3.4 FOUNDATION MATERIALS

The generalized subsurface conditions indicated by the borings are described below. For soil descriptions and general stratification at a particular boring location, the respective Boring Log should be reviewed. For rock descriptions and stratification at a particular boring location, the respective Coring Log should be reviewed. The Boring Identification Diagram, Boring Logs, Coring Logs, and Core Photographs are included in Appendix A. Representative subsurface cross-sections at each drilled bent location and a subsurface profile along the structure are also included in Appendix A. The subsurface properties for the project site are described below.

Foundation materials encountered at the site included roadway embankment fill, alluvial soils, residual soils, weathered rock, and crystalline rock.

Roadway embankment fill was encountered beginning at the existing ground surface at Borings EB1-B1, EB2-A, and EB2-B. The fill extends to a depth of ±22 feet (Elevation ±649 feet) at Boring EB1-B1, and to depths of ±19 feet to ±17 feet (Elevation ±653 feet) at End Bent-2. The roadway embankment fill encountered generally consists of very loose to medium dense, silty, coarse to fine sand (A-2-4); and soft to stiff, silty, coarse to fine sandy clay (A-6 and A-7-5), and clayey, coarse to fine sandy silt (A-4). Small amounts of gravel and mica were common within the roadway embankment fill, and a trace of organics in the form of leaf fragments was present within the fill at Boring EB2-B. Standard Penetration Resistance values of 4 to 14 blows per foot (bpf) were encountered within the roadway embankment fill.

Alluvial soil was encountered underlying the roadway embankment fill at Borings EB1-B1, EB2-A, and EB2-B, and beginning at the existing ground surface at the remaining borings. The alluvium extends to depths of ±24 feet to ±29 feet (Elevations ±631 feet to ±642 feet) at End Bent-1, to depths of ±22 feet to ±20 feet (Elevations ±635 feet to ±636 feet) at Bent-1, to depths of ±9 feet to ±12 feet (Elevations ±648 feet to ±644 feet) at Bent-2, and to depths of ±34 feet to ±23 feet (Elevations ±638 feet to ±647 feet) at End Bent-2. The alluvium generally consists of very loose to medium dense, variably clayey, variably silty, coarse to fine sand (A-2-4); and soft to stiff, coarse to fine variably sandy, silty clay (A-6), and variably clayey, coarse to fine sandy silt (A-4). Standard Penetration Resistance values of Weight-of-Hammer (W.O.H.) to 13 blows per foot (bpf) were encountered within the alluvial material.

Residual soils were encountered underlying the alluvium at all of the borings drilled for this project. The residual soils extend to depths of ±44 feet to ±34 feet (Elevations ±612 feet to ±627 feet) at End Bent-1, to depths of ±31 feet to ±29 feet (Elevations ±625 feet to ±626 feet) at Bent-1, to depths of ±33 feet to ±21 feet (Elevations ±623 feet to ±635 feet) at Bent-2, and to depths of ±44 feet to ±33 feet (Elevations ±627 feet to ±637 feet) at End Bent-2. The residual

soils generally consist of very loose to very dense, variably clayey, silty, coarse to fine sand (A-2-4); and medium stiff to hard, variably clayey, coarse to fine sandy silt (A-4). Standard Penetration Resistance values within the residuum ranged from 3 and 70 bpf.

Weathered rock was encountered underlying the residual soils at the End Bent-1 and Bent-1 borings, and at Borings B2-A and EB2-A. Weathered rock was not encountered at Borings B2-C, B2-B, and EB2-B. Weathered rock was also encountered as zones within the crystalline rock at the Bent-1 borings. The weathered rock generally consists of severely weathered, very soft to soft, metamorphosed mafic rock with very close to close fracture spacing. The weathered rock was encountered between the following depths and elevations: 43.5 to 48.6 feet (Elevations 612.0 feet to 606.9 feet) at Boring EB1-A; 34.0 feet to the boring termination depth of 49.7 feet (Elevations 622.2 feet to 606.5 feet) at Boring EB1-B; 44.0 feet to the boring termination depth of 59.0 feet (Elevations 627.1 feet to 612.1 feet) at Boring EB1-B1; 31.5 feet to 36.5 feet (Elevations 624.9 feet to 619.9 feet) and 40.8 feet to 46.8 feet (Elevations 615.6 feet to 609.6 feet) at Boring B1-A; 29.0 feet to 29.9 feet (Elevations 626.2 feet to 625.3 feet), 31.4 feet to 38.4 feet (Elevations 623.8 feet to 616.8 feet), and 39.7 feet to 41.4 feet (Elevations 615.5 feet to 614.1 feet) at Boring B1-B; 33.5 feet to 39.8 feet (Elevations 622.6 feet to 616.3 feet) at Boring B2-A; and 44.5 feet to 47.5 feet (Elevations 627.2 feet to 624.2 feet) at Boring EB2-A. Borings EB1-B and EB1-B1 were terminated within weathered rock.

Crystalline rock was encountered at all of the borings drilled for this project with the exception of Borings EB1-B and EB1-B1. The crystalline rock directly underlies the residual soil at Borings B2-C, B2-B, and EB2-B, and underlies weathered rock at the remaining borings. The crystalline rock generally consists of metamorphosed mafic rock. The crystalline rock was encountered at the following depths and elevations: 48.6 feet (Elevation 606.9 feet) at EB1-A, 36.5 feet (Elevation 619.9 feet) at B1-A, 29.9 feet (Elevation 625.3 feet) at B1-B, 39.8 feet (Elevation 616.3 feet) at B2-A, 25.5 feet (Elevation 630.6 feet) at B2-C, 20.7 feet (Elevation 635.2 feet) at B2-B, 47.5 feet (Elevation 624.2 feet) at EB2-A, and 33.1 feet (Elevation 637.3 feet) at EB2-B. As noted in the previous paragraph, zones of weathered rock were encountered within the crystalline rock at the Bent-1 borings. Boring EB1-A and the End Bent-2 borings were terminated on crystalline rock, while the Bent-1 and Bent-2 borings were terminated in crystalline rock.

Between ±10 and ±30 feet of weathered rock/crystalline rock was cored at each of the interior bent borings. Rock coring was not performed at the end bent borings. In general, the cored weathered rock is severely weathered, very soft to soft metamorphosed mafic rock with very close to close fracture spacing. Strata recovery (REC) values within the weathered rock ranged from 0 to 86 percent. In general, the cored crystalline rock is moderately to very slightly weathered, soft to very hard metamorphosed mafic rock with isolated metamorphosed granitic intrusions, especially at Bent-2, and with very close to very wide fracture spacing. Strata (REC) values within the