

SECTION II.—Tabular statement of shoals and obstructions.

Locality.	Distance from Madison.		Least depth.		Length.		Fall.		Maximum slope observed.		Total fall.		Remarks.
	Miles.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
Madison Bridge.....													Open truss, wood, 200 feet long, 3 spans, 14 feet wide, 28.2 feet above low water.
Gravel Shoal.....	0.57	1.8	1.8	0.38	750	0.38	1.30	2.07	.....	.....	.....	.....	Gravel bottom.
Roberson Fish-Trap Shoal.....	1.2	2.2	2.2	0.30	580	0.30	2.07	3.59	.....	.....	.....	.....	Sluice 10 feet wide.
Cross-Rock Rapid.....	1.5	2.5	2.5	0.69	150	0.69	6.34	6.34	.....	.....	.....	.....	Rock three-fourths width of river; wing-dam; sluice 20 feet. Rock bottom; sluices 8 to 20 feet; sufficient depth most of distance. Recent formation; will probably wash away.
Slink Shoal.....	1.8	2.3	2.3	2.58	1,074	2.58	8.30	8.30	.....	.....	.....	.....	Ledge at upper end; sand-bar at foot; general depth sufficient. High points of rock for 150 feet; sluice 9 feet wide.
Sand Bar.....	2.0	2.3	2.3	0.04	100	0.04	8.30	8.30	.....	.....	.....	.....	Sluice 10 feet wide.
Ledge.....	2.814	2.5	2.5	1.93	1,480	1.93	9.35	9.35	.....	.....	.....	.....	Two old dams; plenty of stone; sluice 20 feet wide.
Gravel Bar.....	3.585	3.0	3.0	1.62	1,883	1.62	11.28	11.28	.....	.....	.....	.....	Formed below the dams.
Head Long Island.....	3.86	2.5	2.5	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Right channel narrow; left channel narrow at one point.
Long Island Shoal and Rapid.....	4.36	3.0	3.0	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Sluice 9 feet wide.
"Three Islands".....	4.505	2.2	2.2	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Covered, wood, 304 feet long, 16 feet wide, 30.58 feet above low water.
Dam.....	4.889	2.3	2.3	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Sluice 12 feet wide.
Old Fish-Dams.....	5.064	2.3	2.3	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Sluice 12 feet wide.
Sand Bar.....	7.0	2.8	2.8	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Rock nearly across the river; channel on left lock 75 feet wide at mill.
Mulberry Island.....	8.172	1.7	1.7	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Rock bottom.
Dam.....	9.000	2.8	2.8	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Two dams; sluices 8 and 9 feet wide; high points; rock bottom; abundance of stone at hand.
Settle's Bridge.....	9.111	2.8	2.8	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Ledge at head of island shoal for 100 feet.
Wing-Dam.....	9.197	2.1	2.1	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Two dams; sluices 12 feet wide, 2.2 and 2.5 feet deep; short gravel bar; depth, 1.7 feet.
Wing-Dam.....	10.722	2.5	2.5	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Gravel; shoal channel on right.
Eagle Falls.....	11.78	2.3	2.3	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....	Wooden lattice, covered, 273 feet long, 2 spans, 13 feet wide, 29.9 feet above low water; channel under south span; sluice 10 feet; sand-bar below dam.
Ledge.....	12.080	2.1	2.1	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Reese's Rock Shoal.....	14.564	2.5	2.5	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Galloway's Island.....	16.257	2.2	2.2	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Galloway's Fish-Trap Shoal.....	16.627	1.7	1.7	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Hamblin's Island Shoal.....	16.776	2.0	2.0	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Buffalo Creek.....	17.716	2.9	2.9	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Matrimony Creek.....	18.777	2.2	2.2	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Leaksville Bridge.....	19.221	2.2	2.2	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Leaksville Bridge.....	19.221	2.2	2.2	1.38	1,250	1.38	15.14	15.14	.....	.....	.....	.....
Dam and Bar.....													

