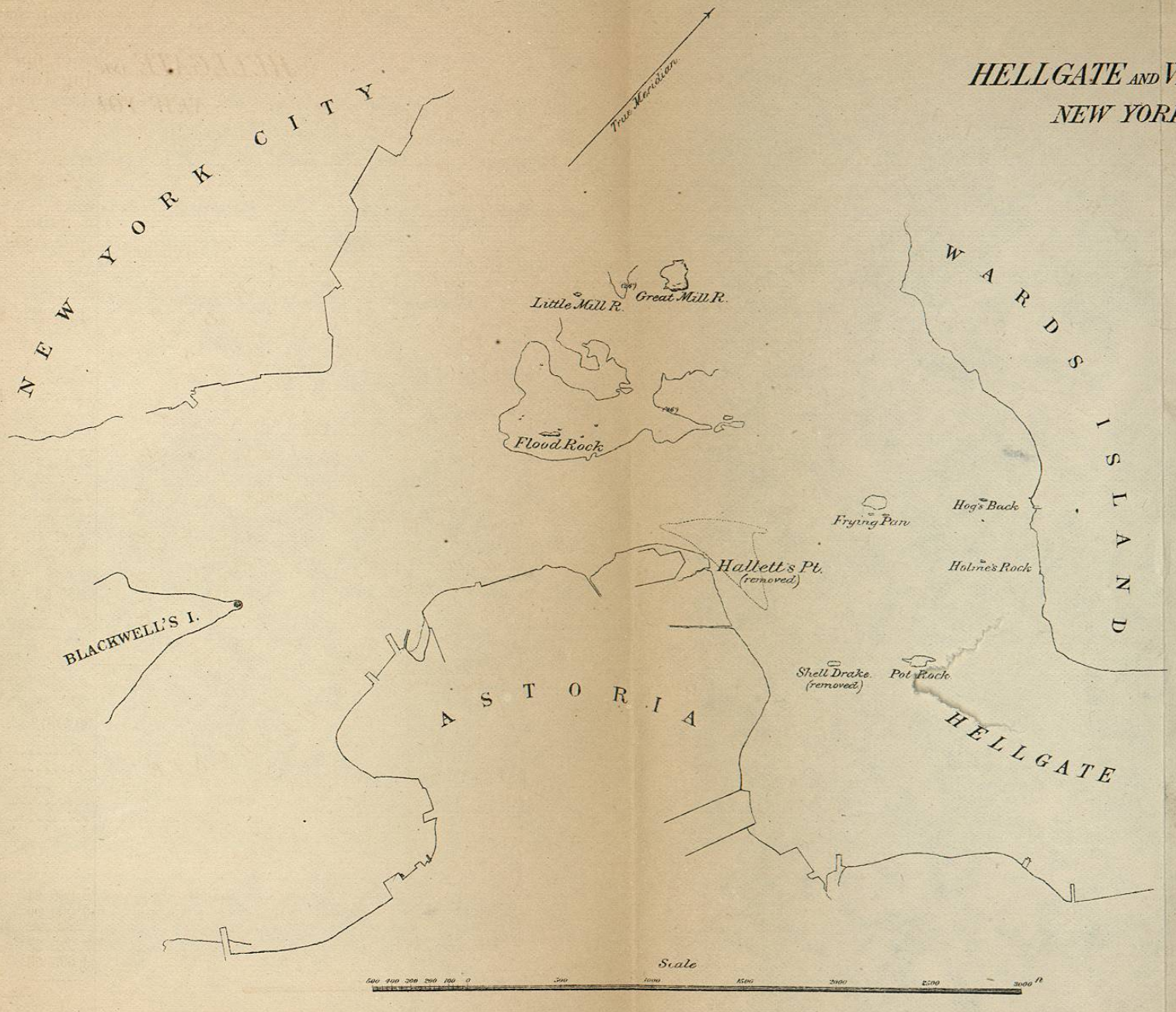
HELLGATE AND VICINITY.
NEW YORK.



Abstract of bids for removing broken rock from Hallet's Point Reef, Astoria, New York opened May 29, 1879.

Bidder.	Price per ton.
Atlantic Dredging Company	$3 39

Abstract of contract for removing broken rock from Hallet's Point Reef, Astoria, New York.

