

195~~8~~ 196

UPPER FRENCH BROAD BENCH MARKS

Tennessee Valley Authority

Fourth Order

The UFB bench marks are filed with the TVA control booklets. The designations range from UFB-1 through UFB-315 and are listed in this order.

This cover sheet is placed with USGS Quads to inform that additional BM's are available in the listed quads.

<u>USGS</u>	<u>TVA</u>
87	194
88	185
123	202
124	193
160	201
161	192
194	200
✓ 195	191
196	182

NGVD 29
Elevations

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NGVD 29
Elevations

14 SPIRIT LEVELING IN NORTH CAROLINA, 1896 TO 1914.

PRECISE

#157 CASAR
#158 LENCIR
#159 GLEN ALPINE

MORGANTON QUADRANGLE.

[Latitude 35° 30'-36°; longitude 81° 30'-82°.]

From Connelly Springs along Southern Ry. to Nebo.

	Page.
Connelly Springs, in front of station; top of north rail.....	1, 194.0
Connelly Springs, 142.4 feet north of north rail, south front of James Hudson's brick store, near east corner; bronze tablet stamped "1193".....	1, 191.762
Valdese, in front of station; top of north rail.....	1, 202.3
Drexel, 15 feet north of north rail, 0.1 mile east of milepost 74; iron post stamped "1193".....	1, 191.628
Morganton, in front of station; top of north rail.....	1, 110.2
Morganton, county courthouse, extreme northwest corner of north portico; bronze tablet stamped "1182".....	1, 180.774
Calvin, in front of station; top of north rail.....	1, 059.5
Glen Alpine, 73.2 feet north of north rail, southeast corner of brick basement of Hennessie & Co's. store; bronze tablet stamped "1215".....	1, 213.944
Glen Alpine, in front of station; top of north rail.....	1, 209.6
Bridgewater, 0.4 mile east of, bridge seat at west end of bridge over Muddy Creek, 2.8 feet south of south rail; copper bolt stamped "U. S. G. S. 1091 Ft. B. M.".....	1, 089.549
Bridgewater, in front of station; top of rail.....	1, 095.7
Nebo, 134.2 feet north of north rail, 1 foot from east front of J. D. Pitt's store, in south basement wall; bronze tablet stamped "1298".....	1, 296.609
Nebo, in front of station; top of north rail.....	1, 282.6

MOUNT MITCHELL QUADRANGLE.

[Latitude 35° 30'-36°; longitude 82°-82° 30'.]

From Nebo along Southern Ry. to Biltmore.

Marion, county courthouse, west face at south end of portico; bronze tablet stamped "1438".....	1, 436.857
Marion, in front of station; top of north rail.....	1, 390.6
Greenlee, at east end of platform, 11.7 feet south of north rail; iron post stamped "1286".....	1, 284.434
Old Fort, 40.7 feet north of north rail of main track, at southwest corner of ticket office; iron post stamped "1437" DESTROYED PRIOR TO 1935.....	1, 436.095
Dendron, in front of station; top of north rail.....	1, 752.7
Round Knob, 9 feet south of north rail and 46.1 feet east of entrance to Round Knob Hotel, in face of solid rock; bronze tablet stamped "1829".....	1, 828.176
Mud Cut, 14.2 feet south of north rail of main track and 293 feet east of switch point; iron post stamped "2153" DESTROYED PRIOR TO 1935.....	2, 151.574
Swannanoa tunnel, 2.6 feet east of west portal, in north side wall; bronze tablet stamped "2522" DESTROYED PRIOR TO 1935.....	2, 520.671
Terrell, in front of station; top of north rail.....	2, 524.2
Black Mountain, in front of station; top of north rail.....	2, 365.6
Swannanoa, 50.6 feet south of north rail, on west side of ticket office; iron post stamped "2222".....	2, 220.393
Azalea, 12.8 feet south of north rail, 59.8 feet west of switch point, in face of rock; bronze tablet stamped "2057" DESTROYED PRIOR TO 1935.....	2, 055.966

ASHEVILLE QUADRANGLE.

[Latitude 35° 30'-36°; longitude 82° 30'-83°.]

From Biltmore along Southern Ry. to Paint Rock.