Wing-dams and shoal water.....	19.547	1.9	1.9	5.85	8,619	5.85	48.34	48.34	.....	.....	.....	.....	Two wing-dams; sluices 10 feet wide; shoal 300 feet; rock bottom. River at foot of Blue Ridge; fine water-power.
Smith's River.....	19.67	2.0	2.0	5.85	8,619	5.85	56.39	56.39	.....	.....	.....	.....	Four wing-dams; sluices 9, 10, 10, and 60 feet; rock bottom; high points.
Double Shoal.....	22.265	1.4	1.4	0.71	901	0.71	57.36	57.36	.....	.....	.....	.....	Channel on right; dam sluice 9 feet wide; gravel shoal.
Sauratown Ford Shoal.....	23.154	3.5	3.5	0.64	890	0.64	58.95	58.95	.....	.....	.....	.....	Drift water-wall 300 feet long; wing at foot; sluice 20 feet; rock bottom.
Indian Shoal.....	24.664	3.0	3.0	2.17	31.35	2.17	61.67	61.67	.....	.....	.....	.....	Dam at head and foot; sluices 10 feet; depth on shoal 3 to 10 feet; rock bottom.
Dam.....	26.751	2.3	2.3	0.37	658	0.37	64.40	64.40	.....	.....	.....	.....	Rises in Pittsylvania County, Virginia; good water-power.
Wide-Month Shoal.....	28.095	3.4	3.4	5.28	4,399	5.28	65.63	65.63	.....	.....	.....	.....	Channel on left 50 to 60 feet wide.
Cascade Creek.....	28.503	1.4	1.4	0.37	658	0.37	66.43	66.43	.....	.....	.....	.....	Narrow sluice on rocks; crooked channel; 3 wing-dams; sluices 10 feet wide; rock bottom.
Devil's Jump Shoal.....	29.648	3.4	3.4	0.60	595	0.60	72.06	72.06	.....	.....	.....	.....	Channel on left, sufficiently wide and deep.
Tan-yard Shoal.....	30.209	3.0	3.0	0.42	559	0.42	73.38	73.38	.....	.....	.....	.....	Sluice 12 feet wide.
Beasley's Gallows Shoals.....	30.413	3.4	3.4	0.42	559	0.42	75.04	75.04	.....	.....	.....	.....	Dam form down.
Dam.....	31.006	1.8	1.8	0.23	689	0.23	75.95	75.95	.....	.....	.....	.....	Pole ferry.
Hairston's Fish-Trap Shoal.....	31.917	2.7	2.7	0.35	631	0.35	77.73	77.73	.....	.....	.....	.....	Gravel and bowlders; channel 13 feet wide.
Daniel's Ferry.....	33.706	2.4	2.4	0.37	631	0.37	78.74	78.74	.....	.....	.....	.....	Boydler's dam and gravel; channel 30 feet wide.
Cow Ford Shoal.....	34.332	2.4	2.4	0.37	631	0.37	79.23	79.23	.....	.....	.....	.....	Rock bottom; dam at foot; sluice 10 feet.
Pruitt's Upper Shoal.....	34.488	1.9	1.9	4.35	3,794	4.35	79.23	79.23	.....	.....	.....	.....	Two wing-dams; sluices 10 and 16 feet wide; two wings and parallel wall; sluice 8 feet wide; bottom is rock, gravel, and bowlders.
Pruitt's Lower Shoal.....	35.632	3.5	3.5	0.50	619	0.50	84.22	84.22	.....	.....	.....	.....	Five dams; sluices 10 feet wide; general depth sufficient; rock and gravel bottom.
Ware's Shoal.....	36.837	3.6	3.6	0.81	532	0.81	85.93	85.93	.....	.....	.....	.....	Pole ferry.
Little Island Ledge Rapid.....	37.043	1.7	1.7	4.38	4,144	4.38	87.06	87.06	.....	.....	.....	.....	Boydler's on right; fish-dams on both sides; channel through dam with sluice 10 feet wide; rock bottom.
Adams' Fish-Trap Shoal.....	38.114	2.4	2.4	2.76	3,508	2.76	91.04	91.04	.....	.....	.....	.....	Three dams; sluices 10 feet wide; rock and gravel bottom.
Adams' Island Shoal.....	39.494	2.0	2.0	2.78	2,420	2.78	93.44	93.44	.....	.....	.....	.....	Dam, with sluice 8 feet wide; snags, rock, and gravel bottom.
Wolf Island Shoal.....	40.801	2.0	2.0	5.68	6,228	5.68	99.84	99.84	.....	.....	.....	.....	Wing-dam at right bank; sluice 10 feet wide; rock and gravel bottom.
Butler Spring Shoal.....	42.311	1.4	1.4	1.53	8,527	1.53	105.87	105.87	.....	.....	.....	.....	Five dams; sluices 10 feet wide; general depth sufficient; rock and gravel bottom.
Glass' Shoal.....	43.000	1.4	1.4	1.53	8,527	1.53	106.80	106.80	.....	.....	.....	.....	Pole ferry.
Wilson's Upper Ferry.....	43.902	2.3	2.3	18.73	5,631	18.73	107.82	107.82	.....	.....	.....	.....	Rock bottom; sluices 8 to 12 feet wide.
Head of Long Shoal.....	45.517	2.3	2.3	2.53	2,531	2.53	126.25	126.25	.....	.....	.....	.....	Rock bottom.
Long Shoal.....	46.868	2.0	2.0	1.53	2,420	1.53	132.87	132.87	.....	.....	.....	.....	Pole ferry.
Lynch's Shoal.....	48.191	1.5	1.5	1.53	3,600	1.53	136.37	136.37	.....	.....	.....	.....	Constructed of logs and plank resting on the rock, and extending two-thirds width of the river.
Wilson's Lower Ferry.....	49.13	1.5	1.5	1.53	3,600	1.53	139.40	139.40	.....	.....	.....	.....	Guard-lock at head, 15 feet wide; width of canal ranges from 20 to 30 feet; depth, 1.5 to 6 feet.
Head of canal.....	49.13	1.5	1.5	1.53	3,600	1.53	140.93	140.93	.....	.....	.....	.....
Dam at Danville Canal.....	49.81	1.5	1.5	1.53	3,600	1.53	156.96	156.96	.....	.....	.....	.....
Canal at Danville.....	50.1	1.5	1.5	1.53	3,600	1.53	156.96	156.96	.....	.....	.....	.....
Richmond and Danville Railroad Bridge.....	50.1	1.5	1.5	1.53	3,600	1.53	156.96	156.96	.....	.....	.....	.....

