

## VandenBerghe, Alissa (Consultant)

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**From:** Donahue, Jeff  
**Sent:** Tuesday, March 31, 2009 10:34 AM  
**To:** Lacy, Paul  
**Cc:** Williamson, Alec  
**Subject:** RE: DEA control  
**Follow Up Flag:** Follow up  
**Flag Status:** Red

Paul,

*Please comment.*

### Agenda for Control Survey Procedures

#### General

It is the intent of this meeting to establish a common, consistent network of physical points that are the basis for controlling the horizontal and vertical positions for the bored tunnel project. This project control survey shall provide accurate horizontal and vertical control for all subsequent project surveys - monument protection, R/W boundary, Building Monitoring, Seawall, Utility locates, Topography and Construction

#### Planning

Planning the control network so that it will meet the needs of all subsequent projects is critical. Areas to be discussed:

- Need for additional project control
- Survey schedule that coincides with project development schedule
- All existing horizontal and vertical control is recovered, published and delivered to all parties
- Horizontal Datum decided on
- Vertical Datum decided on (NAVD88) preferred
- Select methods for establishing control for project control network
- Plan supplemental control

#### Horizontal, vertical and supplemental control

Establishing horizontal control for bored tunnel project (northbound and southbound). Areas to be discussed:

- Methods
- Accuracy
- Monumentation

#### Office Data Processing and Documentation

All control surveys shall be evaluated. Areas to be discussed:

- Reviewing field notes for completeness
- Reviewing all closures
- Calculating final horizontal and vertical positional values

#### Project Control Diagram and Report

A project control network diagram for the horizontal control shall be prepared. The vertical control monuments shall be shown in their location on the diagram. Areas to be discussed:

- What the control diagram and report shall consist of.

#### Responsibility

A project surveyor should be appointed to be an active participant on the project development team, provide advice and input on survey related matters, be responsible for initiating control surveys and respond to project survey needs.

Jeff

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**From:** Lacy, Paul  
**Sent:** Tuesday, March 31, 2009 8:10 AM  
**To:** Donahue, Jeff  
**Cc:** Williamson, Alec  
**Subject:** RE: DEA control

Jeff,

I think a meeting of all involved agencies is a good idea.

Develop an agenda, and a statement of what we expect to accomplish and lets discuss it. Then we can schedule the meeting.

Paul

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**From:** Donahue, Jeff  
**Sent:** Tuesday, March 31, 2009 7:16 AM  
**To:** Lacy, Paul  
**Cc:** Williamson, Alec  
**Subject:** RE: DEA control

Paul,

We have a collection of survey data within the bored tunnel project area that is being used. I see different types of surveys with different agencies implementing them for and potentially for:

- Monument protection
- R/W boundary
- Building Monitoring
- Seawall
- Utility Locates potholing
- Topography
- Construction

The different agencies are the WSDOT, The City of Seattle and contracting surveyor for utility locates and then for construction.

Has there been a discussion / agreement between all the agencies involved of what primary and tertiary control points will be held to establish new control besides what I have listed so far? Would it be to our advantage to have a list of all who would potentially be using this control and set up a meeting to discuss control issues?

Jeff

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**From:** Iverson, Kurt  
**Sent:** Monday, March 30, 2009 12:55 PM  
**To:** Donahue, Jeff  
**Cc:** Williamson, Kurt  
**Subject:** RE: DEA control

I am off to a managers meeting for several hours. Kurt Williamson and I will draft up a fact sheet and get back with you. Several important things to note:

Geo had control throughout Seattle before the earthquake that damaged the Viaduct. We checked it afterward. We have made ties to DEA (as requested by the Viaduct Office) control for the true ortho project and have perspective on the quality. We have performed a Project Geometric Framework (PGF) for the Viaduct project. This PGF accommodates AWW GDMS documents (datums/adjustments). We will detail it for you. The next steps for R/W and monitoring surveys will need to include the PGF.

We will get you this info tomorrow. Thanks!!

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**From:** Donahue, Jeff  
**Sent:** Monday, March 30, 2009 11:33 AM  
**To:** Lacy, Paul  
**Cc:** Williamson, Alec; Iverson, Kurt  
**Subject:** RE: DEA control

Paul,

I just spoke with City of Seattle's Parick Hastings, PLS, regarding the method DEA arrived at holding horizontal control. The primary control DEA held consists of 8 WSDOT control, 5 C.O.S. and 2 NGS points. The 5 COS points were adjusted in a 1993 Parametrics survey using HARN control. The network DEA established was adjusted holding these points with a least squares adjustment program. DEA's horizontal datum is 83/91. There is some question to the positional accuracy of the HARN points that were established and used in 1993.

Kurt, could you give me feedback on this?

My experience with the way DEA established their network says that it will compare favorably with todays surveyor verifying the positions of DEA's held primary and tertiary control points using the Washington State Reference Network(WSRN). However, I would not retrace it to create the primary and tertiary control needed for all the surveys that will describe, monitor and build the bored tunnel project.

My recommendation to you is to do all survey work holding the network established by WSRN.in horizontal datum 83/91 and comparing the work to DEA's survey.

Jeff

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**From:** Lacy, Paul  
**Sent:** Monday, March 30, 2009 8:54 AM  
**To:** Donahue, Jeff  
**Cc:** Williamson, Alec; Iverson, Kurt  
**Subject:** RE: DEA control

Jeff,

The city uses their own datum. They have some adjustments.

Talk to Kurt Iverson. He has worked with the city establishing control points and I think is up to speed on the adjustments.

Paul

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**From:** Donahue, Jeff  
**Sent:** Friday, March 27, 2009 3:15 PM  
**To:** Lacy, Paul  
**Cc:** Williamson, Alec  
**Subject:** DEA control

Paul,

Sorry about the first e-mail regarding DEA's control, but I checked my work again and found out that the current horizontal datum on the WSDOT published control sheets are not the 83/ 91 (adj) that DEA used. Instead it is 83/07. So now when I used the 83/91 (adj) datum to compare DEA's control to Geographical Services control there is a favorable comparison. I am waiting for Patrick Hastings to get back to me regarding his comments about the differences DEA had with City of Seattle's control. Maybe Pat used the wrong datum as well.

Jeff