Contractor.	Residence.	Date of contract.	Subject of contract.	Remarks.
Atlantic Dredging Company.	Brooklyn, N. Y.	June 9, 1879	Removing broken rock from Hallet's Point Reef, Astoria, N. Y.	To be completed by June 30, 1880.

REPORTS OF CAPT. JAMES MERCUR, CORPS OF ENGINEERS.

1. HALLET'S POINT.

UNITED STATES ENGINEER OFFICE,
FLOOD ROCK, HELL GATE IMPROVEMENT,
Astoria, N. Y., July 1, 1879.

SIR: I have the honor to submit the following report of operations at Hallet's Point, N. Y., for the fiscal year ending June 30, 1879, viz:

Under contract with the Atlantic Dredging Company, extended to June 30, 1879, there has been removed 19,706.10 gross tons of broken rock, at $2.29 per ton.

The total amount removed by the company under their contract, as extended, is 26,389.25 tons. The amount of their contract (25,000 tons more or less) having been taken out by May 31, they ceased work on that date. Advantage has been taken of the absence of their machines to make an examination of the reef by means of the sweep. The shoalest point found is 14.7 feet below mean low-water, while over that part of the reef to which the dredging has been principally confined the depths vary from about 21 to 28 feet, the required depth of 26 feet having been obtained over a large part of the reef.

The total amount of rock removed since the final blast is 57,020.29 gross tons, leaving about 20,000 tons to be removed. Under previous contracts the United States was bound to break all stones weighing more than ten tons. For this purpose 27 surface-blasts have been made during the year, using 1,591½ pounds of dynamite.

The probability of a disagreement arising as to the size of submerged stones has caused this clause to be omitted from the contract just closed for finishing the dredging with the Atlantic Dredging Company, they being left at liberty to make such blasts as they consider necessary either for breaking large stones or loosening up the small ones to facilitate dredging. So far as the dredging has been carried there is every indication that every cartridge used in the final blast exploded, no evidence of a single failure having been discovered.

Amount paid on contract	$45,126 96
Amount paid on pay-roll	2,218 64
Amount paid for materials	450 00
Total	47,795 60

The value of the machinery, &c., transferred after the final blast from Hallet's Point to Flood Rock, which has never been credited to Hallet's Point, is $6,433.83. This amount should be deducted from the charge against Hallet's Point and added to those against Flood Rock. Their accounts can be kept entirely separate hereafter.

Respectfully submitted.

JAMES MERCUR,
Captain of Engineers.

Col. JOHN NEWTON,
Corps of Engineers, U. S. A.

2. FLOOD ROCK.

At the beginning of the year the mine was full of water, having been so from the stoppage of work on December 31, 1876. The pumps, having been put in place, were started July 8, and by July 14 had removed the water from the mine. It was then found that, while the mine had been full of water (18 months), numerous seams had opened in the roof and side walls, which required timbering to prevent the piers and roof-rock from falling.

No work except timbering was undertaken until July 31, at which date a drill was started, and on August 1 two more. These were kept at work until September 17, at which date a fall of rock occurred, seriously injuring two men and rendering the gangways so unsafe as to prevent any further work, except securing the walls by timbers, until September 30, at which date drilling, &c., recommenced, and was carried on until January 14, when the steam-boiler (brought here from Hallet's Point) with which the work had been carried on up to this date and which had previously shown signs of weakness, became so bad that it was unsafe to work it at a pressure high enough to carry on any work except pumping. The new boilers were, however, ready to use on February 18, at which time work was recommenced and carried forward until the close of the year, the number of drills at work being increased to four on June 26.

The broken rock which was taken out from the mine up to the 7th of January, 1879, was used for building an island large enough to give a place for machinery and boilers, &c., for carrying on the work, and so placed as to serve for a dike for deflecting the ebb-tide from the gridiron and middle reef until they are removed.

The total number of cubic yards put in this island is, approximately, 5,722, and its area above low-water is 2,600 square yards.

The rock removed since January 7 has been dumped in points selected by yourself as suitable; principally between the two "Mill Rocks." In addition to the work done in the mine, the permanent plant for carrying on the work has been selected, bought, and a large part of it put in position, the principal items being three large flue boilers, a pair of hoisting engines, with drum, one large mining pump, one circulating pump, one large surface condenser, a planer, and a number of drills. The old compressors, lathe, and drill press used at Hallet's Point have been thoroughly repaired, set up, and made ready for use.