SECTION I.—Summary of estimate for improvement of bateaux navigation, Dan River, Hairston's Ford to Madison.

Locality.	Dredging.	Rock excavation.	Wing-dams.	Amounts.	Total
	<i>Cub. yds.</i>	<i>Cub. yds.</i>			
Below Hairston's Ford, Sta. 715 to 722.	118.5				\$237 00
Sta. 732	35.5				71 00
Clay's Island, Sta. 749	130				260 00
Sta. 754	40				80 00
Sta. 761	49				98 00
Sta. 770	76				152 00
Sta. 783		7			24 50
Sta. 798	21				42 00
Sta. 799		22			77 00
Sta. 812	71				142 00
Sta. 815	41				82 00
Sta. 819		50			175 00
Sta. 820			1 wing-dam, 142.43 cub. yds.		498 50
Sta. 826		16			56 00
Sta. 839	44				88 00
Sta. 842		83			290 50
Sta. 847 to 850		107		\$374 50	
			1 wing-dam, 71 cub. yds.	248 50	
					623 00
Sta. 853 to 855		44		504 00	154 00
Shoe-buckle Island, Sta. 880		144		196 00	
			1 dam at head of island, 56 cubic yards.		
			1 wing-dam, 113 cub. yds.	395 50	
					1,095 50
Granny Angel's Shoal and Island, Sta. 897.		243			850 50
Dalton's Fish-Trap Shoal, Sta. 930.		200		700 00	
			2 wing-dams, 141 cub. yds.	493 50	
					1,193 50
Ladd's Shoal, Sta. 995	96			192 00	
			1 wing-dam, 189 cub. yds.	661 50	
					853 50
Sta. 1012		9		31 50	
Sta. 1026	22			44 00	
Buzzard Island Shoal, Sta. 1058	92			184 00	
Rutley's Shoal, Sta. 1096		209		731 50	
	59			118 00	
					849 50
Carter's Shoal, Sta. 1127 to 1155.		479			1,676 50
Sandy Island Shoal, Sta. 1206		116		406 00	
			1 wing-dam, 167 cub. yds.	584 50	
					990 50
Sta. 1272	39			78 00	
		109		381 50	
					459 50
Cross Rock Shoal, Sta. 1300		130		455 00	
			2 wing-dams, 333 cub. yds.	1,165 50	
					1,620 50
Wolf Shoal, Sta. 1366	34			68 00	
		104		364 00	
					432 00
Beaver Island Shoal, Sta. 1403 to 1425.	219			438 00	
		461		1,613 50	
			3 wing-dams, 685 cub. yds.	2,397 50	
					4,449 00
Sta. 1497				84 00	
Removing overhanging trees	24			300 00	
					18,264 50
Contingencies and superintendence, 20 per cent					3,652 90
Total					21,917 40

