

APPENDIX B – QUESTIONNAIRE

A copy of the questionnaire discussed in Chapters 3 and 4 is presented in this appendix.

Corrosion Mitigation Guidance for Hollow Bar Soil Nails

QUESTIONNAIRE

(In this questionnaire “HBSN” refers to “Hollow Bar Soil Nail”)

1. Preparer/General Information

- a. Firm:
b. Prepared by/Title:
c. Phone/E-Mail:
d. What approximate percentage of your practice in the area of soil nail walls includes use of HBSNs as compared to conventional solid bar soil nails?
e. Is lack of understanding about corrosion issues an impediment to use of HBSNs for permanent applications?
f. Can we contact you for more information?

2. Coatings

- a. Do you use purple marine epoxy coated HBSNs?
b. Do you use HBSNs with the conventional green epoxy coating?
c. Have you used galvanized HBSNs?
d. Have you exhumed HBSNs after installation to verify damage to coatings due to nail installation processes?

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3. Sacrificial Steel

- a. Are you aware of sacrificial steel being used in lieu of coatings? (Yes/No): _____
 - i. If Yes, what is the typical sacrificial thickness that has been used?: _____ mils

4. Grout

- a. What is the typical grout cover that you have used? _____ inches
- b. What is the typical unconfined compressive strength of grout you have used? _____ psi
- c. What is the typical cement type that you have used for grout? _____
- d. What is the typical water cement ratio that you have used for grout? _____
- e. What type of mixer do you use for mixing grout? (e.g., high-speed high-shear colloidal type mixers, low-speed low-energy paddle type mixers) _____
- f. Do you use final strength grout from the start of the drilling or do you use diluted grout for initial drilling and then final strength grout after the drill hole has reach target depth? _____

5. Evaluation of Soil Corrosivity

- a. Is soil test data available to assist in determination of required level of corrosion protection or are assumptions frequently made? _____
- b. How do you evaluate soil corrosivity for HBSN applications?
 - i. Use the corrosion criteria in Chapter 6 of GEC #4 (Ground Anchors and Anchored Systems)? (Yes/No): _____
 - ii. Use the corrosion criteria in Appendix C of GEC #7 (Soil Nail Walls)? (Yes/No): _____
 - iii. Use something else? (Yes/No): _____
 If Yes, please provide reference to publication or provide criteria (use additional sheets as necessary) _____

Note: "GEC" refers to "Geotechnical Engineering Circular" which is a publication prepared by the FHWA (Federal Highway Administration). If you do not have GEC #4 and/or GEC#7, you can download them for free at following weblink:
http://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm

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6. Field Corrosion Test Programs

- a. Has your firm conducted or are you aware of field corrosion test programs for HBSNs? (Yes/No) _____
 - i. If Yes, is a copy of the report available and can it be provided for this study? (Yes/No) _____

7. Laboratory Corrosion Test Programs

- a. Has your firm conducted or are you aware of laboratory corrosion test programs for HBSNs? (Yes/No) _____
 - i. If Yes, is a copy of the report available and can it be provided for this study? (Yes/No) _____

8. Thread type/configuration

- a. Have you observed or do you have data that the thread type/configuration, e.g., a smooth rope (or R) thread vs a sharper (coarse) Titan bar type thread, on a HBSN has any effect on corrosion rates? (Yes/No) _____
 - i. If Yes, please provide explanation and supporting information (use additional sheets as necessary) _____

9. Encapsulated HBSNs

- a. Are you aware of HBSNs with encapsulation corrosion protection systems similar to ground anchors? (Yes/No) _____
 - i. If Yes, please provide information for such bars (use additional sheets as necessary) _____

- b. Do you believe encapsulated hollow-core bar soil nail systems are feasible from an economical as well as constructability viewpoint? (Yes/No) _____
 - i. If Yes, please provide additional information as necessary (use additional sheets as necessary) _____

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10. Drill Bit Size/Centralizers

- a. Based on your practice, what is the typical ratio of the drill bit diameter to the outer diameter of the HBSN? _____
- b. Do you use centralizers on HBSNs? (Yes/No) _____
If Yes,
 - i. What percentage of your soil nail jobs have you used centralizers on? ____ %
 - ii. Please provide additional information on size and type of centralizers and the typical distance between centralizers along the HBSN (use additional sheets as necessary) _____

11. Is there any other information (US or international) about corrosion related studies specific to HBSN earth retention structures that you are aware about and can provide?

- (Yes/No) _____
- i. If Yes, please provide additional information as necessary (use additional sheets as necessary) _____

12. Do you have any additional input and/or suggestions for developing corrosion mitigation guidance for HBSN earth retention structures?

- (Yes/No) _____
- If Yes, please provide input/suggestions (use additional sheets as necessary): _____

THANK YOU FOR YOUR TIME AND EFFORT

