from which these cross sections are measured is critical and must be determined in coordination with the photogrammetric representative. Forward this data to the Statewide Location Bureau so it can be merged with the photogrammetric cross sections.
6. Provide the Statewide Location Bureau with a list (location, description and elevation) of all benchmarks on the project.
7. Inform the photogrammetric representative of any areas which require special cross sectioning consideration (channel excavation, special baselines, areas not to be cross sectioned, etc.).

C. Final Terrain Cross Sections

The normal and expected method of obtaining data to produce final (as built) cross section will be by the template method. There will be some projects or portions of projects for which it will be impractical to use templates. The Director of Construction will determine the most efficient method of computation for these projects. In no case will the Area Engineer assume that because original cross sections were obtained photogrammetrically that final cross sections will also be measured by this method. The Director of Construction will review and approve (in writing) all requests for final terrain cross sections to be measured by the photogrammetric method.

The following is a listing of activities and instructions that the Area Engineer will be required to perform on projects which have been approved for final cross sectioning by the photogrammetric process:

1. Insure that all grading activities on the project are complete.

2. Contact the photogrammetric representative to coordinate the type of control network points (centerline alignment or control network points) that should be staked.
3. Insure that the centerline alignments or the control network points are staked, targeted, and that all points have been elevated. (Forward this data immediately to the Statewide Location Bureau.)
4. Contact the photogrammetric representative 8 weeks before the project is ready to be flown so it can be inspected and the airplane reserved.
5. Inform the photogrammetric representative of any areas which require special cross sectioning consideration (areas not to be cross sectioned, modifications to slopes, etc.).
6. Record the status of all subgrade materials which are in place when the project is flown for final cross sectioning. The photogrammetric cross sections will reflect the terrain/ roadways as they appear on the photography.
7. Provide the Statewide Location Bureau with a list (location, description and elevation) of all benchmarks on the project.

D. Earthwork Volumes

1. The final pay earthwork volumes which are computed by the Office of Environment/ Location will reflect the amount of excavation which has taken place between the original and final terrain cross sections. These quantities and the final terrain cross sections will not reflect any base and paving excavation or any undercut volumes which have been displaced by base materials which were in place at the time the final cross section photography was flown.
2. The Statewide Location Bureau will only compute terrain earthwork (from original ground to profile grade) volumes on projects where the final terrain was measured photogrammetrically.
3. The Department's policy is to compute earthwork on all projects using the as-built templates. The design office, either General Office or District Office, must produce design templates that can, with modifications to reflect construction changes, be used for this purpose. The design office will maintain the template files. The file maintained will include the design templates that depict the roadway cross sections at profile grade and also the templates that show the roadway cross sections at the grading template.

References:

None.

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