SECTION II.—Estimate for improving Dan River, Virginia, from Madison, North Carolina, to Danville, Virginia, for bateaux navigation.

Locality.	Dredging gravel and bowlders.	Rock excavation.	Dams.	Amounts.	Total for each mile.
	<i>Cubic yds.</i>	<i>Cub. yds.</i>			
2d mile, Slink Shoal, Station 89 + 30		48		\$168 00	
Station 102 + 18	3			6 00	\$174 00
10th mile, below Settle's Bridge, Station 481 + 80.		21			73 50
11th mile, Eagle Falls		570		1,995 00	
Station 561 + 77		*103		360 50	
			Repairing old mill-dam, movable dam.	2,200 00	
					4,555 50
14th mile, Galloway's Island.	26			52 00	
Station 701 + 21			Deflecting dam 189 cubic yards.	661 50	
					713 50
16th mile, Galloway's Fish-Trap Shoal, Station 801 + 48.		39			136 50
20th mile, below Leaksville Bridge, Station 1033 + 2.		13			45 50
23d mile, Sauratown Ford Shoal, Station 1180 + 90		70			245 00
27th mile, Wide-Mouth Creek, Station 1399 + 72.			Deflecting dam 189 cubic yards.		661 50
29th mile, Tan-Yard Shoal, Station 1529 + 33		19			66 50
30th mile, Tan-Yard Shoal, Station 1563 + 79		52			182 00
34th mile, Cow Ford Shoal, Station 1777 + 78	33				66 00
36th mile, Ware's Shoal			2 snags	10 00	
Station 1870 + 70		43		150 00	
					160 50
38th mile, Adams' Island Shoal, 700 feet above Station		10		20 00	
2002 + 43 to Station 2004 + 43		17		59 50	
					79 50
39th mile, 550 feet below Station 2004 + 43					59 50
43d mile, Glass' Shoal, Station 2221 + 3		16			56 00
44th mile, Long Shoal, Station 2223 + 3		21			73 50
45th mile, Station 2326 + 81.	34			119 00	
Station 2337 + 65	19			66 50	
					185 50
46th mile, Station 2381 + 35		11		38 50	
1,250 feet above Station 2403 + 50		8		28 00	
550 feet above Station 2403 + 50		10		35 00	
					101 50
49th mile, above the dam at Danville.		10		35 00	
50th mile			Extending dam at Danville 100 feet.		350 00
					980 00
Removing overhanging trees for 49 miles, at \$20 per mile.					1,800 10
Add for contingencies and superintendence, 20 per cent.					
Total					10,800 60

* Removing wall of mill-race.

SECTION 1.—Summary of estimate for improvement of Dan River for steam navigation, Danbury to Madison.

