

**SOIL CLASSIFICATION**

AASHTO

- A1 Gravel and Sand
- A3 Fine Sand
- A2 Silty or Clayey Gravel and Sand
- A4 Silty Soil - Low Compressibility
- A5 Silty Soil - Highly Compressible
- A6 Clayey Soil - Low Compressibility
- A7 Clayey Soil - Highly Compressible

**ROCK QUALITY DESIGNATION**

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

**SHEAR STRENGTH**

UNDRAINED SHEAR STRENGTH IN kPa	CONSISTENCY
<12	Very Soft
12-24	Soft
24-48	Med. Stiff
48-96	Stiff
96-192	Very Stiff
>192	Hard

**CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY**

DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**DEFINITIONS (AASHTO)**

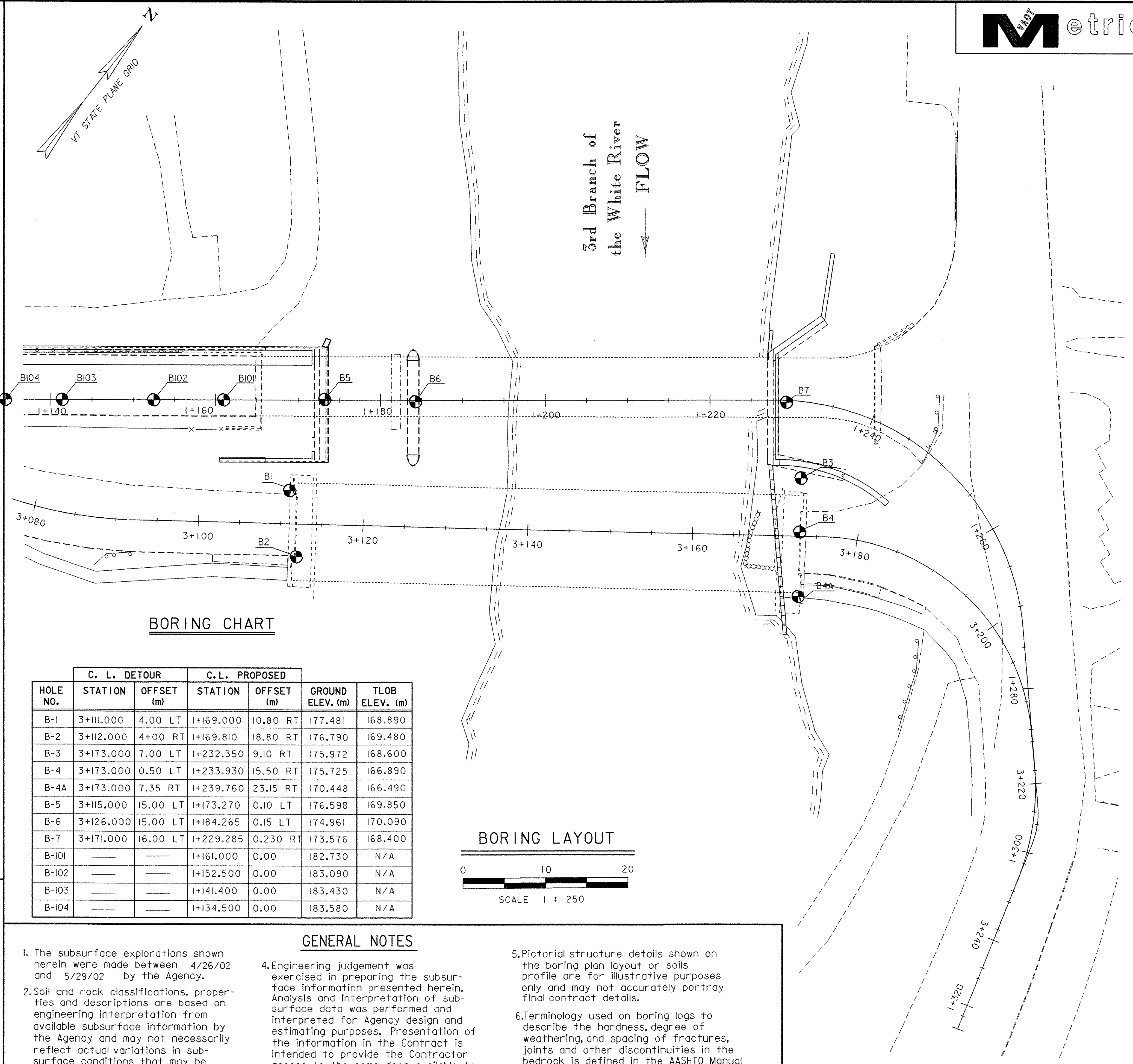
- BEDROCK (LEDGE)** - Rock in its native location of indefinite thickness.
- BOULDER** - A rock fragment with an average dimension > 304.8 mm.
- COBBLE** - Rock fragments with an average dimension between 76.2 and 304.8 mm.
- GRAVEL** - Rounded particles of rock < 76.2 mm and > 2 mm (#10 sieve).
- SAND** - Particles of rock < 2 mm (#10 sieve) and > 75 μm (#200 sieve).
- SILT** - Soil < 75 μm (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.
- CLAY** - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

