SECTION 1 – INTRODUCTION

The purpose of this report is to provide geotechnical engineers with a state-of-practice report on downdrag deflections and drag loads on piles experiencing negative skin friction. The report is divided into six sections and an appendix.

Section 1 – Introduction: outlines the purpose, scope, and contents of the report.

Section 2 – Background: describes the problems associated with downdrag, potential signs of downdrag, and the basic mechanics of negative skin friction.

Section 3 – Single Piles: provides additional details about the mechanics of downdrag for single piles, describes four detailed methods for analyzing downdrag on single piles, discusses more advanced computational methods for single piles, and provides an example problem using the four detailed methods.

Section 4 – Pile Groups: discusses the effects of pile groups versus single piles and extends the methods described for analyzing single piles to pile groups.

Section 5 – Modeling Guidance: provides information and guidance for pile geometry, elastic properties, skin friction, bearing capacity, and settlement for piles experiencing negative skin friction.

Section 6 – Design: presents design guidance concerning negative skin friction for the structural capacity and settlement limit states, and then describes design for piles treated using bitumen.

Appendix A – DRAGPILE Manual: provides a user-interface manual and operational details for a spreadsheet program to calculate downdrag and drag loads.

This report is designed to accompany the Microsoft Excel© spreadsheet DRAGPILE, which was developed to analyze single piles and pile groups experiencing negative skin friction. Before using the spreadsheet, it is important to have a thorough understanding of negative skin friction and its effects. This report should be read in its entirety before using DRAGPILE.