Locality.	Dredg- ing.	Rock ex- cavation.	Locks and dams.		
	<i>Cub. yds.</i>	<i>Cub. yds.</i>			
Above Danbury Ford, Sta. 5		80			\$240 00
Sta. 18			Lock 5 feet lift.....	\$11,000 00	
			Dam 8.8 feet high, 573.6 cubic yards.	4,588 80	
					15,588 80
Sta. 49			Lock 3 feet lift.....	7,000 00	
			Dam 6.6 feet high, 274.3 cubic yards.	2,194 40	
					9,194 40
Sta. 98+60			Lock 7 feet lift.....	15,000 00	
			Dam 10 feet high, 629.6 cubic yards.	5,036 80	
					20,036 80
Sta. 105		13.3			39 00
Sta. 163			Lock 7 feet lift.....	15,000 00	
			Dam 11 feet high, 1,120.4 cubic yards.	8,963 20	
					23,963 20
Sta. 174		33.3			99 00
Sta. 187			Lock 4.5 feet lift.....	10,000 00	
			Dam 8.5 feet high, 535.2 cubic yards.	4,281 60	
					14,281 60
Sta. 257			Lock 5.5 feet lift.....	12,000 00	
			Dam 9.5 feet high, 608.5 cubic yards.	5,348 00	
					17,348 00
Sta. 266		89			267 00
Sta. 280			Lock 4 feet lift.....	9,000 00	
			Dam 8 feet high, 474.1 cubic yards.	3,792 80	
					12,792 80
Sta. 329			Lock 8 feet lift.....	17,000 00	
			Dam 11.8 feet high, 1,031.4 cubic yards.	8,251 20	
					25,251 20
Sta. 387			Lock 8 feet lift.....	17,000 00	
			Dam 12 feet high, 853.3 cubic yards.	6,826 40	
					23,826 40
Sta. 433+50			Lock 4 feet lift.....	9,000 00	
			Dam 8 feet high, 426.6 cubic yards.	3,412 80	
					12,412 80
Sta. 470			Lock 6.8 feet lift.....	14,800 00	
			Dam 10 feet high, 703.7 cubic yards.	5,629 60	
					20,429 60
Sta. 471 and 487 inclusive		3.34			1,002 00
Sta. 542		215.3		645 90	
			Lock 7 feet lift.....	15,000 00	
			Dam 11 feet high, 896.3 cubic yards.	7,170 40	
					22,816 30
Sta. 572		116		348 00	
			Lock 5.7 feet lift.....	12,400 00	
			Dam 8.5 feet high, 535.2 cubic yards.	4,281 60	
					17,029 60
Head of Hairston's Falls, Sta. 588		409			1,227 00
Sta. 596			Lock 5 feet lift.....	11,000 00	
			Dam 9 feet high, 900 cubic yards.	7,200 00	
					18,200 00
Sta. 607+70		133.3		399 90	
			Lock 7 feet lift.....	15,000 00	
			Dam 10 feet high, 740.7 cubic yards.	5,925 60	
					21,325 50
Sta. 674			Lock 8 feet lift.....	17,000 00	
			Dam 11 feet high, 851.5 cubic yards.	6,812 00	
					23,812 00
Sta. 795			Lock 8 feet lift.....	17,000 00	
			Dam 12 feet high, 800 cubic yards.	6,400 00	
					23,400 00

SECTION 1.—Summary of estimate for improvement of Dan River, &c.—Continued.

Locality.	Dredg- ing.	Rock ex- cavation.	Locks and dams.		
	<i>Cub. yds.</i>	<i>Cub. yds.</i>			
Sta. 798		200			\$600 00
Sta. 887			Lock 8 feet lift.....	\$17,000 00	
			Dam 12.5 feet high, 983.8 cubic yards.	7,870 40	
					24,870 40
Sta. 897 Granny Angel's Shoal and Island.		122			366 00
Sta. 1000			Lock 8 feet lift.....	17,000 00	
			Dam 12 feet high, 1,013.3 cubic yards.	8,106 40	
					25,106 40
Sta. 1012		53.3			159 90
Sta. 1017		196			196 00
Sta. 1026		271			271 00
Sta. 1030		44			132 00
Sta. 1038		53			159 00
Sta. 1058, Buzzard Island		326			326 00
Rutly's Shoal, Sta. 1096		27			81 00
Sta. 1178+20			Lock 8 feet lift.....	17,000 00	
			Dam 11.2 feet high, 882.7 cubic yards.	7,061 60	
					24,061 60
Sta. 1179		44.4			133 20
Sta. 1192		8.9			26 70
Sta. 1201		31.1			93 30
Sta. 1308+60			Lock 8.4 feet lift.....	17,500 00	
			Dam 11.5 feet high, 979.6 cubic yards.	7,836 80	
					25,336 80
Sta. 1317		35.5			106 50
Sta. 1327		40			40 00
Sta. 1346		31			31 00
Sta. 1352		78			78 00
Sta. 1357 to Sta. 1369		211		211 00	
				1,599 00	
					1,810 00
Sta. 1394		67			67 00
Beaver Island Shoal, Sta. 1403		382.2		382 20	
				1,968 90	
			8 wing dams, 1,420.8 cubic yards.	4,262 40	
					6,613 50
Sta. 1487 to Sta. 1498+86		240		240 00	
				399 90	
					639 90
					435,890 00
Contingencies and superintendence, 20 per cent.					87,178 00
					523,068 00

SECTION II.—Summary of estimate for improvement of Dan River for steam navigation, Madison, N. C., to Danville, Va.