A head frame and cages for hoisting are nearly completed. A boiler-house, coal-bin, and engine-house have been built, and the revetment of the sides of the island built of crib-work, so as to form good wharves, giving good facilities for unloading coal and other supplies.

There remains to be built a wharf on the east side of the island for stone scows to lie at while receiving their loads, the necessary chutes and pockets for passing the stone from the cars to the scows, and the completion of the self-dumping cages and necessary mine cars, together with the purchase of a powerful tug and two dumping scows for removing the broken rock. With these facilities it is proposed to increase the present rate of working about four times or more, if the amounts appropriated from year to year justify it. The value of the machinery, &c., transferred from Hallet's Point to Flood Rock, allowance being made for wear and deterioration and present low prices, is about $6,700, deducting $266.17 for 595½ pounds No. 2 extra powder furnished Hallet's Point from Flood Rock, $6,433.83. This should be charged to the permanent plant at Flood Rock and credited to Hallet's Point. A tabular statement of work done and material expended is appended. A synopsis of the principal items is as follows:

Length of galleries driven during the year	feet	1,306.78
Length of galleries driven previously	feet	558.00
Total length of galleries driven to date	feet	1,864.78
Total number of blasts made		13,389.00
Total number of drills sharpened		16,682.00
Loss of steel: abrasion and dressing	pounds	834.00
Cubic yards of rock removed		5,115.36
Average drilling per cubic yard	feet	10.86
Average pounds explosive per cubic yard		2.16
Cost of explosive per cubic yard		$1 09 .2
Expenditure for permanent plant, including sea-wall		$26,993 19
Total expenditure for year		$93,074 27

Respectfully submitted.

JAMES MERCUR,
Captain of Engineers.

Col. JOHN NEWTON,
Corps of Engineers, U. S. A.

Report of work at United States works, Flood Rock, New York, for fiscal year ending June 30, 1879.

	Shifts.	Feet drilled.	Average depth drilled per shift.	Cost drilling, per linear foot.	Cost explosives used, per cubic yard.	Average drilling, per cubic yard.	Cubic yards removed.	Number of drills sharpened.	Loss of steel: abrasion and dressing.	Material bought.
	1,907–87	55,591	*Feet.* 29.13	$0 30	$1 09.2	*Feet.* 10.86	5,115.36	16,682	*Pounds.* 834	$3,549 91
Machine work, drill repairs, air-pipe, fittings, &c										59 58
Explosives, laboratory repairs, fittings, &c										2,139 45
Getting rock to shaft, track laying, platforms, &c										829 12
Hoisting rock, engine repairs, derricks, &c										1,311 99
Dumping and track, towing, &c										3,573 91
Pumping, repairs, &c										1,554 18
Timbering in mine										404 81
Steam launch and "Star"										440 05
Compressors, setting up and repairs										59 48
Tubular boiler repairs										7,446 85
Flue boilers, setting, fitting, &c										3,066 51
Hoisting engines, 17 by 24, setting, fitting, &c										949 49
Building boiler and engine rooms, &c										860 76
Building crib										1,233 46
Building head-frame, &c										
Building sea-wall										1,862 30
Condenser, setting and fitting up										765 01
Repair shop										594 61
Water-boat, pontons, floats, &c										1,673 23
Superintendence, including water, rent, &c										

Report of work at United States works, Flood Rock, New York, for fiscal year ending June 30, 1879—Continued.

	Explosives bought.	Wages paid drillers and helpers.	Wages paid miners.	Wages paid blasters.	Wages paid engine-room service.	Wages paid smiths and helpers.	Wages paid steam engineer and machinists.	Wages paid engineer on hoisting-engine, &c.	Wages paid firemen and pumpman.	Wages paid steam launch and "Star."
Machine work, drill repairs, air-pipe, fittings, &c		$8,248 19	$2 50		$1,317 00	$1,080 02	$163 95	$3 75	$339 50	
Explosives, laboratory repairs, fittings, &c	$6,165 11	282 77	22 50	$726 87						
Getting rock to shaft, track laying, platforms, &c		289 68	517 99			60 53				
Hoisting rock, engine repairs, derricks, &c							4 12	687 66	40 25	
Dumping and track, towing, &c		57 24	159 24							
Pumping, repairs, &c		34 10	4 16			22 50	229 27	33 12	2,128 75	$27 19
Timbering in mine		1,161 37	1,336 40	25 00		38 83				
Steam launch and "Star"							62 90		5 75	2,450 45
Compressors, setting up and repairs						9 58	367 11		155 75	
Tubular boiler repairs			15 00			59 76	107 26	31 87	115 25	
Flue boilers, setting, fitting, &c		16 89	1 86			98 28	55 01	80 94	326 50	100 62
Hoisting-engines, 17 by 24, setting, fitting, &c						40 59	51 22		78 00	
Building boiler and engine rooms, &c						131 34				
Building crib						68 64			2 00	
Building head-frame, &c						89 76	6 87		90 75	
Building sea wall			30 63			101 97				
Condenser, setting and fitting up										
Repair shop						25 15	5 50		216 00	
Water boat, pontoons, floats, &c		52 80				77 75				
Superintendence, including water, rent, &c						1,200 00	1,320 00			