Biltmore, Salisbury branch, in front of station; top of north rail of main track.....	1, 992.1
Biltmore, office of the Biltmore estate, northwest pillar of porte-cochère, in bottom stone; bronze tablet stamped "1996".....	1, 994.4

Asheville, 19.3 feet north of north rail, pedestal block of northeast corner post stamped "1936".....	1, 992.1
Asheville, in front of station; top of north rail.....	1, 992.1
Montford, in front of station; top of north rail.....	1, 992.1
Olivette, 1.1 miles east of, 40.8 feet north of station; top of north rail.....	1, 992.1
Olivette, 1.1 miles east of, 40.8 feet north of station; top of north rail.....	1, 992.1
Olivette, 1.1 miles east of, 40.8 feet north of station; top of north rail.....	1, 992.1
Olivette, in front of station; top of north rail.....	1, 992.1
Alexander, in front of station; top of north rail.....	1, 992.1
Alexander, 310 feet west of station, 11.1 feet south of road crossing; copper bolt stamped "1".....	1, 992.1
Bailey, in front of station; top of north rail.....	1, 992.1
Bailey, 1 mile west of station, 11.5 feet south of station; copper bolt stamped "1".....	1, 992.1
Rollins, in front of station; top of north rail.....	1, 992.1
Marshall, in front of station; top of north rail.....	1, 992.1
Marshall, southeast corner county courthouse; copper bolt stamped "1646".....	1, 992.1
Barnard, in front of station; top of north rail.....	1, 992.1
Barnard, 0.2 mile west of station, 140 feet north of north rail, in solid rock; copper bolt stamped "1".....	1, 992.1
Ft. B. M.".....	1, 992.1
Sandy, in front of station; top of north rail.....	1, 992.1
Stackhouse, in front of station; top of north rail.....	1, 992.1
Hot Springs, southeast corner of east abutment of bridge; copper bolt stamped "U. S. G. S. 1326 I".....	1, 992.1
Paint Rock, north end of west abutment of bridge; copper bolt stamped "1259".....	1, 992.1
Paint Rock, in front of station; top of north rail.....	1, 992.1

Clarksville, Creedmoor, Durham and Great Falls

The following is the North Carolina list of precise levels run in 1905 from Southern Railway to Clarksville, V. The method and limit of error was the same as that of the Coast and Geodetic Survey in precise leveling. The levels were leveled independently in both the forward and backward directions. The broken by temporary bench marks. On all sections upon which the levels differed more than 4.0 millimeters (or 0.157 inches) were re-leveled in kilometers) leveled between adjacent points. Forward and backward measures were limited to 1.5 kilometers.

The instruments used were two 10-foot length graduated to centimeters and a Coast and Geodetic Survey level. The party consisting of five persons and a level man.

NGVD 29 Elevations

#159
#160
#161
#195
#196
Biltmore
HALEWOOD
HOT SPRINGS
CLARKVILLE
DURHAM
GREAT FALLS

CLARKVILLE
1929
SLD
1935
1936

...-82°.]	Page.
...y. to Nebo.	1, 194. 0
...uth front of James Hud-	
...stamped "1193".....	1, 191. 762
...of milepost 74; iron post	1, 202. 3
.....	1, 191. 628
.....	1, 110. 2
...t corner of north portico;	
.....	1, 180. 774
.....	1, 059. 5
...corner of brick basement	
...ed "1215".....	1, 213. 944
...nd of bridge over Muddy	
...amped "U. S. G. S. 1091	1, 209. 6
.....	1, 089. 549
.....	1, 095. 7
...t front of J. D. Pitt's store,	
... "1298".....	1, 296. 609
.....	1, 282. 6
NGVD	
82°	
Blittmore.	
...h end of portico; bronze	1, 436. 857
.....	1, 390. 6
...th of north rail; iron post	1, 284. 434
...ck, at southwest corner of	1, 436. 095
...e tablet stamped "1829".....	1, 752. 7
...1.1 feet east of entrance to	1, 828. 176
...e tablet stamped "1829".....	2, 151. 574
...track and 293 feet east of	2, 520. 671
...in north side wall; bronze	2, 524. 2
...h rail.....	2, 365. 6
...est side of ticket office; iron	2, 220. 393
...vest of switch point, in face	2, 055. 966
NGVD	
30'-83°.]	
...to Paint Rock.	
...n; top of north rail of main	1, 992. 1
...west pillar of porte-cochère,	1, 994. 4