Locality.	Dredg- ing.	Rock ex- cavation.	Erecting dams.	Amounts.	Totals for each mile.
	<i>Cub. yds.</i>	<i>Cub. yds.</i>			
1st mile:					
Below Madison Bridge, Sta. 4 to 8..	592			\$592 00	
Sta. 2256	592			592 00	\$1,184 00
2d mile:					
Roberson's Fish-Trap Shoal, Sta. 5720	111			111 00	
Cross Rock Rapid, Sta. 77+56	20	20		80 00	
Below Cross Rock Rapid, Sta. 83+63	20	20		80 00	
Slink Falls, Sta. 89+30	20	30	1,070 cubic yards	3,320 00	
Sta. 102+18	97			97 00	
					3,688 00
3d mile: Sta. 148+56	28				28 00
4th mile:					
Sta. 163+56	83			83 00	
Lone Island, Sta. 187+79	20	30	133 cubic yards	509 00	
					592 00

SECTION II.—Summary of estimate for improvement of Dan River, &c.—Continued.

Locality.	Dredg- ing.	Rock ex- cavation.	Erecting dams.	Amounts.	Totals for each mile.
5th mile:	<i>Cu. yds.</i>	<i>Cu. yds.</i>			
Three Islands, Sta. 221 + 17.....	10	100	133 cubic yards	\$709 00	
Sta. 237 + 85	20	30	133 cubic yards	509 00	
Below Danbury Bridge, Sta. 258 + 12	30	10	50 cubic yards	210 00	\$1,428 00
7th mile: Mulberry Island, Sta. 359 + 98	30				30 00
8th mile: Sta. 378 + 7	30	10	133 cubic yards		459 00
10th mile:					
Below Settle's Bridge, Sta. 481 + 80. Sta. 485 + 58	50	20	266 cubic yards		1,018 00
	50	20		2,004 00	
		668	3 wing-dams	6,200 00	
			1 movable dam	3,000 00	
11th mile: Eagle Falls, Sta. 561 + 77 ..					11,204 00
13th mile: Reese's Rock Shoal, Sta. 643 + 55		*30			402 00
		74			
		*30			
14th mile: Galloway's Island, Sta. 701 + 21			133		399 00
15th and 16th miles: Galloway's Fish- Trap Shoal	69	*4	208 cubic yards		1,674 00
		*4	208 cubic yards		
20th mile:					
Leaksville Bridge, Sta. 1014 + 87 ..		*9	208 cubic yards	1,275 00	
1,500 feet below Leaksville Bridge, Sta. 1030 + 30		*11	208 cubic yards	1,092 00	
		145			2,367 00
21st mile: Double Shoal, Sta. 1093 + 79		*9	208 cubic yards		651 00
22d mile: Sta. 1120 + 81		*5.5			184 50
		5.6			
23d mile:					
Sta. 1173 + 98		*7		222 00	
Sauratown Shoal, Sta. 1189 + 91	336	*8.5	208 cubic yards	1,205 50	1,427 50
24th mile: Indian Shoal, Sta. 1218 + 13		*6	3 dams, 624 cub. yds.		1,890 00
25th mile: Sta. 1303		*7			21 00
27th mile: Wide Mouth Shoal, Sta. 1381 + 13		*84			288 00
		*12			
29th and 30th miles: Tan-Yard Shoal, Sta. 1521 + 44 to Sta. 1565 + 43		*12	722 cubic yards		6,603 00
		537	722 cubic yards		
			208 cubic yards		
31st mile: Beasley's Gallows Shoal, Sta. 1589 + 6		*6	208 cubic yards		684 00
34th mile: Cow Ford Shoal, Sta. 1772 + 89	295				295 00
35th mile:					
Pruitt's Upper Shoal, 300 feet be- low Sta. 1806 + 20	14			14 00	
Sta. 1821 + 4	125	*6		143 00	157 00
36th mile:					
Ware's Shoal, Sta. 1851 + 7	(f)	*12	208 cubic yards	1,995 00	
	360	47	208 cubic yards		
Sta. 1872 + 70	100	*13	208 cubic yards	3,097 00	5,092 00
			778 cubic yards		
37th mile:					
Adams' Fish-Trap Shoal		*6		18 00	
Sta. 1952 + 60		46		138 00	156 00
38th mile:					
Adams' Island, Sta. 1974 + 11		*15	389 cubic yards		
		100	389 cubic yards		
Sta. 1995 + 87	51				6,305 00
Sta. 2004 + 43	116	116	518.5 cubic yards		
			518.5 cubic yards		
39th mile:					
Wolf Island	Snags			10 00	
Shoal Sta. 2050 + 22		120		360 00	
Sta. 2077 + 10		*15	208 cubic yards	669 00	1,039 00
41st mile: Butter Spring Shoal, Sta. 2142 + 6		167	208 cubic yards		1,143 00
		*6			