Report of work at United States works, Flood Rock, New York, for fiscal year ending June 30, 1879—Continued.

	Wages paid watchmen, &c.	Wages paid clerk.	Wages paid overseers and sub-overseers.	Wages paid carpenters.	Wages paid assistant engineers, sounder, and boatmen.	Wages paid laborers.	Wages paid caulkers.	Wages paid painter.	Total cost.	Cost per cubic yard.
Machine work, drill repairs, air-pipe, fittings, &c			$1,697 50			$345 73			$16,748 05	$3 27.4
Explosives, laboratory repairs, fittings, &c						189 20			7,446 03	1 45.6
Getting rock to shaft, track laying, platforms, &c			994 00	$562 33		6,017 04			10,581 02	2 06.9
Hoisting rock, engine repairs, derricks, &c				15 13					1,576 28	30.8
Dumping and track, towing, &c				5 50		1,494 99			3,028 96	59.2
Pumping, repairs, &c				28 88		81 44			6,163 32	1 20.5
Timbering in mine			210 00	55 34		365 52			4,746 64	92.8
Steam launch and "Star"				106 91		13 82		$31 50	3,076 14	60.1
Compressors, setting up and repairs				109 30		567 56			1,649 35	32.2
Tubular boiler repairs						81 67			461 29	09.0
Flue boilers, setting, fitting, &c				187 34		429 74			8,744 03	1 70.9
Hoisting-engines, 17 by 24, setting, fitting, &c			63 00	2 75		100 32			3,402 39	66.5
Building boiler and engine rooms, &c				578 19		348 72			2,007 74	39.2
Building crib				498 43	$57 43	330 32			1,817 58	35.5
Building head-frame, &c				772 73		256 87			2,450 44	48.0
Building sea wall			140 00	2 75		1,609 69			1,885 04	36.9
Condenser, setting and fitting up				95 22		36 96			1,994 48	39.0
Repair shop				265 00		75 00			1,351 66	26.4
Water boat, pontoons, floats, &c				369 16		79 87	$55 00		1,229 19	24.0
Superintendence, including water, rent, &c	$997 66	$1,058 54	1,920 00	1,726 75	2,818 46				12,714 64	2 48.6
Total									93,074 27	18 19.5

Total cost of material	$32,365 70
Total cost of explosives	6,165 11
Total cost of pay-roll	54,543 46
Total cost per cubic yard	18 19.5

Table showing progress on Flood Rock for fiscal year ending June 30, 1879.

Linear feet of galleries driven	1,306.78
Cubic yards removed	5,115.36
Number of holes drilled	13,833
Number of blasts	13,389
Number of exploders used	13,647
Fuzes used, feet	49,138
Boxes hoisted	22,081
Powder used, pounds	11,034.135
Average number pounds powder per cubic yard	2.16

3. WAY'S AND COENTIES REEFS.

In accordance with your instructions the sweep was passed over these reefs during the months of September and October, 1878. Nothing less than 25½ feet below mean low-water was found on Coenties Reef; upon Way's Reef, in addition to some broken pieces, one point of solid rock was found, over which less than 26 feet (about 25 feet) was found. One small surface blast, using 40 pounds of dynamite, was made upon this. The *débris* and other broken stones were ruled off into deeper water by the diver. The sweep being afterwards passed over the reef, nothing less than 26 feet at mean low-water was found upon any point of it.

Amount of pay-roll on two reefs	$285 20
Value of dynamite used	18 00
	303 20

Respectfully submitted.

JAMES MERCUR,
Captain of Engineers.

