March 25, 2019
10:00 am

Meeting Agenda Items

- Clarification on requirements for culvert, bridge, stream and other hydraulic study related survey data collection efforts.
- Mapping Standards for Registered Land Surveyors

Attendees: Tate Jones (KCI Technologies), Keith Seiler (Seiler & Associates Inc.), Corey Baird (GDOT), Jon Blanchard (GDOT), Vance Jones (GDOT), James Gable (GDOT), Benny Walden (GDOT), Greg Karel (SEI), Chris Adams (McKim & Creed), David Simmons (Edwards-Pitman), Allen Brock (GPI), Michael Lewis (GDOT).

The Meeting began with Tate Jones opening the floor for attendee introductions and proceeded as follows:

I. Criteria for use in determining the scope of surveys required for mapping bridges, culverts and other bridge/stream hydraulics related surveys was sought in a discussion began by Tate Jones.

II. It was mentioned that there have been numerous changes in the requirements for hydraulic studies with significant differences between pre and post-recession studies. The following items were listed as criteria for hydraulic study related surveys:

   a) As listed in the GDOT Drainage Manual, for box, pipe, or arched culverts with clear-span widths greater than 20’ (measured along the roadway centerline) the culvert is defined as a bridge culvert and located in the bridge category for design criteria.

   b) One exception to the 20-ft clear span width limit is a multi-barrel pipe culvert. Multi-barrel pipe culverts may exceed the 20-ft clear span width and still be
called a culvert if the spacing between the culverts is greater than half a barrel diameter. Alternatively, a skewed (or angled) structure would be considered a bridge culvert when it’s clear-span width measured parallel to the roadway centerline is greater than 20 ft.

c) Bridge hydraulic studies require surveys that extend 500’ upstream and 500’ downstream of proposed structures, flood plain cross sections for upstream and downstream structures, delineation of columns, overtopping and etc.

d) Stream surveys require surveys to extend 300’ upstream and 300’ downstream of proposed structures and may not require delineation of upstream and downstream structures.

III. It was mentioned that problems arise with requests for hydraulic study related surveys due to the fact that engineers often request information that is beyond the scope of work described in the GDOT Survey Manual, the GDOT Drainage Manual and/or the scope of services a surveyor has been contracted to provide.

a) LIDAR has been used successfully as a stand in for other types of survey data in the event of requests for additional data.

b) Benny Walden mentioned the following:

   i. Any pipes in the flood plain that are conveying flowing water should be addressed via the same approach used for bridge surveys to include a survey corridor that extends 500’ upstream and 500’ downstream.

   ii. If a stream through a pipe or culvert has had a FEMA study or BFE a hydrology survey of 500’ and a hydrology report are mandatory.

   iii. By default, if there is a structure within 2000’ of the project bridge a full scale bridge survey (bridge deck, columns, cross sections and etc.) is required. Cross sections should be perpendicular to the stream spanned by the bridge and extend to the top of the flood plain on both sides of the stream.

   - In the event of small drainage areas or swampy areas that are difficult to access adjustments to these criteria may be deemed appropriate.
iv. Having GDOT Bridge Office staff in attendance at meetings in which project scope is determined is highly recommended.

c) It was also stated that when the upstream and downstream information is required, cross sections above and below the upstream and downstream bridges would also be required along with the Deck Elevations and the “Centerline” of the bridge columns. Additionally, the cross sections from the Centerline of the road to the structures above and below would be taken at 500’ intervals.

Related information from the GDOT Survey Manual concerning Bridge and Stream Surveys reads as follows:

i. Profiles are required of all intersecting roads that are located within the limits of the floodplain. These profiles shall extend 500 feet upstream and/or downstream of the intersection with the project road.

ii. This data is also required for bridges located along the stream and within the floodplain that are no further than 2000 feet upstream and/or downstream of the project site.

iii. ALL LAKES and STREAMS within 300 feet along the project shall be identified. A field survey traverse for all drainage channels or streams shall be run out to a distance of 300 feet perpendicular on each side of the centerline. Elevations along the stream bed lines shall also be obtained.

d) It was mentioned that requirements listed in various sections of the survey manual can be gathered and assembled into an accurate representation of the overall requirements for hydraulic study related surveys.

e) Benny Walden mentioned that he would gather and provide additional information.

f) Tate Jones asked if it is typical for GDOT Bridge Office staff to be in attendance at scoping meetings.

