

**FOUNDATION SUBGRADE DESCRIPTION; BENT BY BENT****END BENT ONE (EB-1)**

The bridge is being changed from a 9 span bridge to 5 span bridge. The new end bent 1 will be located about 5' outboard of the existing endbent 1. It has a planned centerline location of -L-25+55, and skew of 90°. SPT borings were completed with NW casing and tri-cone at both sides of the bent.

**Boring EB1-A.** The "A" Boring was drilled at -L-25+55, 11.00' LT., elevation 394.99 on the shoulder of the existing roadway. The boring encountered 12' of fill: A-6 tan, fine and coarse sandy clay. Soft to very soft A-4 alluvial soil was found down to a depth of 23', then very loose A-3 to 26.2' where residual soil commenced. Penetration resistance increased rapidly to 34.5n where SPT refusal was found. The boring was terminated at 39.5 after drilling through 5' of crystalline rock.

**Boring EB1-B.** The "B" Boring was drilled at -L-25+55, 6.5.0' RT., elevation 395.19 on the edge of the existing roadway. The boring encountered 9.3' of soft to medium stiff, moist tan sandy silty A-6 clay. From 9.3' to 21.5 layers very soft A-4, A-6, then A-4 were found. Weathered rock was confirmed at 24.1, and crystalline rock at 29.1 The boring was terminated at 33.8' in rock.

**Groundwater:**

Groundwater was found at 8.9 and 7.0 feet, in the base of the fill.

**Rock Surface:**

SPT refusal was at elevation 355.49, on the A side, and at 361.39 on the B side.

**INTERIOR BENT ONE (B1)**

The B1 bent is in the Q<sub>100</sub> channel, has a planned centerline location at -L-25+90 and a skew of 90°. One boring through casing, SPT followed by core, was completed at the "B" side of the bent, through the deck.

**The "B" hole** was completed at -L-25+88, 4.6' RT., through the deck collared in alluvium at elevation 384.96'.

**Soil stratigraphy:** From surface to 13.5', soft to medium stiff A-4 silty sand was drilled. From 13.5' - 14.25' gravel was logged as sediment, but not sampled, and at 14.25' weathered rock was encountered. Weathered rock was confirmed at a drive at 15.35. Rock was verified by SPT refusal at 19.35. Coring began at 19.35'.

**Rock stratigraphy:** From 19.35' to 35.15', we cored light tan metamorphosed sediment, which commonly has iron stain on fractures. RQD is poor. From 35.15' to the end of boring at 55', the effects of weathering decrease and RQD improves a little. Considerable RQD loss is along foliation or bedding planes, and may be mechanical breakage. Cumulative recovery was 78.5%, and cumulative RQD was 17%.

**Groundwater**

Water was above the collar of the boring during drilling activities.

**Bedrock surface**

The elevation of the top of crystalline rock was determined to be 365.61'.

**INTERIOR BENT TWO (B2)**

Interior bent 2 is in the Q<sub>100</sub> channel with a planned centerline location at -L-26+40, and a skew of 90°. The "A" boring drilled through casing, SPT followed by core, was completed through the deck.

**The "A" hole** at this bent was drilled at -L-26+40, 6.2' LT., elevation 384.68'.

**Soil stratigraphy:** From the surface to 12.7', very soft A-6 and A-4 soil was drilled. From 12.7' to 15.5, the rind of weathered rock was traversed, and SPT refusal was encountered. The boring was continued with core equipment.

**Rock stratigraphy:** From 15.5' to 34.9', we cored light tan well-foliated gneiss, probably from metamorphosed sediment, with brown fracture coating. This is similar to bent one, and is

feldspar-quartz gneiss. At 34.9' or a little before the rock type shifts to a dark gray less weathered rock, probably biotite-quartz feldspar gneiss. Cumulative recovery of the cored intervals was 61% with a cumulative RQD of 5.7%.

**Groundwater:**

Water was above ground level at the time of boring.

**Bedrock surface**

Crystalline rock was determined to be at 369.74' elevation.

**INTERIOR BENT THREE (B3)**

The B3 bent is in the active channel, with a planned centerline location at -L-26+90 and a skew of 90°. Borings through casing, SPT followed by core, were completed at the "A" and "B" sides of the bent

**The "A" hole** was completed at -L-26+92, 5.5' LT., through the deck collared underwater, in alluvium, at elevation 378.98'.

**Soil stratigraphy:** From the surface to 5.4', very loose alluvial A-1-B coarse sand was encountered. From 5.4' to 10.7, micaceous residual A-2-4 soil increases in consistency from very loose to very dense. Weathered rock was confirmed at 10.7. Coring began at 24.7.

**Rock stratigraphy:** We cored from 24.7' to 44.4'. From 24.7' to 36', we cored light tan metamorphosed sediment, which commonly has iron stain on fractures. RQD is poor, but recovery was 90% or better. From 36' to the end of boring at 44.4, the rock is shattered and with an RQD of zero, the recovery also dropped to 75%, then 56% at the end. Cumulative recovery was 79%, and cumulative RQD was 14%.

**The "B" hole** was completed at -L-26+93, 3.5' RT., through the deck and collared in alluvium at elevation 380.42'.

**Soil stratigraphy:** From surface to 8.5', very soft A-4 silty sand was drilled. From 8.5' to 15.3 A-1B gravel was logged as residual. Coring began at 15.3, where SPT refusal occurred.

**Rock stratigraphy:** From 15.3' to 35.7', we cored light tan metamorphosed sediment, which commonly has iron stain on fractures. RQD is poor. From 35.7' to the end of boring at 50.4', the effects of weathering decrease and RQD improves a little. Cumulative recovery was 75.8%, and cumulative RQD was 13%.

**Groundwater**

Water was above the collar of the boring during drilling activities.

**Bedrock surface**

The elevation of the top of crystalline rock was determined to be 354.28 at the "A" side and 365.12' at the "B" side. (The interval on the "A" hole below 365' is occupied by material that returned N values of 100 for 0.45' penetration, nearly SPT refusal and rock.)

**INTERIOR BENT FOUR (B4)**

The B4 bent has a planned centerline location at -L-27+40 and a skew of 90°. Boring through casing, SPT followed by core, was completed at the "B" side of the bent, through the deck. Considerable erosion has occurred at this location, placing the bent in the current active channel.

**The "B" hole** was completed at -L-27+40, 5.5' LT., through the deck collared underwater, in alluvium, at elevation 378.93'.

**Soil stratigraphy:** From the surface to 7.1', very loose alluvial A-2-4 sand was encountered. From 7.1' to 38.5 weathered rock at near SPT refusal hardness was encountered. SPT refusal confirmed crystalline rock at 41.0 where coring began.

**Rock stratigraphy:** From 41.0' to 47.4', we recovered hard, fresh, rock with wide spaced fractures. From 47.4' to the end of boring at 48.7, 4" of shattered, iron stained rock was recovered. The hard fresh interval includes both the dark colored biotite-quartz-feldspar and the