REPORT OF MR. ROY STONE, ASSISTANT ENGINEER.

STEAM DRILLING SCOW.

The drilling scow was placed on Diamond Reef September 10, 1878, and located on the eastern edge of the reef north of middle. The divers reported small areas of rock exposed, and the dome was lowered twice for drilling; the drills, however, struck through to sand at 3 to 6 feet and proved the rock to be only embedded bowlders; further examination showed the whole northeastern portion of the reef, nearly an acre in extent, and comprising about two-thirds of its whole area, to be of the same character: a bed of stiff clay and cemented sand, filled with rounded bowlders of all sizes up to 20 or 30 tons' weight, and so hard as to defy all ordinary methods of excavation. Upon reporting this fact, I received authority to try the efficacy of streams of water from a powerful steam-pump in cutting away the material and loosening the bowlders.

The experiment was tried at slack water, the divers guiding the hose-pipes, which were lashed to spars held down from above, and was so far satisfactory that it was decided to purchase a large pump and arrange for working it constantly.

The pump purchased was a Worthington Duplex, with 18½-inch steam-cylinders, 10¼-inch plungers, and 10-inch stroke, capable with 80 pounds steam pressure of supplying two streams through 100 feet of 2½-inch hose, with 1¼-inch nozzles, under a pressure of 150 pounds per square inch, and throwing about 400 gallons each per minute.

Each nozzle was attached to a spar about 45 feet long, graduated to show the depth of water, and provided with top and bottom guys to hold it against the tide, with steam tackle for lifting and lowering it, with cross-bars for rocking and twisting it so that the nozzle might work its way downward among the rocks, and with hand tackle for holding it down against the reaction of the discharge.

With this apparatus, which required 4 or 5 men for handling it, no difficulty was found in working in the strongest tideway under 20 to 30 feet of water, and with fully as much effect as upon dry land.

The nozzle penetrated, ordinarily, about 1 foot per minute to a depth of 5 or 6 feet, making a "pot" from 3 to 5 feet in diameter, the clay and sand being washed away and the stones sinking to the bottom when the pipe was withdrawn.

Where large bowlders were found some of them were undermined and sunk below the requisite depth, others were washed out and removed, the largest of these measuring 10 feet in diameter and 7 feet in height.

This method of operation disposed satisfactorily of the edges and projecting points of the reef where the slope was sufficient to carry off the washings into deep water;

but when a level bench was made the washings carried a little way by one tide, and some method had to be devised for carrying them quite off the bench at once. This necessity led to some experiments upon inducing a current in a large pipe laid under water by a small jet of water under high pressure discharged into it.

These experiments which were detailed in my report of November 6, 1878, showed a very economical transmission of power and excellent practical effects in the moving of material.

A pipe 64 feet long and 15 inches in diameter was procured and furnished with an injecting nozzle 1¼ inches in diameter, entering about 4 feet from one end, and curving and discharging toward the other end.

A discharge of 400 gallons per minute through the injector (pressure 150 pounds) gave a discharge from the large pipe of 5,500 gallons per minute (velocity 10 feet per second), and the induced current amounting to 5,100 gallons per minute was sufficient to bring into the pipe sand, gravel, and stone as large as could pass the injector nozzle, and project them some feet beyond its outer end.

In practical use some difficulties were found in holding this pipe athwart the tidal currents, in shifting it as the work required, and in connecting it with the water-boring apparatus so that they might work together. These difficulties were not wholly overcome before the season closed (December 31), but much valuable work was accomplished, and an area of 1,272.9 square yards, about one-fourth of the earth portion of the reef, reduced to the proper depth; at the same time one of Morris & Cuming's grapple dredges cleared the remaining earth portion of such bowlders as could be detached by it, and took from the rock portion the remnants of broken stone from former blasting operations; the material removed amounted to 306.87 cubic yards. This work was necessarily slow and costly, and the expense for grapple, scows, and unloading, was $3,209.03, or $10.13 per cubic yard.

The scow was put into winter quarters December 31, and during the winter necessary repairs were attended to, among others a disused pair of hoisting engines was brought from Hallet's Point, rebuilt on board the scow, and connected to the forward capstans. This is found to be a great improvement upon the former arrangement, and saves much valuable time in heaving the scow; but its full benefit cannot be realized until the same change is made in the stern hauling-gear, which change I would respectfully recommend. If this is done, it will very often be practicable to heave back to position after a blast, and lower the dome upon the same slack water, thus saving a tide.