- VARVED** - Alternate layers of silt and clay.
- HARDPAN** - Extremely dense soil, cemented layer, not softened when wet.
- MUCK** - Soft organic soil (containing > 10% organic material).
- MOISTURE CONTENT** - Weight of water divided by dry weight of soil.
- FLOWING SAND** - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
- STRIKE** - Angle from magnetic north to line of intersection of bed with a horizontal plane.
- DIP** - Inclination of bed with a horizontal plane.

**COMMONLY USED SYMBOLS**

- ▼ Water Elevation
- ⊕ Standard Penetration Boring
- ⊙ Auger Boring
- ⊖ Rod Sounding
- S Sample
- N Standard Penetration Test  
Blow Count Per 300 mm For:  
50.8 mm O.D. Sampler  
35.0 mm I.D. Sampler  
Hammer Weight Of 63.5 kg.  
Hammer Fall Of 762 mm
- VS Field Vane Shear Test
- US Undisturbed Soil Sample
- B Blast
- DC Diamond Core
- MD Mud Drill
- WA Wash Ahead
- HSA Hollow Stem Auger  
Core Size 30.1mm
- AX Core Size 42.0 mm
- BX Core Size 54.7 mm
- NX Core Size 54.7 mm
- M Double Tube Core Barrel Used
- LL Liquid Limit
- PL Plastic Limit
- PI Plasticity Index
- NP Non Plastic
- w Moisture Content (Dry Wgt. Basis)
- D Dry
- M Moist
- MTW Moist To Wet
- W Wet
- Sat Saturated
- Bo Boulder
- Gr Gravel
- Sa Sand
- SI Silt
- CI Clay
- HP Hardpan
- Le Ledge
- NLTD No Ledge To Depth
- CNPF Can Not Penetrate Further
- TLOB To Ledge Or Boulder
- NR No Recovery
- Rec. Recovery
- %Rec. Percent Recovery
- ROD Rock Quality Designation
- CBR California Bearing Ratio
- < Less Than
- > Greater Than
- R Refusal (N > 100)

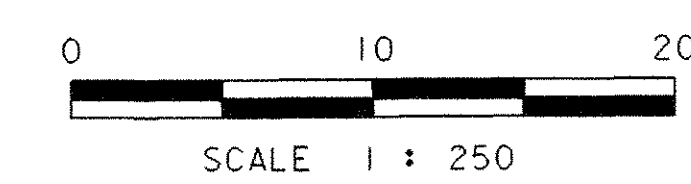
COLOR	
blk	Black
bl	Blue
brn	Brown
dk	Dark
gry	Gray
gn	Green
lt	Light
or	Orange
pnk	Pink
pu	Purple
rd	Red
tn	Tan
wh	White
yel	Yellow
mitc	Multicolored



**BORING CHART**

HOLE NO.	C. L. DETOUR		C. L. PROPOSED		GROUND ELEV. (m)	TLOB ELEV. (m)
	STATION	OFFSET (m)	STATION	OFFSET (m)		
B-1	3+111.000	4.00 LT	1+169.000	10.80 RT	177.481	168.890
B-2	3+112.000	4+00 RT	1+169.810	18.80 RT	176.790	169.480
B-3	3+173.000	7.00 LT	1+232.350	9.10 RT	175.972	168.600
B-4	3+173.000	0.50 LT	1+233.930	15.50 RT	175.725	166.890
B-4A	3+173.000	7.35 RT	1+239.760	23.15 RT	170.448	166.490
B-5	3+115.000	15.00 LT	1+173.270	0.10 LT	176.598	169.850
B-6	3+126.000	15.00 LT	1+184.265	0.15 LT	174.961	170.090
B-7	3+171.000	16.00 LT	1+229.285	0.230 RT	173.576	168.400
B-101	---	---	1+161.000	0.00	182.730	N/A
B-102	---	---	1+152.500	0.00	183.090	N/A
B-103	---	---	1+141.400	0.00	183.430	N/A
B-104	---	---	1+134.500	0.00	183.580	N/A

**BORING LAYOUT**



**GENERAL NOTES**

- The subsurface explorations shown herein were made between 4/26/02 and 5/29/02 by the Agency.
- Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgement by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.



PROJECT: <b>BETHEL</b>	PROJECT NO.: <b>BRF 0241 (33) C/2</b>
DESIGN FILE NAME: 02cl80/structures/s02cl80bor.dgn	PLOT DATE: 15-APR-2005
IPARM FILE NAME: scl80borlayout.l	
US R+12 Over The Third Branch Of The White River	
BORING LAYOUT SHEET	SHEET: 25 OF 130