* Removing old dams.

† 2 snags, \$10.

SECTION II.—Summary of estimate for improvement of Dan River, &c.—Continued.

Locality.	Dredg- ing.	Rock ex- cavation.	Erecting dams.	Amounts.	Totals for each mile.
42d mile:	<i>Cu. yds.</i>	<i>Cu. yds.</i>			
Glasse's Shoal, Sta. 2173 + 76		107	3 dams, 624 cub. yds.		\$2,973 00
Sta. 2196 + 43		*4	1 dam, 208 cub. yds.		
		48			
		*7	1 dam, 208 cub. yds.		1,154 00
43d mile: Sta. 2221 + 3	509				
45th mile:					
Long Shoal Head to Sta. 2337 + 25		942		\$2,826 00	
200 feet above Sta. 2348 + 49			1 dam: Height, 6.1 ft. } Lift of lock, 2.7 ft. }	12,980 00	
200 feet below Sta. 2348 + 49			1 dam, 333 cub. yds.	999 00	
Above Sta. 2359 + 58		34		102 00	
Above Sta. 2367 + 35		404		1,212 00	
510 feet below Sta. 2367 + 35			1 dam: Height, 4.8 ft. } Lift of lock, 1.5 ft. }	11,110 00	29,229 00
46th mile:					
1,230 feet above Sta. 2403 + 50			1 dam: Height, 8.7 ft. } Lift of lock, 6 ft. }	21,500 00	
1,000 feet above Sta. 2403 + 50		19		57 00	
Sta. 2409 + 50		26		78 00	
Sta. 2422 + 27		47		141 00	
Sta. 2426 + 87		*5	1 dam, 389 cub. yds.	1,182 00	22,958 00
47th mile:					
Above Sta. 2441 + 6		19		57 00	
Lynche's Shoal, Sta. 2458 + 35 to 2564 + 90		231	2 dams, 756 cub. yds.	2,961 00	
Sta. 2474 + 63		81		243 00	3,261 00
48th mile:					
900 feet above Sta. 2500 + 94		74		222 00	
1,500 feet above Wilson's lower ferry		53		159 00	381 00
49th mile:					
Sta. 2544 + 51		60		180 00	
Wilson's lower ferry		*6		18 00	
950 feet below Wilson's lower ferry, Sta. 2534 + 3		9		27 00	
Between dam at Danville and point 1,250 feet above the same		237		711 00	936 00
50th mile:					
Raising dam at Danville, 850 linear feet, at \$1.50 per foot				1,275 00	
Extending dam, 100 feet, at \$3.50 ..				350 00	1,625 00
Contingencies and superintendence, 20 per cent					112,926 00
Total					22,585 20
					135,511 20

* Removing old dams.

SUMMARY OF ESTIMATES.

Improvement for *bateau navigation* to be made by means of wing-dams, one movable dam and grading. Hairston's Falls in the upper part of Section I, are impassable except by locks, and no estimate for *bateau navigation* in this part of the river is submitted.

For the lower part of—

Section I, Hairston's Ford to Madison, 14.94 miles	\$21,917 40
Section II, Madison to Danville, 49.13 miles	10,800 60
Total	32,718 00

Improvement for *steam navigation* to be made by means of locks and dams, wing-dams and grading.

Section I, Danbury to Madison, 28.39 miles	\$523,068 00
Section II, Madison to Danville, 49.13 miles	135,511 20
Total	658,579 20

GENERAL CONCLUSIONS.