The scow was brought back to Diamond Reef April 3, and, it having been decided to equip a separate scow with the hydraulic apparatus, preparations were made for drilling, and the rock portion of the reef examined for positions, the hydraulic boring being continued meanwhile upon the earth portion. No rock was found above the depth, excepting detached peaks left between the craters of former blasts. About 20 of these were found, some requiring only 1 or 2 drill-holes, others 6 or 7.

Drilling and blasting these, together with some surface blasting, occupied the time from April 16 to June 1, when the scow was taken to Hell Gate. The accompanying tabular statement will show the details of this work and the success attending it; and it is believed that a fair degree of economy was attained, considering the fragmentary character of the work. * * *

The disadvantages of crater blasting being apparent, I have made it a rule in the subsequent work not to follow the circle of the dome in drilling, but to take only the straight lines of drill pipes across the dome, leaving square work every time for the next position, and taking everything clean as we go. * * *

Shell Drake and an adjacent reef about half as large occupied the scow for the first half of June; the remainder of the month has been spent upon the outlying portions of Frying-Pan, where drilling has been found very difficult owing to the nearly vertical stratification and seamed character of the rock, and to the rapid tidal currents which hold the drills hard against the sides of the pipes and drill-holes and prevent their free fall except at slack water; but the rock, so far, has been very favorable (on account of its deep seams) to surface blasting, the cartridges being laid in the crevices, and very excellent results, as indicated by soundings and the divers' reports, have attended a free use of powder in that manner. Where the rock is in high, narrow-detached ridges as some of it appears here, the surface blasting breaks it down 4 or 5 feet at once and scatters the fragments into deep water; on wider ledges the blast breaks nearly as well and the divers may be able with the aid of tackle from outriggers on the scow to roll or drag enough of the broken rock into deep water to secure the required depth with less expense than would attend grappling; a few days will accomplish this on the outlying portions of the reef, or demonstrate the failure to do it, and the scow will be ready to attack the main Frying-Pan.

Many collisions have occurred here but none of serious consequence. On one occasion, however, the scow was forced about 10 feet from its position while drilling, and the piston-rods and drills bent though not broken. In view of the probable recurrence of this accident, it might be well to arrange some way of making the drill

ropes instantaneously detachable from the engines. Aside from this and the capstan-gear already mentioned, no improvement seems possible or desirable in the drilling scow, and the experience of this year only adds further proof of its admirable fitness for the difficult work allotted to it.

The hydraulic dredging-scow was placed upon Diamond Reef June 18, not fully completed, but ready to commence work. It is a deck scow, 70 feet long, 24 feet beam, and 5 feet deep, and carries a 40-horse-power boiler, received from Hallet's Point, and the pump heretofore described. The main pipe is of wrought iron steam-pipe, 60 feet long and 12 inches diameter, having the same injecting nozzle used in the 15-inch pipe. The mouth, or receiving-end, has a basket or screen, formed of 6 bars of iron riveted to it, and projecting a foot beyond, and converging into a ring through the opening of which the boring nozzle projects about 4 inches, this of heavy pipe 2½ inches in diameter, reduced at the discharge to ¾ of an inch; from the ring backward it curves up between two bars of the basket; then down upon the top of the main pipe, where it is firmly fastened; then up again about 50° to its attachment with the hose.

By this arrangement the boring stream reacting from the bank, and bringing the material it has loosened, is brought into confluence with the induced current which enters through the bars outside the ring, and the two work in entire concert. The other end of the main pipe is brought to the surface so that its discharge can be seen, and that the material carried may be swept as far away as possible by the tide, before it reaches the bottom. The scow is provided with mast and booms, and a double-drum steam hoister and all the necessary hoisting appliances, so that the pipe is easily handled and guided in the most rapid current, and with means of forcing it into or withdrawing it from the bank in which it is working.

The scow is anchored in line with the tide and the pipe is suspended crosswise under it, either directly or diagonally, as desired. The latter can be moved about 60 feet up and down stream, and projected 15 or 20 feet forward without changing position of the scow. It is too early yet to make any exact statement of the capacity of the machine, but I estimate it at 50 to 100 tons per day in material of the character of Diamond Reef.

Respectfully submitted,

ROY STONE,
Assistant Engineer and Superintendent.

