

El. 1432.48: Boring #3

1430	Dark, sandy, clayey, silt-sand & sandstone boulders (Flood Plain)
1425	Gray to black shale, medium hard - w/ Calcite streaks along bedding plane. (The fractures are of a mechanical nature.)
1415	Note: Some weathering on top of rock.
1405	
1400	30.5' Hole bottom.

El. 1430.99: Boring #4

1430	Dark, sandy, clayey silt-sand & sandstone boulders (Flood Plain) (3.0' W.L.)
1425	Gray to black shale, medium hard w/ Calcite streaks.
1415	6'-0" - 11'-0" Fractured some weathering
1410	11'-0" Calcite filled joint.
1405	
1400	30.2' Hole bottom.

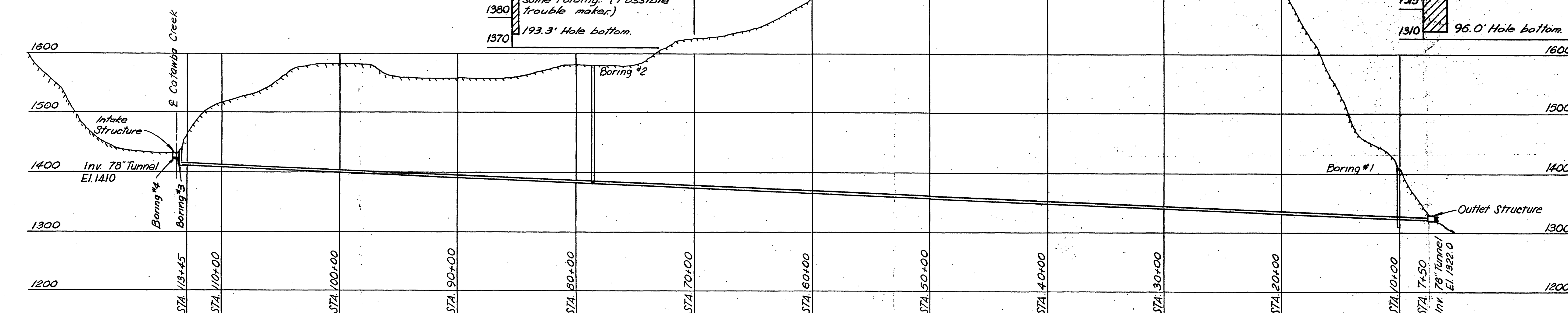
El. 1567.8: Boring #2

1560	Overburden
1550	Gray and dark grey laminated limey shale medium hard.
1540	3.5'-5.0' Fractured & Stained
1530	8.2'-8.5' Fractured & Stained
1520	20.0'-20.8' Fractured
1510	27.8'-28.1' Fractured
1500	Note: 3.5'-112.8' Stress cracks thru out.
1490	44.2'-48.3' High Angle Fracture.
1480	73.6'-76.0' Fractured
1470	Note:
1460	Artesian Flow @ 84.0' in depth. The flow was fairly constant thru out - note that flow stopped when casing was pulled. Exact depth of flow unknown. No indication on core @ 84.0'
1450	102.1'-105.1 Vertical Calcite filled joint, some honeycomb - fresh crystals.
1440	Dark gray to black laminated limey shale medium hard.
1430	
1420	155.2'-155.4' Fracture w/ Calcite deposit.
1410	156.5'-156.6' Same
1400	162.6' H. Angle Joint. Calcite deposit. (Possible slickenside.)
1390	168.2'-176.8' Fractured, random Calcite streaks, some folding. (Possible trouble maker)
1380	
1370	193.3' Hole bottom.

El. 1407.4: Boring #1

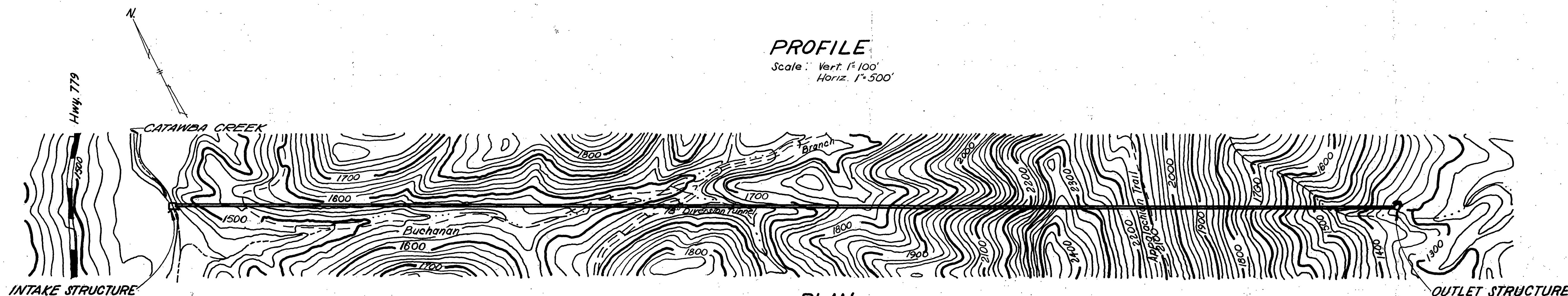
1405	Overburden & Sandstone boulders.
1400	Gray to gray-brown coarse grain weathered porous sandstone, medium to soft, w/ some joints.
1395	Note: Extreme weathering in joints.
1390	Brown, badly weathered sandstone thin bedded, stained
1385	Blue-gray massive limestone, medium hard.
1380	Brown to light gray sandstone, badly weathered & stained, medium to coarse grain - broken, jointed w/ staining, soft. (20.0' W.L.)
1375	Blue-gray limestone, thin bedded, hard.
1370	Brown to gray sandstone, weathered & stained w/ seams, some staining
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1360	Light gray. Fine grain sandstone very hard w/ some jointing. Slight weathering
1355	
1350	Medium dark to very light gray, hard to very hard sandstone. Medium to fine grain. Generally speaking, the lighter in color the harder the material (The transition is a gradual change.)
1345	36.8'-57.3' Joint weathered, some staining
1340	62.6'-62.8' " " " "
1335	70.2' " " " "
1330	73.5' " " " "
1325	74.7' " " " "
1320	74.7'-75.2' Sandstone has a slight red overcast
1315	75.2' Joint weathered, some staining
1310	79.9' " " " "
1305	85.6' " " " "
1300	89.8' " " " "
1295	Note: The very light material may be a Quartz.
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Note: The borings shown on this drawing were made by the Cunningham Core Drilling & Grouting Corp. Full reports of the borings are on file in the offices of the Water Department and the Engineer and are available for examination and reference.



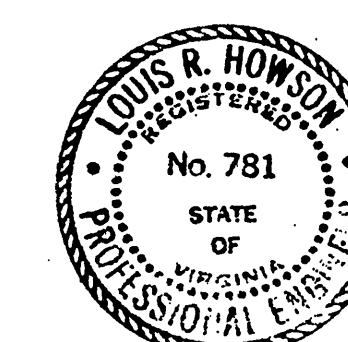
PROFILE

Scale: Vert. 1" = 100'
Horiz. 1" = 500'



PLAN

Scale: 1" = 500'



CATAWBA CREEK
DIVERSION TUNNEL
**PROFILE, PLAN
AND SOIL BORINGS**
CITY OF ROANOKE WATER DEPT.
ROANOKE, VIRGINIA

ALVORD BURDICK & HOWSON
ENGINEERS
CHICAGO
1969