g) Benny Walden responded by mentioning that GDOT Bridge Office staff attend some but not all of the scoping meetings. Benny Walden also offered additional comments as follows:

i. Susan Beck (of the GDOT Bridge Office) is a reliable resource for information concerning GDOT requirements for hydraulic study related surveys.
ii. It has been requested that a member of the survey party who is present (boots on the ground) during the collection of field survey data conduct the hydraulic report.

h) A question of whether or not it is possible for surveyors to attend scoping meetings arose to which Benny Walden responded as follows:

i. Some prime consultants allow surveyors to attend scoping meetings and some do not.

ii. GDOT allows for the decision to be made at the discretion of the prime consultant.

iii. Benny Walden will forward the question to The Office of Program Delivery, OPD, in an effort to determine whether surveyors can be included moving forward.

i) Benny Walden mentioned that when services are provided that are beyond the original scope of services, additional costs can become problematic.

i. Septic tanks are an example.

ii. Tate Jones offered alignment changes and cemeteries as additional examples.

iii. Benny Walden responded by mentioning the fact that ground penetrating radar (GPR) and cadaver dogs are effective tools when used for collecting survey data in cemeteries.

IV. It was mentioned that the bridge gutter/sidewalk/curb edge feature has been designated for use in delineating a number of different bridge items and the need for establishment of a generic TOPO_Bridge-Breakline feature was suggested.

a) Jon Blanchard recommended the use of the surveyor defined features that are already available.

V. Tate Jones submitted questioning concerned with how radii are located.

a) Benny Walden responded by indicating that some take PC/PT shots and create the arc automatically while others take multiple shots.
b) Concerns were raised regarding the fact that taking PC/PT shots with automatic arc creation is unreliable due to the uncontrolled generation of inside and outside arcs.

c) Concerns were also raised regarding the fact that surveyors complain about excessive shots when multiple shots are used to delineate radii.

VI. Tate Jones submitted questioning on behalf of The Georgia Board of Registration (The Board) concerned with mapping requirements as follows:

a) What are the recommendations that should be offered as criteria for the establishment of new standards for mappers? Responses were as follows:
   i. One half foot (absolute) accuracy should be easily acquired with current technology.
   ii. Aerial LIDAR would be more accurate for undeveloped areas with natural features that lack the geometric consistencies that are readily available in developed areas.

b) What is required for points per meter accuracy? Responses were as follows:
   i. Five points per meter with line work is what GDOT prefers.
   ii. USGS QL2, 2 points per meter, 7 ½ cm RSC.
   iii. Twenty validation points for 5 different surface types (100 total).

c) What is required for cross section validation? Benny Walden’s responses were as follows:
   i. Three cross section checks per mile for transportation corridors
   ii. Validation is not required for obscure areas due to the fact that they should contain no data.

d) What is a reasonable standard for 1’ contours? Benny Walden’s responses were as follows:
   i. This depends on the location (mountainous versus flat terrain).
e) Will 2 points per square meter suffice for LIDAR? Benny Walden’s response was as follows:
   
i. Yes

f) How many sections per mile are required for mobile LIDAR? Benny Walden’s response was as follows:
   
i. Three sections per mile is the recommendation for mobile LIDAR

g) What is the range of mobile LIDAR (how far out does it reach)? Benny Walden’s response was as follows:
   
i. The range is usually 300 to 400 feet.

h) It was also mentioned that in Florida, mobile LIDAR is used for pavement and Aerial is used for areas outside of pavement.

i) Tate Jones asked attendees to provide information that he could submit to the Board and offered additional questions as follows:
   
i. What are the requirements for individuals to acquire certification as surveyors?
   
ii. What degree of accuracy should be required for deliverables?
   
iii. How is the required degree of accuracy achieved?
   
iv. How are appropriate quality assurance checks conducted?
   
v. What information should be provided to surveyors in an effort to afford them the ability to insure that the degree of accuracy and quality assurance of their deliverables meets the appropriate standards?
   
vi. How should this information be disseminated?

j) Comments were offered to indicate that it is important for The Board to recognize the fact that aerial and LIDAR are legitimate sources of survey data.

VII. Jon Blanchard mentioned that cells are now in use for signal and electrical boxes in addition to the fact that new guidelines and checklists are available on the GDOT R.O.A.D.S Webpage.
VIII. The meeting was concluded as follows:

a) Tate Jones and Allen Brock agreed to provide a draft document for the Survey Subcommittee to review and discuss. After review and discussion by the Survey Subcommittee the draft document would then be forwarded to the Board for use as a guide during related discussions.

b) Tate Jones briefly submitted the upcoming datum shift as a topic for discussion during the next meeting. This was followed by a brief discussion indicating that projects should remain in the original datum in which they are started.

IX. The meeting was adjourned.