Capt. JAMES MERCUR,
Corps of Engineers, U. S. A.

Tabular statement of the operations of the United States steam-drilling scow, from April 16 to June 30, 1879.

	Diamond Reef.	Shell Drake, Hell Gate.	Frying-Pan, Hell Gate.
Cubic yards of rock removed	519.1	.....	.....
Total number of holes drilled	94	54	8
Total number of feet drilled	649.75	433.75	35
Average depth of holes.....feet..	6.89	8.03	4.4
Size of drilling bit.....inches..	5¾	5¾	5¾
Average number of feet of holes drilled by each machine per shift of eight hours	11.1	7.59	2.94
Average cost of sharpening a drill	$1 62	$1 65	$1 65
Average number of feet drilled to each sharpening.....feet..	9.2	8.03	4.4
Expenditure of steel to each foot of holes drilled.....ounces..	3.05	3.05	3.05
Average cost of linear foot of hole drilled, including placing scow, lowering dome, expense of drilling, cost of sharpening drills, expenditure of steel, hoisting up dome after drilling operations, and heaving off scow	$1 57	$1 20	$3 45
Amount of giant powder used for drill-hole blasts.....pounds..	3,142.5	1,967	220
Average number of feet of drilled holes to each cubic yard	1.25	.....	.....
Average number of pounds of giant powder to each cubic yard	7.5	.....	.....
Average cost of linear foot of holes drilled and blasted, including towing to position, running anchors, and all labor and materials expended, and all current repairs and renewals of machinery, &c., explosives, fuses, connections, and general incidentals	$9 89	$5 66	$37 93
Average cost of same per cubic yard	$12 39	.....	.....
Total time of dredging.....hours..	154 8/60	.....	.....
Average cost of dredging and dumping one cubic yard of *débris*	$5 32	.....	.....
Amount of giant powder used for surface blasts.....pounds..	737.5	.....	2,677½
Average amount of powder per foot of drill-hole.....do....	4.84	4.53	5.71
Average cost of powder to foot of drill-hole	$2 17	$2 03	$2 56
Average cost of giant powder to each cubic yard	$3 38	.....	.....
Total cost per cubic yard	$17 71	.....	.....

D 4.

IMPROVEMENT OF HARLEM RIVER, NEW YORK.

In addition to the appropriation of $300,000, made June 18, 1878, there was appropriated by the act of March 3, 1879, $100,000. Both of these appropriations are subject to a proviso in the act of June 18, 1878, that the amounts are not to be available until the right of way is secured to the United States free of cost.

As no money could be expended from these appropriations, an allotment was made from the appropriation for examinations, surveys, and contingencies of rivers and harbors for the purpose of making detailed surveys of the different routes for cutting a canal across the mainland to connect the Hudson and Harlem Rivers. These routes were laid down on the map and holders of property affected by the proposed cut were addressed by letter to ascertain if they would cede to the United States their claim to the property. As but very few signified their willingness to do so, measures were taken by persons interested in the improvement to have a bill introduced in the State legislature which provided for the appointing of a commission to assess benefits and damages and to condemn such land as may be necessary for the proposed cut or canal. Since this bill became a law, detailed maps and descriptions of each piece of property, in any way affected by the proposed cut, have been in progress of preparation to be submitted to the supreme court, this being necessary before the commissioners can be appointed.

This work is in the collection-district of New York.
Nearest port of entry, New York.
Nearest light-house, North Brother Island.
Amount of duties collected for year ending June 30, 1879, $98,046,244.55.
Amount of commerce to be benefited by this work, ——.

ESTIMATE.

For 15-foot channel $2,100,000 00

AMOUNTS APPROPRIATED.

By act of Congress approved June 18, 1878		$300,000 00
By act of Congress approved March 3, 1879		100,000 00
		400,000 00

Money statement.

July 1, 1878, amount available	$300,000 00	
Amount appropriated by act approved March 3, 1879	100,000 00	
		$400,000 00
July 1, 1879, amount available		400,000 00
Amount (estimated) required for completion of existing project		1,700,000 00

D 5.

IMPROVEMENT OF FLUSHING BAY, NEW YORK.

Under the appropriation of March 3, 1879, of $20,000, it is proposed to construct a dike starting from a point near the entrance of Flushing Creek into the bay, thence parallel to the north shore of the bay, for about 3,000 feet.