

CHAPTER 1 – INTRODUCTION

Hollow Bar Soil Nails (HBSNs) differ from Solid Bar Soil Nails (SBSNs) in that HBSNs are typically advanced through their full design length with a sacrificial bit using grout as the drilling fluid; thus drilling, grouting, and tendon installation are all accomplished as part of one single process. Conversely, depending on the soil conditions, SBSNs are installed by pre-drilling a hole with or without temporary casing, which is then grouted. For SBSNs only, the steel is introduced before or after grouting depending on the specifics of the construction site. The Hollow-Core Soil Nails State-of-Practice Report issued by the Federal Highway Administration (FHWA, 2006) (SOP) provides several areas for further investigation. This report focuses on additional research and guidance for design of grout-to-ground bond and testing of HBSNs.

HBSNs are typically used in collapsing ground conditions where the simultaneous injection of grout through the reinforcing bar during drilling keeps the drill hole from collapsing. Due to their installation method, the procedures for typical solid bar installation and testing are not appropriate.

This work as discussed hereinafter had two objectives. The first objective was to develop an initial data file of the available grout-to-ground bond strength of HBSNs, and to determine if correlations exist with traditional drilled and grouted SBSNs. For this objective, several practical installation procedures for HBSNs were used to install nails for testing. A total of 39 test HBSNs were installed in four different project sites across the United States. The test data collected was used to develop the initial database on bond values and to establish recommendations for the practical installation of test HBSNs.

The second objective was to establish recommendations for practical, standardized methods of performing comparable pullout tests on HBSNs. These recommendations may include unique test HBSN design and related standardization installation procedures. This report includes recommendations for installation, testing, and documentation for HBSNs as a result of this research work, and recommendations for further study.