Asheville, 19.3 feet north of north rail, 505 feet east of milepost 141, in pedestal block of northeast corner post of train shed; bronze tablet stamped "1986".....	Fect. 1,710 1, 984. 525
Asheville, in front of station; top of north rail.....	1, 968. 1
Montford, in front of station; top of north rail.....	1, 968. 1
Olivette, 1.1 miles east of, 40.8 feet north of north rail of main track, 400 feet east of water tank, in bowlder containing 50 cubic yards; copper bolt stamped "U. S. G. S. 1924 Ft. B. M.".....	1, 922. 944
Olivette, in front of station; top of north rail.....	1, 894. 9
Alexander, in front of station; top of north rail.....	1, 790. 9
Alexander, 310 feet west of station, 11.1 feet south of north rail, east side of road crossing; copper bolt stamped "U. S. G. S. 1796 Ft. B. M.".....	1, 794. 837
Bailey, in front of station; top of north rail.....	1, 727. 2
Bailey, 1 mile west of station, 11.5 feet south of track, 19 feet east of milepost 158, in solid rock; copper bolt stamped "U. S. G. S. 1729 Ft. B. M.".....	1, 728. 187
Rollins, in front of station; top of north rail.....	1, 668. 2
Marshall, in front of station; top of north rail.....	1, 643. 9
Marshall, southeast corner county courthouse; bronze tablet stamped "1646".....	1, 645. 193
Barnard, in front of station; top of north rail.....	1, 531. 6
Barnard, 0.2 mile west of station, 140 feet west of milepost 171, 6.5 feet north of north rail, in solid rock; copper bolt stamped "U. S. G. S. 1529 Ft. B. M.".....	1, 528. 401
Sandy, in front of station; top of north rail.....	1, 461. 5
Stackhouse, in front of station; top of north rail.....	1, 417. 7
Hot Springs, southeast corner of east abutment of Spring Creek Bridge; copper bolt stamped "U. S. G. S. 1326 Ft. B. M.".....	1, 325. 026
Paint Rock, north end of west abutment of bridge over Grass Creek; bronze tablet stamped "1259".....	1, 257. 453
Paint Rock, in front of station; top of north rail.....	1, 265. 6

Clarksville, Creedmoor, Durham, and Oxford quadrangles.

DURHAM AND GRANVILLE COUNTIES.

The following is the North Carolina portion of the results of a spur of precise levels run in 1905 from Durham, N. C., north along the Southern Railway to Clarksville, Va. (See Bulletin 562.)

The method and limit of error were those now adopted by the Coast and Geodetic Survey in precise-level work. The line was leveled independently in both the forward and backward directions, broken by temporary bench marks into sections 2 to 3 kilometers long. On all sections upon which the backward and forward measures differed more than 4.0 millimeters \sqrt{K} (in which K is the distance in kilometers) leveled between adjacent bench marks both the forward and backward measures were repeated until they came within limits.

The instruments used were two self-reading rods, 3.2 meters in length graduated to centimeters and reading by estimation to millimeters; and a Coast and Geodetic Survey type precise level.

The party consisting of five persons was in charge of R. L. Libby, level man.

NGVD 29
Elevations

From point 2.5 miles south of White Rock east along Big Laurel Creek to point 2 miles west of Little Creek (single spur line).

Big Laurel, 1,000 feet west of post office, 70 feet north of Spillcorn Creek, in rock 6 feet north of center of road; aluminum bolt stamped "2004 A" . . . 2,002.645
 Little Creek, 2 miles west of post office, in boulder 5 by 7 by 4 feet; aluminum bolt stamped "2636 A" . . . 2,635.083

From Hot Springs south via Bluff and Lee to Spring Creek (single spur line).

Hot Springs, southeast corner of east abutment of bridge over Spring Creek; copper bolt stamped "1326 A" . . . 1,325.026
 Lee, 2.18 miles south of, 0.25 mile north of road forks, 500 feet northeast of ford of Spring Creek, 10 feet southeast of center of road, in sandstone; aluminum bolt stamped "2237 A" . . . 2,235.818
 Spring Creek, 2.5 miles south of post office, 50 feet south of road forks, 10 feet west of center of road, in stone; aluminum bolt stamped "2473 A" . . . 2,472.353

From Bluff west to Roaring Fork Creek (single spur line).

