

THOMAS DRILLING AND BLASTING CORP.

DRILLING AND BLASTING SPECIALISTS

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TO: Carl Gleason, A.L. St. Onge

FROM: John Whittaker Operations / Project Manager

DATE: April 10, 2014

SUBJECT: Enosburg BRO 1448(40) - Micropile Submittal Sent 2-5-14

The following comments apply to the Micropile submittal questions dated 2-12-14 from VTrans.

- It is not evident that Stephen Christo was superintendent or even involved with the micropile projects listed under Thomas' work history. Please clarify. **Stephen Christo has work continuously for Thomas since 1986 and has been involved with most of their Micro Pile Projects as referenced in the Plan. The 5 Micro Pile projects listing Stephen as Installer are separate from the others. Stephen was "superintendent" (as you characterize) on these 5 projects as well as many of the others**
- Down the hole hammer needs approval by Engineer. This method is proposed for use by Thomas Drilling and Blasting **A DTH hammer is the appropriate piece of equipment**
- Where will the water for grout mixing come from? How much water is added per bag of type I/II cement? What specific cement manufacturer is planned for use? **AL St. Onge will provide the potable water used in the grout. Thomas' Plan details a W/C ratio of .45 with Type I-II Portland cement.**
- Who will test the specific gravity of the grout on site? Who will acquire the grout samples and test compression strengths? **Stephen Christo will supervise the SG testing and the cubes will be tested at an approved laboratory (Possibly Knight Engineering)**
- Micropile layout drawing not supplied to show pile numbering and installation sequence **The Plan is to Drill Abutment 2 piles first. Starting with #1 and #6 and working backwards out of the hole towards #5 and #10. Then Abutment 1.**
- Please provide a drawing to show the planned cased drill setup (i.e., drill mandrel, bit lengths, casing lengths). **Casing lengths are 5',threded**
- Please provide a drawing to show the planned grouting setup (i.e., rod, centralizers, grouts tube all attached); show sizes of each component **The Plan details "When ready for installation the anchor rod with centralizers is placed to the bottom of the rock socket...."**
- Provide the worksheet planned for use by the Contractor to record drilling data **Drilling day to be collected is- From the top of precast footing- the length to ledge, length in ledge, and length of rock socket.**

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- **Welder certifications and welding procedures not provided St. Onge will provide a certified Welder.**
 - **Layout Schedule Per Special Provision 52 (b) (9) - Pile sequence is per planned schedule provided on by A.L. St. Onge. Reference Tasks #24 - #28 and #33 - #38. Design load per plans and specs provided, minimum 12 feet bond, estimated micropile length abutment 1 26 feet, abutment 2 17 - 27 feet, micropile attachments include hex nuts, lock nuts and anchor plates**
 - **Approximate time required for each installation sequence step - Drill Casing- 1.5 hr Drill socket 1hr, install, grout, pull casing to required depth, remove extra casing - 1 hr**
 - **Procedures for advancing through boulders and other obstructions - Drill casing through overburden, bit inside casing will drill through boulders and obstructions**
 - **Procedure for containment of drilling fluid - None - There is no Drilling Fluid other than water**
 - **Containment and disposal of drill spoils - Drill is equipped with a divert pipe which will catch all cuttings and will send the spoils through a pipe that will contain the spoils in a pile to be picked up and disposed of.**