Whether the Dan River should be improved above Danville, so as to afford steam navigation as far as Danbury, or whether the operations should be limited to improving the facilities for bateau navigation is a question for Congress to decide. The distance is $77\frac{29}{100}$ miles and the cost of the improvement for steam navigation will be \$658,579.20.

If this work is carried for a distance of 30 miles above Danville, or as far as the Leaksville Landing, the cost will then be \$110,500.00.

The agricultural products of the lands bordering the river have been given in another part of this report. The valuable deposits of coal and iron have been described. The fine water-power which drives the flour and cotton mills has been mentioned. Special mention has been made of the Leaksville cotton-mill, with its 80 looms, which can turn out 4,000 yards of sheeting daily. The foundry, tobacco factories, and distilleries deserve notice. I have endeavored to state all the resources likely to be benefited by the introduction of steam navigation. But the first cost of a lock and dam improvement is but a part of the ultimate cost which will result from the necessity for an annual appropriation for maintenance and superintendence, and for this reason Congress has never authorized this method of improvement, except in cases of national importance.

It must be admitted, however, that this method of improvement will alone afford a sufficient highway for the present and prospective trade of the river. But for the reasons above stated I have thought proper to submit another estimate for improving the present bateau navigation as far as Hairston's Ford, a distance of about 63 or 64 miles above Danville. The bateaux now employed carry from 12,000 to 13,000 pounds, but cannot make the trip at extreme low-water, and in ordinary stages the boats hang sometimes on the rocks.

The cost of this method of improvement for the distance just mentioned will be \$32,718. Should Congress make an appropriation for this river I should commence the improvement upon the last-mentioned method unless otherwise instructed.

The survey of the river between Danville and Clarkville was not made on account of the want of funds. An appropriation was made by the last Congress for this object, and a survey will be made as soon as authority therefor is granted.

The following maps accompany this report:

General map of Dan River; scale 4,000 feet to an inch.
Section I. From Danbury, N. C., to Madison, N. C.
Section II. From Madison, N. C., to Danville, Va.
Profile of Dan River; section I.
Profile of Dan River; section II.

Detailed maps of the entire river have been made in the office for use in the preparation of estimates and plans of improvement.

Very respectfully, your obedient servant,

S. T. ABERT,

United States Civil Engineer.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

APPENDIX H.

ANNUAL REPORT OF CAPTAIN CHARLES B. PHILLIPS,
CORPS OF ENGINEERS, FOR THE FISCAL YEAR ENDING
JUNE 30, 1879.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., July 16, 1879.

GENERAL: I have the honor to transmit herewith annual reports for the fiscal year ending June 30, 1879, for works of improvement of rivers and harbors which have been in my charge during that period.

I am, general, very respectfully, your obedient servant,

CHAS. B. PHILLIPS,
Captain of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

H I.

IMPROVEMENT OF NORFOLK HARBOR, VIRGINIA, AND ITS APPROACHES.

The object of this important improvement has been fully set forth in previous annual reports. Briefly, it consists in securing, by dredging, a channel 500 feet in width and 25 feet in depth at ordinary low-water from the deep water of Hampton Roads to Norfolk Harbor, so as to afford access to the largest class of merchantmen, as well as to men-of-war on their way to and from the Gosport navy-yard; and to improve the inner harbor by dredging through the bar at the eastern branch of the Elizabeth River; by deepening and widening the channel at the mouth of the southern branch (the latter work particularly for the benefit of the navy-yard above), and by dredging off the fore slopes of the Berkely and the Portsmouth Flats to afford more room for anchorage, and to restore in a measure the cross-sectional area which has been lost between these flats during the last twenty years.

As stated in the last annual report, the appropriation (\$35,000) of August 14, 1876, was entirely devoted to dredging at the mouth of the Eastern Branch. This proved of great advantage to the valuable portion of the harbor situated upon this branch.

The act of June 18, 1878, appropriated \$50,000 for continuing this improvement. A project for the expenditure of this amount was submitted to the Chief of Engineers on the 18th of July, 1878.

The project contemplated some further dredging at the Eastern Branch to secure a greater width of channel, by removing about 45,000 cubic yards of material; to dredge about 130,000 cubic yards at the mouth of the Southern Branch to improve the channel leading to the Gosport navy-yard, and to devote the balance of the appropriation to dredging