Bluff, 6.3 miles west of post office, 1.34 miles west of mouth of Roaring Fork 15 feet north of bank, 20 feet west of ford, 10 feet west of center of road, in stone; aluminum tablet stamped "2766 A" . . . 2,764.472

Pisgah and Saluda quadrangles.

HAYWOOD, HENDERSON, POLK, RUTHERFORD, AND TRANSYLVANIA COUNTIES.

The elevations in the following list were determined by extension from the precise-level line along the Southern Railway at Asheville. The leveling was done in Pisgah quadrangle in 1896 by E. L. Faison and E. M. Long, and in 1897 by T. S. Mauldin, jr.; in Saluda quadrangle in 1903 by K. A. Parker, and in 1904 by F. L. Foust.

PISGAH QUADRANGLE. *Chapel Hill #23*

[Latitude 35°-35° 30'; longitude 82° 30'-82° 30' *Pisgah #37*]

From Sandy Bottom southeast via Mills River to Rugby, thence north to Skyland.

Avery, 0.75 mile north of, east side of hollow, 40 feet north of spring, 45 feet east of blacksmith shop at foot of Ball Mountain, in large rock; copper bolt stamped "U. S. G. S. 2184" . . . 2,174.105
 Gypsy, 100 feet northeast of former post office, west of road, in rock; copper bolt stamped "U. S. G. S. 2182" . . . 2,172.015
 Mills River, 20 feet east of former post office, in rock; copper bolt stamped "U. S. G. S. 2086" . . . 2,075.546
 Fletcher, east side of stone curb of well at southeast corner of post office; bronze tablet stamped "2123" . . . 2,112.383
 Fletcher, Southern Ry. station; top of rail . . . 2,091.1
 Skyland, in front of station; top of rail . . . 2,253.8

From Avery Creek southwest to Lance's (spur line):

Avery Creek, 100 yards south of, 350 yards south of road, on Mrs. S. R. Lance's property, 30 feet east of spring near south end, on east side of lane between house and stable; copper bolt stamped "U. S. G. S. 2263" . . . 2,255.195

From Candler south to Dunsmore (single spur line).

Dunsmore, 250 feet east of ford of Stony Fork, inside of pasture fence, south of road, in large rock; copper bolt stamped "2388-A" . . . 2,387.258

From Canton south up Pigeon River
 Lenoir Creek, 200 yards from mouth of Pigeon River, in rock north of river

From Sonoma south up West 1
 Lavinia, about 2 miles south of mouth crossing just south of Pendleton's "2931-A" . . .

From point near Lavinia so
 Little East Fork, 0.25 mile south of fork, about 10 feet west of road, at in rock; copper bolt stamped "31

At Wa
 Waynesville, 135 feet north of station stamped "2638-A" . . .

From Mills River west
 Sitton, 0.5 mile northeast of, east of Mills River Baptist Church, 0.25 copper bolt stamped "U. S. G. S.

From Mills River southwest along
 Henderson-Transylvania county line which runs Mr. Reese's old mill, on road, on stone; chiseled cross in Henderson-Transylvania county line from the old Reese mill, 75 yards 100 yards from house east of road north of road; copper bolt stamped Brevard, at entrance to courthouse cross . . .

Brevard, southeast corner of courthouse stamped "2239" . . .
 From Brevard southeast to Wilson Bri

Davidson River, on bottom stone at Calhoun, in southwest corner of ford stamped "2154" . . .
 Bowman Bluff, 1 mile west of, at about 10 feet from center of road, west of bolt stamped "U. S. G. S. 2083"

From Calhoun
 Grange, Zackey & Rogers's store, Osteen, 100 yards southeast of, north stamped "2201" . . .

From Ecusta west up Davidson
 Avery Creek, 200 yards west of mill on side of road toward river; copper Cove Creek, about 0.3 mile west of River, 375 feet west of river ford; chestnut tree is growing; copper

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Ardine #125
Cassars #87
Waynesville #125
Waynesville #80

NGVD 29 Elevations